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CYCLOPÆDIA

UNIVERSITY OF TORONTO

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CYCLOPÆDIA:

OR, AN

UNIVERSAL DICTIONARY

OF

ARTS AND SCIENCES;

CONTAINING

AN EXPLICATION OF THE TERMS, AND AN ACCOUNT OF
THE THINGS SIGNIFIED THEREBY,

IN THE

SEVERAL ARTS, BOTH LIBERAL AND MECHANICAL;

AND THE

SEVERAL SCIENCES, HUMAN AND DIVINE:

The Figures, Kinds, Properties, Productions, Preparations, and Uses of Things
NATURAL AND ARTIFICIAL:

The Rise, Progress, and State of Things

ECCLESIASTICAL, CIVIL, MILITARY, AND COMMERCIAL:

With the several Systems, Sects, Opinions, &c. among

PHILOSOPHERS,		PHYSICIANS,
DIVINES,		ANTIQUARIES,
MATHEMATICIANS,		CRITICS, &c.

The whole intended as a Course of antient and modern Learning.

Extracted from the best Authors, Dictionaries, Journals, Memoirs, Transactions,
Ephemerides, &c. in several Languages.

By **E. CHAMBERS, F.R.S.**

*Floriferis ut apes in saltibus omnia libant,
Omnia nos* ————— **LUCRET.**

THE SIXTH EDITION,
CORRECTED and AMENDED.

IN TWO VOLUMES.

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M.DCC.L. 1750

~~CYCLORAMA~~

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T O T H E

K I N G.

S I R,

THE ARTS and SCIENCES humbly crave audience of Your Majesty. The near connexion they have with the happiness of a people, promises them a favourable reception from a Prince who makes his peoples happiness the basis of his own. 'Tis by them the parsimony of nature is supplied, and life rendered easy and agreeable under its numerous infirmities. By them the mind is reclaimed from its native wildness, and enriched with sentiments which lead to virtue and glory. 'Tis they, in fine, that make the difference between Your Majesty's subjects, and the savages of Canada, or the Cape of Good Hope.

THE protection of ARTS has ever been esteemed the proper province of the Great. 'Tis a branch of the regal office, which a Prince equal to the whole charge of a Crown, will not suffer to be alienated into other hands. From this, do the first and most distinguished names in history derive a large share of their glory: and if there be any age or nation conspicuous above the rest, and which is looked on with envy by our own; it is that wherein the Sovereigns have signalized themselves most in this quality.----But, the time is now at hand, when we are no longer to envy Rome her AUGUSTUS and AUGUSTAN AGE; but Rome, in her turn, shall envy ours.

SOMETHING extraordinary seems intended by providence, in placing such a Prince at the head of such a people: a Prince inspired with a generous passion to devote his cares to the welfare of mankind; and a people conspiring with unexampled ardor and unanimity to all his glorious views. Some of our best Princes have had their hands tied down; check'd by reluctant factions, which opposed every nobler design: Your Majesty has found the happy secret, to make even contention do You homage; and turn opposition itself into approbation and applause.

T H E R E

D E D I C A T I O N.

THERE is a time reserved in fate for every nation to arrive at its height; and the uppermost place on the terrestrial ball is held successively by several states. May not the numerous presages which usher in Your Majesty's reign, give us room to expect that our turn is next; and that what Greece was under ALEXANDER, and Rome under AUGUSTUS Cæsar, Britain shall be under Your Majesty's government and protection.

BUT even this were to under-rate our hopes, which are raised by Your Majesty to something still more truly glorious. Greatness, so fondly coveted, has already cost the world very dear; and though still pursued by unthinking men under almost every shape, is only desirable in a few. Of itself it is rather an object of terror and alarm, than delight; and at best only pleases, when joined with something naturally amiable. From the practice of Your Majesty, men may correct their sentiments, and learn, that greatness has no charm except when founded in goodness. To be Great and a King, is but a small matter with Your Majesty; 'tis a quality many others enjoy in common with You, and to which some have even been doomed to their infamy: 'tis what Herod was, what Nebuchadnezzar was; and what Nero, and Domitian were. But, while some Princes chuse to be great in what is destructive, and others in things wholly indifferent; 'tis Your Majesty's praise to be great in what is the perfection of our nature, and that whereby we approach nearest the Deity. Happy choice! to use power only as the means of rendering your beneficence more diffusive; and thus to make Royalty minister to the happiness of mankind, which it has been used to invade.

YOUR Majesty commands a people capable of every thing. Not more fitted to shine in arms, or maintain an extended commerce; than to succeed in the stiller pursuits of philosophy, and literature. And it will be Your Majesty's glory, not to let any of their talents lie unemploy'd. If Your Majesty gives the word, while some of them are busied in avenging Your cause, by humbling some turbulent monarch; some in extending your dominions by new settlements, and some in increasing your peoples wealth, by new trades: others will be employ'd in enlarging our knowledge by new discoveries in nature, or new contrivances of art; others in refining our language; others in improving our morals; and others in recording the glories of Your reign in immortal song.

THE Work I here presume to lay at Your Majesty's feet, is an attempt towards a survey of the republic of learning, as it stands in Your Majesty's most auspicious reign. We have here somewhat of the boundary that circumscribes our present prospect; and separates the known, from the unknown parts of the intelligible world. Under Your Majesty's princely influence and encouragement, we promise ourselves this boundary will be removed, and the prospect extended far into the other hemisphere.—Methinks I see trophies erecting to Your Majesty in the yet undiscover'd regions of Science; and Your Majesty's Name inscribed to inventions at present held impossible!

I am, with all sincerity and devotion,

May it please Your MAJESTY,

Your Majesty's most dutiful,

and obedient Subject,

and Servant,

GRAY'S INN,
Octob. 15th,
1727.

Ephraim Chambers.

A D V E R T I S E M E N T

Concerning the SECOND EDITION.

WHAT advantages the present Edition has above the former, I had rather the Reader should find in the perusal, than be taught by a formal recital of them: the rather, as an author's second cares, whatever credit they may do his perseverance, do none to his circumspection; his utmost praise, in such case, being to have done that at a second attempt, which he ought to have done at the first.

THUS much, however, it may be necessary to say, in justice to the Booksellers concerned, That the work is now considerably more correct than at its first appearance; as having been re-touched, and amended in a thousand places. Some advantage it likewise has, in being rendered more uniform, its parts in many places better disposed, as well as more conformable to each other, and the References reformed throughout. Some Additions, likewise, the Reader will meet withal; particularly, the articles BOOK, PAPER, BRIDGE, DEGREE, DYING, SATYR, BOG, and a few others of lesser consequence. --- Some other articles, as GYMNASIUM, GYMNASTICS, LUSTRATION, LUXATION, LYRIC, SPINOZISM, PLANETARY, &c. have also been enlarged, for reasons chiefly typographical, and not very necessary to be recited here; the less, as all additions are beyond the main design, which was, to have reserved the additional matters entire for a supplemental work.

SOME persons, perhaps, instead of a new edition, may have expected a new work, agreeable to the plan published some time ago in my paper of Considerations, &c. To obviate any complaints from this quarter, it may be proper to add, that nothing has been wanting on the author's part, to have satisfied their expectations. A considerable part of the copy was prepared, and upwards of twenty sheets actually printed in that method, with a design to have published a volume last winter, and to have gone on publishing a volume yearly, till the whole had been finished. But while things were in this train, the Booksellers were alarmed with a bill in parliament, containing a clause to oblige the publishers of all improved editions of books, to print their improvements separately: which, in the method we were proceeding in, could not have been done without great loss. The bill, indeed, after having passed the commons, failed (when it was least expected) in the house of lords: but as there were apprehensions of its being revived in some subsequent session, when it might have born still harder on the undertakers of this work, they thought best to retreat, before they were further involved.

'TIS possible, the loss, from this alteration of measures, may be the greatest to themselves; and that the public may even be gainers by it: as, by this means, they now have the former book considerably improved, without either its bulk, or its price being sensibly augmented.

P R E F A C E.

IT is not without some concern, that I put this work in the reader's hands; a work so seemingly disproportionate to any single person's experience, and which might have employed an academy. What adds to my apprehensions, is the scanty measure of time that could be employed in a performance, which a man's whole life scarce appears equal to. The Vocabulary of the academy *della Crusca* was above forty years in compiling, and the Dictionary of the French academy much longer; and yet the present work will be found more extensive than either of them in its subject and design, as much as it falls short of them in respect of years, or of hands employed in it.

HERE, the reader might be led to suspect something of dissimulation; and think I first offer him a book, and then give him reasons why I should not have done it. — But his suspicions will abate, when he is apprized of some advantages under which I engaged; which are superior to what had been known in any former work of the kind: since all that had been done in them, accrued, of course, to the benefit of this. I come, like an heir, to a large patrimony, gradually raised by the industry and endeavours of a long race of ancestors. What the French and Italian academists, the abbe Furetiere, the editors of *Trevoux*, Savary, Chauvin, Harris, Wolfius, Daviler, and others have done, has been subservient to my purpose. To say nothing of an inferior class of books of this kind, which contributed their share; dictionaries on almost every subject, from medicine and law, down to heraldry and the manage.

YET this is but a part: I am far from having contented myself to take what was ready collected; but have augmented it with a large accession from other quarters. Few parts of the commonwealth of learning, but have been trafficked to on this occasion. Recourse has been frequently had to the originals themselves on the several arts; and, not to mention what small matters could be furnished from my own stock, the reader will here have extracts and accounts from a great number of books of all kinds, either overlooked by former lexicographers, or not then extant; and a multitude of improvements in the several parts, especially of natural knowledge, made in these last years. If instances hereof were required, I hope there are few pages which will not afford several.

SUCH are the sources from whence the materials of the present work were derived; which, it must be allowed, were more than sufficiently ample: So that the difficulty lay in the form, and economy of it; so to dispose such a multitude of materials, as not to make a confused heap of incoherent parts, but one consistent Whole. — And here it must be confessed there was little assistance to be had. — Former lexicographers have scarce attempted any thing like structure in their works; nor seem to have been aware, that a dictionary was, in some measure, capable of the advantages of a continued discourse. Hence it is that we see nothing like a whole in what they have done: and, for this reason, such materials as they did afford for the present work, generally needed farther preparation, ere they became fit for our purpose; which was as different from most of theirs, as a system from a cento.

OUR view was, to consider the several matters, not only in themselves, but relatively, or as they respect each other: both to treat them as so many wholes, and as so many parts of some greater whole; their connexion with which to be pointed out by a reference. So that by a course of references, from generals to particulars; from premises, to conclusions; from cause, to effect, and vice versa, *i. e.* from more, to less complex, and from less, to more; a communication might be opened between the several parts of the work; and the several articles be, in some measure, replaced in their natural order of science, out of which the alphabetical order had removed them.

FOR an instance. — The article ANATOMY, is not only to be considered as a whole, *i. e.* as a particular system, or branch of knowledge; and accordingly divided into its parts, *human*, and *comparative*: and human, again, subdivided into the *analysis of solids*, and *fluids*, (to be referred to in their several places in the book, where they themselves being treated of, refer to others still lower, and so on) but also as a part of MEDICINE; which, accordingly, it refers to; and which, itself, refers to another higher, &c. — By such means, a chain may be carried on from one end of an art to the other, *i. e.* from the first or simplest complication of ideas, appropriated to the art, which we call the *elements*, or principles thereof, to the most complex, or general one, the name or term that represents the whole.

NOR is the pursuit to be dropped here: but as the elements or data, in one art, are ordinarily quæsit in some other subordinate one, and are furnished thereby; (as here, for instance, the elements of anatomy are furnished by *natural history*, *physics*, and *mechanics*; and anatomy itself may be considered as a datum furnished to *medicine*;) we may carry on the view farther, and refer out of one art or province into the adjoining ones; and thus lay, as it were, the whole land of knowledge open. — It may appear, indeed, with the face of a wilderness; but it should be a wilderness through which a reader might find his way as securely, though not so expeditiously and easily, as through a regular parterre.

IT may be even said, that if the System be an improvement upon the Dictionary; the Dictionary is some advantage to the System; and that this is, perhaps, the only way wherein the whole circle, or body of knowledge, with all its parts and dependencies, can well be delivered. In any other form, many thousand lesser things must needs be concealed: all the pins, the joints, the binding of the fabric, must be invisible of course; all the lesser parts, one might say, all the parts whatsoever, must be, in some measure, swallowed up in the whole. The imagination, stretched and amplified to take in so large a structure, can have but a very general, indistinct perception of any of the component parts. — Whereas the parts are not less matter of knowledge when exists is one, it may seem more natural to consider knowledge in its parts, *i. e.* as divided into separate articles, denoted by so many different terms; than to consider the whole assemblage in its utmost composition; which is a thing merely artificial, and the work of imagination.

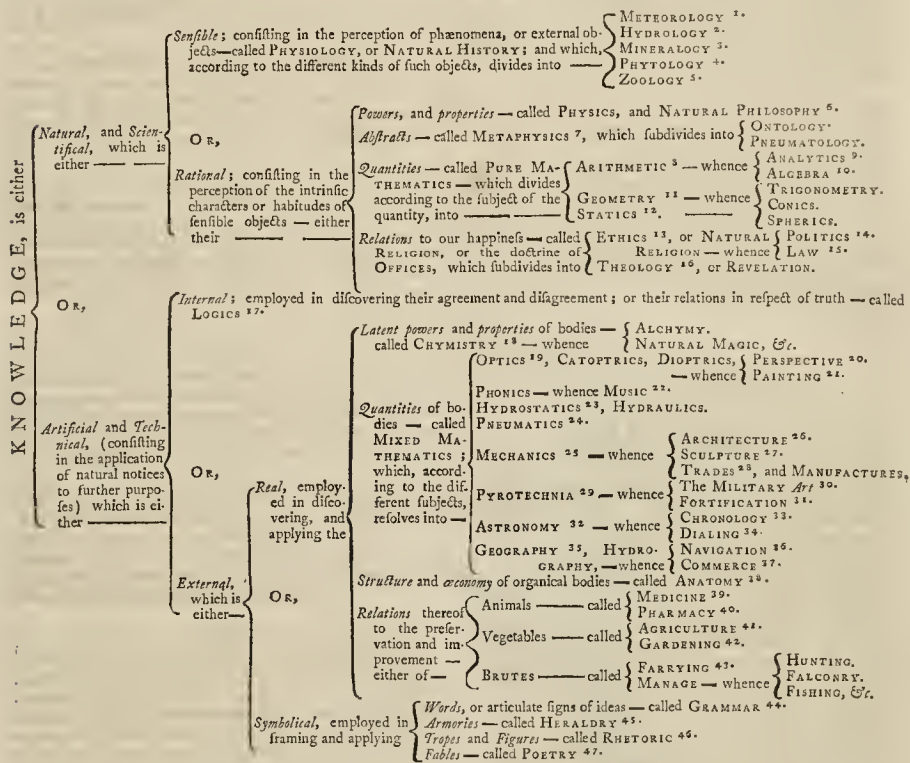
AND yet the latter way must be allowed to have many and real advantages over the former; which, in truth, is only of use and significance, as it partakes of it. — Whence it should follow, that the most advantageous way, is to make use of both: to consider every point, both as a part, to help the imagination to the whole; and

and as a whole, to help the understanding to each part. — Which is the view in the present work. — So far, we mean, as the many and great difficulties we had to labour under, would allow us to pursue it.

IN this view we have endeavoured to give the substance of what has been hitherto discovered in the several branches of knowledge, both natural and artificial: that is, in the knowledge of *nature*, first, as she appears to our senses, either spontaneously, as in *natural history*; or with the assistance of art, as in *anatomy*, *chymistry*, *medicine*, *agriculture*, &c. Secondly, to our imagination; as in *grammar*, *rhetoric*, *poetry*, &c. Thirdly, to our reason; as in *physics*, *metaphysics*, *logics*, and *mathematics*: with the several subordinate arts arising from each, as *agriculture*, *painting*, *sculpture*, *trade*, *manufactures*, *polity*, *law*, &c. and numerous remote particulars, not immediately reducible to any of these heads; as *heraldry*, *philology*, *antiquities*, *customs*, &c.

THE plan of the work, then, I hope, may be allowed to be good; whatever exceptions be taken to the execution of it. It would look extravagant to say, that half the men of letters of an age might be employed in it to advantage; and yet it will appear, that a work accomplished as it ought to be, on the footing of this, would answer most of the purposes of a library, except parade; and contribute more to the propagating of useful knowledge through the body of a people, than half the books extant. — After this, let the reader judge how far I may deserve censure for engaging in it, even under some disadvantages; and whether to have failed in such a design, may not be some degree of praise.

BUT it will be here necessary to carry on the division of knowledge, just laid down, a little farther; and make a more precise partition of the body thereof, in the formal way of an analysis: the rather, as an analysis, by shewing the origin and derivation of the several parts, and the relation in which they stand to their common stock, and to each other; will assist, both in reinstating the scattered articles in the book, and in connecting them together.



THIS is a view of knowledge, as it were *in flamine*; exhibiting only the grand, constituent parts thereof: it would be needless to pursue it into all its members and ramifications; which is the proper business of the book itself. It might here, therefore, seem sufficient to refer, from the several branches thus deduced, to the same in the course of the work; where their division is carried on. And yet this would sometimes prove inconvenient for the reader; who, to find some particular matter, would go a long circuit, and be referred backwards and forwards, from one end of the book to another: to say nothing of the interruptions which may frequently happen in the series of references. — To obviate this, we have taken a middle course, and carried on the distribution further, in the way of *notes* at the bottom of the pages; but this in a looser manner, to prevent the embarrass of a strict analysis, so complex and diffusive as this must otherwise prove. Some

¹ METEOROLOGY, or the history of *AIR* and the *ATMOSPHERE*: including, 1^o. That of its contents, *ETHER*, *FIRE*, *VAPOUR*, *EXHALATION*, &c. 2^o. METEORS formed therein; as *CLOUD*, *RAIN*, *SHOWER*, *DROP*, *SNOW*, *HAIL*, *DEW*, *DAMP*, &c. *RAINBOW*, *PARHELION*, *HALO*, *THUNDER*, *WATER-SPOUT*, &c. *WINDS*, *MONSOON*, *HURRICANE*, and the like.

² HYDROLOGY, or the history of *WATER*; including that of *SPRINGS*, *RIVERS*, *ACIDULE*, *BATHS*, &c. of *LAKE*, *SEA*, *OCEAN*, &c. of *TIDES*, *DELUGE*, and the like.

³ MINERALOGY, or the history of *EARTH*; 1^o. Its parts; as *MOUNTAIN*, *MINE*, *MOSS*, *BOG*, *GROTTO*; and their phenomena, as *EARTHQUAKE*, *VOLCANO*, *CONFLAGRATION*, &c. Its STRATA, as *CLAY*, *BOLE*, *SAND*, &c. 2^o. FOSSILS or MINERALS, as *METALS*, *GOLD*, *SILVER*, *MERCURY*, &c. with operations relating to them; as *FUSION*, *REFINING*, *PURIFYING*, *PARTING*, *ESSAYING*, &c. *LITHARGE*, *LAVATORY*, &c. *SALTS*, as *NITRE*, *NATRON*, *GEMMA*, *ALLUM*, *ARMONIAK*, *BORAX*, &c. *SULPHURS*, as *ARSENIC*, *AMBER*, *AMBERGREASE*, *COAL*, *BITUMEN*, *NAPHTHA*, *PETROL*, &c. *SEMI-METALS*, as *ANTIMONY*, *CINNABAR*, *MARCSITE*,

of the principal articles, in each branch of science, are hereby brought to light, and such as will naturally suggest, and lead to the rest; so that this may afford the reader a sort of *summary* of the whole; and, at the same time, dispense a kind of auxiliary, or succedaneous order throughout the whole; the articles omitted, all naturally enough ranging themselves in their proper places among these. A detail of this kind is of the more consequence,

MARCASITE, MAGNET, BISMUTH, CALAMINE, COBALT, &c. STONES, as MARBLE, PORPHYRY, SLATE, ASBESTOS, &c. GEMS, as DIAMOND, RUBY, EMERALD, OPAL, TURCOISE, &c. EMERY, LAPIS LAZULI, whence ULTRAMARINE, AZURE, &c. PETRIFICATIONS, as CRYSTAL, SPAR, STALACTITES, TROCHITES, CORNU AMMONIS, and the like.

* PHYTOLOGY, or the history of *PLANTS*; their origin in the SEED, FRUIT, &c. Their kinds; as TREE, HERB, &c. Extraordinary species; as TEA, COFFEE, PARAGUAY, VINE, GINSENG, COTTON, TOBACCO, &c. CORAL, MUSHROOM, TRUFFLE, PARASITES, MISTLETO, MOSS, &c. Parts; as ROOT, STONE, FLOWER; WOOD; as GUAIACUM, SASSAFRAS, EBONY, ALOES, &c. LEAVES, FOLIATION, ROLL, &c. BARK; as QUINQUINA, &c. also PISTIL, FARINA, STAMINA, &c. Operations thereof; as VEGETATION, GERMINATION, CIRCULATION, &c. Circumstances; as PERPENDICULARITY, PARALLELISM, FECUNDITY, &c. Productions; as HONEY, WAX, BALSAM, SUGAR, MANNA, &c. GUM, RESIN, CAMPHOR, &c. INDIGO, OPIUM, GALLS, and the like.

† ZOOLOGY, or the history of *ANIMALS*; their origin in Egg, EMERYO, FORTUS, GENERATION, CONCEPTION, GESTATION, HATCHING, MIGRATION, &c. Their kinds; as QUADRUPED, BIRD, FISH, INSECT, REPTILE, RUMINANT, CARNIVOROUS, &c. Extraordinary species; as UNICORN, TORPEDO, TARANTULA, TORTOISE, CAMELION, SALAMANDER, BARNACLE, ANCHOVY, DEATH-WATCH, &c. MONSTERS; as DOUBLE ANIMALS, HERMAPHRODITE, MULE, PIGMY, GIANT, &c. Metamorphoses; as AURELIA, METEMPSYCHOSIS, &c. Parts; as HEAD, HAND, FOOT, FINGER, TAIL, FIN, WING, GILLS, &c. Covering; as HAIR, WOOL, SILK, FEATHERS, &c. Armature; as NAIL, STING, HORN, TOOTH, SHELL, PROBOSCIS, WEB, &c. Productions; as PEARL, BEZOARD, CASTOREUM, CIVIT, MUMMY, USNEA, KERMES, COCHINEAL, &c. Motion; as FLYING, SWIMMING, and the like.

* PHYSICS, or the doctrine of *CAUSES*; as NATURE, LAW, &c. Occasions or means; as PRINCIPLE, MATTER, FORM, &c. Their composition, or constitution, in ELEMENT, ATOM, PARTICLE, BODY, CHAOS, WORLD, UNIVERSE, SPACE, VACUUM, &c. Properties of body; as EXTENSION, SOLIDITY, FIGURE, DIVISIBILITY, &c. Powers thereof; as ATTRACTION, COHESION, GRAVITATION, REPULSION, ELASTICITY, ELECTRICITY, MAGNETISM, &c. QUALITIES; as FLUIDITY, FIRMNESS, DUCTILITY, HARDNESS, VOLATILITY, DENSITY, POLARITY, LIGHT, HEAT, COLD, &c. Operations or effects thereof; as MOTION, RAREFACTION, DILATATION, CONDENSATION, DISSOLUTION, EBULLITION, FREEZING, EVAPORATION, FERMENTATION, DIGESTION, EFFERVESCENCE, &c. VISION, SEEING, HEARING, FEELING, SMELLING, &c. Modifications or changes; as ALTERATION, CORRUPTION, PUTREFACTION, GENERATION, DEGENERATION, TRANSMUTATION, &c. Systems or hypotheses thereof; CORPUSCULAR, EPICUREAN, ARISTOTELIAN, PERIPATETIC, CARTESIAN, NEWTONIAN, &c.—Occult and fictitious qualities, powers, and operations; ANTIPERISTASIS, SYMPATHY, ANTIPATHY, ARCHEUS, &c. MAGIC, WITCHCRAFT, FASCINATION, VIRGULA DIVINA, LIGATURE, TALISMAN, CABBALA, &c. DRUID, BARD, BRACHMAN, GYMNOSOPHIST, MAGI, ROSICRUCIAN, and the like.

† METAPHYSICS, or the doctrine of *ENS*; ESSENCE, EXISTENCE, POWER, ACT, UNDERSTANDING, &c.—The *MIND*, its FACULTIES; APPREHENSION, JUDGMENT, IMAGINATION, REASON, WIT, &c. Its OPERATIONS; REFLECTION, REFLECTION, ASSOCIATION, ABSTRACTION, &c. Its PERCEPTIONS; as SUBSTANCE, ACCIDENT, MODE, &c. RELATIONS; as UNITY, MULTIPLITUDE, INFINITY, UNIVERSAL, &c. QUANTITY, QUALITY, WHOLE, PART, &c. GENUS, SPECIES, DIFFERENCE, &c. PROPER, OPPOSITE, CIRCUMSTANCE, EXTERNAL, &c. Effects hereof; KNOWLEDGE, SCIENCE, ART, EXPERIENCE, &c. Conditions; PROBABILITY, CERTAINTY, FALLACY, &c. Systems hereof; NOMINALS, SCOTISTS, &c.

* ARITHMETIC, including the doctrine of *DISCRETE* or DISCONTINUOUS QUANTITY, viz. NUM-

BER, RATIO, PROPOSITION, &c. Kinds; as INTEGER, FRACTION, DECIMAL, SURD, &c. Relations; as ROOT, POWER, SQUARE, CUBE, &c. RULES or operations thereof; as NOTATION, NUMERATION, ADDITION, SUBTRACTION, &c. REDUCTION, PRACTICE, POSITION, &c. EXTRACTION, APPROXIMATION, &c. Instruments subservient thereto; as LOGARITHMS, NEPER'S BONES, &c.

† ANALYTICS, or the resolution of *PROBLEMS* by SPECIES, or symbolical expressions: RULES or operations hereof; as ADDITION, SUBTRACTION, MULTIPLICATION, &c. Application thereof, in COMBINATION, PERMUTATIONS, MAGIC SQUARES, CHANCES, GAMING, &c. SERIES, PROGRESSIONS, &c. METHODS OF MAXIMIS, FLUXIONS, EXPONENTIALS, TANGENTS, &c.

* ALGEBRA, or the doctrine of *EQUATIONS*; SIMPLE, QUADRATIC, CUBIC, &c. Operations thereof; as REDUCTION, CONSTRUCTION. Objects thereof; PROBLEMS, RESOLUTION, &c.

† GEOMETRY, or the doctrine of *EXTENDED* or CONTINUOUS QUANTITY, viz. 1^o. LINES; RIGHT, PERPENDICULAR, PARALLEL, OBLIQUE, &c. ANGLES; ACUTE, SCALENOUS, VERTICAL, OPPOSITE, &c. 2^o. FIGURES, OF SURFACES; TRIANGLE, SQUARE, PARALLELOGRAM, POLYGON, &c. Circumstances hereof; as PERIMETER, AREA, &c. Operations relating thereto; as BISECTING, DIVIDING, MULTIPLYING, MEASURING, &c. Instruments used therein; as COMPASSES, RULER, SQUARE, PARALLELISM, SCALE, &c. CURVES; as CIRCLE, CYCLOID, CROSSID, CATENARIA, CAUSTIC, EVOLUTE, QUADRATRIX, &c. Circumstances thereof; as AXIS, DIAMETER, RADIUS, CENTER, CIRCUMFERENCE, ABSCESS, ORDINATE, &c. ARCH, CHORD, SINE, TANGENT, SECANT, &c. Instruments used herein; as artificial LINES, CANONS, &c. Operations arising herefrom; as SURVEYING, taking ANGLES OF BEARINGS, &c. with QUADRANT, PLAIN-TABLE, SEMICIRCLE, CIRCUMFERENTOR, &c. taking DISTANCES, with CHAIN, PERAMBULATOR, &c. PLOTTING into DRAUGHT, MAP, &c. with PROTRACTOR, &c. 3^o. SOLIDS, or bodies; as CUBE, PARALLELEPIPED, PRISM, PYRAMID, CYLINDER, POLYHEDRON, &c. Their SUPERFICIES, SOLIDITY, &c. Operations relating thereto; as CUBATURE, measuring of TIMBER, GAUGING, &c. Instruments used herein; as CARPENTERS RULE, SECTOR, SLIDING RULE, GAUGING ROD, &c.—THE SPHERE; its doctrine, PROJECTION, &c. Application thereof; in PLANISPHERE, ANALEMMA, &c.—THE CONE; its SECTIONS, ELLIPSIS, PARABOLA, HYPERBOLA, &c. with its ASYMPTOTES, FOCI, &c. Their CONSTRUCTION; QUADRATURE, RECTIFICATION, &c.

* STATICS, or the doctrine of *MOTION*; its laws; VELOCITY, MOMENTUM, &c. Causes; as GRAVITY, PERCUSSION, COMMUNICATION, &c. Modifications; as COMPOSITION, ACCELERATION, RETARDATION, REFLECTION, REFRACTION, &c. Kinds; as ASCENT, DESCENT, CENTRAL, CENTRIFUGAL, &c. OSCILLATION, UNDULATION, PROJECTION, &c. POWERS, or applications thereof; in LEVER, SCREW, &c. PENDULUM, PROJECTILE, &c. Operations directed hereby; as GUNNERY, the MECHANICAL ARTS, &c. enumerated hereafter.

† ETHICS, or the consideration of *NATURAL INCLINATIONS*, PASSIONS, TASTES, &c. Objects thereof; as GOOD, EVIL, VIRTUE, VICE, BEAUTY, DEFORMITY, &c. PLEASURE, PAIN, &c. RECTITUDE, EQUITY, CONSCIENCE, &c. LAW, OBLIGATION, &c. WILL, LIBERTY, ACTION, ASSENT, &c. NECESSITY, PROMOTION, PROVIDENCE, &c. Systems hereof; STOICS, PLATONISM, ACADEMY, CYNIC, and the like.

* POLICY, or the consideration of *SOCIETY* and *GOVERNMENT*; its origin; in CONTRACT, &c. Constitutions and forms thereof; as, 1^o. MONARCHY, DESPOTISM, &c. Powers thereof; KING, QUEEN, PRINCE, DUKE, EMPEROR, SULTAN, SOPHY, CALIPH, CÉSAR, CZAR, YNCA, ETHNARCH, TETRARCH, DESPOT, and the like. Their TITLES and QUALITIES; MAJESTY, HIGHNESS, GRACE, EXCELLENCE, and the like. Their REGALIA; CROWN, SCEPTRE, TIARA, FASCES, &c. 2^o. ARISTOCRACY, its powers; as ARCHON, DICTATOR, DOGE, SENATE, COUNCIL, &c. 3^o. DEMOCRACY; STATES-GENERAL, STADTHOLDER, PROTECTOR, &c.

THE PREFACE.

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consequence, as it may not only supply the office of a *table of contents*, by presenting the dispersed materials of the book in one view; but also that of a rubric, or directory, by indicating the order they are most advantageously read in.—*Notes*, then, that the initial words of the *notes*, correspond to the final ones of the *analyses*; and that the several members, or items of both, make for many heads or articles in the book.

I

Their SUCCESSION, ELECTIVE, HEREDITARY, by PRIMOGENITURE, &c. Their transfections; as PEACE, WAR, TREATY, UNION, CROISADE, &c. By ARMIES, FLEETS, EMBASSIES, SECRETARY, PLENIPOTENTIARY, ENVOY, LEGATE, NUNTIO, &c. Their TERRITORIES, EMPIRE, SIGNORY, &c. Their ESTATES, NOBLES, COMMONS, CLERGY. CENSUS, ENUMERATION, TRIBE, QUARTER, &c. PROVINCE, CIRCLE, COUNTY, CITY, TOWN, &c. Magistrature, CHANCELLOR, JUDGE, SHERIFF, JUSTICE, MAYOR, ALDERMAN, BAILIFF, CONSTABLE. INTERREX, CONSUL, PRETOR, CENSOR, VISER. TRIBUNE, TRIUMVIR, PROVOST, EPHORI, EDILE, PREFECT, QUESTOR, PROCONSUL, VICE-ROY, LIEUTENANT, STEWARD, WARDEN, KEEPER. JURISCONSULTUS, PROCURATOR, ADVOCATE, BARRISTER, PROTHONOTARY, CUSTOS, PHILAZER, CHIROGRAPHER, USHER, CLERK, &c. Their jurisdiction; COURTS; as AREOPAGUS, COMITIA, &c. PARLIAMENT, DIET, DIVAN. CHAMBER, ASSIZE, PRIVY-COUNCIL, &c. CHANCERY, KING'S-BENCH, EXCHEQUER, ADMIRALTY, VERGE, SESSIONS, TURN, COUNTY COURT, LEET, EYR, &c. TERMS, CIRCUITS, COMMISSIONS, OYER, CONVOCATION, ARCHES, PREROGATIVE, FACULTIES, DELEGATES. ROTA, INQUISITION, &c. Their REVENUES, TREASURY, FISC, EXCHEQUER, TALLY, POLITICAL ARITHMETIC. DUTIES, CUSTOMS, GABEL, EXCISE, &c. COINAGE, MONEY, INTEREST, USURY, &c. Their HOUSEHOLD, CHAMBER, GREEN-CLOTH, WARD-ROBE, &c. Under STEWARD, CHAMBERLAIN, COMPTROLLER, COFFERER, AGA, ODA, &c. GUARDS, ORDINANCE, &c. directed by CAPTAIN, MASTER, QUERRY, &c. MILITIA, NAVY, POST, TIMARIOT, ARRIERE-BAND, &c. DIGNITIES; DAUPHIN, ELECTOR, PALATINE, GRAVE, PALSGRAVE, THANE, EARL, COUNT, KNIGHT, GARTER, BARONET, BATH, TEUTONIC, MALTA, ELEPHANT, &c. GENTLEMAN, YEOMAN, &c. Their NAMES, SURNAMES, TITLES, PRECEDENCE, &c. FACTIONS, PATRICIAN, GUELPH, TORY, &c. CORPORATIONS, or lesser COMMUNITIES, UNIVERSITY, ACADEMY, COLLEGE, SOCIETY, CHAPTER, SCHOOL, HOSPITAL; INN. Public BUILDINGS; HALL, BASILICA, GUILDHALL, PRISON, TOWER, ARSENAL, LIBRARY, MUSEUM, CIRCUS, &c. Solemn CEREMONIES; as TRIUMPH, TURNAMENT, CARROUSAL, QUADRIL DONATIVE, MEDAL, TROPHY, MONUMENT, FUNERAL, TOMB, CATACOMB, &c.

¹⁵ LAW, or the rules and measures of SOCIETY; published in ACT, STATUTE, CHARTER, RESCRIPT, CONSTITUTION, DECRETAL, SENATUS-CONSULTUM, PRAGMATIC SANCTION, &c. Recorded in INSTITUTES, CODE, NOVEL, REGISTER, PANDECT, CORPUS, DOMESDAY, &c. Kinds; CIVIL, CANON, SUMPTUARY, &c. respecting, 1^o. Persons; as the KING; his PREROGATIVE, ROYALTIES, &c. viz. Granting DISPENSATION, PARDON, COMMENDAM, EXEMPTION, DIGNITIES, FRANCHISES, FOREST, PARK, PURLIEU, VERT, CHASE, IMPOST, SUBSIDY, TOLL, TAX, AID, HIDAGE, SCUTAGE, PRISAGE, WAIFE, ESTRAY, ESCHEAT, TREASURE TROVE, &c. OFFICERS, and Magistrates; created by WRIT, WARRANT, COMMISSION, &c. Their OATH, TEST, DECLARATION. VISITATION, PROCURATION, &c. CORPORATIONS; REGULAR, SECULAR, &c. made by CHARTER, PATENT, &c. dissolved by Quo WARRANTO, MANDAMUS, &c. SUBJECTS; as DENIZEN, ALIEN, NATURALIZATION, HUSBAND, WIFE, MARRIAGE, CONCUBINE, SEPARATION, ALIMONY, DOWER, AFFINITY, BASTARD, ADOPTION, EMANCIPATION, LORD, TENANT, VILLAIN, VASSAL, CLIENT, PATRON, SERVANT, SLAVE, RETAINER. MANUMISSION, ENFRANCHISING, &c. TENURE, SERVICE, HOMAGE, FEALTY, SERGEANTY, ESCUAGE, RELIEF, GUARDIAN, WARDSHIP, SOCAGE. HEIR, INTESTATE, ANCESTOR, &c.—2^o. ESTATES, or things; either real, as TENEMENTS, HEREDITAMENTS. FREEHOLD, FEE, CUSTOMARY, TAIL, GAVELKIND, COURTESY, &c. In REVERSION, MORTGAGE, HYPOTHECA, &c. MANOR, DEMESN, HONOURS, COMMON, GLEBE, ADVOWSON, &c. Acquired by OCCUPANCY, PRESCRIPTION, DESCENT, CONVEYANCE, FEOFFMENT, FINE, RECOVERY. DEFEIZANCE, LEASE, DEVISE, ATTORNTMENT, INVESTITURE, LIVERY, &c. Lost by ALIENATION, MORTMAIN, DISEISIN, ABATEMENT, SURRENDER, DISCONTINUANCE, DISCLAIMER, FORFEITURE, RESIGNATION, DEPRIVATION, LAPSE, &c. Of personal; as GOODS, CHATTELS, EMBLEMENS, ANNUITY, DEBTS, SPECIALTY, RECOGNIZANCE, &c. Acquired by SUCCESSION, HERIOT, MORTUARY, HEIR-LOOM, TESTAMENT, EXECUTOR, ADMINISTRATOR, ORDINARY. JUDGMENT, FIERI FACIAS, &c.—3^o. WRONGS OF INJURIES; either to persons; as CRIMES, TREASON, PAR-

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¹⁶ THEOLOGY, or the consideration of GOD; his nature and ATTRIBUTES; as ETERNITY, UBIQUITY, &c. His UNITY, TRINITY, &c. PERSONS, HYPOSTASIS, &c. Our duty to him, discovered by INSPIRATION, REVELATION, PROPHECY, &c. by the MESSIAH, EVANGELISTS, APOSTLES, &c. In the BIBLE; PENTATEUCH, HAGIOGRAPHIA, PSALTER, GOSPEL, APOCALYPSE, &c. CANON, DEUTEROCANONICAL, APOCRYPHA, &c. Circumstances thereof; STYLE, ALLEGORY, TYPE, PARABLE, MYSTICAL, &c. TEXT, VERSION, SEPTUAGINT, VULGATE, &c. PARAPHRASE, TARGUM, &c. POINTS, QUOTATIONS, &c. Matter thereof; Declarations, of INCARNATION, PASSION, CRUCIFIXION, MIRACLES, &c. Injunctions; as WORSHIP, PRAYER, SACRIFICE, &c. SACRAMENTS; as EUCHARIST, BAPTISM, &c. PROMISES; as GRACE, JUSTIFICATION, &c. DEGREES; as PREDESTINATION, ELECTION, REPROBATION, &c. Remedies on our part; SIN, FALL, IMPUTATION, &c. Remedies thereof, by PENITENCE, CONFESSION, &c. Rewards and punishments allotted thereto; HEAVEN, HELL, RESURRECTION, IMMORTALITY, &c. His MINISTERS; ANGELS, DEVIL, &c. His CHURCH; either TRIUMPHANT; as SAINTS, MARTYRS, CONFESSORS, FATHERS, DOCTORS, &c. or MILITANT, &c. Its OFFICES; CREED, LITURGY, DECALOGUE, DOXOLOGY, TRISAGION, &c. Discipline, and rites; as ABSOLUTION, ANATHEMA, EXCOMMUNICATION, &c. CATECHUMEN, CONFIRMATION, GENUFLEXION, &c. Its HIERARCHY; as BISHOP, PRIEST, DEACON, &c. PATRIARCH, ARCHBISHOP, PRIMATE, DEAN, CANON, PREBEND, ARCHDEACON, CHANTOR, &c. Their enligens; MITRE, CROSIER, PALLIUM, &c. Their ORDINATION, CONSECRATION, COLLATION, IMPOSITION, &c. BENEFICES, REVENUES, TITHES, &c. Places sit apart; as CHURCH, CHAPEL, ORATORY, &c. CATHEDRAL, PAROCHIAL, CARDINAL, &c. CHOIR, NAVY, ALTAR, FONT, &c. DIOCESE, PROVINCE, &c. ASSEMBLIES; as SYNOD, COUNCIL, CONVOCATION, CONSISTORY, CHAPTER, PRESBYTER, &c. FEASTS, FASTS, LENT, VIGILS, &c. EASTER, EPIPHANY, PENTECOST, ANNUCIATION, PURIFICATION, PRESENTATION, &c.—Particular SYSTEMS, or professions thereof; viz. REFORMED, or PROTESTANT; as the CHURCH of ENGLAND, LUTHERANISM, CALVINISM, &c. ROMISH, or LATIN; its MASS, BREVIARY, LEGEND, &c. TRANSSUBSTANTIATION, EXTREME UNCTION, SUPEREROGATION, PENANCE, &c. HIERARCHY; POPE, CARDINAL, &c. SECULAR, REGULAR, MONK, RELIGIOUS, ABBOT, PRIOR, &c. ORDER, CONGREGATION, MONASTERY, GENERAL, &c. JESUIT, CARTHUSIAN, CARMELITE, AUGUSTIN, DOMINICAN, &c. THIRD order; COENOBITE, ANACHORET, HERMIT, RECLUSE, MONASTERY, CELL, RULE, VOW, REFORM, NOVICIATE, &c. IMAGE, RELICS, SAINT, VIRGIN, ROSARY, &c. CANONIZATION, BEATIFICATION, &c. INDULGENCE, JUBILEE, EXORCISM, &c.—GREEK; its ANTHOLOGION, PROTHESIS, PARTICLES, &c. MARONITE, JACOBITE, THOMÆAN, &c. ARMENIAN, COPHTI, SOLITARY, &c.—SECTS, and HERESIES; as MANICHEES, GNOSTICS, ARIANS, &c. EBIONITES, NESTORIANS, MILENNARIES, QUARTODECIMANS, &c. MONTANISTS, SOCINIANS, ARMINIANS, &c. PRESBYTERIANS, ANABAPTISTS, INDEPENDANTS, QUAKERS, &c. QUIETISTS, SERVEYISTS, PRE-ADAMITES, &c. DEIST, ATHEIST, SPINOZISM, &c.—

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Jewith;

I might here have ended my preface; and perhaps the reader would be willing enough to be thus dismissed: But something has been already started, which will require further disquisition.—The distribution we have made of knowledge is founded on this; that the several branches thereof commence either Art or Science, according to the agency, or non-agency of the human mind, in respect thereof.—It remains to take the matter up a little higher, and explain the reason and manner of this operation: to consider knowledge in its principles, antecedent to

Jewish; its TALMUD, TRADITION, &c. TEMPLE, TABERNACLE, SANCTUARY, ARK, &c. PONTIFF, LEVITE, TRIBE, &c. EPHOD, THERAPHIM, CIRCUMCISION, SABBATH, SANHEDRIN, &c. RABBIN, DOCTOR, CABBALA, MASSORA, &c. PHARISEE, SADDUCES, ESSEAN, CARAITE, &c. NAZARITE, THERAPEUTA, &c. SAMARITAN, DOSITHEAN, HELLENIST, &c. PASSOVER, SCENOPEGIA, GEHENNA, &c.—MAHOMETAN; their ALGORAN, MUFTI; DERVIS, MOSQUE, MUSSULMAN, &c.—Heathen; their IDOLATRY, THEOGONY, &c. their GODS; PENATES, LARES, LEMURES, &c. SATYRS, SYLVANS, NYMPHS, TRITONS, &c. DEMI-GOD, HERO, FORTUNE, DESTINY, DEMON, GENIUS, &c. APOTHEOSIS, SACRIFICE, &c. FEAST, LUSTRATION, &c. as ELEUSINIA, SATURNALIA, CEREALIA, &c. Ministers thereof; REX, PONTIFEX, FLAMEN, VESTAL, CORYBANTES, &c. GAMES; OLYMPIC, ISTHMA, &c. DIVINATION, ORACLE, PYTHIAN, SIBYL, &c. AUGUR, AUSPEX, &c. TEMPLE, FANE, PAGOD, &c. SECTS; as BANIAN, BRACHMAN, SABBZEAN, &c.

¹⁷ LOGICS, or the consideration of *IDEAS* or *NOTIONS*: their kinds; SIMPLE, COMPLEX, ADEQUATE, &c. Disposition into classes or CATEGORIES, PREDICAMENTS, PREDICATES, &c. Their composition, or association into AXIOMS, PROPOSITIONS, PROBLEMS, THEOREMS, THESES, HYPOTHESES. ARGUMENTS; as SYLLOGISM, ENTHYME, SORITES, SOPHISM, DILEMMA, CROCODILUS, &c. Their RESOLUTION; DEFINITION, DIVISION, &c. into PREMISES, CONSEQUENCES, TERMS, &c. Their TRUTH, FALSHOOD, EVIDENCE, DEMONSTRATION, &c. Operations therewith; as ARGUMENTATION, INDUCTION, DISCOURING, PHILOSOPHISING, &c. DISPUTATION, DISTINCTION, CONTRADICTION, REDUCTIO AD ABSURDUM, &c.

¹⁸ CHYMISTRY, including the use of *FIRE*, WATER, BATHS, FERMENTS, MENSTRUUMS, FURNACES, RETORTS, and other instruments; to change ANIMAL, VEGETABLE, and FOSSILE bodies, by inducing FUSION, PUTREFACTION, FERMENTATION, DISSOLUTION, EXHALATION, &c. and hereby procuring SPIRITS, SALTS, OILS, ACID, ALKALINE, AROMATIC, URINOUS. WINES, VINEGARS, FLOWERS, CALCES, CRYSTALS, SOAPS, TARTARS. REGULUS, MAGISTRY, EXTRACT, ELIXIR. CERUS, MINUM, LITHARGE, QUINTESSENCE, PHOSPHORUS, ALCAHEST, PHILOSOPHER'S STONE, and the like; by the operations of DISTILLATION, EXPRESSION, COHOBATION, SUBLIMATION, RECTIFICATION, CRYSTALLIZATION, CALCINATION, AMALGAMATION, DIGESTION, PRECIPITATION, VITRIFICATION, FIXATION, TRANSMUTATION, and the like.—ARBOR DIANÆ, AURUM FULMINANS, artificial EARTHQUAKE, MAGIC, DIVINATION, &c.

¹⁹ OPTICS, including the laws and consideration of *VISION*, and *VISIBLE* Objects; effected by means of LIGHT: its RAYS; their REFRACTIBILITY, REFLEXIBILITY, &c. FOCUS, TRANSPARENCY, OPACITY, SHADOW, &c.—REFLECTION thereof, in MIRROR, LOOKING-GLASS, CATOPTRIC, CISTULA, &c.—REFRACTION, in LENS, PRISM, GLASS, &c. Application, in TELESCOPE, MICROSCOPE, MAGIC LANTERN, &c. SPECTACLE, POLYMOSCOPE, POLYHEDRON, CAMERA OBSCURA, &c.

²⁰ PERSPECTIVE, or the projection of POINTS, LINES, PLANES, &c. in SCENOGRAPHY, ORTHOGRAPHY, ICHNOGRAPHY, ANAMORPHOSIS, &c.

²¹ PAINTING, or the *DESIGNING* of objects in CLAIR-OBSCURE, PROPORTION, &c. with ORDONNANCE, EXPRESSION, &c. Circumstances thereof; ATTITUDE, CONTRAST, GROUP, &c. Kinds; LIMNING, MINIATURE, CAMIEUX, FRESCO, &c. ENAMELLING, MOSAIC, &c.

²² PHONICS, or the doctrine of *SOUNDS*, VOICE, &c. Their modifications, in ECHO, RESONANCE, WHISPERING-PLACE, SPEAKING-TRUMPET, &c.—Their TUNE, GRAVITY, INTERVAL, &c. TIME, TRIFLE, &c. expressed by NOTE, CHORD, &c. Comparisons thereof; CONCORD, as UNISON, OCTAVE, THIRD, FOURTH, DISCORD, &c. COMPOSITION; as MELODY, HARMONY, COUNTER-POINT. SYMPHONY, SYTAULIA, CHIME, SONG, RHYTHMUS, &c. Kinds; GENUS, MODE, &c. Circum-

stances; KEY, CLEFF, SIGNATURE, TRANSPOSITION, &c. STAFF, SCALE, GAMMUT, SOLFAING, MODULATION, &c. Instruments; ORGAN, BELL, TRUMPET, LYRE, CYMBAL, VIOLIN, HARPSICORD, &c.

²³ HYDROSTATICS, or the consideration of *FLUIDS*; their SPECIFIC GRAVITY, DENSITY, EQUILIBRIUM, &c. Instruments to measure the same; as ARÆOMETER, HYDROSTATICAL BALANCE, &c. SIPHON, TORRICELLIAN, &c.—Motion thereof; in PUMP, FOUNTAIN, SPIRAL SCREW, HYDROCANTHERUM, HYDROMANTIC, &c.

²⁴ PNEUMATICS, or the consideration of the *AIR*; its WEIGHT, DENSITY, PRESSURE, ELASTICITY, &c. CONDENSATION, RAREFACTION, MOTION, WIND, &c. in AIR-PUMP, SUCTION, VACUUM, &c. Measured by BAROMETER, THERMOMETER, HYGROMETER, MANOMETER, &c. ANEMOMETER, WINDMILL, &c.

²⁵ MECHANICS, including the structure and contrivance of *MACHINES*; as BALLANCE, STEELYARD, PULLEY, POLYSPAST, &c. WHEEL, CLOCK, WATCH, PENDULUM, SPRING, FUSEE, &c. CLEPSYDRA, COACH, ROTA ARISTOTELICA, PERPETUAL MOTION, &c. MILL, PRESS, VICE, LATH, LOOM, WINDLASS, &c. Operations of SWIMMING, DIVING, FLYING, &c.

²⁶ ARCHITECTURE, including the construction of *BUILDINGS*; as HOUSE, TEMPLE, CHURCH, HALL, PALACE, THEATRE, &c. SHIP, GALLY, GALLEON, ARK, BUCCANTUR, BOAT, &c. PYRAMID, MAUSOLEUM, PANTHEON, &c. CAPITOL, SERAGLIO, ESCURIAL, &c. ARCH, VAULT, BRIDGE, MONUMENT, TOMB, &c. Forms thereof; ROTUNDO, PLATFORM, PINNACLE, &c. PLANS, DESIGN, ICHNOGRAPHY, PROFILE, &c. Parts; as FOUNDATION, WALL, ROOF, &c. DOOR, WINDOW, STAIRS, CHIMNEY, &c. ORDERS; as TUSCAN, DORIC, CORINTHIAN, &c. CARYATIDES, RUSTIC, GOTHIC, &c. COLUMN; PILASTER, ATTIC, &c. Parts thereof; ENTABLATURE, CAPITAL, PEEDESTAL, &c. CORNICE, FREEZE, BASE, &c. VOLUTE, PEDI-MENT, MODILLION, CONSOLE, &c. MOULDINGS; OEGE, TORE, ASTRAGAL, SCOTIA, ABACUS, OVIOLO, &c. Materials; as BRICK, STONE, TYLE, SLATE, SHINGLE, &c. TIMBER, WAJNSCOT, GLASS, LEAD, PLASTER, &c. BEAM, RAFTER, MORTAR, NAIL, HINGE, KEY, LOCK, &c. QUARRY, MASONRY, &c.

²⁷ SCULPTURE, or the framing of STATUE, FIGURE, ORNAMENT, &c. in RELIEVO, CREUX, &c. as CARVING, POTTERY, PORCELAIN, &c. ENGRAVING; SEAL, DYE, &c. ETCHING, CUTTING, MEZZO-TINTO, &c. FOUNDRY; of BELL, LETTER, ORDINANCE, &c. COINING; MONEY, MEDAL, MEDALLION, &c. PILE, LEGEND, &c. LAPIDARY, TURNING, INLAYING, VANNEERING, DAMASQUEENING, ENCHASING, &c.

²⁸ TRADES and MANUFACTURES; as PRINTING, PAPER-MAKING, BOOK-BINDING, &c. GILDING, JAPANING, GLASS-MAKING, GRINDING, &c. PLUMBERY, FORGING, HAMMERING, &c. WEAVING, BLEACHING, WHITENING, &c. FULLING, DYING, PRESSING, SHEERING, CALENDRING, TABBING, FREEZING, &c. WOOLLEN, SILK, LINUM INCOMBUSTIBLE, &c. CLOTH, SERGE, TAFFETY, STOCKING, &c. VELVET, TAPESTRY, HAT, &c. TANNING, CURRYING, TAWING, &c. SHAMOSING, SHAGREEN, MOROCCO, &c. Making PARCHMENT, GLUE, GUN-POWDER, SMALT, SOAP, STARCH, &c. CANDLE, PAPER, TORCH, &c. STEEL, BUTTON, PIN, NEEDLE, FIFE, FAN, PERUKE, &c.

²⁹ PYROTECHNY, or ARTIFICIAL *FIRE*-WORKS; including the consideration and use of GUN-POWDER, MATCH, FUSEE, &c. Of ORDINANCE, CANNON, GUN, MORTAR, &c. CARRIAGE, CHARGE, PROJECTION, RANGE, POINT-BLANK, RECOIL, &c. PETARD, CARCASS, SHOT, BOMB, GRANADO, &c. ROCKET, STAR, &c.

³⁰ MILITARY ARTS, including the consideration of *ARMIES*, FLEETS, CAVALRY, INFANTRY, &c. consisting of REGIMENTS, TROOPS, COMPANIES, PHALANX, LEGION, &c. SOLDIERS; DRAGON, GRENADIER, FUSILEER, CUIRASSIER, ARCHER, JANISARY, SPAHI, VELITES, ARGYRASPIDES,

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to such intervention of ours; and even pursue it up to its cause, and shew how it exists there: and trace the progress of the mind through the whole, and the order of the modifications induced by it. — This is a desideratum which we could not here decline entering upon, on account of its immediate relation to the present design. It is the basis of all learning in general; the great, but obscure hinge, on which the whole encyclopædia turns.

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GYRASPIDES, GEND'ARMERY, &c. Divided into SQUADRON, BATTALION; BRIGADE, &c. commanded by GENERAL, MARSHAL, BASHAW, ADMIRAL, &c. LIEUTENANT, BRIGADIER, COLONEL, CAPTAIN, SERJEANT, MAJOR, ADJUTANT, ENSIGN, QUARTER-MASTER. TRIBUNE, CENTURION, PRIMIPILUS, &c. in BATTLE, SIEGE, MARCH, CAMP, &c. Ranged in LINE, COLUMN, &c. Motions; ATTACK, RETREAT, HALT, &c. EVOLUTIONS; WHEELING, COUNTER-WHEELING, &c. SIGNALS; WORD, DRUM, CHAMADE, &c. GUARDS; GARRISON, PIQUET, PATROOL, ROUND, QUARTER, PLACE OF ARMS, &c. STANDARD, BANNER, EAGLE, LABARUM, &c. Their ARMS; ARTILLERY, CARABINE, MUSQUET, &c. HELMET, BUCKLER, PELTA, CUIRASS, &c. ARIES, BALISTA, CATAPULTA, SLING, &c.

³¹ FORTIFICATION, or the construction of *FORTRESSES*; as CITADEL, CASTLE, TOWER, &c. FORT, STAR, REDOUBT, &c. WORKS, or parts thereof; RAMPART, BASTION, DITCH, COUNTERSCARP, CURTIN, &c. RAVELING, HORN-WORK, CROWN-WORK, &c. APPROACHES; TRENCH, SAP, MINE, &c. LINE, PARALLEL, CIRCUMVALLATION, &c. BATTERY, ATTACK, &c.

³² ASTRONOMY, or the doctrine of the *HEAVENS*; their CIRCLES, ECLIPTIC, ZODIAC, MERIDIAN, EQUATOR, VERTICAL, AZIMUTH, GALAXY, &c. POINTS; as POLE, ZENITH, NADIR, &c. Celestial bodies, viz. STARS, SUN, &c. Assemblage thereof; into SIGN, CONSTELLATION, &c. Their PRECESSION, CULMINATION, REFRACTION, DECLINATION, ASCENSION, LONGITUDE, LATITUDE, ALTITUDE, AMPLITUDE, AZIMUTH. PLANETS; as SATURN, VENUS, EARTH, MOON, SATELLITE, COMET, &c. Their PLACES, ASPECTS, SYZGY, CONJUNCTION, QUADRATURE, DIAMETER, DISTANCE, PERIOD, REVOLUTION, ORBIT, NODE, &c. Their STATION, RETROGRADATION, EQUATION, &c. Their PHASES, ECLIPSE, PENUMBRA, OCCULTATION, PARALLAX, CREPUSCULUM, MACULE, &c. Observations thereof; taken with the QUADRANT, GNOMON, MICROMETER, RETICULA, &c. Collected in CATALOGUE, TABLES, &c. HYPOTHESES, or SYSTEMS thereof; COPERNICAN, TYCHONIC, PTOLEMAIC, &c. Exhibited in SPHERE, GLOBE, &c.

³³ CHRONOLOGY, or the doctrine of *TIME*; measured by YEAR, MONTH, WEEK, DAY, HOUR, AGE, PERIOD, CYCLE, &c. Commencing from EPOCHA, INCARNATION, HEGIRA, &c. Laid down in FASTI, ALMANACK, CALENDAR, JULIAN, GREGORIAN, &c. Accommodated to FEASTS, FERIE, EASTER, &c. by means of EPACT, GOLDEN NUMBER, DOMINICAL, &c.

³⁴ DIALING, including the FURNITURE, and projection of *DIALS*; HORIZONTAL, DECLINING, RECLINING, DEINCLINING, &c. MOON-DIAL, RING-DIAL, HORODICTIONAL, &c. Instruments; as DECLINATOR, ANALEMMA, SCALES, &c.

³⁵ GEOGRAPHY, including the doctrine of the *EARTH*, or *GLOBE*: its CIRCLES; PARALLEL, TROPIC, HORIZON, AXIS, POLES, &c. Its ZONES, CLIMATES, &c. Its PLACES; their LONGITUDE, LATITUDE, DISTANCE, ELEVATION, &c. Inhabitants; ANTIPODES, ABORIGINES, TROGLODYTES, ASCII, PERSICI, &c. Instruments relating thereto; GLOBE, MAP, &c.

³⁶ NAVIGATION, or the consideration of *SAILING*; in SHIP, FRIGATE, BARK, &c. Parts thereof; MAST, ANCHOR, SAILS, YARDS, CORDAGE, CAPSTAN, RUDDER, DECK, &c. Their COURSE, RHUMB, &c. shewn by COMPASS, NEEDLE, VARIATION, &c. Directed by STEERING, CURRENT, &c. Distance, or RECKONING, by LOG, OBSERVATION, LONGITUDE, LATITUDE, &c. Taken by FORE-STAFF, BACK-STAFF, ASTROLABE, NOCTURNAL SINICAL QUADRANT, &c. Wrought by GUNTER, CHART, MERCATOR, TRAVERSE, &c. The operations of SOUNDING, WEIGHING, CAREENING. SIGNALS; BUOY, &c.

³⁷ COMMERCE, or the affairs of *MERCHANTS*; including MONEY, COIN, SPECIES, &c. as POUND, CROWN, SHILLING, PENNY, STERLING, DUCAT, DOLLAR, PIECE of eight. TALENT, SESTERCE, SHEKEL, and the like. WEIGHTS; LIBRA, OUNCE, &c. MEASURES; FOOT, YARD, STANDARD, &c. Given in EX-

CHANGE, TRUCK, PERMUTATION, COMMUTATION, &c. for MANUFACTURE, SPICE, DRUG, WOOLEN, SLAVE, NEGRO, &c. IMPORTED, EXPORTED, TRANSPORTED, CONVOY, FLOTA, &c. Conditions thereof; TARIFF, CONTRABAND, CHARTER-PARTY, FREIGHT, AVERAGE, &c. CUSTOMS, DUTY, TUNNAGE, POUNDAGE, &c. BOTTOMRY, ASSURANCE, PIKE, &c. Transacted by COMPANY; as HANS, STEEL-YARD, EAST-INDIA, TURKEY, HAMBURGH, MISSISSIPPI, SOUTH SEA, ASSIENTO, REGISTER, COLONY, FISHERY, FACTORY, &c. At STABLE, FAIR, MARKET, BANK, EXCHANGE, &c. By COMMISSION, FACTOR, BROKER, &c. WEIGHING, paying by BILL; at USANCE, ACCEPTANCE, PAR. PROTEST, DISCOUNT, RECHANGE, &c. ACTION, SUBSCRIPTION. BOOK-KEEPING, &c.

³⁸ ANATOMY, or the ANALYSIS of *ANIMAL BODIES*, and their PARTS, viz. BONES; as CRANIUM, RIB, VERTEBRA, RADIUS, FEMUR, TIBIA. SACRUM, PUBIS, PATELLA, &c. Their ARTICULATION, APOPHYSES, &c. MUSCLES; ABDUCTOR, ADDUCTOR, ERECTOR, DEPRESSOR, DELTOIDES, SARTORIUS, CUCULLARIS, ORBICULARIS, SPHINCTER, &c. Their TENDONS, FIBRES, &c. VESSELS; as ARTERY, AORTA, ASPERA, TRACHEA, PULMONARY, &c. VEINS; as CAVA, PORTA, JUGULAR, CAROTID, &c. GLANDS; as PANCREAS, PAROTIDES, PROSTATES, &c. NERVES; OPTIC, OLFATORY, AUDITORY, &c. LYMPHATIC, LACTEAL, MESARAIIC, MUCILAGINOUS, &c. Their VALVES, TUNICS, ANASTOMOSES, &c. Their HUMOURS; as CHYLE, BLOOD, SPIRIT, SEED, GALL, URINE, MILK, SWEAT, MARROW, &c. MEMBRANES; PANNICLE, CUTIS, CUTICULA, PAPPILLA, &c. VENTERS, HEAD, MENINGES, BRAIN, &c. EYE, EAR, PUPIL, TYMPANUM. TONGUE, TOOTH, PALATE, LARYNX, GLOTTIS, OESOPHAGUS, &c. VISCERA, STOMACH, LUNGS, HEART, &c. LIVER, SPLEEN, KIDNEY, INTESTINES, BLADDER, &c. FUNCTIONS or operations thereof; RESPIRATION, DEGLUTITION, DIGESTION, CHYLIFICATION, SANGUIFICATION, CIRCULATION, SYSTOLE, NUTRITION, SECRETION, EXCRETION, PERSPIRATION, VOMITING, &c. GENITALS; PENIS, TESTICLES, CLITORIS, MATRIX, NYMPHA, HYMEN. EMBRYO, ZOOPHYTE, MOLE, &c. ERECTION, GENERATION, CONCEPTION, GESTATION, DELIVERY, LOCHIA, MENSES, &c.

³⁹ MEDICINE, including the consideration of *LIFE* and *HEALTH*: conditions thereof; LONGEVITY, STRENGTH, TEMPERAMENT, &c. Means; as FOOD, DRINK, EXERCISE, &c. Opposites; as DEATH, DISEASE, &c. Kinds hereof; CHRONIC, EPIDEMIC, CONTAGIOUS, &c. as PLAGUE, FEVER, GOUT, APOPLEXY, EPILEPSY, PALSY, POX, POLYPUS, PALPITATION, MANIA, HYDROPHOBIA, SPASM, HYPOCHONDRIC, PHTHISIS, SCORBUTUS, DROPSY, TYMPANITES. LEPRO, ITCH, PLECA, OPHTHALMIA, GUTTA, CATARACT, and the like. WOUND, ULCER, CANCER, FRACTURE, FISSURE, CARIES, and the like. SYMPTOMS; SIGN, DIAGNOSTIC, PULSE, URINE, &c. PRESCRIPTION, CRISIS, CURE, &c. REGIMEN, DIET, MEDICINE, &c. Kinds hereof; SPECIFIC, PURGATIVE, EMETIC, DIAPHORETIC, DIURETIC, ALTERNATIVE, SYMPTIC, ASTRINGENT, EMOLIENT, OPIATE, ABSORBENT, CAUSTIC, ANODYNE, SYMPATHETIC, CARDIAC, CEPHALIC, FEBRIFUGE. ANTIMONIAL, CHALYBEAT, MERCURIAL, and the like. OPERATIONS; as EVACUATION, PHLEBOTOMY, SUTURE, LITHOTOMY, AMPUTATION, INOCULATION. SALIVATION, COUCHING, CUPPING, TREPANNING. TOUCHING, PARACENTESIS, STROAKING, TRANSFUSION, CASTRATION, CIRCUMCISION, and the like.

⁴⁰ PHARMACY, or the PREPARATION and COMPOSITION of *REMEDIES*; as MITHRIDATE, TREACLE, HIERA PICRA, LAUDANUM, DIASENNA, TURBITH, CALOMEL, &c. in the form of ELECTUARY, CONFECTION, EXTRACT, TINCTURE, SYRUP, TROCHE, PILL, POWDER, LOHOC, POTION, APOZEM, DROPS, medicated ALES, WINES, WATERS, UNGUENT, EMLASTER, PURGE, CLYSTER, SUPPOSITORY, PESSARY, COLLYRIUM, &c. From DRUGS, or SIMPLES; as GUAIAIACUM, SASSAFRAS, COLOCYNTHIS, CROCUS, RHUBARB, CASSIA, SENNA, CORTEX, STYRAX, JALAP, SCAMMONY, OPIUM, &c. FATS, CLAWS, HORNS, &c. of VIPER, CRAB, ELK, &c. CANTHARIDES, MILLEPEDES, MUMMY, USNEA, ICHTHYOCOLLA, &c. ANTIMONY, ORPIMENT, ASPHALTUS, BISMUTH, MARCASITE, BOLE, CINNABAR, MARS, VENUS, &c.

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TO be more explicit.—Words are the immediate matter of knowledge; I mean, of knowledge considered as communicable, or capable of being transmitted from one to another. We should have known many things without language; but it would only have been such as we had seen or perceived ourselves. The observations of others, could no way have been added to our own; but every individual must have gone through a course for himself, without any assistance either from predecessors, or contemporaries.—It is evident, that in this case, nothing like an art or science could ever have arose: the little system of things, which come immediately in one man's way, would but have afforded a slender stock of knowledge; especially to a being whose views were all to terminate in himself. Add, that as the chief occasions of his observation would have been of the same kind with those of other animals; it is probable his knowledge would not have been very different, whether we consider its quantity or quality. It is confessed, that all our knowledge, in its origin, is no other than sense; whence it should follow, that one being has no natural advantage over another, in its dispositions for knowledge, other than what it has in the superior number, extent, or acuteness of its senses.

IT is, then, to language that we are chiefly indebted for what we call *science*. By means of language our ideas and notices, though things in their own nature merely personal, and adapted only to private use, are extended to others, to improve their stock. And thus, by a kind of second sense, a man gets perceptions of the objects that are perceived by all mankind; and is present, as it were by proxy, to things at all distances from him: we hear sounds made a thousand years ago, and see things that pass a thousand miles off. If the eagle really sees, the raven smells, and the hare hears, farther and better than man; their sense, at best, is but narrow, in comparison of ours, which is extended, by the artifice of language, over the whole globe. They see with their own eyes only; we with those of a whole species.—In effect, by language, we are upon much the same footing, in respect of knowledge, as if each individual had the natural sense of a thousand: an accession, which, alone, must have set us far above any other animals. But at the same time, this very accession of a multitude of ideas, more than naturally belonged to us, must have been, in great measure, useless, without certain other faculties of ordering and arranging them; of abstracting, or making one a representative of many; of comparing them together, in order to learn their relations; and of combining them, &c. The effect thereof, is what we call *discoursing*, and *philosophizing*; whence arise *doctrines, theories, &c.*

EVERY word is supposed to stand for some point, article, or relation of knowledge. From which it follows, that the vocabulary of any language, is representative of the several notices of the people, among whom it obtains: I mean of the primary, or absolute notices; for by the construction of these words with one another, a new set of secondary, or relative notices are expressed.—To enter better into this, it may be observed, that the several objects of our senses, with that other set of things analogous hereto, the proper objects of the imagination, are represented by fixed names*: denoting some of them, individuals†; others kinds‡, &c. Now these, which make the first, or fundamental part of a language, it is obvious, are no other than a representation of the works of nature and art, as they exist in a kind of still life, or in a state of inaction, and independency one upon another. But, in regard we do not find the Creation thus quiescent, but observe a great number of mutations arise in the things we are conversant among; we are hence put under a necessity of framing another set of words, to express these variations, and the actions to which they are owing, with the several circumstances and modifications thereof§. By this means, nature is removed, as it were, out of her dormant constitution, and shewn in action; and thus may occasional descriptions be framed, accommodate to the present state of things.

* AGRICULTURE, or the TILLAGE and improvement of SOILS, CLAY, SAND, EARTH, &c. by the operations of PLOUGHING, FALLOWING, BURNING, SEMBRADORE, SEMINATION, MANURING, &c. To produce CORN, HEMP, FLAX, LIQUORICE, SAFFRON, &c. For MALT, FARINA, &c. GRANARY, THRESHING, &c. The culture of TREES, TIMBER, &c. by PLANTING, SHROWDING, BARKING, &c. For COPPICE, PARK, PADDOCK, HEDGE, PASTURE, &c.

† GARDENING, including the culture of HERBS, FLOWERS, FRUITS, &c. as DWARE, STANDARD, WALL, ESPALIER, SALET, &c. The operations of PLANTING, TRANSPLANTING, REPLANTING, WATERING, ENGRAFTING, INOCULATING, PRUNING, PINCHING, VARIEGATING, &c. Preventing DISEASES, BLIGHTS, GUM, &c. The Use and ordering of a HOT-BED, GREENHOUSE, NURSERY, GARDEN, VINEYARD, &c. Their EXPOSURE, WALLS, HORIZONTAL SHELTER, &c. WALKS, GRASS-PLOT, TERRACE, QUINCUNX, PAR-TERRE, &c.

‡ MANAGE, including the consideration of HORSES; their AGE, COLOUR, TOOTH, HOOF, STAR, &c. PACES; as AMBLE, GALLOP, &c. AIRS; as VOLTE, DEMIVOLTE, CURVET, CAPRIOLE, &c. AID, CORRECTION, HAND, BIT, &c. SADDLE, SHOE, BRIDLE, &c. DISEASES; as HALTING, FARCY, STAGGERS, SCRATCHES, YELLOWS, &c. Operations; as ROWELLING, CURTAILING, GELDING, &c.—HAWK, HAWKING, HOOD, &c. RECLAIMING, CASTING, &c. PIP, FILANDERS, &c.—HOUND, HUNTING, &c. RUT, STALKING, BIRDLIME, TRAMMEL-NET, BAT-FOWLING, &c.—FISH, FISHING, FISHERY, &c. ANGLING, HOOK, ROD, FLOAT, &c. BAIT, FLYING, HUMING, &c.

§ GRAMMAR, or the consideration of LANGUAGE; as ENGLISH, LATIN, GREEK, HEBREW, FRENCH, &c. Their DIALECT, IDIOM, PATAVINITY, &c. Matter thereof; LETTER, VOWEL, CONSONANT, DIPHTHONG, ASPIRATE, CHARACTER, SYMBOL, HIEROGLYPHIC, &c. SYLLABLE, PARTICLE, &c. WORD; kinds hereof; NOUN, PRONOUN, VERB, &c. SUBSTANTIVE, ADJECTIVE, &c. Their CONSTRUCTION, CONCORD, REGI-

MEN, &c. IN CASE; NOMINATIVE, GENITIVE, &c. GENDER; MASCULINE, &c. NUMBER, PERSON, MOOD, TENSE, &c. INTO SENTENCE, PHRASE, PERIOD, &c. Distinguished by POINT, ACCENT, COMMA, &c. Delivered by PRONUNCIATION, WRITING, ORTHOGRAPHY, &c.

¶ HERALDRY, or the consideration of COATS; consisting of FIELD, CHARGE, FIGURE, &c. as CROSS, CHEVRON, BEND, PALE, &c. with ABATEMENT, DIFFERENCE, QUARTERING, &c. Composed of COLOUR, METALS, POINTS, &c. Born on ESCUTCHEON, SHIELD, &c. Accompanied with SUPPORTERS, HELMET, CREST, MANTLING, MOTTO, &c. DEVISE, EMBLEM, REBUS, ÆNIGMA, &c. And described by BLAZON.

‡ RHETORIC, or the means of PERSUASION; as INVENTION, AMPLIFICATION, TOPIC, PLACE, ARGUMENT, PASSIONS, MANNERS, &c. DISPOSITION, EXORDIUM, NARRATION, CONFIRMATION, PERORATION, &c. ELOCUTION, SUBLIME, STYLE, NUMBERS, &c. FIGURES; as EXCLAMATION, PLEONASM, EPIPHONEMA, APOSTROPHE, PROSOPOEIA, ANTI-THESIS, &c. TROPES; as METAPHOR, ALLEGORY, SYNECDOCHE, SARCASM, HYPERBOLE, CATACHRESIS, &c. ACTION, GESTURE, MONOTONIA, &c. COMPOSITIONS; as ORATION, DECLAMATION, PANEGYRIC, &c. PARABLE, ESSAY, DIALOGUE, HISTORY, &c.

¶ POETRY, including the consideration of VERSE; its MEASURE, FEET, QUANTITY, &c. as HEXAMETER, ALEXANDRINE, SPONDEE, IAMBIC, &c. RHYME, STANZA, &c. COMPOSITIONS; as EPIGRAM, ELEGY, SONG, MADRIGAL, HYMN, ODE, PINDARIC, &c. ECLOGUE, SATYR, GEORGIC, &c. ANAGRAM, ACROSTIC, BURLIQUES, MACARONIC. LEONINE, TROUBADOUR, &c. DRAMATIC; as TRAGEDY, COMEDY, HILARIO-TRAGEDIA, FARCE, &c. Parts thereof; ACT, SCENE, PROTASIS, EPITASIS, CATASTROPHE, &c. Circumstances; PROLOGUE, EPILOGUE, SOLILOQUY, CHORUS, &c. LAWS, UNITY, ACTION, &c. EPIC; its FABLE, HERO, MACHINES, &c. CHARACTERS, MANNERS, SENTIMENTS, &c. PERSONIFICATION, PROPOSITION, INVOCATION, EPISODE, &c. ILIAD, ODYSSEE, RHAPSODY, &c.

* Nouns.

† Proper Names.

‡ Appellatives.

¶ Verbs, Particles, Adverbs, &c.

HENCE arise two kinds of knowledge; the one absolute, including the standing phenomena; the other relative, or occasional, including what is done, or passes with regard to them. The former is, in some sense, permanent; the latter is merely transient, or historical. The first is held forth, as already observed, in the vocabulary; the second is vague, and uncircumscribed by any bounds; being what fills all the other books. In effect, this last, being in some measure casual, may be said to be infinite: for that every new case, *i. e.* every new application and combination of the former, furnishes something new.

IN the wide field of intelligibles, appear some parts which have been more cultivated than the rest; chiefly on account of the richness of the soil, and its easy tillage; but partly too, by reason of the skilful and industrious hands under which it has fallen. These spots, regularly laid out, and conveniently circumscribed, and fenced round, make what we call the *Arts and Sciences*: and to these have the labours and endeavours of the men of curiosity and learning, in all ages, been chiefly confined. Their bounds have been enlarged from time to time, and new acquisitions made from the adjoining waste; but still the space of ground they possess is but narrow; and there is room either to extend them vastly, or to lay out new ones.

THEY were divided, by their first discoverers, into a number of subordinate provinces, under distinct names; and have thus remained for time immemorial, with little alteration. And yet this distribution of the land of science, like that of the face of the earth and heavens, is wholly arbitrary; and might be altered, perhaps not without advantage. Had not Alexander, Cæsar, and Gengiskan lived, the division of the terraqueous globe had, doubtless, been very different from what we now find it: and the case would have been the same with the world of learning, had no such person been born as Aristotle. The first divisions of knowledge, were as scanty and ill concerted, as those of the first geographers; and for the like reason: and though future Bacon, Cartes's, and Newtons, by opening new tracks, have carried our knowledge a great way further; yet the regard we bear to the antient adventurers, and the established division, has made us take up with it, under all its inconveniencies, and strain and stretch things, to make our later discoveries quadrate thereto. I do not know whether it might not be more for the general interest of learning, to have the partitions thrown down, and the whole laid in common again, under one undistinguished name. Our inquirers, in such case, would not be confined to so narrow bounds; but we should be led to explore many a rich track, now doomed to lie neglected because without the pale.

ART, and SCIENCE, are, indeed, words of familiar use, and great significance, but, I doubt, little understood: philosophers have long laboured to explain and ascertain their notion and difference; but all their explanation amounts to little more, than the substituting one obscure notion for another. Their attempts have usually terminated in some abstracted definition, which rather casts obscurity, than light on the subject; and expresses very little of the essence, and obvious phenomena thereof.— To come at which, we must be at the pains of a new investigation.

TO SCIENCE, then, seem to belong such things as men may discover by the use of sense and reasoning: whatever the mind descries in virtue of that faculty whereby we perceive things and their relations, is matter of science: such are the laws of nature, the affections of bodies, the rules and criterions of right and wrong, truth and error, the properties of lines and numbers, &c. Science, in effect, is the result of reason and sense, in their general or natural state, as imparted to all men, and not modified, or circumstantiated by any thing peculiar in the make of a man's mind, the objects he has been conversant among, or the ideas he has present to him. In fine, science is no other than a series of deductions, or conclusions, which every person, endued with those faculties, may with a proper degree of attention, see, and draw: and a science, *i. e.* a formed science, is no more than a system of such conclusions, relating to some one subject, orderly and artfully laid down in words. Thus a person who has all the ideas expressed in Euclid's *Definitions*, and sees the immediate connection of those in his *Axioms*; which no man, acquainted with his language, can be supposed without; may be said to have it in his power, with attention and industry, to form all the theorems, and problems that follow: He has nothing to do, but to range those ideas orderly in his mind, compare them together, one by one, in all their changes, and put down the immediate relations observed in the comparison, *i. e.* their parity, imparity, &c. And after the relations of each to each are thus got, which make a kind of primary propositions; to proceed to combine them, and take down the relations resulting from a comparison of the several combinations. By such means, without any other helps than penetration, and perseverance, might he make out an infinite number of propositions; possibly more than Euclid has done: there being a new relation, *i. e.* a new proposition, resulting from every new combination.

TO ART, on the other hand, belong such things as mere reason would not have attained to; things which lie out of the direct path of deduction, and which require a peculiar cast, or turn of mind, to see or arrive at. A man might call these, the results of particular, or personal reason, in opposition to the former; but that such a denomination would be thought unphilosophical. It may, perhaps, be more just to consider reason, here, as modified or tinged with something in the complexion, humor, or manner of thinking of the person; or as restrained and diverted out of its proper course, by some views or notices peculiar to him.— The difference between the two, may be illustrated by that between wit and humour; the former whereof is a general faculty of exciting agreeable and surprizing pictures in the imagination; and the latter a particular one: the former is pure and absolute in its kind; the latter tinged with something foreign and complexional.

AN *art* and a *science*, therefore, only seem to differ as less and more pure: a science is a system of deductions made by reason alone, undetermined by any thing foreign, or extrinsic to itself: an art, on the contrary, requires a number of data, and postulata, to be furnished from without; and never goes any length, without, at every turn, needing new ones. It is, in one sense, the knowledge and perception of these data that constitutes the art: the rest, that is, the doctrinal part, is of the nature of science; which attentive reason alone will descry.

AN art, in this light, appears to be a portion of science, or general knowledge, considered, not in itself, as science, but with relation to its circumstances, or appendages. In a science, the mind looks directly backwards and forwards, to the premises, and conclusions: in an art we also look laterally, to the concomitant circumstances. A science, in effect, is that to an art, which a stream running in a direct channel, with regard to any thing but its own progress, is to the same stream turned out of its proper course, and disposed into cascades, jets, cisterns, ponds, &c. In which case, the progress of the stream is not considered, with regard to itself, but only as it concerns the works; every one of which, modifies the course of the stream, and leads it out of its way. It is easy to trace the progress of the former, from its rise, to its issue; in regard it flows consequentially: but a man ever so well acquainted with this, will not be able to discover that of the latter, in regard it depends on the genius, humor, and caprice of the engineer who laid the design.

THESE are some of the different characters, or conditions of *art* and *science*; but there is a difference between them prior to any of these, and of which these are only consequences. The origin of them all lies higher, in the principle of action, or operation, above specified; namely, as the mind is either active or passive, in respect of them. With regard to this, those things may be said to belong to science, which we only

fee, or perceive; which flow from the nature and constitution of things, by the sole agency of the author thereof; subservient only to his general purposes; exclusive of any immediate agency, or intervention of ours. — And, on the contrary, those things belong to art, wherein such science or perception is further modified, and applied by us, to particular purposes and occasions of our own. — From hence arise the several differences above-mentioned: for the matters of art are only personal, as they are, according to the measure of the artist's natural faculties, in respect of quantity, and degree; and to the complexion and cast of his moral faculties, in respect of their quality. The perception, even of matters of art, is of the nature of science: so that thus far the two agree: and their differences only commence, from the superinducing a farther modification in the matter of such perception; and the giving it a new direction to some particular end. By means hereof, it becomes invested with a new set of conditions, and circumstances wholly personal; as being all framed, and adapted to the particular view and aim of the artist, and conducted according to his particular degree of knowledge and address; which is the effect of a particular set of objects, and a particular organism of body. In a word, in art there is a moral view or motive, superadded to the natural science, or perception; which motive is the proper principle, or primum mobile of art: perception is its matter; and some member of the body its organ, or instrument. And from such new principle, &c. arise a new set of secondary perceptions analogous to the natural, and primary ones. — The whole, therefore, ends in this, that science arises from a natural principle, art from a moral one; or even, as moral matters are also, in one sense, natural, science may be said to be of divine original; art of human*.

HAVING

* THIS doctrine may seem to overturn the Aristotelian definition of art: *Artis est habitus mentis cum reâ ratione effectivus*, a habit of the mind operative according to right reason; which, at first sight, appears to be taken from a partial consideration of the subject. — If it be the single character or condition of art, to proceed according to right reason; the more and purer this reason, the more perfect the art. But, in some of the arts, reason appears to have little to do; and the less, as those arts are in greater purity and perfection. — Thus it is in poetry; a man that would undertake an ode, or an epic poem, on the strength of his reason, would be miserably mistaken: all his efforts would not carry him above the humble sphere of versification, where he must be contented to wait for an impulse of another kind. So far is reason from leading the way, that it can scarce follow at a distance, so as to keep in sight. The principle of motion is evidently something other than reason; otherwise, the greatest philosophers would be the best poets, and vice versa. On the contrary, most of us have known people weak enough in their rational, yet powerful in their poetical faculties. Poetry is an appendage of one kind of madness, and accordingly passes, among physicians, for a symptom thereof. — Let not this be thought any reflection upon the poets: a spice of the *μανιακος παθος*, is no unagreeable thing; a man, seated on that bench, finds himself in very good company; some of the greatest philosophers, prophets, legislators, doctors, fathers, and saints, of all ages, being confessedly his associates. It is remarkable with what respect and awe the ancients treated people suspected to be touched: the very names they called them by import a high veneration, and places them as it were, at the threshold of Jupiter †. One of their most common appellations, *numine afflatus*, is, at the same time, the most just and philosophical that can be thought of. In effect, a share of fury and enthusiasm is held, by them, a condition absolutely necessary, in order to rise above the crowd. We may add, that the poets themselves have, an hundred times, expressly attributed all their greater and happier thoughts, to enthusiasm, ecstacy, and fury; and they do it implicitly, almost in every piece they write: it being their standing practice, to take a formal leave of common sense at first setting out, and call a muse for their future guide; which, to talk out of the poetical style, is as much as to say, they resign themselves over to the conduct of genius, and imagination, which they now find strong and prevalent in them: thus inspired, a new scene of objects arises: castles on castles: and they see things invisible to other eyes. — From such prevalence of imagination, arises what we call *ΠΟΙΗΣΙΣ*, which is common to all men, in a greater or less degree: philosophers have a little of it, poets a great deal, and lunatics scarce any thing else.

IT may look strange to say, that the principle is precisely of the same kind in them all. We are used to consider it, in the two first, as constitution; in the latter, as disease: in the former, it is only occasional; in the latter, perpetual: in the one, it is arbitrary, and uncontrollable; in the other, limited, and restrained. The bacchus, in the one case, drives of necessity, as wanting cable and anchor to hold her; and in the other, falls out of choice, as finding the wind favourable, and the voyage desirable. But all this amounts to little more than a difference in degree, between the fictions of the poet, and those of the lunatic: the moving principle is the same in both, though its effects be various. If the proper balance and adjustment between the powers of reason and imagination be wanting, yet they still retain their nature: as the wind is the same, whether the pilot directs the helm or not.

THIS doctrine is plainly countenanced by the ancients; who, in some respects, seem to have had clearer and juster notions than the moderns; as being less embarrassed with the jargon and refinements of the scholastic learning. Philosophy, with them, was one degree more simple, and obvious than among us: nature was not yet covered and concealed under so much elucidaion, but afforded more frequent, and nearer views of herself. — Accordingly, the divine Plato, in his *Phædrus*, asserts, “that enthusiasm and madness, are one and the same thing;” and has a long and cogent discourse, to prove that it must be so: and among the several species of enthusiasm, he expressly ranks poetry. In effect, the *συναίσθησις*, and *μανιακος*, make two of the principal branches in his division of enthusiasm, or inspiration. And Plutarch, though he divide enthusiasm somewhat differently from Plato; yet agrees with him in making poetry a species of it. Nay, the most reserved of all the ancient critics, Longinus, declares, “that the poet is possessed with a kind of enthusiasm, that he believes he really sees what he speaks; and represents it so to others, that they catch the enthusiasm, and see it likewise.” Add, that speaking of the orators, he does not scruple to use *συναίσθησις* and *μανιακος*, as synonymous with *μανια*.

THE principle, then, of the art of poetry, is something other than reason; and I know of no art that has more of the nature and essence of an art, than poetry: nothing that can fashion, build, and produce things so fine, and so fast: sculpture, architecture, agriculture, &c. are arts, but in an inferior degree. — And yet, turning another side of things forward, poetry will scarce appear to have any thing of an art in it, but rather to be all the work of nature; wherein human thought and study have the least hand. It is produced by a principle superior to that of reason, *i. e.* a more immediate action of the author of nature. — But the same may be said of most of the other arts; and when we say that art produces effects, we mean nature does so. The poet's imagination may be considered as a field, wherein the author of nature produces a set of objects, which existed not before: new images arise here, like new plants, according to the settled laws of the Creator; so fruitful is the womb of nature! New worlds, innumerable, arise out of every particle of an old one.

THE *sublime* arts, as some love to call them, *i. e.* those from which permanent effects arise, may be considered, as so many secondary, or derivative natures, raised by engraftment, from the old stock; and spreading out, or projecting from this or that part thereof. — Here, at first sight, man appears somewhat in quality of creator; the potter's power over his clay, has been made a shadow or similitude of that of the Deity over his works; and yet the potter, at that, is only accessory, or occasional to his own productions. Nature, that is, the power or principle of action and motion, to which we owe this visible frame, and all the appearances and alterations therein, acts by fixed laws, which necessarily produce different effects, according to the different circumstances of things: thus a glass globe, being swiftly revolved about its axis, and a hand applied to its surface, grows warm, emits light, attracts bodies, &c. *i. e.* becomes a hot, luminous, electrical body; though, before, it had none of those properties. So gunpowder, a mass of dark, inert, motionless matter, being only touched with a lighted brand, instantly blazes up, and smokes, with noise; perhaps bursts a rock, or drives a ball in a parabolical direction, and levels a tower, or other work. — Now nothing arises here, but in consequence of pre-established laws, which import, that the globe and the powder, whenever by any means they come under such circumstances, shall exhibit such appearances. There are no two bodies in nature more different from each other, than the same is from itself, under the different circumstances of contiguity, or non-contiguity with some other body, *e. gr.* with a spark of fire. But both states are equally natural; and there must be a law of nature, to produce the appearance of one state, as well as of the other. — Now the agency of man amounts to this, that he has it in his power to put bodies in such circumstances, as are necessary to make this or that respective law take hold of them. And this we call *art*; and by this means, we can produce a number of things, or bring them into act, which otherwise would have remained in eternal non-entity. — Man may be said to create them, but no otherwise than the apothecary creates the blister, or the gardener the apple; *i. e.* those effects would necessarily have arisen, upon the same position of the cantharides and the cutis, and the scion and stock, if there never had been apothecary or gardener in the world.

WE may define the works or productions of art, therefore, to be all those phenomena, or effects, which would not have arisen without the agency or intervention of man. But man can only be said to act, or intervene so far, as what he does is his own principle, without being moved, or directed by any external power; *i. e.* so far as he is exempted from the influence of any necessary laws of nature, concurring, however remotely, to such effect. So that if, as some philosophers have maintained, man were not really and truly a free agent, there would be no such thing as art, in the sense here understood; but art would only be a name given to that system or series of effects, to which man is made by nature, and in her hands, subservient; and might, with equal reason, be attributed to such effects, as any other natural production is subservient to.

WE see then, how far man is concerned in the productions of art. Our endeavours are contrived, by nature, to be means accessory to the laws taking place, from whence the effects are to arise. We are part of the chain, whereby the effect is connected to the cause. The circumstances are in our power, on which such and such laws depend; and thus far we may be said to be active, in the case of art; supposing that there is nothing higher, or further; and that the chain ends with us: in a word, that our agency is not subordinate, but collateral to that of the Almighty. But if there be other superior laws which respect those same circumstances and which are not in our power, *i. e.* if the circumstances necessary to the former laws be, themselves,

† Θεραπειαι, Ειδωσιςται, Ειδωσιτικοι, Οισθησιται, Εθεισι, Καταχοι, Εκστασι, Phrenetici, Pythii, Siderii, &c.

HAVING discussed the nature and characters of *art* and *science*, it remains to settle the notion of a *TERM* of *art*; an expression as little understood as any thing in nominations of knowledge, under this or that habitude; of. The whole compais of words, in all their cases, is supposed equivalent to the whole system of possible science,

themselves, supposed the effects of necessary laws, and the immediate work of nature; our agency will dwindle into nothing. The utmost that can be said of us in such case, is, that we are active in respect of the one, and passive in respect of the other; which, to most people, may appear a kind of contradiction. — The statue cannot be formed, unless our inclination concur thereto; so far its existence depends on us: but are our inclinations, with respect thereto, of our own growth; or do they arise naturally, in consequence of an apprehension of good, and advantage in the subject? That is, does any thing appear good and advantageous to us, absolutely, and of itself? or only what the Creator represents to us as so? And do we desire and pursue this seeming good, from any principle and tendency that is in us, other than what we owe to his laws? The difficulty seems to amount to this; whether between our faculties of apprehending, or willing, and their respective objects, there be any relation which he did not create? If any allege, that it is such relation constitutes the faculty; and therefore, that the question ends in this, whether our faculties are from God, or ourselves; *i. e.* whether they be the causes of themselves? I should suspect some sophism in the case, which, at present, I have not penetrated enough to detect.

BUT, having traced the agency of man thus far, we must here desist; and from the passive arts, resume the consideration of the active ones; *i. e.* we must pass from what art does out of us, to what it does in us: or rather, from the arts whose source is supposed in ourselves, and which proceed outwards; to those whose source seems without us, and act inwards; that is, from those which arise from our observation and reason, directing us how to minister occasions to the laws which obtain in the external world; to those which flow into our imagination, and furnish occasions to the laws which obtain in the internal world. — An inquiry which may, perhaps, carry us where the reader little imagines; but which will afford an ample discussion of the principle above established; and a further insight into the origin and cause of science and art, and the nature and measure of our agency, and passion therein.

WE have already said some thing concerning poetry; not for its own sake, but as a proper instance to illustrate the nature of art in. It makes the lowest article in our *Analysis*, and may be considered as the last in the scale of arts; there being a sort of progression, from the beginning of the analysis, to the end. It begins with the first matter of knowledge, the common objects of our senses; and proceeds through the various modifications they undergo by the other faculties of imagination and reason, till those sensible objects become so much our own, are assimilated to us, and, as it were, humanized; that they are part of ourselves, and obey and take directions from our will, and minister to all our views and purposes: of which, this of producing images, and making fables, is, in one sense, the most conspicuous; inasmuch as the greatest effects here, arise from the slenderest means and endeavours. The poet lifts but little in the matter; but nature co-operates so strongly with him, that this little suffices, even to make new worlds. In effect, the poet seems, as it were, to sit nearer the spring of action than other men; and to have only to do with the general, and higher principles thereof, which command and direct a number of other subordinate ones, that he himself is not ordinarily aware of. What we shall say of poetry, therefore, will hold proportionally of all the other arts; and we have only kept to that, because the influence or inspiration is here the most apparent and palpable. — The principle or spirit of poetry, may be said to be that of art in general; and hence many authors make no scruple, to make all arts the invention of poets; thus it is that Homer is often complimented, with being the father of all arts.

THE mind is allowed to be passive, in respect of the matter of the art of poetry. We need not quote the poets to prove it; no true poet ever questioned his inspiration: every body knows that their whole system is built on the supposition. And hence the stories of *Apollo* and the *Muses*, of *Helicon* and *Parnassus*; the dreams of *Pindus* and the *Sovian* maids; but the philosophers, and critics also, give them their suffrages, and attest their inspiration, in the strongest terms. Plato contends at large, that all poetry is “by immediate divine inspiration, in the proper and literal sense of the word.” Aristotle confirms it; “*ἐστὶν ἡ ποίησις*, poetry comes by divine inspiration.” And Plutarch says as much of all the branches of enthusiasm, poetical, divinator, bacchical, or corymbantal, martial and erotic: to all which, he asserts, the appellation, *ἐνθουσιαστικόν*, or *ἐνθουσιαστικὸν καὶ θεοειδὲς*, equally agrees. — And not only so, but they hold the enthusiasm communicable from one to another. It arises from the poet, as its centre, and is diffused in orbem; in a less degree of intensity, the further it recedes from him. Plato asserts, that the *ἰαχῶν*, or those who sung and rehearsed the poets works on the public theaters; nay, and the spectators themselves, were all divinely inspired, in some degree; which he illustrates in case of a needle touched by a magnet, which communicates an attractive property to another needle; that, to a third; and so on, but with a continual diminution. — Nor does the effect end here, but the professors of other arts, as sculpture, criticism, and even philosophy itself, borrow their flame and inspiration from this fire. Thus Phidias declared he was inspired to make that wonderful statue of *Jupiter Olympius*, by the reading of *Homer*; and thus Aristotle may be said to have been inspired by the same poet, to compile his immortal *Poetics*: the like one of our own poets says of *Longinus*; that he was inspired by the mules, or with the fire of a poet.

BUT after poetry, rhetoric comes next, and shares most of the spirit thereof: accordingly Plato, in his dialogue inscribed *Meno*, allows, that “as we say pythians, prophets, and poets, are divinely agitated; so we do of orators.” Elsewhere he adds, “that they are “certainly inspired of God, and plainly possessed.” So *Dion. Hal-*

“*carneus* relates, that *Demothènes* did plainly *ὑβουαῖν*.” And adds that the distemper caught so among his audience, that “they were “possessed at second hand, and brought to do many things against “their own reason and judgment.” And *Æschines*, his professed enemy and antagonist, allows as much. I need not say, that *Plutarch* relates the like of *Cicero*, in the instance of his oration to *Cæsar*, for *Ligarius*.

SOMETHING like this has been observed, even in the case of prayer to God: several heretics are on record for possessing their hearers that way. *Hackett*, executed for blasphemy under queen *Elizabeth*, is said, by the historian, “to have ravished all that heard him at his “devotions, and converted many in spite of their teeth;” and *Saravivus* relates, the people were persuaded that “God directed his “tongue.” *S. Basil* even affirms, “that our prayers are never right “or acceptable, till the fervour thereof carry us out of ourselves, so “that God possesses us in some extraordinary manner.” And hence the learned and pious *Casaubon* establishes a new kind of enthusiasm, which he calls *applicativo*, or *precatory*. To say no more, the author last mentioned makes no scruple, to rank even “the ordinary “delights and benefits men receive from the harangues of orators, “sophists, preachers, &c. among the effects of enthusiasm and inspiration; as being what could never have arisen from mere common “sense.” And *Plutarch*, and others, make that ardour which the soldier feels in battle, of the same kind with that which inspired the prophet, orator, and poet.

WE have here little less than a system, sufficient to account for most of the phenomena in the moral world, on principles of enthusiasm: and yet there are only a few, out of infinite instances, of the immediate agency and inspiration of the deity. We find the same principle in every art, every invention, every discovery; where no natural and necessary connexion is perceived between the discovery, and something known before. What has no immediate dependence, either on what we perceive by sensation, or reflection, comes by the vehicle of inspiration, *i. e.* of imagination, for there it rises. The imagination may be called the medium of art, as sense is of science. The faculty of reason, can make no great discoveries; it can only advance from one step to another, which must be ready laid to its hand; and if there be any where interrupted or discontinued, there it is at a stand. It is, in fine, a limited principle, subject to very narrow bounds; whereas the imagination seems to be indefinite, and still kept in the Creator’s hand, to be occasionally made use of for the conduct of mankind.

THE truth is, when we say, such a thing is the effect of enthusiasm, or inspiration; (speaking, I mean of profane matters, the inspiration, for instance, of scripture, being matter of a very different consideration, and quite beside our present purpose) this does not remove it out of the ordinary course of things; it does not put it on any principle different from that, whereby causes and effects succeed each other in the physical world. We can account for the phenomena of the imagination, as well as those of sensation. They have their respective laws, like other things, which they are subject to; and to which we have arts and processes appropriated. In effect, all the inspiration here spoken of, may be produced without any great conjuration. — If the reader will not take offence at this novel philosophy, he may be convinced of it. And so. In the instance of the poetical kind.

THE inspiration of poetry is of a still and pure kind; and needs little artifice and apparatus, to produce it in an imagination naturally disposed for it. The attentive consideration of some interesting object, usually suffices to set it a-going. And the gentlemen of that faculty have all nature to chide out of: the finest seasons, the most agreeable scenes, and the most moving objects. Hence it is, that they are continually harping on “groves and shades, and gods and nymphs, “and darts and flames.” — How do they riot in “meadows, trim “with daisies pied; shallow brooks, and rivers wide: towers and “battlements they see, bosom’d high in tufted trees.” Sometimes they sing of “knights and squires, and maids forlorn.” Then, “tilts and tournaments, and feats of arms: pomp, and feast, and revelry, with masque and antique pageantry: stories of Thebes, “or Pelop’s line; or the tale of Troy divine; of Arthur and “Cambuscan bold; of Cambal and of Algaris, and who took Ca- “nace to wife.” If these fail, they have all that is gloomy, and solemn, and terrible in nature, at their beck; we may now expect to see “the red bolt, or forked lightning glare.” Earthquakes and tempests seldom roar in vain: if by chance they do, the “ill-boding “raven’s croak” is ready at hand; or else “the far-off cypress fountains, “o’er some wide watery shore, swinging flow with solemn roar.” And now for “baleful ebon shades, and ragged low-brow’d rocks;” next enter “horrid shapes, and shrieks, and sights unholly: Gorgons, “and Hydres, and Chimera’s dire.” Images of things most moving to sense, readily alarm and raise a commotion in the imagination. And the new ideas thus procured, coming to be mixed, and combined in the imagination, with others there before; new effects arise from them, in consequence of the laws of the Creator: much as intelligibly as fire and flame, upon mixing spirit of nitre, and oil of cloves.

SCALIGER distinguishes two kinds of *ἑνθουσιασμοῦ*, or poets divinely inspired: the first, those on whom the inspiration falls, as it were, from heaven; without any thought or seeking; or, at least by means of prayer and invocation. The second, those in whom it is procured by the fumes of wine. — All required to the first, is a delicate, pregnant imagination; susceptible of any feeble impressions, that may happen to be made in the course of things; and ready to take fire at the least spark. The surfaces of the finer fluids, we find, are kept in continual motion, by the bare tremor of the atmosphere, though to us insensible: and thus the air is never so still, but that the alpin

ence, though it is only a small part thereof that is actual, *i. e.* only a few of the possible combinations are, or ever will be made.

THE business of knowledge, then, is cantoned out among the body of words: but they do not bear equal shares thereof. Being creatures of our own, we have dealt with them accordingly; and made some more, others

leaf feels its impulse, and bends and trembles to it; when others require a ruder gust to move them: yet these, too, give way in a general storm; whose forests then totter indifferently: accordingly, we read, in ancient history, of whole nations being at once seized with the poetical fury; few of the cities of Greece, not even Athens itself, with all its philosophy, but has, one time or other, laboured under these epidemical enthusiasms.

WE have already observed, that invention is the principle, or source of poetry: an excellent poet of our own age adds, that it is this which furnishes art with all its materials; and that, without it, judgement itself can, at best, but steal wily. — Now this faculty of invention itself, is usually no other than a delicacy, or readiness of taking hints: but even at most, what we are said to *invent*, results or arises from something already in us. Invention produces no new simple ideas: those can only come by the way of sense and observation; all that passes in the other case, is, that from the memory of certain things, *i. e.* the comprehension of certain ideas to the mind, certain new images or pictures arise, according to the order of things. The sprightly imagination is led, on various occasions, to compound its ideas; and many of them so oddly and boldly, that we take its productions for new things; and thus think we invent them, because they did not before exist in that form: there is no more real invention in the poet, than in the tlapetly or mosaic worker, who ranges and combines the various coloured materials furnished to his hand, so as to make an assemblage or picture, which before had no existence.

THE reader who has any doubt about this, need only take the first piece of poetry that comes in his way, to be convinced that all that is new, and moving in it, is no other than new composition, and combination of sensible ideas. In the *Illegre*, and *Il Penitente*, two of the most poetical pieces in our, or perhaps in any language; how easy is it to resolve all that is so magical and ravishing, to the new, uncouth, and frequently wild and romantic assemblages of imagery! Who can contain himself at — “ Sport which wrinkled care
“ derides, and laughter holding both his sides. — Cynthia peeping
“ through a cloud, while rocking winds are piping loud. — To hear
“ the lark begin her flight, and singing startle the dull night; or early
“ cock with lively din, scatter the rear of darkness thin: or, listen
“ how the hounds and horn, loudly rouse the slumbering morn. —
“ or see glowing embers, through the room, teach light to count-
“ erfeit a gloom. — Or, storied windows richly dight, casting a dim
“ religious light. — Or hear Orpheus sing such notes, as warbled to the
“ string, drew iron tears down Pluto’s cheek.”

PERSONIFICATION, which is of that extent and importance that it is usually held the life and essence of poetry, is a vast source of new imagery. By this, not only different objects, but different systems and worlds are combined and blended together; and what belongs to one kind of beings, man, is attributed to every other; each object, either of sense or imagination, being occasionally invested with all the characters and properties belonging to the human kind. Thus an arrow grows impatient, and thirsts to drink the blood of a foe; or solters and tops half way, loth to carry death, &c. So an action of the body, *laughter*, is represented, by Milton, as itself laughing, ready to burst its sides. One of the planets, the moon, is represented as tricked up, and frowned; and again as kerchiefed, and in a decent undress, and thus going a hunting. To tell us that a fine spring morning, attended with a gentle gale of wind, is very pleasant; presently — “ Zephyr with Aurora playing, as he met her once
“ maying, on a bed of violets blue, and fresh-blown roses dipt in dew,
“ filled her with a daughter fair, yclep’d in heaven Euphrosyne, and
“ mirth on earth.” How consistent with the nature of things, that a breath of air should lay an early hour of the day down; and that, from a green gown thus given, a passion of the mind should in time be brought forth? In effect, the inspiration of the poet frequently amounts to little more, than relating things that are naturally incongruous. He does not invent, he only transposes; nor has he the least power to move, other than what he derives from the novelty and strangeness of his combinations; to which nothing exists in the ordinary system, any way conformable. — To say no more, if invention furnish art; memory furnishes the invention; and sensation the memory, where all knowledge originally commences. And the whole process is nothing but the action or operation of the Deity, in a course of laws.

AS to the second kind of poets, in whom the inspiration is excited by means of wine; Cataubon is perfectly frightened at it, judging it the highest strain of impiety, to suppose a man may be divinely inspired by the fumes of liquor. — And yet I do not know whether his fright be not founded on a misapprehension. If Scalliger alledge, that the juice of the grape may be a means or condition, necessary to make the laws that concur to invention take place; I do not see what religion has to do here, more than in any other enthusiasm. The use of such means is no way derogatory to the power or goodness of God, who still remains the author of this, as of any other inspiration; whether it be by visions, by voices, dreams, or the like. — What matters it, whether the sound of a cymbal, or the sight of an image, or the effluvia of a liquor, be the occasion? And of all the blessings this juice is made the instrument of to us; why should it be precluded from that, which even the vilest of God’s creatures occasionally minister?

THE inspiration of orators, bears a near relation to that of the poets; though being somewhat grosser, it demands more industry and art. — Quintilian tells us how a rhetor is to get inspired: “ not by
“ supinely lolling and gazing at the next moveable, and carelessly
“ turning things over in his mind; but by imagining the judge and
“ the audience present, and strongly representing to himself the time,
“ the occasion, &c.” He adds, that no body ought to pretend to be

an orator, unless he have this art of inspiration at command; so that he can raise it at pleasure.

WHAT has been said above, contains some of the general principles of enthusiasm, and their connection with other physical effects: and it would be easy to trace and pursue the same, where they appear in other cases, and with other circumstances. Thus the inspiration, excited by the orator in his audience, is resolved, by Cataubon, into the music of the speaker, *i. e.* the tone and cadence of his voice; and the *sublimis*, or order and placing of his words: in which last, how simple and trivial soever it may seem, all the great matters on the subject allow somewhat mysterious, and unaccountably forcible; and accordingly make it the principal part of rhetoric. And yet there is nothing in the whole, but what results from the powers, properties, &c. of the several letters, considered as so many sounds, artfully combined. In effect, there is some *εὐφροσύνη*, or numbers, and some *πίεσις*, or dimension, in all diction; much more in that of oratory; and music itself has no charm in it, but what it derives from those very sources.

NOR must it be omitted, that the use of metaphors contributes its share to the effect: the secret whereof consists in this, that they are, as it were, accommodated to the senses; and present such images to the imagination, as move us most, when perceived in the way of sensation.

AS to that enthusiasm felt in prayer, its cause it not far to seek. The powers of rhetoric and music, and a peculiar fervour of imagination, raised by an apprehension of the presence of God, &c. will go a great way. We may add, that the ancient heathens made use of dithyrambs in all their most solemn prayers; which, Proclus observes, are peculiarly fit to stir up enthusiastic dispositions. A man that rides Pindar’s horse cannot well fall of going at a great rate.

BUT the most extraordinary, and unaccountable kind of inspiration is still behind, *viz.* that of prophecy, divination, discovering cures by dreams, &c. which yet may all be produced by art; and accordingly, they have all been taught and studied like other arts: not to say, also, practised like them for a livelihood. Schools and colleges of prophets, divines, augurs, &c. were numerous, both among Jews and Gentiles; and there was little in their discipline, but what may be resolved into what has been already said. Here, all the means abovementioned, all the springs of enthusiasm were used; and frequently all combined together, to make the more compound and extraordinary effect. The sight of vast objects, as rocks and mountains, wild prospects, solitary groves, gloomy caves, furious rivers, seas, &c. which we find to work so strongly on the mind, were indulged; and frequent changes, and sudden transitions were made from one to another. Such unusual objects, necessarily suggested unusual ideas; which were heightened by proper applications to all the other senses. And when the patient was at length got out of the ordinary system of thinking, what he uttered was judged oracular. And among a large train of objects, which presented themselves to him, some could not want an analogy to things that were really to happen; at least in the opinion of a person already possessed with the notion thereof. It may be added, that the prophecies themselves, had their share in producing futurity; the events whereof partook of the predictions, some more, others less, according to the degree of possession of the parties concerned in them. In effect, the revelation still retained something of the means made use of to raise it. And hence a revelation was artificially producible of the complexion required; which was the very apex of the art. So that the divination, when most perfect, really supplied a natural knowledge of the thing demanded, and was built on it.

AS to dreams, &c. there was a formula for them; and the circumstances whereof, might be appropriated to raise in the imagination an idea of the thing required. — After a number of ceremonies, the party was to sleep in the temple; and the priests had not only the placing of his body, and the strewing of his bed; but also the management of colours, sounds, &c. in the night time. So that if any natural means were known for the cure, here was room enough to suggest it to the patient’s imagination, which was made accessible to them; and, as it were, put into their hands. But if no adequate remedy were known; as, it is probable, they hardly entered so far into the part; yet, what was thus suggested, perhaps at random, how strongly must it operate, when incited by the opinion of its coming by miracle and inspiration? We see what the bare presence and assurance of a physician will frequently do; even cure disorders far above the reach of his skill; and what an improvement would it not be to the faculty, to have the further assistance of a little shew of religion, and ceremony?

I am afraid I may seem to have been too long absent from my subject; but it has been all along in my eye, and a little recapitulation will convince the reader that we have not wandered far out of the way. — We have shewn whence all our knowledge originally rises; that sensation is its only source; that what comes this way, comes by the agency of the divine being; that it is further modified in the memory or imagination, where new assemblages are frequently made, which is called *inventions*; that it is continually altering, by the admission of new ideas from without; but still remains subject to the laws imposed by the Creator; so that nothing happens therein, but in consequence of such laws. — Thus far the mind appears merely passive; and thus it stands with respect to the matter of all knowledge and art. — It remains, now, to consider its *form*, or that whereby such knowledge becomes *art*, *i. e.* becomes subservient to human purposes, and under the direction of human reason.

HERE, therefore, a new state of the mind, *agency*, and a new faculty thereof, *reason*, come in play: the foundation and office, whereof,

others less significant, at pleasure; some stand for large provinces, others for petty districts thereof. In effect, the order wherein we attain our knowledge, has occasioned us to make a kind of fortment in the matter thereof. Though the mind only sees and perceives individuals, which alone are the proper objects thereof; yet it has a power of combining and complicating these together, for its own conveniency: and hence its progress from particulars,

whereof, will be best ascertained, by inquiring what there is in the artist's, *e. gr.* Homer's mind, that concurred with his inspiration or invention, to the production of his poem? This will be found to resolve into, first, an inclination to produce some piece, in the way of fable, that shall strongly represent the mischiefs of discord among confederates; and secondly, a knowledge of certain means necessary to that end, or an acquaintance with certain rules and measures, which tend to produce such an effect.

THE first is a *moral view, or motive*, which has already been laid down as the spring or principle of all human action, and which is founded on the apprehension of good or advantage to arise from such a poem. The second, *viz.* the knowledge of the *means*, stands on the common footing of the knowledge hitherto discoursed of.

THE means and measures of an art, make a kind of preliminary doctrine, necessary or conducive thereto, called the *theory of the art*; which also, in one sense, may be considered as another art, distinct from the former: at least, to come at it, is the business of another art.—If, for instance, a certain position, or set of motions of the body, be constituted, by nature, the occasion of a poetic inspiration; and such and such images and ideas arising herefrom, be constituted the occasions of such passions in the mind of a reader, and such views consequent thereon, *viz.* an aversion to enmity, and contention; to form an art productive of these effects, we must first observe the like effects to arise from the like causes; and infer, that it is probable these motions, or these images, are the occasions thereof: and consider their order, manner, and circumstances, to form the art, or method.—So that we have here, as before, 1^o. *Matter*, or phenomena, furnished by sensation, and preserved in the memory; 2^o. *Form*, arising from the moral view, which led us to frame an art; and in order thereto, to consider and dwell on the phenomena, compare them together, and infer something from them.

IT appears, therefore, that we have two arts of poetry, very different from each other; arising from different causes, tending to different ends, and rarely found, in any great degree, in the same person. The first art Homer possessed in perfection; the second, Aristotle.

BUT for all their difference, the two will be found of the same general nature and kind; and only to differ in point of degree, and subordination; as they are nearer to, or further from the principle of all knowledge and art, sensation.—Homer, we have shewn, was inspired: he derived his art only from nature, acting on him in the ordinary course of things, and first presenting objects to his sense, then to his imaginations; and others are inspired from him, *i. e.* they derive the inspiration from nature, through his means: among whom is Aristotle. Nature, as she appears to the senses, is Homer's object; as she shews herself in Homer, he is Aristotle's: by which time the inspiration is grown a degree cooler, and less forcible; and the ideas thus excited at second hand, moving the mind less, can attend more steadily to them, and perceive their relations better.—In the first, it falls like lightning immediately from heaven; the second may be compared to the reflection of the same lightning in a mirror. The reading of Homer, *i. e.* the exciting and calling up his ideas, and images, does, as it were, impregnate Aristotle's imagination; and transplant the poet's whole stock into the philosopher's garden, to be further cultivated. Accordingly, Aristotle; applying his reason to them, and examining them closely on all sides, perceives divers relations and analogies between them, which Homer was not aware of; and which the warmth of his imagination, and the quick succession of new ideas, would not give him room to attend to. These analogies he calls *rules, or laws*, the assemblage or system whereof, make what we call Aristotle's *Art of Poetry*.

THE like process might be observed in the several other arts. Those we have hitherto chiefly kept to have been of the symbolical kind. We shall here give an instance in what we call the real kind, *viz.* architecture.—An Athenian sculptor, then, observing an acanthus shooting up under a basket, is pleased with the figure it presents; and, taking the hint, invents the capital of a column on the model thereof; and by a number of like steps, an entire order gradually arose; and, in time, a whole art.—Things thus advanced; and another person seeing a building framed after such manner, he attentively examines the several members, their forms, proportions, &c. and puts them down in writing; and thus does another posterior art arise. And between the two, there still remains the subordination already observed between the means, or occasions of producing them; *i. e.* the rules thus formed, being couched in words, supply the office of the external objects they were originally derived from, and prove occasions of raising ideas, or images, in the imaginations of future artists, to be limited in the proper materials.

THE arts, then, of poetry and architecture, come first in at Homer's and Callimachus's sense, in the simple quality of natural objects; which, meeting with other ideas in the memory or imagination, and coming to be compared and combined therewith, by the agency of the moral view or principle which suggested the making of a poem, &c. as advantageous and desirable, new productions arise, *e. gr.* a poem, or a building; which, coming at length under the cognizance and consideration of reason, certain relations or analogies are discovered therein, which tend to propagate, and produce the like at any time.—Reason returns rules for matter; which rules prove like the philosopher's stone, which tends to turn all materials it is applied to into gold; and the materials thus transmuted, like the pretended multiplicative virtue of the same stone, from every thing they are applied to, produce rules again.—And thus are we arrived at the reason of the Aristotelian definition of art above-mentioned, which we see lies pretty deep, and coils some pains to come at; as do many of his doctrines of that philosopher, which the precipitancy of moderns has rejected as false, only because they would not be at the pains to discover their truth.

REASON, in effect, which is the last faculty the matter of art arrives at, is the first from which the form or rules thereof, which are to propagate it, arise. In which view, reason may be laid down as the principle of this secondary art, or theory; as imagination is of the primary one. We still see the effect of the first laws, even in the latter art; external objects strike the sense and imagination so strongly that they reach to reason; which, like an infinitely elastic substance, reflects them back again; and thus they again grow into objects of sense: and so on in a circle.

THIS seems to make the two arts differ very widely; and as reason appears our highest faculty (inasmuch as it is this alone that tends to produce and multiply, and accordingly all our knowledge appears proportionably higher and purer, as reason is more concerned therein: the rules or theory of an art, appear of infinitely nearer consequence than the matter thereof. The former is, in some sense, active, and, like the almighty mind, tends to produce new things, new worlds, new systems, without end; the latter is mere passion, and ends in bare brute perception.

YET Aristotle's rules, it must be observed, do not tend to produce poetry; I mean not the matter of poetry; but only the form. Aristotle's art is not the art of poetry, in that sense, as its rules do not tend to produce enthusiasm. They only give the human part, and relate what reason observes in the productions of the imagination, *i. e.* what there is in them, that is a proper object in this last faculty, and comes under its notice. In effect, poetry is only subject to Aristotle's rules, as there is reason, not as there is inspiration or invention in it.

THE source of poetry, we have observed, lies out of poetry, in a higher ground; and to turn the stream upon us, is the business of this other art of inspiration. The immediate inspiration, is not so immediate as we may imagine. It is not the ultimate principle of art, but it is itself subordinate to another further or purer art; so that we must not only have art and rules to produce poetry, but also to produce the principle thereof, inspiration or invention. And the same will hold of the rules of this last art, themselves, which will require others; and so on in infinitum. At least, the series will be infinite, if we only take ourselves and our own agency into the account.

TO clear up this, it may be observed, that the art, *e. gr.* of poetry is not only the result of another higher art, as above laid down; but that its matter and form, are each of them the subject of a particular art, and each of them require another higher art, to produce them.—The means, for instance, necessary for inspiration, or the invention of images, make one art; and those for their application to the present purpose, another. So that the art of poetry resolves itself into two subordinate ones; the first of which may be called the *art of invention*, the other the *art of judgement, or criticism*: each of which, has all the characters of the general art; is come at like it, produces new objects like it, and resolves into principles of the same kind with it.—Nor does the view end here: for as each of these subordinate arts, may be considered as consisting of matter and form, each of them resolves lower into two other arts; and the same may be said of each of these; and so on. So that there is really an infinite series of arts, previous to any one, and accessory thereto; all distinct from each other, though all of the same general nature, and only differing in point of order or subordination. They arise subordinately from the same cause, and tend subordinately to the same end: which difference or subordination, as already noted, arises only from their greater or less distance from the principle of all knowledge, sensation.

UPON the whole, sensible nature furnishes the matter of them all, by means of the imagination; and moral nature the form, by means of the light of reason.—The former proposition has been sufficiently discussed. It remains to enquire a little further into the latter; for, *that reason furnishes the means, &c.* may be further qualified, ere it be received.—Our reason, it is to be observed, does not perceive any necessary and immediate connexion between the means and the effect: for there really is none. Consequently, reason cannot be the author of them; in regard, the medium is wanting, whereby alone it could possibly attain them. So that they must be produced by some other canal; which will at length be found to end in sensation. In effect, ere we know that such means conduce to such end, we must first have observed, or found it so by experience. Our memory suggests to us, that such or the like causes have been followed by such or the like effects; which is the only foundation we have to expect any thing from them on the present occasion.—Thus, if Homer's reason direct him to retire into a place free of noise and disturbance, at a time when his mind is clear, and in due temper; and there to apply himself with attention and earnestness to think on his subject: in consequence of which means, new ideas and images present themselves, some more immediately relative to the present purpose, others less: whence comes all this, but that Homer remembers such or the like ideas as are now wanted, to have arisen upon the use of such or the like means? And if, among the crowd of images, he chuses only such as are most proper and immediately conducive to his end, and throws aside, or expunges the rest; whence is this, but that he remembers such, on former occasions, to have contributed more fully to ends like his own, than such other? So that the whole process appears to be little other than remembrance, which, we know, resolves into sense.

BUT, memory, it is here to be noted, deals only in past things. It informs us, that on such an occasion such means, under such circumstances, produced such effects: but its notices are merely narrative, or historical; and relate only to those numerical means, occasions, circumstances, &c. which can never happen again. So that memory speaks nothing to the present case; nor gives any directions how the particular purpose, now in view, is to be attained. Its language is

particulars, to generals; from simple to complex.—Hence we come to have words of all orders, and degrees; from the simplicity of an atom, to the complexness of the universe. It is pleasant to trace the mind, bundling up its ideas, and giving names to the several parcels; to observe, for instance, how it proceeds from the simple idea, *thinking*, to the more comprehensive one, *knowledge*, thence to a *science*, thence forward to *scientific*, &c.

INDEED it is very few of our words that express single or simple ideas. The reason is, that, observing certain relations to obtain between the several ideas; as of cause and effect, subject and attribute, &c. we do not so much consider them absolutely, and independently, as under such circumstances and relations to each other. The great readiness and propensity of the mind to combine its ideas, and thus pay or receive them in parcels, has left us very few simple ones; I mean, very few names which denote only one idea. The words *atom*, or *mathematical point*, usually imply several ideas; in regard we are led to take the attributes and relations into the consideration of the subject: thus we consider the *atom*, as hard, heavy, and invisible; as the principle of physical magnitude; as contributing to the constitution of bodies, &c. And even the primary qualities themselves, as hardness, heaviness, and the like, simple as they are in their own nature; are so far combined with particular circumstances, *e. gr.* their cause, &c. that their names become none of the least complex.

NOW what we call a *term*, is no other than “a word which denotes an assemblage, or system of ideas, relating to some one point, which the mind has artfully complicated, or associated together, for the convenience of its own operations.” Or, it is “a word which comprehends several ideas under a certain relation to each other, whereby they represent some complex piece of knowledge to the mind, for the conveniency, &c.” Or, “it is a word, which holds several different ideas combined together in a relation, such as they appeared under when the mind first considered them as a standing phenomenon, and took measures to have them fixed, or retained in that quality.”

THE effect of *term* is, that by virtue thereof, we are enabled to receive, or communicate knowledge with more ease and dispatch, so far as having proper combinations thereof always ready made, we are saved the necessity of beginning *denovo*, and detailing it in individuals: much as in arithmetic, to avoid the embarrass of a large number of units, we tell by tens, or sixties, or hundreds: with the like view, on some occasions, we make up certain sums of money in rouleau’s, or in purses; and thus pay and receive them, without the trouble of telling or enumerating the contents.

IN this sense of a *term*, we shall find little else in language:—Among nouns all are such, except proper names, which, indeed, are out of the ordinary case of language; yet even these sometimes become terms; as when any particular ideas become constantly attached to them, *e. gr.* in *Mecenas*, *Machiavel*, *Augustus*, *Atlas*, *Bucephalus*, *Argo*, &c. And, among verbs, very few but are terms, except the general ones, *to be*, *to do*, and *to suffer*. As all the others suppose these, and modify, or superadd some farther circumstances thereto; they commence terms of course: such, for instance, is the word *to moisten*, which, as it carries a farther meaning, than the bare act of applying a fluid to a dry body; and denotes, *e. gr.* the modus of action, and the alteration superinduced by it, *viz.* the softening, lubricating, &c. is a thorough term. So, *to strike*, as it not only implies a certain motion of the arm, but this motion effected by the successive contraction and dilatation of certain muscles, &c. has every thing that is essential to a term. In the same sense, a *staff*, is a term, as much as a *lever*; and a *pin*, as an *axis in peritrochio*.

THIS may look like stretching a point, especially to those who are used to consider *terms*, as things, I know not how, quaint and mysterious; and make a *term* and a hard word the same thing. But there is no remedy: complexness is the only characteristic, that will be found to hold good, of them all; and if there be any other more specific, and distinguishing properties in most of them, as we shall have occasion, hereafter, to shew there are; yet these, not being universal, cannot be made the foundation of a just philosophical definition. They may, perhaps, be introduced, to good purpose, into a popular one; as they afford a more useful and adequate knowledge of the subject, so far as they do obtain.

THUS much relates to what we may call *terms of knowledge*, which are one degree more simple than the terms of an art or science; and were, for that reason, pitched upon to exhibit the common nature, and origin of both. These latter arise out of the former, by the super-addition of some new character, or condition. They were before members of the commonwealth of knowledge; but they are now incorporated into some certain province, or city thereof; where they become of farther significance and consideration than before: that is, some new ideas and circumstances, are now taken into the combination, which before did not belong to it.—A term of art, then, “is a word that has a meaning beyond its general, or scientific one; and this meaning restrained “to some one art.” Or, “it is a word used to denote a certain combination of ideas, under some peculiar rela-

only this, “Such means did produce such and such effects.”—To make the application of past things to present, is the office of reason; which comes in where memory ends; and subjoins, that “if such “means have done so, such others will now do so.” And, consequently, it is reason that, in strictness, prescribes the present measures.

OUR enquiry now draws towards an issue; and it only remains to shew, in what manner reason attains this end, *i. e.* what farther or higher means there are, to enable it to furnish measures for the present exigency, from the circumstances of past ones.—This it effects by certain perceptions of similitude and dissimilitude, parity and imparity, congruity and incongruity, between former, and present means, occasions, &c. By virtue of these, the mind infers, that, “inasmuch as such means were followed by such effects; “such others, by parity of reason, will be followed by such others.” And that, “as there are such and such differences between former “and present occasions, and circumstances; there must be such and “such other correspondent variations in the present measures, to “keep up the congruity.” All which resolves into the comprehensive word, *analogy*.—Thus it is found, that every means, every step of an art, includes what has been already shewn of the whole art; and consists of *matter*, furnished by memory, from sense and observation; and *form*, furnished by reason, from comparison and analogy.

AND thus it is reason that makes all our historical knowledge of any significance to us. It is this that makes former cases subservient to the present occasion. We may look upon this, as the instrument or faculty of transferring; whereby the effects of former times and places, are brought over to the present ones. Without this, sense would lose its chief use; and memory, with all its copia, would be no other than useless lumber.—It is this faculty alone, that arranges our sensible ideas into any thing of subordination. Memory only presents them such as they first appeared; wholly distinct all, and independent of

each other, being connected by nothing but their preference, or co-existence, in point of time and place. The establishment of all other relations is the work of reason; which, from these few sensible relations, infers numerous others, *e. gr.* from the preference of two things in respect of time, place, &c. it concludes that some new appearance, perceived in the one, was occasioned by the other; and, therefore, that there was some power in the latter, by which this was effected, &c. And thus it is we come by the relations or perceptions of cause, effect; action, passion; property, quality, &c. so that to this faculty of reason we owe the whole science of physics; which is no other than the doctrine of causes; at least the form thereof. The matter, *i. e.* the sensations themselves, being furnished by sense, constitute *natural history*, the basis of all knowledge whatsoever.

WE are now got to the top of all our natural faculties, *reason*; and the most refined of all our sciences, *analogy*.—It remains to observe, that with this natural reason is connected *moral inclination*. In the case, for instance, of good; to the voice of reason representing a thing as such, is connected a desire or inclination towards the same; which is the great principle of human action, or operation; and commands a number of subordinate ones; the application of all which, constitutes what we call the *purport* of such good.

AND thus we are got to the bottom of all our moral faculties, *desire*, or *inclination*.—Hence, as reason is the end of passion or perception; inclination is the beginning of action: the one terminating in the apprehension of good, where the other commences. And again, as the perception of analogy is the ultimate effect of science; the inclination, arising by means hereof, is the beginning of art: the two being joined, and as it were, inoculated, in some middle point. And thus external or physical things, come to influence or produce internal, or moral ones; thus the whole effect of sensible nature, is applied to moral nature. And thus do physics take hold of ethics, God of man.

tion, retained arbitrarily in some art, and either not used in any other art, or for a different combination, or "with other relations and circumstances."

TO make the way a little clearer to the philosophy of a term of art, it is to be observed, that from the primary, or literal sense of words, we frequently, by abstraction, form a secondary, general, or philosophical one, expressing only the quality most predominant in the former, exclusive of the particular circumstances of the concrete. Thus, the word *spirit*, literally and primarily signifying *breath*; we thence frame a more simple general meaning, and use the word for any thin, subtle matter whatsoever.—Now, terms of art are not immediately formed from the literal or grammatical, but from the general or philosophical acceptation of words; which is their proper basis, or the ground-work they are erected on. The general or abstract sense of some word already established, being found to agree to something which we have occasion to give a name to; we take the word in that sense, and superadd the other incidents and circumstances, which the present occasions furnish, thereto; which, being different, according to the different matter and subject of the art, specify the meaning of the term in this or that art. So that the word which, to raise it to a philosophical or scientific sense, was generalized; to form a technical one, is again particularized, or appropriated and invested with new accidents.

THUS, the same word *spirit*, which literally signifies breath, and philosophically any subtle substance, is technically brought to denote divers other things; as, in anatomy, a thin animal juice secreted in the brain, and detached thence through the nerves, for the uses of sensation, and muscular motion: in chymistry, the exhalations of bodies exposed to the fire: in theology, the third person of the Trinity: in metaphysics, any incorporeal agent, or intelligence, &c. In all which, we see the same substratum, *viz.* a fine subtle substance; but this modified a great diversity of ways; each of which is susceptible, by further super-additions, of infinite more. And hence we have legions of sorts of spirits, both in the human body, the chymists laboratories, the hierarchy, &c.

THE notion of a term, will receive some farther light from that of a DEFINITION; which is, as it were, the analysis thereof.—By definition we undo what was done in forming the term; that is, we resolve the complex ideas into simple ones, or restore the ideas from their new and artificial state, to their primitive and vague one. A definition, then, may be defined "An enumeration of the several simple ideas couched under any terms in the relation wherein they stand to one another."—We have already shewn, that terms are words which have peculiar and determinate meanings, resulting from a certain combination of ideas; in which view, a term may be said to be, "a word that is capable of definition;" *i. e.* of having its sense explained and ascertained, by an enumeration of its properties and relations: by which it is distinguished from words merely grammatical, whose meanings are general and indeterminate, and may be used with equal propriety in a thousand cases. We can explain a term; a word is inexplicable: all we can do towards this, amounts not to definition, but only to substitution, or the giving a synonymon.

THUS the idea attached to the word *force*, is absolutely incommunicable by means of any language: we can only try whether the party have it not already, under another name; to which end, we may tell him it is *power*, or *energy*, or *vigor*; if he have ideas for any of these, he will take in that of *force*, by its relation thereto; if he have not, we must proceed to try him with more, and tell him it is *forza*, or *vis*, or *efficacia*, or *potentia*, &c. or it is *flus*, or *fluxus*, or *diversus*, &c. If none of these will do, it remains to try, whether he may not have it without any name to it; and say, it is "that whereby one thing, coming in contact with another, moves, or shakes, or breaks it," &c.—If, by any of these means, he learns what *force* is, he does not form any new idea; he only learns a new name: and finds, that what he had known by one name, others call by another; or that what he had never taken the pains to distinguish by any name, some others have. To get the idea, he must have recourse to sensation, not to language; it being a physical *ens*, and only to be attained that way.

BUT the simple idea called *force*, being given; and coming to be afterwards modified, or circumstantiated by new accidents added thereto, and thus formed into terms, in this or that art; it is here in the power of language alone to excite them; by resolving such compound idea into its ingredient ones; which, being re-compounded, or put together again, in the manner assigned by the definition, gives the full adequate import thereof.—Thus the idea of *force* being variously modified, and combined with other ideas of *centre*, *attraction*, *repulsion*, *will*, *machine*, &c. in the words *central force*, *centripetal force*, *centrifugal force*, *necessity* or *moral force*, *mechanic force*, &c. we can, by definition, arrive at the meaning thereof; by having those circumstances specified, or superadded to the idea of *force*.—In this case, there is no coming at the idea by sensation; in regard it is a creature of our own, and does not exist any where without us, to make an object of sense.

HENCE appear all the diversity of definitions; technical ones, comporting only to terms, as to *central force*; scientific, or philosophical, to qualities, as *forcibleness*; and nominal or succedaneous, belonging to simple ideas, as *power*, or *energy*.

IT is the various assemblage of simple ideas, denoted by common words, that makes all the variety of terms; as it is of simples in an apothecary's shop, that makes the variety of his medicines.—The analogy goes farther; and it may be said terms, like medicines, only differ from each other as their ingredient ideas, and the relations thereof differ.—If these be not all rehearsed in the definition, the term or medicine is not specified, or distinguished from some other, which may have all, except that one or two omitted. Consequently, such one or two, are the characteristics of that term; which may be explained, in some sort, by only enumerating those characteristics, and couching the rest under the name of that other term. This amounts to little more than the substitution abovementioned; and yet to this is reducible all that the schoolmen teach of *genus*, *species*, and *difference*.

BESIDES simple words, which we have observed are, in their own nature, inexplicable; there are divers others that become accidentally so: and such are all the data, or preliminary principles of any art, with respect to those who confine themselves to the bounds of that art. Thus, if it be demanded of an apothecary to define one of his simples, *e. gr.* mercury; he must needs be at a stand, unless he be likewise versed in mineralogy; by reason it is putting him to explain a principle, which his art does not explain, but assume; the explication thereof lying in another province. But ask him to define calomel, and he is prepared for you; and will readily enumerate the several ingredients, and the manner of preparing it, which is the proper pharmaceutical definition of calomel.

HERE it may be observed, that the words used in the definition of a term, do many of them represent complex ideas; and, consequently, ought themselves to be first defined, if we would have the definition complete. The term has usually divers subaltern ones; all which are resolvable into it, and make part and parcel of the knowledge held forth by it. Thus, if *mercurius præcipitatus albus* be defined, "a white medicinal powder, precipitated from a solution of crude mercury in aqua fortis, by adding thereto a lixivium of sea-salt; and then purified by repeated ablutions in a filter," &c. The ideas, *powder*, *precipitated*, *solution*, *mercury*, *aqua fortis*, *ablution*, *filter*, &c. remain to be explained, to furnish the complete notion of white precipitate.—But as this would be endless, and would defeat the intention of a definition; the practice obtains, to suppose all other terms known, except that particular one under definition. By this means we avoid the embarrass of bringing

bringing down every word to its principles, or simple ideas; and acquit ourselves, by bringing it to the next complex ones: since the bringing an unknown term to several known ones, is a kind of indirect definition.

SUCH is the nature of a technical definition, which holds good or valid for those of that art, or craft; who are to be supposed furnished with the necessary data, or preliminary notices. But to make a scientific definition, we must go a little lower; and bring down the words, if not to their simple ideas, yet to general or common ones. For, it is to be observed, there are great numbers of complex ideas current among most people, which therefore may be considered as data, and used as simple ones, for more convenience sake. All technical apparatus, then, is to be here thrown by; and instead of giving five or six hard words for one, the general effect and meanings thereof are to be made use of. Thus, the precipitate abovementioned may be defined, "a white powder, which falls down from quicksilver dissolved in spirit of salt petre, upon casting salt therein; and afterwards washed, again and again, by passing fair water through it," &c. where, though several of the words be complex; yet most people in the ordinary course of life, have framed the complex ideas belonging to them: so that they may be considered as simple ones. — Yet the definition can scarce be said to be complete, even here: the general, or philosophical sense of words, we have observed, is formed from the grammatical one; and, consequently, the definition ought, in strictness, to extend thither: the solution, to be adequate, should go as far as the knot; the analysis, as the synthesis.

THE reader already begins to feel this preface grow tiresome; and yet several things are still behind. When so large a work was to follow, he perhaps imagines he should have been excused from a long introduction: and the like, probably, may the author say; who, after so tedious a work, could not be over-fond of any additional fatigue. But, the expediency of the case, which swayed and determined the one; may, we hope, suffice to satisfy the other. Several matters were purposely waved in the course of the Book, to be treated of in the PREFACE; which appeared the most proper place for such things as have a regard to the whole work. What has been hitherto insisted on, as well as what remains, immediately affects every article in the book; and tends, withal, to let a little needful light into certain points, hitherto involved in great obscurity. A preface may be considered as a vehicle wherewithal to convey the reader, commodiously, from the title page into the book. The preface is a kind of comment upon the title; the book a paraphrase on it: or, if you had rather, the book is the title executed, the preface the title explained.

HAVING, therefore, dispatched some of the leading words of our title, ART, SCIENCE, TERM, and DEFINITION; we proceed to consider the nature of a DICTIONARY. — It were to be wished, that the many adventurers in print, who publish their thoughts under this or that form and denomination, would frame to themselves some precise notion of the character and laws thereof. — There is something arbitrary and artificial in all writings: they are a kind of draughts, or pictures, where the aspect, attitude and light, which the objects are taken in, though merely arbitrary, yet sway and direct the whole representation. — Books are, as it were, plans or prospects of ideas artfully arranged and exhibited, not to the eye, but to the imagination; and there is a kind of analogous perspective, which obtains in them, wherein we have something not much unlike points of sight, and of distance. An author, in effect, has some particular view or design in drawing out his ideas; either nakedly, to represent something, or to distort and ridicule it, or to amplify and extenuate, or discover, or teach, or prove, &c. whence arise divers kinds of compositions, under the names of *histories, discourses, treatises, essays, enquiries, examinations, paraphrases, courses, memoirs, burlesques*, &c. in all which, though the matter or subject may be the same, the conduct or artificial part is very different; as much as a still-life from a history, or a grotesque, or a nudity, or a caricature, or a scene-work, or a miniature, or a profile, &c. each of these methods of composition has its particular characters, and laws; and, to form a judgment of the things represented, from the picture made of them, it is necessary we be able to unravel, or undo what is artificial in them, resolve them into their former state, and extricate what has been added to them in the representation: that is, we should know the manner thereof; whether, *e. gr.* they be mere nature, shewn through this or that medium, in a fore, or side-view, withinside, or without, to be viewed from above, or below; or nature raised and improved, or altered for the better, or the worse. — The case amounts to the same as the viewing of objects in a mirror; where, unless the form of the mirror be known, *viz.* whether it be plain, concave, convex, cylindric, or conic, &c. we can make no judgment of the magnitude, figure, &c. of the objects.

IT is beyond my purpose to enter into the nature of the several methods of composition abovementioned. I shall only note, by the way, that the first writers in each, marked and chalked out the measures of all that came after them. — The several manners of composing amount to so many *arts*; which we have already shewn, are things, in great measure, personal, and depend on the genius or humour of the inventors.

WERE we to enquire who first led up the way of Dictionaries, of late so much frequented; some little grammarian would, probably, be found at the head thereof: and from his particular views, designs, &c. if known, one might probably deduce, not only the general form, but even the particular circumstances of the modern productions under that name. The relation, however, extends both ways; and if we cannot deduce the nature of a Dictionary from the condition of the author, we may the condition of the author from the nature of the Dictionary. Thus much, at least, we may say, that he was an *analyst*; that his view was not to improve or advance knowledge, but to teach or convey it; and that he was hence led to unty the complexions, or bundles of ideas his predecessors had made, and to reduce them to their natural simplicity: which is all that is essential to a lexicographer. Probably this was in the early days of the Egyptian sages, when words were more complex and obscure than now, and mystic symbols and hieroglyphics obtained; so that an explication of their marks or words, might amount to a revelation of their whole inner philosophy: in which case, instead of a grammarian, we must put perhaps a priest or mystagogue at the head of Dictionaries. — Indeed, this seems the more probable, for that a grammatical Dictionary could only have place where a language was already become very copious, and many synonyms got into it; or where the people of one language were desirous to learn that of another: which we have no reason to think could be very early, or till much commerce and communication had made it necessary.

WHEN a path is once made, men are naturally disposed to follow it; even though it be not the most convenient: numbers will enlarge and widen, or even make it freighter and easier; but it is odds they do not alter its course. To deviate from it, is chiefly for the ignorant, or the irregular; persons who do not well know it, or are too licentious to keep it. And hence the alterations and improvements made in the several arts, are chiefly owing to people of those characters. There is scarce a more powerful principle in nature than that of imitation, which not only leads us to do *what* we see others do, but *as* they do it. It is true, there are exceptions from every rule: there are persons in good measure exempted from the influence of this principle; and it is happy there are; witness our Paracelsus's, Hobbes's, Leibnitz's, &c. In effect, if an art were first broached by a happy genius, it is afterwards cultivated, on his principles, to advantage; otherwise, not: and it may wait long for the anomalous hand of some reformer, to set it to rights. Some of our arts have met with such hands, others still want them.

WERE we to give an absolute and consistent definition of a Dictionary; we should say, "It is a collection of definitions of the words of a language." — Whence, according to the different kinds of words, and

and definitions above laid down, *i. e.* according to the different matter, and the different view wherein such matter is considered, will arise different sorts of Dictionaries: *grammatical*, as the common Dictionaries of languages; which, for one word, substitute another of equal import, but more obvious sense: *philosophical*, which give the general force or effect of words, or what is common to them in all the occasions where they occur: and *technical*, which give the particular sense attached to them in some one or more arts.

BUT, in truth, this is a little chimerical: though we have Dictionaries under all these titles, it would, perhaps, be hard to find any conformable to this partition; which is not so much taken from what really is, as what might, or should be. Dictionary-writers are far from considering their subject so closely, or confining themselves to so narrow, though direct a channel: they must have more room; and think themselves privileged by the general quality of lexicographers, to use all kinds of definitions promiscuously. It is no wonder they should not keep to views which they had not, and which could only arise from researches they never made. While the notions of *term* and *art* remained yet in the rubbish wherein they were left by the schoolmen, those of *definition*, and *Dictionary* must needs be vague, and arbitrary enough; and the Dictionarists and Expositors profited by an embarrass which it was their business to have removed. They have not only built on it, but improved it, by a continual varying, and confounding of views, imperfect enumerations, &c.

IT is not to be imagined, what mischiefs and inconveniences have arisen from this single head; what great uncertainty it has introduced into language; and what an obstacle it has been to the improvement thereof. It is certain it has, in great measure, defeated the intention of speech; and turned knowledge, which that was to be the medium of, into jargon and controversy. All the confusion of Babel is brought upon us hereby; and people of the same country, nay the same profession, no longer understand one another. — The effect is, that our knowledge is grown into little other than that of peoples misunderstandings, or misapprehensions of one another; which is the only kind of knowledge that grows; and which will for ever grow: there being the seeds already laid of such disputes, as, according to the ordinary spreading of such things, must overshadow and starve every thing else. If all men meant precisely the same thing, by the same name, there would be no room for their differing upon any point, either in philosophy, or any thing else: there is no more possibility of seeing the relations of things to each other, differently; than of altering their nature, and overturning the system. Relations of ideas are as immutable as the Creator's will. — Error, in effect, is no natural production; nor is there any direct way of coming at it: we must go about for it; and find some law of nature, to put it in our power. So that error is, in one sense, truth, ere it takes place; only it is not the truth it is taken for.

THERE are two manners of writing: in the one, which we may call *scientific*, we proceed from ideas, and things, to words; that is, we first lay down the thing, then the name it is called by. — This is the way of discovery, or invention; for that the thing ought to be first found, before it be named. In this way, we come from knowledge to ignorance; from simple and common ideas, to complex ones.

THE other is *didactic*, just the reverse of the former; in which we go from words and sounds, to ideas and things; that is, begin with the term, and end with the explanation. — This is the historical way, or the way of teaching, and narration; of resolving the extraordinary knowledge of one person, into the ordinary of another; of distributing artificial complications into their simple ideas; and thus raising, and levelling again, what art had erected.

THE Dictionary comes under the latter kind. It supposes the advances and discoveries made, and proceeds to explain or relate them. The Lexicographer, like an historian, comes after the affair; and gives a description of what passed. The several terms, are so many subjects, supposed to be known to him; and which he imparts to others, by a detail of the particulars thereof. — Indeed, the analogy between a *Dictionary* and a *history*, is closer than people at first sight may imagine: the Dictionary relates what has passed, with regard to each of our ideas, in the coalitions, or combinations that have been made thereof: its business is, to deliver the progresses made in the several parts of knowledge under consideration, by an orderly retrospect, and deduction of the terms, from their present complex, to their original simple state. The Dictionary of an art, is the proper history of such art: the Dictionary of a language, the history of that language. The one relates that such an art, or such and such parts thereof, stand so and so; are managed so and so; and the result so and so: the other, that such and such a word is used as synonymous to such and such others. The Dictionary-writer is not supposed to have any hand in the things he relates, he is no more concerned to make the improvements, or establish the significations, than the historian to achieve the transaction he relates.

THE difference between what we commonly call the *history of an art*, and a *Dictionary* thereof, is only circumstantial; arising from the different views of the two sorts of authors: the one chiefly regards the time and order, when each step, each advance was first made, *i. e.* how it stood with respect to such and such arts, or periods of time; and might more properly be called the *chronology of the art*: the other regarding chiefly the object or intention of the art, relates its present constitution, and how it proceeds to attain the end proposed. You may add, that the former primarily considers what is past, or already advanced; the other also what is present, or remains to be done; the one tells, *e. gr.* how Mercury finding a dead tortoise on the shore, took its shell, added strings to it, and made it into a lyre: the other, how a lyre is, or may be made. And if you will likewise add this, that the history intermixes divers foreign and accidental circumstances with the discovery, which the Dictionary abstracts, and sets aside, and so reduces it nearer to science, you will have the full and adequate difference between them. Thus the making of the first lyre is related with some circumstances, which have no place in the proper structure of the instrument, and are therefore to be omitted in the Dictionary, which only takes in what belongs to the art, or artists in general; not what belongs to some one of them.

THE whole, in effect, amounts to this, that the first time of doing a thing is related by the historian with the several particulars which in any wise, though occasionally only, and remotely affected it: whereas the lexicographer, coming afterwards, keeps more closely and severely to the point, and relates nothing but what is essential: *i. e.* the first time the thing is considered as now arising; a new production or phenomenon, from some analogous principle; and therefore we attend to the foreign causes that brought it forth: whereas, afterwards, we consider it as arising from a pre-existent theory, or the prescription of an artist, and thus resolve the cause into the art itself.

ANY other difference which may seem to be between the two, is only as to more or less particular; which indeed is a thing that embarrasses and amuses us on many other occasions: thus in mere civil histories, if one relate the series of a campaign, another the bombardment of a town, and a third the wounding and death of a general officer; though the latter subjects be only part of the former, yet the first will be said to have composed a piece of *history*, the second a piece of *fortification*, and the third a piece of *chirurgery*. And yet there is no other difference between them, than between the geography of a country, and the topography of a village, or a hillock; the history of a nation, and the life of a single person.

TO say no more, the Dictionary of an art, stands in much the same relation to the history thereof, that the history of a people does to the lives of all the considerable and active persons therein. Their difference is only as to the point of sight; the eye being supposed so near in the one case, as to see the parts distinctly; and in the other so far off, as to take in the whole completely: whence the one gives you all the incidents; the other

only the greater. In effect, the one is all concerted to one point of view, most favourable to the whole, and the great parts; the other to many; the eye being shifted for each part, to furnish an adequate representation of each.

I am afraid to keep the reader any longer in this painful way of disquisition, wherein we are obliged to dig for every step we take. It would doubtless seem a more agreeable, as well as more reputable employment, to be raising things on high; than thus engaged in sinking, and working under-ground: a castle in the air, is an object of pleasure to every body, while it lasts; and withal is easily raised, and at small expence. Mines and subterranean cavities, are mere drudgery, and pioneers work; difficult to carry on, dubious of success, and overlooked when done.—Being therefore arrived near the surface, we take this opportunity to quit the course, and emerge to open air.

AFTER so severe an enquiry into the reason, nature, and perfections of a Dictionary; it may prove dangerous and impolitic, to speak any thing about the present one. From the design of a Dictionary in general, to the actual performance of any particular one, the style must be much altered. A man would make fine work, that would examine the several Dictionaries extant, by the standard here laid down: none of them could abide such a trial; even that here offered must go to wrack, like the rest.—It may be remembered, that the thing executed, is allowed to come short of the idea conceived: the former is only a copy of the latter, and liable to all the imperfections incident to other copies. A thousand things interfere: lexicography, being of the nature of an art, deviates, of course, from the standard of pure reason; and its productions come to degenerate still farther, by the accidents that attend their bringing forth. The instruments, the materials, and forty things come into the account: the former prove out of order; the latter obstinate and untractable, or perhaps not easy to be had. In effect, the author's situation, his want of leisure or perseverance, his frailties and foibles, may his very perfections and all conspire against it.

INDEED a too servile attachment to the rules and methods of an art, in many cases proves incommodious and impertinent. We know, that the rules of an art are posterior to the art itself, and were taken from it, or adjusted to it, *ex post facto*. An author, therefore, is still in some measure left to his own conduct, and may consider himself as invested with a sort of discretionary power, whereby he can dispense with some of them, and go by others of his own suggesting, where he apprehends it for the general advantage of his work. The heights of art are never to be reached by rule, but by genius; by reason the rules were accommodated to a certain concourse of circumstances, which rarely happens twice; so that laws should be made *de novo* for every new case. While a person considers himself as following, at second hand, the measures pointed out and prescribed by others; he will not go on with that spirit and alacrity, as when he follows his own bent. He should therefore consider himself in the place of the first inventor, or as his representative, or successor; and therefore qualified to enact with the same authority for the present occasion, as he did for another.

WHEN a law is not founded on mere reason, as we have shewn is the case in art; the observation of such law cannot be enjoined on others. It may well obtain, with respect to the person that first established it, as being accommodated to his particular genius, situation, and other circumstances; but it cannot extend to those in whom these conditions are different. Accordingly, few laws of art are universal. Small matter by what laws and precepts a people is guided, provided they be led on to happiness; or by what course a vessel steers, if she do but make a prosperous voyage.

WITH this view, in the present work, we have taken all the advantages the nature of the thing would afford us; and have frequently made ourselves delinquents against strict rule, for our reader's benefit.—A Dictionary, by our own confession, is to be a history; and yet we have not kept so close to that form, as to abandon the benefit of all others. In the business of mathematics, for instance; the regular way would be to relate or enumerate the several matters belonging thereto, without investigating or demonstrating their truth: demonstrations, strictly speaking, have nothing to do in a Dictionary, no more than authentic instruments, declarations, &c. in a history. To demonstrate the several properties and relations, *e. gr.* of *lines, angles, numbers, &c.* in a Dictionary, were an indiscretion as great, as for an historian to produce certificates, and copies of parish registers, of the births, burials, marriages, &c. of several persons whose actions he relates.—And yet, on some extraordinary occasions, we have not omitted to give demonstrations; where, for instance, there was any thing very interesting, or important in them: a practice like which historians themselves frequently give into; though it be a confessed irregularity, as it breaks in upon the unity of the narration.

BUT we are far from the views of certain Dictionary-writers, who seem to think it incumbent on them to demonstrate every thing that is capable thereof. This is directly to forget the nature of their work; and dispense with the rules, both to their own and reader's cost. How dear, *e. gr.* must a competent demonstration of most of Euclid's propositions be here purchased? Either the reader must be at the pains of picking it piece-meal, out of twenty several parts of the book, where the alphabet has happened to cast it; or the author must relinquish the Dictionary-method, and deliver things together, that properly belong to so many several places; or else there must be a repetition of the same thing a dozen times over. And for what? Why, to make the Dictionary do the business of an Euclid's elements; which it is the unfittest in the world for. You might, with equal propriety, make an ozier-basket supply the office of a pleasure-boat; or a sword-pommel that of a portmanteau, as Paracelsus is said to have done.

WHEN a thing has been once regularly demonstrated, it may be assumed, or taken for granted: every body, perhaps, may be concerned in the truth of it, but not to see the truth of it. To make it a principle to take nothing on trust, would be as troublesome in the sciences, as in life; and would render us, for ever, both wretched and ignorant. Not only suppositions, but even errors, frequently lead us to knowledge otherwise inaccessible. Mathematicians themselves, who, of all others, keep most to demonstration, yet find themselves under a frequent necessity of admitting and making use of things as true, which they do not then see to be so; and thus are swayed, like other people, by authority. A person who makes use of the equality of the square of the hypotenuse, to the squares of the two sides, upon the credit of Pythagoras, or Euclid's having demonstrated it; does little more than what they themselves do on many occasions, who assume and make use of propositions they have no other evidence of, but the knowledge or remembrance of their having been demonstrated.

THE case is much the same with *experimenting*, which stands on the like footing as demonstrating. They are both necessary in their kind; the former, as it leads on our knowledge, the latter as it follows and secures the rear: but their use is to be restrained to these purposes; and may be dispensed withal, in cases where neither of these are concerned. A person who would discover any point in physics, or broach and establish any point in mathematics, must use them: but the occasion is, in great measure, private and personal; and does not extend to the public, in the same degree as the knowledge of the doctrines themselves. That is, the particular means by which a thing was first come at, or is shewn to be true, do not interest us so immediately as the knowledge of the thing itself, which might have arisen from various other means, and in other manners: a man may know a thing in the way of *presumption*, or *opinion*, or *surmise*, or *authority*, and forty other ways; which, though all much inferior, and less excellent than the way of *demonstration* and *certainity*; yet we are glad of them on many occasions, and use them to good purpose. Every degree of knowledge is valuable. It would be an unreasonable

able, as well as incommodious fullnesses in us, to refuse all light, except that of noon-day. We find our ease and happiness frequently depend on the doing of things by twilight, or even moon-light, or the still more dubious light of a rush, or a glow-worm.

PYTHAGORAS, in all probability, was not ignorant of the equality of the square of the hypotenuse, &c. before he demonstrated it; else, what should have led him to look for the demonstration? And the like may be said of many of Mr Boyle's experiments. Plato even observes, that "the very putting a question, implies some knowledge of the thing demanded; since, without this, we should not know that what is returned is an answer."

LESS might have sufficed, to shew why, in the course of this work, we have usually omitted the apparatus of demonstrations and experiments; and given the doctrines pure and unincumbered, by any thing not essential to them. The experiments, for instance, which led to the theory of light, and colours, what would they be, but like the scaffolding before a fine building, which break and interrupt the sight, and hide most of the beauties of the work? Such scaffolding, it is true, would be of use to the connoisseurs; who might have a mind to examine the work, to measure the proportions of the several parts, and enquire whether every stone were justly laid. But, to the generality, it would rather be an incumbrance, much to the disadvantage of the edifice. — Yet, in the case of experiments, as of demonstrations, we have receded a little from strict method, in favour of such as have any thing very remarkable or beautiful in them. For the rest, the reader, if his curiosity serve him, is told where to have them at first hand.

IN the case of definitions, too, we do not keep inviolably to what has been above laid down, but reserve to ourselves the discretionary right claimed by our predecessors. — We make use, occasionally, of all sorts of definitions, as they best suit our design, the conveying of knowledge. In effect, we have usually a regard to the degree of notoriety, importance, &c. of the term, though a point arbitrary and indeterminate enough; and endeavour to accommodate the explication thereto. The rule should be, to say, *Communia proprie, propria communiter*, to express common things so as that even the ignorant may enter into them. Accordingly, in popular terms, we endeavour to give a technical definition, *i. e.* to wave the general and obvious meaning, which is supposed to be known, and enter further into the nature of the thing, not known. But, in the more remote terms, the popular and nominal definition is also given, as being supposed there to be wanted.

THE literal and technical definitions of a term, are lame and imperfect without each other; the first gives its use and effect, as part of general, or abstracted science; the second, as applied to some particular subject. — The literal notion. *e. gr.* of *relation*, is that of "conformity, dependence, or comparison of one thing to another;" thus much is common to relation, both in grammar, logic, geometry, &c. *i. e.* it expresses this, both when applied to words, to propositions, to quantities, &c. — The technical notion of relation, in grammar, is "the dependence of words in construction;" this makes the grammatical notion of relation, *i. e.* it limits, or ties down the general abstract idea of relation, to the particular subject of grammar, words. So, the technical notion of relation with regard to arithmetic, geometry, &c. is "the conformity or dependence between two or more lines or numbers."

FROM the whole, it follows, that the two kinds of definitions differ as an art and a science, as general and particular reason. — And hence, from the several technical or particular meanings, one might run back to the general, or literal meaning, by abstracting, but not contrariwise, from the general or abstract, to the particular ones; in regard those other are arbitrary, and depend on the good pleasure of the artist, who first introduced them.

IN strictness, every term should be first given in its literal, or grammatical, meaning; especially if it be a term in several arts: as this helps to shew the orderly derivation of the word, from the simple or general idea that gave rise to it, to its last, and most complex state. — Yet we have not always kept to this method. In some words, there is much of the literal import of the word preserved in the term, or the technical one; as in the word *free*, or *freedom*: a man who has a notion of *freedom*, in its common or literal sense, will easily pass on to all the particular ones, as *free-city free-port, freedom of speech, of behaviour, &c.* so that, in this case, a literal definition might almost alone suffice; the meaning of the word having suffered little alteration at the hands of artists. — In other words, the literal or primary import of the word, is almost lost in the term: for instance, in the word *power*, in arithmetic: which will scarce bear any tolerable definition at all. Literally, the word implies a relation of superiority, or influence over something, which, in respect hereof, is conceived as weak, &c. According to the analogy of language, therefore, the arithmetical power should have somewhat of this relation of superiority over the root: but the root itself is also a *power*: so that the definition of power must take in two opposite relations, *viz.* both power and subjection.

PERHAPS, to go on in the most regular manner, and take up things at their source, we should begin with settling the etymologies of words; but the great alteration many words have undergone, and the great length they have been carried from their original meanings, in being borrowed from one language or age to another, would frequently make this not only a tedious, but an useless labour: so that here, too, we have used a discretionary power, and only meddled with etymologies, where they appeared of some significance.

TO explain a term, as a term, we usually express the circumstances wherewith it is attended, in the art to which it belongs, in their technical names. This is agreeable to the manner of artists, who, writing of their respective arts, use terms as common words, and suppose them to be known: and it is this that constitutes a technical explanation; not the giving the general effect or force, in such words as may equally agree to all other arts. — And yet, in some cases, we recede from this rule, particularly in divers of the lower classes of manual arts, and the structure of some machines: thus, *e. gr.* in turnery, we make no difficulty, instead of *chuck*, to say a round piece of wood, &c. The reason is, that where the several subordinate terms of a definition are themselves explained in their places, we may suppose them understood; but where the term defined is itself so low, that we do not go lower to define the parts couched under it; there we chuse, as more intelligible, to substitute some more obvious name, or the general meaning of the word for the term itself; and thus prefer the general or popular, to the technical definition.

FOR it is to be observed, that the Dictionary has its limits; it only carries matters to a certain pitch of simplicity, where we suppose people may take them up, and carry them farther as they please. We bring them into their sphere, and so leave them. So much knowledge, *i. e.* such a number of complex ideas, as we may presume people usually to have got in the common occurrences of life, we are willing to suppose, as a footing: where these end, our work is to begin, which is to take in the rest.

IF at any time we explain a complex idea, which it may be supposed most people have formed; it is because we think they do not take in all the simple ideas that go to constitute it: as in the case of *milk, blood*, or the like, where people are contented with two or three of the more obvious properties and phenomena, and sur over the rest. — Thus, in *milk, whiteness and fluidity* are almost alone considered; and these, in the common opinion, constitute *milk*; so that whatever has these two attributes, comes in for the denomination *milky*. The texture and component parts of this milk, the manner of that fluid's being secreted, collected, &c. with the peculiar

culiar properties and virtues resulting from all these, are left behind. So in *blood*, it is enough it be a reddish, pretty compact, animal juice, when warm, fluid and homogeneous, &c. This is going a great way, and even Dictionaries seldom go farther: but, for the component parts, the *crur* and *serum*; with the component principles of these, *viz.* the *oil*, *phlegm*, &c. their form, properties, &c. whence arises the crisis, colour, heat, specific gravity, &c. of blood; Dictionary-writers do not ordinarily trouble themselves.

IF, by the artifice abovementioned, we get free of a vast load of plebeian words, which must have greatly incumbered us; the grammar and analogy of language, disengages us from a still greater number of all kinds. The various states of the same word, considered as it comes under different parts of speech, and accordingly assumes different terminations, increases the list of terms immensely: as, in *dark*, *darkness*, *darkening*; *project*, *projection*, *projectile*, *projective*, &c. which may either be considered as one and the same word, under different habitudes; in regard there is a common basis of them all: or, as so many different terms; in regard every one takes in something not contained in the other.—This latitude we make use of occasionally; and either consider the words this way or that, as seems most advantageous to our purpose. In some cases, where the alteration is merely grammatical, we content ourselves to explain them in one state, *e. gr.* *steering*; and suppose the reader able, by grammar, to form the rest, as *sporn*, &c. In others, where several particular ideas are arbitrarily superadded to the word in one part of speech, which do not belong to it in another, we there explain it in all: as *precipitate*, *precipitant*, *precipitation*, &c.

THIS gives an occasion to mention a strange kind of licence, frequently practised in our language. Though there be ordinarily a great deal of difference between the several states, or modifications of the same word, *e. gr.* *reflecting*, *reflection*, *reflexible*, &c. the same as between the action and quality, the power and the exercise of it in this or that case, the cause and the effect; yet authors make no difficulty of using them promiscuously; which would make downright nonsense, were the readers to keep to the strict import of the word. But the truth is, they are not so critical about the matter: if the meaning come within their reach, they jump at it, and are glad to take it; without waiting to see whether it would reach them in its present direction, or whether it might not rather fall short, or fly by them. What confusion should we make, even in our best and clearest writers, were we resolved not to understand them but according to the strict rules of grammar, and not indulge them the liberty of using one word for another? In a thousand cases, the same idea is denoted by opposite terms: thus, we say, such a medicine is good *for*, or *against*, the worms, plague, &c.

IT may be urged, that as custom has authorized this latitudinarian practice, it is become of grammatical authority; and that as the licence is known, it cannot deceive us; since the readers are led, on such occasions, to relax the bands of grammar, and annul the difference between words, in order to admit one a substitute for another. — But I am afraid this expedient scarce indemnifies us from the abuse. Besides the extraordinary embarrassments ther. — But I am afraid this expedient scarce indemnifies us from the abuse. Besides the extraordinary embarrassments of reading what is thus promiscuously wrote; it is not always we know when and how to supercede the strict import of an author's words, and make him speak sense in his own despite. This I take to be none of the least occasions of controversy and dispute owing to language, and which we may almost despair of seeing rectified, unless in a new one.

I shall not here enter upon the merits and defects of the English tongue, considered as a language: a great deal has been said on that head by others, for which the reader may turn to the proper article in the Dictionary itself. — What we have to add, will be chiefly as it stands with regard to the arts, and more particularly to a Dictionary of arts.

I believe none will question but we have met with difficulties enough in the course of this work. The very bulk and dimensions of it confers as much, and the variety of its matter still more. But these were natural difficulties, appendant to the very design; and therefore did not afflict us so much as some others, which arose from it at second hand, or were superadded to it, as it were, by accident. And such was the present state of our language, which alone were sufficient to have baffled the best scheme, and broke though the best measures that could be formed.

WE have already represented language as something very important; and as having a near and necessary interest in knowledge. Names are solemn things, as they are representatives of ideas themselves, and used on most occasions in their stead: and terms, or combinations of ideas, are still more so; as much as complex engines are of farther and nicer consideration than the simple mechanic powers. But who would imagine this, to consider the wanton use we make of them; and with how little fear or discretion words are treated among us? Every body thinks himself privileged to alter, or set aside the old, and introduce new ones at pleasure. England is open to all nations; and our traders in this commodity import their wares from every country, in all security. The humour of importing seems to have possessed every part of us: we are not only unwilling to be without the natural produce, the fashions, and the follies of our neighbour countries; but we even envy them their words and phrases. The effect is, that our language continues in a perpetual flux; and no body is master of it for two days together.

A man never knows when he is at the end of the terms, *e. gr.* in architecture. When he has got two or three names for some one member, and thinks himself over-stocked, it is odds he has not half. It is not enough he knows what the thing is named in English; but he must likewise learn what the French, Italians, Latins, and Greeks, likewise call it, or frequently find himself at a stand. Thus it is in the case of *fillets*, *list*, *listels*, *reglers*, *plattbands*, *bandedlets*, *tania's* and *baguettes*; of *chaplets*, *asragals*, *batons*, and *tores*; of *gula's*, *guelles*, *aucines*, *cyma's*, *cy-mattius*, *ages* and *salons*; *ovums*, *ovolo's*, *echinus's*, *quarter-rounds*, *boulins*, &c. between which, there is no known, allowed differences; but they are either used indiscriminately, or distinguished arbitrarily; one person making this distinction, and the next another, or perhaps none at all. So that if we come strictly to Dictionaries, we should have a different one for every author.

BUT the mischief does not end here: for as the ancient arts are, in many respects, different from the modern; the use of their terms necessarily involves us in a new confusion, and makes the same word stand in an ancient author for one thing, and in a modern for another. Thus it is in *parafata*, *orbosfata*, *anta*, &c. In effect, there is that alteration continually making in the language of architecture, that there ought to be a different Dictionary of it for every different age.

THE truth is, a fourth part of the words in some of our popular Dictionaries, stand on no better authority than the single practice of some one fanciful author; who has met with Dictionary-writers fond enough to take his frippery off his hands, and expose them to the public for legitimate goods. By such means these exotics have obtained a kind of currency; so that a Dictionary would be thought defective without them. To omit even our fopperies would be thought a failing; and might even be esteemed, by some, as the most unpardonable of all. — On these accounts we have been obliged to temporise a little, how much soever against the grain; and thus, perhaps, have contributed to the still farther establishment of a number of words, which we had much rather have proscribed.

UPON the whole, nothing could be more desirable than an *index expurgatorius*, to clear the language of superfluous words and synonyms; to expunge the modern French and Italian terms in the several arts, where we have Latin and Greek ones; and even the Latin and Greek ones, where we have English or Saxon ones, equal

in sound and significancy. I think the learned languages ought to have the preference to the modern, because every person may be supposed to have read, but not to have travelled; and our country words I would prefer to any others, because there is the most analogy between them, and they usually retain more of the origin and etymology, than those transplanted from other languages. — Such a reform would reduce our Dictionaries to more reasonable dimensions; and disencumber the arts of half the difficulty now to be surmounted in attaining them.

BUT there is another spring of words no less prolific than that hitherto spoke of, and which has produced a swarm of spurious, mishapen words, which no nation but our own would have owned: I mean the itch of coining or making English words, by a sort of analogy, from the Latin and Greek ones. This fault the tribe of lexicographers have carried to a strange excess. How must a man stare, to see what detestable stuff some late writers of that class have furnished us with; words of their own manufacture, scarce fit to do any thing with, except cureagues! Witness *scapuloſity, ſticulous, ſcatebroſity, ſiccific, pugnacity, ſegnity, ſputative, mulierofity, mugient, ſaknouſnefs*; and many thousand more, at the reader's service, to be met withal in a Dictionary which few people are without. We are already over-run with this writer's scarecrows: what shall we be, when, having thus anglicised all the Greek and Latin words, he proceeds to do the same with the Dutch, Irish, and Welsh? Indeed I am the less angry with him, for that he has carried the abuse so far, as must not only save people from being seduced, but bring the practise into contempt. Such monsters cannot possibly live long: if they have escaped the midwife, who ought to have strangled them ere they came to light; yet if ever they stir abroad, they must infallibly be knocked off the head.

HOW oddly will our practice in this respect look, when confronted with that of our neighbours? one of the most learned men, and best critics of the last age, M. Menage, incurred infinite censure, for only endeavouring to introduce the single word *profateur*: and could not succeed in it, notwithstanding that a word of that nature was confessedly wanting in the French, and both the sound and analogy of the new word were unexceptionable.

TO return — The different states of different arts is remarkable: some of them have been refined to a degree of subtilty that has ruined them: as metaphysics and logics: others have scarce had any culture, but lie waste and over-run for want of it; as agriculture, &c. The grossness of some is their fault; it being such as disgusts, and forbids a delicate mind from pursuing them: In others, their subtilty and nicety is their bane, as leaving nothing for the mind to feed on. What meagre fare, for instance, are the school rules, and doctrines of *mediums, and extremes*? &c. They furnish us indeed with relations, and true relations too; but these so remote from all purposes of life, that they are in great measure insignificant.

IT is certain all our knowledge and arts ultimately refer to the great end of preservation. The faculties of the mind, like those of the body, were not given us for the mere exercise, or gratification of them, but in subſervency to further purposes. Our knowledge is all originally a sort of revelation; and the divine Being reveals nothing to us for the mere vague sake of our knowing it, but that it may minister to his ends, the being and well-being of his creatures. Our perceptions and notices are second causes, or at least occasions, of what we do; and, no doubt, are under the direction of him for whom we do; whose glory is served thereby. In reality, they all center and terminate, at last, in our preservation; and according as they are farther from, or nearer to this point, they are found fainter or stronger: very near, they are palpable and cogent; as they recede, they continually abate of their clearness and evidence; and when arrived at a certain distance, they dwindle to nothing, and are lost. At a great height from this center, the nexus or chain whereby things are held together, and in virtue whereof we conclude from things known, to things unknown, becomes insensible; so that we lose our hold, and wander on we know not where. Our faculties here falter; the objects they meet with are inadequate to them; the air grows too thin for respiration. But where we leave off, there possibly some superior order of beings may take it up.

IN effect, the several arts have been cultivated to more or less purpose, as our preservation is more or less immediately interested in them: and by this key one might almost venture to judge which arts are capable of being carried still farther, and which not. — Our knowledge of *very great*, and of *very little* things, is very imperfect, *e. gr.* of very great and little *objects, distances, sounds, &c.* And the reason, no doubt, is, that there is but little relation between us and them; so that we are but little interested in the knowledge of them. Those things we have necessarily and immediately to do withal, are made to our reach; for the rest, it is no great matter what they are.

AND yet our curiosity has found means of making even these more cognizable than otherwise they are: we can, in some measure, alter the established relation between our faculties and their objects; and make use of one law of nature to undo or supersede another. — Thus we can magnify a little sound, or little body, or a little distance, &c. or we can diminish large ones; and thus make things, in some measure, adequate objects, that naturally are not so.

BUT there is no great advantage in this: we only, by these means, come at a better apprehension of things which nature seemed to put out of our way, for no other reason, but because they did not concern us: lest we should be engaged to mistake, and run after things we had no business with, to the neglect of those with which we have. — Thus, anatomy is found of less use in physic, than at first sight one would imagine; as being employed in taking things asunder, and considering them in parts, which nature intended to act in conjunction. There is I know not what secret law, whereby the effect of a thing is, as, it were, annexed to its integral state; so that in proportion as you either diminish it, or enlarge it, its effect is altered, in a manner beyond what we can well account for, from the bare consideration of magnitude.

ABUNDANCE of the less useful notices we find, were kept back, and left to be accidentally turned up in course of time: such as the knowledge of optic glasses, and their effects. — This affords an illustration of the goodness of nature in contriving, that things most useful and necessary should be most obvious, so as to be almost discoverable by a sort of instinct; and the other less immediately useful ones, left to be accidentally turned up in the course of experiment and disquisition. We may admire her wisdom still farther in this, that she should, as it were, go out of her way, and annex a sort of pleasure, beyond her main purpose, to the knowledge even of things not immediately useful; in order to engage us to industry and activity. This shews that she has ends to serve by that very activity; and, perhaps, is the best demonstration in the world, of the necessity we are under to pursue knowledge; and may raise a suspicion, that this very pursuit may possibly contribute to our preservation, in some farther manner not yet attended to.

'TIS no wonder the school philosophy should be carried to such a length; considering the narrowness of its object, and the great number of hands to cultivate it for so long a time. Its chief employment is in assigning and enumerating the characters and differences of our perceptions, taken as they are excited in us in the natural course of things: by which it is distinguished from the modern philosophy, which is chiefly employed in means to vary and modify these perceptions, and thus find out farther relations and differences than would otherwise have appeared. — The philosophers of the former kind are contented to take nature as she comes home to them, and apply their reasonings thereto without more ado: those of the latter go out in quest of her, to have more matter to reason upon. — The former are more contemplative, the latter more active; the former, in fine, reason, abstract, and discourse more; the latter, observe, try, and describe more.

HENCE, we discover why the old is much more perfect in its kind than the new. The former has little to do but compare, order, methodize, &c. what is ready at hand; the latter has likewise to *find*. After which, all the labour of the other still remains. The former takes nature in all her simplicity; the latter adds art to her, and thus brings nature into consideration in all her diversity: the former chiefly considers natural bodies in their integral state; the latter divides and analyses them: so that the former finds most of the principal relations; the latter, many more curious, and amusing ones.—Hence, the former, hasted to its perfection, and could not long hold out; for that its matter was limited: the latter can scarce ever arrive at perfection, since experiments are endless. To say no more, to have philosophy complete, we should have the order, precision, and distinctness of the old; and the matter, the copia of the new.

THE modern is yet wild, and unascertained: 'tis not arrived at the maturity of method; the mine is but just opened, and the adventurers are chiefly solicitous about the matter, to see what it affords: it will be long ere it arrive at a just extent, to give room and leisure for reducing it to regularity. Not but the rules and methods of the antients are, in some measure, applicable to the new, and will go a good way towards the arranging of it; but the present philosophers seem too warm and sanguine for such a business; and the farther they go on to dig materials, still the more difficult will the ranging of them be.—This a man may be positive of, he never will see half the experiments and observations already made, employed in a system of physics.

BUT when that is done, a deal will still remain, ere we have the chief uses of it. For physical knowledge, strictly considered, is only a means of arriving at a higher and farther kind.—Histories, observations, and experiments of the kinds, order, strata, &c. for instance, of fossils, are useful things, as they tend to lay in a stock of sensible phenomena for the mind to work upon, digest, and draw new notices from, for the improvement of our own faculties, and the better conduct of life: but it is short-sightedness to forget this farther view, and look only to the things themselves. The bare acquisition of new ideas is no real advantage, unless they be such as are adapted to the circumstances of our wants, and occasions, or capable of being made so. Knowledge, in its first state, is like food in the stomach, which may please and satisfy us, but is of no use to the body, till farther prepared. It must be carried farther, and assimilated, ere it feed us.—The modern philosophy is not so properly a philosophy, as the adit or opening of one: its matter has yet only undergone the first concoction: we are yet chiefly conversant about new physical relations learned by sensation; whereas, to bring it to the perfection required, it must have undergone the farther operations of imagination, and reason. Mere physics, as such, do not make a philosophy; those physics must first be carried up to metaphysics, and ethics, ere we can justly stop.

SENSIBLE phenomena, we have already shewn, are the foundation of philosophy: but the edifice will neither make any figure, nor afford much convenience, till it be carried one or two stories higher. 'Tis but, as it were, the cellaring or ground-work; which one would think, were no very comfortable place to live and spend ones time in. 'Tis one extreme, to take our lodging, as some virtuoso's are contented to do, under ground; and another to reside altogether in the garrets, as the schoolmen may be said to have done.

THE school philosophy, however, is of some farther use, as matter of history: we learn by it how people have thought, what views have obtained, and in what various manners the same thing has been conceived; which, though it be knowledge, as it were, once removed, yet is not entirely useless. The history of human thoughts is, no doubt, the most valuable of all others; it being this alone that can make the basis of a just logic, as physiology of a just physics. We must know wherein people have failed, or fallen short, or been deceived, to learn the reasons thereof, or be able to form rules for avoiding the like. The several opinions that have obtained, may be considered as so many phenomena of the human mind, which must be considered and inquired into, to find its nature.—This, alone, were enough to have engaged us not to omit that part of learning in the present work: though there were not wanting other circumstantial reasons, which had also their share; as, the necessity hereof to the understanding not only of the antient writers, but even of the modern ones, who frequently combat, remark, &c. upon the antient notions. To which it may be added, that abundance of our terms and phrases are derived from them, and therefore could not be so completely understood without them.

THE language of the antient and modern philosophy is not very different: the chief diversity is in the different ideas affixed to the same words, and the different applications of them. And happy had it been for the moderns, had they formed a new set of terms, adapted to their new notions: by adopting the old ones, they have not only introduced much ambiguity and confusion, but have even lost the credit of many of their own discoveries, which now lie blended and buried among those of the antients. One is at a loss to think what could induce the great philosopher of our age to retain the word *attraction*, in the sense he has done. The stamp and impression it had already taken from the antients, made it less fit to receive a new one: it could, at best, but take it imperfectly; and the result was, a promiscuous image, wherein we neither see the old nor the new distinctly. 'Tis difficult for the imagination totally to divest a found of its received meaning, and consider it as indifferent to all things; as much as it is to annihilate the characters on a piece of paper, and consider it as a mere blank. Accordingly, though the great author abovementioned explained over and over, in the clearest terms, the sense he affixed to his *attraction*, yet experience verifies how much he was overseen; the chief objections against his whole system having been drawn from misapprehensions of this very word, which kept half the philosophers in Europe still at a distance, afraid to admit a most excellent doctrine, merely out of distrust of the vehicle by which it is conveyed. But this by the way—the reader who desires to see farther, may turn to the articles *ATTRACTION*, *NEWTONIAN PHILOSOPHY*, *GRAVITATION*, &c.

WHAT has been spoke of the school philosophy, reminds us of *astrology*; the terms whereof are not omitted in this work.—Were it only that it once obtained, is still extant in books, and has given occasion to abundance of terms and phrases adopted into other arts; it would have a title to be remembered.—“The history of mens follies, says the inimitable Fontenelle, makes no small part of learning; and, unhappily for us, much of our knowledge terminates there.” But this is not all; and they who absolutely reject all astrology as frivolous, do not know it. Every art and science has its vanities and foibles, even philosophy, mathematics, and theology; and every one its good sense, even astrology. The heavenly bodies have their influences: the foundation therefore, of astrology is good: but those influences are not directed by the rules commonly laid down, nor do they produce the effects usually attributed to them: so that the superstructure is false. Astrology, therefore, ought not to be exploded, but reformed. Indeed, a reformation would reduce it into a little compass; but this little is too much to be lost, as it now is, among the heap of trumpery mixed with it.—We have even been careful to preserve what is just and rational in the doctrines of *physiognomy*, *witchcraft*, and many other fanciful arts. The time was, when physics was not much more worthy the study of a man of sense, than astrology now is; so that one might propose an *introducitio ad sanam astrologiam*, as a desideratum.

OUR Preface seems now grown into a Dissertation in good earnest: enough has been discoursed of the general nature and subject of the work: allow me now to descend a little more to particular and personal matters; and thus end my Preface, where I need not have wanted precedents for beginning it.

WHAT has been said hitherto, has been on the advantageous side of my work: to acquit myself to the reader it will be necessary I turn the medal, and represent some things which appear on the contrary side. — The book, in reality, is not without considerable failings, of more kinds than one. — The curious reader must expect he will here meet with omissions, and there with redundancies; here the method and œconomy are not kept to; there an article is imperfectly treated: here, a passage from some other language is not sufficiently naturalized; there, a sentiment of some other author is not sufficiently digested: here, in fine, the author was overseen; and there the printer.

ONE might palliate these objections, by alledging, that “they are things not peculiar to this work, but extend to all the kind; that most of them arise, of necessity, from the very nature and form of a Dictionary, and that many of them are not peculiar even to a Dictionary, but are found in all extensive undertakings, and are appendant to the very best part of the design, its universality.” But instead of extenuating, I had rather be taxed with enflaming and aggravating.

FOR errors, they cannot be very few, considering the hands through which most parts of our knowledge have passed, and from whom we are obliged to take many of our accounts! What one author, upon the narrowest subject can be produced, that has not his share of them? And what Argus could possibly see and correct the oversights in all the authors he had to do with? Scaliger, in his exertions against Cardan, has shewn some twenty thousand in one small work; and no one imagines he has pick'd it perfectly clean. Yet Cardan was no ill author. Bayle's chief design in composing his Dictionary, was to detect the errors in Moreri; which he succeeded in so well, that his book has been called the *errata of Moreri's*. Yet is not Bayle himself without his errors: a late writer has discovered some twenty-five in a single article of not quite so many lines. — F. Hardouin, in the preface to his *Nunni Antiqui Populorum & Urbium*, says, it may be called *Errata Antiquariorum*; and yet M. Vailant spied not less than three hundred errors at the first reading it over. So easy a matter is it to discover faults in others, and so difficult to prevent them in ourselves! The most learned Dr**** who offered to point out five thousand faults in the *Lexicon of Hesychius*, has been charged with committing forty six in his emendations of the first book of Horace's *Odes*, besides ninety in the notes.

NOTHING of this kind can appear surprizing, when we consider on what a multitude of sides a man is accessible to error! An author we trust to deceive us — our own judgment betrays us — our attention leaves us for a moment — our very eyes and hands play us false — or, suppose we escape all these snares: an amanuensis shall bring us into the scrape; or, if we get clear here too, we are in imminent danger of miscarrying in the printer's hands.

IN a work of any considerable extent, and variety of matters, it seems impossible not to err. All the qualifications requisite for a faultless writer, scarce ever concurred in a more signal manner than they did in Jos. Scaliger, whose book *de Emendatione Temporum* is one of the top performances in the whole compass of literature. Yet has F. Petau discovered, at least, a thousand slips in it! — Who then can be safe? He only who writes nothing, or next to nothing. If a Baronius will compile *Annals*; Du Pin, a *Bibliothèque*; or Baillet, *Jugemens des Savans*, what triumphs do they prepare for future Pagi's, Simons, and Menages?

THE most we can say, is, that we hope there will be few errors found in the present work, in comparison with others of the like kind: many thousands we have corrected, both in the Dictionaries and other writings we have collected from, by means of the light which other parts of knowledge afforded: but after so large a harvest, no doubt, there remains a sufficient gleanings. We flatter ourselves, however, that what we have overlooked, the reader will frequently be enabled to correct, by the means here afforded; and that there will not be many errors found in the book, which the book itself will not help to rectify.

AS to omissions, there is scarce any avoiding them; and the more intelligent the reader is, the more of this kind he will necessarily discover. Indeed, I must own myself greatly a debtor on this score; and though at present insolvent, yet if the reader will give me credit, it shall be my endeavour to see all I owe discharged: if not in a lump, yet by a course of payments.

FOR redundancies, people will hardly be agreed about them. After one man has picked what he thinks fit of this kind, and laid it by, 'tis odds but a second taxes his temerity, and want of taste, and restores half of them to their places; and a third will, perhaps, be tempted to replace the remainder.

As to irregularities, and breaches of method, I will not claim impunity on the score of being the first that has attempted to introduce any certain rules or method into this way of writing: but there will be, at least, this peculiarity attending my case, that I cannot easily be indicted for the breach of any laws but my own. — I am sensible, however, there is no point I have been more delinquent in, than this of method: and that the references, and necessary connexions between the parts, which should shew their relation, and help to put them together, are but too frequently either dropt, by which the reader is left without his clue; or misplaced, by which he is put on a wrong quest.

THE references, it may be necessary to observe, are of two kinds; the one *real*, which directs to some other article, wherein the matter in hand is further explained; the other *grammatical*, or *verbal*, serving to indicate some particularity relating to the name; *e. gr.* some synonym, paronym, opposite, etymon or the like. The use of the former is palpable, as they are conversant about the relation of *things*; that of the latter is more obscure, as dealing only in the relations of *words*: yet are these as essential to the work, considered as a Dictionary, as the others are to it, considered as a body, or system.

AS to *jejuneness*, and crudity, no doubt, there must be a deal of that kind, considering the short time so great a load of fruit had to hang and ripen. Much of it was gathered ere it could possibly be matured; so that it is no wonder it now and then tastes of the wood. But setting aside this; if a man may not be allowed to say a good number of but indifferent things in the compass of five hundred sheets, I know not who would be an author.

LASTLY, as to there being little *new*, and of my own growth, I must here change my style; and, from confession, turn to vindication. — The work is, what it ought to be, a *collection*; not the produce of one man's wit, for that would go but a little way; but of a whole commonwealth. If any person will undertake to write a Dictionary, even of some one particular art, from his own fund alone, a man may safely venture to foretel, that it will not be good for much. — I do not pretend to entertain my guests at this rate, with just what my own scanty granaries afford: the whole country is ransacked to make them the fuller banquet. No body that fell in my way has been spared, ancient nor modern, foreign nor domestic, Christian nor Jew, nor Heathen: philosophers, divines, mathematicians, critics, casuists, grammarians, physicians, antiquaries, mechanics, have been all brought under contribution.

NONE of my predecessors can blame me for the use I have made of them; since it is their own avowed practice. It is a kind of privilege attached to the office of lexicographer; if not by any formal grant, yet by connivance, at least. — I have already assumed the *bee* for my device; and who ever brought an action of trover or trespass against that avowed free-booter?

'TIS vain to pretend any thing of property in things of this nature. To offer our thoughts to the public, and yet pretend a right reserved therein to ones's self, if it be not absurd, yet it is forbid. The words we speak, nay, the breath we emit, is not more vague and common than our thoughts, when divulged in print. You may as well prohibit people to use the light that shines in their eyes, because it comes from your candle: e'en clap it in a dark lantern, and let us not be amused and dazzled by it: if we may not be the better for the good things, let us not be the worse for the ill and indifferent ones mixed with them.

WE see the same thought, which was first started in one author under a world of crudity, borrowed by another, become farther improved, and ripened; and at length, being transmitted to a third, yield fruit in abundance. All plants will not thrive in all soils that will produce them; some languish in their mother beds: whence the gardener is under a frequent necessity of replanting, &c.

SOME persons, I know, condemn all use of Dictionaries, abridgments, and compilations whatever. The Scaligers, Salmasius's, Huets, and other critics, protest against every thing that may tend to facilitate and shorten the course of study, as it tends, at the same time, to lessen diligence and application, to exempt men from the necessity of going to the fountain-heads, and thus renders them superficial. What we attain easily, say they, is lost again as easily: one of the chief fruits of study, is to inure men to labour and attention: what room is left for the judgment to act, where every thing is methodized, and laid in order? what occasion for the memory, where a man can immediately have recourse to every thing he wants? and who would burthen his head with a stock of knowledge, which he can always keep by him on much easier terms? It is added, that the exact and profound learning of the antient writers, was chiefly owing to this, that they had no such helps, which obliged them to go painfully to the sources, and study their authors at first hand.

THIS is the common style of men of the first-rate erudition; and were it only directed to those who aspire to the same rank with themselves, it would undoubtedly be excellent. He who pretends to have a seat on that bench, must go to work the severe way: he must not study, *e. gr. antiquity*, in Dictionaries, or even in modern systems, but in the antient writers themselves; the *Jewish* antiquities, for instance, in the books of the Old Testament, Philo, Josephus, the Talmud, Maimonides and the rabbins: the *Grecian*, in Homer, the antient tragedians, Aristophanes's comedies, Diodorus Siculus, Pausanias, Athenæus, and others: the *Roman*, in Livy, Dionysius Halicarnassus, and other antients in both languages; the *Christian* in the Acts of the apostles, and the Greek and Latin fathers. — These he is to be reading night and day, in order to arrive at the right understanding of them, meditating, and making frequent reflections on them, striving to penetrate into all their views; maturely weighing all the circumstances in them; and lastly, comparing all with the hints, remarks, and improvements, suggested in the writings and comments of the more learned among the moderns.

ALL this, no doubt, is excellent. — But it is not many subjects or branches of science that a man can thus go through! And the greater part of mankind consists of such as are not enough interested in any one, to be solicitous about so thorough and profound a knowledge of it. — Add, that those who do, are forced, on many occasions, to make use of Dictionaries and other helps; and that those who speak most contemptuously of them do the same, oftner than they care to own it.

IN reality, a reduction of the vast bulk of universal knowledge into a lesser compass, (as I have elsewhere had occasion to observe) is of no small advantage to all those concerned in the acquisition of learning, that is, of all persons in general: for I know of no rank, condition, or even sex, that is dispensed from the necessity of cultivating and improving their own minds. By means hereof a stock of knowledge becomes attainable on easy terms, sufficient for the purposes of most persons, except those who make learning their more immediate profession; and for those too in most parts of science, except that which makes their immediate province. Such a design may perhaps seem most adapted to the uses of men of business, who cannot spend a deal of time, or of men of pleasure, who do not care to be at such pains in the pursuit of knowledge: but it would be no less advantageous to men of letters and study, whatever faculty or branch of science the devote themselves to; since Polymathy, or a general acquaintance with all the rest, is indispensably requisite to arrive at an excellency in any one, by reason of that near connexion which is between the several sciences, and the mutual lights they afford each other. And what a vast career does this open? what a multitude of books and subjects will they have to make their way through; and what helps are not requisite to facilitate so laborious a course? Without these, either a man's whole life will be in danger to be spent in preliminaries, and preparing himself for his province, or he must resolve to set out with less ceremony, exclude the numerous kindred sciences out of his scheme, and retrench himself within the narrow limits of a single one. This, it must be owned, is but too often done, to the no small dishonour both of learning itself, and of those who cultivate it. By this means the sciences become cantoned out into so many separate districts, and the due communication between them is cut off; by which each is defrauded of the improvements which might be derived to it from the rest. Hence, in great measure, the inferiority of the modern authors to the antient. A narrow compass of knowledge, it is certain, will not enable a man to write with that dignity and malterhood, which is found in most of the antient writers; who, besides the particular science they wrote on, were conversant in all the rest. Those who have the least acquaintance with the antient method of study, know how severe they were on this head: a man was not allowed to be an orator, historian, poet, grammarian, or even architect, or musician, much less a philosopher, without the whole circle of sciences. — The same we still find insisted on as necessary by later writers, though the difficulty of arriving at it is so much increased, and the modern *Cyclopædia* become so vastly more extensive, as well as intricate, than the antient. How many new arts and sciences, and new appendages of old ones, come under consideration among us, that the antients overlooked? How many languages, living and dead, is a modern obliged to learn, when a Roman or Athenian was thought sufficiently furnished with one, or two? And how many difficulties have we to struggle withal in the acquisition of their sciences; the antient chronology, for instance, geography, or the like, from which they were free? We charge ourselves with the knowledge of their affairs, as well as our own; study minutely not only their sciences, but their most indifferent actions and customs, and their very words and phrases, which with us make spacious fields of learning, under the denomination of *antiquity* and *philology*. The dilemma then is apparent; either our talents and application must be greater, or our lives must be longer than those of the antients; or else our proficiency must be less in proportion, unless some means be had recourse to, to expedite the same.

IN effect, a reduction of the body of learning is growing every day more and more necessary, as the objects of our knowledge are increasing, books becoming more numerous, and new points of dispute and enquiry turning up. For want of this, the sciences remain in great measure at a stand, or can advance only imperceptibly; since the whole life of those who should make discoveries, is spent in learning what is already found out. Hence, such improvements as are occasionally made, rarely arrive at any maturity, but terminate in hints and imperfect openings, or in queries and proposals for farther enquiry. Most of the late discoveries in the sciences remain thus crude and imperfect; the whole vast systems of microscopical plants and animals, and telescopic worlds, of attraction, magnetism, electricity, and the like, remain,

as it were in embryo. How many curious observations and anomalous cases, are scattered in the writings of modern philosophers, which want to be reduced to systems? And what numerous lights are held forth in the writings of modern virtuoso's, for supplying divers desiderata in the sciences, to no purpose? — How many operations are there both of nature and art, of which we have imperfect notices, which want to be compared and traced more minutely? Transmutations, petrifications, reproductions of organical parts, recompositions of bodies from their principles, resuscitations, meliorations, accelerations of growth, multiplications of species; to say nothing of transfusions, inoculations, injections, and the like, which are like to perish, as multitudes have done before them, for want of time to pursue them.

TO do justice to a *collection*, I mean a general and promiscuous one, it has its advantages. Where numbers of things are thrown precariously together, we sometimes discover relations among them, which we should never have thought of looking for: as the painter's and sculptor's fancy is frequently led on to the boldest and most masterly designs, by something they spy in the fortuitous sketches of chance or nature; inasmuch that a celebrated Italian makes no scruple to lay this down as the first origin and occasion of all these arts. 'Tis certain, most of our knowledge is empirical, the result of accident, occasion, and casual experiment: 'tis but very little we owe to dogmatizing, and method; which, as already observed, are posterior things, and only come in play after the game is started. It was, in all probability, the hand of chance that first threw sulphur, charcoal, and saltpetre together, and little did he who thus produced gunpowder, imagine he was inventing a new art of making war.

'TIS, indeed, surprizing to consider what slender experiments and observations many of the capital doctrines have arisen from: the blows of a smith's hammer on his anvil, are said to have given rise to the musical notes, which Guido, a poor friar, perfected by what he observed in conning over his beads. — The inventions of printing, of glass, of dying, of the dipping needle, of phosphorus, of telescopes, of taffety, of antimony, &c. are supposed to have arisen in the like manner; as the reader may find under their proper articles: and how many more we know not, by reason the great obscurity of their first rise, ere they attained a degree of usefulness and perfection fit to be taken notice of, has buried the particular circumstances thereof. If we will hear the ancient Phœnicians and Egyptians, among whom most of the arts are supposed to have arisen; they all came from casual observations: geometry from the inundations of the Nile; the flight of the crane, gave occasion to the invention of the rodder; the ibis taught to administer a glyster, the swallow to build, and the spider to weave, &c. In effect, a new observation, in some peoples minds prepared for it, is like a spark in a heap of gunpowder, which may blow a whole mine.

WHAT advantages may not philosophy be expected to derive from such a collection, or farrago of arts, when it is considered, that every circumstance, every article of an art, is to be looked upon as a datum, a phenomenon, or experiment in philosophy? and that the least of them may possibly be the foundation of a new system? — To consider only the dying of cloth, or tanning, or currying of leather; what is the whole process, but a series of physical effects, arising from new applications of body to body? And how many lectures will the philosopher have from painting, gardening, agriculture, &c. touching planting, ingrafting, pruning, exposure, exprefion, walls, &c. which might never have come in his way, but by such a chance? When a thing is once started, it may be applied infinite ways, and no body knows where it will stop.

THROUGHOUT the whole of this work, a particular regard has been had both in the choice of the several heads, and in amplifying on them, to the extending of our views, and opening new tracks, new scents, new vistas. We have endeavoured not only to furnish the mind, but to enlarge it, by placing it in a great variety of situations, and presenting to it the sentiments, notions, manners, customs, &c. of most ages, people, sects, &c. that have any thing new, unusual, or original in them.

SUCH a variety of views, and manners of thinking, is a sure remedy against being too violently attached to any one; and is the best way of preventing the making of pedants, bigots, &c. of any kind. It may be said, that every art, every system, tends to give the mind a particular turn; and that the only way of maintaining it in its natural rectitude, is by calling in other opposite ones, by way of counter-balance. Thus what is unfufferable in the mere mathematician, critic, grammarian, chymist, poet, or herald, is qualified and rendered amiable, by a due admixture of the rest.

THIS, indeed, is not the way to make a very great progress in any art; but at the same time it is the only way to hinder our being spoiled by any. Though this is only to be understood with regard to personal benefit: for no doubt the public is more benefited by the mere pursuers of particular arts, than by the general appliers to all: since, by the former, each is brought to greater perfection, and the mixture and temperament wanting in the individuals is found in the whole.

TO conclude, the ultimate view of a work of this kind, should be, the forming a sound mind, *i. e.* acquiring a system of perceptions and notions agreeing to the system of things, or in the relations thereto intended by its author. The end of learning and study, is not the filling our heads with other mens ideas; that is an enrichment which may prove for the worse; richness is only a matter of secondary consideration; soundness is the first. There are many manures which the husbandman dare not use, by reason they would corrupt the land, at the same time they enriched it, and lay the foundation of a disease, which would in the end impoverish, and make it spend itself in unprofitable weeds. — But it must be owned, mens heads are not so easily filled: the memory is not so tenacious as we may imagine; ideas are transient things, and seldom stay long enough with us to do us either much good, or harm: ten to one but what we read to day, is most of it forgot again to morrow. And what chiefly makes new ideas of any significance, is their extending and enlarging the mind, and making it more capacious, and susceptible. — But neither is this enlargement the last aim; but is chiefly of use, as it contributes to the increasing our sensibility, to the making our faculties more subtle and adequate, and giving us a more exquisite perception of things that occur; and thus enabling us to judge clearly, pronounce boldly, conclude readily, distinguish accurately, and to apprehend the manner and reasons of our decisions. To which end several things may conduce, that are not so much direct matters of knowledge, as collateral to it; for instance, much of the school philosophy, which, by exercising and exciting the mind, has a kind of instrumental tendency to sharpen its faculties, and needs only be read, not retained, to produce its effect. — But even this does not amount to the full and adequate end of knowledge: this is only improving the organ; and there must be some farther end in such improvement. No man sharpens his weapon on the sole consideration of having it sharp, but to be the fitter for use. Briefly then, our faculties being only so many inlets whereby, and according to the measure whereof, we receive intimations of the Creator's will, and the effects of his power and action; all the improvements made in them, have a tendency to subject us more entirely to his influence and direction; and thus make us conspire and move more in concert with the rest of his works, to accomplish the great end of all things. In which our happiness and perfection consists; the perfection of a single nature arising in proportion as it contributes to that of the universe.

Concerning the C U T S.

THE Reader may be pleased to observe, that the Figures relating to each Art, are brought into a several Plate, and placed in the Book fronting the name of such Art; and referred to under that name: as *Tab. Architecture*, *Tab. Geometry*, *fig. 3.* &c. — This may also serve for

Directions to the BOOKBINDER:

Who is hereby instructed to place the several Cuts fronting those words which make their respective titles; *e. gr.* the Plate intitled ANATOMY, fronting the article ANATOMY: and so of the rest.

N. B. The Plate *Analysis*, is joined to that of ALGEBRA; and the Plate *Navigation*, to that of GEOGRAPHY.



CYCLOPÆDIA:

OR, AN

UNIVERSAL DICTIONARY

OF

ARTS AND SCIENCES.

A.

A, a vowel, and the first letter of the English, and most other alphabets.

The grammarians will needs have *A* the first letter in all languages; and some of them assign a natural reason for it, *viz.* that it is the most simple, and the easiest pronounced of all articulate sounds.—To confirm this, Jul. Scaliger observes, that *A* is the first found nature puts forth at the crying or smiling of infants; and that it needs no other motion to form it, but a bare opening of the lips.

Covarruvias, refining on this sentiment of Scaliger, observes, very gravely, that the first found put forth by boys, is *A*; but that girls first put forth *E*; each pronouncing the initial letter of the name of the first parent of its respective sex.—Dr. Littleton, setting Adam aside, makes the one speak the final, and the other the initial letter of the mother of mankind, *EVA*.—But it is in vain that authors compare the *A* of the English, Latin, French, &c. with the Aleph of the Hebrews, or the Eliph of the Arabs. Those two letters have no conformity with our *A*, except in this, that they are the first of their several alphabets. What sets them very far asunder, is, that these oriental *A*'s are not Vowels.

Some critics take the Hebrew Aleph to be neither vowel, nor consonant, but what the grammarians call an aspirate, or pneumatic letter; like the *H* in the Latin, and our language: adding, that S. Jerom appears to have had the same thoughts, who probably learnt it from the Jews of the school of Tiberias. But later writers give the thing another turn; having shewn that the Hebrew Aleph, Arabic Eliph, and Syriac O-laph, are real consonants; and that the same holds of all other aspirates. This is a paradox in grammar; but it is not the less true for being a paradox. See *ASPIRATE*.

Of all the letters, *A* is observed to be that which dumb persons are soonest taught to pronounce. The reason is, that it does not depend on the muscles, and other organs of the mouth, and tongue, which are generally wanting in mutes; but on those of the throat and nose, which they commonly have.

This first, simplest sound, serves us to express most of the vehement movements of the soul. It is so much the language of nature, that upon all sudden and extraordinary occasions we are necessarily led to it, as the instrument readiest at hand. With this we speak our admiration, joy, anguish, aversion, apprehension of danger, &c.—Where the passion is very strong, we frequently enforce the *A*, by adding an aspirate, as *Ah*.

It is observed of the English pronunciation, that we speak the *A* with a slenderer, and more pure sound than any of our neighbours: ordinarily, it is scarce broad enough for a French *e* neuter; and comes far short of the gross *A* of the Germans, which would make our *au*, or *aw*, or *o*.—In some words however, as talk, wall, stall, &c. the *A* is broad, and deep enough. But this, it is observed, may not be the mere sound of *A*; but the effect of the ancient orthography, which, as low as queen Elizabeth, frequently added an *u* to the *A*, and wrote *taulk*, &c.

The Romans laid a mighty stress on their *A*; and distinguished exactly, both in writing and speaking, when it was

long, and when short.—To denote it long, they first wrote it double, *Aala*, for *Ala*; which not being enough, they inserted an *b* between them, *Abala*: at length they fell to the common long accent *Ala*. See *ACCENT*.

A was one of the numeral letters among the ancients, and signified 500.—With a dash at top, *Ā*, it stood for 5000. See *CHARACTER*.

Baronius gives us a set of ancient technical verses, wherein the numeral value of each letter of the alphabet is expressed; whereof this is the first,

Possidet A numeros quingentes, ordine recto.

But we shall here observe, once for all, that it was not strictly among the ancients that this use of numeral letters had place, as is commonly supposed. Isidore Hispalensis, an author of the seventh century, affirms it expressly: *Latini autem numeros ad literas non computant*. The usage was really introduced in the days of barbarism. M. du Cange, explains what that usage was, at the beginning of each letter of his Glossary, but the generality of dictionary-writers, who take it from him, mistake him. The account, they all say, is found in Valerius Probus: whereas du Cange says no such thing; but only that it is found in a collection of grammarians, among whom are Valerius Probus, and Petrus Diaconus. *Habetur verò illud cum Valerio Probo, Paulo Diacono, (it should have been Petro) & aliis qui de numeris scripserunt, editum inter grammaticos antiquos.*

A is also used, in the Julian calendar, as the first of the seven dominical letters.

It had been in use among the Romans long before the establishment of Christianity, as the first of the eight *nundinales litteræ*; in imitation whereof it was, that the dominical letters were first introduced. See *NUNDINAL*.

A is also an abbreviation, used in divers arts, and with divers intentions. Hence,

A, among logicians, is used to denote an universal affirmative proposition; according to the verse,

Afferit A, negat E, verum generaliter ambe.

Thus, in the first figure, a syllogism consisting of three universal affirmative propositions, is said to be in *Bar-bara*; the *A* thrice repeated, denoting so many of the propositions to be universal, &c.

A, among the Romans, was used in the giving of votes, or suffrages.—When a new law was proposed, each voter had two wooden ballots put in his hand; the one marked with a capital *A*, signifying *antiquus*, *q. d.* *antiquam volo*; and the other with *V. R.* for *uti rogas*. Such as were against the law passing, cast the first into the urn, as who should say, I refuse it, I antiquate it; or I like the ancient law, and desire no innovation.

A, in the trials of criminal causes, denoted absolution: whence Cicero, *pro Milone*, calls *A, littera salvatoria*, a saving letter.

—Three ballots were distributed to each judge, marked with the letters, *A* for *absolvere*, I acquit; *C* for *condemno*, I condemn; and *N. L.* for *non liquet*, it is not clear. From the number of each cast into the urn, the prætor pronounced the prisoner's fate. If they were equal in number, he was absolved.

A, in the ancient inscriptions of marbles, &c. occasionally stands for *Augustus*, *ager*, *ajunt*, &c. When double, it denotes *Augusti*: and when triple *aurv*, *argento*, *ere*. *Idiore* adds, that when it occurs after the word *millis*, it denotes him young.

A on the reverse of ancient medals, denotes them struck by the city of Argos, sometimes by that of Athens.—And among the later coins, the same letter is the mark of Paris. See Medal.

A, among English writers, is ordinarily used for *anno*, as *A. D. anno domini*; for *artium*, as *A. M. artium magister*, &c.

A, *ā*, or *āā*, among physicians, is used in prescription for *ana*; to denote an equal portion of divers ingredients, whether in respect of measure or weight.

Thus, *R. Sal volat. olej. tinct. croc. āā ʒ ss.* expresses *Sal volatile oleosum*, and tincture of saffron, of each half an ounce. The same *ā* or *āā* is also used in the like sense, without expressing any limited quantity or weight: Thus, *ā* or *āā* *P. B.* denotes simply, equal parts of the ingredients there mentioned.

A A A, among chymists, signifies an amalgama, or the operation of amalgamating. See AMALGAMATION.

A, An. See ARTICLE.

ABACTOR*, in some law-writers of the middle age, denotes a thief who drives off cattle by open force; more usually called *abigevus*.

* The word is compounded of *ab*, from; and *actor*, a driver; from *agere*, to drive.

ABACTUS, among the ancient physicians, was used for a miscarriage procured by art, or force of medicine; in contradistinction to *aborsus*, which is natural. But the moderns know no such distinction. See ABORTION.

ABACUS*, among the ancients, was a kind of cupboard, or buffet. See BUFFET.

* The word is Latin, but formed from the Greek *αβαξ*, which among that people signified the same thing; which some suppose to be compounded of *a* privative, and *βασις* foundation; *q. d.* without a foot or frame, to be fastened some way to the wall. But Guichart goes higher: he derives *αβαξ*, from the Hebrew *בַּבְּאֵל*, *extalli*, to be elevated, raised; and supposes its primary signification to be a high shelf, or other convenience for things to be laid upon out of the way.

In this sense, Livy describing the luxury into which the Romans degenerated after the conquest of Asia, says, They had their *Abaci*, beds, &c. plated over with gold. Dec. IV. Lib. ix.

ABACUS* was particularly used among the mathematicians, for a little table strewed over with dust, on which they drew their schemes and figures.

* In this sense, the word seems formed from the Phœnician *בַּבְּאֵל*, *abak*, dust.

ABACUS *Pythagoricus*, a table of numbers, contrived for the ready learning of the principles of arithmetic; denominated from its inventor *Pythagoras*, *pythagoricus*.

Hence also, from an agreement in point of use, the names *Abacus* and *Abaco*, are used among Latin, and Italian Writers for an alphabet, or ABC, &c.

The *Abacus Pythagoricus* was, in all probability, no other than what we call multiplication-table.

Ludolphus and Wolfius give us methods of performing multiplication without the help of the *Abacus*; but they are too operose in ordinary cases for practice. See MULTIPLICATION.

ABACUS, in architecture, is the uppermost member of the capital of a column; serving as a kind of crowning, both to the capital and the whole column.

Divers of our dictionary-writers, make the *Abacus* to be the capital itself; which is altogether as just, as to make the crown of the head the whole head.

Vitruvius, and others after him, who give the history of the orders, tells us, the *Abacus* was originally intended to represent a square tile laid over an urn, or rather over a basket.—An Athenian old woman happening to place a basket thus covered over the roof of an acanthus; that plant shooting up the following spring, encompassed the basket all around, till meeting with the tile, it curled back in a kind of scrolls. An ingenious sculptor passing by, took the hint, and immediately executed a capital on this plan; representing the tile by the *Abacus*, the leaves by the volutes, and the basket by the vase, or body of the capital.—Such was the origin of the first regular order.—See the representation hereof in *Tab. Archit. fig. 21.*

There is some difference in the form of the *Abacus* in different orders. In the Tuscan, Doric, and ancient Ionic, it is a flat, square number, well enough representing its original tile; whence the French call it *tailloir*, trencher. See *fig. 24. lit. l. & fig. 28. lit. o. & fig. 32. lit. k.* See also the articles TUSCAN, DORIC, and IONIC.

In the richer orders it loses its native form; its four sides, or faces, being arched, or cut inwards, with some ornament, as a rose, or other flower, or fish's tail in the middle of each arch.—See *fig. 26. lit. d. & fig. 20.* See also the articles CORINTHIAN, and COMPOSITE.

But some architects take other liberties in the *Abacus*, both in

respect of its name, place, and office. Thus, in the Tuscan order, where it is the largest and most massive, as taking up one third of the height of the whole capital, it is sometimes called the dye of the capital.—In the Doric it is not always the uppermost member of the capital; a cymatium being frequently placed over it.—In the Ionic, some make it a perfect ogee, and crown it with a fillet. See the figures above referred to.

The proportion of the *Abacus*, as prescribed by Vitruvius (4.1) is, that its diagonal (from corner to corner) be twice its height. A rule which the moderns make no difficulty of dispensing with.

Abacus is also used by Scamozzi for a concave moulding in the capital of the Tuscan pedestal.

ABAST, in the sea-language, is used in speaking of things placed, or done, toward the stern, or hind-part of a vessel; called also *ast*, and stands opposed to *fore*.—Thus they say a thing is *abast* the fore-mast, when it is behind it, or nearer the stern than the fore-mast. The post of the master, captain, and other officers is *abast* the main-mast.

The stern, strictly speaking, is only the outside; *abast* includes both inside and out.

ABALIENATION*, in the Roman law, denotes a species of alienation; whereby those goods called *res mancipi* were transferred to persons legally capable thereof; either by a formula called *traditio nexu*, or a surrender in open court. See ALIENATION.

* The word is compounded of *ab*, from; and *alienare*, to alienate.

The things here called *res mancipi*, which were the object of *abalienation*, were cattle, slaves, lands, and possessions within the territory of Italy.—The persons capable of purchasing were Roman citizens, Latins, and certain foreigners who were particularly indulged this traffic.—The manner in which it was transacted was either with the ceremony of weights and money in hand, or a surrender before a magistrate.

ABAPTISTON, or ANABAPTISTON, a name anciently given to an instrument in chirurgery, by modern writers more usually called *trepan*, *modiolus*, *terebra*, *terebellum*, and *trifan*. See TRIFAN.

ABARTICULATION, in anatomy, the same with *diarthrosis*. See DIARTHROSIS.

ABASED, lowered, or made low; from the French *bas*, low; which Nicod. derives from *βασις*, foundation.

ABASED, ABAISSE, in heraldry, is applied to the vol. or wings of eagles, &c. when the tip, or angle looks downward toward the point of the shield; or when the wings are shut: the natural way of bearing them being spread, with the tip pointing to the chief, or the angles.

A chevron, a pale, bend, &c. are also said to be *abased*, when their points terminate in, or below the centre of the shield.

Again, an ordinary is said to be *abased*, when below its due situation. Thus, the commanders of the order of Malta, who have chiefs in their own arms, are obliged to *abase* them under those of the religion.

ABASING, in the sea-language. See STRIKING.

ABATEMENT, in heraldry, something added to a coat-armour, to diminish its proper value and dignity, and note some dishonourable action, or stain in the character of the person who bears it.

It is a little controverted among authors, whether heraldry allows of any such things as regular abatements. Leigh and Guillim, however without any scruple as to their reality, give us several kinds.

Abatements, according to the last of those writers, are either made by reversion or diminution. Reversion is either turning the whole escutcheon upside-down; or the adding another escutcheon, inverted, in the former.

Diminution, is the blemishing any part by adding a stain, or mark of diminution: such are a delf, a point dexter, a point champaign, a plain point, a goar finifter, and a gusset. See each under its proper article.

It may be added, that these marks must always be either tawny, or murrey; otherwise, instead of diminutions, they become additions of honour.

The last editor of Guillim discards the whole notion of *Abatements*, as a chimera. He alleges, that no one instance is to be met with in such bearing; and that it implies a contradiction to suppose it. Arms, being *insignia nobilitatis & honoris*, cannot admit of any mark of infamy, without ceasing to be arms, and becoming badges of disgrace; which all would covet to lay aside. Add, that as no hereditary honour can be actually diminished; so neither can the marks thereof. Both, indeed, may be forfeited; as in the case of treason, where the escutcheon is totally reversed, to intimate a total suppression of the honour.

Some instances, however, are produced to the contrary by Colombiere, and others. But these, though they may seem these extraordinary resentments of princes for offences committed in their presence, do not amount to a proof of such custom or practice; much less authorize the being of particular badges in the hands of inferior officers, as Kings at arms.

ABATEMENT is also used, in a law-sense, for the frustrating, or setting aside a suit, on account of some fault either in the matter, or proceeding thereof. Hence,

Plca in ABATEMENT, is some exception alledged, and made good, either against the plaintiffs writ, as wanting due form, or containing false Latin; or against his count, or declaration, as being insufficient, or varying from the writ, speciality or record; or against the matter of either, as insufficient, or being before another court; or against the allegations, as being uncertain, on account of some misnomer, or the death of one of the parties, or the marriage of the plaintiff being a woman: to which some add disability.—Upon any of these, the defendant prays that the plaintiff's writ, or plaint may *abate*, i. e. that his suit may cease for that time: if it be granted, all writs and process must be begun *de novo*.

ABATEMENT also denotes an irregular entry upon lands, or tenements, left vacant by their former possessor, and not yet laid hold of by the next heir.

As he that puts out the possessor is said to *disseize*; so he that intrudes, or steps in between the former possessor and his heir, is said to *abate*.

Coke on Littleton distinguishes between *Abatement* and intrusion; but the new book of entries renders *Abatement* by intrusion. Some think it were better, for distinction-sake, to render it by *interpassio*. *Term de ley*, p. 2.

ABB, among clothiers, denotes the yarn of a weaver's warp.—In a riot at Melkinnam, J. Crab is said to have marched with *Abb* on a stick; another evidence calls this a blue skain on a stick; and a third, a chain on a stick.—They also use the phrase, *Abb-wool*.—Great quantities of *Abb-wool* were by rioters thrown into the river.

ABBESS the superiour of an abbey, or convent of nuns. See **ABBEY**.

The *Abbes* has the same rights, and authority over her nuns, that the abbots regular have over their monks. See **ABBOT**. The sex indeed does not allow her to perform the spiritual functions annexed to the priesthood, wherewith the abbot is usually invested; but there are instances of some *Abbes*, who have a right, or rather a privilege, to commission a priest to act for them. They have even a kind of episcopal jurisdiction, as well as some abbots, who are exempted from the visitation of their dioceses.

F. Martene, in his treatise of the rites of the church, observes, that some *Abbes* have formerly confessed their nuns. But he adds, that their excessive curiosity carried them such lengths, that there arose a necessity of checking it.

St. Basil, in his rule, allows the *Abbes* to be present with the priest at the confession of her nuns.

ABBLY*, or **ABBY**, a monastery, or religious house, governed by a superiour under the title of abbot, or abbess. See **ABBOT**.

* In our ancient statutes the word is sometimes also written *Abbaty*. By 31 H. 8. c. 13, *Abbaties* are given to the king.

Abbeys differ from *priories*, in that the one are under the direction of an abbot, and the other of a prior: but abbot and prior (we mean a prior conventual) are much the same thing; and differ in little but the name.

Fauchet observes, that in the early days of the French monarchy, dukes and counts were called abbots, and duchies and counties *Abbeys*. Many persons of the prime quality, without any concern in the monastic life, took the same quality; even some of their kings are mentioned in history under the title of abbots. Philip I. Louis VI. and afterwards the dukes of Orleans, are called abbots of the monastery of S. Agnan. The dukes of Aquitan were called abbots of the monastery of S. Hilary, at Poitiers; and the earls of Anjou of S. Aubin, &c.

One third of the best benefices in England were anciently, by the popes grant, appropriated to *Abbeys*, and other religious houses; which, upon their dissolution under King Henry VIII. became lay-tees: 190 such were dissolved of between 200 l. and 35000 l. yearly revenue, which at a medium amounted to 2853000 l. *per annum*.

ABBOT*, or **ABBAT**, the superiour of a monastery of monks, erected into an abbey, or prelacy.

* The name *Abbot* is originally Hebrew, where it signifies father. The Jews call father, in their language, *Ab*; whence the Chaldees and Syrians formed *Abba*; thence the Greeks *αββας*, which the Latins retained, *Abbas*; and thence our *Abbot*, the French *Abbe*, &c.—St. Mark and St. Paul use the Syriac *Abba* in their Greek; by reason it was then commonly known in the synagogues, and the primitive assemblies of the Christians; adding to it, by way of interpretation, the word father, *αββας ε πατρις*, *abba*, father, *g. d. Abba*, that is to say, father.—But the name *Ab* or *Abba*, which at first was a term of tenderness and affection, in the Hebrew and Chaldees, became at length a title of dignity and honour: The Jewish doctors affected it; and one of their most ancient books, containing the sayings or apophthegms of divers of them, is entitled *Pirke Abbot*, or *Avot*; i. e. chapters of the Fathers. It was in allusion to this affection, that Jesus Christ forbade his disciples to call any man their father on earth: which word S. Jerom turns against the superiours of the monasteries of his time, for assuming the title of *Abbot*, or fathers.

The name *Abbot*, then, appears as old as the institution of monks itself.—The governours of the primitive monasteries assumed indifferently the titles *Abbot*, and *Archimandrite*.

They were really distinguished from the clergy, though frequently confounded with them, because a degree above laymen. St. Jerom, writing to Heliodorus, says expressly, *alia monachorum est causa, alia clericorum*.

In those early days, the *Abbots* were subject to the bishops, and the ordinary pastors. Their monasteries being remote from cities, and built in the farthest solitudes, they had no share in ecclesiastical affairs. They went on Sundays to the parish-church with the rest of the people: or, if they were too remote, a priest was sent them to administer the sacraments; till at length they were allowed to have priests of their own body. The *Abbot*, or *Archimandrite* himself was usually the priest: but his function extended no farther than to the spiritual assistance of his monastery; and he remained still in obedience to the bishop.

There being among the ancient *Abbots* several persons of learning, they made a vigorous opposition to the rising heresies of those times; which either occasioned the bishops to call them out of their deserts, and fix them about the suburbs of cities; and at length in the cities themselves: from which era their degeneracy is to be dated.

The *Abbots*, now, soon wore off their former plainness and simplicity, and began to be looked on as a sort of little prelates. In time they would be independent of the bishops; and became so insupportable, that some severe laws were made against them at the council of Chalcedon: notwithstanding this, in time, many of them carried the point of independency; and got the appellation of lord, with other badges of the episcopate, particularly the mitre.

Hence arose new species and distinctions of *Abbots*: mitred, and not mitred; croziered, and not croziered, *ecumenical Abbot*, cardinal *Abbot*, &c.

Mitred ABBOTS, were those privileged to wear the mitre; and allow'd, withal, a full episcopal authority within their several precincts.—Among us, these were also called *Abbots* sovereign, and *Abbots* general; and were lords of parliament. Of these Sir Edward Coke reckons twenty-seven in England, beside two mitred priors.

The rest, who were not mitred, were subject to the diocesan.

Pere Flay, a Benedictine monk, in his book entitled *Astrum inextinctum*, maintains, that the *Abbot* of his order have not only a sort of episcopal, but even of papal jurisdiction, *potestatem quasi episcopalem, imo quasi papalem*; and as such can confer the lower orders of deacon and subdeacon.

When the *Abbots* first assumed the mitre, the bishops made heavy complaints of their privileges being invaded by the monks; and were particularly offended, that in synods and councils there was no distinction between them. On this occasion pope Clement IV. ordered, that the *Abbots* should only wear their mitres embroidered with gold, and leave jewels to the bishops.

Croziered ABBOTS, are those who bear the crozier, or pastoral staff.

There are some croziered and not mitred; as the *Abbot* of the Benedictine abbey at Bourges: and others, both the one and the other.

Among the Greeks, some even took the quality of *ecumenical Abbot*, or universal *Abbot*, in imitation of the patriarchs of Constantinople.

Nor have the Latins been much behind them in that respect; the *Abbot* of Cluny, in a council held at Rome, assumed the title of *Abbas abbatum*, *Abbot of Abbots*; and pope Callistus gave the same *Abbot* the title of cardinal *Abbot*.

To say nothing of other cardinal *Abbots*, thus denominated from their being the principal *Abbots* of monasteries, which came to be separated.

Abbots are now chiefly distinguished into regular, and commendatory.

ABBOTS regular, are real monks, or religious, who have taken the vows, and wear the habit of the order. See **REGULAR**, and **VOW**.

Such are all *Abbots* presumed to be; it being expressly provided by the canons, that none but a monk have the command over monks.—But, in fact, it is found far otherwise: in France, I think, there are now but six regular abbots.

ABBOTS in commendam, are seculars; though they have undergone the tonsure, and are obliged by their bulls to take orders when they come of age.

Though the term *commendam* insinuates, that they have only the administration of their abbays for a time; yet do they hold, and reap the fruits of them for ever; as well as the regular *Abbots*.

Their bulls give them a full power *tam in spiritualibus quam in temporalibus*. And yet, it is true, that the commendatory *Abbots* do not perform any spiritual offices; nor have they any spiritual jurisdiction over their monks. So that the phrase *in spiritualibus*, is rather something of the Roman style, than a reality.

Some of their canonists rank the *commendam* in the number of benefices,

benefices, *inter titulos beneficiarum*. It is, in truth, no more than a canonical title, or provision to enjoy the fruits of a benefice: but as such provisions are contrary to the ancient canons, none but the pope, by dispensing with the old law, can grant them.

Our own history speaks very little of these commendatory Abbots; and it is probably the practice never prevailed much among us. Hence, many of our writers have been led into the mistake, of supposing that all Abbots are monks. Of this we have a remarkable instance, in the dispute about the inventor of the lines for transforming geometrical figures, called by the French the Robervalian lines. Dr. Gregory, in the Philosophical Transactions anno 1694, rallies the Abbot Galloys, who held the abbey of St. Marun de Cores in commendam, with being a monk: 'The good father, says he, 'imagines we are returned into that fabulous age wherein a monk might be allowed to say what he pleased.' Which passage the Abbot takes hold of, and returns the railery, with interit, on the doctor, in the *Memoir, de l'Academ. an. 1703*. The ceremony whereby Abbots are created, is properly called benediction; or sometimes, though that abusively, consecration.

It anciently consisted in cloathing him with the habit called *cutella*, a cowl; putting the pastoral staff in his hand, and the shoes called *pedales*, or *pedules*, on his feet. These particularities we learn from the *ordo Romanus* of Theodore archbishop of Canterbury.

ABBOT is also a title, which has been given to certain bishops, by reason their sees had originally been abbeys; and that they were even elected by the monks: such are those of Catania and Montreal, in Sicily.

ABBOT is also an appellation sometimes given to the superiours, or generals of some congregations of regular canons; as that of S. Genevieve at Paris. See CANON.

ABBOT is also a title bore by several magistrates, and other lay-persons.—Among the Genoese, one of their principal magistrates was called the *Abbot* of the people.

In France, particularly about the time of Charlemaign, there were several lords and courtiers, who having the superintendency of certain abbeys committed to them, were styled, *Abbo-comites*, or abhey-counts.

ABBREVIATURE*, or ABBREVIATION, a contraction of a word, or passage; made by dropping some of the letters, or by substituting certain marks, or characters in their place.

* The word is derived from the Latin *brevis*, of the Greek *βρεβης*, short.

Lawyers, physicians, &c. use abundance of *Abbreviatures*; partly for the sake of expedition, and partly for that of mystery.—A list of the principal *Abbreviatures* in the several arts and faculties, see under the article CHARACTER.

Of all people, the Rabbins are the greatest dealers in this way; their writings are unintelligible, without an explication of the Hebrew *Abbreviatures*. The Jewish authors and copists don't content themselves to *abbreviate* words, like the Greeks and Latins, by retrenching some of the letters, or syllables thereof; but they frequently take away all but the initial letter. Thus, R stands for *rabbi*, and N for *רַבִּי*, or *רַבִּי* according to the place it is found in.

But what is more, they frequently take the initial letters of several succeeding words, join them together, and adding vowels to them, make a barbarous sort of word, representative of all the words thus abridged. Thus, *Rabbi Schelembi Jarchi*, in the jargon of Hebrew *Abbreviatures*, is called *Rasi*; and *Rabbi Moses ben Meisiam*, is *Rambam*. And thus again, *N' B' N'* is put for *הַבְּנֵי בְּרַחֲמֵי דַמְּוּן* in *abdito evertit in em*. Mercerus, David de Pomis, Schindler, Buxtorf, &c. have given explications of such *Abbreviatures*.—The most copious collection of Roman *Abbreviatures*, is that of Sertorius Ursatus: *Sertorii Ursati, equitis, de notis Romanorum, commentarius*.

ABBREUVOIR*, in masonry, the joint, or juncture of two stones; or the interstice, or space left between them and filled up with mortar.

* The word is French, and literally denotes a watering-place.

ABBROCHMENT. See the article ABROCHMENT.

ABBUTTALS. See the article ABUTTALS.

ABCEDARY, ABCEDARIAN, or ABCEDERIAN, is sometimes applied to compositions, whose parts are disposed in the order of the letters of the alphabet.

In this sense *Abcedarian* is synonymous with alphabetical.— Thus we meet with *Abcedarian* psalms, lamentations, prayers, and the like; chiefly among Hebrew writers; which makes it probable they were the inventors of this species of wit.

ABDICATIO*, ABDICATIO, the act whereby a magistrate, or person in office, renounces, and gives up the same, before the legal term of service is expired.

* The word is derived from *abdicare*, which is compounded of *ab*, from; and *dicere*, to declare.

Abdicatio is frequently confounded with resignation; but, strictly speaking, there is a difference: *Abdicatio* being done

purely and simply; whereas resignation is done in favour of some third person.

In this sense, Diocletian, and Charles V. are said to have *abdicated* the crown; But Philip IV. of Spain resigned it. The parliament voted King James's violation of the laws, and his quitting the kingdom, without providing for the due administration of affairs in his absence, to import an *Abdicatio* of the crown.

ABDICATIO, among Roman writers, is more particularly used for the act whereby a father disclaimed or disclaimed his son, and expelled him the family.

In this sense the word is synonymous with the Greek *ἀποκλησις*, and the Latin a *familia alienatio*, or sometimes *ablatio*, and *negatio*; and stands opposed to adoption.— It is distinguished from *exhereditatio*, or disinheriting, in that the former was done in the father's life-time, the latter by will at his death: so that whoever was *abdicated*, was also disinherited, but not *vice versa*. See EXHEREDITATION.

ABDOMEN*, in anatomy, the belly, or lower venter; or that part of the body comprehended between the thorax, and the hips.

* The word is purely Latin, and is derived from *abdere*, to hide; either because many of the principal viscera of the body are contained, and as it were hidden in this part; or as others imagine, because the part itself is usually covered and concealed from sight, whereas the part over it, *viz.* the thorax, is frequently left bare.—Others suppose the word *abdomen*, a compound of *abdere* and *omentum*, in regard the omentum or caul is one of the parts contained in it.—Others take it for a mere paronymy, or different termination of *abdere* especially as in some ancient glosses it is written *abdomen*, which might have been formed from *abdere*, as *legumen* from *legere*, the *e* and *u* being often interchanged.

Anatomists usually divide the body into three regions, or venters: the head, the thorax or breast, and the *Abdomen*, which makes the lowest part of the trunk; being terminated by the diaphragm above, and by the inguen or pubis below. See BODY.

The *Abdomen* is lined internally with a thin, soft membrane, which investing all the viscera above mentioned, contains and keeps them in their place, this is called the *peritonæum*: upon a rupture or dilatation whereof, they are apt to fall, and form those tumors called hernias. See PERITONÆUM.

It is covered and defended with five pair of muscles; which not only defend the viscera, but by their alternate relaxations, and contractions in respiration, promote the action of digestion, and the extrusion of the feces and urine. By their contraction, the cavity of the *Abdomen* is straitened, and the descent of the contents of the viscera through the intestines is promoted. They are the proper antagonists to the sphincters of the anus and bladder, and forcibly expel the excrements of those parts, as also the fetus in parturition.

These muscles are the *obliqui descendentes*, and *ascendentes*, the *transversarius*, and *pyramidalis*; see each under its proper article.

The *abdomen* is subdivided into three lesser regions or cavities: the uppermost, called the epigastric, commences from the diaphragm and cartilago ensiformis, and terminates two fingers breadth above the navel: the second, called the umbilical, begins where the former ends, and terminates two fingers breadth below the navel: the third, called the hypogastric, descends as low as the os pubis.

Each of these subdivisions, the more accurate writers divide further into three parts; a middle, and two lateral ones, called the *hypochondriums*. The middle part of the umbilical, is called the *umbilicus*, or navel; and its lateral parts the *lumbi*, or loins: the middle of the hypogastric, is called the *hypogastrium*; and its sides the *ilæ*, or flanks. To which may be added the pubes, groin, ischiatic region, and perinæum. See each under its proper place.

ABDUCTION*, in logic, a kind of argumentation, by the Greeks called *apagoge*; wherein the greater extreme is evidently contained in the medium, but the medium not so evidently in the lesser extreme as not to require some further medium, or proof to make it appear.

* It is called *Abduction*, from *ab*, from; and *ducere*, to draw; because, from the conclusion, it draws us on to prove the proposition assumed.

Thus, in the syllogism, 'All whom God absolves are free of sin; but God absolves all who are in Christ: therefore, all who are in Christ are free of sin.' The major is evident; but the minor, or assumption is not so, without some other proposition to prove it; as, 'God received satisfaction for sin by the suffering of Jesus Christ.'

ABDUCTOR*, or ABDUCTOR, in anatomy, a name common to several muscles, whose action is the withdrawing, opening, or pulling back the parts they are fixed to.

* The name is Latin, compounded of *ab*, from; and *ducere*, to draw.—Their antagonists are called *Adductores*. See ADDUCTOR.

ABDUCTOR Auricularis, or of the little finger, arises from the annular ligament, and the third and fourth bones of the carpus in the second rank; and is inserted externally into the first bone of the little finger: it serves to draw that finger from the rest, and also to bend it a little.—See *Tab. Anat.* (Myol.) *fig. 2. n. 23.*

In some subjects it appears divided into two or three muscles, consisting of so many different series of fibres.

ABDUCTOR Indici, or of the fore-finger, arises from the inside of the bone of the thumb, and is inserted into the first bone of the fore-finger, which it draws from the rest towards the thumb.—See *Tab. Anat.* (Myol.) *fig. 1. n. 32. & fig. 6. n. 24. & fig. 7. n. 8.*

ABDUCTOR minimi digiti manus. See **ABDUCTOR Auricularis**.
ABDUCTOR minimi digiti pedis, or of the little toe, arises from the outside of the os calcis, near the exterior bone of the metatarsus, and is inserted laterally into the outside of the second bone of that toe, which it pulls from the rest.—See *fig. 1. n. 74. & fig. 6. n. 45.*

ABDUCTOR oculi, or of the eye, is one of the four recti, or strait muscles, arising from the bottom of the orbit, and spread over the first proper tunica; serving to draw the eye towards the outer canthus.

ABDUCTOR pollicis, called also *thenar*, springs from the annular ligament, and first bone of the carpus; from whence passing to the thumb, it makes that fleshy body called *mons lunæ*: it draws the thumb from the fingers.—See *fig. 1. n. 31. & fig. 2. n. 21. & fig. 6. n. 25. & fig. 7.*

ABDUCTOR pollicis pedis, or of the great toe, springs from the inside of the os calcis, and the greater os cuneiforme; and is inserted into the outside of the exterior os sesamoideum pollicis; it serves to draw the great toe from the rest.—See *fig. 1. n. 72. & fig. 2. n. 52.* See also the article **TOE**.

ABŒCEDARIAN. See the article **ABŒCEDARY**.

ABELIANS, **ABELONIANS**, or **ABELOITES**, a sect of heretics in Africa, not far from Hippo, whose distinguishing tenet, and practice was to marry, and yet live with their wives in a professed abstinence, without having any carnal commerce together.

These heretics, inconsiderable in themselves, (for they were confined to a little compass, and lasted not long;) are become famous, by the great pains the learned have taken to ascertain the principle they went upon, and the reason of their denomination.

Some will have them to have built on that text of St. Paul, *1 Cor. vii. 29. Let them that have wives be as though they had none.* A late writer concludes, that they regulated their marriage on the foot of the terrestrial paradise; alleging, that there was no other union between Adam and Eve, but that of hearts. He adds, that they had likewise an eye to the practice of Abel, whom they held to have been married, but never to have known his wife: and that from him they derived their name.

Bochart observes, that it was a tradition current throughout the east, that Adam conceived too much sorrow for the death of Abel, that he was a hundred and thirty years without having to do with Eve. This, he shews, was the sentiment of the Jewish doctors; from whom the fable was transmitted to the Arabs: and hence it was, according to Giggeus, that **אבולתאבאל**, in Arabic, came to signify, to abstain from one's wife. He concludes, that he is the most mistaken person in the world, or that his story had reached Africa, and given occasion both to the sect, and the name.

It is true, the Rabbins do hold, that Adam, after the death of Abel, remained a long time without any use of marriage; and till the time when he begot Seth: but to say that this was a hundred and thirty years is a manifest error; and contrary to their own chronologies, which place Seth's birth in the hundred and thirtieth year of the world, or of Adam's life; as may be seen in their two *Seder Olams*.

Abarbanel says, it was a hundred and thirty years after Adam's fall; as believing, with the other Rabbins, that Cain and Abel were conceived immediately after Adam's transgression. But, say others, be this as it will, whether a continuance on occasion of the fall, or of Abel's death; it was the continuance of Adam, not of Abel, that these heretics imitated; who, on this footing, should have been called *Adamites*, rather than *Abelians*. In effect, it is more than probable, they took their name from Abel, for no other reason, but because like that patriarch they had no issue; not that he lived in continence after marriage; but because he was killed before he had married.

ABETTOR*, or **ABBETTOR**, in law, one who incites, incourages, or sets another on to perform something criminal; or some way seconds, and assists him in the performance itself. See **ACCESSORY**.

* The word *abet* some deduce from *ad*, to; and *bet*, to lay on one's side;—others from the Belgic *bact*, to, to profit.—It alludes to the Saxon *bedon*, and the French *houer*, to stir up. Thus those who procure others to sue out false appeals of felony, or murder against men, to render them infamous, are particularly denominated *Abettors*.

So, *Abettors* in murder, are such as advise or procure a murder to be committed, or are accessory thereto. See **MURDER**.

There are *Abettors* in felony, but not in treason; the law looking on all those concerned in treason as principals. See **TREASON**.

ABEYANCE*, **ABEYANCE**, or **ABAYANCE**, in law-books; something that only exists in expectation, or in the intendment, or remembrance of the law.

* The word seems derived of the French *Abloyer*, or Italian *Abbojare*, to bark; by a metaphor taken from dogs, who when earnest for meat, bark, and as it were devour it with expectation. Though Spelman rather chuses to derive it from the phrase *tenir en Abbay*, to hold at bay, to defer or keep off.

Abeyance in our law, amounts to much the same with *hereditas jacens*, among the Romans, and *κατασ αποροσ*, or *δαμνωσ*, among the Greeks; i. e. *hereditas sperata*, or *expectata*, or rather *novum Dominium expectans*. As civilians say lands and goods do *jacere*; so common lawyers say, that things in like condition are in *Abeyance*: much as logicians say a thing is *in posse*, or in understanding; and as we sometimes say a thing is *in nubibus*.

It is a maxim in law, that of every land, either there is a fee simple in somebody, or it is in *Abeyance*.—If a church become vacant by the death of the parson, the freehold is said to be in *Abeyance*, till a new parson be inducted: for the patron has not the fee, but only the right of presenting to it, the freehold itself being in the incumbent thus presented, and therefore till such presentation in no body.

ABIGEUS. See **ABACTOR**.

AB-INTESTATE, **AB-INTESTATO**, in the civil law, is applied to a person who inherits from one who died intestate. See **INTESTATE**.

ABISHERSING*, an ancient law-term, denoting a being free, or exempt, from all americiaments for transgressions of any kind. See **AMERICAMENT**.

* According to Spelman, it originally signifies a forfeiture, or americiament; and should rather be wrote *Misbersing*, *Misbersing*, or *Misferring*.

The word *Abishersing*, in a charter or grant, is said to give the proprietor not only the forfeitures, and americiaments of all others for transgressions committed within his fee; but also to exempt him from all such controul by any within that compass.

ABJURATION*, in a general sense, the act of denying, or renouncing a thing in a solemn manner, and even with an oath.

* The word is Latin, *Abjuratio*, compounded of *ab*, and *jurare*, to swear from, or against.

Among the Romans, *Abjuration* signified the denying a debt, pledge, deposit, or the like trust, by a false oath. In which sense, *Abjuration* coincides with perjury; and stands distinguished from *ejuration*, where the oath is supposed just.

ABJURATION, more particularly is used for a solemn recantation, or renunciation of some doctrine, or opinion, as false and pernicious.

In our own laws, to *abjure* a person, is to renounce all authority or dominion of such a person.—By the oath of *Abjuration*, a person binds himself not to own any regal authority in the person called the Pretender, or ever pay to him the obedience of a subject.

ABJURATION is also used in our ancient customs, for an oath taken by a person guilty of felony; who flying to a place of sanctuary, would swear to forsake the realm for ever, in lieu of other punishment.—We also find instances of temporary *Abjurations*, viz. for three years, for one year and a day, and the like. This, in some cases, was admitted from criminals in lieu of death. The devotion for the church was so warm, from the time of Edward the confessor to the reformation, that if a man having committed felony, could recover a church or church-yard before he were apprehended, it was an asylum from which he could not be brought to take his trial at law; but confessing his crime to the justices, or coroner, and *abjuring* the kingdom, he was at liberty.

After *Abjuration*, a cross was given him, which he was to carry in his hand through the highways, till he was got out of the king's dominions; this was called the banner of mother-church. In time, *Abjuration* dwindled into a perpetual confinement of the prisoner to the sanctuary; wherein, after *abjuring* his liberty and free habitation, he was allowed to spend his life. By Stat. 21 Jac. I. all use of sanctuaries, and consequently of *Abjuration*, is taken away.

ABLACTATION. The weaning a Child from the Breast. See **SUPPLEMENT article WEANING**.

ABLACTATION, in the ancient agriculture, is a method of engrafting; wherein the cyon of one tree, being united for some time to the stock of another, is afterwards cut off, and as it were weaned from its mother-tree.*

* Whence the name *Ab lactation*, viz. of *ab*, from; and *lac*, milk.

Among the modern writers, *Ab lactation* is more usually called *inarching*, or *grafting by approach*. See the manner of performing it under the article **INARCHING**.

Ab lactation is only practicable where the stock to be grafted on, and the tree from which the graft is to be taken, stand so near, that the branch or cyon may be applied, without cutting

thing off. Hence, it is chiefly used on plants that grow in cañes; as orange, lemon, and pomegranate trees, vines, jef-famins, &c. The season is April or May. To perform it, the usual method is to take the branch intended for the graft, and pare it away, both the rind and wood, the length of three inches; then, paring likewise the stock, so that they may join closely to each other, they bind them together, and cover them over with clay, or grafting-wax. As soon as they are found well incorporated together, the head of the stock is to be cut off four inches above the binding; and the spring following, the graft: leaving the stock to subsist by it self.

Or, the operation may be done, by cutting off the head of the stock at the first, and leaving the top a little sloped, and applying the graft thereto, as in shoulder-grafting. But this method is not found equally successful.

ABLAQUEATION*, a name used by the ancient writers of agriculture, for an operation in gardening, whereby the earth is dug from about a vine, or other fruit-tree, and its roots are laid bare, to expose them more to the sun, rain, and air, in order to promote its fecundity.—This is generally done in January.

* The word is form'd from *ab*, from; and *lacus*, a hole or ditch.

ABLATIVE*, in grammar, the sixth case of Latin nouns.

* The word is Latin, formed from *auferre*, to take away. Priscian also calls it the *comparative case*; as *servans*, among the Latins, for comparing, as well as taking away.

The *Ablative* is opposite to the *dative*; the first expressing the action of taking away, and the latter that of giving. See *DATIVE*.

The *Ablative* scarce answers to the just idea of a case; at least, it is the most vague of all others. It will be shewn in its place that the English, and other modern tongues, have properly no such thing as cases: (See *CASE*.) But even in the ancient languages, from which the notion of cases is borrowed, it is suggested that the *Ablative* is only a sort of supererogatory, or supplement to the rest. The five proper cases not being found sufficient to express all the relations of things to each other, recourse was had to an expedient; *viz.* the putting a preposition before some of the other cases; and this made the *Ablative*.

It may be added, that in the plural number, the *Ablative* is still more obscure; as being only the *dative* repeated.

In English, French, &c. there is no precise mark whereby to distinguish the *Ablative* from other cases; and we only use the term in analogy to the Latin. Thus, in the two phrases, the magnitude of the city, and he spoke much of the city; we say, that of the city in the first is *genitive*, and in the latter *Ablative*; by reason it would be so, if the two phrases were expressed in Latin.

ABLEGATIO. See *ABDICATIO*.

ABLUENTS, ABLUENTIA, in medicine, a name which some authors give to a sort of remedies, better known by the name of *abstersgents*. See *ABSTERSGENT*.

ABLUTION, in antiquity, a religious ceremony, in use among the Romans; being a sort of purification, performed by washing the body, before they entered on sacrifice.

Sometimes they washed their hands, and feet, sometimes the head, and oftentimes the whole body: for which purpose, at the entrance into their temples were placed marble vessels filled with water.

This custom, they probably learnt from the Jews; since we read in scripture, that Solomon placed at the entry into the temple which he erected to the true God, a great laver, which the text calls a brazen sea, where the priests washed themselves before they offered sacrifice; having beforehand sanctified the water, by throwing into it the ashes of a victim that was slain in sacrifice.

ABLUTION is particularly used in the Romish church, for a sup of wine and water, which the communicants anciently took after the host, to wash it down, and help to digest it.

The same term also signifies the water which serves to wash the hands of the priest who consecrated it.

ABLUTION, in pharmacy, is a preparation divers remedies undergo, by washing them in water, or some other fluid, proper to cleanse, and free them of their impurities, and so to exalt their powers.

ABLUTION is sometimes also used, though with less propriety, for the washing, or infusing certain medicines in water, to freshen them, and dissolve their salts; this is otherwise called *dalcisging*.

ABOLITION*, **ABOLISHING**, in a general sense, the act of destroying a thing, or reducing it to nothing.

* The word is Latin; derived, as some think, from the Greek *abolous*, to destroy; but, according to others, compounded of *ab* and *olere*, to smell; *q. d. ita perdere ut ne oleat quidem*, not to leave any smell of it behind: yet in Pliny we even meet with *abolere advenum*.

In our laws, the *Abolition* of a law, statute, or custom, is the abrogating or repealing it.

In the civil law, the leave given by a prince or judge, to

a criminal accuser, to desist from further prosecution of the accused, is peculiarly called *Abolition*. *V. 25. H. 8. c. 51.*

ABOMASUS, ABOMASUM, or ABOMASIUM, in comparative anatomy, one of the stomachs, or ventricles of animals of the ruminating kind. See *RUMINANT*.

Beasts that chew the cud are found to have four stomachs; *viz.* the rumen, or magnus venter, or stomach, properly so called, the reticulum, omasus, and *Abomasus*. See *RUMINATION*, &c.

The *Abomasus*, popularly called the *masu*, is the last of the four; being the place wherein the chyle is formed, and from which the food descends immediately into the intestines.

It is full of a sort of leaves like the omasus; but its leaves have this particular to them, that beside the membranes they consist of, they contain a great number of glands, not found in any of the first.

It is in the *Abomasus* of calves and lambs, that the rennet or curdling is formed, wherewith housewives turn or curdle their milk.

ABORIGINES, or ABORIGENES, in geography, a name sometimes given to the primitive inhabitants of a country, or those who had their original therein; in contradistinction to colonies, or new races of inhabitants, derived from elsewhere.

The term *Aborigines* is famous in antiquity.—Though now an appellation, it was originally a proper name, given only to a certain people of Italy; and both the reason and origin of it are greatly disputed among the learned.

ABORIGINES then denoted a nation in Italy, which inhabited the ancient Latium, or country now called *Romania*, or *Campania di Roma*.

In which sense, the *Aborigines* are distinguished from the Janigenæ, who, according to the false Berofus, inhabited the country before them; from the Siculi, whom they expelled; from the Grecians, whom they descended from; from the Latins, whose name they assumed, after their union with *Æneas* and the Trojans; and lastly, from the Aefonii, Volsci, Oenotrii, &c. neighbouring nations in other parts of the country.

Whence this people came by the appellation, whether (1) as belonging to any of the species of *Aborigines*, above recited; or (2) from their having been *aberrigines*, i. e. wanderers; or (3) from their inhabiting the mountains; or on what other account, is much disputed.

- (1) S. Jerom says, they were so called as being, *ab ipse origine*, the primitive planters of the country, after the flood: Dion. Halicarnæus accounts for the name, as denoting them the founders of the race of inhabitants of that country: others think them so called as being originally Arcadians, who claimed to be earth-born, and not descended from any people.
- (2) Aurelius Victor suggests another opinion, *viz.* that they were called *Aborigines*, *q. d. Aberrigines*, from *ab*, from; and *errare* to wander; as having been before a wandering people, to which opinion Festus gives some credit: it is added that Pelagians, another name sometimes given them, is of the same import, and denotes vagabonds, like cranes.
- (3) Pausanias rather thinks they were thus called *απο οριων*, from mountains; which opinion seems confirmed by Virgil, who speaking of Saturn, the legislator of his people, says:
Is genus indocile, ac dispersum montibus altis
Conspicit, læsusq; dedit.

The *Aborigines* were either the original inhabitants of the country, settled there by Janus, as some imagine, or by Saturn, or Cham, as others, not long after the dispersion; or even as some think before it: or they were a colony sent from some other nation; who expelling the ancient inhabitants the Siculi, settled in their place. About this mother-nation there is great dispute: some maintain it to be the Arcadians, parties of whom were brought into Italy at different times; the first under the conduct of Oenotrius, son of Lycaon, four hundred and fifty-five years before the Trojan war; a second from Theffaly; a third under Evander, sixty years before the Trojan war: besides another under Hercules; and another of Lacedæmonians, who fled from the severe discipline of Lycurgus: all these uniting, are said to have formed the nation or kingdom of the *Aborigines*. Others will have them of Barbarian rather than Grecian origin, and to have come from Scythia; others from Gaul: and lastly others will have them to be Canaanites, expelled by Joshua.

ABORTION, is used in medicine, for the unseasonable exclusion of an imperfect human fœtus, either alive, or dead; before the legitimate time of delivery.

In this sense, *Abortion* amounts to the same with what we popularly call *miscarriage*; the Latins *abortus*, and sometimes *abaetus*.

This may happen at any time of pregnancy; but if before the second month after conception, it is properly called a *false conception*, or effluxion.

We have also histories of irregular deliveries by the way of the anus, the navel, &c.

The usual causes of *Abortion*, are immoderate evacuations, violent motions, sudden passions, frights, &c. Other causes are, the largeness and heaviness of the fœtus, irritation of the womb,

womb, relaxation of the ligaments of the placenta, weakness, and want of nourishment in the fetus; excess of eating, long fasting or waking, the use of bulks for the shape, offensive smells, violent purgatives; and, in the general, any thing that tends to promote the menses.

The symptoms usually preceding, are a fever, either continual or intermitting; pain in the loins and head, heaviness in the eyes, a bearing down and constriction of the abdomen; an eruption of aqueous, or pure blood; falling of the breasts; watery milk, &c. When the time of miscarriage is just at hand, the pains are much the same as those in labour.

Abortion is dangerous where the time of pregnancy is far advanced, so that the fetus must be large, where the cause is very violent, or the patient strongly convulsed, and where a large hemorrhage precedes or ensues, or the fetus is putrefied, &c. Under other circumstances it rarely proves mortal.

The treatment is to be adapted to the particular symptoms and circumstances: if the patient be plethoric, as soon as the first symptoms discover themselves, a vein is to be opened. In case of flooding, recourse is had to proper astringents; or if those fail, to fomentations, injections, and suffumigations. If a tenesmus attend, rhubarb is to be used; and if there be an habitual laxity of the uterine vessels, gualiacum. See GESTATION.

ABORTION is also used, somewhat abusively, for a fetus which dying in the womb, continues there beyond the legitimate term; sometimes several years, and sometimes even during the whole life of the mother.

ABORTIVE, something come before its due time, or before it has arrived at its maturity and perfection.

F. Jerom. Florentinus has an express treatise of the baptism of *Abortivos*, or *abortivus* children. His aim is to shew that an *Abortivus* may, and ought to be baptized, at what time or term soever it come into the world; by reason the precise time when the fetus begins to be animated is not known. There are several curious, and uncommon things in this work, which is intitled *Homo dubius, sive de baptismo Abortivorum*. Ludg. 1674. 4to.

ABORTIVE VELUM, is that made of the skin of an *abortive* calf. See **VELOM**.

ABRACADABRA *, a magic word, which being repeated in due form, a certain number of times, is supposed to have the virtue of a charm or amulet, in curing agues, and preventing other diseases.

* The word is of barbarous origin, formed from **ABRACA**, the name of a god, supposed to contain great mysteries; from **THI**, by lengthening the word with two additional syllables, to make it more quaint and sonorous, comes *Abacadabra*. See **BASILIDIAN**.

The invention of this charm is generally ascribed to the elder Serenus Sammonicus, who lived under Severus and Caracalla. Others suppose he only copied it from some other writer of the Basilidian sect. All we know for certain is, that in an heroic poem of this author still extant, concerning easy and parable remedies for most diseases, *de medicina parvo pretio parabili*, the word *Abacadabra* is prescribed for semi-tertian agues, with the manner how it is to be applied; viz. by writing it as many times as it contains letters, omitting each time the last letter in the former; so that the whole may form a kind of inverted cone * in which there is this property, that way soever the letters be taken, beginning from the apex, and ascending either to the right or left, they make the same word, or as some will have it the same sentiment, as is found in the first whole line.—According to Julius Africanus, another ancient writer, the pronouncing of the word in the same manner will do as well.

* The prescription, as given by Serenus, is as follows:

*Inscribes chartæ quod dicitur Abacadabra,
Sapius & subter repetes, sed detrahe summam,
Et magis atque magis desint elementa figuris,
Singula que semper rapies, & cætera figes,
Donec in angustum redigatur littera conum.
His lino nexis collum redimire memento:
Talia languentis conducunt vincula collo,
Lethalesque abigent (miranda potentia) morbos.*

ABRASION *, is sometimes used, among medical writers, for the act of wearing away the natural mucus which covers the membranes, and particularly those of the stomach and intestines, by sharp corrosive medicines, or humours.

* The word is compounded of the Latin *ab*, and *rado*, I shave, or scrape off.

ABRAXAS. The same as **ABRACADABRA**. Which see **ABRENUNCIATION**. See the article **RENUNCIATION**.

ABRIDGMENT, a summary, or contraction of a discourse; wherein the less material things being more briefly insisted on, the whole is brought into a lesser compass. See **EPITOME**.

The *Abridgments* of the Philosophical Transactions, of Mr. Boyle's Philosophical Works, &c. are works very useful in their kind: though it has been charged as a fault in the former of these, that the authors have taken upon them

entirely to omit a great number of such papers and discourses, as were not so much to their own taste; which is not the nature of an *Abridgment*, but of a florilege, analecra, or excerpta.

ABRIDGMENT, in law, is particularly used for the shortening a count, or declaration, by subtracting some of the substance of it.

A man is said to *abridge his plaint* in assize, or a woman her demand in an action of dower, when, having put any lands therein which are not in the tenure of the tenant or defendant; and non-tenure, or the like, is pleaded to that land in abatement of the writ; they are brought to *abridge*, i. e. to desist from and leave that parcel out of the demand; and pray that the tenant may answer to the rest, to which he has not yet pleaded any thing.—Though the demandant has *abridged* his plaint or demand; yet the writ still remains good for the rest. The reason is, that such writs run in general, and do not specify particulars. See 21 H. 8. c. 3.

ABROCHMENT, or **ABROCHMENT**, **ABROCAMENTUM**, in some ancient law-writers, denotes the act of ingrossing or buying up commodities by wholesale, before they come into the open market; in order to sell them off dear by retail: otherwise called *forestalling*.

ABROGATION, the act of abolishing a law, by authority of the maker.

In which sense, the word is synonymous with abolition, repealing, and revocation.

Abrogation stands opposed to rogation: it is distinguished from derogation, which implies the taking away only some part of a law; from subrogation, which denotes the adding a clause to it; from obrogation, which implies the limiting, or restraining it; from dispensation, which only sets it aside in a particular instance; and from antiquation, which is the refusing to pass a law.

ABSCCESS *, in medicine, a kind of inflammatory tumor, containing purulent matter, pent up in a fleshy part, and corrupting and consuming the fibres, and other substance thereof. See **TUMOUR**.

* Authors are divided as to the reason of the appellation: some think the tumor thus called, by reason parts before contiguous, *abscedunt*, or separate from each other; others, because particles of the fibrous matters, are torn off and wasted; others, because the matter flows and is derived from another part, or is secreted from the blood; lastly, others derive the appellation from the running of the pus; on which principle they assert that it is not properly an *Abscess*, till it bursts and begins to vent itself. But this is a critic's decision; which physicians will hardly be determined by.

Abscess is the same with what the Greeks call *apostema*, and the English, *imposthume*, or *imposthumation*.

Almost all *Abscesses* are the consequences of inflammation.

—The ripening of *abscesses* is promoted by poultices, &c.

—*Abscesses* are open'd either by caustic or incision; but the latter in most cases is preferable. *Sharp Surg. Intr. c. 2.*

Abscesses arise often in women after delivery; and though dangerous in themselves, yet they often appear to be the crisis of the disease that gave rise to them.—For the cure, if they cannot be dissipated, i. e. carried off by proper artificial evacuations, as phlebotomy, purging, &c. with the use of calomel between whites, and gentle perspiratives foment's, liniments, and cataplasms; recourse is to be had to the contrary method, and they must be brought to suppuration. When the matter is fully ripened, they are to be opened with a lancet or caustic, and their cure attempted by digestives and incarnatives. See **RIPENER**, and **INCARNATIVE**.

ABSCISSE, **ABSCISSA**, in conics, a part of the diameter, or transverse axis of a conic section, intercepted between the vertex or some other fixed point, and a semiordinate. See **CONIC SECTION**.

Such are the lines AP, AP, &c. (*Tab. Conicæ, fig. 20.*) intercepted between the vertex A and the semiordinates PM, PM, &c. which are called *Abscisses*, of the Latin *abscindere*, to cut off; as being parts cut off from the axis.—Others call them, *scagitta*, q. d. arrows.

In the parabola, the *Abscisse* is a third proportional to the parameter and semiordinate; and the parameter a third proportional to the *Abscisse* and semiordinate.

In the ellipsis, the square of the subordinate is equal to the rectangle of the parameter into the *Abscisse*, subtracting another rectangle of the same *Abscisse*, into a fourth proportional to the axis, parameter, and *Abscisse*.

In the hyperbola, the squares of the semiordinates are to each other as the rectangles of the *Abscisse* into another line, composed of the *Abscisse* and the transverse axis.

ABSENT. See the article **PRESENT**.

ABSIS. See the article **APSES**.

ABSOLUTE *, in a general sense, something that stands free or independent on others.

* The word is compounded of the Latin *ab*, from; and *solvere*, to loosen.

ABSOLUTE, in metaphysics, denotes a being, whose whole existence

fence does not consist in a mere habitude, or relation to another.

In which sense *Absolute* stands opposed to relative or respective.

ABSOLUTE is more particularly understood of a thing which does not proceed from any cause, or does not subsist by virtue of any other being, considered as its cause.

In which sense, God alone is *Absolute*.

Absolute in this sense is synonymous with independent, and stands opposed to dependent.

ABSOLUTE also denotes a thing's being free from conditions, or limitations.

In this sense, the word is synonymous with unconditional. We say, an *Absolute* decree, *Absolute* promise, *Absolute* obedience. The covenant with Noah was *Absolute*, and without conditions; that under the gospel, on condition of faith and obedience. The Antinomians also hold the gospel-covenant *Absolute*, and that Christ has purchased our salvation, without any conditions to be performed on our side.

ABSOLUTE Government, that wherein the prince is left solely to his own will, being not limited to the observance of any laws except those of his own discretion.

When the Danes made their king *Absolute*, in 1670, they declared him absolved from his coronation-oath.

ABSOLUTE Number, in algebra, is the known quantity or number which possesses one entire side, or part of an equation; being the rectangle, or solid whose root or value is to be found. See **EQUATION**.

Thus, in the Equation $aa + 16a = 36$, the *Absolute Number* is 36: which is equal to a multiplied by itself, added to 16 times a .

This is what Vieta calls *homogeneous comparisons*.

ABSOLUTE Equation, in astronomy, is the sum of the optic and eccentric equations.

Abolutive ABSOLUTE, in grammar, is a word or phrase detach'd, and independent of the rest of the discourse; neither governing, nor being governed of any other thing.

This is frequent among the Latins; in imitation of whom, the modern languages have likewise adopted it: *deleto exercitu*, the army being cut to pieces. *All things considered*, reason will appear the best guide in matters of religion.

ABSOLUTE Motion. } See { **MOTION**.

ABSOLUTE Place. } See { **PLACE**.

ABSOLUTE Space. } See { **SPACE**.

ABSOLUTELY, in a general sense, stands opposed to relatively. See the articles **ABSOLUTE** and **RELATIVE**.

Thus, the terms of a proposition are said to be taken *Absolutely*, that is, without relation to each other.—Man, considered *Absolutely*, and in himself, is a reasonable creature.

ABSOLUTELY is also used for unlimitedly or unconditionally.

In which sense, the schoolmen oppose it to *secundum quid*. Thus a thing is said to be *Absolutely*, and simply good.

ABSOLUTELY is also used, by divines, in opposition to declaratively.

The church of Rome holds, that the priest can forgive sins *Absolutely*; the protestants say, only declaratively and ministerially.

In grammar, we say, a word is taken *Absolutely*, *absolute sumptus*, when it has no regimen, or government. Thus, in the phrase *We should pray without ceasing*, the word *pray* is taken *Absolutely*, as it governs nothing.

In geometry, *Absolutely* is taken for entirely, or completely. Thus, we say, such a thing is *Absolutely* round; in contradistinction from what is only partly so, as a spheroid, cylinder, &c.

ABSOLUTION, **ABSOLUTIO**, in the civil law, &c. a definitive sentence, whereby a person accused of any crime, is acquitted, and declared innocent.

Among the Romans, the ordinary method of pronouncing judgment was this: After the cause had been pleaded on both sides, the *Præco* used the word *dixerint*, *q. d.* they have said what they had to say. Then, three ballots were distributed to each judge; one marked with the letter *A.* for *Absolution*; another with *C.* for condemnation; and a third with *N. L.* for *non liquet*, it is not clear; to require respite of judgment: and according as the majority fell of this or that mark, the accused was *absolved* or condemned, &c. If he were *absolved*, the *Prætor* dismissed him with *uidetur non fecisse*, or *iure videtur fecisse*?

When the votes were equally divided on the sides of *Absolution* and condemnation, the accused was *absolved*: this procedure is supposed to be founded on the law of nature. Such is the sentiment of Faber on the 125th law, *de Div. Reg. Jur.* of Cicero, *pro Cluentio*; of Quintilian, *Declam.* 254; of Strabo, lib. ix. &c.

ABSOLUTION, in the canon law, is a juridical act, whereby a priest, as a judge, and in virtue of a power given him by Jesus Christ, remits the sins of such as, upon confession, appear to have the conditions requisite thereto.

The Romanists hold *Absolution* a part of the sacrament of penance: the council of Trent, sess. xiv. cap. iii. and that of Florence, in the decree *ad Armenos*, declare the form or

essence of the sacrament to lie in the words of *Absolution*, *I absolve thee of thy sins*.

The formula of *Absolution* in the Romish church is absolute; in the Greek church, it is deprecatory; and in the churches of the Reformed, declarative. Arcuvius, indeed, contends that the Greek formula is absolute; and that it consists in these words, *Mea medicoritas habet te venia donatum*. But the instances he produces are either no formula's of *Absolution*, or only of *Absolution* from excommunication, not of sacramental *Absolution*.

ABSOLUTION is chiefly used in the Reformed churches for a sentence whereby a person who stands excommunicated, is released or freed from the same.

In the church of Scotland, if the excommunicated shew real signs of godly sorrow, and if upon application to the presbytery a warrant be granted for his *Absolution*, he is brought before the congregation to confess his sin, and express his sorrow as often as the Presbytery shall think meet: when the congregation is satisfied of his penitence, the minister puts up a prayer, desiring Jesus Christ who has instituted the ordinance of excommunication, (*i. e.* of binding and loosing the sins of men on earth) with a promise of ratifying the righteous sentence above, to accept of this man, to forgive his disobedience, &c. This done, he pronounces his *Absolution*; by which his former sentence is taken off, and the sinner is again received into the communion.

In the church of Rome there are divers other political *Absolutions*; as,

ABSOLUTIO a seculo, which is necessary where a person has been concerned in seeing sentence of death executed on a criminal, or has any other way disqualified himself for the holding of a benefice.

ABSOLUTIO ad cautelam, is that granted to a person who has lodged an appeal against a sentence of excommunication, by which the force of the censure is suspended.

It being a maxim in the papal jurisprudence, that the sentence stands good notwithstanding any appeal; this sort of *Absolution* is sometimes granted until the issue of his appeal be known: by means hereof, some articles, at least, of his excommunication are taken off; inasmuch that persons may converse with him without danger: and beside, in case of death, this sentence is supposed to stand him in some stead.

ABSORBENTS, in medicine, remedies which by the softness or porosity of their component parts, become proper to sate the asperities of sharp pungent humors; or to imbibe or dry away, as with a sponge, superfluous moistures.

Such are the tefaceous powders, hartshorn, coral, crabs eyes and claws, calcined bones, burnt ivory, terra sigillata, and even iron it self: also divers woods; as sanders, mastic, guaiacum, salsfaras; and divers roots, as china, sarsaparilla, &c.

Absorbents are much the same with what we otherwise call driers and sweetners. Latin writers also use the word as synonymous with *imbibentia*, and *saturantia*.

The term *Absorbent* is frequently confounded with *alcali*; *alcalies* having, really, the effect of *Absorbents* with respect to acids.

ABSTEMIOUS, is properly understood of a person who refrains absolutely from all use of wine.

In which sense, *Abstemiös* is synonymous with the Latin *invinius*, *vini abstinentes*, and the Greek *αεινός*, or even *ἀσφαρσις*, and *ἀσφαρσις*, *q. d.* water-drink, water-advocate, &c. being compounded of *abs*, from; and *temetum*, wine.

ABSTEMIOUS is particularly used among ecclesiastical writers, in speaking of persons, who are disabled from partaking of the cup in the eucharist, by reason of a natural aversion to wine.

It has been disputed, whether those naturally *Abstemiös* may be allowed to communicate in the species of bread only? The Calvinists, in the synod of Charenton, permitted them to communicate by only touching the cup with the lips, without drinking a drop: the Lutherans exclaim against this toleration, as a sacrilegious mutilation of the sacrament. There is no devout person, say they, but by force of prayer to God, may obtain power to swallow, at least a drop of wine.—*V. Stricker*, in *Nov. lit. germ.* 1709. p. 304.

The bishop of Meaux alleges the case of the *Abstemiös*, to justify the retrenchment of the cup; since it appears hence, that communion under both kinds is not a divine command, inasmuch as there are some cases wherein it may be dispensed withal.—*V. Nouv. rep. lett.* 4 3. p. 23. *Mem. de Trev.* 1708. p. 33. 1717. p. 1415.

The Roman ladies, in the first ages of the republic, were all enjoined to be *Abstemiös*; and that it might appear by their Breath whether or no they kept up to the injunction, it was one of the laws of the Roman civility, that they should kiss their friends and relations whenever they accosted them.

ABSTERGENTS *, or **ABSTERSIVE** medicines, a class of remedies, whose effect is to abrade, and wipe away such mucous particles as they meet in their passage; and thus cleanse the parts from viscid, or impure adhesions, and carry off the morbid matter of wounds, ulcers, &c.

* The

* The word is compounded of the Latin *abs*, from; and *tergere* to wipe.

Abfergents are more usually called among physicians, *detergents*. See **DETERGENT**.

Many *Abfergents* are of the genus of balsamics; and some only differ in their degree of subtilty and efficacy, from what are called vulneraries.

The principal simples in the class of *Abfergents*, are the leaves of wormwood, garlick, leeks, capers, scurvygrafs, fumitory, liverwort, tanfy, and vervain: bitter almonds, figs, jujubs, raisins, dates, juniper-berries; gum ammoniac, balsam of Capivi, balm of Gilead, tacamahaca; turpentes; barberies, liquorice, turmeric, madder, parmasity, mummy, sulphur, salt, mercury, and native cinnaur.—These the reader will find particularly described under their proper articles.

ABSTINENCE *, in a general sense, the act or habit of refraining from something, which we have a propension to, or find pleasure in.

* The word is derived from the Latin *abstinere*; formed of *abs*, from; and *tenere*, to hold; *q. d. ab aliqua re se tenere*.

The Jews were obliged to *abstain* from their wives at certain seasons.—The same is enjoined in the apostolical constitutions on all fast and meagre days: the church of England recommends certain days of fasting, and *Abstinence*.—*Abstinence from flesh* has been enjoined by statute even since the Reformation, particularly on Fridays, and Saturdays, and on vigils, and all commonly called *fast-days*. 2 and 3 *Ed. 6. c. 19*.—The like injunctions were renewed under Q. Elizabeth, but at the same time it was declared, that this was done not out of motives of religion, as if there were any difference in meats, but in favour of the consumption of sea-fish, and to multiply the number of fisher-men and mariners, as well as spare the stock of sheep, 5 *Eliz. c. 15*.—The great fast, says St. Augustin, is to *abstain* from sin. See **FAST**.

The ancient Athlete lived in a perpetual *Abstinence* from all kind of sensible pleasure, to render their bodies more robust, and hardy.

ABSTINENCE is more particularly used for a spare diet, or a slender parsimonious use of food, much below the ordinary standard of nature. See **FOOD** and **DIET**.

The physicians relate wonders of the effects of *Abstinence* in the cure of many disorders, and in protracting the term of Life.—The noble Venetian, Cornaro, after all imaginable means had proved vain, so that his life was despaired of at forty, recovered and lived to near an hundred, by mere dint of *Abstinence*; as he himself gives the account.

It is indeed surprizing to what a great age the primitive Christians of the East, who retired from the persecutions into the deserts of Arabia and Egypt, lived, healthful and cheerful, on a very little food: Cassian assures us, that the common rate for twenty four hours was twelve ounces of bread, and meer water: and that with this S. Anthony lived an hundred and five years; James the hermit, an hundred and four; Arsenius, tutor of the emperor Arcadius, an hundred and twenty; St. Epiphanius, an hundred and fifteen; Simoon the stylite, an hundred and twelve; and Romuald, an hundred and twenty.

Indeed, we can match, nay out-do these instances of longevity from the same cause, at home: Buchanan writes, that one Laurence preserved himself to an hundred and forty by force of temperance and labour; and Spotswood mentions one Kentigern, afterwards called S. Mongah or Mungo, who lived to an hundred and eighty-five by the same means.—Other instances see under the article **LONGEVITY**.

Most of the chronicl diseases, the infirmities of old age, and the short lives of Englishmen, are owing, according to Dr. Cheyne, to repletion; and may be either cured, prevented, or remedied, by *Abstinence*.

Among the brute creation, we see extraordinary instances of long *Abstinence*. *—It is the natural course of divers species to pass four, five, or six months every year without either eating or drinking; accordingly, the tortoise, dormouse, serpent, &c. are observed regularly to retire, at certain seasons, to their respective cells, and hide themselves; some get into the caverns of rocks, or ruins; others dig holes under ground; others get into the woods, and lay themselves up in the clefts of trees; others bury themselves under water, &c.

* The serpent-kind bear *Abstinence* to a miracle. We have seen rattle-snakes that had subsisted many months without any food, yet still retained their vigour and fierceness.—Dr. Shaw (*Trav. p. 419*) speaks of a couple of cerastes, (a sort of Egyptian serpents) which had been kept five years in a bottle close corked, without any sort of food, unless a small quantity of sand wherein they coiled themselves up in the bottom of the vessel, may be reckoned as such: yet when he saw them, they had just cast their skins, and were as brisk and lively as if just taken.

the wisdom of the creator: The proper food of these creatures, especially the insect-tribe, being then wanting; there is a provision for them to live without it. When the fields are divested of their flowery furniture, and the trees and plants are stripped of their fruits; what would become of such animals as are subsisted only by the produce of the spring, and summer? And when the air is grown rigid and chilly with frost, what would become of those many tender species which are impatient of cold? To prevent the total destruction and extirpation of many species of animals, the author of nature has provided, that creatures thus bereaved of their food, should be likewise impatient of cold; to lead them thus to shelter themselves out of the way of danger; and that when there arrived, the natural texture and viscosity of their blood, should dispose it, by a further degree of cold, to lag and stagnate in the vessels: so that the circulation stopping, and the animal functions being in great measure suspended; there is no sensible waste or consumption of parts, but they remain in a kind of drowsy neutral state, between life and death; till the warm sun revive both them and their food together, by thawing the congealed juices both of such animals, and vegetables.

It is more than probable, that all motion of the animal juices is extinct in flies, and other insects, when thus asleep; in that, though cut in pieces they do not awake, nor does any fluid ooze out at the wound; unless some extraordinary degree of warmth have been first applied to unwind the congelation.—The sleep of such animals is little else than death; and their waking, a resurrection.—For if life do not consist in a circulation of the blood, we do not know what it consists in.

Hence it is no wonder that tortoises, dormice, &c. are found as fat and fleshy after some months *Abstinence* as before.—Sir G. Ent weighed his tortoise several years successively, at its going to earth in October, and coming out again in March; and found that of four pounds four ounces, it only used to lose about one ounce. V. *Philosoph. Transact. N^o 194*. Indeed, we have instances of men passing several months as strictly *abstinent* as other creatures.—The records of the Tower mention a Scotchman imprisoned for felony, and strictly watched in that fortress for six weeks; in all which time he took not the least sustenance; for which he had his pardon. The German Ephemerides speak of men one Martha Taylor, who by a blow on the back fell into such a prostration of appetite, that she took no sustenance, besides a few drops with a feather, for thirteen months: but this was a morbid and unnatural case, for she slept but little all the time.—We may add the instance of S. Chilton of Tinbury near Bath, who in the years 1693, 1694, 1695, slept sometimes four months, and sometimes above six together, with very little food; and six weeks without any more than a little tent, conveyed with a quill into his mouth through a hole in his teeth. V. *Philosoph. Transact. N^o 304*.

It is to be added, that in most of the instances of long *Abstinence* related by naturalists, there were apparent marks of a texture of blood, and humours, much like that of summer-beasts, and insects.—Though it is no improbable opinion, that the air itself may furnish something for nutrition. It is certain, there are substances of all kinds, animal, vegetable, &c. floating in the atmosphere; which must be continually taken in by respiration. And that an animal body may be nourished thereby, is evident in the instance of vipers, which if taken when first brought forth, and kept from every thing but air, will yet grow very considerably in a few days. So the eggs of lizards are also observed to increase in bulk, after they are produced, though there be nothing to furnish the increment but air alone; after the like manner, as the eggs or spawn of fishes grow, and are nourished with the water.—And hence, say some, it is that cooks, turn-spit dogs, &c. though they eat but little, yet are usually fat.

ABSTRACT, **ABSTRACTUM**, in philosophy, a thing separated from some other thing, by an operation of the mind called *Abstraction*. See **ABSTRACTION**.

ABSTRACT, in a more particular sense, denotes an idea formed in the mind, when we consider a thing simply in itself, without respect to the subject wherein it resides; or it is a simple idea, detached and separated from any particular subject or complex idea, for the sake of viewing and considering it more distinctly.

Thus, magnitude, and humanity are *Abstracts*, or *Abstract* ideas, when considered in themselves, and without being attached to any particular body, or person; though they cannot have any real subsistence without such subjects, nor the subjects without them.

Whiteness is an *Abstract*, inasmuch as it does not denote any one white object, but that colour, or idea in the general, wherever found.

From the knowledge of *Abstracts* we arrive at that of concretes, which is the opposite term; concrete denoting a general or *abstract* idea's being attached to some particular subject, or considered as combined with some other ideas; as, great house, white wall.

ABSTRACT, is also used as a term which signifies an *abstract* idea.

In which sense, the words whiteness, paternity, animality, justice, crookedness, &c. are *Abstracts*, or *Abstract* terms.

Abstract Terms may be conceived as words which denote a more simple conception of a form, or quality existing in a thing; without expressing the subject wherein it resides.—The school-philosophers define *Abstract* terms from the simplicity of their signification: *Abstracts*, according to them, express only the form of things, or attributes of things, distinct from the subjects whereof they are forms or attributes.

All our simple ideas, says Mr. Locke, have *Abstract*, as well as concrete names; as, whiteness, white; sweetness, sweet, &c. The like also holds in our idea of modes, and relations; as, justice, just; equality, equal; &c.

But as to our ideas of substances, we have very few *Abstract* names at all.—Those few that the schools have forged, as *animalitas*, *humanitas*, &c. hold no proportion with the infinite number of names of substances; and could never get admittance into common use, or obtain the licence of public approbation: which seems to intimate a confession of mankind, that they have no ideas of the real essences of substances; since they have not names for such ideas.

It was only the doctrine of substantial forms, and the confidence of mistaken pretenders to a knowledge they had not, which first coined, and then introduced *animalitas*, *humanitas*, and the like; which yet went very little farther than their own schools, and could never get to be current among understanding men.

But the reality and existence of all *Abstract* ideas, and of any such faculty in the mind as *abstraction*, has of late been controverted. See **ABSTRACTION**.

In effect, if there were any such things as *Abstracts*, *Abstract* qualities, &c. we do not see how they could be destroyed; they must be permanent and immutable; for that which destroys the white warm flame, could not reach the whiteness or the warmth; that which destroys the figured, moving, solid ball, could not hurt the figure, motion, solidity, &c.—*Abstract* ideas, in fine, seem to tend to substantial forms.

ABSTRACT is also extended to divers other things, in respect of their purity, simplicity, subtilty, &c.—In which sense, we say, **ABSTRACT Numbers** are assemblages of units, considered in themselves, and not applied to denote any collections of particular sorts of things.

ABSTRACT Mathematics, are those branches employed about quantity considered absolutely, or in the general; without restriction to any certain kind, or species of it.

Such are geometry, and arithmetic.

In this sense, *Abstract* mathematics stand opposed to mixt mathematics; where the simple and *abstracted* properties and relations of quantity delivered in the former, are applied to sensible objects; and by that means become intermixed with physical considerations.—Such are hydrostatics, optics, navigation, &c.

ABSTRACT, is also used in matters of literature, for a compendious view, or epitome of a larger work.

An *Abstract* is supposed to be a degree shorter, and more superficial than an abridgement. See **ABRIDGEMENT**.

ABSTRACTION, an operation of the mind, whereby we separate things naturally conjunct, or existing together; and form, and consider, ideas of things thus separated. See **ABSTRACT**.

The faculty of *abstracting*, stands directly opposite to that of compounding.—By composition we consider those things together, which in reality are not joined together in one existence. And by *Abstraction* we consider those things separately and apart, which in reality do not exist apart.

Abstraction is chiefly employed these three ways.—First, when the mind considers any one part of a thing, in some respects distinct from the whole; as a man's arm, without the consideration of the rest of his body.

Secondly, when we consider the mode of any substance, omitting the substance itself, or when we separately consider several modes which subsist together in one subject. See **MODE**.

This *Abstraction* the geometricians make use of, when they consider the length of a body separately, which they call a line; omitting the consideration of its breadth and depth. See **LINE**.

Thirdly, it is by *Abstraction*, that the mind frames general, or universal ideas; omitting the modes, and relations of the particular objects whence they are formed.—Thus, when we would understand a thinking being in general, we gather from our self-consciousness what it is to think; and omitting the consideration of those things which have a peculiar relation to our own mind, or to the human mind, we think of a thinking being in general.

Ideas framed thus, which are what we properly call *abstract* ideas, become general representatives of all objects of the same kind; and their names applicable to whatever exists conformable to such ideas.—Thus, the colour that we receive from chalk, snow, milk, &c. is a representative of all of that kind; and has a name given it, *whiteness*, which signifies the same quality, wherever found or imagined.

It is this last faculty, or power of *abstracting*, according to Mr. Locke, that makes the great difference between men and brutes; even those latter must be allowed to have some share of reason: that they really reason in some cases, seems almost as evident as that they have sense; but it is only in particular ideas. They are tied up to those narrow bounds; and do not seem to have any faculty of enlarging them by *Abstraction*. *Essay on Human Understanding*, L. III. c. 3.

Such is the doctrine of *abstract* ideas, under the improvements of that excellent author.—In effect, it is the standing opinion, that the mind has such a power or faculty of framing *abstract* ideas, or notions of things; and on such very ideas do a great part of the writings of philosophers turn. These are supposed in all their systems; and without them there would be nothing done.—They are more especially reputed the object of logic, mathematics, and metaphysics, and all that passes under the notion of the most *abstracted* and sublime learning.

Yet has a late eminent and ingenious author, Dr. Berkeley, contested the reality of any such ideas; and gone a good way towards overturning the whole system, and consequently towards setting philosophy on a new footing.

The qualities or modes of things, it is on all hands agreed, do never really exist apart, and separated each from all others; but are constantly mixed and combined together, several in the same object.—But, say the philosophers, the mind being able to consider each quality singly, or *abstracted* from other qualities with which it is united, does by that means frame to itself *abstract* ideas, of a different nature and kind from the sensible ones.

For an example hereof: the eye perceiving an object extended, coloured, and moved, resolves this compound idea, into its simple constituent ones; and viewing each by itself, exclusive of the rest, frames *abstract* ideas of extension, colour, and motion themselves, or in their own nature.—Not that it is possible for such colour and motion to exist without extension; but only that the mind can frame to itself, by *Abstraction*, the idea of colour exclusive of extension; and of motion, exclusive both of colour and extension.

Again, say the same philosophers, the mind having observed that in the particular extensions perceived by sense, there is something common, and alike in all; and some other things peculiar; as, this, or that figure, or magnitude, which distinguish them one from another; it can consider apart, or single out by itself, what is common; making thereof a general *abstract* idea of extension, which is neither line, surface, nor solid, nor has any figure or magnitude, but is an idea entirely precluded from them all.—So, likewise, by leaving out of the several colours perceived by sense, that which distinguishes them from one another, and only retaining what is common to all, it makes an idea of colour in the *abstract*, which is neither red, nor blue, nor white, &c.—After the same manner, by considering motion *abstractedly*, both from the body moved, and from the figure it describes, and all particular directions, and velocities; an *abstract* idea of motion is framed, which equally corresponds to all motions whatever.

They add, that as the mind frames *abstract* ideas of qualities or modes; so does it by the same faculty, attain *abstract* ideas of the more compound beings, which include many coexistent qualities.—For an example.—Having observed that Peter, James, John, &c. resemble each other in shape, and other qualities; we can leave out of the complex idea we had of Peter, James, &c. that which is peculiar to each, retaining only what is common to all, and so make an *abstract* idea, wherein all the particulars equally partake.—And thus it is we are supposed to come by the *abstract* idea of man, or of humanity, or human nature; wherein there is indeed included colour, because no man but has some colour, but it is neither white, nor black, nor brown; because there is no one particular colour wherein all men partake. So likewise there is included stature, but then it is neither tall, nor low, nor yet middle stature, but something *abstracted* from all these: And so of the rest.

Farther yet, there being a general variety of other creatures, which partake in some parts, but not all, of the complex idea of man; the mind leaving out those parts which are peculiar to men, and retaining those only which are common to all living creatures, frames the idea of animal; which *abstracts* or participates not only of all men, but all birds, beasts, fishes, and insects.

The constituent parts of such *abstract* idea of animal, are body, life, sense, and spontaneous motion.—By body, is meant, body without any particular shape, or figure; there being no one common to all animals; without covering, either of hair, or feathers, or scales: nor yet naked; hair, feathers, scales, and nakedness, being the distinguishing properties of particular animals, and for that reason left out of the *abstract* idea.

Upon the same account, the spontaneous motion must be neither walking, nor flying, nor creeping; it is nevertheless a motion.—But what that motion is, it is not easy to conceive.

I will not affirm, says Dr. Berkeley, that other people have not this wonderful faculty of *abstracting* their ideas; but I am confident I have it not myself.—I have, indeed, a faculty of imagining, or representing to myself the ideas of

things

things I have perceived, and of variously compounding or dividing them: I can imagine a man with two heads, or the upper parts of a man join'd to the body of a horse. I can consider the hand, the eye, the nose, each by it self, abstracted or separated from the rest of the body.—But then, whatever hand or eye I imagine, it must have some particular shape and colour.—So, again, the idea of a man I frame to my self, must be either of a white, or a black, or a tawny, a straight or a crooked, a tall, or a low, or a middle-sized man.

I cannot by any effort of thought conceive the *abstract* idea above described; and it is equally impossible for me to form the *abstract* idea of motion, distinct from the body moving, and which is neither swift nor slow, curvilinear, nor rectilinear.—And the like may be said of all other *abstract* general ideas whatever.

Since all things that exist are only particulars, Whence, says Mr. Locke, is it, that we come by general words, expressing five of a thousand individuals? His answer is, terms only become general, by being made the signs of *abstract* and general ideas; so that the reality of *abstract* ideas, should follow from the reality of general words.—But this seems a deception.—A word becomes general, by being made the sign, not of an *abstract* general idea, but of several particular ones, any one of which it indifferently suggests to the mind.—For an example, when I say that *Whatsoever has extension is divisible*; the proposition is to be understood of extension in general: not that I must conceive any *abstract* general idea of extension, which is neither line, surface, nor solid, neither great nor small, &c. To make this more evident, suppose a geometrician to be demonstrating a method of dividing a line into two equal parts: In order hereto, he draws, for instance, a black line, an inch long; and this, which in it self is a particular line, is nevertheless, with respect to its signification, general: since it represents all lines whatever: so that what is demonstrated of this one, will hold of all others.—And as that particular line becomes general by being made a sign; so does the name *line*: and as the former owes its generality, not to its being the sign of an *abstract* or general line, but of any or all particular right lines that may possibly exist; so must the latter derive its generality from the same cause.

Mr. Locke, speaking of the difficulty of forming *abstract* ideas, says; 'And does it not require some pains and skill to form the general idea of a triangle, which yet is none of the most *abstract* and comprehensive; for it must be neither oblique, nor rectangular; neither equilateral, isosceles, nor scalenous; but all, and none of these, at once.'—Now, let any man look into his thoughts, and try whether he has, or can attain to an idea of a triangle, correspondent to this description.

From the notion of *abstract* ideas, Dr. Berkeley endeavours to shew, it was, that bodies first came to be supposed to have an existence of their own, out and independent of the mind perceiving them.—Can there be a greater strain of *Abstraction*, says he, than to distinguish the existence of sensible objects from their being perceived, so as to conceive them existing unperceived?

We shall only add, that *abstracting*, on the common system, is no more than generalizing: it is making one thing stand for an hundred, by omitting the consideration of the differences between them: it is taking several differents, *i. e.* different combinations, setting aside the peculiarities in each, and considering only what is found alike in all.—Thus it is that I say, *I love my friend, love my mistress, love my self, my bottle, my book, my ease, &c.*—Not that it is possible I should have the same perception with respect to so many different sorts of things, things that stand in such different relations to me; but only that there appearing something in them all that bears a resemblance to the rest, in some circumstance or other, I chuse to express all by one name, *love*. For if I consider the tendency and effects of them all, I shall find they lead me very different ways, to very different actions; all the analogy there is between them, is a sort of pleasure or satisfaction, arising upon the application of the particular object to its proper organ, or sense.—The *abstract* idea of love, then, will terminate in the idea of pleasure: but, it is certain, there can be no idea of pleasure, without a thing pleasant to excite it. Any other *abstract* idea of pleasure, will amount to no more than a view or perception of the circumstances wherewith our pleasures have been attended: but these are mere externals, foreign to the pleasurable sensation it self; which nothing but an object applied in such and such a manner, can excite.—To suppose an idea of pleasure produced indirectly, by any other than the proper cause, is as absurd as to suppose an idea of sound, produced without a sonorous object. The mind has no power of making any ideas, call them what you will, whether *abstract*, or *concrete*; or *general*, or *particular*: its activity goes no farther than to the perceiving of such as are presented to it: so that its action is really no other than a degree of passion.

ABSTRUSE *, denotes something deep, hidden, or far removed from the common apprehensions, and ways of conceiving; in opposition to what is obvious, and palpable.

* The word is of Latin original, *abstrusus*; formed of *ab*, from, and *trads*, I thrust; *q. d.* being far off, and out of reach.

In this sense, metaphysics is an *abstruse* science; the new doctrine of infinites is an *abstruse* point of knowledge that few people attain to.

ABSURD, ABSURDUM, a thing that thwarts, or goes contrary to the common notions, and apprehensions of mankind.

Thus, a proposition would be *absurd*, that should affirm, that two and two make five; or that should deny them to make four.

The logicians have a way of proving the truth of a proposition, by shewing that the contrary is *absurd*.

This they call

Reductio ad ABSURDUM, or *arguing ex Absurdo*. See REDUCTION.

ABSURDITY, a kind of error, or offence against some evident, and generally allowed truth, or principle.

The greatest of all *Absurdities* is the contradiction. See CONTRADICTION.

The schoolmen make two species of *Absurdities*—The one, *absolute*, *absolutes*, which contradicts the common sense of mankind; the other *relative*, *relatives*, which gives the lie to some one, or more philosophers; or persons of great weight and authority.

In this sense, the doctrine of a *vacuum* is an absurdity, as being contrary to Aristotle: and that of a *plenum*; as being contrary to Sir Isaac Newton.—In effect, there is scarce one truth of any moment, but what is an absurdity in this sense; as being repugnant to the system of some sect, or party.

ABSINTHUM *, or **ABSINTHUM**, a medicinal plant, of considerable efficacy in quality of a bitter, and stomachic; popularly called *wormwood*.

* The word seems compounded of the privative particle *a*, and *shintis*, *delictatis*, pleasure; alluding to the disagreeable taste of this plant.

There are divers kinds of *Absinthium* enumerated by botanists. Those which chiefly obtain in medicine, are, 1^o, the *Roman*, or small, called also *ponic*; used as a stomachic, astringent, and discutient, and to prevent putrefaction.—Etmuller says, there is not a chronic distemper in which it is not serviceable.—A conserve of the Roman *Absinthium* is now also much used in the shops.

2^o, The common, or large *wormwood*, *Absinthium Vulgare*, or *Vulgare Major*, this is much bitterer than the former, and anciently was used not only as a stomachic, and a destroyer of worms, but also as a detergent, and prescribed against the jaundice, and dropsy: but it is now grown into disuse in those intentions, as being prejudicial to the eyes; and is chiefly retained as an ingredient in some of the official compositions; and particularly some cephalic distilled waters.—The infusion of *Absinthium* in wine, makes what they call *Vinum Absinthites*.

The pharmacopœias also mention an extract of *Absinthium*, *extractum Absinthii*; and a syrup of *Absinthium*, *Syrupus de Absinthio*—

Some will have it to be the common wormwood that yields the *semen sanctum* or *santonium*, *i. e.* wormseed; but Mathioli with justice makes the contrary. See **SANTONICUM**.

ABUNDANCE *, *Copia*, plenty.

* *Abundantia*, overflowing, is compounded of *ab*, from; and *unda*, wave, or water.

Abundant, when carried to an excess, is a fault, called *redundance*, *exuberance*, &c.

The author of the *Dictionnaire Oeconomique* gives divers manners or secrets of producing *Abundance*; as an *abundant* crop of wheat, pears, apples, peaches, &c. See **FECUNDITY**.

ABUNDANT Numbers, are those whose quota-parts added together, exceed the number it self whereof they are parts. See **NUMBER**.

Thus, the number 12 is *abundant*, its quota-parts, 1, 2, 3, 4, and 6, amounting to 16.—In opposition to *abundant* numbers stand defective ones. See **DEFECTIVE**.

ABUSE *, an irregular use of a thing; or the introducing something contrary to the true intention thereof.

* The word is compounded of *ab*, from; and *usus*, use.

The business of reformations, visitations, &c. is to correct *Abuses* secretly crept into discipline, &c.—Constantine the great, by introducing riches into the church, laid the foundation for those numerous *Abuses* in it, which the succeeding ages groaned under.

Self-ABUSE, is a phrase used by some late writers for the crime of self-pollution. See **POLLUTION**.

In grammar, to apply a word *abusively*, or in an *abusive* sense, is to misapply, or pervert its meaning.

A permutation of benefices, without the consent of the bishop, is deemed *abusive*, and consequently is null.

ABUTTALS, ABUTALS, ABUTALS, among law-writers, denote the buttings or boundings of a piece of land; expressing on what other lands, highways, or the like, the several extremes thereof do *abut*, or terminate. See **BOUNDARY**.

In this sense, the word is sometimes also written corruptly *Abuttals*, or *Abutals*.—In old surveys we often find them called

called *headlands*.—*Abuttals* amount to the same with what Latin writers call *capita*; Marcellus, *frontes*; the French, *bouts*.—In Croke, the plaintiff is said to fail in his *Abuttals*, that is, in setting forth how the land is bounded.

ABYSS*, in a general sense, denotes something profound, and, as it were, bottomless.

* The word is originally Greek *αβυσσος*; compounded of the privative *α*, and *βυσσο*, bottom; *q. d.* without a bottom. Suidas and others give different origins; as, from *α*, and *βυ*, to cover, to hide; or from *α*, and *βυ*, &c. But the more judicious reject them, as but one degree better than that of the old glossarist, who derives *Abysus* from *ad ipsus*, in regard the waters flock thither.

We say, the *Abyfs* of a mountain, an *Abyfs* of waters, the great *Abyfs*, the Mosaic *Abyfs*, an unfathomable *Abyfs*, &c.

ABYSS, in a more particular sense, denotes a deep main, or fund of waters.

In this sense, the word is particularly used in the Septuagint, for the water which God created at the beginning with the earth, which encompassed it round, and which our translators render by the *deep*.—Thus it is that darkness is said to have been on the face of the *Abyfs*.

ABYSS is also used for an immense cavern in the earth, where God collected all those waters on the third day: which, in our version, is rendered the *deep*, and elsewhere, the *great deep*.

Dr. Woodward has let some light into this great *Abyfs*, in his *Natural History of the Earth*.—He asserts, that there is a mighty collection of waters inclosed in the bowels of the earth; constituting a huge orb in the interior or central parts of it; and over the surface of this water, he supposes the terrestrial strata to be expanded.—Thus, according to him, is what Moses calls the *great deep*, and what most authors render the *great Abyfs*.

That there is such an assemblage of waters lodged in the depths of the earth, is confirmed by abundance of observations. See EARTH, and DELUGE.

The water of this vast *Abyfs*, he asserts, does communicate with that of the ocean, by means of certain hiatus's, or chafins passing betwixt it and the bottom of the ocean: and this and the *Abyfs* he supposes to have one common centre, around which the water of both is placed; but so, that the ordinary surface of the *Abyfs* is not level with that of the ocean, nor at so great a distance from the centre as the other, it being for the most part restrained and depressed by the strata of earth lying upon it; but wherever those strata are broken, or are so lax and porous, that water can pervade them, there the water of the *Abyfs* ascends, fills up all the clefts, and issues into which it can get admittance; and saturates all the interstices and pores of the earth, stone, or other matter all around the globe, quite up to the level of the ocean.

ACACIA*, in medicine, an inspissated juice of a shrub of the thorn kind; used as an astringent.

* The word is compounded of *α*, very, and *κακω*, evil: on account of the prickles.

There are two kinds, the *vera* and *germanica*.

The *ACACIA vera*, is brought from the Levant in round balls of different sizes, in fine bladders, and supposed to be the juice of the pods of a large thorny tree, growing in Egypt and Arabia.—Some naturalists will have it the same tree that yields the gum arabic.

This is very austeric and binding; and on that account good against fluxes.—Chuse that of a tan-colour, smooth, and shining; and of an astringent disagreeable taste.—It is, or should be, an ingredient in the *Theriacal Andromachi*.

The *German ACACIA* is a counterfeit of the former; being made of the juice of unripe sloes, boiled to the consistence of a solid extract; and put up in bladders like the former.—It is distinguished from it chiefly by its colour, which is as black as that of Spanish liquorice.—It is used as a substitute to the true *Acacia*.

ACACIA, among antiquaries, something resembling a kind of roll, or bag; seen on medals in the hands of several of the consuls, and emperors, from the time of Anaxastus.

Authors are not agreed either about the use of this roll, or about the substance whereof it consists; some taking it for a handkerchief rolled up, which the person who presided at the games threw out as a signal for their beginning; whilst others rather imagine it intended to represent a roll of memoirs, or petitions.

ACADEMICS, a sect of philosophers, who followed the doctrine of Socrates, and Plato, as to the uncertainty of knowledge, and the incomprehensibility of truth.

Academic, in this sense, amounts to much the same with *Platonist*; the difference between them being only in point of time. They who embraced the system of Plato, among the ancients, were called *Academic*, *Academic*; whereas those who did the same since the reformation of learning, have assumed the denomination of *Platonists*. See PLATONIST.

The original dogma of the *Academic* was this: *Unum scio, quod nihil scio*, I know this one thing, that I know nothing;

which was afterwards improved into, *Nihil scio, ne hoc quidem, quod nihil scio*, I know nothing, not even this, that I know nothing.—Accordingly they pleaded, that the mind ought always to remain in suspense; as having nothing to determine on but bare probability, or verisimilitude, which is as likely to lead into error as truth.

It should seem however that Plato, in recommending it to his disciples to distrust and doubt of every thing, had it not so immediately in view to leave them fluctuating and in continual suspense between truth and error, as to guard against those rash precipitate decisions, which young minds are liable to; and to put them in a disposition to secure themselves from error, by examining every thing without prejudice.

M. des Cartes, has adopted this same *Acatalepsia*, or principle of doubting; but, it must be allowed, he makes a very different use of it.—The *Academic* doubted of every thing, and were resolved still to doubt: Des Cartes, on the contrary, sets out with doubting of every thing; but declares he will not always doubt; and that he only doubts at first, that his determinations afterwards may be the surer. See CARTESIANISM.—In Aristotle's philosophy, say the followers of Des Cartes, there is nothing doubted of; every thing is accounted for, and yet nothing is explained, otherwise than by barbarous, unmeaning terms, and dark confused ideas: whereas Des Cartes makes you even forget what you knew before; but from your new, affected ignorance, he leads you gradually into the sublimest knowledge.—Hence they apply to him what Horace says of Homer:

Non fumum ex fulgore, sed ex fumo dare lucem

Cogitat, ut speciosa debuit miracula premat

Antiphaten, Scyllamque, Et cum Cyclope Charybdim.

It is thus the Cartesians talk: but we may add, that long before their master, Aristotle himself had said, that to know a thing well, a man must first have doubted it; and that it is with doubting that all our knowledge must begin.

ACADEMICS, or rather ACADEMISTS, is also used among us for the members of the modern *Academy*, or illustrious societies of learned persons. See ACADEMY, and ACADEMIST.

ACADEMY, ACADEMIA, in antiquity, a fine villa, or pleasure-house, situate in one of the suburbs of Athens, about a mile from the city; where Plato, and the wise men who followed him, held assemblies for dispute and philosophical conference: and which gave the denomination to the sect of *Academics*. See ACADEMIC.

It took its name, *academy*, from one *Academus* or *Ecademus*, a citizen of Athens, to whom it originally belonged; and who used to have gymnastic sports or exercises therein.—He lived in the time of Theseus.

Some, mistakenly, derive its name and origin from *Cadmus* the Phœnician, as being the first who introduced learning, and the use of letters among the Greeks.

The *Academy* was further improved and adorned by *Cimon*, with fountains, trees, shady walks, &c. for the convenience of the philosophers, and men of learning, who here met to confer, dispute, &c.—It was also the burying-place of illustrious persons, who had deserved well of the republic.

Here it was that Plato taught his philosophy; and from him, all public places destined for assemblies of the learned and ingenious, have been since called *Academies*.

Scylla sacrificed the delicious groves and walks of the *Academy* planted by *Cimon* to the laws of war; and employed those very trees to make machines wherewith to batter the city. Cicero also had a villa, or country retirement near *Puzzuoli*, which he called by the same name *Academia*; where he used to entertain his philosophical friends.—It was here he composed his *Academical Questions*, and his books *De Natura Deorum*.

ACADEMY also denotes a sect of philosophers, who maintained that truth is incomprehensible, all knowledge uncertain, and that a wife man therefore is always to doubt, and remain in suspense, never positively asserting or denying any thing.

In which sense, *Academy* is synonymous with the sect of *Academic*s. See ACADEMIC.

We usually reckon three *Academies*, or sects of *Academic*s; though some make five.—The ancient *Academy*, was that whereof Plato was the chief. See PLATONISM.

Arcefilas, one of his successors, introducing some alterations into the philosophy of this sect, founded what they call the *second Academy*.

The establishment of the third, called also the *new Academy*, is attributed to *Lacydes*, or rather to *Carnæades*.

Some authors add a fourth, founded by *Plilo*; and a fifth by *Antiochus*, called the *Antiochan*, which tempered the ancient *Academy* with *Stoicism*. See STOICISM.

The ancient *Academy* doubted of every thing; and went so far as to make it a doubt, whether or no they ought to doubt.

—It was a sort of principle with them, never to be certain, or fatished of any thing; never to affirm, or deny any thing, either for true or false.—In effect, they asserted an absolute *Acatalepsia*. See ACATALEPSIA.

The *new Academy* was somewhat more reasonable; they owned several things for truths, but without attaching themselves to any with entire assurance. — These philosophers had found, that the ordinary commerce of life and society was inconsistent with the absolute and universal doubtfulness of the ancient *Academy*: and yet, it is evident they themselves looked upon things rather as probable, than as true, and certain: by this amendment, thinking to secure themselves from those absurdities into which the ancient *Academy* had fallen. See the *acdemical* questions of Cicero; where that philosopher explains, and unravels the sentiments of those who in his days called themselves followers of the new and old *Academy*, with great clearness and address.

ACADEMY is more frequently used among the moderns, for a regular society, or company of learned persons; instituted under the protection of a prince, for the cultivation, and improvement of arts, or sciences.

Some authors confound *Academy* with university; but though much the same in Latin, they are very different things in English. — An university is, properly, a body composed of graduates in the several faculties; of professors, who teach in the public schools; of regents or tutors, and students who learn under them, and aspire likewise to degrees. Whereas, an *Academy* is not intended to teach, or profess any art, such as it is, but to improve it: it is not for novices to be instructed in, but for those that are more knowing; for persons of distinguished abilities to confer in, and communicate their lights and discoveries to each other for their mutual benefit and improvement.

The first *Academy* we read of, was established by Charlemain at the motion of Alcuin: it was composed of the chief wits of the court, the emperor himself being a member. — In their *acdemical* conferences, every person was to give an account of what ancient authors he had read; and each of them assumed the name of some ancient author, who pleased him most, or some celebrated person of antiquity. Alcuin, from whose letters we learn these particulars, took that of Flaccus, the surname of Horace: a young lord, named Augilbert, took that of Homer: Adelaar, bishop of Corbie, was called Augustin: Riculf, bishop of Mentz, was Dametas; and the king himself, David.

This lets us see a mistake in some modern writers, who relate, that it was in conformity with the genius of the learned men of those times, who were great admirers of Roman names, that Alcuin took the name of Flaccus Albinus.

Most nations have now their *Academies*, Russia not excepted: but, of all countries, Italy bears the bell in this respect. — We have but few in England. — The only one of eminence is called by another name, *viz.* the *Royal Society*: an account whereof, see under the article *ROYAL SOCIETY*.

Beside this, however, we have an *Academy* of music; and another of painting; established by letters patent, and governed by their respective directors.

The French having flourishing *Academies* of all kinds, established at Paris; mostly by the late king. — *viz.* the *ROYAL ACADEMY of Sciences*, for the improvement of physics, mathematics, and chemistry; first set on foot in 1666, by order of the king, though without any act of royal authority issued for that end. — In the year 1699, it had as it were a second birth; the same prince, by a regulation dated the 26th of January, giving it a new form, and putting it on a new and more solemn footing.

In virtue of that regulation, the *Academy* was to be composed of four kinds of members, *viz.* *honorary, pensionary, associates, and elevés.* — The first class to consist of ten persons; and the rest of twenty each. — The honorary *academists* to be all inhabitants of France; the pensionaries all to reside at Paris; eight of the associates allowed to consist of foreigners; and the elevés all to live at Paris. — The officers, to be a president, named every year by the king, out of the class of honorary *academists*; and a secretary and treasurer, to be perpetual. Of the pensionaries, three to be geometers, three astronomers, three mechanics, three anatomists, three chemists, three botanists; the remaining two, secretary and treasurer. — Of the twelve associates, two to apply themselves to geometry, two to botany, and two to chemistry. — The elevés to apply themselves to the same kind of science with the pensionaries they are attached to; and not to speak, except when called thereto by the president. — No regular or religious to be admitted, except into the class of honorary *academists*; nor any person to be admitted, either for associate or pensionary, unless known by some considerable printed work, some machine, or other discovery. — Further, no person to be allowed to make use of his quality of *academist*, in the title of any of his books, unless such book have been read to, and approved by the *Academy*.

* Dr. Lister observes, that they would have been glad of F Plumier; but they avoided making a precedent for the admission of any regulars.

The meetings of the *Academy* were appointed to be held twice a week, on Wednesdays and Saturdays, in the king's library: (though soon after, they were removed to a more commodious apartment in the Louvre.) And to last, at least, two hours, *viz.* from three to five. At the beginning of every

new year, each pensionary to be obliged to declare in writing what work he intended chiefly to prosecute that year; and the rest to be invited to do the same. All the observations the *academists* bring to the meeting to be left in writing, in the hands of the secretary; who is to enter the substance of what passes at each assembly in a register: and at the end of every year, to publish the history, or transactions of the *Academy* for that year.

No person, not a member, to be present at their ordinary meetings; unless such as are introduced by the secretary, to propose some new machine, or discovery; though their public meetings, twice a year, shall be open to every body.

To encourage the members to continue their labours, the king engages not only to pay the ordinary pensions, but even to give extraordinary gratifications, according to the merit of their respective performances: furnishing withal, the expence of the experiments, and other inquiries necessary to be made. — If any member give in a bill of charges of experiments which he has made, or desire the printing of any book, and bring in the charges of gravings, the president allowing and signing it, the money is immediately paid by the King. — So if an anatomist require live tortoises, for instance, for making experiments about the heart, &c. they shall be brought him as many as he pleases at the king's charge. *Litt. Journ. 12 Paris.* — Their motto, *Invenit & persequit.*

In the year 1716, the duke of Orleans, then regent, made an alteration in their constitution; augmenting the number of honoraries, and of associates capable of being foreigners, to twelve; admitting regulars among such associates; suppressing the class of elevés, and establishing, in lieu thereof, a new class of twelve adjuncts, to the six several kinds of sciences cultivated by the *Academy*: and, lastly, appointing a vice-president, to be chosen yearly by the king, out of the honorary members; and a director, and sub-director out of the pensionaries.

Their secretary, M. de Fontenelle, has obliged the public with a great number of elegant volumes of the productions of this illustrious body; under the title of *Histoire de l'Académie Royale, &c. avec les Mémoires de Mathématique & de Physique tirez des Registres, &c.*

ACADEMY of Painting, Sculpture, and Architecture, was established under the cardinal Mazarin, first protector thereof; and the chancellor Seguyer, vice-protector.

It consists of a director, a chancellor, four rectors, a treasurer, twelve professors; adjuncts to the rectors, and professors; counsellors; a secretary; a professor for anatomy, and another for geometry, and perspective.

Persons are here admitted either in quality of painters, or sculptors. — The painters are admitted according to their respective talents; there being a distinction made between those who work in history, and those who only paint portraits, or landscapes, or beasts, or fruits, or flowers, or paint in miniature; or only design; or engrave; or carve, &c. — Their productions are exposed to the public view, yearly, in the great hall of the Louvre; and there are prizes for those who perform best. *V. Guerin. desir. de l'acad. roy. de peint. & sculpt. M. erudit. 1717. p. 188.*

There is also a French *Academy* of painting, sculpture, &c. at Rome, established by Lewis XIV. wherein those who have won the annual prizes in the like *Academy* at Paris, are received and entertained for three years, to give them an opportunity for perfecting themselves. *Lett. Juiv. 15.*

ACADEMY of Medals and Inscriptions, was created for the study, and explanation of ancient monuments; and to consecrate great, and memorable events to posterity, by similar monuments; as medals, reliefs, inscriptions, &c.

ACADEMY of Politics, is composed of six persons, who meet on certain days each week at the Louvre, in the chamber where the papers relating to foreign affairs are lodged. Here they peruse such papers as are put in their hands, by order of the secretary for foreign affairs, who acquaints the king with the progresses they make, and the capacities of each, that his majesty may employ them accordingly.

French ACADEMY, established for the improvement and refining of the language. See LANGUAGE.

ACADEMY of Music, this consists of the managers, and directors of the opera.

The French have also considerable *Academies* in most of their great cities; as, at Montpellier a royal *Academy* of sciences, on the like footing as that at Paris; being as it were a counterpart thereof: at Tholouse an *Academy* under the denomination of Lanternists: others at Nismes, Arles, &c.

The *Royal Spanish ACADEMY*, is an *Academy* for cultivating the Castilian tongue, established at Madrid, on the model of the French *Academy*. — The design of this was laid by the duke d'Escalona; and approved of by the king in 1714, who declared himself protector thereof. — It consists of twenty-four *academists*; including the director and secretary. Its device is a crucible on the fire, with this motto, *Limpia, sija, y da esplendor.*

ACADEMY of Natural Curiosity, in Germany, was first founded in 1652, by M. Baufch a physician; and taken in 1670 under the protection of the emperor Leopold.

There are other *acdemical* institutions at Berlin, and other

parts of the north; several of which having distinguished themselves by their journals, ephemerides, &c. the reader will find some account of them under the article JOURNAL.

Italy, alone, has more Academies of note than all the rest of the world; not a city but furnishes a set of learned persons for an Academy, which to them seems an essential part of a regular constitution.—Jarcnius has given us a specimen of their history, printed at Leipzig, in 1725; and withal, grounds to expect a fuller, and more perfect account from several learned persons, who had been long employed about the same; as Kraufus, professor of eloquence at Leipzig: Hyacynth, Gimma, and Mich. Richeyus.

The Academists, e. gr. of Boulogna, are called *Abbandonati, Anziosi, Ociosi, Arcadi, Consijsi, Dissettuosi, Dubbiosi, Impatici; Inabili, Indiferenti, Indomiti, Inquieti, Iustabili, Della nette, Piaceri, Stienti, Sonnolenti, Torbidi, Vespertini*.—Those of Genoa, *Accordati, Sopiti, Resvegliati*: of Gubio, *Adormentati*: of Venice, *Acuti, Allettati, Discordanti, Disgiunti, Disinganati, Dodonei, Filadelfici, Incrucabili, Insancibili*: of Rimini, *Adagiati, Eutrapeli*: of Pavia, *Affidati, Della Chiave*: of Fermo, *Raffrontati*: of Molise, *Agitati*: of Florence, *Aterati, Humidi, Furfurati, Della Crusca, Del Cimento, Infocati*: of Cremona, *Animosi*: of Naples, *Arditi, Infernati, Intronati, Lunatici, Secreti, Sirenes, Sturci, Valenti*: of Ancona, *Argonauti, Caliginosi*: of Urbino, *Afforditi*: of Perugia, *Atomi, Eccentrici, Insefatti, Inspidati, Unifoni*: of Tarentum, *Andatei*: of Macerata, *Catenati, Imperfetti*: of—*Chimarioti*: of Sienna, *Cortesi, Giovali, Trapassati*: of Rome, *Delfici, Humaristi, Lyucei, Fantastici, Illuminati, Incitati, Indisposti, Infecundi, Malencolici, Negletti, Notti Vaticane, Naturati, Ombrosi, Pellegrini, Sterili, Vigilanti*: of Padua, *Delii, Innaturati, Orditi*: of Trepano, *Difficili*: of Bressa, *Dispersi, Erranti*: of Modena, *Dissonanti*: of Recanatun, *Disguati*: of Syracuse, *Ebrii*: of Milan, *Elitoni, Faticosi, Fenici, Incerti, Nascisti*: of Candia, *Extravaganti*: of Pescara, *Eterociti*: of Comacchio, *Flutuanti*: of Arezzo, *Forzati*: of Turin, *Fulminale*: of Reggio, *Fumosi, Muti*: of Cortona, *Humorosi*: of Bari, *Inogniti*: of Rossano, *Incuriosi*: of Brada, *Immanitati, Pigri*: of Acis, *Intricati*: of Mantua, *Inuogbiti*: of Agigento, *Mutabili, Offuscati*: of Verona, *Olympici, Uranii*: of Viterbo, *Ostinati*: of—*Vagabondi*.

ACADEMY, is also used among us for a kind of collegiate school, or seminary; where young men are instructed in the liberal arts, and sciences; in a private way.

The nonconformist ministers, &c. are many of them bred up in such private Academies; as not relishing the common university-education.

Frederic I. king of Prussia established an Academy in Berlin in 1703, for the education of the young nobility of the court, suitable to their extraction. The expense of the students was very moderate, the king having undertaken to pay the extraordinary. This illustrious school, which was then called the Academy of Princes, has now lost much of its ancient splendor. *Pelwitz. Mem. T. 3. p. 52.*

ACADEMY is also used in speaking of the schools of the Jews: i. e. those seminaries where the rabbins, or doctors instruct the youth of their nation in the Hebrew tongue; explain to them the Talmud; teach them the Cabbala, &c.

The Jews have had of these Academies ever since their return from their Babylonish captivity. The Academies of Tiberias and Babylon are particularly celebrated. See MASSORETES.

ACADEMY is particularly understood of a riding-school; or a place where young gentlemen are taught to ride the great horse, with other suitable exercises; as fencing, &c.

This is what Vitruvius calls *Ephēbeum*, and some others among the ancients *Gymnasium*: the moderns *equestrian*, or *military Academy*.

The duke of Newcastle will have the art of riding to have had its origin in Italy; and the first Academy of this sort to have been established at Naples, by Frederic Grison; who, he adds, was the first that wrote on this subject; which he did like a true cavalier, and a great master.—Henry VIII. says the same author, called over two Italians, disciples of Grison, into England; who soon stock'd the nation with cuycers, or riding-masters.

He adds, that the greatest master Italy ever produc'd, was a Neapolitan, Pignatelli by name; that la Broue rid under him five years; Pluvinel nine; and S. Antoine many years: and that these three Frenchmen filled France with French masters; which till then had known none but Italians.

The ground set apart in an Academy, for riding, is called the *Manège*; having usually a pillar in the centre, and other pillars, placed two by two, at the sides.

ACADEMY, or ACADEMY-Figure, in painting, is a drawing,

or design made after a model, with a crayon, or pencil.—Or the copy of such a draught. See DESIGN.

ACANACEOUS. See the article ACANTHACEOUS.

ACANTHA, among some anatomists, is applied to the hind, or posterior protuberances of the vertebrae of the back; forming what we call the *spina dorsii*. See VERTEBRA, and SPINA.

ACANTHABOLUS*, *Ακανθαβόλος*, a surgeon's instrument, wherewith to extract foreign bodies, which by the sharpness of their points have penetrated, and cutred the parts of the body.

* The word is sometimes also written, corruptly, *Acantabolus*, It is compounded of the Greek *ακανθα*, a thorn; and *βολω*, to cast away.

The *Acantabolus* is the same with what is otherwise called *vesfella*.—Its chief use is for extracting of fish-bones, or the like, sticking in the œsophagus; as also the fragments of weapons, bones, hair, &c. remaining in wounds.—Its figure resembles that of a pair of pincers; sometimes it is also made crooked, for more commodious application to the fauces.

ACANTHABOLUS is also sometimes used for an instrument, wherewith people pull out the hairs from their eye-brows.

ACANTHACEOUS*, among botanists, a term applied to a class of plants, popularly known under the name of the *thistle kind*. See THISTLE and CARDUUS.

* The word is formed of the Greek *ακανθίζω*, *acuo*, to sharpen; or *ακανθα*, *spina*, a thorn; in regard of the prickles they are beset withal.

ACANTHUS*, in architecture, an ornament in the Corinthian, and Composite orders; being the Representation of the leaves of an acanthaceous plant, in the capitals thereof.—See *Tab. Archit. fig. 21. lit. bb.*

• It takes its name from *ακανθός*, the name given this plant among the Greeks; as being prickly, or of the thistle kind. The Latin botanists, call it *Branca Urfsua*, or bear's breech, from some supposed resemblance it bears thereto; and some *Branca Hircina*, by reason its leaves bend, and twist somewhat like a goat's horns.

There are two kinds of the plant *Acauthus*, one whereof grows wild, and is full of prickles; the other grows in gardens, and is by Virgil called *mollis*, in regard it is soft, and without any prickles.—The Greek sculptors adorned their works with the figure of the latter; as the Gothic did with that of the former, which they represented not only in their capitals, but also in other ornaments.

The garden *Acanthus*, is the most dented; bearing some sort of resemblance to smallage: and thus it is we find it represented in the composite capitals of Titus, and Septimius Severus at Rome. These leaves make the principal character, and distinction of the two rich orders from the rest: and their different number and arrangement does also distinguish the two orders from each other. See SUPPLEMENT, article ACANTUS.

The origin and occasion of the ornament, see under the article ABACUS.

ACATALECTIC*, ACATALECTICUS, in the ancient poetry, a term applicable to such verses as have all their feet and syllables; and are in no wise lame or defective at the end. See VERSE, and FOOT.

* The word comes from *κατα*, and *ληγω*, to cease or end; whence *καταληγόμενος*, *καθ'ησυχας* *σμερῶν* at the end; and the privative *a* being prefixed *ακαταληγόμενος*, *καθ'ησυχας* *nothing at the end*.

On the contrary, catalectic verses are those which end too hastily, and with a syllable too little. See CATALECTIC. In the following strophe of Horace, the two first verses are *Acatalectic*, and the last *catalectic*.

*Solvitur acris hyems, grata vice
Veris & Favoni:*

Trahuntque siccas machine carinas.—

ACATALEPSIA*, ACATALEPSY, in philosophy, an impossibility of a thing's being conceived or comprehended.

* The word is compounded of the privative *a*, and *καταλαμβάνω*, *deprehendo*, to find out; of *κατα*, and *λαμβάνω*, *capio*, to take. See CATALEPSIS.

Acatalepsia, is synonymous with incomprehensibility. The Pyrrhonists or Sceptics asserted an absolute *Acatalepsia*: all human science and knowledge, according to them, went no further than to appearances, and verisimilitude; they declaimed much against the senses; and charged them with a principal share in seducing, and leading us to error. See PYRRHONIST.

ACATERY, ACCATRY, in the king's household, a kind of check betwixt the clerks of the kitchen, and the purveyors. See PURVEYOR.

The officers of the *Acetry*, are a Serjeant, (salary 6 l.) two joint-clerks, (sal. 120 l.) and a yeoman of the salt-flores.

ACATIUM*, in the ancient navigation, a kind of boat or pinnace used for military purposes.

* The word is Greek, *Ακατιον*, formed, according to some, from *ακν*, point: on account of the sharpness of its make. The *Acatium* was a species of those called *Acturia Navis*, i. e. such as were wrought with oars. It was sometimes made use

of in battle : Strabo represents it as kind of privateer, or pyrate floop.

ACCAPITARE*, **ACCAPTARE**, **ACAPTARE**, in ancient law-books and records, the act of becoming vassal of a lord, or of yielding homage and obedience to him.

* The word is compounded of the Latin *ad*, to; and *caput*, head; by reason vassals own their lords for their head. Whence also the lords are sometimes called *domini capitales*; as those who command in an army are called *capitanei*, captains; and in old French, *cheveteines*, chieftains, in respect of their lords.—

ACCAPITUM*, a sum of money paid by a vassal, upon his admission to a feud. See **ACCAPTARE**.

* The word is also written *Acapitum*, *Accapitamentum*, *Acaptis*, *Acaptatio*, and *Acaptagium*.

ACCAPITUM, in our ancient law-books, signifies relief due to the chief lord. See **RELIEF**.

ACCATRY. See **ACATERY**.

ACCEDAS*, *ad Curiam*, an original writ, which lies for removing suits in any Court Baron except the County Court, into the King's Court; upon apprehension of partiality or false judgment in the other.

* *Accedas* is a Latin word signifying an order that thou come, &c. compounded of *ad*, to; and *cedere*, to come.

A like writ lies for him who has received false judgment in the County Court; where it is called *de falso judicio*. An *Accedas ad Curiam* lies also for justice delay'd, as well as falsely given; and is a species of the writ *Recordari*. See the article **RECORDARI**.

ACCEDAS ad Vice-comitem, is a writ directed to the coroner, commanding him to deliver a writ to the sheriff, who having a pone delivered to him, suppresses it. See **PONE**.

ACCELERATED Motion, in mechanics, is a motion which receives continual increments, or accessions of velocity. See **MOTION**.

If the accessions of velocity be equal in equal times; the motion is said to be *uniformly accelerated*.

The motion of falling bodies is an *accelerated motion*: and supposing the medium they fall through, *i. e.* the air, void of resistance; the same motion may be also considered as *uniformly accelerated*.

For the *Laws of ACCELERATED Motion*, see **MOTION**.

ACCELERATION*, in mechanics, the increase of velocity in a moving body.

* The word is compounded of *ad*, to; and *celer*, swift.

Acceleration stands directly opposed to retardation, which denotes a diminution of velocity.

ACCELERATION is chiefly used in physics, in respect of falling bodies, *i. e.* of heavy bodies tending towards the centre of the earth by the force of gravity. See **GRAVITY**, and **CENTRE**. That natural bodies are *accelerated* in their descent, is evident from various considerations, both *a priori* and *posteriori*.—Thus, we actually find, that the greater height a body falls from, the greater impression it makes, and the more vehemently does it strike the subject plane, or other obstacle.

Various are the systems and opinions which philosophers have produced to account for this *Acceleration*.—Some attribute it to the pressure of the air: the farther, say they, a body falls, the greater load of atmosphere is of consequence incumbent on it: and the pressure of a fluid, is in proportion to the perpendicular altitude of the column thereof.—Add, that the whole body of the fluid pressing in innumerable right lines, which all meet in a point, *viz.* the centre; that point, by the meeting of those lines, sustains, as it were, the pressing of the whole mass: consequently, the nearer a body approaches thereto, the effect or pressure of more united lines must it sustain.

But what overturns this account, is, that as the pressure of the air downwards increases; so, by the known laws of statics, does the resistance, or the force wherewith the same fluid tends to repel, or drive the body upwards again.

Others insist, that the incumbent air is the grosser and more vaporous, the nearer the earth; and filled with more heterogeneous particles, which are not true elastic air: and hence, say they, a descending body, meeting continually with less resistance from the elasticity of the air, and having the same force of gravity still acting on it, must necessarily be *accelerated*. Hobbs (*Philos. probl. c. 1. p. 3.*) attributes *Acceleration* to a new impression of the cause which makes bodies fall; which, on his principles, is also the air. As part of this mounts, part also must descend; for reasons drawn from the motion of the earth, which is compounded of two motions, one circular, the other progressive; consequently the air ascends, and circulates at once. As the body, in its fall, receives a new pressure in every point of its descent, its motion he says must needs be *accelerated*.

But what overturns all accounts where the air or atmosphere are concerned, is, that the *Acceleration* holds in vacuo, and even more regularly than in air. See **VACUUM**.

The Peripatetic account is worse than this; the motion of

heavy bodies downwards, say they, arises from an intrinsic principle, which makes them tend to the centre, as their proper seat, or element, where they would be at rest: Hence, add they, the nearer bodies approach thereto, the more is their motion intended.

The Gassendists, on the other hand, hold that the earth emits a sort of attractive effluvia, innumerable threads whereof continually ascend and descend; which threads, proceeding like radii from a common centre, divaricate the more, the further they go: So that the nearer a heavy body is to the centre, the more of these magnetic threads it receives; and hence the more is its motion *accelerated*.

But this is refuted by an easy experiment: for if a ball be let fall out of the lowest window of a high tower, and also out of the highest; the *Acceleration* will be the same in both cases, notwithstanding the greater vicinity to the centre in the one, than in the other case.

The Cartesians account for the *Acceleration*, from the repeated pulses of a subtil etherial matter, which is continually acting on the falling body, and impelling it downwards.

After all, the cause of *Acceleration* is nothing mysterious; the principle of gravitation, which determines the body to descend, determining it to be *accelerated* by a necessary consequence. See **GRAVITATION**.

Suppose a body let fall from on high: the primary cause of its beginning to descend, is doubtless, the power of gravity; but when once the descent is commenced, that state becomes in some measure natural to the body; so that if left to itself, it would persevere in it for ever, even though the first cause should cease: as we see in a stone cast with the hand, which continues to move, after it is left by the cause that gave it motion.

But, beside the propensity to descend impressed by the first cause, and which of it self were sufficient to continue the same degree of motion once begun, in infinitum; there is a constant accession of subsequent efforts of the same principle, gravity, which continues to act on the body already in motion, in the same manner as if it were at rest.

Here, then, being a double cause of motion, and both acting in the same direction, *viz.* directly towards the centre of the earth; the motion they jointly produce must necessarily be greater than that of any one of them.—And the velocity thus increased, having the same cause of increase still persisting, the descent must necessarily be continually *accelerated*.

For, supposing gravity, whatever it be, to act uniformly on all bodies, at equal distances from the earth's centre; and that the time in which a heavy body falls to the earth, be divided into equal parts infinitely small: let this gravity incline the body towards the earth's centre, while it moves in the first infinitely small part of the time of its descent; if after this, the action of gravity be supposed to cease, the body would proceed uniformly on towards the earth's centre, with a velocity equal to the force of the first impression.

But, now, since the action of gravity is here supposed still to continue; in the second moment of time, the body will receive a new impulse downwards, equal to what it received at first; and thus its velocity will be double of what it was in the first moment: in the third moment it will be triple; in the fourth quadruple, and so on continually: for the impression made in one moment, is not at all altered by what is made in another; but the two are, as it were, aggregated, or brought into one sum.

Wherefore, since the particles of time are supposed infinitely small, and all equal to one another; the impetus acquired by the falling body will be every where, as the times from the beginning of the descent.—And hence, since the quantity of matter in the body given, continues the same; the velocity will be as the time in which it is acquired.

Further, the space passed over by a moving body in a given time, and with a given velocity, may be considered as a rectangle made by the time and the velocity.—Suppose *A*, (*Tab. Mechan. fig. 62.*) a heavy body descending, and let *AB* represent the time of its descent; which line suppose divided into any number of equal parts, *AC*, *CE*, *EG*, &c. representative of the intervals, or moments of the given time.

—Let the body descend through the first of those divisions, *AC*, with a certain equable velocity arising from the proposed degree of gravity: this velocity will be represented by *AD*; and the space passed over, by the rectangle *CAD*.

Now, as the action of gravity in the first moment produced the velocity *AD*, in the body before at rest; in the second moment, the same will produce in the body so moving, a double velocity, *CF*; in the third moment, to the velocity *CF* will be added a further degree, which together therewith, will make the velocity *EH*, which is triple of the first, and so of the rest. So that in the whole time *AB*, the body will have acquired a velocity *BK*.—Again, taking the divisions of the line, *e. g.* *AC*, *CE*, &c. for the times, the spaces gone through will be the areas or rectangles, *CD*, *EF*, &c. So that in the whole time *AB*, the space described by the moveable, will be equal to all the rectangles, *i. e.* to the dented Figure *ABK*.

Such would be the case, if the accessions of velocity only happened in certain given points of time, *e. g.* in C, in E, &c. So that the degree of motion should continue the same till the next period of *Acceleration* come up.—If the divisions or intervals of time were supposed less, *e. g.* by half; then the denatures of the figure would be proportionally smaller; and it would approach so much the nearer to a triangle.—If they were infinitely small, *i. e.* if the accessions of velocity were supposed to be made continually, and in every point of time, as is really the case; the rectangles thus successively produced will make a just triangle, *e. g.* ABE, (*fig. 63.*)—Here, the whole time AB, consisting of the little portions of time A I, A 2, &c. and the area of the triangle ABE, of the sum of all the little triangular surfaces answering to the divisions of the time: the whole area or triangle expresses the space moved through in the whole time AB; and the little triangles A I f, &c. the spaces gone through in the divisions of time a 1, &c.

But these triangles being similar, their areas are to one another, as the squares of their homologous sides A B, A I, &c. and consequently, the spaces moved, are to each other as the squares of the times.

Hence we easily infer the great law of *Acceleration*, *viz.* "That a descending body uniformly *accelerated*, describes, in "the whole time of its descent, a space which is just half of "what it would have described in the same time, with the "accelerated velocity, it has acquired at the end of its fall." For, the whole space the falling body has moved through in the time AB, we have already shewn, will be represented by the triangle ABE; and the space the same body would move through in the same time, with the velocity BE, will be represented by the rectangle ABEF.—But the triangle is known to be equal to just half the rectangle.—Therefore, the space moved, is just half of what the body would have moved with the velocity acquired at the end of the fall.

Hence, 1^o, we gather, that the space moved with the last acquired velocity BE, in half the time AB, is equal to that really moved by the falling body in the whole time AB. 2^o, If a falling body describe any given length in a given time, in double that time it will describe four times that length; in thrice the time, nine times, &c. and universally, if the times be in arithmetical proportion, 1, 2, 3, 4, &c. the spaces described will be, 1, 4, 9, 16, &c.

The spaces described by a falling body, in a series of equal moments or intervals of time, will be as the unequal numbers 1, 3, 5, 7, 9, &c.—And since the velocities acquired in falling are as the times; the spaces will also be as the squares of the velocities; and both times and velocities in a subduplicate ratio of the spaces.

The motion of a body ascending, or impelled upwards, is diminished or retarded from the same principle of gravity acting in a contrary direction, in the same manner as a falling body is *accelerated*. See *RETARDATION*.

A body thus projected upwards, rises till it has lost all its motion; which it does in the same time that a body falling would have acquired a velocity equal to that wherewith the body was thrown up.

Hence, the same body thrown up, will rise to the same height, from which, falling, it would have acquired the velocity wherewith it was thrown up.

And hence, the height which bodies thrown up with different velocities do ascend to, are to one another as the squares of those velocities.

ACCELERATION of bodies on inclined planes.—The same general law obtains here, as in bodies falling perpendicularly: the effect of the plane is, to make the motion slower; but the inclination being every where equal, the retardation rising therefrom will proceed equally in all parts, at the beginning and the ending of the motion.—The particular laws, see under the article *Inclined PLANE*.

ACCELERATION of the motion of pendulums.—The motion of pendulous bodies is *accelerated* in their descent; but in a less ratio than that of bodies falling perpendicularly. See the *laws thereof* under the article *PENDULUM*.

ACCELERATION of the motion of projectiles. See *PROJECTILE*.

ACCELERATION of the motion of compressed bodies, in expanding or restoring themselves. See *COMPRESSION*.

That the motion of compressed air, expanding itself by its elasticity to its former dimensions, is *accelerated*, is evident from various considerations.

ACCELERATION is also applied in the ancient astronomy, in respect of the fixed stars.—This *Acceleration* was the difference between the revolution of the primum mobile, and the solar revolution; which was computed at 3 minutes, and 56 seconds.

ACCELERATOR *, in anatomy, a muscle of the penis, whose office is to expedite the discharge of the urine, and semen.

* This is more peculiarly called *Accelerator urinae*: some make two muscles of it, and give them the denomination *Acceleratores*, or *acceleratory muscles*.

It arises tendinous from the upper and fore-part of the urethra, but soon grows fleshy, passes under the os pubis, and incompletes the bulb of the cavernous body of the urethra.—Both

sides of this muscle meet in a middle line, corresponding to the seam in the skin over it; and continue so united, the space of two inches; after which, it detaches two fleshy elongations, which become thin tendons at their terminations on the cavernous bodies of the penis.

Its upper part covering the bulb, when in action, straightens the veins which pass through it from the corpus cavernosum of the urethra, and hinders the reflux of the blood in an erection. By the repeated contractions of this upper part, the blood in the bulb is also driven towards the glans.

The two elongations compress the channel of the urethra, and so force out the contained seed, or urine; whence the muscle takes its name.

ACCENSIO *, in antiquity, denotes an inferior order of officers, appointed to attend the Roman magistrates, somewhat in the manner of ushers, serjeants, or tiptaves among us.

* They were thus called from *accire*, to send for; one part of their office being to call assemblies of the people, summon parties to appear and answer before the judges, &c.

ACCENSI *, also denotes a kind of supernumerary foldiers in the Roman armies; whose office was to attend the motions of their principals, and supply the places of those who were killed, or disabled by their wounds.

* They were thus denominated from *ad*, to; and *accensere*, to reckon.

ACCENSION *, **ACCENSIO**, in physics, the act of kindling, or setting a body on fire.

* The word is formed of the Latin *accendere*, to kindle; a compound of *ad*, to; and *candere*, o glow. Though some Grammarians suspect the primitive signification of *accendere*, to have been, to render famous.

Accensio, on other occasions, is called *inflammation*, *ignition*, *conflagration*, &c. See the articles *IGNITION* and *INFLAMMATION*.

Accensio, stands opposed to extinction. See *EXTINCTION*. Chemists furnish us various instances of the *Accensio* of cold liquors by bare mixture: as of the acid spirits of minerals, and the essential oils of plants. V. *Mem. Acad. Scien. an.*

1726. p. 132. *Hist. p. 39.*

ACCENT *, in its primitive sense, an affection of the voice, which gives each syllable of a word its due pitch, in respect of height or lowness.

* The word is originally Latin, *accentus*, a compound of *ad*, to; and *canto*, to sing. *Accentus quasi Adcantus*; or *juxta cantum*.—In this sense, *Accent* is synonymous with the Greek *ᾠδὴ*, the Latin *tenor*, or *tonor*, and the Hebrew *מַעְלָה גָּבִיט*, *tafe*.

The *Accent*, properly, has only to do with high and low, or acute and grave.—Though the modern grammarians frequently also use it in respect of loud and soft, long and short; but this confounds *Accent* with *Quantity*. See the article *QUANTITY*.

The difference between the two may be conceived from that which we observe between the beat of a drum, and the sound of a trumpet: the former expresses every thing belonging to loud and soft, and long and short: but, so long as there is a *movens* in the sound, there is nothing like *Accent*.

ACCENT is also used in grammar, for a character placed over a syllable, to mark the *Accent*, *i. e.* to shew it is to be pronounced in a higher, or in a lower tone; and regulate the inflections of the voice in reading.

We usually reckon three grammatical *Accents* in ordinary use, all borrowed from the Greeks, *viz.* the *Acute Accent*, which shews when the tone of the voice is to be raised; and is expressed thus (´).

The *Grave Accent*, when the note or tone of the voice is to be depressed; and is figured thus (˘).

The *Circumflex Accent*, which is composed of both the acute and the grave; it points out a kind of undulation of the voice, and is expressed thus (ˆ or ˘).

Words which have no accent are called *Atomics*.

The Hebrews have a grammatical, a rhetorical, and a musical *Accent*; though the first and last seem, in effect, to be the same; both being comprized under the general name of *Tonic Accents*, because they give the proper tone to syllables: as the rhetorical *Accents* are said to be *Euphonic*; inasmuch as they tend to make the pronunciation more sweet and agreeable.

There are four euphonic *Accents*, and twenty-five tonic; of which some are placed above, and others below the syllables; the Hebrew *Accents* serving not only to regulate the risings, and fallings of the voice, but also to distinguish the sections, periods, and members of periods in a discourse; and to answer the same purposes with the points in other languages.

Their *Accents* are divided into *emperors*, *kings*, *dukes*, &c. each bearing a title answerable to the importance of the distinction it makes.—Their emperor rules over a whole phrase, and terminates the sense completely; answering to our point.—Their king answers to our colon; and their duke to our comma.—The king, however, occasionally becomes a duke, and the duke a king, as the phrases are more or less short.—It must be noted, by the way, that the management and

and combination of these *Accents* differs in Hebrew poetry from what it is in prose.

The use of the tonic, or grammatical *Accents*, has been much controverted; some holding that they distinguish the sense, while others maintain that they are only intended to regulate the raising, or singing; alleging that the Jews sing, rather than read, the scriptures in their synagogues. V. Cooper, *dom. Misraic. clav. p. 31.*

The truth seems here to lie between the two opinions; for though we are inclined to think, that the primary intention of these *Accents* was to direct the singing; yet the singing seems also to have been regulated according to the sense; so that the *Accents* might serve not only to guide the singing, but also to point out the distinctions.—Though it must be confessed, that many of these distinctions are too subtle and inconsiderable; nor can the modern writers, or the editors of old ones, agree in the matter; some of them making twice as many of these distinctions as others.

The Hebrew *Accents*, in effect, have something common with those of the Greeks, and Latins; and something peculiar to themselves.—What they have in common, is, that they mark the tones; shewing how the voice is to be raised, and sunk on certain syllables. What they have peculiar, is, that they do the office of the points in other languages. See PUNCTUATION.

Be this as it will, it is certain the ancient Hebrews were not acquainted with these *Accents*; so that, at best, they are not *jure divino*.—The opinion which prevails among the learned, is, that they were invented about the sixth century, by the Jewish doctors of the school of Tiberias, called the *Massorettes*.

The learned Hennis affirms them to be of Arabic invention; and to have been adopted and transferred thence into the Hebrew by the *Massorettes*; especially by the celebrated Rabbi Ben Ascher, who flourished in the middle of the sixth century; on occasion of the emperor Justinian's prohibiting the reading their traditions in their synagogues. He adds, that they were first brought to their degree of perfection, by Rabbi Juda Ben David Chiug, a native of Fez, in the eleventh century.—It is indeed possible, the Jews might borrow their points from the Arabs; but how they should have their *Accents* from them is hard to conceive, the Arabic language having no such thing as *Accents*, either in prose or verse.

The same Hennis makes the Arab Alchahil Ebn Ahmed, who lived about the time of Mahomet, the great improver of the Arabic *Accents*.—The chief ground of the opinion, is, that this writer is said to have been the first who reduced poetry into an art; marking the measures, and quantities of the verses, by the Latins called *Pædas*, and by us feet.—Add, that the same Hennis, gives Rabbi Juda of Fez, in completing the Hebrew *Accents*, is chiefly founded on the common opinion, that this rabbin was the first grammarian among the Jews. But the opinion is erroneous; there having been a Hebrew grammar composed by R. Saadiah Gaon, many years before R. Juda. In M. Simon's critical history of the old testament, we have a catalogue of Hebrew grammars, at the head of which is this of R. Saadiah: M. Simon, on this occasion, observes, “that after the Jews of Tiberias had added points, and *Accents* to the texts of the old testament, the doctors of the other schools began to do the like in their copies, which were afterwards imitated “by the rest.”

As to the Greek *Accents*, now seen both in manuscript and printed books, there has been no less dispute about their antiquity and use, than about those of the Hebrews.—Hæc Vossius, in an express treatise de *Accentibus Græcicis*, endeavours to prove them of modern invention; asserting, that anciently they had nothing of this kind *, but only a few notes in their poetry, which were invented by Aristophanes the Grammarian, about the time of Ptolemy Philopater; and that these were of musical, rather than of grammatical use, serving as aids in the singing of their poems; and very different from those introduced afterwards.

* This appears from inscriptions as well as manuscripts, none of which till 170 years before Christ, has either accent, spirit, apostrophe, or *vox* sublebed. V. *Maj. de Numm. Græc. Escri. p. 10, seq. P. Livan. Miscell. 75. Voss. Aristarch. l. 8. Idem de accent. p. 5.*

He adds, that Aristarchus, a disciple of Aristophanes, improved on his master's art; but that all they both did was only designed to facilitate youth in the making of verses.—The same Vossius shews from several ancient grammarians, that the manner of writing the Greek *Accents* in those days, was quite different from those now used in our books.

Hen. Christ. Hennis, in a dissertation published to shew that the Greek tongue ought not to be pronounced according to the *Accents*, espouses the opinion of Vossius, and even carries the matter still further.—He thinks that *Accents* were the invention of the Arabians, about nine hundred years ago; and that they were only used in poetry; that they were intended to ascertain the pronunciation of the Greek, and to keep out that barbarism which was then

breaking in upon them; that the ancient *Accents* of Aristophanes were perfectly agreeable to the genuine Greek pronunciation, but that the modern ones of the Arabs destroy it.

Wetstein, Greek professor at Basil, in a learned dissertation, endeavours to prove the Greek *Accents* of an older standing.—He owns that they were not always formed in the same manner by the ancients; but thinks that difference owing to the different pronunciation which obtained in the several parts of Greece.

He brings several reasons a priori for the use of *Accents*, even in the earliest days; as that they then wrote all in capital letters equidistant from each other, without any distinction either of words, or phrases; which without *Accents* could scarce be intelligible: and that *Accents* were necessary to distinguish ambiguous words and to point out their proper meaning; which he confirms from a dispute on a passage in Homer, mentioned by Aristotle in his *Poësis*, chap. V. Accordingly, he observes, that the Syrians, who have tonic, but no distinctive *Accents*, have yet invented certain points, placed either below or above the words, to shew their mood, sense, person, or sense. See further in his *Dissertatio Epistolica de Accentuum Græcorum Antiquitate & Ufu*. Basil, 1686.

ACCENT is also applied, somewhat abusively, to the Characters which mark the quantities of syllables, or the time the voice is to dwell on them.

The spurious *Accents* answer to the characters of time in music; as crotchets, quavers, &c.—The genuine *Accents* rather answer to the musical notes, sol, fa, &c.

Such are the *long Accent*, which shew that the voice is to stop on the vowel, and is expressed thus (ˉ).

The *short Accent*, which shews that the time of pronunciation ought to be short, and is marked thus (˘).

Some even rank the hyphen, diastole, and apostrophe, among *Accents*.

ACCENT, also denotes a certain inflection of voice; or a peculiar tone, and manner of pronunciation, contracted from the country, or province where a person was bred.

In this sense, we say, the Welch tone or *Accent*, the northern *Accent*, the Gascoign *Accent*, Normin *Accent*, &c.

ACCENT is also a tone or modulation of the voice frequently used as a mark of the intention of the speaker, and giving a good or an evil signification to his words.

One may give offence with the softest and most soothing words imaginable, by a proper management of the *Accent*, and manner of pronouncing them.—The *Accent* frequently gives a contrary sense to what the words themselves naturally imported.

ACCENT, in music, is a modulation of the voice, to express a passion.

Every bar or measure is divided into *accented* and *unaccented* parts.

The *accented* parts are the principal; being those intended chiefly to move and affect: It is on these the spirit of the music depends. See BAR and MUSIC.

The beginning and middle; or the beginning of the first half of the bar, and the beginning of the later half thereof, in common time; and the beginning, or first of the three notes in triple time; are always the *accented* parts of the measures.

In common time, the first and third crotchet of the bar are on the *accented* part of the measure.—In triple time, where the notes always go by three and three, that which is in the middle of every three is always *unaccented*; the first and last *accented*. But the *Accent* in the first is so much stronger, that in many cases the last is accounted as if it had no *Accent*.

The harmony is always to be full, and void of discords in the *accented* parts of the measure. In the *unaccented* parts this is not so absolutely necessary; discord here passing without any great offence to the ear.

ACCENT, in Poetry. See RHYTHM.

ACCEPTANCE*, in a general sense, the act of accepting, i. e. of receiving, or admitting a thing offered to us, which by our refusal would have been frustrated, and rendered of no effect.

* The word is formed from *accipere*, to receive; which is compounded of *ad*, to; and *capere*, to take.

The *Acceptance* of a donation, is necessary to its validity; and is a solemnity essential thereto.—*Acceptance*, say the civilians, is the concurrence of the will, or choice of the donee, which renders the act complete; and without which the donor may revoke his gift at pleasure.

In beneficiary matters, the canonists hold, that the *Acceptance* should be signified at the same time with the resignation; not *ex intervallo*. See RESIGNATION.

ACCEPTANCE, in common law, denotes a tacit agreement to a preceding act, which might have been defeated and avoided, were it not for such *Acceptance* had.—If a man and his wife, seized of land in right of the wife, make a joint

lease, or feoffment by deed; reserving rent: the man dying, and the wife receiving the rent; such receipt is deemed an *Acceptance*, and shall make the lease good: so that she shall be barred from bringing the writ, *Cui in Vita*. See *Cui in Vita*.

ACCEPTANCE is more particularly used in the Romish ecclesiastical law, for the manner of receiving or admitting the pope's constitutions; or the act whereby they are received, and made obligatory.

There are two kinds of *Acceptances*; the one solemn, the other tacit.

The *solemn Acceptance* is a formal act, whereby some error, or scandal which the pope condemns, is expressly condemned by the acceptor.—Infinite disputes and dissensions have been raised in the Roman catholic world, especially in France, on occasion of the *Acceptance* of the constitution *Unigenitus*: and many of the French clergy still refuse to *accept it*.

When a constitution has been solemnly *accepted* by those it more immediately relates to; it is supposed to be tacitly *accepted* by all the other prelates in the Christian world, who have cognizance thereof: and this acquiescence is what they call a *Tacit Acceptance*.

In this sense, France, Poland, &c. tacitly *accepted* the constitution against the doctrine of Molinos, and the Quietists.—And Germany, Poland, &c. tacitly *accepted* the constitution against Janfenius.

ACCEPTANCE, in commerce, is particularly used in respect of bills of exchange.—To *accept* a bill of exchange, is to sign, or subscribe it; and thereby become principal debtor of the sum contained therein; with an obligation to pay, or discharge it at the time prefixed. See *BILL of Exchange*.

The *Acceptance* is usually performed by him on whom the bill is drawn; upon its being presented to him by the person in whose behalf it was drawn, or by some others by his order.—While the acceptor is master of his signature, i. e. before he has returned the *accepted* bill to the bearer, he may erase his *Acceptance*: but not after he has once delivered it.

Bills payable at sight are not to be *accepted*; as being to be acquitted at their first presenting; or, in defect of payment, to be protested.—In bills drawn for a certain number of days after sight, the *Acceptance* must be dated; in regard the time is to be accounted therefrom.—The form of this *Acceptance*, is, *Accepted such a day*, and then the signature.

Bills drawn payable on a day named, or at usance, or double usance, need not be dated; usance being reckoned from the date of the bill it self. See *USANCE*.—On these it is sufficient to write, *Accepted*, and the signature.

If the bearer of a bill be contented with an *Acceptance* to be paid in twenty days after sight, where, in the bill it self, only eight days are expressed; he runs the risk of the twelve additional days: so that if the acceptor fail, he has no remedy against the drawer. And if the bearer content himself to receive a less sum than is expressed, in part; he is to stand the chance of the rest.

ACCEPTATION, in grammar, the signification of a word; or the sense wherein it is taken and received. Thus we say:

Such a word has several *Acceptations*.—In its first and most natural *Acceptation*, it denotes, &c. See *SIGNIFICATION*.

ACCEPTILATION, in the civil law, an acquittance given without receiving any money; or a declaration of the creditor, in favour of the debtor, signifying that he is satisfied for his debt, and forgives all further claim, or demand; though in reality no payment has been made.

ACCEPTION, or **ACCEPTATION**. See **ACCEPTATION**.

ACCEPTOR, of a bill of exchange, the person who accepts the bill.

The *Acceptor*, who is usually the person on whom the bill is drawn, becomes personal debtor by the acceptance; and is obliged to pay it, though the drawer fail before it become due. See **ACCEPTANCE**.

ACCESS*, in a general sense, signifies the approach of a thing towards another.

The word is of Latin original, *accessus*, or *accessus*; formed of *accidere*; compounded of *ad*, to; and *cedere*; to come.

In which sense, *Access* stands opposed to recess. See **RECESS**.

We sometimes say, the *Access* of bodies, the *Access* of the moon, the sun, planets, &c. but more frequently, the approach of bodies: the appulse of the moon, the rising of the sun, &c. geometricians speak of a line called the curve of equable *access*, or approach.

ACCESS, in a more particular sense, denotes entrance, or admission. See **ENTRY** and **ADMISSION**.

We say, such a person has *Access* to the prince: the *Access* on that side was very difficult, by reason of rocks, &c.

ACCESS, in medicine, denotes a fit, or return of some periodical disease.

We say an *Access* of the gout, but especially an ague, an intermitting fever, an epilepsy, &c. an *Access* of madness; sometimes also a prophetical *Access*, a cold *Access*, &c.

Access is frequently confounded with paroxysm; but they are different things; an *Access* being properly the beginning, or first onset of a disease, a paroxysm the height of it. See **PAROXYSM**.

ACCESSIBLE, something that may be approached; or, that *Access* may be had to.

Such a place, a fortress, is *accessible* from the sea-ward, i. e. the passage to it is practicable. See **FORTIFICATION**, and **FORTIFIED place**.

ACCESSIBLE height, or *distance*, in geometry, &c. is either that which may be mechanically measured by the application of a measure to it; or it is a height whose base and foot may be approached to, and a distance measured thence on the ground.

With the quadrant, &c. we can take altitudes both *accessible* and *inaccessible*.

Surveying, includes the measuring, plotting, &c. both of *accessible* and *inaccessible* distances.

ACCESSION, in a general sense, is the act of approaching, or going to a place, person, or thing.

ACCESSION, is more particularly used for the act whereby a thing is joined or united to something existing before.

ACCESSION is also used for a prince's succession to the throne. The first of August is observed in memory of the late king's *Accession* to the crown of Great Britain.

ACCESSION is also used for the act of engaging, and becoming a party in a treaty before concluded between other powers; or on the same footing and conditions as if originally comprehended in the treaty it self, such as

The *Accession* of the States General to the treaty of Hannover; of the Czarina to the treaty of Vienna, &c.

ACCESSORY, or **ACCESSARY**, something that accedes, or is added to another more considerable thing.

In which sense, the word stands opposed to principal. See **PRINCIPAL**.

ACCESSORY, or **ACCESSARY**, in common law, is chiefly used for a person guilty of a felonious offence, not principally, but by participation; as, by advice, command, or concealment.

There are two kinds of *Accessories*; before the fact, and after it.—The first is he who commands, or procures another to commit felony, and is not present himself; for if he be present, he is a principal.

The second, is he who receives, assists, or comforts any man that has done murder, or felony, whereof he has knowledge. A man may also be *accessory* to an *Accessory*, by aiding, receiving, &c. an *Accessory* in felony.

An *Accessory* in felony shall have judgment of life, and member, as well as the principal, who did the felony; but not till the principal be first attainted, and convicted, or outlawed thereon.—Where the principal is pardoned without attainer, the *Accessory* cannot be arraigned; it being a maxim in law, *Ubi non est principalis, non potest esse Accessorius*. But if the principal be pardoned, or have his clergy after attainer, the *Accessory* shall be arraigned.

4 & 5 IV. & M. c. 4. In the lowest and highest offences there are no *Accessories*, but all are principals: as in riots, routs, forcible entries, and other trespasses, which are the lowest offences.—So also in the highest offence, which is high treason, there are no *Accessories*. *CoL. Littlet. 71.*

Accessories in petty treason, murder, and felony, are riot to have their clergy.—There can be no *Accessory* before the fact in manslaughter; because that is sudden and unpremeditated.

ACCESSORY by statute, is such a one as abets, advises, aids, or receives one that commits an offence, which is made felony by statute.

ACCESSORY NERVES, **ACCESSORIUS Willisii**, or **PAR ACCESSORIUM**, in anatomy, a pair of nerves, which arising from the medulla in the vertebrae of the neck, ascend and enter the skull, and pass out of it again, with the par vagum, wrapped up in the same common integument therewith; and after quitting the same, are distributed into the muscles of the neck and shoulders.—See *Tab. Anat. (Ofteol.) fig. 5. lit. rr.*

In their ascent towards the head, they receive branches from each of the first five pair of cervical nerves, near their rise from the medulla; and send forth twigs to the muscles of the larynx, gula, &c.—Uniting with a branch of the intercostal, they form the plexus gangliiformis.

ACCIDENCE, **ACCIDENTIA**, a name chiefly used for a little book, containing the first elements, or rudiments of the Latin tongue. See **GRAMMAR**.

ACCIDENS, **ACCIDENT**, in philosophy. See **ACCIDENT**.

Per ACCIDENS, is frequently used among philosophers to denote what does not follow from the nature of a thing, but

from

from some accidental quality thereof: in which sense, it stands opposed to *per se*, which denotes the nature and essence of a thing. See *PER SE*.

Thus, fire is said to burn *per se*, or considered as fire, and not *per accidens*: but a piece of iron, though red-hot, only burns *per accidens*, by a quality accidental to it, and not considered as iron.

ACCIDENT *, **ACCIDENS**, in philosophy, something additional, or superadded, to a substance; or not essentially belonging thereto, but capable, indifferently, either of being or not being in it, without the destruction thereof. See **SUBSTANCE**.

* The word is derived from *accidere*, to happen; which is compounded of *ad*, to; and *cadere*, to fall.

The schoolmen distinguish three kinds of *Accidents*; verbal, predicable, and predicamental.

Verbal ACCIDENT, *Accidens Verbalis*, stands opposed to essence; and in this sense, the adjuncts to a thing, though substances themselves, are denominated *Accidents* thereof.

Thus, the clothes a man has on, though real substances, yet, as they are not essential, but adventitious or accessory to his existence, are *Accidents*.

Predicable ACCIDENT, *Accidens Predicabile*, is used in opposition to *Proper*.—Such is any common quality; as whiteness, heat, learning, or the like.

Thus a man may be sick or well; and a wall white or black; yet the one be still a man, and the other a wall.

These are called in the schools, *Predicable Accidents*, because usually laid down and explained in the doctrine of predicables.

Predicable Accidents may either be taken in the abstract, as whiteness, learning; or in the concrete, white, learned. See **ABSTRACT**, and **CONCRETE**.

If taken in the abstract, as is done by Porphyry; the *Accident* is defined as above, that which may either be present, or absent, without the destruction of its subject.

If it be taken in the concrete; *Accident* is usually defined by the schoolmen, to be something capable of being predicated contingently, of many, in respect of quality.—As learning, which may probably be predicated of you, he, &c.

Predicamental ACCIDENT, *Accidens Predicamentale*; which alone properly answers to the idea of an *Accident*; is a mode, or modification of some created substance, inhering or depending thereon, so as not to be capable of subsisting without the same.

In this sense, *Accident* is opposed to substance.—Whence, as substance is defined a thing that subsists of itself, and the substratum of *Accidents*; so an *Accident* is said to be that *qujus esse est inesse*: and therefore Aristotle, who usually calls substances simply *ous*, entities, beings; commonly calls *Accidents*, *ous ouia*, entities of entity; requiring some substance wherein to reside, as their subject of inhesion.

An *Accident*, then, has an immediate, and essential dependence on its substance; both as to its production, its continuation, and its effects: it arises or is deduced from its subject, is preferred or subsisted by it; and can only be effected by what alters, or affects the subject.

The old schoolmen, however, will not have *Accidents* to be mere modes of matter, but entities really distinct from it; and, in some cases, separable from all matter.—But the notion of real *Accidents*, and qualities, is now exploded.

Aristotle and the Peripatetics make nine kinds or classes of *Predicamental Accidents*; others contract them into a less number.

Absolute ACCIDENT, is a term used in the Romish theology, for a predicamental *Accident* which subsists, or may possibly subsist, at least miraculously, and by some supernatural power, without a subject.

Such, they contend, are the *Accidents* of the bread and wine in the eucharist, *e. gr.* the colour, flavour, figure, &c. thereof, which remain after the substances they belonged to are changed into other substances of flesh.

This absurdity has been very justly maintained by many of the casuists; and even solemnly decreed by some of their councils.—The eucharist, say they, being a sacrament, *i. e.* a visible sign of an invisible grace; it is necessary there be something sensible therein: now, this cannot be the substance, that being destroyed or transubstantiated; and therefore it must be *Accidents*.—Add, that in every conversion there must be something of the former nature remaining after the change; otherwise it would be no more than a simple substitution of one thing for another: as, then, nothing of the substance remains, it must be *Accidents*.—Hence, the council of Constance condemns the following proposition, which is the second of Wickliff, as heretical: The *Accidents* of bread do not remain without a subject in the sacrament. *Seff. VIII.*

Some of the fathers seem to give countenance to the same opinion.—S. Basil, in his sixth homily on the creation, ob-

erves that light, or rather brightness, the splendor of light, *το φως η λαμπριος*, is a thing distinct from its subject, as whiteness is from a white body; and that it existed in the beginning, without this subject; having been created four days before the sun.

The Cartesians, to a man, combat the notion of *absolute Accidents*; It being their doctrine, that the essence of matter consists in extension; and that *Accidents* are only modifications thereof, in no wise distinct from it: An *Accident* therefore without a subject must be a contradiction.—And hence, Cartesianism is branded as contrary to the catholic faith.

Various expedients have been invented by the Cartesians, to account for transubstantiation, &c. without the hypothesis of *absolute Accidents*.—Some hold, that the usual impressions are made on the sense by the immediate agency of God; and without any thing remaining of the former nature. Others ascribe the whole to heterogeneous matters contained in the pores of the bread, &c. which remaining unaltered by the transubstantiation, produce the same sensations as the bread produced.

ACCIDENT, in the popular sense of the word, signifies a contingent effect; or something produced casually, and without any foreknowledge or destination thereof in the agent that produced it.

ACCIDENT, in heraldry, is an additional note, or mark in a coat-armour, not necessarily belonging thereto, but capable either of being retained, or omitted, without altering the essence of the armour.—Such are abatements, differences, and tincture.

ACCIDENTAL, something that partakes of the nature of an *Accident*; or, that is not essential to its subject, but indifferent thereto.

Thus, whiteness is *accidental* to marble; and heat, to a red hot iron.

ACCIDENTAL Point, in perspective, is a point in the horizontal line, where lines parallel to one another, though not perpendicular to the picture, or representation, meet. See **POINT**, and **PERSPECTIVE**.

ACCIDENTAL Dignities, and **Debilities**, in astrology, are certain casual dispositions, and affections of the planets, whereby they are supposed to be either strengthened, or weakened, by their being in such a house of the figure.

ACCLAMATION *, a confused noise, or shout of joy, by which the public express their applause, esteem, or approbation of any thing.

* *Acclamatio*, the Latin term, is compounded of *ad*, to, or at; and *clamare*, to cry out, or shout.

These were formerly used in churches, as well as theatres; and the bishops and other ecclesiastical officers, were elected by the *Acclamations* of the people.—But their principal use has always been at the solemn entries of princes, and heroes; where they are usually attended with good wishes, prayers, vows, &c.

Antiquity has handed down to us several forms of *Acclamations*; the Hebrews used to cry, *Hofanna*; the Greeks, *Αγαθη τυχη*, Good luck.—The Romans to their princes, generals, &c. *Dii te nobis seruent, vestra salus, nostra salus*: 'the Gods preserve you for us; your safety, our safety.'—*In te omnia, per te omnia habemus, Antonine*. 'In you, Antoninus, and by you, we have every thing.'

—Lampridius relates, that at the entry of Severus, the people cried out, *Salve Roma, quia saluus Alexander*. 'O Rome, be safe; since Alexander is safe.'—Brissotius, in his treatise of Formulas, enumerates various sorts of *Acclamations*, used by the senate, the army, &c. Among the moderns, the English cry, 'God save the king.'—The French, *Vive le Roy*, 'May the King live,' &c.

ACCLIVIS, in anatomy, a muscle, otherwise called *Obliquus Ascendens*. See **OBLIQUUS Ascendens**.

ACCLIVITY *, the steepness, or slope of a line or plane inclined to the horizon; reckoned upwards. See **Inclined PLANE**.

* The word is compounded of the Latin *ad*, to; and *clivus*, a cliff, a flanting or sloping.

The ascent of a hill is an *Acclivity*; the descent of the same a declivity.

Some writers of fortifications, use *Acclivity* for *Talus*. See **TALUS**.

ACCOLA *, in a general sense, denotes an inhabitant near any certain place.

* The word is compounded of *ad*, to; and *colere*, to dwell, inhabit; *Accola eo quod adveniens terram colat*. Hence some place the distinguishing character of *Accole* in this, that they come from elsewhere: *Accola cultor loci in quo non est natus*; by which they stand opposed to *Incola*.—According to the verse: *Accola non propriam, propriam colit incolaterram*.

ACCOLADE *, a ceremony anciently used in the conferring of knighthood.

* The word is French, and literally denotes an embrace, or hugging; being formed of *ad*, to; and *col*, or *collum*, neck.

The *Accolade* consisted in the king's laying his arms about the young knight's neck, and embracing him; in token of friendship.—After the *Accolade*, the prince giving him a little blow on the shoulder with the flat of a sword, he forthwith entered into the profession of arms.

ACCOMMODATION *, in philosophy, the application of one thing, by analogy, to another.

* The word is compounded of *ad*, to; and *commodus*, commodious.

To know a thing by *Accommodation*, is to know it by the idea of a similar thing referred thereto.

A prophecy of scripture is said to be fulfilled various ways; properly, as when a thing foretold comes to pass; and improperly, or by way of *Accommodation*, when an event happens to any place or people, like to what fell out some time before to another.—Thus, the words of Isaiah, spoke to those of his own time, are said to be fulfilled in those who lived in our Saviour's; and are *accommodated* to them: Ye hypocrites, well did Isaiah prophesy of you, &c. which same words, St. Paul afterwards *accommodates* to the Jews of his time.—This method of explaining scripture by *Accommodation*, serves as a key for solving some of the greatest difficulties relating to the prophecies.

On many occasions, a man finds it expedient to translate by *Accommodation*: thus, the word *Librarian*, scrivener, may be translated, by *Accommodation*, a printer; as it originally signifies those who made it their business to furnish copies of books, before the invention of printing.

ACCOMMODATION, is also used for an amicable agreement, or composition between two contending parties.—Thus we say the process is grown so intricate and perplex'd, that there is no hopes of getting out of it but by an *Accommodation*.

These *Accommodations* are frequently effected by means of compromise, and arbitration.

ACCOMPANIMENT, something attending, or added as a circumstance to, another; either by way of ornament, or for the sake of symmetry, or the like.

The music, in dramatic performances, should only be a simple *Accompaniment*.—The organists sometimes apply the word to several pipes which they occasionally touch to accompany the treble; as the drone, flute, &c.

The *Accompaniments*, in heraldry, are all such things as are applied about the shield, by way of ornament; as the belt, mantling, supporters, &c.

A thing is also said to be *accompanied*, when there are several hearings, or figures about some one principal one; as a falconer, bend, fess, chevron, or the like.

ACCOMPLICE *, one that has a hand in a business; or is privy in the same design or crime with another. See **ACCESSORY**.

* The word is compounded of *ad*, to; *con*, together; and *placare*, to fold.

ACCOMPLISHMENT *, the entire execution, achievement, or fulfilling of something proposed, or undertaken.

* The word is compounded of *ad*, to; and *completus*, to fill up.

The *Accomplishment* of the prophecies of the Old Testament, in the person of our Saviour, is the great mark of his being the Messiah.

There are two ways of *accomplishing* a prophecy, directly, and by *accommodation*. See **ACCOMMODATION**.

Mr. Sykes has a particular enquiry into the meaning of those words used by the evangelist, That it might be fulfilled, or accomplished, which was spoke by the prophets: where he shews, that the *accomplish*, fulfilled, does not necessarily refer to a prediction of a future event *accomplished*; but is frequently a mere *accommodation* of words, borrowed from some other author, and accommodated to the present occasion.

ACCOMPT. See the article **ACCOUNT**.

ACCORD *, in music, is more usually called *concord*. See **CONCORD**.

* The word is French, formed, according to some, from the Latin *ad*, to; and *cor*, the heart; but others, with more probability, derive it from the French *corde*, a string, or cord; on account of the agreeable union between the sounds of two strings struck at the same time. Whence also some of the consonants in music come to be called *tetrachord*, *hexachord*, &c. which are a fourth, and a sixth. See **CHORD**, and **TETRACHORD**.

ACCORD, in law, is a verbal agreement between two, at the least, to satisfy an offence that the one hath committed against the other; whether it be a trespass, or the like; for which the one agrees to make, and the other to accept a certain satis-

faction.—This, if executed, becomes a good bar in law to any suit to be brought for the same matter.

ACCOUNT *, or **ACCOMPT**, in arithmetic, a calculus, or computation of the number of certain things.

* The word is compounded of *ad*, to; and *computus*, a computation.

There are various ways of *accounting*; as, by enumeration, or telling one by one; and by the rules of arithmetic, addition, subtraction, &c.

We *account* time by years, months, &c. The Greeks *accounted* it by olympiads; the Romans by indictions, lustris, &c. We *account* distances by miles, leagues, &c.

Money of ACCOUNT, is an imaginary species, contrived for the facilitating, and expediting the taking, and keeping of *Accounts*.—Such are pounds, angels, &c.

ACCOUNT is also used in respect of a company or society, when two, or more persons have received, or disbursed money for each other; or when this has been done by their order, or commission. See **COMPANY**, and **COMMISSION**.

ACCOUNT, or **ACCOUNTS**, is also used, collectively, for the several books or registers which merchants keep of their affairs and negotiations.

Hence, to make out an *Account*; to pass one's *Account*, &c. —Bankrupts are obliged to surrender their *Accounts*.

ACCOUNT, or **ACCOMPT**, in a legal sense, is a particular detail, or enumeration delivered to a court, a judge, or other proper officer or person, of what a man received or expended on the behalf of another, whose affairs he has had the management of.

In the remembrancer's office in the exchequer, are enter'd the states of all the *Accounts* concerning the king's revenue; for customs, excise, subsidies, &c. See **REMEMBRANCER**.

The great *Accounts*, as those of the mint, wardrobe, army, navy, tents, &c. are called *impress Accounts*.

All *Accounts* which pass the remembrancer's office, are brought to the office of the clerk of the pipe. See **PIPE**; see also **TALLY**, and **AUDITOR**.

ACCOUNT is also more particularly used for a writ which lies where an agent, steward, or other person, who ought to render an *Account*, refuses to give in the same.

Chamber of ACCOUNTS, in the French polity, is a sovereign court, of great antiquity, where the *Accounts* relating to the king's revenue are delivered in, and registered.

This answers pretty nearly to the court of exchequer in England.

There are presidents of *Accounts*, masters of *Accounts*, correctors of *Accounts*, &c.

ACCOUNTANT, or **ACCOMPTANT**, a person, or officer appointed to keep, or make up the *accounts* of a company, office, court, or the like. See **ACCOUNT**.

Thus there are *Accountants* in the custom-house, the excise, &c.

ACCOUNTANT-General of the Court of Chancery. See **CHANCERY**.

ACCOUNTING- or **ACCOMPTING**- or **COUNTING**-*House*. See **COUNTING-HOUSE**, and **BOOK-KEEPING**.

ACCOUTREMENT *, an ancient term, used for a habilliment; or a part of the apparatus, and furniture of a soldier, knight, or even of a gentleman.

* The word is French; formed from the ancient German, *Kuster*; whence *Courte*, a name used in some cathedrals in France, e. g. at Bayeux, for the sacristan or officer, who has the care of furnishing, and setting out the altar, in the church; called in German *Kuster*, *kuustor*.

ACCRETION *, in physics, the growth, or increase of an organical body, by the accession of new parts.

* The word is compounded of *ad*, to; and *cretere*, to grow.

Accretion is of two kinds; the one, consisting in an external apposition of new matter.

This is what we otherwise call, *juxtaposition*; and it is thus, stones, shells, &c. are supposed to grow.

The other is by some fluid matter received into proper vessels, and gradually brought to adhere, or grow to the sides thereof.

—This is what we call *introsuspension*; and it is thus that plants and animals are nourish'd.

ACCRETION, in the civil law, denotes the union or accession of a thing vague or vacant to another already occupied, or disposed of. See **ACCESSION**.

A legacy given to two persons jointly, *tan re quam verbis*, falls wholly to him that survives the testator, by right of *Accretion*.—Alluvion is another species of *Accretion*. See **ALLUVION**.

ACCRUE, or **ACCREW**, in law, is understood, of a part that accedes to, or follows the property of, another part, or person.

ACCUBITOR *, an ancient officer of the emperors of Constantinople; whose business was to lie near the emperor.

* The word is Latin, formed of the verb *accubere*, to lie by; whence also *accubatio*, that state, or posture of the body, when we sit, and at the same time lean backwards.

ACCUMULATION *, the act of heaping, or amassing several things together.

* The word is originally compounded of *ad*, to; and *cumulus*, heap.

The lawyers speak of an *Accumulation* of titles; as, when a person claims lands, a benefice, or the like, in virtue of several titles, or pretensions of different kinds; *e. gr.* by death, by resignation, &c.

In a like sense, we sometimes read of *accumulative* treason, which is, where a fact is not treason in itself, but becomes so by an *Accumulation* of circumstances.

The Earl of Strafford was condemned of *accumulative* treason; none of the facts alleged against him amounting singly to treason. 13 & 14 Car. 2. c. 29.

ACCURSED, something that lies under a curse, or a sentence of excommunication. See **ANATHEMA**.

ACCUSATION*, **ACCUSATIO**, in the civil law, the intending a criminal action against any person, either in one's own name, or that of the public.

* The word is compounded of *ad*, to; and *causari*, to plead.

By the Roman law, there was no public *Accuser*, for public crimes; every private person, whether interested in the crime, or not, might *accuse*, and prosecute the *accused* to punishment, or abolition.

But the *Accusation* of private crimes was never received but from the mouths of those who were immediately interested in them.—Thus none but the husband could *accuse* his wife of adultery.

Indeed, it was not properly an *Accusation* except in public crimes; in private ones it was called simply *action*, or intending an action, *intendere actionem*, or *litem*. See **ACTION**.

Cato, the most innocent person of his age, had been *accused* 42 times; and absolved as often.

When the *accused* accuses the accuser, it is called *recrimination*; which is not admitted till the *accused* has been first purged.

By the cruel laws of the inquisition, the *accused* is forced to accuse himself of the crime objected to him. See **INQUISITION**.

It has formerly been the custom in some parts of Europe, where the *Accusation* was very heavy, either to decide it by combat, or at least to make the *accused* purge himself by oath; which, however, was not admitted, excepting a certain number of his neighbours, and acquaintance, swore together with him.

ACCUSATIVE, in grammar, the fourth case of nouns that are declined.

Its use may be conceived from this, that all verbs which express actions that pass from the agent, as to beat, &c. must have subjects to receive those actions: for, if I beat, I must beat something; so that such verb evidently requires after it a noun, or name, to be the object of the action expressed. Hence, in all languages which have cases, the nouns have a termination, which they call *Accusative*: as, *amo Deum*, I love God; *Cæsar vicit Pompeium*, Cæsar over-came Pompey.

In English, we have nothing to distinguish this case from the nominative; but as we ordinarily place words in their natural order, it is easily discovered; the nominative constantly preceding, and the *Accusative* following the verb.—Thus, when we say, the prince loves the princess, and the princess loves the prince: the prince is the nominative in the first, and the *Accusative* in the last; and the princess the *Accusative* in the first, and the nominative in the second.

ACEPHALUS*, or **ACEPHALOUS**, something that wants a head.

* The word is composed of the privative *a*, and *κεφαλη*, *caput*, head.

Pliny represents the Blemmyes as a headless, or *Accephalous* nation.—*Accephalus* worms, or what are supposed such, are frequent. See **WORMS**.

ACEPHALOUS, in a figurative sense, is more frequently applied to persons destitute of a leader, or chief.

Thus, the name *Accephali* is sometimes applied to such priests, or bishops, as are exempted from the discipline, and jurisdiction of their ordinary bishop, or patriarch.

Anastasius the library-keeper, calls this exemption from the jurisdiction of a patriarch, *autocephalia*.

We find a great number of canons of councils, capitulars of princes, &c. against *Accephalous* clerks.

ACEPHALOUS, in our ancient law-books, is also used for those poor people who had no proper lord; as holding nothing in fee, either of king, bishop, baron, or other feudal lord.

ACEPHALI, or **ACEPHALITÆ**, frequently occurs, in ecclesiastical history, as the denomination of divers sects: particularly,

1°, Of those who in the affair of the council of Ephesus, refused to follow either St Cyril, or John of Antioch.

2°, Of certain heretics of the fifth century, who at first followed Peter Mongus; but afterwards abandoned him, upon his subscribing the council of Chalcedon; they themselves sticking to the errors of Eutyches.

3°, Of the adherents of Severus of Antioch; and of all in general who refused to admit the council of Chalcedon.

VOL. I.

ACERB, **ACERBUS**, a compound taste, consisting of sour, with the addition of a degree of roughness, and astringency.

Such is the taste of pears, grapes, and most other fruits before they are ripe.

Physicians usually make *Acerb* an intermediate flavour between acid, austere, and bitter. All matters which come under this denomination are astringent.

ACERRA, in antiquity, a kind of altar, erected near the bed of a person deceased. It was much used among the Romans; and the friends and familiars daily burnt incense on it, till the time of the burial.

ACETABULUM*, in antiquity, a little vase, or cup, used at table, to serve up things proper for sauce, or seasoning: much after the manner of our salts, and vinegar-cruets.

* Hence Agricola, in his treatise of Roman measures, L. I. takes the name to have been formed from *Acetum*, vinegar; as supposing it principally destined to serve vinegar on.

ACETABULUM also denotes a Roman measure, used both for liquid and dry things, chiefly in medicine. See **MEASURE**. The *Acetabulum* contained a cyathus, and a half, as is proved by Agricola, from two verses of Fannius; who speaking of the cyathus, says, it weighs ten drachms; and the *Oxybaphus*, or *Acetabulum*, fifteen.

Bis quinquæ hunc faciunt drachmæ, si appendere tentes, Oxybaphus fiet si quinquæ addantur ad illas.

Binet, in his treatise of weights and measures prefixed to his translation of Pliny, makes the *Acetabulum* of oil weigh two ounces and two scruples; the *Acetabulum* of wine, two ounces, two drachms, a grain, and a third of a grain; and the *Acetabulum* of honey, three ounces, three drachms, a scruple, and two filiquæ.

ACETABULUM, in anatomy, is used for a deep cavity, in certain bones, appointed for the reception of the large heads of other bones, in order to their articulation.—See *Tab. Anat. (Osteol.) fig. 12. lit. b.* Thus, the cavity of the ischium, or huckle-bone, which receives the head of the thigh-bone, is called *Acetabulum*, and sometimes *Cotyle*, or *Cotylodes*.

The *Acetabulum* is lined, and capped round with a cartilage, whose circular margin is called *supercilium*.—In its bottom lies a large mucilaginous gland.

ACETABULUM is also used, by anatomists; in the same sense with *Cotyledon*. See **COTYLEDON**.

ACETARIA*. See the article **SALLET**.

* The word is formed of *Acetum*, vinegar; in regard that fluid is commonly used for the seasoning of sallets.

ACETOUS, or **ACETOSE**, something relating to vinegar; called in Latin *Acetum*. See **ACETUM**, and **VINEGAR**.

We say, an *Acetous* taste; *Acetous* qualities, &c. Wine, and all vinous liquors, are rendered *Acetous*, by exciting their salts, and tempering, or abating their sulphurs. Chemists give the preparation of divers *Acta*, or *Acetous* liquors.

ACETUM*, in medicine, &c. the same with vinegar; the properties, uses, and preparation whereof, see under the article **VINEGAR**.

* The word is pure Latin; formed of *acer*, to be sharp.

There are several medicines in the shops, whereof this liquor is the basis; as,

ACETUM Distillatum, distilled vinegar; chiefly used in preparations, for dissolution, and precipitation.

Spiritus ACETI, spirit of vinegar; made by drenching copperfilings, with distilled vinegar, then evaporating it till the fumes of the vinegar cannot be smelt; the saturation and evaporation to be again repeated, till the menstruum be fatiated; which being then distilled, the spirit comes over.—Its qualities and uses are much the same with those of the distilled vinegar, only it is more powerful.

ACETUM Rosatum, vinegar of roses; this is made of rosebuds infused in vinegar forty or fifty days; the roses are then pressed out, and the vinegar preserved.—It is chiefly used by way of embrocation on the head and temples, in the head-ach.

After the like manner are made *Acetum Sambucinum*, vinegar of elder; *Acetum Anthosatum*, vinegar of rosemary-flowers; *Acetum Scilliticum*, vinegar of squills, &c.

The German dispensatories abound with medicated vinegars, chiefly aimed against peccidental diseases; but they are not used among us.—Our dispensatories retain indeed some of them, as the *Acetum Theriacale Norimbergense*, but it is never prescribed.

ACETUM Alcalizatum; is made of distilled vinegar; with the addition of some alkaline, or volatile salt. See **ALKALI**.

ACETUM Phosphorum, a four kind of liquor; made by dissolving a little butter of antimony in a great deal of water.

ACHANE, *Axan*, an ancient Persian corn measure, containing 45 Attic medimni. *Arbuton. Diff. p. 104.*

ACHAT, in our Law-French, signifies a contract, or bargain; especially in the way of purchase.

Pourveyors were by act of parliament 36 Ed. III. ordained to be thenceforth called *Achators*.

ACHE, or **ACH**, a painful ailment in any part of the body.

Aches, may be either scorbutic, rheumatic, owing to violent pains, or the like.

Head-ACH. See **HEAD-ACH**, and **CEPHALALGY**.

ACHERNER, or **ACHARNER**, in astronomy, a star of the first magnitude in the southern extremity of the river Eridanus.—his longitude, latitude, &c. see under the article **ERIDANUS**.

ACHILLEIS, or **ACHILLEID**, a celebrated poem of Statius, wherein he propos'd to deliver the whole life, and actions of Achilles.

It only takes in his infancy, the poet being prevented from proceeding by death.

The *Achilleid* is of the heroic, or epic kind; but extremely faulty in the plan, or fable.

It is a point controverted among the critics, whether the whole life of a hero, *e. gr.* of Achilles, be a proper subject matter of an epic poem? See **EPIC**, and **HEROIC**.

ACHILLES, a name which the schools give to the principal argument alledged by each sect of philosophers in behalf of their system.

In this sense, we say, this is his *Achilles*; that is, his masterpiece: alluding to the strength, and importance of *Achilles* among the Greeks.

Zeno's argument against motion, is peculiarly termed *Achilles*.—That philosopher made a comparison between the swiftness of *Achilles*, and the slowness of a tortoise: whence he argued, that a slow moveable that precedes a swift one by ever so small distance, would never be out-run by it. See **MOTION**.

The ancient botanists gave the name *Achillea* to several plants; one of which is said to be the same with our milfoil; and took its name from *Achilles*, who, having been the disciple of Chiron, first brought it into use for the cure of wounds and ulcers.

Tendon of ACHILLES, *Chorda Achillis*, is a large tendon, formed by the union of the tendons of the four extensor muscles of the foot. See **FOOT**.

It is so called, because the fatal wound whereby *Achilles* is said to have been slain, was given there.

ACHOR, in medicine, the third species or degree of a tinea, or scald head. See **TINEA**.

Achor is a sort of small running ulcer on the face, and head, chiefly of children while at suck; by which the skin is broken into a number of little holes, out of which issues a viscid humour.

ACHRONICAL, in astronomy. See the article **ACRONYCHAL**.

ACID*, **ACIDUM**, any thing which affects the tongue with a sense of sharpness, and sourness.

* The word is formed from *acere*, to be sharp; which is derived from *acis*, a point or edge.

Acids are divided by many into *manifest* and *dubious*.

Manifest ACIDS, are those above defined, which impress the idea sensibly.—Such are vinegar, and its spirit; the juices of crabs, citrons, oranges, lemons, barberries, and tamarinds; spirit of nitre, spirit of alum, spirit of vitriol, spirit of sulphur per campanam, spirit of sea-salt, and the like.

Dubious, or **Latent ACIDS**, are those which do not possess enough of the *Acid* nature to give sensible marks thereof on the taste, but agree with the manifest *Acids* in some other properties, sufficient to refer them to the same class.

Hence it appears, that there are some characters of acidity more general than that of a sharp taste; though it is that taste which is chiefly regarded in the denomination.

The great and general criterion, then, of *Acids*, is that they make a violent effervescence, when mixed with another sort of bodies, called *Alcalies*.

Yet is not this property alone universally to be depended on, to determine a body an *Acid*, without the joint consideration of the taste, and the changes of colour producible in other bodies thereby.—To distinguish dubious *Acids* from alkalies, mix them with a blue tincture of violets: if they turn it red, they are of the *Acid* tribe; if green, alkaline.

Acids are all of the tribe of salts; and compose a particular species thereof, called *Acid salts*.

Acid salts are all found to be volatile; by which they are distinguished from the rest, which are either fixed, or have an urinous, instead of an *Acid* taste.

Some late chymical philosophers have even made it very probable, that it is the *Acid* which is the saline part, or principle in all salts.—They consider it as a subtle, penetrating substance, diffused through the several parts of the globe; which according to the different matters it happens to be united

with, produces different kinds of bodies; if it meets a fœfible oil, it converts it into sulphur; if it be received into the lapis calcarius, it coagulates with it, and becomes alum; with iron it grows into green vitriol; with copper, into blue vitriol, &c.

Of this sentiment is Sir I. Newton.—' In decomposing sulphur, says that author, we get an *Acid* salt, of the same nature with oil of sulphur per campanam: which same *Acid* abounding in the bowels of the earth, unites sometimes with earth, and thus makes alum; sometimes with earth and metal, and makes vitriol; and sometimes with earth and bitumen, and thus compounds sulphur.'

In effect, all our native salts, though without any mixture from art, are yet found to be real mixtures; and their composition and decomposition is easily made.—' As many as they are, they may be all reduced, according to M. Homberg, to three kinds, *viz.* salt-petre, sea-salt, and vitriol; each whereof has its several species. Of the combinations of these with different oily matters, are all the other salts produced. By the analyses we have made of them, they all appear to be composed of an aqueous, an earthy, a fulphurous, and an *Acid* part; but the *Acid* we hold the purest: this makes our chymical principle salt, the common basis of all salts; and which antecedent to its determination to any particular species, appears to be one similar, uniform matter, though never found alone, but always accompanied with some sulphureous mixture or other; which determines it to some one of the three sorts of fossil salts above-mentioned.'

The *Acid*, accompanied with its determining sulphur, never becomes sensible to us, except when lodged either naturally in some earthy matter, or artificially in an aqueous one.—In the first case, it appears under the form of a crystallized salt; as salt-petre, sea-salt, &c. In the second, it appears in form of an *Acid* spirit; which, according to the determination of the sulphur accompanying it, is either spirit of nitre, or spirit of salt, or spirit of vitriol.

What is here spoken of the three simple fossil salts, may be equally applied to all the compound salts of vegetables and animals, with this difference, that the latter have always a larger proportion of the earthy matter than the simple ones, when in the form of a concrete salt; and a larger proportion of the aqueous matter, when in the form of an *Acid* spirit.—And hence we account for two important phenomena: 1^o, That the *Acid* spirits of animal and fossil salts, are always weaker, and less penetrating, as well as lighter in weight, than those of the fossil salts: 2^o, That after a vehement distillation, they leave a larger quantity of earthy matter behind them than those of the fossil do.

The salt naturally contained in plants, may be considered as a mixture of earth, oil, a little water, and an *Acid*: this last ingredient being separated from the plant with the help of fire, shoots into a new salt, which sometimes retains an *Acid* taste, as in the tartar of wine; sometimes it assumes a sweetness, as in sugar; sometimes is bitter, as in quinquina; and sometimes almost as insipid as in figs. This M. Homberg calls the *essential salt* of the plant; which, by a gentle distillation, resolves into an insipid water, and *Acid* liquor, and a ruddy fetid oil, containing part of the *Acid* salt, and part of the fetid oil of the plant: of the combination of which, is composed a particular kind of fetid salt, smelling like urine, called the *volatile salt*, or *volatile alcaly salt* of the plant: and the caput mortuum remaining, being reduced into ashes, is separated by lixiviation into one part of fixed alcaly salt, and another of insipid alcaline earth.—Add, that the essential salt always dissolves entirely in water, even the earthy part joined with it. But if the same salt have been robbed, by means of fire, of a great part of its *Acid*, the earthy part will not wholly dissolve, but a sediment of insipid earth, indissoluble in water, will be found at bottom; to which, if an *Acid* spirit be added, it then becomes intirely dissoluble in water: whence it may be fairly concluded, that the other part of the ashes, before dissolved in the water, and which after evaporation appears in form of a fixed lixivial salt, was only dissolved by virtue of the *Acid* it contained; or as having retained enough of the *Acid* to effect a solution.

Again, when the earth of the plant, satiated with its *Acid*, becomes a crystallized salt; no more of the same *Acid* can be introduced into it: whereas the lixivious salt drawn from the ashes, does not crystallize, but still greedily imbibes the *Acid* spirits.

Hence it may be probably concluded, that the lixivious, or fixed alcaly salt, is no other than the earth of the plant, which, notwithstanding the violence of the fire, has retained a little portion of its *Acid* salt, sufficient to dissolve it in water; still reserving a sufficient number of loculi, or pores, to lodge the first *Acid* that shall offer itself, in lieu of that driven out of it by the fire.—And as the name alcaly is only given to a salt, in respect of its imbibing and retaining an *Acid* presented to it, in order to the producing a crystallized salt; the lixivious salts of plants may be said to be more or less alkaline,

caline, as they absorb more or less of the *Acid*; or, which amounts to the same, as they contain more or fewer vacuities which may be filled with *Acids*.

An alcaly, after it has been fully satiated with one sort of *Acid*, will yet sometimes admit, and retain part of another *Acid*. This is chiefly observed where a vegetable *Acid* has been received first, and a fossil one is offered after. And it seems owing to this, that the vegetable *Acid* having undergone a greater degree of fermentation in the body of the plant, is become rare and pervious, in respect of the more solid, and weighty particles of the mineral *Acid*; which therefore force their way in.

The same is always the case, where an *Acid* appears an alcaly with respect to another *Acid*; that is, where of two *Acid* spirits, one whereof has a mixture of some alcaly; the rarer of the two having possessed the pores of the alcaly, is compressed by the other denser *Acid*.—Thus, a pin-cushion, though ever so full of bran, will admit a good number of pins.

Now, urinous salts are alkalies as well as the lixivious kind, *i. e.* they greedily imbibe *Acids*, retain them, and together with them compose salts which crystallize.—But their volatility seems to make it plain, that they are not, like the former, a composition of a mere earthy matter, with a little *Acid*; in regard a mere earth can never become volatile by such admixture. Yet is there a great deal of reason to imagine, that their composition is no other than a part of the same matter which would have produced the lixivious salt, intimately mixed with a deal of the fetid oil of the plant; and that the oil is the sole cause of the volatility of these salts.

M. Homberg, in his *Essai du Sel principe*, makes three classes of acid salts, corresponding to the three species of sulphurs, wherewith the primitive *Acids* may be combined.

The first class consists of such as contain an animal, or a vegetable sulphur, which amount nearly to the same.—To this class belong all the distilled *Acids* of plants, fruits, woods, &c. which must necessarily retain part of the oil of the plant, which is their sulphur. To this class also belongs spirit of nitre; as being a substance procured from the excrements of animals, &c.

The second class is of those which contain a bituminous sulphur.—Such are vitriol, common sulphur, and alum; which are all usually procured from a mineral stone, wherein bitumen is the prevailing ingredient.

The third is of such as contain a more fixed mineral sulphur, approaching the nature of a metalline one.—Such are the *Acids* drawn from sea-salts, and sil gemma's; the latter of which is chiefly found in places near mines of metals; and the former probably arises from rocks, or veins of sil gemme running into the sea, and there dissolved.

From the peculiar nature, and properties of the sulphur thus accompanying the several kinds of *Acid* salts, their different phenomena and effects are to be accounted for.

The *Acids* of animals are doubtless chiefly derived from plants, in the ordinary way of food, and nutrition; and those of plants, again, from those of minerals. So that there should seem to be but one spring of *Acidity*: the diversities arise from what happens to them in passing through the organized bodies of plants, and animals. Hence it is, that plants and animals especially, yield a very volatile alcaly salt; whereas, the salts of minerals are found altogether *Acid*, and much more fixed and concrete; though it is the same matter in both cases, under different assumed forms.

Thus, the younger Lemery argues, that as animals feed on plants, and reciprocally, in the instance of salt-petre, &c. plants feed on animals, inasmuch as their vegetation is excited by manure; it happens, that what was real salt-petre in plants, becomes only a nitrous sal armoniac in animals, and *vice versa*.—The same author accounts for this double metamorphosis, by supposing that the nitrous principle remains the same in both cases, and in both cases is attached to the same matrix, with this only difference, that the matrix becomes more earthy in plants, and by that means, fixed; and in animals, it loses its earthy parts, and assumes other oily ones, which render it volatile.

As to the manner wherewith *Acids* act on alkalies, the great number of little bubbles produced during their action, and the heat arising thereupon: M. Homberg explains it thus.—The matter of light, which he supposes to be the chymical principle, sulphur, and to possess the whole extent of the universe, is kept in a perpetual motion by the continual impulses which the sun, and fixed stars give it: but this motion happening on some occasions to be slackened, may be retrieved again, and augmented by the near approach of flame, which that author supposes the only matter capable of giving motion to light.—This motion of light cannot proceed, without continually striking against the solid bodies, and even passing through all the porous ones, it meets in its way.

Suppose, now, *Acids* to be little, solid, pointed bodies, swimming at liberty in an aqueous fluid, and kept in continual motion, by the repeated impulses of the matter of light; and alkalies, to be spongyous bodies, whose pores have formerly been filled with the points of *Acids*, and which still retain

the dents, or impressions thereof, and are ready to receive the like points when driven into them. It is easy to conceive, that if some of those porous alkalies float in the same liquor wherein the solid *Acids* float; these latter, being impelled by the matter of light, will enter the cavities of the former, which are framed as it were on purpose for their reception; and that they will do it the more readily, if the motion of the matter of light, wherewith they are impelled, have been accelerated by external heat.

This introduction of *Acids* into the body of alkalies, is, in all appearance, effected with a great velocity and a deal of friction; inasmuch as it produces so considerable a degree of heat: and as the pores of the alkalies were before filled with an aerial matter, which is now expelled by the points of the *Acids*; that air is put in motion, and produces the bubbles, which are so much the more sensible, as the heat accompanying the action is the greater.

Sir I. Newton accounts for the effects of *Acids* in a different manner, *viz.* from the great principle of attraction.

The particles of *Acids*, he observes, are of a size greater than those of water, and therefore less volatile; but much smaller than those of earth, and therefore much less fixed than they.—They are endued with a very great attractive force, wherein their activity consists; it being by this that they attract, and stimulate the organ of taste; and by this also, that they get about the particles of bodies, either of a metalline or stony nature, and adhere closely to them on all sides; so as scarce to be separable from them by distillation or sublimation: and when thus gathered about the particles of bodies, by the same power they raise, disjoin, and shake them one from another; that is, they dissolve them.

By their attractive force, also, wherewith they rush towards the particles of bodies, they move fluid ones, and excite heat; shaking asunder some particles, so as to turn them into air, and generate bubbles; and hence all violent fermentation; there being in all fermentation a latent *Acid*, which coagulates in precipitation.

Acids, also, by attracting water as much as they do the particles of other bodies, occasion the dissolved particles readily to mingle with water, or swim or float in it, after the manner of salts: and as this globe of earth, by the force of gravity, attracting water more strongly than it does lighter bodies, causes those bodies to ascend in water, and go upwards from the earth; so, the particles of salts, by attracting the water, mutually avoid and recede from one another as far as they can; and are thus diffused throughout the whole water.

The particles of alkalies consist of earthy and acid parts united together; but these *Acids* have so great an attractive force, that they cannot be separated therefrom by fire; and that they even precipitate the particles of dissolved metals, by attracting from them those acid particles, which before had dissolved, and kept them in solution.

If these acid particles be joined with earthy ones, in a small quantity; they are so closely retained by the latter, as to be quite suppressed and lost, as it were, in them; so that they neither stimulate the organ of sense, nor attract water; but compose bodies which are not acid, *i. e.* fatty and sweet bodies; as mercurius dulcis, brimstone; lynnæa, cornes, &c.—From the same attractive force in these acid particles thus suppressed, arises that property of fat bodies, that they stick or adhere to almost all bodies, and are easily inflammable.—Thus, the *Acid* that lies suppressed in sulphureous bodies, by more strongly attracting the particles of other bodies (earthy ones for instance) than its own; promotes a gentle fermentation, produces and cherishes natural heat, and carries it on so far sometimes, as to the putrefaction of the compound: putrefaction arising hence, that the acid particles which have long kept up the fermentation, at length insinuate into the little interstices that lie between the particles of the first composition; and so intimately uniting with those particles, produce a new mixture or compound, which cannot be returned into its original form.

Water has no great dissolving force, because there is but a small quantity of acid in it; for whatever strongly attracts, and is strongly attracted, may be reputed an *Acid*: but in such things as are dissolved in water, the dissolution is slowly performed, and without any effervescence.

When *Acids* are applied to the tongue, or any excoriated part of the body; leaving the subtle earth wherewith they were before united, they rush upon the sensory, act there as menstruums, and disjoin its parts; thus causing a painful sensation.

The illustrious author, it must be owned, here carries the notion of *Acidity* a great length: dissolution, according to him, is only effected by attraction, and is proportional to the

degree of attractive power in the dissolvent; but all bodies which attract much, are *Acids*, on his principle; and consequently all powerful menstrua must belong to that class.—And yet spirit of urine, which readily dissolves iron or copper, even in the cold, is allowed an *alcaly*; and accordingly it makes a vehement conflict with aqua fortis.—Boyle *Imperfect. of Chym. Doct. of Qual.*

Some chymical philosphers, in the last century, endeavoured to derive all the qualities of bodies, and the other phenomena of nature, from the consideration of *alcaly*, and *Acid*.

It has been a point much controverted among physicians, whether, or no, there be any real *Acid* in human blood? the generality stand for the negative; and all Mr. Boyle's experiments, in his *History of Blood*, seem to give the thing on that side.—But the accurate M. Homberg has at last turned the scale the other way; and shewn by repeated experiments, that an *Acid*, or what is commonly called *fo*, and judged such by the change of colour it causes in a tincture of violets, may be drawn from the blood of all animals in general, and from human blood in particular.

Hence, and from the careful analysis that author has made of the flesh, and excrements of divers animals, particularly man; he infers, that the *Acid*, or sea-salt of the aliment taken into the bodies of animals, is not destroyed therein, but passes into the substance of them: the superfluous portion being returned unaltered along with the excrements. *Acids*, are prescribed, in medicine, as coolers, anti-febrifics, anti-scorbutics, diaphoretics, alexipharmics, &c.

Acids, Mr. Boyle observes, not only disturb the body while they continue *acid*; but in many cases create distempers, whereof they should seem the remedies.—Though they be reputed to have an incisive and resolute virtue, and accordingly are prescribed to cut tough phlegm, and dissolve coagulated blood: yet there are some *Acids* which must evidently coagulate the animal fluids, and produce obstructions, with all their train of consequences.—Thus, it is known, that milk readily curdles with spirit of sea-salt, &c.

ACID Salts. } See **ACID**.—See also **SALT**, **SPIRIT**, and **ACID Spirits**. } **PRINCIPLE.**

ACIDITY, ACIDITAS, the quality which constitutes, or denominates, a body, *acid*; or that sensation of sharpness and sourness which acids excite upon the taste. See **ACID**.

A little vitriol leaves an agreeable *Acidity* in water.—Vinegar and verjuice have different sorts of *Acidity*.

The predominancy of *Acidities* in the body, and their ill effect in coagulating the blood, &c. is prevented by either repelling and mortifying them with lixivious or urinous salts; or by breathing and absorbing them with alcalious bodies.—Thus, out of the body, minium destroys the *Acidity* of spirit of vinegar; lapis calaminaris that of sea-salt, &c.

ACIDULÆ*, in natural history, a species of mineral waters, distinguished by a latent acidity in their nature.

* The word is a diminutive of *Acidus*; which is formed from the Greek *axn*, point, edge; in regard the points of acid substances prick and vellicate the tongue.

Acidulae are native waters, impregnated with particles of some acid mineral; as vitriol, alum, nitre or salt. Sometimes there is also a vinous flavour joined with the acid; by which they become peculiarly denominated vinous waters.

The class of *Acidulae* are usually very cold; whence some authors define *Acidula* to be all such mineral, or medicinal waters as are not hot.

The physicians also frequently include chalybeate and aluminous or ferruginous waters, under the class of *Acidulae*. See **CHALYBEATE**, and **FERRUGINOUS**, &c.

ACIDULATED, any thing wherein acid juices have been put, in order to give it a coolness, and briskness.

ACINI*, in botany, small grains, or berries, growing in bunches; after the manner of grapes; also the stones or seeds of grapes.

* The word is Latin, formed from *acus*, or the Greek *axn*, a point.

Hence, anatomists have called some glands of a similar formation *Acini Glandulosi*.—See *Tab. Anat. (Splanch.) fig. 41. lit. bb. & dd. &c.* See also **GLAND**.

ACINIFORMIS Tunica, the same with the *Tunica Uvea* of the eye. See **UVEA**.

ACME*, the height, or top of any thing.

* The word is Greek, *ακμη*, point, tip; of *ακμαζε*, *αγειο*, to grow sharp.

ACME is more especially used to denote the height, or utmost vehemence of a distemper.

Accordingly, some institution-writers divide diseases into four flates, or periods:

1°. *Arche*, the beginning, or first attack.—2°. *Anabasis*, the growth.—3°. *Acme*, the height.—And 4°. *Paracme*, which is the declension of the distemper.

ACOMETÆ*, or **ACOMETTI**, a name given to certain monks in the ancient church, who flourished particularly in

the east; and who were thus called, because they had divine service continually, and without interruption, performed in their churches.

* The word is Greek, *ακμησις*, formed of the privative, *α*, and *κωμω*, to lay down, or sleep in bed.

The *Acemetæ* divided themselves into three bodies, each of which officiated in their turn, and relieved the others: so that their churches were never silent, night nor day.

Nicephorus mentions one Marcellus as the founder of the *Acemetæ*; whom some modern writers call, Marcellus of Apamea.—In Bollandus we have 'the life of S. Alexander, 'institutor of the *Acemetæ*, who were unknown before him,' says the author of the life, who was a disciple of Alexander. This saint, according to Ballandus, lived about the year 430. He was succeeded by Marcellus.

The Stylites were also sometimes called *Acemetæ*. See **STYLITES**.

There are a kind of *Acemetæ* still subsisting in the Romish church; the religious of the Holy Sacrament, coming properly enough under that denomination; in regard they keep up a perpetual adoration, some or other of them praying before the sacrament, day and night.

ACOLUTHI*, or **ACOLYTHI**, in antiquity, a term applied to such persons as were steady, and immovable in their resolutions.

* The word is Greek, *ακολυθησις*, compounded of the privative *α*; and *κολυθησις*, *via*, way; as still persisting in their way, or course.

For this reason, the Stoics were called *acolythi*; in regard, nothing could shake or alter their resolves.

Among the ecclesiastical writers, the term *Acolythus*, or *Acolythiss*, is peculiarly applied to those young people, who, in the primitive times, aspired to the ministry; and for that purpose continually attended the bishops: which assiduity occasioned their being distinguished by this appellation.

In the Romish church *Acolythi* were of longer continuance; but their functions were different from those of their first institution. They were such as had only received the first of the four lesser orders, whose business was to light the tapers, carry the candlesticks, and the incense-pot, and prepare the wine and water.

At Rome there were three kinds of *Acolythi*, viz. *Palatini*, who waited on the pope; *Stianarii*, who served in churches; and *Reginarii*, who, together with the deacons, officiated in other parts of the city.

ACONITE*, **ΜΥΩΟΤΟΝΟΝ**, a plant, famous among the ancients, both in quality of a poison and a remedy. See **POISON**.

* *Aconitum* is said by some to take its name from *Acone*, a city in Bithynia, where it grew in great abundance: though it is also found in other places, particularly the mountains about Trent, &c. Others derive it from *aconis*, a rock naked or bare of earth, whereon the plant readily thrives. It was also called *monodon*, as killing mice with its bare smell, according to Pliny.—The poets feign it to have arose from the foam of the dog Cerberus, when Hercules dragged him out of hell.

The ancient botanists give the name *Aconite* to several plants of different kinds.—One species they called *Lycostictum* *Λυκοστικτον*, wols-bane; or *Cynoctonon* *Κυνοκτιονον*, dogs-bane; from its effects: of these they had likewise their divisions; as the *Napellus*, thus called à *nappo*, because its root resembled the turnip-kind: another called *Anthora*, q. d. *Anti-thora*, good against disorders caused by the *Thora* another kind of *Aconite*.

The class of *Aconites* is held extremely caustic, and acrimonious, in virtue whereof they produce mortal convulsions, or inflammations, which end in mortifications: the ancients were so surprized at these effects, that they were afraid to touch the plants and hence a thousand superstitious precautions took the manner of gathering them.—Their roots are however held of service in malignant fevers by some; and accordingly make an ingredient in some orvietans, and other alexipharmic compositions.

The ancients used this plant against the sting of the scorpion, which is said to be deadened by the touch of the *Aconite*, and restored to its vigour by that of hellbore.—Theophrastus relates, that they had a way of preparing it in those days, so as it should only destroy at the end of one, or two years.—Arrows dipt in its juice are said to prove mortal, wherever they wound.—The Indians use *Aconite*, corrected in cow's urine, with good success against fevers.—*V. Lettr. Edif. & Cur.*

ACONITAS*, a name used by some authors, for a sort of comet or meteor, whose head appears round or oblong, and its tail very long and slender, resembling a javelin. See **COMET** and **METEOR**.

* It takes its denomination from a serpent thus called, frequent in Calabria and Sicily; where it is also named *factone*, (from *folgitta* an arrow) by reason of its flying at passengers like an arrow; in order to which, it winds itself up a tree, to spring thence with the greater violence. For the like reason the Greeks call it *Aconitas*, of *ακωνις*, a dart or arrow.

ACOPUM,

ACOPUM*, among ancient physicians, a topical medicine, composed of warm, and emollient things, intended to allay the sense of weariness, occasioned by too violent labour, exercise, or the like.

* The word is compounded of the privative *a*, and *κοπος*, labor. **ACORUS**, a medicinal plant, of the flag kind; frequently confounded by the ancients, and also by the modern apothecaries, with the *calamus aromaticus*.

They are distinguished by this, that from the middle of some of the leaves of the latter, there arises a longish cluster of an infinity of little flowers, the thickness of the little finger, and resembling macropiper, or long pepper.—The other is the common flag flower.

It is only the root of the *Acorus* that is used in physic; and it is this we usually call *Acorus*.—The *calamus aromaticus* is brought from Lithuania and Tartary: it is knotty, reddish without, and white within; as thick as the little finger, and half a foot long.

It is spicy and bitterish; and used in cephalic and stomachic compositions.—It is also an ingredient in the Theriaca Andromachi.

Some rank galangals as a species of *Acorus*. See SUPPLEMENT article ACORUS.

ACOUSTICS*, **ACOUSTICA**, the doctrine, or theory of hearing, or of sounds.

* The word is formed of the Greek *ακουω*, *audio*, to hear. *Acoultics*, is the same with what we otherwise call *Phonics*. See PHONICS.

ACOUSTICS, **ACOUSTICA**, or **ACOUSTIC Medicines**, are remedies against the imperfections and disorders of the ear; or of the sense of hearing. See EAR and HEARING.

ACOUSTIC is particularly applied to instruments used by those who are dull of hearing; to supply that defect.

Dr. Hook says, it is by no means impossible to hear the lowest whisper that can be made, to the distance of a furlong; and that he knows a way of hearing any person speak through a stone-wall three foot thick.

ACOUSTIC Nerve. See the article AUDITORY Nerve.

ACQUEST*, or **ACQUIST**, is understood in a legal sense, of goods, or effects, not descended or held by inheritance; but acquired either by purchase, or donation. See GOODS.

* The word is French; formed of the verb *acquies*, from *acquiescere*, to acquire, or get.

The French laws make a deal of difference between *Acquests*, and hereditary effects. The civil law allows none. See HEIR, HEREDITARY, &c.

ACQUEST is also popularly used for conquest, or a place acquired by the sword.

ACQUIETANDIS Plegiis, a writ of justices lying for a surety against the creditor that refuses to acquit him after the debt is paid. *Reg. Orig. fol. 158. cit. Cov.*

ACQUIETARE, in ancient law-books, signifies to discharge, or pay the debts of a person deceased; as the heir those of his father, &c.

ACQUISITION, the act of procuring a right or title to the enjoyment, or property of a thing.

ACQUISITION is also sometimes used for an acquest. See ACQUEST.

ACQUITTAL, a discharge, deliverance or setting free of a person from the guilt or suspicion of an offence.

Acquittal is of two kinds; in *law*, and in *fact*.—When two are appealed or indicted of felony, one as principal, the other as accessory; the principal being discharged, the accessory is by consequence also freed: in which case, as the accessory is *acquitted by law*, so is the principal *in fact*.

ACQUITTAL is also used, where there is a lord mesn, and tenant, and the tenant holds land of the mesn, and the mesn holds over the lord paramount: here, the mesn ought to *acquit* the tenant of all services claimed by any other for the same lands; the tenant being to do service to the mesn only, and not to divers lords for one parcel of land. See MESN.

ACQUITTANCE, or **QUITTANCE**, a release, or discharge in writing, of a sum of money, or other duty, which ought to be paid, or done.

The verb *Acquit*, the participle *Acquitted*, and the noun *Acquittal*, do all signify a discharge from an offence objected.—In which sense, we meet with *Acquitted by proclamation*.

ACRASIA, **AKPAZIA**, is used by some writers in physic, for the excess or predominancy of one quality above another; either in a mixture, or in the constitution of a human body.

ACRE*, a quantity of land, containing four square roods, or 160 square poles, or perches. See MEASURE, ROOD, and PERCH.

* The word perhaps is formed from the Saxon *Acre*, or German *Acker*, field, of the Latin *Ager*. Salmastius derives it from *Aera*, used for *Acena*, a land measure among the ancients, containing 10 feet.

By a statute of 31 Eliz. it is ordained, that if any man erect a new cottage, he shall add four *Aeres* of land to it.

To find the quantity of *Aeres* in a piece of ground, &c. See SURVEYING.

The kingdom of England contains by computation 39038500 *Aeres*: the United Provinces 4382000, &c.

The French *Acre*, *Arpent*, contains 1½ English *Acre*, or 55206 square English feet, whereof the English *Acre* contains only 43560.—The Strasburg *Acre* is about half an English *Acre*. *Arbuth. Tab. anc. Coins*, &c. 33.

The Roman *Acre* was properly the jugerum. See JUGERUM.

ACRE-Tax, a tax laid on land at so much per *Acre**.—In some places this is also called *Acre-Subst*.

* Impositions on lands in the great level are to be raised by a proportionable *Acre-tax*, 20 *Car. II. c. 8*.—An acre-tax of 2s. 6d. per acre, for draining Hadenham-level, 13 *Geo. I. c. 18*.

ACREME, a term sometimes used in ancient law-books, for ten acres.

ACRIBEIA, a term purely Greek, *ακριβεια*, literally denoting an exquisite or delicate accuracy; it is sometimes used in our language for want of a word of equal significance.

ACRIDOPHAGI*, in the ancient geography, a nation, or people said to have fed on locusts.

* The word is compounded of the Greek *ακρις*, locust, and *φαγωω*, to eat.

The *Acridophagi* are represented as a people of Ethiopia, inhabiting near the deserts. In the spring they made provision of a large kind of locusts, which they salted, and kept for their standing food all the year: they lived to forty years of age, then died, as is said, of a sort of winged worms generated in their bodies. See S. Jerom against Jovinian, L. II. and on S. John, C. 4. Diodor. Sicul. L. III. c. 3. and 29. and Strabo, L. XVI.—Pliny also speaks of *Acridophagi* in Parthia; and S. Jerom, in Lybia.

Though the circumstances of these people be fabulous; yet may the *Acridophagia* be true; and to this day they are said to eat locusts in some parts of the east. And hence S. John the baptist is said to have lived on locusts, *ακριδες*, and wild honey, *Math. c. 3. v. 4*.

Yet is the rendering of *ακριδες*, by locusts, as the English translators have done, much controverted.—Isidore of Pelusium, in his 132d epistle, speaking of this food of S. John, says, it was not animals, but the tops of herbs; and even charges those who understood the word otherwise of ignorance: but S. Augustin, Beda, Ludolphus, and others, are of a different opinion. Accordingly, the Jesuits of Antwerp reject, with contempt, the opinion of the Ebionites, who set *ακριδες* put *αζαριδες*, a delicious diet prepared of honey and oil; that of some other innovators, who read *ακκαριδες*, or *κακκαριδες*, sea-crabs; and that of Beza, who reads *ακκαριδες*, wild pears.

ACRIMONY, that quality in things which renders them acrid, or acrimonious to the taste. See ACRID.

Acrimony imports much the same with *asperity*, or sharpness; and expresses a quality in bodies, by which they corrode, destroy or dissolve others.

Salts are only caustic in virtue of their *Acrimony*. The *Acrimony* of the bile is supposed the cause of divers disorders; and a catarrh is a deflection of *acriminicus* humor.

ACROATICS*, a name given to Aristotle's lectures in the more difficult, and nice parts of philosophy; to which none but his disciples and intimate friends were admitted. See ARISTOTELIAN, &c.

* The word is formed from *ακροαμας*, to hear.

ACROMION*, **ACROMIUM**, in anatomy, the upper process of the scapula, or shoulder-blade. See SCAPULA.

* The word is derived from *ακρος*, highest, and *ωμος*, shoulder, *q. d.* the extremity of the shoulder: and not from *anchora*, on account of any resemblance in figure, which the *Acromion* bears to an anchor, as Dionis has imagined.

Some have thought the *Acromion* of a nature different from other bones; in regard, during infancy, it appears no more than a cartilage, which ossifies by little and little, and about the age of twenty years becomes hard and firm, like a common bone.

ACRONYCHAL*, **ACRONYCUS**, in astronomy, is applied to the rising of a star, or other point, above the horizon, when the sun sets; or its setting when the sun rises. See the article RISING and SETTING.

* The word is originally Greek, *ακρονυχος*; compounded of *ακρος*, extremity, and *νυξ* night: *Acronychos*, *quod circa akrotus nubes*; whence some write it *Acronichal*, agreeably enough with the etymon, but not with usage.—Others write it corruptedly, *Abronical*, or *Abrornichal*, from a mistaken notion of its being derived from *a*, and *ζωωος*, time.

The *Abrornichal* is one of the three poetical risings, and settings of the stars; and stands distinguished from *cosmical* and *heliacal*. See COSMICAL and HELICAL.

ACROSPIRE, in natural history, *ſc.* the ſame with *Plumule*. See *PLUMULE*.

ACROSPİRED, is uſed in reſpect of Barley; which, in the operation of making malt, is apt, after coming, or ſprouting, at the lower, or root-end, to become *acroſpired*, i. e. to ſprout alſo at the upper, or blade-end*. See *MALT*.

* By 6 G. 1. c. 21. *Malt makers* are forbid to wet or water their malt when on the floor, or coach; or to permit it to *acroſpire*.

ACROSTIC*, a kind of poetical compoſition, the verſes whereof are diſpoſed in ſuch manner, as that the initial letters make up ſome perſon's name, title, motto, or the like.

* The word is derived from the Greek *ακροστικός*, *ſummus*, that which is at one of the extremes, and *στίχος*, *verſus*.

There are alſo *Acroſties*, where the name or title is made up by the initial letters of the middle words, or the laſt of the final ones.—And others which go backwards; beginning with the firſt letter of the laſt verſe, and proceeding upwards. Some refiners in this trifling way, have even gone to *pentacroſties*; where the name is to be repeated five times. See *PENTACROSTIC*.

ACROSTIC is alſo an appellation given by ſome authors to two ancient epigrams in the firſt book of the *Anthology*; the one in honour of Bacchus, the other of Apollo. Each conſiſts of 25 verſes; the firſt whereof is the propoſition or argument of the whole, and the other 24 compoſed of four epithets, beginning each with the ſame letter; and thus following in the order of the 24 letters of the Greek alphabet: ſo that the firſt of the 24 comprehends four epithets beginning with *α*; the ſecond as many, with *β*; and ſo of the reſt to *ω*; which make 96 epithets for each God.

ACROTHERIA*, or **ACROTTERS**, in architecture, little pedeftals, uſually without baſes, anciently placed at the middle, and the two extremes of pediments; and ſerving alſo to ſupport ſtatues.

* The word, in its original Greek, ſignifies the *ακρον* extremity of any body; as the tip of a rock, &c.

Thoſe at the extremes ought to be half the height of the tympanum; and that in the middle, according to Vitruvius, ſhould be one eighth part more. See *PEDIMENT*.

ACROTHERIA ſometimes alſo ſignifies figures, whether of ſtone or metal, placed as ornaments, or crownings, on the tops of temples, or other buildings.

Sometimes it alſo denotes thoſe ſharp pinnacles, or ſpiry battlements, which ſtand in ranges about flat buildings, with rails and baluſters. See *PINNACLE*.

ACT, **ACTUS**, in physics, an effective exerciſe, or application of ſome power, or faculty.

In this ſenſe, *Act* ſtands oppoſed to power, *potentia*, which is only the capacity of acting, not the exertion of that capacity.

Though the word *Act*, properly and primarily, be only applicable where the power might exiſt without being drawn forth into *Act*; yet the ſchoolmen extend it further; deſigning it by the preſence of any power or perfection, even though it could not be abſent.

In which ſenſe, God himſelf is ſaid to be a moſt pure *Act*; by reaſon his perfections are always and neceſſarily preſent. And thus, form is called an *Act*; inasmuch as the preſence hereof compleats the power and perfection of matter.—Form, ſay ſome, is matter reduced into *Act*. See *MATTER* and *FORM*. Even exiſtence is termed an *Act*; by reaſon when this is given a being, nothing further is wanted.

The Greeks ſometimes call *Act*, *ενεργεια*, a term denoting an actual poſſiſſion of perfection, by the Latins uſually rendered *Perſeſſibilitas*.

Metaphyſicians give various diviſions of *Act*, viz. into *infinite*, as the *Act* of creating; and *finite*, as the *Act* of moving.—*Transient*, or thoſe exerciſed in other beings, as heating; and *immanent*, which remain in their own ſubject, as thinking.

ACT, in logic, is particularly underſtood of an operation of the human mind.

Thus, to diſcern and examine, are *Acts* of the underſtanding; to judge and affirm, are *Acts* of the will.

There are voluntary *Acts*, and ſpontaneous ones which ſeem produced without the privy, or participation of the ſoul.

ACT, in a legal ſenſe, is an inſtrument, or other matter in writing; of uſe to declare, or juſtify the truth of a thing.—In which ſenſe, records, decrees, ſentences, reports, certificates, &c. are called *Acts*, authentic *Acts*, ſolemn *Acts*, &c. See *DEED*.

ACTS alſo denote the deliberations, and reſolutions of an aſſembly, ſenate, council, or convocation; taken down by clerks, notaries, actuaries, or the like, and entered in a regiſter.

Acts of parliament are particularly denominated *Statutes*. The *Acts* of the royal ſociety are called *Transactions*; thoſe of the royal academy of ſciences at Paris, *Memoirs*; thoſe

of the ſocieties of Leiſpic, &c. ſimply *Acts*, *Acta Eruditorum*, &c.

The edicts and declarations of the council of the Roman emperors, were called conſiſtory *Acts*, *Acta Conſiſtorii*. Clerk of the *ACTS*, is an officer of the navy. See *CLERK*, and *NAVY*.

ACTS are alſo matters of fact transmitted to poſterity in certain authentic books, and memoirs. In which ſenſe, we ſay, the *Acts* of the Apoſtles, *Acts* of the martyrs, &c.

The book called *Acts* of Pilate relating to Jeſus, is a falſe and ſuppoſitious relation of our Saviour's trial before Pilate; impudently framed by the enemies of Chriſtianity; and filled with the blackeſt blaſphemy.—The emperor Maximin, by a ſolemn edict, ordered it to be ſent into all the provinces of the empire; and enjoined the ſchoolmaſters to teach and explain it to their ſcholars, and make them learn it by heart.

The piece was wrote with ſo much careleſſneſs or ignorance, that our Saviour's death was therein referred to the 4th conſulate of Tiberius, that is, to the 7th of his empire; which is eleven years before our Saviour's paſſion, and five before Pilate was made governor of Judea. See Eusebius, L. IX. c. 4. and 6. Ruffin. L. I. c. 5. &c.

The true and genuine *Acts* of Pilate, were ſent by him to Tiberius, who reported them to the ſenate; but they were rejected by that aſſembly, becauſe not immediately addreſſed to them: as is teſtified by Tertullian, in his *Apol.* C. 5, and 20, 21. Euseb. *Hiſt.* L. II. c. 2.

There are alſo ſpurious *Acts* of the Apoſtles compoſed in Hebrew by one Abdias; tranſlated into Greek by his diſciple Eutropius; and thence into Latin, by Julius Africanus. Wolfgang Lazius published the piece in 1551, from a manuſcript near 700 years old; ſuppoſing it an authentic work.—A diſciple of Manes, named Leucius, or Seleucus, is alſo ſaid to have compoſed *Acts* of the apoſtles, towards the cloſe of the third century.

There have formerly appeared numerous other pieces in this way: as the *Acts* of S. Thomas, the *Acts* of S. Andrew, the *Acts* of S. Paul and Thecla, the *Acts* of S. Matthew, *Acts* of S. Peter, *Acts* of S. John, *Acts* of S. Philip; all which have been declared apoſeſphal.—The laſt were the production of the heretic Peucius: and thoſe of S. Thecla were the work of a prieſt in Aſia minor, whom S. John degraded for his offence.

ACT, in the univerſities, is a theſis maintained in public, by a candidate for a degree; or, to ſhew the capacity, and proficiency of a ſtudent.

The candidates for a degree of bachelor and maſter of arts, are to hold philoſophy *Acts*; thoſe for bachelor of divinity are to keep divinity *Acts*, &c. See *UNIVERSITY*.

At Oxford, the time when the maſters or doctors compleat their degrees, is alſo called the *Act*; which is held with great ſolemnity: at Cambridge they call it the *commencement*.

ACT of faith, **AUTO DA FE**, in the Romiſh church, is a ſolemn day held by the inquisition, for the puniſhment of heretics, and the abſolution of the innocent accuſed. See *INQUISITION*.

They uſually contrive the *Auto* to fall on ſome great feſtival; that the execution may paſs with the more awe, and regard: at leaſt it is always on Sunday.

The criminals are firſt led to church; where their ſentence is read to them, either of condemnation, or abſolution.—Thoſe condemned to death, are here ſurrendered up by the inquirers to the ſecular power, with an earnest intreaty that no blood may be ſhed.—If they perſiſt in their ſuppoſed errors, they are burnt alive.

ACTS, in poetry, are certain diviſions, or principal parts in a dramatic poem, contrived to give a reſpite, or breathing-time, both to the actors and ſpectators.

In the interval between the *Acts*, the theatre remains empty, and without any action viſible to the ſpectators; though it is ſuppoſed all the while there is one paſſing out of ſight.

It is not, however, purely for the ſake of the reſpite, that theſe *Acts* are obſerved; but to give affairs a greater degree of probability, and render the intrigue more affecting. For the ſpectator who ſees the action prepared that is to paſs in the interval, cannot forbear acting, in his imagination, the part of the abſent actors; by which means, he is the more agreeably ſurprized when a new *Act* coming upon the ſtage, he ſees the effects of that action, which before he could but gueſs at.

To this it may be added, that authors contrive to have the moſt dry and difficult parts of the drama tranſacted between the *Acts*; that the ſpectators may have no notion of theſe, excepting what their fancy preſents them with at a diſtance; and that nothing may appear upon the ſtage, but what is natural, probable, and entertaining.

The ancient Greek poets were unacquainted with this diviſion of a play into *Acts*; though their episodes, or chorus's ſerved almoſt the ſame purpoſe.

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It is true, they considered their pieces as consisting of certain parts or divisions, which they called *prologus, epilogus, catasista, and catastropha*; but there were no real divisions or interruptions answering to them in the representation.

It was the Romans who first introduced *Acts* into the drama; and in Horace's time, the five *Acts* were grown into a law, as appears by the verse,

Neu brevior quinto, neu fit productior, actu.

This law stands unpealed to this day; though it seems to draw its force from the authority of Horace, rather than that of reason, or nature.—All plays are held irregular that have either more, or fewer than five acts.

Some indeed have asserted, that every just action consists of five distinct parts: and have undertaken to mark out the precise share of the action, which each of the five *Acts* ought to bear.

The first, say they, is to propose the matter or argument of the fable, and to shew the principal characters.—The second, to bring the affair or business upon the carpet.—The third to furnish obstacles and difficulties.—The fourth either points a remedy for those difficulties, or finds new ones in the attempt.—The fifth puts an end to all by a discovery.

Be this as it will, it is certain, on the principles of that great master of the drama, Aristotle, we may have a just and regular play, though only divided into three *Acts*.

These *Acts* are subdivided into scenes. See *SCENE*.

ACTIAN Games, Ludi ACTIACI, solemn games, instituted, or according to some only restored, by Augustus, in memory of the victory at Actium.

Stephanus and some others will have them held every third year; but the more common opinion, is that of Strabo, who says, they only returned every fifth, and were celebrated in honour of Apollo, since surnamed *Actius*.

By the way, it is a gross oversight in some others, to imagine that Virgil insinuates them to have been instituted by *Aeneas*; from that passage *Aen. III. v. 280*.

Actiaque Iliaci celebramus littora ludis.

It is true, the poet there alludes to the *Actian* games; but he only does it by way of complement to Augustus, to attribute that to the hero from whom he descended, which was done by the emperor himself: as is observed by Servius.

ACTIAN Years, Anni ACTIACI, were a series of years, commencing from the *Era* of the battle of Actium; called the *Era* of Augustus. See *YEAR*, and *EPOCHA*.

ACTION, in a general sense denotes the operation of a power. See *ACT*.

The idea of *Action* is so familiar to us, that a definition may as easily obscure as explain it.—Some schoolmen, however, attempt to express its nature by 'a manifestation of the power or energy of a substance; made either within, or without it.'—Thus, say they, when the mind *acts*, what does it more, than perceive a vital power exerting it self; as, in reality, the several *Actions* of the mind, are no other than so many indications of its vitality!

It is a point controverted among the schoolmen, whether or no *Action*, thus taken, be a thing distinct both from the agent, and the term, or effect. The modists stand for the affirmative, and the nominalists assert the negative.

The latter observe, that the *Action* may be considered, two ways, *entitatively* and *connotatively*.

ACTION, *Entitatively* taken, is what we call a cause, or what may act. See *CAUSE*.

ACTION, *Connotatively* considered, is the same cause, only considered as acting, or connoting the effect it produces.

Now, say they, a cause may be without any *Action*, connotatively taken, *i. e.* it may be considered as not producing an effect: but it cannot be without it *entitatively*, for that would be to be without it self. Hence they conclude, that the cause differs from the *Action* connotatively, not *entitatively* taken; and the agent is the cause of the *Action*, considered connotatively, not *entitatively*.

Actions are divided, with respect to their principle, into *univocal*, where the effect is of the same kind with the cause; as the production of man by man: and *equivocal*, where it is different; as the supposed production of frogs by the sun. See *UNIVOCAL*, and *EQUIVOCAL*.—And again, into *vital*; as nutrition, respiration, the *Action* of the heart, &c. And *not-vital*; as heating.

With respect to their subject, *Actions* are divided into *inmanent*; which are received within the agent that produced them: as are vital *Actions*, cogitation, &c.—And *Transient*, which pass into another.

In respect of duration, *Actions* are again divided into *instantaneous*, where the whole effect is produced in the same moment; as the creation of light: and *successive*, where the effect is produced by degrees; as corruption, fermentation, putrefaction, dissolution, &c.

The Cartesians resolve all physical *Action* into metaphysical; bodies, according to them, do not act on one another; the *Action* all comes immediately from the deity; the mo-

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tions of bodies, which seem to be the cause, being only the occasions, thereof. See *OCCASIONAL cause*.

It is one of the laws of nature, that *Action* and reaction are always equal, and contrary to each other.

For the *Actions* of powers, &c. See *POWER*, *WRIGHT*, *MOTION*, *RESISTANCE*, and *FRICITION*.

For the laws of the *Action* of fluids, &c. See *FLUID*, and *SPECIFIC gravity*.

ACTION, in ethics, or moral **ACTION**, is a voluntary motion, of a creature capable of distinguishing good, and evil; whose effect, therefore, may be justly imputed to the agent. See *MORAL*.

A moral *Action* may be more fully defined to be whatever a man, considered as endued with the powers of understanding and willing, with respect to the end he ought to aim at, and the rule he is to regard in acting; resolves, thinks, does, or even omits to do; in such manner as to become accountable for what is thus done or omitted, and the consequences thereof.

The foundation, then, of the morality of *Actions*, is, that they are done knowingly, and voluntarily.

All moral *Actions* may be divided, with respect to the rule, into *good* and *evil*.

ACTION, in oratory, is an accommodation of the person of the orator to his subject; or, a management of the voice and gesture, suited to the matter spoken, or delivered. See *ORATORY*.

Actions make one of the greatest branches or divisions of rhetoric, as usually taught. The ancients usually call it *pronunciation*.

Action is a collateral or secondary method of expressing our ideas; and is susceptible of a kind of eloquence as well as the primary.—It is an address to the external senses; which it endeavours to move, and bring into its party, by a well-concerted motion and modulation; at the same time that the reason and understanding are attacked by force of argument.

Accordingly, Tully very pertinently calls it *Sermo Corporis*, the discourse of the body; and *Corporis Eloquentia*, the eloquence of the body.—The Roman mimes and pantomimes, we read, had such a copia in this kind, such a compass even of mute *Action*, that voice and language seemed useless to them: they could make themselves understood to people of all nations; and Roscius, the comedian, is particularly famed, as being able to express any sentence by his gestures, as significantly and variously as Cicero with all his oratory.

Quintilian gives us a system of the rules of *Action*; taken not only from the writers of the ancient orators, but from the best examples of the Forum. See his *Institut. Orat. L. XI. c. 3. de Pronunciatione*.

The force and effects of *Action*, at least as practised among the ancients, appears to be very great; scarce any thing was able to withstand it. What we usually attribute to eloquence, was really the effect of the *Action* only, as some of the greatest masters in that way have frankly acknowledged.

Demosthenes expressly calls it, 'the beginning, the middle, and the end of the orator's office;' and Cicero professes, that 'it does not so much matter what the orator says, as how he says it.' *Neque tantum refert quælia just quæ dicas, quam quomodo dicatur.* De Orat.—Hence, the great Greek orator is represented as practising and adjusting his *Action* in the glass: *Demosthenes grande quoddam intuenti speculo componere Actionem solebat.* Quintil.

Every part of the body is by them listed into the service, and marshalled in its proper place: the hand, the eye, head, neck, sides, cheeks, nostrils, lips, arms, shoulders, &c.—*Præcipuum in Actiane, Caput est.—Cum gestu concordat, & Laterebus obsequatur. Oculi, Lachrymæ, Supercilium, Genæ, Rubor.—Non manus salum sed & Nutus.—Dominetor autem maxime Vultus.—Quin & in vultu Pallor.—Nares, Labia—Dentes, Cervix, Humeri, Brachia.—Manus, vero, sine quibus trunca esset Actio.—V. Quintil. XI. 3.*

The hand is master of a whole language, or set of signs, it self.—Even every finger is laid down by the ancients as having its distinct office; and hence the different names they still bear, *Pollex, Index*, &c. See *HAND* and *FINGER*.

By such a multitude of rules and observances, it is no wonder some of the orators of those, as well as of our days, were perverted more than profited.—Rules only tend to perfect the *Action*, which must have its origin from another source, *viz.* nature, and good sense; where those are deficient, rules will sooner make an ape than an actor.

Eloquentiæ, says Cicero, *sicut & reliquarum rerum fundamentum, sapientia.*—And hence we find the great masters above-mentioned continually softning, and even unfasting, and calling people off from the interperate use of their own rules, *Nulle argutia digitorum, non ad numerum articulum cadens.* Cicero even assures us, he was a whole year in learning to keep his hand within his gown. *Pro Cæli.*

The same author recommending a motion of the whole body, says, the orator should make more use of his trunk than of his hand; *Trunca magis toto se ipse moderans, & virili laterum flexione.* Brut.

Walking,

Walking, *incessus*, in oratory, is sometimes recommended as highly deserving to be cultivated; but Cicero will scarce allow it to be used at all. It seems, some of the active orators of that time had rendered it ridiculous; one of whom was pleasantly asked by Flavius Virginius, how many miles he had declaimed? Cassius Severus, when he perceived an orator given to walking, used to cry out for a line to be drawn round him, to keep him within bounds.—The orator Titius improved walking into a sort of dancing; and it is hence, as we are told by Quintilian, that the dance Titius took its name.—Junius rallied his father Curio's incessant libration, or tossing from one side to another, by asking, who that was haranguing in a ferry-boat? And to the like effect was that speech of C. Sicinius, when Curio having spoke with his usual bustle near Octavius, who by reason of his infirmities had divers liniments and plasters on his limbs; You can never be enough thankful, Octavius, to your good colleague, who has saved you this day from being eaten up by the flies.—Demosthenes, being naturally apt to be too busy, and especially with his shoulders, is said to have reformed himself by speaking in a narrow pulpitum, and hanging a spear pointed just over his shoulders; that if in the heat of his discourse he should forget himself, the puncture might remind him.

After all, it is a point that will bear being controverted, whether *Action* ought to be practised, and encouraged at all? A thing that has so much command over mankind, it is certain, must be very dangerous; since it is as capable of being turned to our disadvantage, as our advantage. It is putting a weapon in the hands of another, which, if he pleases, he may make use of to subdue and enslave us: and accordingly, history is full of the pernicious uses made thereof.—For this reason, eloquence and *Action* are generally discouraged in the modern policy; and both the bar and the pulpit, are brought to a more frigid way of delivery.

Perhaps the foundation of all *Action* may be vicious, and immoral.—Voice and gesture, we know, will affect brutes; not as they have reason, but as they have passions: so far as these are used in a discourse, therefore, it does not regard an assembly of men, more than it would a herd of quadrupeds: that is, their whole effort is spent not on the rational faculties, which are out of the question, but on the animal ones, which alone they endeavour to possess and actuate, independent of reason.—Nay more, our reason and the judgment it self are intended to be byassed and inclined by them; *Action* being only used as an indirect way of coming at the reason, where a direct and immediate one was wanting, *i. e.* where the judgment cannot be taken by the proper means, argument; it is to be taken indirectly, by circuition, and stratagem.

The natural order of things, then, is here inverted: our reason, which should go before, and direct our passions, is dragged after them: instead of coolly considering, and taking cognizance of things; and according to what we perceive therein, raising our selves to the passions of grief, indignation, or the like: we are attacked the other way; the impression is to be carried backwards, by virtue of the natural connection there is between the reason and the passions: and thus the helm, the principle of our actions, is taken out of our own hand, and given to another. See *PASSION*.

The case is much the same here, as in sensation and imagination: the natural and regular way of arriving at the knowledge of objects, is by sense; an impression begun there is propagated forward to the imagination, where an image is produced, similar to that which first struck on the organ.—But the process is sometimes inverted: in hypochondriac, lunatic, and other delirious cases, the image is first excited in the imagination; and the impression thereof communicated back to the organs of sense: by which means, objects are seen, which have no existence.

To say no more, *Action* does not tend to give the mind any information about the case in hand; is not pretended to convey any arguments or ideas which the simple use of language would not convey. But is it not that which we should form our judgments upon? And can any thing help us to make a just judgment, beside what some way enlarges our understanding? When Cicero made Cæsar tremble, turn pale, and let fall his Papers; he did not appraise him of any new guilt which Cæsar did not know of: the effect had no dependence on Cæsar's understanding; nor was it any thing more than might have been produced by the unmeaning sounds of a musical instrument duly applied. Logs of timber and stone have often trembled on the like occasions.

ACTION, in poetry, is an event, either real or imaginary, which makes the subject of an epic, or dramatic poem.

The *Action* of a poem coincides nearly with the fable thereof; it being the usual practice, not to take any real transaction of history, but to feign or invent one; or at least, to alter the historical fact, so as to render it in good measure fictitious.

F. Boffu has two chapters, *Of Real Actions*, the recitals whereof are fables: and of *Figned Actions*, the recitals whereof are historical.

The critics lay down four qualifications, as necessary to the epic and tragic *Action*: the first, *unity*; the second, *integrity*; the third, *importance*; and the fourth, *duration*; to which some add a fifth, *viz. continuity*.

For the unity of the epic *Action*, see *UNITY*.

This unity is not only to exist in the first draught, or model of the fable; but in the whole episodized *Action*.

In order to the integrity of the *Action*, it is necessary, according to Aristotle, that it have a beginning, middle, and end.

—If the three parts of a whole, seem to be generally denoted by the words, *beginning, middle, and end*; Boffu interprets them more expressly, thus: The causes, and designs of a man's doing an *Action*, are the beginning; the effects of these causes, and the difficulties met withal in the execution of those designs, are the middle of it; and the unravelling and extricating of those difficulties, is the end of the *Action*.

The poet, says Boffu, should go begin his *Action*, that, on one hand, nothing should be farther wanting for the understanding of what he afterwards delivers; and, on the other, that what thus begins require after it a necessary consequence. The end is to be conducted after the like manner, only with the two conditions transposed; so that nothing be expected after it, and that what ends the poem be a necessary consequence of something that went before it. Lastly, the beginning is to be joined to the end by a middle, which is the effect of something that went before it, and the cause of what follows.

In the causes of an *Action*, one may observe two opposite designs; the first, and principal, is that of the hero: the second comprehends all their designs, who oppose the pretensions of the hero. These opposite causes do also produce opposite effects, *viz.* the endeavours of the hero to accomplish his design, and the endeavours of those who are against it.—As the causes and designs are the beginning of the *Action*; so those contrary endeavours are the middle of it; and form a difficulty, plot, or intrigue, which makes the greatest part of the poem.

And the solution or clearing up of this difficulty, makes the unravelling.

The unravelling of the plot or intrigue, may happen two ways; either with a discovery, or without.

The several effects which the unravelling produces; and the different states to which it reduces the persons, divides the *Action* into so many kinds.—If it change the fortune of the principal person; it is said to be with a *peripetia*; and the *Action* is denominated *implex*, or mixed: if there be no *peripetia*, but the unravelling be a mere passing from trouble to repose; the *Action* is simple.

For the duration of the epic *Action*, Aristotle observes, it is not so limited as that of the tragic *Action*; the latter is confined to a natural day; but the epoea, according to that critic, has no fixed time.—In effect, tragedy being full of passion, and consequently of violence, which cannot be supposed to last long, requires a shorter time: and the epic poem being for the habits which proceed more slowly, requires a longer time either for them to take hold, or to be rooted up; and hence the difference between the epic and dramatic *Action*, in point of duration.

Boffu lays it down as a rule, that the more vehement the manners of the principal personages are, the less time ought the *Action* to last: accordingly, the *Action* of the *Iliad*, containing the wrath of Achilles, &c. holds but forty-seven days; whereas that of the *Odyssey*, where prudence is the reigning quality, lasts eight years and a half: and that of the *Eneid*, where the prevailing character of the hero is piety and mildness, nearly seven years.

As to the importance of the epic *Action*, there are two ways of providing for it: the first, by the dignity and importance of the persons. This way alone Homer makes use of; there being, otherwise, nothing great and important in his models, but what might have happened to ordinary persons.—The second, by the importance of the *Action* it self; such as the establishment, or downfall of a religion, or a state; which is Virgil's *Action*, and in which he has much the advantage of Homer.

Boffu mentions a third way of making the *Action* important, *viz.* by giving a higher idea of the personages, than what the readers conceive of all that is great among men.—This is done by comparing the men of the poem with the men of the present time.

ACTION is also used in painting and sculpture, for the posture of a figure; or the *Action* it is supposed to be in; expressed by the disposition of the body, or the passion appearing in the face.

In the manage, *ACTION* of the *Mouth*, denotes the agitation of the horse's tongue, and mandible, or his champing on the bit; discoverable by a white, rosy foam thereon.—This, with the masters, passes for a sign of health, vigour and mettle.

ACTION, in law, is a right of demanding, and pursuing, in a court of judicature, what is any man's due.

Or, *Action* is any kind of process which a person enters for the recovery of his right. See *CAUSE* and *PROCESS*.

Actions are divided, by Justinian, into two general kinds; *real*, or those against the thing; and *personal*, or those against the person.—For whoever brings an *Action*, either does it against one obnoxious to him, in respect either of contract, or of offence: in which case arise *Actions* against the person, which require the party to do, or give something: or, he does it against one not obnoxious, yet with whom a controversy is risen touching some matter; as, if Caius hold a field, which Julius claims as his property, and brings his *Action* for the same. See the *Instit. L. IV. Tit. 4.* where the principal *Actions* introduced by the Roman law, are summarily explained.

In common law, from the two classes of real and personal *Actions*, arises a third, called a *mixed Action*; which regards both the person, and thing.

Real ACTION, is that whereby the defendant claims title to lands, or tenements, rents, or commons, in fee-simple, fee-tail, or for life.

But real *Actions*, formerly so numerous and considerable, as writs of right, of entry, &c. with their appendages, as grand cape, petit cape, receipt, view, aid-prayer, voucher, counter-plea of voucher, counter-plea of warranty, and recovery of value, are now much out of use; by reason of the usual admixture of personal matters therewith, which change them into mixed *Actions*.

Personal ACTION, is that which one man hath against another on account of a contract for money, or goods; or of an offence done by him, or some other person, for whose fact he is answerable.

Mixed ACTION, is that laid indifferently for the thing detained, or against the person of the detainer; being thus called, because it has a mixed respect, both to the thing, and to the person.

Others better define it, a suit given by law to recover the thing demanded, and damages for the wrong done.

Such is, affize of novel disseisin, which, if the disseisor make a feoffment to another, the disseisee shall have against the disseisor, and the feoffee, or other ten-tenant; to recover not only the land, but damages also.—And the like in *Action* of waste, *Quare impedit*, &c. See *ASSIZE*.

Actions are also divided into *civil* and *penal*.—**Civil ACTION**, is that which only tends to the recovery of what, by reason of a contract, or other like cause, is a man's due.—As, if a person by *Action* seek to recover a sum of money formerly lent, &c.

Penal ACTION, aims at some penalty upon the party sued; either corporal, or pecuniary.

Such is the *Actio Legis Aquilæ*, in the civil law: and with us, the next friends of a man feloniously slain, or wounded, shall pursue the law against the offender, and bring him to condign punishment.

ACTION is also distinguished, as it lies for the recovery either of the simple value of the thing challenged; or of the double, triple, quadruple, &c.

Thus, a *Decies tantum* lies against embracers; and against jurors that take money for their verdict; of either, or both parties.

To this class also belong all *Actions* on a statute that punishes an offence by restitution, or fine, proportionable to the transgression.

Action, again, is divided into *prejudicial*, called also *preparatory*, and *principal*.

Prejudicial ACTION, is that which arises from some question, or doubtful point in the principal one.

As, if a man sue his younger brother, for land descended from his father; and it be objected, he is a bastard: this point of bastardy must be tried, before the cause can proceed: whence the *Action* is termed *Prejudicialis, quia prius iudicanda*.

ACTION, again, is either *ancestral*, or *possessory*.—**Ancestral ACTION**, is that which we have by some right descending from our ancestor.—**Possessory**, sometimes also called *personal Action*, is that which hath its beginning in, and from ourselves.

ACTION upon the Case, Actio super Casum, is a general *Action*, given for the redress of a wrong done any man without force, and not especially provided for by law.

This, of all others, is now most in use.—Where there arises an occasion of suit, that has neither fit name, nor certain form already prescribed; the clerks of the chancery, anciently, conceived a proper form of *Action* for the thing in question: which was called an *Action upon the Case*, by the civilians *Actio in factum*.

ACTION upon the Statute, Actio super Statutum, is a writ or *Action* brought against a man, upon an offence against a statute whereby an *Action* is given that did not lie before. See **STATUTE**.

Thus, where one commits perjury to the prejudice of another, he who is damaged shall have a writ upon the statute, and a cause accordingly.

Action Popular, only differs from an *Action* upon the statute, in that, where the statute gives the suit or *Action* to the party grieved, or otherwise to one single person certain, it is

called *Action* upon the statute; and where the authority is given by the statute to every one that will so sue, it is an *Action popular*.

Action is also divided into *perpetual* and *temporal*.

Perpetual ACTION, is that whose force is not determined by any period or term of time.

Of this kind were all civil *Actions* among the ancient Romans, viz. such as arose from laws, decrees of the senate, and constitutions of the emperors; whereas *Actions* granted by the prætor died within the year.

We have also perpetual and temporary *Actions* now in England; all being perpetual, which are not expressly limited.

Divers statutes give *Actions*, on condition they be pursued within the time prescribed.—Thus the Statute of 1 Edw. VI. gives *Action* for three years after the offences committed, and no longer; and the statute of 7 Hen. VIII. c. 3. does the like for four years; and that of 31 Eliz. c. 5. for one year, and no more.

But, as by the civil law no *Actions* were so perpetual, but that by time they might be prescribed against; so, in our law, though *Actions* be called *perpetual*, in comparison of those that are expressly limited by statute; yet is there a means to prescribe against real *Actions*, after five years, by a fine levied, or a recovery suffered. See **PRESCRIPTION**.

ACTION of a Writ, is when a person pleads some matter, whereby he shews, that the plaintiff had no just cause to have the writ he brought, though it be possible he might have another writ or *Action* for the same matter.—Such plea is called, a *plea to the Action of the writ*. See **WRIT**.

When by the plea it appears, that the plaintiff has no cause of any *Action* for the thing demanded; it is called, a *plea to the Action*.

ACTION, in affairs of commerce, or **ACTION of a Company**, is a part or share in the company's stock, or capital, which consists of a number of such *Actions*. See **COMPANY** and **CAPITAL**.

Actions, in France and Holland, amount to the same with shares, or subscriptions in England.

Thus, the capital of a company, which has three hundred *Actions* of a thousand livres each, consists of three hundred thousand livres. Hence, a person is said to have four or six *Actions* in such company, if he have contributed to the capital, and be interested therein, for four or six thousand livres.

ACTION also denotes an obligation or instrument, which the directors of such companies deliver to those who pay money into their stock. See **ACTIONARY**, and **BANK**.

Actions are always rising, and falling; according as the company's credit gains or loses. The smallest whisper of an approaching war or peace, true or false, shall frequently occasion a considerable alteration therein. In the year 1719, the French company of the west, since called the *India company*, arrived at such an immense degree of credit; that in six months time, its *Actions* rose to eighteen hundred per Cent. a pitch no other company ever came near.

In 1672, the *Actions* of the Dutch East-India company were at six hundred and fifty per Cent. which was the highest they were ever known at.—But the war with France then coming on; they fell 250 per Cent. in a few months. After the peace of Nimeguen, they rose again; and in 1718 were 600 per Cent.

The French have three kinds of *Actions*.—**Simple**, which are entitled to a share in all, both the profits and losses of the company.—**Rentierer**, entitled only to a profit of two per Cent. sure; for which the king is security.—And **interested Actions**, which claim the two per Cent. secured by the king; and are also to share the excess of the dividend with the simple *Actions*.

There were several other kinds of *Actions* introduced by the breakers, in the busy days of the *Rue Quinquempoix*, but they have since dropt into oblivion; these were called mother *Actions*, daughter, grand-mother, grand-daughter *Actions*, &c.

To melt or liquidate an *Action*, is to sell, or turn it into money, &c.

ACTIONARY, or **ACTIONIST**, a term frequent in foreign news-papers; denoting the proprietor of an *Action*, or share in a company's stock.

ACTIVE, **ACTIVES**, something that communicates motion, or action to another.

In this sense, the word stands opposed to *passive*. Thus we say, an *active* cause, *active* principles, &c.

The quantity of motion in the world, Sir I. Newton shews, must be always decreasing, in virtue of the *Vis Inertiae*, &c. So that there is a necessity for certain *active* principles to recruit it: such he takes the cause of gravity to be, and the cause of fermentation. Adding, that we see but little motion in the universe, except what is owing to these *active* principles.

Active Principles, in chymistry, are those which are supposed

posed to act of themselves, and do not need to be put in action by others.

Salt, sulphur, and mercury, are usually considered by the chymists as *active principles*; and phlegm and earth, as passive ones.

M. Homberg, and some late chymists after him, only make one *active principle*, viz. sulphur, or fire; which they take to be the source or principle of all the motion, and action of the universe.

The term *active principles*, says Dr. Quincy, has been used to express certain divisions of matter, that are, by some particular modifications, comparatively *active*, in respect of others; such are spirit, oil, and salt, whose parts are better fitted for motion, than those of earth and water: but with how much impropriety will easily appear.

For in a strict sense, all motion in matter is rather passive; and there is no *active principle*, unless we call for the known powers of gravitation, attraction, and repulsion, on which the Newtonian philosophy is founded; so that let bodies exist under what modifications soever, there can be no alteration made of these universal properties.—Hence, the division of matter, into what, for distinction sake, may be called *spirit*, does not give it any properties inconsistent with this general law.

ACTIVE, in grammar, denotes a word that has a signification, that serves to explain, or denote an action.

Thus we say, a verb *active*, a conjugation *active*, &c. or an *active* participle.

Verbs **ACTIVE**, are such as do not only signify doing, or acting, but have also nouns following them, to be the subject of the action or impression.

Thus, to love, to teach, are verbs *active*; because we can say, to love a thing, to teach a man.

Verbs neuter also denote an action: but are distinguished from verbs *active*, in that they cannot have a noun following them.—Such are, to sleep, to go, &c.

Some grammarians, however, make three kinds of verbs *active*: the *transitive*, where the action passes into a subject different from the agent; *reflexed*, where the action returns upon the agent; and *reciprocal*, where the action turns mutually upon the two agents who produced it.

ACTIVITY, the power of acting, or the active faculty.

The *Activity* of fire exceeds all imagination.—The *Activity* of an acid, a poison, &c.—Bodies, according to Sir I. Newton, derive their *Activity* from the principle of attraction.

The *Sphere of ACTIVITY* of a body, is the space which surrounds it, so far as its efficacy or virtue extends to produce any sensible effect.

ACTOR, one that acts. See **ACT**.

ACTOR, in the drama, one who represents some person, or character upon the theatre.

The drama in its original only consisted of a simple chorus, who sung hymns in honour of Bacchus; so that the primitive actors were no more than singing men. Thespis was the first who took upon him to introduce a Person, or *Actor*; who was to eat the chorus, by reciting the adventures of some of their heroes. Thus came the recitation or declamation in use.

Æschylus finding a single person tiresome, thought to entertain the audience more agreeably by the introduction of a second person, who should converse and make dialogue with the first. He likewise dressed his *Actors* a little more decently than they had been before; and put them on the buskin.

Sophocles finding the two persons of Æschylus too few for the variety of incidents, added a third; and here the Greeks stopped; at least, we do not find in any of their tragedies above three persons in the same scene: though in their comedies, they took a greater liberty.

The moderns have brought a much greater number of *Actors* upon the stage.—This heightens the trouble and distress that should reign there; and makes a diversity in which the spectator is sure to be interested.

Horace speaks of a kind of secondary *Actors* in his time, whose business was to imitate the first; and lessen themselves, to become better foils to their principals. We have very little notion how these subaltern *Actors* behaved.

ACTUAL, something that is real, and effective; or that exists truly and absolutely.

In philosophy, we say, *Actual heat*, or *cold*; in opposition to *virtual* or *potential*.

Actual heat, considered actively, is the act of producing heat; passively taken, it is the quality whereby a body is denominated *hot*.—*Virtual* or *potential heat*, actively taken, is the power or faculty of producing heat; passively taken, it should be the power or faculty of being heated, or of receiving *actual heat*.

In theology, we say, *actual grace*; in opposition to *habitual grace*.

Actual grace is that which God gives us, to make or enable

us to act, or do some action.—*Habitual grace* is a sanctifying grace, a habit of charity, or a habit inherent in the soul, which renders us agreeable to God, and objects of eternal recompence.

So *actual sin* is used in opposition to *original sin*.

Actual sin is that committed knowingly, by a person arrived at years of discretion. Original sin is that we contract by descent, as being the children of Adam.

ACTUARIE Naves, in antiquity, a sort of long ships, thus denominated, as being peculiarly contrived for swiftness and expedition; they answer to what the French call *brigantines*.

Cicero, in an epistle to Atticus, calls a ship *decem scalmorum*, of ten banks of rowers, *Actuariola*.

ACTUS, in the ancient agriculture, the length of one furrow; or as far as a plough goes before it turns. *Plin. l. 18. c. 3.*

In English it may be rendered by a *furlong*.—It is also used as a determinate measure, where it contains 120 Roman feet.

ACTUS minimus, was 120 feet in length, and 4 in breadth; being equal to the sextans, or sixth part of the jugerum, or integer. See **JUGERUM**.

ACTUS major, called also *Actus quadratus*, was the square of 120 feet, or 14400; being the semis, or half of the jugerum.—This was also denominated *modius* and *mina*. *Varro de re Rust. l. 1. c. 10.*

ACTUATE, to bring into act; or put a thing in action.

Thus, an agent is said by the schoolmen to *actuate* a power, when it produces an act in a subject.—And thus the mind may be said to *actuate* the body.

ACUTE, *sharp*, something that terminates in a point, or edge; disposed either for piercing, or cutting.

In this sense, the word usually stands opposed to *obtuse*.

ACUTE Angle, in geometry, is that which is less than a right angle; or which does not subtend 90 degrees. See **ANGLE**.

Such is the angle AEC. (*Tab. Geometry, fig. 86.*)

ACUTE-Angle Triangle, is that whose three angles are all *acute*; called also an *Oxygonous Triangle*. See **TRIANGLE**.

Such is the triangle ACB. (*Tab. Geometry, fig. 68.*)

ACUTE-Angular Section, of a cone, is used by the ancient geometers for the ellipsis.

ACUTE, in music, is understood of a sound, or tone, which is sharp, shrill, or high, in respect of some other.

In which sense, the word stands opposed to *grave*.

Sounds considered as *acute*, and *grave*, that is, in the relation of gravity and *acuteness*, constitute what we call *tune*, the foundation of all harmony.

ACUTE accent, in grammar, is that which denotes a syllable to be pronounced with a high or *Acute* tone of voice.

The *Acute accent*, is a little line, or virgula, placed over the vowel, a little sloping or inclined in its descent from right to left, as ´.—It is not ordinarily used either in English, or Latin: the French indeed retain it; but it is only to mark the close or masculine é.

In the ancient Greek manuscripts, the *Acute accent* stoops a great deal more than in the modern writings, or editions.

ACUTE Disease, is that which terminates or comes to its period, in a few days; or, as the physicians express it, *cito & cum periculo terminatur*.

In this sense, the word stands opposed to *chronical*.—All diseases which hold above forty days, are reputed *chronical*.

Dr. Quincy thinks an *Acute disease* may be defined, that which is attended with an increased velocity of blood.

Acute diseases are the more dangerous, in that, beside the violence of the symptoms, if there be not time to empty the prime viæ, it is very difficult to stop their progress, and save the patient.

Acute diseases, are usually divided into those simply called *Acute*; and those which, by reason of the vehemence of the symptoms, are called *most Acute*.

ACUTENESS, in music, &c. that which constitutes, or denominates, a sound, *acute*.

There is no such thing as *Acuteness*, or gravity, absolutely so called; they are only relations; so that the same sound may be either *acute*, or *grave*, according to that other sound they refer, or are compared, to.

The degrees of gravity or *Acuteness*, make so many tones, or tunes of voice, or sound.

For the cause and measure of gravity and *Acuteness*, see **GRAVITY**, and **INTERVAL**.

AD, a Latin preposition, signifying *to*—frequently used in composition; and sometimes also prefixed to other terms: as—*ad inquiringum*—*ad jura regis*—*ad octo*—*ad pondus omnium*—*ad quod damnum*—*ad terminum qui præterit*—*ad ventrem insipientium*.—Which see, in the course of the alphabet.

ADAGE*, ADAGIUM, a proverb, or popular saying;

* The word is compounded of *ad*, and *agor*, according to Scaliger: *quod agatur ad aliud significandum*, because made to signify some other thing.

Erasmus has made a large and valuable collection of Greek and Roman *Adages*, from their poets, orators, philosophers, &c.

Adage, proverb, and paremia, are the same thing; but they differ from *gnome*, sentence and apophthegm.

ADAGIO, in music, one of the words used by the Italians, to denote a degree, or distinction of time.

Adagio expresses a slow time; the slowest of any, except *grave*.

A DALIDES, in the Spanish policy, are officers of justice, for matters touching the military forces.

In the laws of king Alphonfus, the *Adalides* are spoke of, as officers appointed to guide and direct the marching of the forces in time of war.—Lopez represents them as a sort of judges, who take cognizance of the differences arising upon excursions, the distribution of plunder, &c.

ADAMANT, ADAMAS, in natural history, &c. an ancient name for a precious stone, by us called a *diamond*. See *DIAMOND*.

ADAMI *Pomum*, ADAM'S *Apple*, in anatomy, a little prominence in the middle of the cartilago fcutiformis. See *POMUM ADAMI*.

ADAMITES*, ADAMITÆ, a sect of ancient heretics, who took upon them to imitate the nakedness of Adam: as if man had been reinstated in his original innocence.

* The critics explain the name Adam, אָדָם from whence the term arises, variously; some by *earth*, others by *red*, others by *acquiescence*.—Some of the Greek interpreters explain it cabalistically: according to them, the *A* signifies *α. α. α. α. α.* east; *D*, *δ. δ. δ. δ.* west; *A*, *α. α. α. α.* north; and *M*, *μ. μ. μ. μ. μ.* south; as being king of the four quarters of the world: or, in that he was to people it; or that he was a little world, or *α. α. α. α. α. α. α. α.*

The *Adamites* assisted in the temples naked, and had to do with women in public.

Prodicus was their author, according to the account given by Theodoret.—They were, in reality, a branch sprung out of the Carpopartians, and Basilidians. See *CARPOCRATIAN*, and *BASILIDIAN*.

This sect is said to have started up a-fresh in the 15th century, under Picard, their leader; who pretended to re-establish the law of nature, which, according to him, consisted in two things, *viz.* community of women, and nakedness.—These last walked naked in the public places; whereas the former only put off their clothes in their assemblies.—Jovet speaks of *Adamites* in England.

Pre-ADAMITES. See the article *PREADAMITES*.

ADAPTING. See the article *ACCOMMODATION*.
We say, to *adapt*, i. e. to fit, a recipient to the capital, &c. See *RECIPIENT*.

ADDER-STUNG, is used in respect of cattle, when stung with any kind of venomous reptiles; as adders, scorpions, &c. or bit by a hedge-hog, or shrew.

ADDICE, or ADZE, a sharp tool, of the ax-kind, but different from the common ax.—It is made crooked, and by that means more convenient for cutting the hollow side of any board, or timber; being what the coopers generally make use of for that purpose.

ADDICTIO, ADDICTION, in the Roman law, a transferring, or passing over goods to another; whether by sentence of a court; or in the way of sale, to him that bids most for them.

The word stands opposed to *abdictio*, or *abdication*. See *ABDICATION*.

It is formed of *addico*, one of the stated words used by the Roman judges, when they allowed the delivery of the thing or person on whom judgment had passed.

Hence, goods thus adjudged by the pretor, to the right owner, were called *bona addicta*; and the debtors delivered up in like manner to their creditors, to work out their debt, were called, *servi addicti*.

ADDICTIO *in diem*, denoted the adjudging of a thing to a person for a certain price; unless by such a day the owner or some other person gave more for it.

ADDITION, ADDITAMENTUM, a thing added to another.

Addiments, in physic and chymistry, are things superadded to the ordinary ingredients of any composition.

ADDITION, the act of joining one thing to another; or augmenting a thing, by the accession of others thereto.

In matters of Holy Scripture, it is forbid to make any *Addition* to the text, for fear of corrupting and altering the sense.—In physic, we say, that natural bodies are formed by the *Addition* or aggregation of parts.

ADDITION, is also used for the additament, or the thing added itself.—In the new editions of books, authors use to make

Additions; and they frequently make needless *Additions*, in lieu of retrenching superfluities and impertinencies.

It is an axiom, that if to equal quantities you *add* unequal ones; the excess of the wholes, will be the same as the excess of the *additional* parts.

ADDITION, in arithmetic, is the first of the four fundamental rules, or operations of that art.

Addition consists in finding the amount of several numbers, or quantities severally added one to another.—Or, *Addition* is the invention of a number, from two or more homogeneous ones given, which is equal to the given numbers taken jointly, or together.

The number, thus found, is called the *sum*, or aggregate of the numbers given.

The character of *Addition* is +, which we usually express by *plus*. Thus 3+4 denotes the sum of 3 and 4; and is read 3 plus 4.

The *Addition* of simple numbers is easy. Thus it is readily perceived that 7 and 9, or 7+9 make 16; and 11+15 make 26.

In longer, or compounded numbers, the business is performed by writing the given numbers in a row downwards; homogeneous under homogeneous, i. e. units under units, tens under tens, &c. and singly collecting the sums of the respective columns.

To do this, we begin at the bottom of the outmost row or column to the right; and if the amount of this column do not exceed 9, we write it down at the foot of the same column; if it do exceed 9, the excess is only to be wrote down, and the rest referred to be carried to the next row, and added thereto; as being of the same kind or denomination.

Suppose, e. gr. the numbers 1357 and 172, were given to be added; write either of them, *v. gr.* 172, under the other, 1357; so, as the units of the one, *viz.* 2, stand under the units of the other, *viz.* 7; and the other 1357 numbers of the one, under the correspondent ones of the other, *viz.* the place of tens under tens, as 7 under 5; and that of hundreds, *viz.* 1, under the place

of hundreds of the other, 3.—Then, beginning, say, 2 and 7 make 9; which write underneath; also 7 and 5 make 12; the last of which two numbers, *viz.* 2, is to be written, and the other one referred in your mind to be added to the next row, 1 and 3: then say, 1 and 1 make 2, which added to 3 make 5; this write underneath, and there will remain only 1, the first figure of the upper row of numbers, which also must be writ underneath; and thus you have the whole sum, *viz.* 1529.

So, to add the numbers 87899+13403+885+1920 into one sum, write them one under another, so as all the units make one column, the tens another, the hundreds a third, and the place of thousands a fourth, and so on.—Then say, 5 and 3 make 8, and 8+9 make 17; write 7 underneath, and the 1 add to the next rank; saying, 1 and 8 make 9; 9+2 make 11, and 11+9 make 20; and having writ the 0 underneath, say again, 2 and 8 make 10, and 10+9 make 19, and 19+4 make 23, and 23+8 make 31; then, reserving 3, write down 1 as before, and say again, 3+1 make 4, 4+3 make 7, and 7+7 make 14; wherefore write 4 underneath: and lastly, say 1+1 make 2, and 2+8 make 10, which in the last place write down, and you will have the sum of them all. 104107

ADDITION of numbers of different denominations, for instance, of pounds, shillings and pence, is performed by adding, or summing up each denomination by it self, always beginning with the lowest; and if after the *Addition*, there be enough to make one of the next higher denomination, for instance, pence enough to make one or more shillings; they must be added to the figures of that denomination, that is, to the shillings; only reserving the odd remaining pence to be put down in the place of pence.—And the same rule is to be observed in shillings with regard to pounds.

For an instance, 5 pence and 9 pence make 14 pence; now in 14 there is once 12, or a shilling, and two remaining pence; the pence, set down; and reserve 1 shilling to be added to the next column, which consists of shillings. Then 1 and 8 120 15 9 and 2 and 5 make 16: the 6 put down, and 9 12 5 carry the 1 to the column of tens; 1 and 1 9 18 0 and 1 make three tens of shillings, or 30 shillings; in 30 shillings there is once 20 shillings, or a pound, and 10 over: write one in the column of tens of shillings, and carry 1 to the column of pounds; and continue the *Addition* of pounds, according to the former rules.

So, half of an even sum will be carried to the pounds; and the odd one (where it so happens) set under the tens of the shillings.

ADDITION of Decimals, is performed after the same manner as that of whole numbers; as may be seen in the following example. See also *DECIMAL*.

620.953
51.0807
305.27
967.3037

ADDITION of Vulgar Fractions, see under the article FRACTION.

ADDITION, in Algebra, or the **ADDITION of Species,** is performed by connecting the quantities to be added, by their proper signs; and also by uniting into one sum, those that can be so united. See QUANTITY, SPECIES, &c. Thus a and b make $a+b$; a and $-b$ make $a-b$; $-a$ and $-b$ make $-a-b$; $7a$ and $9a$ make $7a+9a$; $-a\sqrt{ac}$ and $b\sqrt{ac}$ make $-a\sqrt{ac}+b\sqrt{ac}$, or $b\sqrt{ac}-a\sqrt{ac}$; for it is all one in whatever order they be written.

But, particularly, 1^o, Affirmative quantities of the same species or kind, are united by adding the prefixed numbers whereby the species are multiplied. See POSITIVE. Thus, $7a+9a$ make $16a$. And $11bc+15bc$ make $26bc$.

Also $3\frac{a}{c}+5\frac{a}{c}$ make $8\frac{a}{c}$; and $2\sqrt{ac}+7\sqrt{ac}$ make $9\sqrt{ac}$;

$6\sqrt{ab-xx}+7\sqrt{ab-xx}$ make $13\sqrt{ab-xx}$. And in like manner $6\sqrt{3}+7\sqrt{3}$ make $13\sqrt{3}$. Again, $a\sqrt{ac}+b\sqrt{ac}$ make $a+b\sqrt{ac}$, by adding together a and b , as numbers multiplying \sqrt{ac} . And fo $2a+3c\sqrt{3axx-x^2}+3a\sqrt{3axx-x^2}$ make $5a+3c\sqrt{3axx-x^2}$ since $2a+3c$ and $3a$ make $5a+3c$.

2^o, Affirmative fractions, which have the same denominator, are added together by adding their numerators.

Thus $\frac{1}{3}+\frac{2}{3}$ make $\frac{3}{3}$, and $\frac{2ax}{b}+\frac{3ax}{b}$ make $\frac{5ax}{b}$; and thus

$\frac{8a\sqrt{cx}}{2a+\sqrt{cx}}+\frac{17a\sqrt{cx}}{2a+\sqrt{cx}}$ make $\frac{25a\sqrt{cx}}{2a+\sqrt{cx}}$, and $\frac{aa}{c}+\frac{bx}{c}$ make $\frac{aa+bx}{c}$.

3^o, Negative quantities are added after the same manner as affirmative. See NEGATIVE.

Thus, -2 and -3 make -5 ; $-\frac{4ax}{b}$ and $-\frac{11ax}{b}$ make $-\frac{15ax}{b}$; $-a\sqrt{ax}$ and $-b\sqrt{ax}$ make $-(a+b)\sqrt{ax}$.

When a negative quantity is to be added to an affirmative one; the affirmative must be diminished by the negative one.

Thus, 3 and -2 make 1 ; $\frac{11ax}{b}$ and $-\frac{4ax}{b}$ make $\frac{7ax}{b}$;

$-a\sqrt{ac}$ and $b\sqrt{ac}$ make $b-a\sqrt{ac}$.

And note, that when the negative quantity is greater than the affirmative, the aggregate or sum will be negative. Thus,

2 and -3 make -1 ; $-\frac{11ax}{b}$ and $\frac{4ax}{b}$ make $-\frac{7ax}{b}$; and $2\sqrt{ac}$ and $-7\sqrt{ac}$ make $-5\sqrt{ac}$.

ADDITION of Irrational Quantities.—If they be of different denominations, reduce them to the same denomination; and if they be then commensurable, add the rational quantities without the vinculum; and to their sum prefix the radical sign.—The rest is as in the **ADDITION of rationals**.

Thus, we shall find $\sqrt{8}+\sqrt{18}=2\sqrt{2}+3\sqrt{2}=5\sqrt{2}=50$. On the contrary, $\sqrt{7}$ and $\sqrt{5}$ being incommensurable, their sum will be $\sqrt{7}+\sqrt{5}$.

ADDITION, in law, is that name, or title which is given to a man, over and above his proper name, and surname; to shew of what estate, degree, or mystery he is; and of what town, village, or country.

Additions of Estate, or quality, are yeomen, gentlemen, squire, and such like.

Additions of Degree, are those we call names of dignity; as knight, lord, earl, marquiss, and duke.

Additions of Mystery, are such as scrivener, painter, mason, and the like. See CHOPCHURCH.

Additions of Place, are, of Thorp, of Dale, of Woodstock.—

Where a man hath household in two places, he shall be said to dwell in both; so that his **Addition** in either may suffice. Knave was anciently a regular **Addition**.

By Stat. 1. Hen. V. it was ordained, that in suits or actions where process of outlawry lies; such **Addition** should be made to the name of the defendant, to shew his estate, mystery, and place where he dwells; and that the writs, not having such **Additions**, shall abate, if the defendant take exception thereto; but not by the office of the court.—The reason of this ordinance was, that one man might not be troubled by the outlawry of another; but by reason of the certain **Addition**, every person might bear his own burden.

ADDITIONAL Duty. See DUTY.

ADDOUBORS, in law. See the article REDOUBORS.

ADDRESS*, a discourse presented to the king, in the name of a considerable body of his people; to express, or notify their sentiments of joy, satisfaction, or the like, on some extraordinary occasion.

* The word is French, *Adresse*, formed of the verb *Adresser*, to send or direct any thing to a person.

We say, the lords *Adress*, the commons *Adress*.—*Adress* were first set on foot under the administration of Oliver Cromwell.—At Paris, their office of intelligence is called *Bureau d'Adresse*.

ADDRESS, is also used for dexterity, or good management.

ADDUCTENT*, *Muscles*, or **ADDUCTORS**, are those which bring forward, close, or draw together, the parts of the body whereto they are annexed. See MUSCLE.

* The word is compounded of *ad*, to; and *ducere*, to draw, or bring.

Adducents, or *Adductors*, stand opposed to *Abducents* or *Abductors*.

ADDUCTION, in anatomy, the motion, or action of the adducent muscles. See ADDUCENT, and ABDUCTOR.

ADDUCTOR Oculi, a muscle of the eye; so called, because, it inclines its pupil towards the nose.

It is also called *bitorius*; because it directs the eye toward the cup in drinking.

ADDUCTOR Pollicis, is a muscle of the thumb, which arises tendinous, and ascends obliquely towards a broad termination, at the superior part of the first bone of the thumb.—See *Tab. Anat. (Myol.) fig. 1. n. 31. & fig. 7. n. 7.*—Its office is to bring the thumb near the fore-finger.

ADDUCTOR Pollicis Pedis, called also *Antithenar*, is a muscle of the great toe, which arises from the inferior part of the os cuneiforme tertium, and is inserted into the internal part of the ossa sesamoidea of the great toe; which it draws nearer the rest.

ADDUCTOR Indicis, is a muscle of the fore-finger, arising from the inside of the bone of the thumb, and inserted into the first bone of the fore-finger, which it draws towards the thumb.

ADDUCTOR minimi Digiti Pedis: the same as TRANSVERSALIS *Pedis*.

ADELING. See the article ATHELING.

ADEMPMENT, ADEPTIO, in the civil law, the revocation of a grant, donation, or the like. See REVOCATION.

The *Ademption* of a legacy, may be either *express*; as when the testator declares in form, that he revokes what he had bequeathed: or *tacit*, as when he only revokes it indirectly, or implicitly. See RECESSISSIO.

ADEPS*, in anatomy, fat, found in the cavities of the abdomen, or other parts.

* It is so called, as being *adaptus*, gotten, or as it were extrinsecal.

The *Adeps* according to some differs from the common fat, called *pinguedo*; in that it is thicker, harder, and of a more earthy substance.

ADEPS is also used among physicians, as a general name for all animal fat.

The *Adeps anseris*, goose's fat; *Adeps canis*, fat of a dog; *Adeps hominis*, fat of a man; *Adeps viperæ*, viper's fat; and *Adeps ursi*, bear's fat, are all used in medicine, in quality of ripeners, or drawers; as being of a penetrating nature, and thereby suited to dissolve, and rarify the tumors, and bring them quickly to maturity. The specific virtues ascribed to certain of them, do not however seem well warranted.

ADEPTS*, **ADEPTI**, a denomination given to the proficients in alchemy; particularly to those who pretend to the secrets of the philosopher's stone, and the universal medicine.

* The word is Latin, *adeptus*, having obtained; formed of the verb *adipisci*, to obtain.

Ripley, Lilly, Paracelsus, Helmont, Hollandus, Sendivogius, &c. are the principal among the *Adepti*.

It is a sort of tradition among the alchemists, that there are always twelve *Adepti*; and that their places are immediately supplied by others, whenever it pleases any of the fraternity to die, or transmigrate into some other place, where he may make use of his gold: for in this wicked world it will scarce purchase them a shirt.—*Harri*.

ADEQUATE, ADEQUATUM, something equal to, or co-extended with, another; and filling the whole measure and capacity thereof.

In this sense, the word stands opposed to *Inadequate*. See **INADEQUATE**.

ADEQUATE Ideas, or *Nations*, are such Images or conceptions of an object, as perfectly represent it, or answer to all the parts and properties of it.

M. Leibnitz defines an *adequate notion*, to be that of whose several characters we have distinct ideas.—Thus, a circle being defined a figure bounded by a curve line which returns into itself, and whose points are all equally distant from a certain intermediate point therein: our notion of a circle is *adequate*, if we have distinct ideas of all these circumstances, viz. a curve returning upon itself, a middle point, an equality of distance, &c.

All simple ideas are *adequate* and perfect; and the faculty, be it what it will, that excites them, represents them entire. See **Simple IDEA**.

The ideas of modes are likewise *adequate*, or perfect; except of those modes which occasionally become substantives: for when we speak of modes separately existing, we only consider them separate from the substance by way of abstraction.

All abstract ideas are also *adequate* and perfect; since they represent all that part of the subject which we then consider.—Thus, the idea of roundness is perfect, or *adequate*, because it offers to the mind all that is in roundness, in general.

Of the same kind are all ideas, of which we know no original, or external object really existing out of the mind, by occasion of which they were excited in us, and of which we think them the images. Thus, when a dog is before us, it is the external object without us which raises the idea in our mind; but the idea of an animal in general, has no external object to excite it: it is created by the mind itself, and must of necessity be *adequate* or perfect.

On the contrary, the ideas of all substantives are *inadequate*, and imperfect, which are not formed at the pleasure of the mind, but gathered from certain properties, which experience discovers in them.

This is evident, in regard our knowledge of substantives is very defective; and that we are only acquainted with some of their properties: thus, we know that silver is white, that it is malleable, that it melts, &c. but we do not know what further properties it may have; and we are wholly ignorant of the inward texture of the particles whereof it consists.—Our idea of silver therefore, not representing to the mind all the properties of silver, is *inadequate*, and imperfect.

ADESSENERII*, a name given to those who hold that Jesus Christ is really present in the eucharist; but in a manner different from what the Romanists hold.

* The name was first framed by Præcolus, from the Latin verb *adesse*, to be present.

The *Adessenarii*, called also *Impanatores*, are divided into four different opinions touching the point.—Some hold that the body of Jesus Christ is in the bread; others, that it is about the bread; others, that it is with the bread; and lastly, others, that it is under the bread. See **IMPANATION**.

ADFFECTED Equation is that where the unknown quantity is found in two or more different degrees, or powers. *E. gr.* $x^2 - px^2 + qx = a^2 b$. Where there are three different powers of x ; *viz.* x^2 , x , and x^0 . See **EQUATION**.

ADHESION*, **ADHERENCE**, in physics, the act of two bodies which are joined or fastened to each other, either by the mutual impression of their own parts; or the compression of external bodies. See **COHESION**.

* The word is compounded of the Latin, *ad*, to; and *hæerere* to stick or cleave.

Anatomists sometimes observe prophygies, or *Adhesions* of the lungs to the sides of the thorax, the pleura, and diaphragm, which give occasion to various disorders.

The *Adhesions* of two polished planes, and two hemispheres, are phenomena urged in behalf of the weight, and pressure of the atmosphere. See **ATMOSPHERE**.

ADHESION, in logic. The schoolmen distinguish two kinds of certitude: the one of speculation, which arises from the evidence of the thing; and the other of *Adhesion*, or attachment, which has nothing to do with evidence, but arises purely from the importance of the matter, and the interest we have in its truth.

ADHESION, or **ADHERENCE** is also used for the persisting in a former opinion, or resolution.—After the free conference between the two houses, concerning the bill for preventing occasional conformity, when the lords retired and it came to the final vote of *adhering*, they were so equally divided, that in three questions put on different heads, the *adhering* was carried by one vote in every one, and by a different person each time.—The commons likewise *adhered*: so the bill was lost. *V. Burnet Hist. of own Time*, T. ii, p. 338.

ADJACENT*, or **ADJOINING**, something situate near, or aside of another.

* The word is compounded of *ad*, to; and *jacere*, to lie.

ADIAPHORISTS*, **ADIAPHORISTÆ**, or **ADIAPHORITES**, a name given in the sixteenth century to the moderate Lutherans, who adhered to the sentiments of Melancthon; and afterwards to those who subscribed the interim of Charles V. See **LUTHERAN**.

* The word is originally Greek, *αδιαφορησ*, compounded of the privative *α*, and *διαφορησ* different.

ADIAPHOROUS, **ADIAPHORUS**, is a name given by Mr. Boyle, to a kind of spirit distilled from tartar, and some other vegetable bodies; and which is neither acid, vinous, nor urinous; but in many respects different from any other sort of spirit.

ADJECTIVE*, in grammar, a kind of noun joined with a substantive either expressed, or implied, to shew its manner of being; that is, its qualities, or accidents.

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* The word is formed of the Latin *adjicere*, to add to; as being to be added to a substantive, without which it has no precise signification at all.

Father Buffier defines *Adjectives* in a manner somewhat different from other grammarians.—Nouns, according to him, are substantives, when the objects which they represent are considered simply, and in themselves, without any regard to their qualities: on the contrary, they are *Adjectives*, when they express the quality of an object.

Thus, when I say simply, a heart; the word *heart* is a substantive, because none of its qualities are expressed; but when I say a generous heart, the word *generous* is an *Adjective*; because it adds a quality, or attribute to the heart. *Adjectives*, then, appear to be nothing else but modifications.

—In effect, the end of an *Adjective* being only to express the quality of an object; if that quality be the object itself whereof we speak, it becomes a substantive; *e. gr.* if I say, *this book is good*; *good*, here, is an *Adjective*: but if I say, *good is always to be chosen*, it is evident *good* is the subject I speak of; and consequently, *good*, there, is the substantive.

On the contrary, it often happens in other languages, and sometimes in our own, that a substantive becomes an *Adjective*; as for instance, in these words, *the king, hero as he is, remembers he is a man*: where the word *hero*, though ordinarily a substantive, is yet apparently an *Adjective*.

From this idea of an *Adjective*, it appears that many of the nouns, which in the common grammars, are accounted substantives, are really *Adjectives*, and vice versa; grammar in this and a thousand other instances depending upon custom.

AD INQUIRENDUM, a judicial writ, commanding inquiry to be made of any thing touching a cause depending in the king's court, for the better execution of justice; as of bastardy, or the like.

ADJOINING, **ADJUNCTIO**, in philosophy, &c. See **ADJUNCTION**.

ADJOINING is particularly used for the associating of a person to another; or appointing him a colleague, or adjunct. See **ADJUNCT**, &c.

ADJOURNMENT*, in law, the putting off a court, or meeting; and appointing it to be kept at another time or place. See **COURT**.

* The word is formed of the Latin *ad*, to; and the French *jour*, day; *q. d.* to another day.

In which sense, we meet with the phrase *Adjournment in eye*, for an appointment of a day when the justices in eye intend to sit again.

Adjournments of parliament differ from prorogations. And each house has the privilege of *adjourning* itself. See **PARLIAMENT**.

ADIPOSA Membrana, in anatomy, denotes a membrane investing the body, immediately under the cutis; supposed to be the basis of the fat, which is lodged in the spaces between its fibres, and in peculiar cells formed herein.

Anatomists are divided as to the reality of this membrane; most of the later writers taking it to be no other than the exterior membrane of the *membrana carnea*, or *musculorum communis*.

Vasa ADIPOSA, fat-vessels, making a part of the substance of the omentum, or caul. See **OMENTUM**.

ADIPOSE Cells, *Cellule ADIPOSEÆ*, or *Loculi ADIPOSI*. See **CELLULÆ ADIPOSEÆ**.

ADIPOSE Ducts, *Ductus ADIPOSI*. See **DUCTUS ADIPOSI**.

Malpighi starts a doubt whether the *Adipose ducts* may not be propagated from the fibres which abound in the spleen; or those fibres from them?—As also whether there be not a yet undiscovered communication between the omentum and the *membrana Adiposa*?

ADIPOSUS, fat, or fatty. The word is chiefly used in anatomy, as an epithet of certain cells, ducts, membranes, and vessels.

ADIT of a Mine, the hole, or aperture whereby it is entered and dug, and by which the water and ores are carried away. See **MINE**.

ADJUDGING, in law, the act of passing a determinate sentence in behalf of a person. See **ADJUDICATION**.

ADJUDICATION, the act of adjudging the property of a thing to a person by a legal sentence, decree, or judgment.

ADJUDICATION is more particularly used for the addition, or configning a thing sold by auction, or the like, to the highest bidder.

ADJUNCT, **ADJUNCTUM**, in philosophy, something joined or superadded to a being from without. See **ADJUNCTION**. Or, an *Adjunct* is an additament or accession to a thing, not essentially belonging to it, but only accidental thereto.

There are two kinds of *Adjuncts*; the one, a substance (whether spirit or body) accidentally superadded to another, as its subject.—Such is water in a sponge, or vessel, and such is the soul in the body.

The second an attribute, or mode, accidentally likewise peradded to a substance; whether body or spirit.—Such is figure in a body, knowledge in the mind, &c.

Some divide *adjuncts* into *Absolute*; which agree to the whole thing, without any limitation: thus, passions are *absolute Adjuncts* of a man.—And *limited*; which only agree to their subject in a respect of some certain part thereof: thus, man only thinks, considered as to his mind; only grows, as to his body, &c.

In ethics, we usually reckon seven *Adjuncts*, popularly called *circumstances*; *Quis, quid, ubi, quibus auxiliis, cur, quomodo, quando*.

ADJUNCTS, in rhetoric and grammar, are certain words or things added to others; to amplify the discourse, or augment its force.

Such are adjectives, attributes, and epithets, which are added to substantives, subjects, &c. to express their nature, qualities, accidents, &c.

Arguments drawn from *Adjuncts*, are supplements or reinforcements of the proof arising from the circumstances of the fact.

ADJUNCT, is also used in civil concerns, for a colleague, or fellow-officer, associated to another, to assist him in his ministry, and share the functions thereof. See **COLLEAGUE**.

ADJUNCTION, the act of joining, or adding of one thing to another.

All *Adjunction* implies a subordination.—The *Adjunct* is for the sake of the thing it is joined to, not contrary-wise; as, the clothes for the man; not the man for the clothes.—Whatever is a part of a thing, cannot be called an *Adjunct* of it.

There are various species of *Adjunction*; viz. by adhesion, by apposition, adjacency, accubation, incubation, imposition, affection, &c. See **ADHESION**.

ADJURA REGIS, is a writ that lies for the king's clerk, against him that sought to eject him, to the prejudice of the king's title in right of his crown.

ADJURATION*, a part of exorcism, wherein the devil is commanded in the name of God, to depart out of the body of the possessed, or to declare something.

* The word is Latin, formed of *adjurare*, to adjure; *ad*, to; and *jurare*, to swear. See **CONJURATION**.

ADJUTAGE. See the article **ADJUTAGE**.

ADJUTANT, in the military art, an officer in the army, whose business it is to aid and assist the major.

Adjutant is the name that we otherwise call *Aid-Major*.

ADJUTANT is sometimes also used by the French for an *Aid de Camp*.

The word is formed of the latin *adjutare*, to help, to assist.

ADJUTORIUM*, in anatomy, the humerus, or shoulder-bone. See **HUMERUS**.

* It is thus called from *adjutare*, to help; on account of its office in lifting the arm up.

ADMEASUREMENT, ADMENSURATIO, in law, a writ which lies for the bringing those to reason, or mediocrity, who usurp more of any thing than their share.

This writ lies in two cases; termed,

ADMEASUREMENT of Dower, Admensuratio dotis, where the widow of the deceased holds more from the heir or his guardian, on account of her dower, than of right belongs to her. And,

ADMEASUREMENT of Pastures, Admensuratio Pasturae; this lies between those who have common of pastures appendant to their freehold, or common by vicinage, in case any of them purchase the common with more cattle than they ought. See **COMMON**.

ADMINICLE, or ADMINICULE, ADMINICULUM, a termed used in some ancient statutes, for aid, help, or support.

In the French jurisprudence, *Adminiculum* signifies the beginning of a proof; an imperfect proof; or a circumstance or conjecture, tending to form or fortify a proof.

Among antiquaries, the term *Adminicules* is applied to the attributes, or ornaments wherewith Juno and some other figures are represented on medals.

ADMINISTRATION, imports the government, or direction of affairs; and particularly the exercise of distributive justice.

Indolent princes confide the *Administration* of public affairs to their ministers.—Civil wars are usually raised on pretence of *mal-administration*; or of abuses committed in the exercise of justice, &c.

ADMINISTRATION, in the English law, signifies the act, or office of an administrator, in managing and disposing of a man's goods, or estate, that died intestate, or without any will; with an intent to give an account thereof.

In this case, instruments, or powers, called letters of *Administration*, are taken out in the prerogative court.

ADMINISTRATION is sometimes also used for the direction of the affairs of a minor, a pupil, a lunatic, or the like.

ADMINISTRATION is also used in respect of ecclesiastical functions.—The parson has the *Administration* of the sacraments in his parish.—*Administration* of the Eucharist is prohibited to persons excommunicate.

In beneficiary matters, they distinguish two kinds of *Administration*; *temporal*, which relates to the temporalities of a benefice, diocese, &c. and *spiritual*, to which belong the power of excommunicating, &c.

ADMINISTRATOR, in law, he to whom the ordinary commits the *Administration* of the goods of a dead man, in default of an executor.

An action lies for, or against an *Administrator*, as for, or against an executor; and he shall be accountable to the value of the goods of the deceased, and no further.—Unless there be waste, or other abuse chargeable on him. If the *Administrator* die, his executors are not *Administrators*; but the court is to grant a new administration.—If a stranger, who is neither *Administrator*, nor executor, take the goods of the deceased, and administer; he shall be charged, and sued as an executor, not as an *Administrator*.

If a woman have goods thus committed to her charge, or administration, she is called *Administratrix*; and is accountable, &c. in like manner as an *Administrator*.

ADMIRAL, ADMIRALIS, ADMIRALLUS, a great officer, who commands the naval forces of a kingdom or state, and takes cognizance by himself, or officers appointed by him, of all maritime causes.

Authors are divided about the origin and denomination of this important officer, whom we find established, with some variation, in most kingdoms that border on the sea.—Some borrow it from the Greeks; the captain of the seas, under the emperors of Constantinople, being called *Amiralius* or *Amiralis*, of ἀμειραλιος, saline; or ἀμιρ, salt water; and *αρχη*, princeps; in regard his jurisdiction lay on the sea, which the Latin calls *Jalium*.—But it is to be observed, that this officer had not the supreme administration of naval affairs; that immediately belonged to the *Dux Magnus*, or grand general; to whom the *Amiralius* was subordinate, in quality of *Protocoenes*, first count, or associate.

Others derive the name from the Arabic *Amir*, or *Emir*, lord; and the Greek ἀμιρ, marine, q. d. chief of sea affairs; and accordingly we find *Emir* in Zonaras, Cedrenus, Nicetas, and other Greeks of that time, used in the sense of a commander.—Add, that in the life of St. Peter Thomaſius, we meet with *Admiratus Jerusalem*, for the governor of Jerusalem, under the foldan of Egypt. And hence, some will have both the name, and the dignity of oriental, and even Sarazen extraction; in effect, there are no instances of *Admirals* in this part of Europe, before the year 1284; when Philip of France, who had attended St. Louis to the wars against the Sarazens, created an *Admiral*.—To say no more, Du Cange assures, that the Sicilians were the first, and the Genoese the next after them, who gave the denomination *Admiral* to the commanders of their naval armaments; and that they took it from the Sarazen, or Arabic *Amir*, a general name for any commanding officer.—The first *Admiral* we read of in our English affairs, was under Edward I.

The Lord High **ADMIRAL of England**, in some ancient records called *Copiteus Marinorum*, is judge, or president of the court of admiralty.

He takes cognizance, by himself, his lieutenant, or deputies, of all crimes committed on the sea, or the coast thereof; and all the civil, and marine transactions relating thereto: as also of what is done in all great ships, riding in any great river, beneath the bridges thereof next the sea.

Anciently, the *Admiral* had also jurisdiction in all causes of merchants, and mariners' not only on the sea, but in all foreign parts.—We have had no *High Admiral* for some years; the office being put in commission, or under the administration of the lords *Commissioners of the Admiralty*. See **COMMISSION**, &c.

ADMIRAL is also used for the commander in chief of a single fleet, or squadron.

Thus, we say, the *Admiral* of the red; the *Admiral* of the white; and *Admiral* of the blue. See **SQUADRON** and **NAVY**. The term **ADMIRAL** is also applied to all flag-officers: in which sense it includes *Vice-Admirals*, and *Rear-Admirals*. See **FLAG-Officer**.

Rear-ADMIRAL, } See { *Rear-Admiral*
Vice-ADMIRAL, } See { *Vice-Admiral*

Vice-ADMIRAL, is also an officer appointed by the lord *High-Admiral*, in divers parts of the kingdom, with judges and marshals subordinate to him; for the exercising of jurisdiction in maritime affairs, within his respective limits.

There are upwards of twenty *Vice-Admirals*.—From their decisions and sentences, appeal lies to the court of *Admiralty* in London.

There are also *Admirals of the Gallies*. See **GALLEY**. Montfletet makes mention of an *Admiral of the Archers*, or cross-bow-men. See **ARBALET**.

ADMIRAL, is likewise the name of the principal vessel of a fleet, which carries the *Admiral* on board.

When

When two ships of war, bearing the same colours, meet in the same port; that which arrived first, has the title and prerogative of *admiral*; and the other, though of greater strength and rate, shall only be accounted *Vice-Admiral*.—It is pretty much the same with the vessels in the cod and whale fishery. That which arrives first, in any harbour or creek of Newfoundland, takes the title and quality of *Admiral*, which it retains during the whole fishing season.—Such ship may secure to himself so much beech, or flakes, or both, as are necessary for the number of boats he shall use, with an overplus of one boat only more than he uses.—The master of the second ship is *Vice-Admiral*; and the master of the third *Rear-Admiral*. See FISHERY.

ADMIRAL'S COURT, or the *High Court of ADMIRALTY*, is a court held by the *High Admiral*, or commissioners of the admiralty; to which belongs the decision of all maritime controversies, trials of malefactors, and the like.

The proceedings in this court, in all civil matters, are according to the civil law; because the sea is without the limits of the common law, and under the *Admiral's* jurisdiction.

In criminal affairs, which ordinarily relate to piracy, the proceedings in this court were anciently likewise by information and accusation, according to the civil law; but that being found inconvenient, in regard no person could be convicted without either their own confession, or an eye-witness of the fact, so that the greatest offenders often escaped with impunity: there were two statutes made by Henry VIII. enacting, that criminals should henceforth be there tried by witnesses and a jury; and this by special commission from the king to the *Lord Admiral*: wherein some of the judges of the realm are always to be commissioners; and the trial according to the laws of England, directed by those statutes.

The court of *Admiralty*, is said to have been first erected in 1357, by king Edward III.—To the civil law, first introduced in it by the founder, were afterwards added, by his successors, particularly Richard I. the laws of Oleron; and the marine uses and constitutions of several people; as those of Genoa, Pisa, Marseilles, Messina, &c.

Under this court is also a court-merchant, or court of equity; wherein all differences between merchants are decided, according to the rules of the civil law.

Between the courts of *Admiralty* and common law, there seems to be *division imperium*; for the sea, so far as the low-water mark, is accounted *infra corpus comitatus adjacentis*; and the causes thence arising are determinable by the common law: yet when the sea is full, the *Admiral* has jurisdiction there also so long as the sea flows, over matters done between the low-water mark and the shore.

ADMIRALTY.—*Court of ADMIRALTY, Commissioners of the ADMIRALTY, &c.* See *ADMIRAL'S COURT, &c.* Among the Hollanders, the five *Admiralties*, are so many chambers, composed of the deputies of the nobles, the provinces, and the towns; to whom belong the equipping out of fleets, the furnishing provisions for them; and directing what relates to maritime matters.

ADMIRATION, in grammar, a note, or character, intimating something worthy to be admired, or wondered at.—It is expressed thus (!). See CHARACTER.

ADMISSION, *ADMISSIO*, in the ecclesiastical law, an act whereby a bishop, upon examination, admits or allows a clerk to be able, or competently qualified for the office; which is done by the formula *Admitto te habilem*.

ADMITTENDO Clerice, is a writ granted to him who hath recovered his right of presentation against the bishop in the common pleas.

ADMITTENDO in Socium, is a writ for the association of certain persons to justices of assize formerly appointed. See JUSTICE, and ASSIZE.

ADNATA, in anatomy, a thick white membrane, investing the ball of the eye; and making the outermost coat thereof: called also *conjunctiva*.

It is the *tunica Adnata* that makes what we commonly call the *white of the eye*; whence it is also called the *Albuginea*. See ALBUGINEA, and EYE.

AD OCTO, *q. d.* to the eighth number; a term used by some ancient philosophers, to denote the highest, or superlative degree: because in their way of distinguishing qualities, they reckoned no degree above the eighth.

ADOLESCENCE *, **ADOLESCENTIA**, the state of growing youth; or that period of a person's age commencing from his infancy, and terminating at his full stature or manhood.

* The word is formed of the latin *adolescere*, to grow.

The state of *Adolescence* lasts so long as the fibres continue to grow, either in magnitude or firmness.

It is commonly computed to be between 15 and 25, or even 30 years of age; though in different constitutions its terms are very different.—The Romans usually reckoned it from

12 to 25 in boys; and to 21 in girls, &c.—And yet, among their writers, *Juventus* and *Adolescentia* are frequently used indifferently, for any person under 45 years.

The fibres being arrived at the degree of firmness, and tension sufficient to sustain the parts, no longer yield and give way to the efforts of the nutritious matter, to extend them: so that their further accretion is stopped from the very law of their nutrition.

ADONIA, in antiquity, solemn feasts, in honour of Venus, and in memory of her beloved Adonis.

They were begun by the women; who imitated the cries and lamentations of Venus, for the death of her paramour.

—When they were well weary of this, they changed their note, and sung his praises, and made rejoicings, as if he were raised to life again: or rather, according to Meursius, these two offices made two distinct feasts, which were held at different times of the year, the one six months after the other; Adonis being supposed to pass half the year with Proserpine, and half with Venus.

ADONIC, in poetry, denotes a short kind of verse, consisting of a dactyl, and a spondee, or trochee.—As *Rara juvenus*.

It takes its name from Adonis; as having been originally used in the Threne, or lamentations for that favourite.

The chief use of the *Adonic* verse is at the end of each strophe of Sapphic verse; or among Aristophanic Anapaests in the ancient tragedy.

ADOPTIANI, in church-history, a sect of heretics in the eighth century, whose distinguishing tenet was, that Christ, as to his human nature, was not the proper, or natural, but only the adoptive son of God.

The *Adoptiani* had their rise under the empire of Charlemain about the year 783; when Elipand, arch-bishop of Toledo, having consulted Felix, bishop of Urgel, about the manner of the filiation of Christ, received for answer, that Christ, in respect of his divine nature, is the true and proper son of God, begotten naturally by the father; but that the man Christ, or the son of Mary, was only the adoptive son of God: to which Elipandus also subscribed.

ADOPTION *, **ADOPTIO**, an act by which any one takes another into his family, owns him for his son, and appoints him his heir.

* The word is derived from *adoptare*; whence the latin barbarous *adobare*, to make a knight: and hence also, *miles adobatus*, a knight newly made, or dubbed; he who knighted him, being supposed in some sense to *adopt* him.

The custom of *adopting* was very familiar among the ancient Romans, who had an express formula for it.—They first learnt it from the Greeks, among whom it was called *iovanis*, filiation.

As *Adoption* was a sort of imitation of nature, intended for the comfort of those who had no children; eunuchs were not allowed to adopt; as being under an actual impotency of begetting children.

Neither was it lawful for a young man to *adopt* an elder; because that would have been contrary to the order of nature; but it was even required, that the person who *adopted*, should be eighteen years older than his adoptive son; that there might at least appear a probability of his being the natural father.

The Romans had two forms of *Adoption*; the one before the pretor: the other at an assembly of the people, in the times of the commonwealth, and afterwards by a rescript of the emperor.

In the first, the natural father addressed himself to the pretor, declaring that he emancipated his son, resigned all his authority over him, and consented he should be translated into the family of the adopter.

The latter manner of *Adoption* was practised, where the party to be adopted was already free; and this was called *Adrogation*.

The person adopted changed all his names; assuming the prename, name, and surname of the person who adopted him.

The Romans had likewise their *testamentary Adoptions*, wherein persons were adopted by the last will of the deceased; but these were never esteemed valid, till they had been confirmed by the people.

In later times another form of *Adoption* took place; *viz.* by cutting off the hair of a person, and delivering it to the father that was to adopt him.

It was this way that pope John VIII. adopted Boson king of Arles; which perhaps is the only instance in history of *Adoption* in the order of ecclesiastics; a law that professes to imitate nature, not daring to give children to those in whom it would be thought a crime to beget any.

M. Bouffac, in his *Noctes Theologicae*, gives us divers modern forms of *Adoption*; some performed at baptism; others by the sword, &c.

ADOPTIVE, **ADOPTIVUS**, or **ADOPTITIUS**, denotes a person adopted by another.

Adoptive children, among the Romans, were on the same footing

footing with natural ones; for which reason, they were either to be infituted heirs, or expressly disinherited; otherwise the testament was null.

The emperor Adrian preferred *Adoptive* children to natural, ones; by reason we chuse the former, but are obliged to take the latter at random.

M. Menage has published a book of eloges, or verses addressed to him; which he calls *Liber Adoptivus*, an *Adoptive* book; and adds it to his other works.—Heinhus, and Furtenburg of Munster, have likewise published *Adoptive* books.

ADOPTIVI, in church-history. See ADOPTIANI.

ADORATION *, the act of rendering divine honours; or of addressing God, or a being, as supposing it a God. See GOD, and WORSHIP.

* The word is compounded of *ad*, to; and *os*, *oris*, mouth; and literally signifies, to apply the hand to the mouth; *Moxum ad os obsecrare*, *q. d.* to kiss the hand: this being, in the eastern countries, one of the great marks of respect and submission.

The Adoration of idols is called *Idolatry*.

The Romanists profess a subordinate Adoration to saints, images, relics, the cross, &c.

The election of popes is performed two ways, by Adoration and by scrutiny.—In the election by Adoration, the cardinals rush hastily, as if agitated by some spirit, and fall without more ado to the Adoration of some one among them, and proclaim him pope.

In the election by scrutiny, Adoration is the last thing, and follows the election; as in the other it is the election itself, or rather supercedes the election.

AD PONDUS Omnium, to the weight of the whole; an abbreviation among physicians, &c. signifying, that the last prescribed ingredient is to weigh as much as all the others put together.

AD QUOD Damnum, a writ directed to the sheriff, commanding him to enquire what hurt may befall the king by granting a fair, or market in any town, or place.

The same writ also issues for an inquirer to be made of what the king, or other person may suffer, by granting lands in fee-simple to a convent, chapter, or other body politic; by reason such land falls into mortmain: that is, into such condition, that the chief lord loses all advantage of heriots, service of court, and escheats, upon any traitorous or felonious offence committed by the tenant: for that a body politic dies not, nor can perform personal service to the king, or their mesn lords; as single persons may do. See MORTMAIN.

ADRAGANTH, or TRAGACANTH, a sort of gum. See TRAGACANTH.

ADDRESS, or ADDRESS. See the article ADDRESS.

ADROGATION *, in antiquity, a species of adoption, whereby a person who was his own master, was taken by another into the relation of a son.

* The word is compounded of *ad*, to; and *rogare*, to ask; on account of a question put in the ceremony of it, whether the adopter, would take such person for his son? and another to the adoptive, whether he consented to become such a person's son?

AD TERMINUM *qui præterit*, is a writ of entry, which lies where a man, having leased lands or tenements for term of life, or years, is, after the term expired, held from them by the tenant, or other stranger who enjoys the same, and desorcteth the lessor.—The same writ also lies for the lessor's heir.

ADVANCE-FOSSE, or Ditch, in fortification, denotes a ditch of water round the esplanade, or glacis of a place; to prevent its being surpris'd by the besiegers. See FOSSE, and GLACIS.

ADVANCE-GUARD, or VAN-GUARD, is the first line, or division of an army ranged, or marching in battle-array; or that part of it which is next the enemy, or which marches first toward them.

The whole body of an army is divided into *Advance-guard*, *rear-guard*, and *main-body*.

The word is sometimes also applied to a small party of horse, *viz.* 15, or 20, commanded by a lieutenant, beyond, and in sight of, the main guard.

ADVANCER, among hunters, is one of the starts, or branches of a buck's attire, between the back antler and the palm.

ADVENT, ADVENTUS, in the calendar, the time immediately preceding Christmas; anciently employed in pious preparation for the *Adventus*, or coming on, of the feast of the nativity.

Advent includes four sundays, or weeks; commencing either from the Sunday which falls on St. Andrew's day, or that next before or after it, *i. e.* from the Sunday which falls between the 27th of November, and the third of December inclusive.—But it is to be noted, this rule has not always obtained.—In the Ambrosian office, there are six weeks marked

for *Advent*; and St. Gregory, in his Sacramentary, allow'd five.

The first week of *Advent*, in our way of reckoning, is that wherein it begins; but it was anciently otherwise; the week next Christmas being reputed the first; and the numeration carried backwards.

Great austerity was practis'd in the ancient church during this season.—At first they fasted three days a week; but they were afterwards obliged to fast every day: whence the season is frequently called in ancient writers, *Lent*, and *Quadragesima S. Martini*.

The courts of justice were at one time all shut.—In advent under king John, it was expressly declared, that *in Adventu Domini nulla Assisa capi debet*: but this was afterwards altered by the statute of Westminster; and it was made lawful, in respect of justice and charity, which ought at all times to be regarded, to take assizes of novel disseisin, mort d'ancestre, and darrein presentment, in the time of *Advent*, Septuagesima, and Lent.

ADVENT is also one of the times, from the beginning whereof, to the end of the octaves of the Epiphany, the solemnizing of marriage is forbid, without express licence. See MARRIAGE.

ADVENTITIOUS, something accruing, or befalling a person, or thing, from without.

Thus, *Adventitious* matter is such matter as doth not properly belong to any body, but is casually joined to it.

ADVENTITIOUS, in the civil laws, is applied to such goods as fall to a man, either by mere fortune, or by the liberality of a stranger, or by collateral, not direct succession.

In this sense the word stands opposed to *Profectitious*; by which are signified such goods as descend in a direct line, from father to son.

ADVENTREM *inspicendum*, in law. See VENTRE *inspicendum*.

ADVENTURE *, an extraordinary, and surprizing enterprise, or accident, either real, or fictitious.

* The word is French, and literally denotes an event, or accident.

Novels, romances, &c. are chiefly taken up in relating the *Adventures* of cavaliers, lovers, &c.

MINE-ADVENTURE. See the article MINE-Adventurer.

ADVERB, ADVERBIUM, in grammar, a particle joined to a verb, adjective, or participle, to explain their manner of acting or suffering; or to mark some circumstance or quality signified by them.

The word is formed from the preposition *ad*, to; and *verbum*, a verb, and signifies literally a word joined to a verb, to show how, or when, or where, one is, does, or suffers: as the boy paints neatly, writes ill; the house stands there, &c.

Not that the *Adverb* is confined purely to the verbs; but because that is its most ordinary use. Whence it becomes so denominated *verbi significans*. We frequently find it joined to adjectives, and sometimes even to substantives, particularly where those substantives signify an attribute, or quality of the thing spoken of: *v. gr.* he is very sick; he is truly king.

An *Adverb* is likewise joined sometimes to another *Adverb*, to modify its meaning: *v. g.* very devoutly, &c. Whence some grammarians chuse rather to call *Adverbs* modificatives; comprising under this one general term, both *Adverbs*, conjunctions, prepositions, and even adjectives.

Adverbs are very numerous, but they may be reduced under the general classes of *Adverbs* of time, of place, of order, of quantity, of quality, of manner, of affirmation, of doubting, and of comparison.

ADVERSARIA, among the ancients, was used for a book of accounts, like our journal or day-book.

Hence, ADVERSARIA is sometimes also used among us for a common-place-book.

ADVERSARY *. See ANTAGONIST.

* The word is formed of the Latin preposition *adversus*, against; from *ad*, to; and *versare*, to turn.

ADVERSATIVE, in grammar.—A particle *Adversative*, is that which expresses some difference, or opposition between what goes before, and what follows.

Thus, or is an *Adversative*; *v. gr.* in yes, or no.

ADVERTISEMENT *, an intelligence, or information, given to persons interested in an affair.

* The word is formed either of the French *Avertissement*, or from the Latin *advertire*, to turn to, to advert, consider, regard.

ADULT *, ADULTUS, one who is arrived at years of discretion; and entered upon manhood, or the age of adolescence; and is old enough to have understanding, and discernment.

* The word is formed from the participle of the verb *adolescere*, to grow up. See ADOLESCENCE.

There is a notable difference between the proportions of infants and Adults.—A man, M. Dodart observes, formed like a fetus, would be a monster, and would scarce be acknowledged

ledged for one of the species.—The Anabaptists confer the sacrament of baptism upon none but *Adults*. See BAPTISM, and ANABAPTIST.

ADULTERATION*, in a general sense, the act of corrupting, or debasing a thing that was pure, by some improper admixture.

* The word is Latin; formed of the verb *adulterare*, to corrupt, by mingling something foreign (*ad alterum*, to another) to any substance.

We have laws against the *Adulteration* of coffee, tea, tobacco, snuff, wine, wax, hair-powder, &c.

To adulterate or debase the current coin, is a capital crime in all nations.—The ancients punished it with great severity; among the Egyptians both hands were cut off; and by the civil law, the offender was thrown to wild beasts: The emperor Tacitus enacted, that counterfeiting the coin should be capital: and under Constantine it was made treason, as it is also among us. *Arbuth. Diff.* p. 8.

ADULTERINE, in the civil law, is particularly applied to a child issued from an adulterous amour, or commerce.

Adulterine children are more odious than the illegitimate offspring of single persons.—The Roman law even refuses them the title of natural children; as if nature disowned them.

ADULTERY, ADULTERIUM, (in ancient law-books called **ADVOURY**) a crime committed by married persons, against the faith pledged to each other in marriage; by having carnal commerce with some other: or even by a person not married; by having to do with another that is.

The ancient Romans had no formal law against *Adultery*; but both the accusation, and punishment were arbitrary.—The emperor Augustus was the first who brought them into a law; which he had the misfortune to see executed in the persons of his own children.—This was the Julian law, by which *Adultery* was punished with death. But though this law left the accusation of *Adultery* open to every body; yet it is certain, *Adultery* has been always looked upon as a private, and domestic crime, rather than a public one; so that strangers were seldom suffered to prosecute, especially where the couple were peaceable, and the husband made no complaint.

Some of the succeeding emperors abrogated this law, which left the accusation of *Adultery* open to strangers; in regard such accusation could not be entered without setting the husband, and wife at variance, throwing the children into a state of uncertainty, and bringing contempt and derision upon the husband; for as the husband is the nearest interested in the matter, it is supposed he will examine his wife's actions with more circumspection than any other: so that where he is silent, it is not fair any body else should speak for him.

For this reason, the law, in some cases, has made the husband both judge, and executioner in his own cause; and has allowed him to revenge himself of the injury, by taking away the lives of the adulterers whom he should apprehend in the act.—It is true, where the husband made a trade of his wife's infamy, or where having seen her shame with his own eyes, he yet suffered patiently, and dissembled the affront; in these cases, *Adultery* became a crime of public concern; and the Julian law provides punishment for such husbands, as well as for their wives.

In most European countries, at this day, *Adultery* is not a public crime; and none but the husband is suffered to intermeddle, excepting where the scandal is very notorious.—Even the king's advocates, attorney, or the like, may not intermeddle.

Add, that though the husband who violates the conjugal bond be guilty of *Adultery* as well as the wife, yet is not the wife allowed to accuse, or prosecute him for the same.

Socrates relates, that under the emperor Theodosius, in the year 380, women convicted of *Adultery* were punished by a public constupration.

Lycurgus punished the adulterer as a parricide.—The Locrisians tore out his eyes; and most of the orientals still punish him very severely.

The Saxons formerly burnt the adulterers, and over her ashes erected a gibbet, whereon the adulterer was hanged.—In England, king Edmond punished *Adultery* as homicide; but Canutus ordained the man to be banished, and the woman to have her nose and ears cut off.—*Qui uxoratus faciet Adulterium, habet rex vel dominus superiorem; Episcopus inferiorem.* L. Hen. I. c. 12. *De Adulterio per totam Chent (Cantium) habet Rex hominem, Episcopus mulierum.* Domest. day, tit. Cestre Civi.

In Spain, they punished *Adultery* in men by cutting off that part which had been the instrument of the crime.

In Poland, before Christianity was established, they punished *Adultery* and fornication in a very particular man-

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ner: the criminal they carried into the market-plate, and there fastened him by the testicles with a nail; laying a razor within his reach, and leaving him under a necessity, either of doing justice upon himself, or of perishing in that condition.

By the civil law, as altered by Justinian, who, at the instance of his wife Theodora, mitigated the severity of the *lex Julia*, *Adultery* is punished with whipping, and shutting up in a convent for two years: during which time, if the husband do not consent to take her back again, she is thence and shut up for life.—This is called *authentizing*, as having been established by an authentic.

At present, the laws are still more favourable.—To divorce, and strip the adulterers of her dower, is all her punishment among us: in the Romish countries, they also shut her up in a nunnery.—The whipping is omitted in France, to make the husband less averse to take her back again within the two years.

The Lacedaemonians, instead of punishing *Adultery*, permitted it, or at least tolerated it; as we are told by Plutarch.

According to some of the papal decisions, *Adultery* renders marriage between the two criminals unlawful; this making what the schools call *impedimentum criminis*.

The Greeks, and other Christians throughout the east, adhere to the opinion that *Adultery* dissolves the bond of marriage: so that the husband, without more ado, may marry another.—The council of Trent condemns that opinion; and even in some measure anathematizes those who hold it. *Seff. XXIV. Can. 7.*

ADULTERY is also used by some fanciful astronomers and astrologers, for an eclipse of the sun, or moon; happening in an unusual, and; as they suppose, irregular manner: as in the case of horizontal eclipses; where, though the sun and moon be diametrically opposite, yet they appear as if both above the horizon at the same time.

ADVOCATE*, **ADVOCATUS**, among the Romans, a person skilled in their law, and who undertook the defence of caecis at the bar.

* The word is compounded of *ad*, to; and *vocare* to call: *g. d. I call to my aid, or defence.*

The Roman *Advocates* answered to one part of the office of a barrister among us, *viz.* the pleading part; for as to the giving counsel, they never meddled with it: that being the business of the juriconsulti.

The Romans, in the first ages of their state, held the profession of an *Advocate* in great honour; and the seats of their bar were crowded with senators, and consuls; they, whose voices commanded the people, thinking it an honour to be employed in defending them.

They were titled, *Comites, Honorati, Clarissimi*, and even *Patroni*; as if their clients were not less obliged to them, than freedmen to their masters. See **PATRON**, and **CLIENT**.

The bar was not at that time venal.—Those who aspired to honours, and offices, took this way of gaining an interest in the people, and always pleaded *gratis*.

But no sooner was luxury and corruption brought into the commonwealth, than the bar became a sharer in them.—Then it was that the senators let out their voices for pay, and zeal and eloquence were sold to the highest bidder.—To put a stop to this abuse, the tribune Cincius procured a law to be passed, called from him, *Lex Cincia*, whereby the *Advocates* were forbid to take any money of their clients.—Fred. Brunnerus has published an ample comment upon this law.

It had before this been prohibited the *Advocates* to take any presents, or gratuities for their pleading.—The emperor Augustus added a penalty to it: notwithstanding which, the *Advocates* played their part so well, that the emperor Claudius thought he did a great thing, when he obliged them not to take above eight great sesterces, which are equivalent to upwards of 64 pounds sterling, for pleading each cause.

ADVOCATE is still used in countries, and courts, where the civil law obtains, for those who plead and defend the causes of clients trusted to them.

In Scotland they have a college, or *Faculty of Advocates*, 180 in number; appointed to plead in all actions before the lords of session.—They have a dean, treasurer, clerks, examiners, and a curator of their library.

By the articles of the union, none are to be named ordinary lords of session, except those who have been *Advocates*, or principal clerks of session for five years, &c.

In France, they have two kinds of *Advocates*, *viz.* pleading *Advocates, Advocats Plaidants*; and counsel *Advocates, Advocats Consultants*.

This distinction was formed with a view to the two branches among the Romans, *Advocati*, and *Juriconsulti*.—Yet there is this difference, that the function of the *Juriconsulti*, who only gave their bare advice, was of a different kind from that of the *Advocati*; being a sort of private, and perpetual

magistrate, principally under the first emperors; and the *Advocati* never became *Jurifconfulti*. Whereas, on the other hand, in France, after the *Advocates* have attained to reputation, and experience enough at the bar, they quit so buily a province, and become as it were chamber council.—They have also their *Advocate* general, and king's *Advocate, Avocat du Roy*.

LORD ADVOCATE, in Scotland, is one of the officers of state, whose business is to give his advice about the making, and executing of laws; to defend the king's right and interest in all public meetings; to prosecute all capital crimes before the judiciary; and to concur in all pursuits before sovereign courts for breaches of the peace; and also in all matters wherein the king, or his donator, has interest.—He intends no process of treason, except by warrant of privy council.

The *Lord Advocate* is sometimes an ordinary lord of session; in which case, he only pleads in the king's causes: otherwise, he is at liberty to plead in all causes.

FISCAL ADVOCATE, Fisci ADVOCATUS, was an officer instituted by the emperor Adrian, to defend the cause, and interests of the *Fiscus*, or private treasury; in the several tribunals where that might be concerned. See **FISCUS**.

CONSISTORIAL ADVOCATE, is an officer of the court of Rome, whose business it is to plead on the oppositions made to the provisions of benefices in that court. See **PROVISION**. There are ten of these in number.

ADVOCATE of a City, or Town, is a magistrate established in several places of Germany, for the administration of justice in that city, in the emperor's name. See **ADVOWEE**.

ADVOCATE*, is more particularly used in church history, for a person appointed to defend the rights and revenues of a church, or religious house.

* In this sense it amounts to the same with *Advocatus, Defensor, Conservator, Oeconomus, Causidicus, Mundibardus, Tutor, Aitor, Lay Pastor, Vidams, or Scholasticus*.

The word *Advocatus*, or *Advocatus* is still retained, for what we usually call the *Patron*, or he who has the advowion, or right of presentation in his own name.

The abbies and monasteries had also all their *Advocates*, or *Advocatus*.

ADVOCATIONE Decimarum, a writ which lies for the claim of the fourth part, or upward, of the tithes that belong to any church. See **TITHES**.

ADVOWEE*, in ancient customs and law-books, denotes the *advocate* of a church, religious house, or the like.

* The word is otherwise written *Advocatus, Avocatus, and Avocatus*; sometimes *Advocatus*; being derived from the French *Avouer*, to own, or acknowledge.

There were *Advocates* of cathedrals, abbies, monasteries, &c.—Thus, Charlemaign had the title of *Advocatus* of St. Peter's; king Hugh, of St. Riquier; and Bolandus mentions some letters of pope Nicholas, by which he constituted king Edward the confessor, and his successors, *Advocates* of the monastery at Westminster, and of all the churches in England.

These *Advocates* were the guardians, protectors, and, as it were, administrators of the temporal concerns of the churches, &c. and under their authority, were passed all contracts which related thereto.

It appears also, from the most ancient charters, that the donations made to churches, were conferred on the persons of the *Advocates*.—They always pleaded the causes of the churches in court, and distributed justice for them, in the places under their jurisdiction.—They also commanded the forces furnished by their monasteries, &c. for the war; and even were their champions, and sometimes stood duels for them.

This office is said to have been first introduced in the fourth century, in the time of Suloico; though the Benedictines do not fix its origin before the eighth century. *Act. Sanct. Benedicti*. S. III. P. 1. Pref. p. 91. &c.

By degrees, men of the first rank were brought into it, as it was found necessary, either to defend with arms, or to protect with power and authority. In some monasteries, they were only called *Conservators*; but these, without the name, had all the functions of *Advocates*.

There were also sometimes several *Sub-Advocates*, or sub-advocates in each monastery, who officiated instead of the *Advocates* themselves; which, however, proved the ruin of monasteries; those inferior officers running into great abuses.

Hence also, husbands, tutors, and every person in general, who took upon him the defence of another, were denominated *Advocates*, or *advocatus*.—Hence several cities had their *Advocates*; which were established long after the ecclesiastical ones, and doubtless from their example.—Thus, we read in history of the *Advocates* of Augsburg, of Arras, &c.

The vidames assumed the quality of *Advocates*; and hence it is, that several historians of the eighth century, confound the two functions together. See **VIDAME**.

Hence also it is, that several secular lords in Germany bear mitres for their crests, as having anciently been *Advocates* of the great churches.

Spelman distinguishes two kinds of ecclesiastical *Advocates*.—The one, of causes, or processes, *Advocati Causarum*, the other, of territory, or lands, *Advocati Sedi*. The former were nominated by the king, and were usually lawyers, who undertook to plead the causes of the monasteries.

The other, which still subsist, and are sometimes called by their primitive name, *Advocates*, though more usually patrons, were hereditary; as being the founders, and endowers of churches, &c. or their heirs. See **PATRON**.

Women were sometimes *Advocates, Advocatissa*. And, in effect, the canon law mentions some who had this title, and who had the same right of presentation, &c. in their churches, which the *Advocates* themselves had.

In a Stat. 25 Edw. III. we meet with *Advocatus Paramount*, for the highest patron; that is, the king.

There were also *Advocates* of counties, and provinces.—In a charter of the year 1187, Berthold duke of Zeringhen, is called *Advocatus* of Thuringia; and in the *Notitia* of the Belgic churches, published by Miraeus, the count of Lovain is styled count and *Advocatus* of Brabant.—In the eleventh and twelfth centuries, we also meet with the *Advocates* of Alstania, of Subbia, &c.

Raymond, d'Agiles relates, that after the recovery of Jerusalem from the Saracens, it being proposed to elect a king thereof, the bishops pleaded, *Non debere ibi eligi regem, ubi Deus passus & coronatus est*, &c. That "they ought by no means to appoint a king, in a place where God had suffered and been crowned; but should content themselves with electing an *Advocatus*, or advocate of the city, to take care of the garrison, &c."—In effect, Dodechin, a German abbot, who wrote a voyage to the Holy Land in the twelfth century, calls Godfrey of Bulloign, *Advocatus of the holy sepulchre*.

ADVOWING*, or **AVOWING, ADVOCARE**, in law, the justifying, or maintaining an act formerly done.

* Bracton, and other ancient lawyers, use the Latin term *Advocare*, in the same signification; as, *Advocatio diffinitive*, L. IV. c. 26. Calfaneus also uses the substantive *Dejavocamentum*, for a disavowing, or refusing to avow.

Thus, if one take a distress of rent, or other thing, and he that is distrained sues a replevin, the distrainer, justifying or maintaining the act, is said to *avow*.

The original use of the word was this.—When stolen goods were bought by one, and sold to another, it was lawful for the right owner to take them wherever they were found; and he in whose possession they were found, was bound, *Advocare*, i. e. to produce the seller to justify the sale, and for on till they came at the thief.

Afterwards, the term was applied to any thing which a man acknowledged to be his own, or done by himself; in which sense, it is mentioned by Fleta, L. I. pars 4. *Si vir ipsum in dono sua suscepit, nutritur & advocaverit filium suum*.

ADVOWSON, ADVOCATIO, the quality, or office of an *Advocatus*, or *advocate*.

ADVOWSON, or **ADVOWZEN**, in common law, signifies a right to present to a vacant benefice.

In this sense, the word imports as much as *Jus patronatus* in the canon law. See **PATRONAGE**.

The reason of the name *Advowson, Advocatio*, is, that anciently those who had a right to present to a church, were maintainers of it, or great benefactors to it; and were sometimes called *Patroni*, and sometimes *Advocati*, or *Advocates*.

In the general, an *Advowson* is where either a bishop, dean and chapter, or a lay-patron, have a right to present whom they please to any spiritual benefice, when it becomes void.

This *Advowson* is of two kinds.—*Advowson in gross*, that is, not immediately restrained, or adhering to any manor, as parcel thereof.

And *Advowson appendant*, which depends on a manor, as appurtenant to it.—This Kitchen calls an *Incident*, which may be separated from its subject.

Add, that as the builders and endowers of a church were the patrons of it; so those who founded any religious house, had the *Advowson* or patronage of it.

Sometimes the patron had the sole nomination of the prelate, abbot, or prior; either by investiture, (i. e. delivery of a pastoral staff) or by direct presentation to the diocesan: and if a free election was left to the religious, yet a *Consent d'Elire*, or licence of election, was first to be obtained of the patron, and the person elected was confirmed by him.

If the founder's family became extinct, the patronage of the convent went to the lord of the manor.—Unless the several colleges in the universities be restrained in the number of Advowsons they may receive; it is argued they will in time acquire such a stock, as to frustrate the design of their foundation (which is the education of youth) by creating too quick a succession of fellows; so that there will not be in the colleges a sufficient number of persons of sufficient age, knowledge and experience.

rience to instruct and form the minds of the youth.—In some colleges the number of *Adversations* is said to be already two thirds, or more of the number of fellows.—'Tis objected on the other side, that the succession of fellows may be too slow, as well as too quick; whereby persons well qualified may be detained too long in colleges, as not to have strength or activity enough left for the discharge of parochial functions. V. *Kenn. Paroch. Antiq. in voc.*

ADVOUWTRY. See the article **ADULTERY.**

ADUST*, **ADUSTUS**, among physicians, &c. is applied to such humours, as by long heat become of a hot, and fiery nature.

* The word is formed of the Latin *adure*, to burn.

Such is cholera supposed to be:—Melancholy is usually considered as black, and *adust* bile. Blood is said to be *adust*, when by reason of some extraordinary heat, its more subtle parts are all evaporated, leaving the grosser, with all the impurities therein, half torried, as it were.

ADYTUM*, *Adyton*, a secret, or retired place in the Pagan temples, where oracles were given, and into which none but the priests were admitted.

* The word, originally Greek, signifies inaccessible; being compounded of *α*, not; and *δω*, or *δωω*, to enter.

ADZE, or **ADDICE**, a cutting tool, of the ax-kind; having its blade made thin, and arching; and its edge at right-angles to the handle; chiefly used for taking thin chips of timber or boards, and for paring away certain irregularities which the ax cannot come at.

The *Adze* is used by carpenters, but more by coopers, as being convenient for cutting the hollow sides of boards, &c. It is ground from a base on its inside to its outer edge. So that when it is blunt, they cannot well grind it without taking its helve out of the eye.

AE, or **Æ**, a diphthong, or double vowel, compounded of A and E.

Authors, are by no means agreed as to the use of the *æ* in English words.—Some, out of regard to etymology, insist on its being retained in all words, particularly technical ones, borrowed from the Greek and Latin; while others, from a consideration that it is no proper diphthong in our language, its found being no other than that of the simple *e*; contend, that it ought to be intirely disused, except in words which retain the Latin and Greek form in every thing else.

For our own part, till the point is a little better settled, we must be continued to steer a kind of middle course; conforming ourselves to custom as nearly as may be.—Such articles, therefore, as are omitted under *Æ*, the reader may please to look for under *E*.

ÆACEA, in antiquity, solemn feasts and combats, celebrated in *Ægina*, in honour of *Æacus*, who had been their king, and who on account of his singular justice upon earth, was supposed to have a commission given him, to be one of the judges in hell.

ÆCHMALOTARCHA, *Αιχμαλωταρχης*, in antiquity, a Greek term, signifying, the chief, or leader of the Jewish captives in Babylonia.

The Jews, who refused to follow Zorobabel, and return with him to Jerusalem, after the Babylonish captivity, created an *Æchmalotarch*, to govern them.—Not that the Jews themselves called him by this name, as some authors have asserted; for that people spoke Hebrew, or Chaldee, not Greek. But Origen, and others, who wrote in the Greek tongue, rendered the Hebrew name *רֹאשׁ גָּלוּת* *Rosh galuth*, q. d. *Chief of the Captivity*, by a Greek name of the like import, *αιχμαλωταρχης*, formed from *αιχμαλωτες* captive, of *αιχμη*, point, spear, or war: and *αρχων*, commander, chief.

However, the Jews seemed to have had officers of this kind before the return from Babylon: witness the history of Sufannah; the two elders who condemned her, being supposed to have been *Æchmalotarchæ* that year.—The Jewish writers assure us, that the *Æchmalotarchæ* were only to be chosen out of the tribe of Judah.

ÆDES, in antiquity, a chapel, or inferior kind of temple, distinguished by this, that it was not consecrated by the Augurs, as those properly called temples were. See **TEMPLE.**

Such was the *Ævarium*, or treasury; called *Ædes Saturni*. See **ÆRARIVM.**

ÆDILE*, **ÆDILIS**, in antiquity, a Roman magistrate, vested with divers functions, chiefly that of superintending the buildings both public and private; as baths, aqueducts, roads, bridges, causeways, &c.

* The word is formed of *Ædes*, temple, or house, on account of their having the care of temples, houses, &c.

The *Ædiles* at Rome corresponded to what the Greeks called *Agoranomi*, and *Alynomi*; they differed from *Oeconomi* and *Arcarii*, who were rather receivers of the revenues; also from *Logistæ*, *Curatores* & *Patres civitatis*.

To the *Ædiles* belonged the inspection of the weights and measures. They fixed the rates of provisions, and took care the people were not exacted on therein. The inquiry and cognizance of debauches, and disorders in public houses, likewise belonged to them: they were also to revise comedies; and it belonged to them to treat the people with grand games, and spectacles at their own expence.

To the *Ædiles* also belonged the custody of the plebsita, and the censure and examination of Books. They had the power on certain occasions of issuing edicts; and by degrees they procured to themselves a considerable jurisdiction, the cognizance of various causes, &c.—This office ruin'd numbers by its expensiveness, so that in Augustus's time, even many senators declined it on that account.

All these functions, which rendered the *Ædiles* so considerable, belonged at first to the *Ædiles* of the people, *Ædiles plebeii*, or *minores*. These were only two in number; and were first created in the same year as the tribunes: for the tribunes, finding themselves oppressed with the multiplicity of affairs, demanded of the senate to have officers, whercon they might discharge themselves of matters of less importance; and, accordingly, two *Ædiles* were created. And hence it was, that the *Ædiles* were elected every year, at the same assembly as the tribunes.

But these plebeian *Ædiles*, having refused, on a signal occasion, to treat the people with shews; as pleading themselves unable to support the expence thereof: the patricians made an offer to do it, provided they would admit them to the honours of the *Ædilate*.

On this occasion, there were two new *Ædiles* created, of the number of the patricians, in the year of Rome 388. They were called *Ædiles curules*, or *maiores*; as having a right to sit on a *curule* chair, enriched with ivory, when they gave audience; whereas the plebeian *Ædiles*, only sat on benches. See **CURULE.**

Besides that the *curule Ædiles* shared all the ordinary functions with the plebeian, their chief employ was, to procure the celebration of the grand Roman games, and to exhibit comedies, shews of gladiators, &c. to the people.

To ease these four first *Ædiles*, Cæsar created a new kind, called *Ædiles cereales*, as being deputed chiefly to take care of the corn, which was called *donum Cereis*; for the heathens honoured Ceres as the goddess who presided over corn, and attributed to her the invention of agriculture. These *Ædiles cereales* were also taken out of the order of patricians. In the municipal cities there were *Ædiles*, with the same authority as at Rome.

We also read of an *Ædilis alimentarius*, expressed in abbreviation by *Ædil. alim.* whose business seems to have been to provide diet for those who were maintained at the public charge, though others assign him a different office.

In an ancient inscription we also meet with *Ædile* of the camp, *Ædilis castrorum*.

ÆGLOPS*, in medicine, a tumor, or rather ulcer, in the great angle of the eye; either with, or without an inflammation.

* The word in its original Greek, *αιγλωψ*, signifies a goat's eye; compounded of *αιξ*, goat, and *ωψ*, eye; in regard, goats are supposed extremely liable to this distemper.

Authors frequently use the words *Æglops*, *Anchlops*, and *Fistula Lachrymalis* promiscuously; but the more accurate, after *Ægineta*, make a difference.—The tumor, ere it becomes ulcerous, is properly called *Anchlops*; and, after it is got into the lachrymal passages, and has rendered the Os Lachrymale carious, *Fistula Lachrymalis*.

If the *Æglops* be accompanied with an inflammation; it is supposed to take its rise from the abundance of blood, which a plethoric habit discharges on the corner of the eye.—If it be without an inflammation, it is supposed to proceed from a viscid pituitous humour, thrown upon this part. The method of cure is the same as that of the Ophthalmia.

If the *Æglops* be neglected; it bursts, and degenerates into a fistula, which eats into the bone. See **FISTULA.**

ÆGIPAN*, in antiquity, a denomination given to Pan, and the Panes. See **SATYR.**

* The word is compounded of *αιξ*, *αιγος*, goat; he being represented with the horns, legs, feet, &c. of that animal.

The ancients also give the name *Ægipans* to a sort of monsters mentioned by Pliny, Solinus, and Pomp. Melæ, L. I. c. 8.—Salmasius, in his notes on Solinus, takes *Ægipan* to have signified the same in Lybia with *Sylvanus* among the Romans. See **SYLVAN.**

Vossius rejects the opinion, and shews, that the *Ægipans* had not faces like men, as the Sylvans had; but like goats. In effect, the whole upper part of the body resembled that animal; and as to the lower, they painted it with a fifth's tail. The monster represented on some medals of Augustus, by antiquaries called *Capricornus*; appears to be the true *Ægipan*.

ÆGIS, in the ancient mythology, a name given to the shield, or buckler of Jupiter, and Pallas.

The goat Amalthea, which had suckled Jove, being dead; that God is said to have covered his buckler with the skin thereof: whence the appellation *Ægis*, from *ais*, *aiyos*, she-goat.

Jupiter, afterwards restoring the beast to life again, covered it with a new skin, and placed it among the stars.

As to his buckler, he made a present of it to Minerva; whence that goddess's buckler is also called *Ægis*, in Virgil, *Æneid* L. VIII. v. 354, and 435; and by other authors.

Minerva, having killed the Gorgon Medusa, nailed her head in the middle of the *Ægis*, which henceforth had the faculty of converting into stone all those who looked thereon; as Medusa herself had done during her life. See Homer, *Iliad*. L. 5.

Others take the *Ægis* not to have been a buckler, but a cuirass, or breast-plate. And it is certain, the *Ægis* of Pallas, described by Virgil, *Æneid*. L. VIII. v. 435. must have been a cuirass; since the poet says expressly, that Medusa's head was on the breast of the goddess. But the *Ægis* of Jupiter, mentioned a little higher, v. 354. seems to have been a buckler. The words

*Cum sepe nigrantem
Ægida concutens dextra,*

agreeing very well to a buckler; but not at all to a cuirass, or breast-plate.

Servius makes the same distinction on the two passages of Virgil; for on v. 354, he takes the *Ægis* for the buckler of Jupiter, made as above mentioned of the skin of the goat Amalthea: and on verse 435, he describes the *Ægis* as the armour which covers the breast; and which in speaking of men is called *Cuirass*, and *Ægis* in speaking of the gods. Many authors have overlooked these distinctions for want of going to the sources.

ÆGYPTIACUM, in medicine, a name given to divers unguents of the detergent, or corrosive kind. See **UNGUENT**, &c.

We meet with a *black*, a *red*, a *white*, a *simple*, a *compound*, and a *magistral Ægyptiacum*.

The *simple Ægyptiacum*, which is that usually found in our shops, is a composition of verdigrise, vinegar and honey boiled to a consistence: the prescription is Meusie's.—It is usually supposed to take its name from its dusky colour, wherein it resembles that of the natives of Egypt.—It is improperly called an unguent; as there is no oil, or other fat in it. Some chuse to call it, *Mel Ægyptiacum*. It is chiefly used for eating off rotten flesh, and cleansing foul ulcers; particularly venereal ones in the throat, &c. It also destroys those cancerous excrescences apt to grow in children's mouths.

ÆNIGMA *, a proposition put in obscure, ambiguous, and generally contradictory terms, to puzzle, or exercise the wit, in finding out its meaning. Or, an obscure discourse, covering some common, and well known thing, under remote and uncommon terms.

* The word is Greek, *Ανιγμα* formed of *ανιμιθεαι*, *obscurè innuere*, to hint a thing darkly, of *αιωσι*, an obscure speech, discourse. The Latins sometimes call it *serpens*, *serpens*, or *serpens*, Gell. l. 12. c. 6. The popular with us name is *riddle*: from the Belgic *raeden*, or the Saxon *araethan*, to interpret.

Fran. Junius defines an *Ænigma* to be an obscure parable, or allegory; and makes two kinds: the one *greater*, rendering the sentence more intricate and knotty, by a multitude of words; the other *lesser*; consisting of only one or two remote words, or allusions; as in Isaiah, C. XI. 1. where Jesus Christ is called *ῥαβδ*, *serculus*, rod, or branch.

Fa. Bouhours, in the memoirs of Trevoux, defines an *Ænigma*, a discourse, or painting, including some hidden meaning, which is proposed to be guessed.

Painted Ænigma's, are representations of the works of nature, or art, concealed under human figures, drawn from history, or fable. Thus Jesus Christ, in the middle of the doctors, represents the bible, &c.

A *Verbal Ænigma* is a witty, artful and abstruse description of any thing. Bouhours.

Fa. Menestrier, has given us a learned treatise of *Ænigma's* and ænigmatistical figures.

The use of *Ænigma's* was very great among the Egyptians. That people, Gale observes, covered their doctrines, both of divine, human, and natural things, under this sort of disguises: thus some of the stars, Clemens Alexand. *Strom.* 5. observes, were, on account of their oblique motions, likened to serpents, the sun to a crocodile, a ship, &c.

Gale thinks they might borrow the custom from the Hebrews, among whom, it is certain the *Ænigmatist* way was not less in use. Witness Samson's riddle, *Judg.* XIV. 12.

13. *I will now put forth a riddle to you, &c. הוֹרֵה לִי. i. e. according to Vatable, an Ænigmatistical problem: the LXX render it, αἰνιγματικα. Out of the eater came forth meat, and out of the strong came forth sweetness.* Where, by eater and strong, is meant a lion; and by meat, honey.

Solomon is said to have been particularly skilful in the solution of *Ænigma's*, Joseph *Antiq.* Lib. V. c. 2. Clemens assures us, that the Egyptians plac'd Sphynxes before their temples; to inti-

mate that the doctrines of God and religion were *Ænigmatist* and obscure. See **HIEROGLYPHIC**.

ÆOLIC, or **ÆOLIAN**, in grammar, denotes one of the five dialects of the Greek tongue.

It was first used in Bœotia; whence it passed into Æolia, and was that which Sappho and Alcaeus wrote in.

The *Æolic* dialect generally throws out the aspirate or sharp spirit, and agrees in so many things with the *Doric* dialect, that the two are usually confounded together. See **DORIC**.

ÆOLIPILE *, **ÆOLIPILA**, a hydraulic instrument, consisting of a hollow, metalline ball, with a slender neck, or pipe arising from the same. This being filled with water, and thus exposed to the fire, produces a vehement blast of wind. See **WIND**.

* This instrument, Des Cartes and others have made use of, to account for the natural cause, and generation of wind.—And hence its name, *Æolipila*, q. d. *pila Æoli*, Æolus's ball; Æolus being reputed the god of the winds.

Sometimes the neck is made to screw into the ball, which is the most commodious way, because then the cavity may the more readily be filled with water: if there be no screw, it may be filled thus.—Heat the ball red-hot, and throw it into a vessel of water; the water will run in at the small hole, and fill about two thirds of the cavity.

If, after this, the *Æolipile* be laid on, or before, the fire; so that the water and vessel become very much heated; the water being rarified into a kind of momentary air, will be forced out with very great noise and violence; but it will be by fits, and not with a constant and uniform blast.

These phenomena the reader will be easily enabled to solve, from what is shewn under the articles, **AIR**, **WATER**, and **RAREFACTION**.

The air or vapour issuing out of the *Æolipile*, is found sensibly hot near the orifice; but at a farther distance, cold; like what we observe of our own breath: the cause of which is controverted.—The Corpuscularians account for it hence, that the fire contained in the rarified vapour, though sufficient to be felt near the orifice, disengages itself in the progress of the stream; and becomes insensible ere it be arrived at the journey's end. See **FIRE**.—The mechanical philosophers, on the other hand, hold that the vapour, at its exit from the ball, is endowed with that peculiar species of circular motion, which constitutes the quality heat; and that the further it recedes therefrom, the more is this motion destroyed, by the reaction of the contiguous air; till the heat at length becomes insensible. See **HEAT**.

Chauvin suggests some further uses of the *Æolipile*.—1^o, He thinks it might be applied instead of a bellows to blow the fire, where a very intense heat is required. 2^o, If a trumpet, horn, or other sonorous instrument were fitted to its neck, it might be made to yield music. 3^o, If the neck were turned perpendicularly upwards, and prolonged by a tube or hollow cylinder fitted to it, and a hollow ball laid on the orifice of the tube; the ball would be blown up, and kept fluctuating or playing up and down: as in the stream of a fountain. See **FOUNTAIN**.—And, 4^o, it might serve to scent, or fumigate a room, if filled with perfumed, instead of common water.

ÆON, **ΑΙΩΝ**, *age*; literally signifies the duration of a thing. Some ancient heretics have affixed another idea to the word *Æon*: in order to which, they have made use of the philosophy of Plato, giving reality to the ideas, which that philosopher had imagined in God; and even personifying them, and feigning them distinct from God, and to have been produced by him; some male, others female. See **IDEA**, and **PLATONISM**.

These ideas they call *Æons*; of an assemblage whereof they compose the deity, calling it *πνευμα*, a Greek word, signifying *substance*.

Simon Magus is said to have been the first inventor of these *Æons*; which were afterwards brought to perfection by Valentinus, who refining on those who had preceded him in this way, produced a long genealogy of *Æons*, to the number of 30. The first, and most perfect, he particularly denominates *Πρωτος*, *Proton*, that is, pre-existent; beside other names, the most usual whereof was that of *Bythos*, *Βυθος*, depth.

This *Bythos* he says continued long alone with *Ennoia*, *Εννοια*, thought; whom Valentinus also called *Χαρις*, grace, and *Σιγη*, silence. At length, *Bythos* with *Sige*, produced *Nous*, *Νους*, understanding, and *Αληθεια*, truth, her sister. *Nous* begat two *Æons*; *Λογος*, *Λογος*, word, and *Ζωη*, *Ζωη*, life: which two begot others, *Ανθρωπος*, *Ανθρωπος*, man, and *Εκκλησια*, church. And these eight *Æons* were the chief of all the rest.

The word, *Αγγελος*, and life, *Ζωη*, begot ten other *Æons*: Man and the Church begot twelve more; among whom were the Paraclete, Faith, Hope, Charity, the Perfect, *Τελειος*, and wisdom, *Σοφια*. And thus were 30 *Æons* made up; which all together made the *Pleroma*, *Πληρωμα*, or spiritual and invisible plenitude.

These 30 *Æons*, the Valentinians hold to have been figured by the 30 years of our Saviour's private life. See Gnostics.

ÆQUATION.
ÆQUATOR.
ÆQUILIBRIUM.
ÆQUINOX.
ÆQUINOCTIAL.
ÆQUIPOLLENT.
ÆQUIVALENT.
ÆQUIVOCAL.
ÆQUIVOCATION, &c.

See } **ÆQUATION.**
ÆQUATOR.
ÆQUILIBRIUM.
ÆQUINOX.
ÆQUINOCTIAL.
ÆQUIPOLLENT.
ÆQUIVALENT.
ÆQUIVOCAL.
ÆQUIVOCATION, &c.

ÆRA *, in chronology, a fixed point of time, from whence to begin a computation of the years ensuing.

* The word is sometimes also written in ancient authors, *Era*: its origin is contested, though it is generally allowed to have had its rise in Spain. Sepulveda supposes it formed from *A. ER. A.* the note or abbreviations of the words, *Annus. Era. Augusti*, occasioned by the Spaniards beginning their computation from the time their country came under the dominion of Augustus, or that of their receiving the Roman calendar. This opinion, however ingenious, is rejected by Scaliger, not only on account that in the ancient abbreviations *A* never stood for *Annus*, unless when preceded by *V* for *vixit*; and that it seems improbable they should put *ER* for *erat*, and the letter *A* without any discrimination both for *Annus* and *Augustus*. Vossius nevertheless favours the conjecture, and judges it at least as probable, as either that of Isidore, who derives *Era* from *Ær*, the tribute money, wherewith Augustus taxed the world: or that of Scaliger himself, who deduces it likewise from *Ær*, though in a different manner: *Ær*, he observes, was used among the ancients for an *article*, or *item*, in an account. And hence it came also to stand for a sum or number itself. From the plural *Æra*, came by corruption *Æra*, *Æraam*, in the singular; such as *Offia*, *Offiam*, the name of a place from *Offia*, the mouths of the Tyber. The opinion of Christmannus carries still less probability, who derives the word from the Arabic *Arach*, to compute; and the same may be said of that of H. Vossius, who supposes *Era* to be originally the same with *Hegira*, and to be derived from *Heger*, q. d. *stranger*; a name given by the Jews to Herod.

ÆRA is more particularly used in speaking of the ancient method of computing time among the Spaniards, which anticipated the common *Era* from the birth of Christ, by 37 years. See EPOCH.

* This is by some called the *Era of Cæsar*, by others the *Era of Æras*, by the later writers the *Spanish Æra*.

ÆRARIUM *, the public treasury of the Roman state. See FISCUS.

* The temple of Saturn at Rome, being the great treasury of the state, was first called *Ærarium*; from *Ær*, *Æris*, copper; that being the only money in use before the year of Rome 485.

It was first erected under Augustus, and maintained by a yearly voluntary contribution; but that proving insufficient, the twentieth part of all legacies and inheritances, except of such as fell to the next of kin or the poor, were consigned to this treasury.

For the custody hereof, three of the emperor's lifeguard were constituted *Præfæcti Ærarii*.

AERIAL, AERIUS, something that consists of, or has relation to, air. See AIR.

The Effeni, the most refined and rational sect among the Jews, held that the human soul consisted of an *aerial* substance.

Angels or spirits, whether good or evil, said sometimes to appear, are supposed to assume an *aerial* body, in order to become sensible.

Porphyry and Jamblicus admit a sort of Demons or *aerial* spirits, to which they give various names.

And the Rosicrucians, and other visionaries, fill the atmosphere with *aerial* inhabitants.

AERIAL Perspective, is that which represents bodies weakened, and diminished, in proportion to their distance from the eye. See PERSPECTIVE.

Aerial Perspective, has chiefly to do with the colours of objects, whose force and lustre it takes off more, or less, to make them appear as if more, or less, remote.

It is founded on this, that the longer column of air an object is seen through; the weaker do the visual rays emitted from it affect the eye.

AERIAN, AERIANI, in antiquity, a religious sect denominated from Aeriis, an Armenian priest of the fourth century.

The *Aerians* had much the same sentiments, in respect of the Trinity, as the Arians; beside which, they had some dogmas of their own, and particularly this: that there is no difference between priests, and bishops; but that the priesthood, and episcopate are absolutely one and the same order, or dignity: an opinion since strenuously asserted by many modern divines. See BISHOP, PRIEST, PRESBYTER, &c. Aeriis built his doctrine chiefly on some passages in St. Paul; and, among others, that in the first epistle to Timothy, Ch. IV, v. 14. where that apostle exhorts him not to neglect the gift he had received by the laying on of the hands of the presbytery. Here, observes Aeriis, is no mention of bishops; but

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Timothy evidently received his ordination from the presbyters or priests.

St. Epiphanius, *Har. 75.* stands up briskly for the superiority of bishops, against the Aeriens.—The word *presbytery* in St. Paul, he observes, includes both bishops and priests; the whole senate, or assembly of the ecclesiastics of the place; and in such an assembly had Timothy been ordained. See PRESBYTERY.

AEROMANCY *, **AEROMANTIA**, an ancient species of divination, performed by the means of the air, and phenomena happening therein.

* The word is compounded of the Greek, *αἰρ*, air; and *μαντῖα*, divination. See HYDROMANCY.

AEROMETRY *, **AEROMETRIA**, the art of measuring the air, its powers, and properties. See AIR.

* The word is compounded of *αἰρ*, air; and *μετρεω*, to measure.

Aerometry includes the laws of the motion, gravitation, pressure, elasticity, rarefaction, condensation, &c. of the atmospheric fluid.

The word *Aerometry* is but little used: in lieu hereof, we commonly call this branch of philosophy, *Pneumatics*. See PNEUMATICS.

C. Wolfius, professor of mathematics at Hall, having reduced many of the affections of this fluid to geometrical demonstration; first published *Elements of Aerometry*, at Leipzig, 1709, in High-dutch, and afterwards more largely in Latin.—Thus is the doctrine of the air incorporated into the mathematical sciences.

ÆRUGINOUS, something partaking of, or like to, the rust of copper.

Authors do not seem perfectly agreed about the colour to be expressed by this word, some expressing by it green, others brown.

ÆRUGO, denotes rust, especially that of copper. See RUST.

ÆRUGO is also used for the common verdigrease. See VERDIGREASE.

AERY, or **AIRY** *, in speaking of hawks, eagles, or the like, answers to the nest of other birds. See NIDUS.

* The word is formed from the French *aire*; and that from the German, *Ey*, egg, in the plural *Eyer*.

ÆS, a Latin term, signifying copper, money, &c.

Æs, in antiquity, is frequently used for *As*. See AS.

Æs Grave denotes money paid by weight, and not by tale, *Liv. l. 4. in fine.*

Æs Ustum, is a chemical preparation, ordinarily made of copper cut into thin plates, put into a crucible with sulphur and salt, *stratum super stratum*; and thus set in a hot charcoal fire, till the sulphur be consumed.

It is very detestive; and is used for eating of dead flesh. They who make this use of it, are ordered to heat it red-hot in the fire nine times; and quench it as often in lincsed oil. But this is a precaution rarely complied with.

ÆSCHYNOMENOUS Plants, among botanists, are those popularly called *sensitive plants*. See SENSITIVE.

ÆSNECY, in law, priority of age among coparceners.

ÆSTIMATIO Capitis, in our ancient law-books. See WERT, and WERELADE.

King Athelstan, in a great assembly held at Exeter, declared what mulcts were to be paid *pro Æstimatione capitis*, for offence committed against several persons according to their degrees: the *Æstimation* of the king's head to be 30000 thrymæ; of an archbishop, or satrapa, or prince, 15000; of a bishop or a senator, 8000; of a priest, or athane, 2000, &c. *Cressy's Church Hist. fol. 834. b. and L. Hen. I.*

ÆSTIVAL, or **ESTIVAL**, of, or belonging to summer. Thus, we say, the *Æstival* solstice, &c. in opposition to *Brumal*.

ÆSTUARY, ÆSTUARIUM, in geography, an arm of the sea, running up a good way into the land. See SEA. Such is Bristol channel, many of the firths of Scotland, &c. See ARM, BAY, and FRITH.

ÆSTUARY, is sometimes also used in pharmacy, for a vapour-bath, *balneum vaporosum*. See VAPOUR and BATH.

ÆTHER *, is usually understood of a thin, subtle matter, or medium, much finer and rarer than air; which commencing from the limits of our atmosphere, possesses the whole heavenly space.

* The word is Greek, *αιθερ*, supposed to be formed from the verb *αιθω*, to burn, to flame; some of the ancients, particularly Anaxagoras, supposing it of the nature of fire. See FIRE.

The philosophers cannot conceive that the largest part of the creation should be perfectly void; and therefore fill it with a species of matter under the denomination of *Æther*.—But they vary extremely as to the nature and character of this *Æther*.—Some conceive it as a body *sui generis*, appointed only to fill up the vacancies between the heavenly bodies; and therefore confined to the regions above our atmosphere.—Others suppose it of so subtle and penetrating a nature, as to pervade the air, and other bodies; and possess the pores and intervals thereof.—Others deny the existence of any such specific matter; and think the air it self, by that immense tenuity and expansion it

is found capable of, may diffuse it self through the interstellar spaces, and be the only matter found therein.

In effect, *Æther*, being no object of our sense, but the mere work of imagination, brought only upon the stage for the sake of hypothesis, or to solve some phenomenon, real or imaginary; authors take the liberty to modify it how they please.—Some suppose it of an elementary nature, like other bodies, and only distinguished by its tenuity, and the other affections consequent thereon; which is the philosophical *Æther*.—Others will have it of another species, and not elementary; but rather a sort of fifth element, of a pure, more refined, and spirituous nature, than the substances about our earth; and void of the common affections thereof, as gravity, &c. The heavenly spaces, being the supposed region or residence of a more exalted class of beings; the medium must be more exalted in proportion.—Such is the ancient and popular idea of *Æther*, or *ætherial* matter.

The term *Æther* being thus embarrassed with a variety of ideas, and arbitrarily applied to so many different things; the later and feverish philosophers chuse to set it aside: and in lieu thereof, substitute other more determinate ones.

Thus, the Cartesians use the term *Materia Subtilis*; which is their *Æther*: and Sir I. Newton, sometimes, a *Subtile Spirit*, as in the close of his *Principia*; and sometimes a *Subtile* or *Ætherial Medium*; as in his *Optics*.

The truth is, there are abundance of considerations, which seem to evince the existence of some matter in the air, much finer than the air it self.—There is an unknown something, which remains behind when the air is taken away; as appears from certain effects which we see produced in *Vacuo*.—Heat, Sir I. Newton observes, is communicated through a vacuum, almost as readily as through air: but such communication cannot be without some interjacent body, to act as a medium. And such body must be subtle enough to penetrate the pores of glass; and may be very well concluded to penetrate those of all other bodies; and consequently be diffused through all the parts of space: which answers to the full character of an *Æther*. See **HEAT**.

The existence of such an ætherial medium being settled, that author proceeds to its properties; inferring it to be not only rarer and more fluid than air, but exceedingly more elastic, and active: in virtue of which properties, he shews, that a great part of the phenomena of nature may be produced by it.—To the weight, *e. gr.* of this medium, he attributes gravitation, or the weight of all other bodies; and to its elasticity, the elastic force of the air, and of nervous fibres, and the emission, refraction, reflection, and other phenomena of light; as also, sensation, muscular motion, &c.—In fine, this same matter seems the *primum mobile*, the first source or spring of physical action in the modern system.

The Cartesian *Æther* is supposed not only to pervade, but adequately to fill all the vacancies of bodies; and thus to make an absolute plenum in the universe. See **MATERIA subtilis**.

But Sir I. Newton overturns this opinion, from divers considerations; by shewing, that the celestial spaces are void of all sensible resistance: for, hence it follows, that the matter contained therein, must be immensely rare, in regard the resistance of bodies is chiefly as their density; so that if the heavens were thus adequately filled with a medium or matter how subtle soever, they would resist the motion of the planets and comets much more than quicksilver, or gold.

ÆTHER of plants. See **ÆTHERIAL**.

ÆTHERIAL, **ÆTHERIUS**, something that belongs to, or partakes of the nature of *Æther*.

Thus, we say, the *Ætherial* space; *Ætherial* regions, &c.—Some of the ancients divided the universe, with respect to the matter contained therein, into elementary and *ætherial*.

Under *Æther*, or the *Ætherial* world, was included all that space above the uppermost element, *viz.* fire. This they supposed to be perfectly homogeneous, incorruptible, unchangeable, &c. See **CORRUPTION**, &c.

It is a point has been much controverted, whether or no the *Ætherial* matter has the property of gravity?—Many late philosophers, not only at home but abroad, contend for its gravity; and even for its being the cause of gravity in all other bodies.—In effect, says Chauvin, bodies do not descend by any inherent principle; but by the impulse, or trusion of something external: which can be nothing but æther; in regard they fall in *vacuo* as readily, nay more so, than in open air: and from the same principle they say arises the cohesion of bodies.

ÆTHERIAL OIL, is a fine, subtle, essential oil, approaching nearly to the nature of a spirit. See **OIL**.

Thus, the pure liquor rising next after the spirit, in the distillation of turpentine, is called the *Ætherial Oil* of turpentine. See **SUPPLEMENT**, article **OIL ESSENTIAL**. Some chymists distinguish two principles in urine; the one

a volatile urinous salt, resembling spirit of nitre; the other an *Ætherial Oil*, or sulphur; partaking of the nature of spirit of wine.

ÆTHERIAL Heaven. See **ÆTHERIAL HEAVEN**.

ÆTHIOPS Mineral, a preparation of mercury, usually made by grinding equal quantities of crude quicksilver and flower of sulphur, in a stone or iron mortar: till they become incorporated into a black powder.

It is prescribed for the worms, and all crudities and acrimony of the humours; and is reputed infallible against the itch, and other cutaneous diseases.

ÆTIANANS, **ÆTIANI**, in church history, a sect, or branch of Arians, so called from their leader *Ætius*, furnished the *Atheist*, in the fourth century. See **ARIAN**.

The *Ætians* were of the stricter kind of Arians, who held that the Son, and Holy Ghost, are in all things dissimilar to the Father. See **HETEROUSIAN**.

Whence also they are called *Anomæi* and *Heterosianii*; sometimes *pure Arians*.

ÆTIOLOGY*, **ÆTIOLOGIA**, in medicine, a rationale, or discourse of the cause of a disease.

* The word is compounded of the Greek *αιτια*, cause, and *λογος*, sermo, discourse.

In this sense, we say, the *Ætiology* of the small-pox, of the hydrophobia, of the gout, the dropsy, &c.

ÆTITES*, in natural history, a flinty, or a cruusted stone, hollow within side, and pregnant, as it were, with another; formerly in repute for several extraordinary medical, as well as magical powers.

• The word is formed from the Greek, *αιτιον*, eagle; the popular tradition being, that it is found in the eagle's nest, whither it is supposed to be carried while the female sits, to prevent her eggs from being rotten.

The *lapis Ætites* is found in several parts: near Trevous in France, one can scarce dig a few feet, without finding considerable strata or beds, of the coarser or ferruginous kind: this sort is found of various forms, and sizes; but its texture or confidence is pretty uniform; consisting of two or three lays or coats of a matter resembling baked earth: especially the innermost.—They are originally soft, and of the colour of yellow oker.

Dioscorides says, it is of use in discovering a thief; for by mixing it with his meat, he will be unable to swallow it.—Matthiolus informs us, that birds of prey never hatch their young without this stone; and that they seek it as far as the Indies.

The use now made of the stone, is to assist women in labour; to which end they fasten it about the knee: it being a tradition, that according as it is applied above, or below the matrix, it has the faculty of retaining, or excluding the child.

Hence, it is sometimes directed to be bore about the arm to prevent abortion. See **SUPPLEMENT**, article **ÆTITES**.

AFFECTION*, in a proper sense, denotes an attribute peculiar to some subject, and arising from the very idea or essence thereof. See **ATTRIBUTE**.

* The word is originally Latin, formed from *afficere*, to affect; the subject being here supposed in some measure *affected*, or acted on by the thing attributed to it. See **SUBJECT**.

In this sense, *Affection* is synonymous with *Property*, or what the schoolmen call *Proprium quarto modo*.

Philosophers are divided as to the doctrine and division of *Affections*: according to Aristotle, they are either *subordinating*, or *subordinated*; under the first of which comes only *mode*; and under the second *finiteness*, *place*, and *time*.

The generality of Peripatetics divide *Affections* into *internal*, as motion, and finiteness; and *external*, as place and time. According to Sperslingus, *Affections* are better divided into *simple* or *united*, and *disjunct* or *separate*: under the first come *quantity*, *quality*, *place*, and *time*: under the second, *motion*, and *rest*.

Sperslingus then seems to reject finiteness from the number of *Affections*; and Aristotle and the Peripatetics, quantity, and quality: but the difference is not irreconcilable; since Sperslingus does not deny body to be finite, nor Aristotle and his followers, that it has *quantum*, and *qualis*. Only they have not made peculiar heads and titles for these.

Affections are also distinguished into those of *body*, and those of *mind*.

AFFECTIONS of *Body*, are certain modifications thereof; occasioned or induced by motion; in virtue whereof, a body comes to be so and so disposed.

The *Affections* of *Body* are sometimes subdivided into *primary* and *secondary*.

Primary AFFECTIONS are those which arise either from the idea of matter; as quantity, and figure; or from that of form, as quality, and power; or from both together, as motion, place, and time.

Secondary, or **derivative AFFECTIONS**, are those which arise from some of the primary; *e. gr.* from quantity, as divisibility,

bility, continuity, contiguity, finity, impenetrability; from *figure*, as regularity and irregularity; from *quality*, as health; strength, &c.

AFFECTIONS of *Mind*, are what we more usually call *passions*. See *PASSION*.

Mechanical AFFECTIONS. See *MECHANICAL Affection*.

AFFECTION is more peculiarly used in medicine, for a morbid, or preternatural state of the body, or some of its parts. See *DISEASE*, &c. Thus we say an hypochondriacal, an hysterical *Affection*. And, in like manner, such a part of the body is *affected*, i. e. indisposed, or seized with a disease. The sick are frequently mistaken as to the place *affected*, by reason of the consent between the several parts, which often makes a disorder in one part be felt in another.

Hypochondriacal AFFECTION; } See { HYPOCHONDRIACAL.
Hysterical AFFECTION, &c. } HYSTERIC, &c.

AFFEERORS*, AFFERATORS, in law, persons, appointed in court-leets, and other places, upon oath, to settle and moderate the fines of such as have committed faults arbitrarily punishable, or which have no express penalty set down by statute. See *FINE*.

* The word is formed, according to Cowel, of the French *affirer*, to affirm; by reason those appointed to this office, do affirm upon their oaths, what penalty they think in conscience the offender hath deserved. Others better derive it from *afferver*, a word in the customary of Normandy, rendered by the latin interpreter *taxare*, to set the price of a thing; as *affimare*, *indicare*, &c.—Kitchin joins the three words as sononyms; *affidati*, *ameritatores*, *afferatores*.

AFFERI, in law. See the article *AVERIA*.

AFFIANCE, in law, the plighting of troth, between a man and a woman; upon an agreement of marriage to be had between them.

AFFIDATIO *Dominorum*, signifies an oath taken by the lords in parliament; thus called in the *Rot. Parl.* Hen. VI.

AFFIDATUS, or AFFIDIATUS, in our law-books, denotes a tenant by fealty.

Affidati are not properly vassals, but quasi-vassals, or persons who vow fealty to, and put themselves under the protection of, another.

In this sense they amount to the same with what are otherwise called *commendati*, and *recommendati*.

AFFIDAVIT, an oath in writing, sworn before some person who hath authority to take such oath; and made use of, and read in court, upon motions; though not allowed upon trials.

In the court of chancery is an *Affidavit office*; under the direction of a master. See *OATH*.

AFFILIATION, AFFILIATIO, in middle-age writers, the same with adoption.

Among the ancient Gauls, *Affiliation* was a sort of adoption only practised among the great.—It was performed with military ceremonies: the father presented a battle-ax to the person he was to adopt for his son; as an intimation that he was to preserve the effects he thus called him to succeed to, by arms.

AFFINAGE, is sometimes used in ancient law-books, for the refining of metals.

AFFINITY*, properly imports a relation contracted between one of two parties married, and the kindred of the other party.

* The word is originally Latin, compounded of *ad*, to; and *finis*, boundary, limit; by reason, as the lawyers say, that one of the families here approaches to the bounds of the other: *Quod dicit cognationis per nuptias copulatur, & altera ad alterius cognationis finem accedit*. Or as another expresses it, *Quod utriusque cognationis fines in unum locum conferuntur*.

In which sense, the word stands contradistinguished from consanguinity; which is a relation by blood.

In the Mosiacal law, there are several degrees of *Affinity*, wherein marriage is expressly prohibited; which yet seem not at all prohibited by the law of nature.—Thus, Levit. C. XVIII. ver. 16. a man was forbid to marry his brother's widow, unless he died without issue; in which case, it became enjoined as a duty. So it was forbid to marry his wife's sister, while she was living, v. 18. which was not forbidden before the law, as appears from the instance of Jacob.

The ancient Roman law is silent on this head; and Papinian is the first who mentions it; on occasion of the marriage of Caracalla.—The lawyers who came after him, stretched the bonds of *Affinity* so far, that they placed adoption on the same foot with nature. See *ADOPTION*.

Affinity, according to the modern canonists, renders marriage unlawful to the fourth generation, inclusive: but this is to be understood of direct *Affinity*; and not of that which is secondary, or collateral.—*Affinis mei affinis, non est affinis meus*.

It is further to be observed, that this impediment of marriage, does not only follow an *Affinity* contracted by lawful

matrimony, but also that contracted by a criminal commerce; with this difference, that this last does not extend beyond the second generation; whereas the other, as has been observed, reaches to the fourth.

The canonists distinguish three species of *Affinity*.—The *first*, that contracted between the husband and the relations by blood of his wife; and between the wife, and the relations by blood of her husband.

The *second*, between the husband, and those related to his wife by marriage; and the wife, and those so related to her husband.

The *third*, between the husband, and the relations of his wife's relations; and the wife, and the relations of her husband's relations.

By the fourth council of Lateran, held in 1213, it was decreed, that none but the first kind was any real *Affinity*; the rest being mere refinements, which ought to be set aside. *C. non debet, Tit. de Consang. & Affin.*

The degrees are reckoned after the same manner in *Affinity*, as in consanguinity; and therefore differently in the canon law from what they are in the civil law.

The Romanists talk of a *spiritual Affinity*, contracted by the sacrament of baptism, and confirmation.—In that church, a god-father may not marry with his god-daughter, without a dispensation.

AFFIRMATION, AFFIRMATIO, a positive proposition, alleging the truth, or reality of something.

Affirmation is defined by the logicians, an act whereby we attribute one idea to another; as supposing it to belong, or agree thereto.—As when, conceiving perfection to agree to the Deity, we say, *God is perfect*.

This, on other occasions, is called *enunciation*, *proposition*, *composition*, and *judging*.

AFFIRMATION in law, signifies the ratifying or confirming a former law, or judgment.

We say, to *affirm* a judgment: the house of lords on an appeal *affirmed* the lord chancellor's decree.

AFFIRMATION is also used in grammar, by some late refinements upon that art, for what is usually called a verb; in regard the office of that part of speech, is to express what we *affirm*, or attribute to any subject.

AFFIRMATION, is also used for a solemn form of attesting the truth, allowed to be used by the Quakers, instead of an oath, which they hold absolutely unlawful to take. See *QUAKER*.

This people, by their refusal of all oaths, lay liable to much trouble; particularly for declining the oath of allegiance, in the time of king Charles II.—But by an act passed anno 1689, it was decreed, that their solemn declaration of allegiance and fidelity, should be accepted instead of an oath.

In 1695, they also obtained, by a temporary act, that their solemn *Affirmation* should be accepted in all cases where an oath is by law required; except in criminal cases, upon juries, and in places of profit and trust under the government. In this form:—*I, A. B. do declare, in the presence of almighty God, the witness of what I say, &c.*

This act was afterwards continued; and at last made perpetual.—But this form not being such as was desired, and having, in reality, all the essentials of an oath; they applied to the parliament for an alteration, which they obtained anno 1721: when the following form was settled to their general satisfaction, *viz.*—*I, A. B. do sincerely, solemnly, and truly declare and affirm.*—Which is the form now used, in the same manner, and under the same limitation with the former.—Any person deposing, upon his solemn *affirmation*, a known falsehood, incurs the penalty of wilful and corrupt perjury.

AFFIRMATIVE, in logic, &c. is understood of a proposition, or the like, which imports an *Affirmation*; or that says, *a thing is*.

In which sense the word stands opposed to negative. There are universal *Affirmative* propositions; and such, usually, are the first of syllogisms. See *SYLLOGISM*.

In algebra we have also *Affirmative* or positive quantities. See *QUANTITY*, and *POSITIVE*.

AFFIRMATIVE Sign, or character. See *CHARACTER*. In grammar, authors distinguish *affirmative* particles: such is, *yes*.

The term *Affirmative* is sometimes also used substantively.—Thus we say, the *Affirmative* is the more probable side of the question: there were so many votes, or voices for the *Affirmative*.

AFFIRMATIVE is particularly applied in the Roman inquisition, to such heretics as own the errors, and opinions they are charged withal; and maintain the same in their examination with firmness, and resolution.

AFFORESTING, AFFORESTATIO, the turning ground into forest. See *FOREST*.

In this sense, the word stands opposed to *deafforesting*. See *DEAFFORESTING*.

The conqueror, and his successors, continued *afforesting* the lands

lands of the subject, for many reigns; till the grievance became notorious, that the people, of all degrees and denominations, were brought to sue for relief; which was at length obtained, and commissions were granted to survey and perambulate the forest, and separate all the new *afforested* lands, and re-convert them to the uses of their proprietors, under the name and quality of *parlieu* or *pouralle land*. See the article **PORLIEU**.

AFFRAY, or **AFFRAYMENT**, in law, an affright put upon one, or more persons.

This, according to the lawyers, may be done without a word spoke, or a blow struck.—As, where a man shews himself armed, or brandishes a weapon, it may strike a fear into others unarmed.

Affray is a common injury; in which it differs from an assault, which is always a particular injury.

AFFREIGHTMENT*, or **AFFRETAMENT**, **AFFRETAMENTUM**, in law, signifies the freight of a ship. See **FREIGHT**.

* The word is formed from the French, *Fret*, which expresses the same thing.

AFFRONTE, in heraldry, is understood of animals bore in an escutcheon, as facing, or with their heads turned toward each other.—This is otherwise called *confronté*.

* The word is French; and literally signifies the same. It is compounded of *ad*, to; and *frons*, forehead.

AFFILIATION. See the article **AFFILIATION**.

AFRICAN Company. See the article **COMPANY**.

AFT. See **ABAST**.

AFTER-BIRTH, among midwives, the coat, or membranes wherein the fetus is inclosed, *in utero*.

It is thus called, by reason it comes away some time after the fetus; by way of a second birth, or delivery.

Physicians usually call it the *secundine*; it also includes the *placenta uterina*, popularly called the *womb-cake*. See **SECUNDINE**.

In brutes it is denominated the *beam*, or *cleaning*. See **HEAM**, &c.

AFTER-PAINS, are pains felt in the loins, the groin, &c. after the birth is brought away. See **DELIVERY**.

They seem to arise from a distension of the ligaments of the uterus in time of delivery; and are seldom dangerous, unless aggravated by a detension of the lochia.—To prevent them, oil of sweet-almonds, sperma-ceti, syrup of capillus veneris, &c. are usually prescribed.

AFTER-MATH, among husbandmen, the after-grass, or second mowings of grass; or else grass or stubble cut after corn.

AGA, in the language of the Mogols, &c. signifies a great man, lord, or commander.

In this last sense, the term is also used among the Turks: thus, the *Ag* of the Janizaries, is their colonel; and the *Capi-Aga*, the captain of the gate of the seraglio.

The title *Aga* is also given by way of courtesy, to several persons of distinction; though not in any office, or command to entitle them to it.

On some occasions, in lieu of *Aga*, they say, *Agasi*, or *Agassi*: thus, the *Aga* or governor of the pages, is called *Capi-Agassi*; and the *Aga* or general of the horse, *Shpabilar-Agassi*. See **PAGE**, **ODA**, and **SPAH**.

AGAL, or **AGIO**. See the article **AGIO**.

AGAPES*, or **AGAPÆ**, in church-history, a kind of religious festival, celebrated in the ancient church, to keep up a harmony, and concord among its members.

* The word is formed of the Greek *αγαπη*, love, dilection; of *αγαπαι*, dilige, I love.

In the primitive days the *Agapes* were held without scandal, or offence; but in after-times, the heathens began to tax them with impurity.—This gave occasion to a reformation of these *Agapæ*.

The kiss of charity, with which the ceremony used to end, was no longer given between different sexes; and it was expressly forbidden to have any beds or couches, for the convenience of those who should be disposed to eat more at their ease. Notwithstanding these precautions, the abuses committed in them became so notorious, that the holding of them (in churches at least) was solemnly condemned at the council of Carthage in the year 397.

Some critics will have it to be these *Agapæ* that St. Paul speaks of, 1 Cor. ch. XI. under the name of the *Lord's Supper*; which, they contend, was not the eucharist, but a feast accompanying it; held by the Christians of those times, in commemorating of our Saviour's instituting that sacrament, in his last supper with the apostles.—The text seems to intimate, that the feast was first held before the communion; but by an ordinance afterwards made, they were obliged to communicate fasting: so that the *Agapæ* were postponed till the sacrament was over.

Some authors imagine the *Agapæ* to have been, not a commemoration of our Saviour; but a custom borrowed from the heathens: *Mos vero ille, ut referunt*, says Sedulius on the XIth chapter of the epistle to the Corinth. *de Gentili adhuc superstitione veniebat*. And Faustus the Manichee is represented in St. Augustine, as reproaching the Christians, with

converting the heathen sacrifices into *Agapæ*: *Christiani sacrificia paganorum convertisse in Agapæ*.

AGAPETÆ, in ecclesiastical history, a name given to certain virgins and widows, who in the ancient church associated themselves with, and attended on ecclesiastics, out of a motive of piety and charity.

In the primitive days, there were women instituted deaconesses; who devoting themselves to the service of the church, took up their abode with the ministers, and assisted them in their functions. See **DEACONESS**.

In the fervour of the primitive piety, there was nothing scandalous in these societies: but they afterwards degenerated into libertinism; inasmuch, that St. Jerom asks, with indignation, *unde Agapetarum pestis in ecclesiis intravit?* This gave occasion to councils to suppress them.—St. Athanasius mentions a priest named Leontius, who, to remove all occasion of suspicion, offered to mutilate himself, to preserve his beloved companion.

AGARIC, in pharmacy, a kind of fungous excrescence, growing on the trunks, and large branches of several trees; but chiefly on the larch-tree.

This is also called *Fungus Agarici*, by way of contradistinction from the *mineral Agaric*. Dioscorides derives its name from a province of Sarmatia, called *Agaria*; whence it was first brought.

Several authors, and among the rest, Galen, took it for a root; but the common opinion is right, which makes it a fungus.—It is brought chiefly from the Levant; being found in Muscovy, and Tartary; though an inferior sort also grows on the Alps, and the mountains of Dauphiné, and the Trentine. It is white, light, tender, smooth, brittle, of a bitter taste, pungent, and a little styptic.—This was what the ancients called the *female Agaric*. For the *male*, it was usually rough, yellowish and woody, and was generally excluded out of physic, being only used in dyeing. It is probable, this latter was what grows on old oaks, and beech-trees; the former only on the larch.

Agaric was a medicine in mighty use among the ancients, not only for the purging of phlegm, but in all distempers proceeding from gross humours and obstructions; as the epilepsy, madness, asthma, &c.—Yet they complained, that it weakened the bowels, and purged too violently. They had divers correctors for it; these were chiefly of the aromatic kind: but Dr. Quincy says, that the best way is to banish it for good and all, as the present practice has almost done: for that it rather makes people sick than purges them; being very nauuseous, and but little cathartic: slow in its operation, and by staying too long in the stomach, exciting terrible nauuseas, followed by sweats, lyncopes, and languors, which last a long time.

By a chymical solution, it passes almost wholly into oil: it yields no volatile salt, but abounds with a sort of flaky earth, and an acid phlegm; as to texture, it seems much to resemble colocyth.

We read of *Pillule de Agarico*, and *Troches of Agaric*: but they are disused.—*Agaric* is also an ingredient in the theriaca Andromachi, where it is admitted in quality of a cordial; though its cardiac virtue is excepted to as much as its purgative.

AGARIC is also a denomination given to an earthy concretion, of the colour, and consistence of coagulated milk, which by drying, forms a white, light, friable mass, not unlike the vegetable *Agaric*.

This is more peculiarly called, *mineral Agaric*, sometimes *stone Agaric*, *lac luna*, or *moon's milk*, *Heinonarga*, *litbonarga*, &c. See **SUPPLEMENT**, article **LAC LUNÆ**.

AGAT*, in natural history, a precious stone, partly transparent, and partly opaque; usually diversified with a variety of colours, veins, spots, &c. and sometimes exhibiting figures, or appearances of natural objects.

* The word is sometimes also written *Acat*; by the Greeks and Latins *Αγαθός*, and *Acatés*; a denomination taken from that of a river in Sicily, on the banks of which it was first found.

There are various kinds of *Agats*; which, according to their different colours, degrees of transparency, &c. have different names.—The principal may be reduced to these four, *viz.* the *onyx*, the *caledony*, the *black*, and the *German Agats*.

The *Agat* has often a reddish teint; and is finely variegated with spots and stains; many of which seem very naturally to represent woods, rivers, trees, animals, fruits, flowers, &c.—De Boe mentions one, of the size of a nail, wherein a bishop, with his mitre, was very well represented; and on turning it a little, a man and a woman's head were seen in its place.

The *fardians*, and *fardonix Agats*, are very valuable; the latter is of a sanguine colour, and is divided into zones, which seem to have been painted by art.—Pliny, Strabo, and Cicero say, that Polycrates's ring was a *fardonix*. See **SARDONYX**.

Authors also speak of Roman *Agats*, Egyptian *Agats*, *onyx* and *fardonix Agats*, &c.—The ancients mention a *red Agat*, spotted with points of gold, found in Candia; and called *jaered*, as being a preservative against the poison of vipers, &c.

scorpions, and spiders.—Pliny has a whole chapter of the virtues of *Agats*.

Agat has always been esteemed for seals; as being a stone that no wax will stick to.

The gold wire-drawers burnish their gold with an *Agat*; whence the instrument made use of on that occasion, is also called an *Agat*.

Mr. Boyle takes *Agats* to have been formed of separate beds, or strata of fine clay or earth, brought by a petrifying liquor to coagulate into a stone. The fame author observes, that the fire will purge away the colours of *Agat*. He also mentions an *Agat* with a moveable spot or cloud in it.

M. du Fay has given the art of staining *Agats*, with divers beautiful colours. *Vid. Mem. Acad. R. an. 1728. p. 71.*

The figures and ramifications of *Agats*, whether natural or artificial, may be discharged with aqua fortis. *Vid. Eund. ibid. an. 1733. p. 38.* See SUPPLEMENT, articles AGAT, and SARDONYX.

AGE, properly denotes the natural duration of the life of man. See LIFE.

The ordinary *Age* of mankind has been occasionally varied, in such manner as to afford a fine instance of the wisdom of Providence.

AGE is also used in chronology, for a century; or a system, or period of an hundred years. See the article CENTURY. In which sense *Age* amounts to much the same with *seculum*, and differs from *generation*.

AGE is also understood of a certain state or portion of the ordinary life of man: which is divided into four different *Ages*, viz. infancy, youth, manhood, and old *Age*. Infancy, or childhood, *pueritia*, extends as far as the fourteenth year.

Youth, adolescence, or the *Age* of puberty, commences at 14, and ends at about 25.

Manhood, or the virile *Age*, terminates at 50.

Old *Age*, *senectus*, succeeds, which is the last: though some divide this into two; calling it *decrepit Age* after 75. See LONGEVITY.

AGE, in horsemanship, makes a considerable point of knowledge; the horse being an animal that remarkably shews the progress of his years, by correspondent alterations in his body.

We have characteristics from his teeth, hoofs, coat, tail, and eyes.

The first year he has his foal's teeth, which are only grinders and gatherers: the second, the four foremost change, and appear browner and bigger than the rest: the third, he changes the teeth next to these; leaving no apparent foal's teeth, but two on each side above, and two below: the fourth year, the teeth next to these are changed, and no foal's teeth are left, but one on each side above and below.

At five years, his foremost teeth are all changed; and the tushes on each side are compleat: those which come in the places of the last foal's teeth, being hollow, and having a little black speck in the midst; which is called the *mark in a horse's mouth*: This continues till eight years of *age*.

At six years, he puts out new tushes; near which appears a little circle of young feth, at the bottom of the tush: the tushes withal being white, small, short, and sharp.

At seven years, the teeth are all at their growth, and the mark in the mouth appears very plain.—At eight, all his teeth are full, smooth, and plain, and the mark scarce discernable; the tushes looking yellowish.—At nine, the foremost teeth shew longer, yellow, and fouler than before; and the tushes become bluntnish.—At ten, no holes are felt on the inside of the upper tushes; which till then are very sensible: add, that the temples begin to be crooked, and hollow.—At eleven years, his teeth are very long, yellow, black, and foul; but he will cut even, and his teeth stand directly opposite to one another.—At twelve, the upper teeth hang over the nether.—At thirteen, the tushes are worn close to his chaps, if he have been much ridden; otherwise they will be black, foul, and long.

2°, As to the hoof.—If it be smooth, moist, hollow, and well-founding, it is a sign of youth: on the contrary, if rugged, and as it were feamed, one seam over another, and withal dry, foul, and rusty, it is a mark of old *Age*.

3°, For the tail.—Taking him by the stern thereof, close at the setting on to the buttock, and gripping it between the finger and thumb; if a joint be felt to stick out more than the rest, the bigness of a nut, the horse is under ten: but if the joints be all plain, he may be fifteen.

4°, The eyes being round, full, and staring; the pits that are over them filled, smooth, and even with his temples; and no wrinkles to be seen, either under or above: are marks of youth.

5°, The skin being plucked up in any part betwixt the finger and thumb, and let go again; if it return suddenly to its place, and remain without wrinkles, he may be believed to be young.

6°, A dark-coloured horse, growing grizzly above the eyebrows, or under the main; or a whitish horse growing

meanelled, either with white or black, all over; may be infallibly concluded extremely aged.

Lastly, a horse being young, the bars of his mouth are soft and shallow; otherwise they are deep, and feel hard and rough. See BARS.

AGE, in hunting, is an article of consequence.—Deer, and other beasts of game, have different denominations, according to their *Age*; which see under the article HUNTING.

The *Age* of a hart, &c. is chiefly judged of by the furniture of his head.

The first head, called in fallow deer, *Bracher*, and in red deer, *Pricks*, does not come till the second year of their *Age*: the next year, they bear four or six small branches: the fourth year, eight or ten; the fifth, ten or twelve; the sixth, fourteen or sixteen; the seventh year, they bear their heads beamed, branched, and fumed, as much as ever they will be.

The huntmen have several other marks, whereby to know an old hart without seeing him; as, the spot, entries, abatements, foils, fewmets, gate, and fraying posts.

AGE of the Moon, in astronomy, is understood of the number of days elapsed since the last conjunction, or new moon; called also her *quarter*. See CONJUNCTION, and QUARTER.

To find the Moon's AGE. See the article MOON.

AGE, in chronology, and antiquity, is also used in speaking of the time passed since the creation of the world.

The several *Ages* of the world, may be reduced to three grand epochs, viz. the *Age* of the law of nature, from Adam to Moses.—The *Age* of the Jewish law, from Moses to Christ.—And the *Age* of grace, from Christ to the present year. The first *Age*, according to the Jews, consisted of 2447 years; according to Scaliger, of 2452; and according to Usher, 2513.—The second *Age*, according to the Jews, consisted of 1312 years; according to Scaliger, of 1508; and according to Usher, of 1491.

—Of the third *Age*, there have elapsed 1749 years; though this, too, is controverted by chronologers. Petavius will have our Saviour to have been born four years before the vulgar epocha; on which footing, the current year should be 1753; according to Cappelletti it should be 1754; and according to Baronius and Scaliger, 1751. See INCARNATION.

The Romans distinguished the time that preceded them into three *Ages*: the *obscure* or *uncertain Age*, which reached down as low as Ogyges king of Attica; in whose reign the deluge happened in Greece.—The *fabulous*, or *heroic Age*, which ended at the first Olympiad: and the *historical Age*, which commenced at the building of Rome.

Among the poets, the four *Ages* of the world, are the *golden*, the *silver*, the *brazen*, and the *iron Age*. See the *Metamorphosis* of Ovid, Lib. I. or rather, Hesiod in his poem, *Εργα και ημεραι*, *Opera & Dies*, ver. 108, &c. He is the first that has described the four *Ages*, and the best.

The East-Indians also reckon four *Ages* since the beginning.—The first, which they represent as a sort of golden *Age*, lasted, according to them 1728000 years: in this the god Brahma was born; and the men were all giants; their manners were innocent: they were exempt from diseases, and lived 400 years.—In the second *Age*, which lasted 1296000, their Rajas were born: vice now crept into the world; mens lives were fallen to 300 years, and their size retrenched proportionally.—Under the third *Age*, which lasted 8064000 years, vice being more increased, men only attained to 200 years.—The last *Age* is that wherein we now live, of which 4027200 years are already gone; and the life of man sunk to one fourth of its original duration.

AGE of Medals. See the article MEDAL.

AGE, in law, is particularly understood of a certain state or time of life, wherein a person is qualified for certain offices of civil society, which before, for want of years, and discretion, he was incapable of.

By the common law, there are two principal *Ages* in a man: at fourteen, he is at the *Age of discretion*; at twenty-one years, at full *Age*.

In a woman, there were anciently six *Ages* observed: at seven years, her father might distrain the tenants of his manor for aid to marry her; for at those years she may consent to matrimony.—At nine years old she is dowable; for then, or within half a year after, she is said to be able *promereri dotem, & virum sustinere*.—At twelve years, she is able finally to ratify, and confirm her former consent to matrimony.—At fourteen, she may take her lands into her own hands; and should be out of ward, if she were at this *Age* at her ancestor's death.—At sixteen, she should be out of ward, though at the death of her ancestor she was under fourteen: the reason is, that then she might take a husband able to perform knight's-service.—At twenty-one years, she may alienate lands, and tenements.

For a man; the *Age* of twelve years binds to appearance before the sheriff and coroner, for inquiry after robberies, 52 H. III. 14. at the *Age* of fourteen he may chuse his own guardian, and claim his lands held in socage. Though

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Bracton

Bracton limits this to fifteen years; with whom Glanville agrees.—At fourteen, a man may consent to marriage, as a woman at twelve.—At fifteen he ought to be sworn to the peace, an. 24 Edw. I. Stat. 3.—At the *Age* of twenty one, a man was obliged to be a knight, if he had twenty pounds land per annum in fee, or for term of life, anno 1 Edw. II. Stat. 1. But this statute is repealed, 17 Car. I. cap. 10.—The same *Age* also enables him to make contracts, and manage his own estate; which, till that time, he cannot do with security of those that deal with him.

The *Age* of twenty-four years enabled a man to enter into an order of religion, without consent of parents, anno 4 Hen. IV. cap. 17.

AGE PRIOR, *actum precari*, a petition, or motion made in court, by one in his minority, having an action brought against him for lands coming to him by descent; requesting, that the action may rest till he come to full *Age*.—This, the court, in most cases, ought to grant.

It is otherwise in the civil law; which obliges children in their minority to answer by their tutors, or curators. See **CURATOR**.

AGEMOGLANS*, or **AZAMOGLANS**, children of tribute raised every third year by the Grand Seigneur, among the Christians whom he tolerates in his dominions.

* The word, in its original, signifies a Barbarian's Child; that is a child not a Turk.—It is compounded of two Arabic words, 1^o, **AGEM**, which among the Turks signifies as much as *barbarous* among the Greeks; the former people dividing the world into Arabs or Turks, and *Agem*: as the latter into Grecians and Barbarians. 2^o, **MOGLY**, child.

The commissioners appointed for this levy, take them by force, even out of the houses of Christians; always claiming one in three, and pitching upon such as seem the handsomest, and promise to be the most handy.

These are immediately conveyed to Gallipoli or Constantinople; where they are first circumcised, then instructed in the Mahometan faith, taught the Turkish language and the exercises of war, till such time as they become of age to bear arms: and out of these the order of Janizaries is formed: See **JANIZARY**.

Such as are not judged proper for the army, they employ in the lowest and most servile offices of the seraglio; as in the kitchen, stables, &c.

AGENT, **AGENS**, in physics, that whereby a thing is done, or effected; or that which has a power whereby it acts on another; or by its action induces some change therein. The word *Agent* is used promiscuously with *efficient*; and in contradistinction to *patient*. See **EFFICIENT**, **PASSIVE**, &c. The schools divide *Agents* into *natural* and *free*.

Natural or Physical AGENTS, are those immediately determined by the author of nature, to produce one sort of effect; with an incapacity to produce the contrary thereto.—Such is fire, which only heats, and does not also cool.

Free or voluntary AGENT, is that which may equally do any thing, or the opposite thereof; as acting not from any predetermination, but from choice.—Such is the mind supposed to be; which may either will, or will the same thing.

Natural Agents, again, are subdivided into *univocal*; which are such as produce effects of the same kind, and denomination with the *Agents* themselves: and *equivocal*, whose effects are of a different kind, &c. from the *Agents*.

The schoolmen reckon the following circumstances necessary to the being of an *Agent*, viz. that it be contiguous to the object, distinct from it, have a power over it, a sphere of activity, and a proportion, or rate of acting.

AGENT, is also used for a person entrusted with the management of the affairs, either of a corporation, or a private person. In which sense, the word coincides with *deputy*, *procurator*, *syndic*, *factor*, &c.

Among the officers in the exchequer, are four *Agents* for taxes. See **EXCHEQUER**, &c.

AGENTS of Bank and Exchange, are public officers, established in the trading cities of France, to negotiate matters between merchants, relating to bills of exchange, and the buying and selling of goods. These amount to what, among us, are called *exchange-brokers*. See **BROKER**, and **EXCHANGE**.

AGENT and Patient, in common law, is where a person does, or gives, something to himself; so that he is at the same time both the doer or giver, and the receiver or party it is done to.—Such is a woman when she endows her self with part of her husband's inheritance.

AGGEOMETRIA*, a defect in point of geometry, or a deviation from the strict principles, and conclusions of that science. See **GEOMETRY**.

* This is otherwise called *Agometresia*; the words are both pure Greek, *Agometria* and *Agometresia*; though sometimes retained in English, and other writers.

Some have complained of the *Agometria* of the scriptures in respect of the proportions of the brazen sea, ark, &c. See **ARK**, &c.

AGER Terre, in middle-age writers, the same with an acre of land.

AGERIUM. See **AGISTMENT**.

AGGLUTINANTS* **AGGLUTINANTIA**, in medicine, a species of strengthening medicines, whose office, and effect is to adhere to the solid parts of the body, and thus recruit, and supply the place of what is wore off, and wasted in the animal actions.

* *Agglutinants* are most of them of the glutinous kind, or such as easily form themselves into jellies, and gummy consistences; whence the name *Agglutinant*, which is formed of *ad*, to; and *gluten*, glue. See **GLUE**, and **AGGLUTINATION**.

For the operation and use of *Agglutinants*, see **STRENGTHENERS**.

The principal simples which come under this class, found in the shops, are iising-glasis, olibanum, gum arabic, dragons blood, castia, figo, vermicelli, pulve, comfrey, plantain, &c.

AGGLUTINATION, literally, denotes the act of joining, or cementing two bodies together, by means of a proper gluten, or glue. See **CEMENT**, **GLUE**, &c.

In medicine, the term is peculiarly used for the apposition or adherence of new substance; or the giving a greater consistence to the animal fluids, to fit them the more for nourishment.

AGGRAVATION*, the act of augmenting a crime, or the punishment thereof. See **CRIME**, and **PUNISHMENT**.

* The word is compounded of *ad*, to; and *gravis*, heavy, grievous.

Aggravation, in the Romish canon-law, is particularly used for an ecclesiastical censure, threatening an excommunication, after three admonitions used in vain.

From *Aggravation*, they proceed to *re-aggravation*; which is the last excommunication. See **EXCOMMUNICATION**.

AGGREGATE*, the sum, or result of several things aggregated, or added together.

* The word is formed of *ad*, to; and *greg*, *gregis*, a flock, or company.

Natural bodies are *Aggregates*, or assemblages of particles, or corpuscles, bound together by the principle of attraction.

AGGREGATION, **AGGREGATIO**, in physics, a species of union, whereby several things which have no natural dependence, or connexion with one another, are collected together, so as in some sense to constitute one. See **UNION**. Thus, a heap of fane, or a mass of ruins, are bodies by aggregation.

AGGREGATION is also used figuratively, for association. See **ASSOCIATION**.

We say, to be of a company, or community by *Aggregation*.—An *Aggregation* of several doctors to the faculty of laws.—In Italy, *Aggregations* are frequently made of houses, or families; by virtue whereof, they all bear the same name, and arms.

AGGRESSOR, in law, he, of two contending parties, who makes the assault, or attack; or who began the quarrel, encounter, or difference.

In criminal matters, it is always first enquired who was the *Aggressor*.

AGILD*, or **AGILDE**, in our ancient customs, a person so vile, that whoever killed him was to pay no mulct for his death.

* The word comes from the privative *a*, and the Saxon, *gildan*, *subvenire*, to pay.

AGILITY, **AGILITAS**, a light, and active habitude, or disposition of the members, and parts designed for motion.

AGILLARIUS, in ancient law-books, a hayward, or keeper of a herd of cattle in a common field. See **HAYWARD**.

AGIO*, in commerce, is a term used, chiefly in Holland, and at Venice, for the difference between the value of bank notes, and current money.

* The word is originally Italian; where it signifies ease, or convenience.

AGISTMENT*, **AGISTAGE**, or **AGISTATION**, in law, the taking in, and feeding the cattle of frangers in the king's forest, and gathering the money due for the same.

* The word is usually supposed to be formed of the French *Giste*, a bed, or lying place; though Kennet excepts to this etymon, and chooses rather to derive it from *Ager*, the field, or feeding place of cattle; imagining *Agistment* to have originally been the same with *Agro-tim*, *Agro-tim*, or *Agro-ticum*, the profit of feeding cattle on such a piece of ground.

AGISTMENT is also used metaphorically for a charge, or burden on any thing.

In this sense we meet with *Terre ad custodiam maris Agistata*, i. e. charged with a tribute to keep out the sea.—So *Terre Agistata*, are lands whose owners are bound to keep up the sea-banks.

AGISTOR, or **AGISTATOR**, an officer of the forest, who takes in the cattle of strangers, to feed therein; or takes they do not wander beyond their bounds, or stay beyond the

the stated time; and receives for the king's use, all such tack-money as becomes due on that account.

In English, they are otherwise called, *Gross-takers*, or *Gist-takers*; they are made, by letters patent, to the number of four, in every forest, where his majesty has any pannage. See PANNAGE.

Their function is termed *Agistment*, and *Agistage*.

AGITATION, **AGITATIO**, properly signifies *shaking*; or a reciprocal motion of a body this way, and that. See MOTION.

The prophets, quakers, Pythian priestesses, &c. were subject to violent *Agitations* of body.

Among physiologists, the term is sometimes appropriated to that species of earthquake, called *Tremor*, or *Arietatio*. See EARTHQUAKE.

Among the philosophers, it is chiefly used for an intestine commotion of the parts of any natural body.

Thus, fire is said to *agitate* the minute particles of bodies. — Fermentation, and effervescence, are attended with a brisk *Agitation* of the particles.

AGITATION of Beasts in the Forest, anciently signified the drift of beasts in the forest. See DRIFT.

AGITATORS, in our English affairs, were certain officers, created by the army in 1647, to take care of the interests thereof.

Cromwell leagued himself with the *Agitators*, whom he found to have more interest than the council of war. — The *Agitators* undertook to make proposals relating to the reformation of religion and the state.

AGLECTS, **AGLETS**, or **AGLEEDS**, among florists, the apices, or pendants hanging on the tip-ends of chives, or stamina; as in tulips, roses, spike-grass, &c. See CHIVE, and APICES.

AGNATI, in the Roman law, the male descendants from the same father.

Agnati stand contradistinguished from *Cognati*, which include also the females descended from the same father. See COGNATI.

AGNATION*, in the civil law, the kinship, or relation, between the descendants of the same father, being males, and issued only from males.

* The word is originally Latin, formed from *ad*, to; and *nasci*, to be born.

Agnation differs from *Cognition*, as the latter is an universal name, under which the whole family, and even the *Agnati* themselves are contained; and *Agnation*, a particular branch of *Cognition*, which only includes the descendants in the male line. Again, *Agnation* is properly only a civil name, as that of *Genis*, or family; *Cognition*, a natural name, or derived from blood.

By the law of the twelve tables, males and females succeeded one another, according to the order of proximity, and without any regard to the sex: but the laws were afterwards changed in this respect, by the *Lex Voconia*; and women were excluded from the privileges of *Agnation*, excepting such as were within the degree of consanguinity, i. e. excepting the sisters of him who died intestate: and it was hence that the difference between *Agnati*, and *Cognati* first took its rise. But this difference was again abolished by Justinian, (*Inst.* 3. 10.) and the females were re-instated in the right of *Agnation*, and all the descendants on the father's side, whether males or females, were appointed to succeed each other indiscriminately, according to the order of proximity.

Hence, cognation came to take in all the relations of the mother as well as father; and *Agnation* to be retrained to those of the father alone.

Adoptive children enjoy the privileges of *Agnation*; which was called *civil* in their respect, in opposition to the other, which was *natural*. See ADOPTION.

AGNOETÆ*, in church history, a sect of ancient heretics, who maintained that Christ, considered as to his human nature, was ignorant of certain things, and particularly of the time of the day of judgment.

* The word is Greek *ἄγνοεταί*, formed of *ἄγνοια*, ignorance, to be ignorant of.

Eulogius, patriarch of Alexandria, ascribes this heresy to certain solitaries in the neighbourhood of Jerusalem, who in defence hereof, alleged divers texts of the New Testament, and among others, this of St. Mark, C. XIII. ver. 32. "Of that day and hour knoweth no man; no not the angels who are in heaven, neither the son, but the father only." — The same passage was made use of by the Arians; and hence the orthodox divines of those days were induced to give various explanations thereof: some allege, that our Saviour here had no regard to his divine nature, but only spoke of his human. Others understand it thus, That the knowledge of the day of judgment does not concern our Saviour considered in his quality of Messiah, but God only. Which is the most natural solution.

AGNOMEN, in antiquity, an epithet given to a person,

either by way of praise, or dispraise, or from some remarkable event which became, as it were, an additional name, but peculiar to the person, and not defendible to his issue. Thus, one of the Scipio's was named *Africanus*, and the other *Asiaticus*, from the brave achievements which the one did in Africa, and the other in Asia.

The *Agnomen* was the third in order of the three Roman names. — Thus in Marcus Tullius Cicero, Marcus is the prænomen, Tullius the nomen, and Cicero the *Agnomen*.

AGNUS CASTUS*, a medicinal shrub, having a monopetalous flower, and a narrow digitated leaf; famous among the ancients as a specific for the preservation of chastity, and the preventing of all venereal desires, pollutions, &c.

* The Greek called it *αγνος*, chaff; to which has since been added the reduplicative *Castus*, q. d. chaff chaff.

The Athenian ladies, who made profession of chastity, lay upon leaves of *Agnus Castus*, during the feast of Ceres. See CEREBALIA.

It is reputed a cooler, and particularly of the genital parts; and was anciently used in physic, to allay those inordinate motions arising from femal turgescences: but it is out of the present practice.

AGNUS DEI*, in the Romish church, denotes a cake of wax, stamped with the figure of a lamb, supporting the banner of the cross, consecrated in due form by the pope, to be distributed in presents among the people, and supposed to have great virtues annexed to it.

* The name literally signifies *Lamb of God*; this being supposed an image, or representation of the lamb of God, who took away the sins of the world.

They cover it up with a piece of stuff, cut in form of a heart, and carry it very devoutly in their processions. — The Romish priests, and religious, make a good penny, by selling these *Agnus Dei's* to some, and presenting them to others. The pope consecrates fresh ones once in seven years, the distribution whereof belongs to the master of the wardrobe; and they are received by the cardinals, with a world of reverence, in their mitres. — This ceremony they pretend to derive from an ancient custom of the church, wherein part of the paschal taper, consecrated on holy thursday, was distributed among the people, to perfume their houses, fields, &c. in order to drive away devils, and to preserve them from storms and tempests.

AGNUS DEI, is also a name popularly given to that part of the mass, wherein the priest, striking his breast three times, rehearses, with a loud voice, a prayer beginning with the words *Agnus Dei*.

AGNUS Scythicus. See the article ZOOPHYTE. See also SUPPLEMENT, article BAROMETZ.

AGON, in antiquity, a dispute or contest for the mastery, either in some exercise of the body, or of the mind. There were *Agones* on certain days, in most of the ancient feasts, and other ceremonies in honour of the gods, or heroes.

There were also *Agones* established expressly, and not attached to any other solemnity. — Such was the *Agon Gymnicus*, at Athens; the *Agon Nemeus*, instituted by the Argians in the 53d olympiad; the *Agon Olympius*, instituted by Hercules, 430 years before the first olympiad.

The Romans had also *Agones* instituted after the example of the Greeks: the emperor Aurelian established the *Agon Salis*, *Agon* of the sun; and Diocletian, the *Agon Capitolinus*, which was held every fourth year, after the manner of the olympic games. — Hence, the years instead of lustra, are sometimes numbered by *Agones*.

AGON was also a minister of sacrifice, whose business was to strike the victim.

The name is supposed to have been derived hence, that standing ready to give the stroke, he asked *Agon?* or *Agone?* shall I strike?

The *Agon* was also called *Papa*, *Cultrarius*, and *Victimarius*.

AGONALES, in antiquity, an epithet given to the Salii, consecrated by Numa Pompilius to the god Mars surnamed *Gradivus*. See SALII.

They were also called *Quirinales*, from the *Mons Quirinalis*, where they officiated. Romulus calls them *Agenenses Salii*.

AGONALIA, in antiquity, feasts celebrated by the Romans, in honour of Janus; or, as some will have it, in honour of the god *Agonius*, whom the Romans used to invoke upon their undertaking any business of importance.

Authors vary as to the etymology of this solemnity; some derive it from the mount *Agonus*, afterwards called *Mons Quirinalis*, whereon it was held. — Others suppose it taken from that ceremony in the feast, where the priest holding the naked knife, and ready to strike the victim, which was a ram, asked, *Agone?* shall I do it? — This last is Ovid's opinion. *Fast.* L. I. v. 319.

AGONISTICI*, in antiquity, a name given by Donatus to those of his sect, whom he sent into the neighbouring places,

fairs, markets, &c. to preach his doctrine; for which reason they were also called *Circutores, Circelliones, Catropites, Coroptice*, and at Rome, *Monsenses*.

* They were called *Agonistici*, from the Greek *αγους*, combat; in regard they were tent as it were to fight, and subdue the people to their opinion.

AGONOTHETA*, **AGONOTHETES**, in antiquity, a magistrate chose among the Greeks, to preside, and have the superintendency of their sacred games, or combats; to defray the expences thereof, and to adjudge the prizes to the conquerors.

* The word is compounded of *αγους*, combat, sacred sport; and *θητης*, he who disposes, appoints, ordains.

Among the Romans, the like officer was denominated *Designator*, and *Munerarius*.

AGONY*, **AGONIA**, denotes the extremity of pain, or a disease; when nature makes her last effort, or struggle, to throw off the evil that oppresses her.

* The word is formed from the Greek *αγους*, certamen, combat; this being a kind of strife, between life and death.

AGONYCLITE*, or **AGONYCLITES**, in antiquity, a sect in the seventh century; whose distinguishing principle it was, never to kneel, but to deliver all their prayers standing. See **GENUFLECTION**.

* The word is compounded of the privative particle, *α*, *γους*, kneel, and *κλιση*, to bend.

AGORANOMUS*, in antiquity, a magistrate of Athens, established for the maintenance of good order, and policy in the markets, settling the prices of provisions, and deciding disputes relating to buying, and selling, inspecting the weights, measures and the like.

* The word is Greek, compounded of *αγορα*, market; and *νομος*, law.

The *Agoranomus* among the Greeks was much the same with the *Curule Edile* among the Romans. See **EDILE**. Aristotle distinguishes two kinds of magistrates, the *Agoranomi*, who had the intendance of the markets; and the *Asynomi*, who inspected the buildings of the (αριστοι) cities.

AGRARIAN*, in the Roman jurisprudence, a denomination given to such laws as relate to the partition, or distribution of lands.

* The word is formed of the Latin *Ager*, field.

There are fifteen or twenty *Agrarian* laws, whereof, the principal are, the *Lex Apuleia*, made in the year of Rome 653; the *Lex Bœbia*; the *Lex Cassia*, in the year 267; the *Lex Cornelia*, in the year 673; the *Lex Flaminia*, in the year 525; the *Lex Flavia*; the *Lex Julia*, in the year 691; the *Lex Licinia*, in 377; the *Lex Licinia Licinia*; the *Lex Livina*; the *Lex Marcia*; the *Lex Roscia*, made after the taking of Carthage; two *Sempronian* laws, in the year 620; the *Lex Servilia*, in 690; and the *Lex Thoria*; and the *Lex Titia*.

The *AGRARIAN LAW*, *LEX AGRARIA*, absolutely, and by way of eminence fo called, was a celebrated law, published by Spurius Cassius, about the year 268, for an equal division of the conquered lands among all the citizens, and for limiting the quantity of ground possessed by each person to a certain number of acres.—Those other two in the Digest, the one published by Cæsar, and the other by Nerva, only relate to the limits, or boundaries of grounds; and have no relation to that of Spurius Cassius.

AGRARIUM. See **AGREMENT**.

AGREEMENT, **AGREAMENTUM**, in law, a joining, or putting together of two, or more minds in any thing done, or to be done.

Of this there may be three sorts.—The first, an *Agreement executed at the beginning*; mentioned in the statute of 25 Edw. III. c. 3, which says, 'That the goods bought by forestallers, being thereof attained, shall be forfeited to the king; if the buyer thereof have made *Gree* with the seller; where the word *Gree*, otherwise called *Agreement executed*, signifies payment for the things, or satisfaction.

The second is, an *Agreement after an act*, that is, where one does an act, and another agrees or assents thereto, afterwards. The third is, an *Agreement executory*, which is, when both parties at one time are agreed that such a thing shall be done in time to come. It is called executory, in regard the thing is to be done afterwards.

AGRESSES, or **OGRESSES**, in heraldry, the same as *Pellets*. See **PELLETS**.

AGRICULTURE*, the art of tilling, or cultivating the earth, in order to render it fertile, and make it bear plants, trees, fruits, &c.

* The word is formed of the Latin *Ager*, field; and *cultura*, tilling; of *colere*, to till.

The principal and most general operations in *Agriculture*, are manuring, ploughing, fallowing, sowing, harrowing; as also, reaping, and mowing. See the articles **MANURE**, **PLOUGHING**, **SEMINATION**, &c.

To the operations of *Agriculture* do also belong the management of the productions of particular countries; as hops, hemp, vines, tobacco, saffron, liquorice, wood, &c.

To the same art belong planting, transplanting, pruning, engraving; the culture of forests, timber, copies, &c. See

PLANTING, **PRUNING**, **ENGRAFTING**, **TIMBER**, **TREE**, &c.

Even gardening, or horticulture it self, is only a branch of *Agriculture*. See **GARDEN**.

Among the ancients, *Agriculture* is frequently called *Georgica*.

We forbear to say any thing about the antiquity or usefulness of this art; every reader's imagination will supply that defect.—It has been cultivated by many of the greatest men among the ancients; as emperors dictators, and consuls; and has been treated of by some of their greatest authors: Virgil for instance, Cato, Varro, Columella, Constantinus Porphyrogenitus, Palladius, &c.

The latter authors on *Agriculture*, are Baptista Porta, Heresbachius, and Agricola in Latin; Alphonso Herrera, in Italian; Stephens, Liebaud, de Serrée, de Croicenes, Bellon, and Chomel, in French; and Nourse, Evelyn, Mortimer, Switzer, Bradley, Lawrence, Miller, and Tull, in English.

AGRIPPA*, a name applied, among the ancients, to children delivered in an unusual, or irregular manner; particularly such as come with the feet foremost, instead of the head.

* They were called *Agrippæ*, according to Pliny, on account of their being (*agre parti*) born with difficulty.

AGRYPNIA, **APPYNIA**, a privation of sleep; otherwise called *watching*, *waking*, *vigilia*, *pervigilium*, &c. See **WATCHING**.

AGUE, a periodical disease, of the fever kind, consisting in a cold shivering fit, succeeded by a hot one; and going off in a diaphoresis, or sweating.

If the coldness and shivering be inconsiderable, and only the hot fit felt; the disease is called an *intermitting fever*.

According to the periods or times of the returns of the fit, the disease is either a quotidian, tertian, or quartan *ague*, or fever. See **QUOTIDIAN**, **TERTIAN**, and **QUARTAN**.

The cause of *Agues*, seems to be an obstructed perspiration, or whatever by overloading the juices, retards their motion, or occasions a lentor in the blood.—The symptoms are heaviness and reaching; a weak, slow pulse; coldness and shivering, felt first in the joints, thence creeping over the whole body; pain in the loins, and an involuntary motion of the under jaw.

A vernal *Ague* is easily cured; but an autumnal one is more obstinate, especially in aged and cachectical persons; and particularly if complicated with a dropsy, peripneumony, &c.

When an *Ague* proves fatal, it is usually in the cold fit, thro' the oppression of the spirits.

The cure is usually begun with an emetic of ipecacuanna, an hour before the access; and completed with the cortex peruvianus, administered in the interval between two fits; and continued at times, to prevent a relapse.

Quincy endeavours to account for the effect of the bark, from the irregularity, asperity, and solidity of its particles, which fit it to break those viscidities in the juices whereby the capillaries were obstructed, and to draw up the solids into a tension, sufficient by the vigorous vibrations ensuing thereon, to prevent any future accumulation thereof.—The first intention, he observes, is answered by giving the blood a greater momentum; and the second, by its corrugating the nerves, and rendering the contractions of the vessels more brisk and forcible.—Hence also its effects upon such as are apt to sweat immoderately. See **SUPPLEMENT**, article **AGUE**.

AGUGLIA. See **OBELISK**.

AID, or **AYDE**, **AUXILIUM**, literally denotes the help, succour, or assistance, which any person lends another, when too weak to do, or avoid something.

* The word is French, formed, according to M. Menage, from the Italian *Aitare*; and that from the Latin *Adjutare*, to help, or assist.

AID, or **AYDE**, in law, is when a petition is made in court, for the calling in of help from another person interested in the matter in question; who, it is probable, may not only strengthen the party's cause who thus prays for *Aid*, but also prevent a prejudice arising from his own right.—This is called *Aid prier*, but this course of proceeding is now much disused.

A city or corporation, holding a fee-farm of the king, may pray in *Aid* of him; if any thing be demanded of them relating thereto.

The *Aid prier*, is sometimes also used in the king's behalf, to prevent any proceeding against him till his council be called, and heard what they have to say for avoiding the king's prejudice, or loss.

Aid de Camp, an officer in an army, whose business is to attend the general officers, and receive, and carry their orders, as occasion requires.

When the king is in the field, he usually appoints young volunteers of quality to carry his orders, who are called the king's *Aids de Camp*.

Aid Major, or **Adjutant**, is an officer, whose business is to ease the *Major* of part of his duty; and to perform it all in his absence. See **MAJOR**.

Some Majors have several *Aid Majors*.—Each troop of guards has but one major, who has two *Aid Majors* under him; or more, according as the business requires. Every regiment of foot has as many *Aid Majors* as it contains battalions.—When the battalion is drawn up, the *Aid Major's* post is on the left, beyond all the captains, and behind the lieutenant-colonel.

AID, AUXILIUM, in our ancient customs, denotes a subsidy or sum of money due to the lord, from his tenants, on certain occasions.

It differed from a *Tax*, which is imposed at any time when wanted; whereas the *Aid* could only be levied where it was customary, and where the particular occasion fell out.

Such was the *Aid de Relief*, due from the tenants in fee, upon the death of the lord mesne, to his heir; towards the charge of a relief of the fee, of the superior lord.

Such also was the *Aid Chevel*, or *capital Aid*, due by vassals, to the chief lord, or the king, of whom they held in *capite*. See **CAPITE**.—Of this there are three kinds.

The first, of chivalry; or, as they call it, *Par faire fitz Chevalier*, towards making his eldest son a knight, when arrived at the age of 15 years; the second of marriage, or *par fille marier*, towards marrying his eldest daughter.—Both these, with all charges incident thereto, are taken away by Stat. 12 Car. II. See **TENURE, SERVICE, &c.**—Some will have them to have been first established in England, by William the conqueror; and afterwards transferred to Normandy: but the more common opinion is, that the conqueror brought them with him.—The third was of ransom, due when the lord was taken prisoner by the enemy. See **RANSOM**.

In some provinces there was a fourth kind of *Aid*; due whenever the lord should undertake an expedition to the holy land.

We also read of *Aids* paid the lord, when he was minded to purchase any new land, or tenement. These were only granted once in his life.—Also *Aids* for the repairing, and fortifying of castles, feats, &c.

Aids were at first imposed by the lord, or king, at what rate he pleased; but by a statute of 3 Edw. I. a restraint was laid on common persons being lords, and they were tied down to a fixed proportion: and by a subsequent statute, the same rate was extended even to the king.

Aids seem to have been first established with a view to the clients and freedmen of ancient Rome, who made presents to their patrons towards his daughter's fortune, as also on his birth-day, and on other solemn occasions.—Accordingly, Bouteiller relates, that in his time, these *Aids* depended on the courtesy and good will of the vassals; for which reason they were called, *Droits de Complaisance*.

The bishops also received *Aids* from their ecclesiastics, called *Synodals*, and *Pentecostals*. They were to be paid at the time of their consecration; or when they had a king to entertain; or when called by the pope to his court, or to a council; as also when they went to receive the *Pallium*.

Aid, that the archdeacons also exacted *Aids* from the clergy of their jurisdiction. See **PROCURATION**.

Aids are also used in matters of polity, for any extraordinary taxes, or impositions occasionally levied by the kings, and parliament, upon the subjects; to support the charges of the government, when the ordinary revenue proves short.

Royal Aid is a name frequently given to the land tax.

AIDS, in the manege, are helps, or assistances, by which the horseman contributes towards the motion, or action required of the horse; by a discreet use of the bridle, cavesson, spur, pommel, rod, calf of the leg, and voice.

Such a horse knows his *Aids*, answers his *Aids*, takes his *Aids* with vigour, &c.—The *Aids* are made use of, to avoid the necessity of corrections.—The same *Aids*, given in a different manner, become corrections.

The *Aids* used to make a horse go in airs, are very different from those required in going upon the ground. *New-castle*.

The inner heel, inner leg, and inner rein, are called *inner Aids*.—The outer heel, outer leg, &c. are *outer Aids*.

Court of Aids, in France, is a sovereign court, erected for the cognizance of matters relating to the taxes.—Appeals come to this from the court of elections, where matters relating to the taille are first heard.—The *Court of Aids* of a province is sometimes separated from the parliament of the province, and fixed in another city, as at *Montpellier*, *Montauban*, &c.

AIGLETTLE, in heraldry. See the article **EAGLE**.

AIGUE Marine, in natural history. See **AQUA Marina**.

AIGUISSE, **AIGUISSE**, or **ECUISSE**, in heraldry, a term applied to a cross, when its four ends are sharpened, so however as to terminate in obtuse angles. See **CROSS**.

The cross *Aiguisee* differs from the cross fitchee, in that the latter goes tapering by degrees to a sharp point; whereas only the ends of the former are tapered. See **PITCHEE**.

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AILE*, or **AIEL**, in law, a writ which lies where the grandfather, or great grandfather called *Besails*, was seized of lands or tenements in fee-simple, on the day he died; and a stranger abates or enters the same day, and dispossesseth the heir or grandchild. See **ABATEMENT**.

* The word is formed of the French *Aicul*, *Acus*, grandfather.

AIR, AER, in physics, a thin, fluid, transparent, compressible, and dilatible body; surrounding the terraqueous globe to a considerable height.

Air was considered by some of the ancients as an element; but then, by element they understood a different thing from what we do.

It is certain, that *Air*, taken in the popular sense, is far from the simplicity of an elementary substance; though there may be something in it, which bids fair for the appellation.—Hence, *Air* may be distinguished into *vulgar*, or heterogeneous; and *proper*, or elementary.

Vulgar or Heterogeneous Air, is a coalition of corpuscles of various kinds, which together constitute one fluid mass, wherein we live and move, and which we are continually receiving and expelling by respiration.—The whole assemblage of this, makes what we also call the *atmosphere*.

Where this *Air*, or atmosphere term-nate, there æther is supposed to commence; which is distinguished from *Air*, in that it does not make any sensible refraction of the rays of light, which *Air* does.

The substances whereof *Air* consists, may be reduced to two kinds, viz. 1^o, The matter of light, or fire, which is continually flowing into it from the heavenly bodies.—To which, probably, may be added the magnetical effluvia of the earth.

2^o, Those numberless particles, which in form either of vapours, or dry exhalations, are raised from the earth, water, minerals, vegetables, animals, &c. either by the solar, subterranean, or culinary fire.

Elementary Air, or *Air properly so called*, is a certain subtle, homogeneous, elastic matter; the basis, or fundamental ingredient of the atmospheric *Air*, and that which gives it the denomination.

Nature and Origin of Air.—The peculiar nature of this aerial matter, we know but little of; what authors have advanced concerning it being chiefly conjectural. We have no way of examining it apart, or separating it from the other matters it is mixed with; and consequently no way of ascertaining with evidence what belongs to it abstractedly from the rest.

Dr. Hook, and some others, will have it to be no other than the æther itself; or that fine, fluid, active matter, diffused through the whole expanse of the celestial regions: which coincides with Sir I. Newton's *Subtile Medium*, or spirit.

In this view it is supposed a body *sui generis*, ingenerable, incorruptible, immutable, present in all places, and in all bodies. Others, considering only its property of elasticity, which they account its essential and constituent character; suppose it mechanically producible; and to be no other than the matter of other bodies altered, so as to become permanently elastic.—Mr. Boyle gives us several experiments, which he made “for the production of *Air*; taking production for the obtaining “a sensible quantity thereof, from bodies wherein it did not “appear either at all, or in so great plenty.”—Among the several ways of doing this, ‘the fittest for practice,’ he observes, ‘are fermentation, corrosion, dissolution, decomposition; the boiling of water and other fluids; and the mutual ‘action of bodies, especially saline ones, upon each other.’ *Hist. of Air*.—He adds, ‘that various solid and mineral bodies, unsuspected of elasticity, being plunged in corrosive ‘unelastic menstrua, will, by a proper continuation of their ‘parts in the conflict, afford a considerable quantity of permanently elastic *Air*.’ *Ubi supra*.

Of the same opinion is Sir I. Newton; ‘The particles of ‘dense, compact, and fixed substances, cohering by a strong ‘attractive force, are not separable without a vehement heat, ‘or perhaps not without fermentation; and such bodies being ‘at length rarified by such heat or fermentation, become true ‘permanent *Air*.’ *Optics*.—‘Thus, the same author adds, ‘gunpowder generates *Air* by explosion.’ *Ibid*.

We have here, therefore, not only the materials whereof *Air* should be made; but the means of doing it: with regard to which, the *Air* is divided into real or permanent; and apparent or transient.—For, that all which appears to be *Air* does not continue such, is evident from the instance of an æolipile; the water of which being sufficiently rarified by the fire, rushes out in a sharp whistling blast, perfectly resembling *Air*, while the motion lasts; but it soon loses that resemblance, especially in the cold, and returns by condensation into its original water: and the same may be observed of alcohol of wine, and other subtle and fugitive spirits, raised by distillation.—Whereas real *Air* is not reducible by any compression, condensation, or the like, into any other substance beside *Air*. Water, then, though it may put on an aerial nature for a while, yet is not capable of persisting therein: and the same

may be said of other fluids.—The furthest they can go, is to become vapour; which is the matter of the fluid rendered much rarer, and put in a brisk motion.—For a substance to become permanent *Air*, it must be of a fixed kind: otherwise, it is not capable of undergoing the alteration necessary to be induced in it; but gives way and flies off too soon. So that the difference between permanent and transient *Air*, amounts to the same as that between vapour and exhalation; the one, *e. gr.* being dry, the other moist.

We can go a little further yet.—This elastic property of *Air*, is supposed by many philosophers, to depend on the figure of its corpuscles, which they suppose to be ramous: some will have them in many minute flocculi, resembling fleeces of wool; others conceive them rolled up like hoops, and curled like wires, or shavings of wood, or coiled like the springs of watches, and endeavouring to restore themselves in virtue of their texture: so that to produce *Air*, must be to produce such a figure and disposition of parts; and those bodies only are proper subjects, which are susceptible of such disposition; which, fluids, from the smoothness, roundness, and slipperiness of their parts, are not.

But Sir I. Newton (*Optics*, p. 371.) puts the thing another way; such a texture he thinks by no means sufficient to account for that vast power of elasticity observed in *Air*, which is capable of diffusing into above a million of times more space than it before possessed.—But, as all bodies are shewn to have an attractive and a repelling power; and as both these are stronger in bodies, the denser, more solid and compact they are: hence it follows, that when by heat, or any other powerful agent, the attractive force is surmounted, and the particles of the body separated so far as to be out of the sphere of attraction; the repelling power commencing thence, makes them recede from each other with a strong force, proportionable to that wherewith they before cohered; and thus they become permanent *Air*.—Hence, says the same author, it is, that as the particles of permanent *Air* are grosser, and rise from denser bodies, than those of transient *Air*, or vapour: true *Air* is more ponderous than vapour; and a moist atmosphere is lighter than a dry one.

But, after all, there may still be reason to doubt, whether the matter thus produced from solid bodies have all the properties of *Air*; and whether such *Air* be not transient, as well as that from humid ones; though not to that degree.—Mr. Boyle argues, from an experiment made in the *Air*-pump with lighted match; that those light and subtle fumes into which the fire itself flatters dry bodies, have no such spring as *Air*; since they were unable to hinder the expansion of a little *Air*, included in a bladder they surrounded. *Phys. Mech. Exper.*—Yet, in some subsequent experiments, by dissolving iron either in oil of vitriol and water, or in aqua-fortis; a large aerial bubble was produced, which had a real spring; so as to hinder the surrounding liquor from regaining its place; and which, by the application of a warm hand, readily dilated itself like other *Air*, and broke into the liquor in several succeeding bubbles; and even through the liquor into the open *Air*. *Ubi supra*.

The same excellent person farther assures us, he procured a really elastic substance from divers other matters; as bread, grapes, malt, ale, apples, peas, beef, &c. and from some bodies by only burning them in vacuo, particularly paper, hartshorn, &c. which yet, upon farther examination, was so far from being pure *Air*, that animals inclosed in it, not only could not respire it without harm; but even died sooner than in vacuo, where there was nothing like *Air*. *Phys. Mechan. Exper.*

We may here add an observation of the members of the Royal Academy of Sciences at Paris; which imports, that the property of elasticity is so far from constituting *Air*; that *Air* is rendered more elastic by the admixture of some other matters along with it, than it is in its purity.—Thus, from some experiments of M. de la Hire at Paris, and of M. Stancari at Boulogne, M. Fontenelle assures us, that *Air* moistened with water, is considerably more elastic, and expands farther, than when pure.—M. de la Hire even found the moist *Air* eight times more elastic than the dry. *V. Hist. de l'Acad. an. 1708*. But it must not be omitted, that Dr. Jurin explains the experiments another way; and endeavours to shew, that the conclusion does not necessarily follow from them. *V. Append. ad Varen. Geogr.*

Thus much for *Air* considered in itself.—But such *Air*, we have observed, no where exists in its purity.—That wherewith we are concerned, and whose properties and effects are chiefly considered, is acknowledged by Mr. Boyle to be the most heterogeneous body in the universe: Boerhaave even shews it to be an universal chaos, or colluvies of all the kinds of created bodies.—Whatever fire can volatilize is found in the *Air*; and there is no body that can withstand the force of fire.

Hence, for instance, 1^o. The whole fossil kingdom must necessarily be found therein: for all of that tribe, as salts, sulphurs, stones, metals, &c. are convertible into fume, and thus capable of being rendered part of the *Air*.—Gold

itself, the most fixed of all natural bodies, is found to adhere close to the sulphur in mines; and thus to be raised along with it.

2^o. All the parts of the animal kingdom must also be in the *Air*: for, besides the copious effluvia continually emitted from their bodies, by the vital heat, in the ordinary course of perspiration; by means wherof an animal, in the course of its duration, impregnates the *Air* with many times the quantity of its own body. Beside this, we find that any animal when dead, being exposed to the *Air*, is in a certain time carried wholly off, bones and all. So that the whole of what before was an animal, *e. gr.* a man, an ox, or the like, is now in the *Air*.

By the way, it may be noted that huge swarms of the grosser excrementitious matters of animals must swim in the *Air*: at Madrid, we are assured, they have no necessary houses; and that they always make a jakes of their streets over night; yet does the *Air* imbibe the filth as fast as it is laid; inasmuch, that there is no increase of any fetid smell.

3^o. As to vegetables, nothing of that class can be supposed wanting; since we know that all vegetables by putrefaction become volatile; even the earthy or vascular part, in time following the rest.

Of all the effluvia floating in this grand ocean the atmosphere; the principal, are the saline. These, authors commonly conceive, are chiefly of the nitrous kind; but there is no doubt but that there are of all the sorts, vitriolic, aluminous, and of the nature of sea salt, &c.

Mr. Boyle even observes, that there may be many compounded kinds of salts in the *Air*, which we have not on earth; arising from different saline spirits, fortuitously meeting and mixing together.—Thus, the glass windows of ancient buildings are sometimes observed to be corroded, as if they had been worm-eaten; though none of the simple salts above-mentioned have the faculty of corroding glass.

The sulphurs, too, must make a considerable article in the *Air*; on account of those many volcanos, grottos, caverns, and other spiracles chiefly affording that mineral, dispersed through the globe.

And the associations, separations, attritions, dissolutions, and other operations of one sort of matter upon another, may be considered as a source of numerous other neutral or anonymous bodies, unknown to us.

Air, in this general sense, is one of the most considerable and universal agents in all nature; being concerned in the preservation of life and the production of most of the phenomena relating to our world.—Its properties and effects, including a great part of the researches and discoveries of the modern philosophers, have some of them been reduced to precise laws and demonstrations; in which form they make a branch of mathematics, called *Pneumatics*. Which see.

Mechanical Properties and Effects of Air. The most considerable of these are its fluidity, weight, and elasticity.—1^o. Fluidity.—That the *Air* is a fluid, is evident from the easy passage it affords to bodies through it; as in the propagation of sounds, smells, and other effluvia: for this argues it a body whose parts give way to any force impressed, and in yielding, are easily moved among themselves; which is the definition of a fluid.

They who, with the Cartesians, make fluidity consist in a perpetual intestine motion of the parts, find *Air* also answers to that character: thus, in a darkened room, where the species of external objects are brought in by a single ray; they appear in a continual fluctuation; and thus even the more accurate weather-glasses are observed never to remain a moment at rest. See *WEATHER-Glass*.

The cause of this fluidity of *Air*, is attributed by some late philosophers to the fire intermixed therewith; without which, they imagine, the atmosphere would harden into a solid, impenetrable mass.—And hence, the greater the degree of fire therein is, the more fluid, moveable and pervious is the *Air*: and thus, as the degree of fire is continually varying, according to the circumstances and position of the heavenly bodies; the *Air* is kept in a continual reciprocation.

Hence, in a great measure, it is, that on the tops of the higher mountains; the senses of smelling, hearing, &c. are found very feeble. See *MOUNTAIN*.

II^o. Weight, or gravity.—That the *Air* is heavy, follows from its being a body; weight being an essential property of matter.

But we have infinite arguments of the same thing also from sense, and experiment: thus, the hand, applied on the orifice of a vessel empty of *Air*, soon feels the load of the incumbent atmosphere.—Thus, glass vessels, exhausted of their *Air*, are easily crushed to pieces by the weight of the *Air* without. So, two small hollow segments of a sphere, exactly fitting each other, being emptied of *Air*, are pressed together with a force equal to an hundred pounds, by the pondus of the ambient *Air*. Farther, a tube close at one end, being filled with mercury, and the other end immersed in a basin of the same fluid; and thus erected; the mercury in the tube will be suspended to the height of about thirty inches above the surface of that in the basin. The reason of which suspension, is, that the mercury

in the tube cannot fall lower, without raising that in the basin; which being pressed down with the weight of the incumbent atmosphere, cannot give way, unless the weight of the mercury in the tube, exceeds that of the *Air* out of it.—That this is the case, is evident hence; that if the whole apparatus be included in an *Air*-pump; in proportion as the *Air* exhausted from the same, the mercury falls: and on gradually letting in the *Air* again, the mercury reascends to its former height.—This makes what we call the *Toricellian experiment*.

To say no more, we can actually weigh *Air* for a vessel, full even of common *Air*, by a very nice balance, is found to weigh more than when the *Air* is exhausted; and the effect is proportionably more sensible, if the same vessel be weighed full of condensed *Air* in a receiver void of *Air*.

The weight of *Air* is continually varying, according to the different degree of heat, and cold.—Riccioli estimates its weight to that of water, to be as 1 to 1000; Merfennus as 1 to 1300, or 1 to 1356; Lana, as 1 to 640; Galileo only makes it as 1 to 400.—Mr. Boyle, by a more accurate experiment, found it about London, as 1 to 938, and thinks, all things considered, the proportion of 1 to 1000 may be taken as a medium; for there is no fixing any precise ratio, since not only the *Air*, but the water itself, is continually varying. Add, that experiments made in different places necessarily vary, in regard of the different heights of the places, and the different consistencies of *Air* arising therefrom. Boyle, *Phys. Mechan. Exper.*

It must be added, however, that by experiments made since before the Royal Society; the proportion of *Air* to water was, first, found as 1 to 840; then, as 1 to 852; and a third time, as 1 to 860. *Phil. Trans.* N^o 181.—And lastly, by a very simple and accurate experiment of the late Mr. Hawksbee; the proportion was settled as 1 to 885. *Phys. Mechan. Exper.*—But these experiments being all made in the summer months, when the barometer was twenty-nine inches $\frac{1}{2}$ high; Dr. Jurin thinks, that at a medium between heat and cold, when the barometer is thirty inches high; the proportion between the two fluids, may be taken as 1 to 800.

Air, then, being heavy and fluid; the laws of its gravitation, or pressure, may be inferred to be the same as in other fluids; and consequently, its pressure must be as its perpendicular altitude.

This is also confirmed by experiment.—For, removing the Toricellian tube to a more elevated place, where the incumbent column of *Air* is shorter; a proportionably shorter column of mercury is sustained; it being found to descend at the rate of one fourth of an inch, for every hundred foot of ascent.

On this principle depends the structure and office of the barometer.

From hence, also, it follows, that the *Air*, like all other fluids, must press equally every way.—This is confirmed by what we observe of soft bodies sustaining this pressure without any change of figure; and brittle bodies, without their breaking, though the pressure upon them be equal to that of a column of mercury thirty inches high, or a column of water of thirty-two foot.—It is obvious, that no other cause can preserve such bodies unchanged, but the equable pressure on all sides, which resists as much as it is resisted. And hence, upon removing, or diminishing the pressure on one side only; the effect of the pressure is soon perceived on the other.

For the quantity and effect of this pressure of the atmosphere on the human body. See ATMOSPHERE.

From this gravity of the *Air*, considered with its fluidity, several of its uses and effects are deducible.—And, 1^o, by means hereof, it closely invests the earth, with all the bodies on it; and constringes and binds them down with a force amounting, according to the computation of M. Pascal, to 2232 pounds weight, upon every square foot, or upwards of 155 pounds upon every inch square.—Hence, it prevents, *e. gr.* the arterial vessels of plants and animals, from being too much distended by the impetus of the circulating juices, or by the elastic force of the *Air* so plentifully contained in the blood.—Thus, we see, in the operation of cupping, that upon a diminution of the pressure of the *Air*, the parts of the body grow tumid; which necessarily alters the manner of the circulation through the capillaries, &c.

The same cause hinders the juices from oozing and escaping through the pores of their containing vessels: this is experienced by such as travel up high mountains, who, in proportion as they ascend, find themselves grow more and more relaxed; and at length fall into a spitting of blood, and other hemorrhages; by reason of the *Air* not sufficiently binding up the vessels of the lungs.—The like is observed of animals inclosed in the receiver of the *Air*-pump, who, as the *Air* is taken from them, swell, vomit, drivel, dung, urine, sweat, &c. See VACUUM.

2^o, The mixture of contiguous bodies, especially fluid ones, is chiefly owing hereto.—Hence many liquids, as oils and salts, which readily and spontaneously mix in *Air*, upon taking that away, remain quietly in their state of separation.

3^o, It determines the action of one body upon another.—Thus,

the fire which burns wood immediately goes out, and its flame dissipates upon removing the *Air*; by reason something is then wanting to press the corpuscles of fire against those of the fuel, and prevent the too speedy diffusion of the flame. The same is observed of aqua-regia, and gold; that menstruum ceasing any longer to operate on the metal, after the *Air* is taken away. And upon the same determining power of the *Air* it is, that Papin's digester is built.

Hence also it is, that on the tops of high mountains, as on the pike of Teneriffe, the most acrid bodies, as pepper, ginger, salts, spirit of wine, &c. have no sensible taste; for want of their particles being pressed upon the tongue, so as to enter its pores, but instead thereof, being dissipated and blown away by its heat. The only thing that there retains its flavour, is canary wine, which is chiefly owing to its unctuous quality; in virtue whereof, it adheres closely to the part, and is not easily blown away.

From this principle of gravity chiefly arise our winds; which are only *Air* put in motion by some alteration in the equilibrium thereof.

III^o, Elasticity,—or a power of yielding to an impression by contracting its dimensions; and, upon removing or diminishing the impressing cause, returning to its former space or figure.—This elastic force is accounted the distinguishing property of *Air*; the other properties hitherto enumerated being common to it with other fluids.

Of this power we have numerous proofs.—This, a blown bladder being squeezed in the hand; we find the included *Air* sensibly resist; so as upon ceasing to compress, the cavities or impressions made in its surface, are readily expanded again, and filled up.

On this property of elasticity, the structure and office of the *Air*-pump depends.

This visus or endeavour to expand, every particle of *Air* always exerts; and thus strives against an equal endeavour of the ambient particles; whose resistance happening by any means to be weakened, it frantically diffuses into an immense extent.—Hence it is, that thin glass bubbles, or bladders filled with *Air*, and exactly closed; being included in the exhausted receiver of an *Air*-pump, burst, by the force of the included *Air*. So a bladder quite flaccid, containing only the smallest quantity of *Air*; swells in the receiver, and appears quite full. The same effect is also found, by carrying the flaccid bladder to the top of an high mountain.

This power does not seem to have any limits assigned it; nor does it appear capable, by any means whatever, of being destroyed or diminished.—Mr. Boyle made several experiments, with a view to discover how long *Air*, brought to the greatest degree of expansion he could reduce it to in his *Air*-pump, would retain its spring; and could never observe any sensible diminution; even though this poor thin *Air* was clogged some months with a weight which one would wonder how it should support a moment.

Yet, Mr. Hawksbee, by a later experiment, has shown, that the spring of the *Air* may be so disturbed by a violent pressure, as to require some time to return to its natural tone. The weight or pressure of the *Air*, it is obvious, has no dependence on its elasticity; but would be the same, whether the *Air* had such property or not.—But the *Air*, in being elastic, is necessarily affected by the pressure, which reduces it into such a space, as that the elasticity which re-acts against the compressing weight, is equal to that weight.

In effect, the law of this elasticity, is, that it increases as the density of the *Air* increases; and the density increases, as the force increases wherewith it is pressed. Now, there must necessarily be a balance between the action and re-action: *i. e.* the gravity of the *Air*, which tends to compress it, and the elasticity of the *Air* which endeavours to expand it, must be equal.

Hence, the elasticity increasing, or diminishing universally as the density increases, or diminishes, *i. e.* as the distance between the particles diminishes or increases; it is no matter whether the *Air* be compressed, and retained in such space by the weight of the atmosphere, or by any other means: it must endeavour, in either case, to expand with the same force.—And hence, if *Air* near the earth be pent up in a vessel, so as to cut off all communication with the external *Air*; the pressure of the inclosed *Air* will be equal to the weight of the atmosphere. Accordingly, we find Mercury sustained to the same height, by the elastic force of *Air* inclosed in a glass vessel, as by the whole atmospheric pressure.

On the same principle may *Air* be artificially condensed. And hence the structure of the wind-gun.

Dr. Halley asserts, in the *Philosoph. Transactions*, that from the experiments made at London, and by the academy del Cimento at Florence, it may be safely concluded, that no force whatever is able to reduce *Air* into eight hundred times less space than what it naturally possesses on the surface of our earth. In answer to which, Monsieur Amontons, in the memoirs of the French academy, maintains, that there is no fixing any bounds to its condensation; that greater and

greater

greater weights will still reduce it into less and less compass; that it is only elastic in virtue of the fire it contains; and that as it is impossible ever absolutely to drive all the fire out of it, it is impossible ever to make the utmost condensation.

The dilatation of the *Air*, by virtue of its elastic force, is found to be very surprising; and yet Dr. Wallis suggests, that we are far from knowing the utmost it is capable of.—In several experiments made by Mr. Boyle, it dilated first into nine times its former space; then into 31 times; then into 60; then into 150. Afterwards, it was brought to dilate into 8000 times its space; then into 10000, and even at last into 13679 times its space: and all this by its own expansive force, without any help of fire.

On this depends the structure and use of the manometer. Hence, it appears, that the *Air* we breathe, near the surface of the earth, is compressed by its own weight into at least the 13679th part of the space it would possess in vacuo.—But if the same *Air* be condensed by art; the space it will take up when most dilated, to that it possesses when condensed; will be, according to the same author's experiments as 550000 to 1.

Hence, we see how wild and erroneous was that observation of Aristotle, that *Air*, rendered ten times rarer than before, changes its nature, and becomes fire.

M. Amontons, and others, we have already observed, take the rarefaction of *Air* to arise wholly from the fire contained in it; and hence, by increasing the degree of heat, the degree of rarefaction may be carried still further than its spontaneous dilatation.

On this principle depends the structure and office of the thermometer.

M. Amontons first discovered that *Air*, the denser it is, the more it will expand with the same degree of heat.

On this foundation, the same ingenious author has a discourse, to prove “that the spring and weight of the *Air*, “with a moderate degree of warmth, may enable it to produce even earthquakes, and other of the most vehement “commotions in nature.”

According to the experiments of this author, and M. de la Hire, a column of *Air* on the surface of the earth, 36 fathoms high, is equal in weight to three lines depth of mercury; and it is found, that equal quantities of *Air* possess spaces reciprocally proportional to the weights wherewith they are pressed: the weight of the *Air*, therefore, which would fill the whole space possessed by the terrestrial globe, would be equal to a cylinder of mercury, whose base is equal to the surface of the earth, and its height containing as many times three lines, as the atmospheric space contains orbs equal in weight to 36 fathoms of that wherein the experiment was made.—Hence, taking the densest of all bodies, *e. gr.* gold, whose gravity is about 14630 times greater than that of *Air* in our orb, it is easy to compute, that this *Air* would be reduced to the same density as gold, by the pressure of a column of mercury 14630 times 28 inches high, *i. e.* 409640 inches: since the bulk of *Air*, in that case, would be in the reciprocal ratio of the weights wherewith they are pressed. This 409640 inches, therefore, expresses the height at which the barometer must stand, where the *Air* would be as heavy as gold, and the number $2\frac{2}{3} \times 10^8$ lines, the thickness to which our column of 36 fathoms of *Air*, would be reduced in the same place.

N. w. we know, that 409640 inches, or 43528 fathoms, is only the 74th part of the semidiameter of the earth: and therefore when you are past that, whatever matters there be, they must be heavier than gold: It is not improbable, therefore, that the remaining sphere of 6451538 fathoms diameter, may be full of dense *Air*, heavier, by many degrees, than the heaviest bodies among us.—Hence, again, as it is proved, the more *Air* is compressed, the more does the same degree of fire increase the force of its spring, and render it capable of so much the greater effect; and that, for instance, the heat of boiling water increase the spring of our *Air*, beyond what it ordinarily is, by a quantity equal to one third of the weight wherewith it is pressed: we may infer, that a degree of heat, which in our orb can only produce a moderate effect, may have a very violent one in such lower orb; and that as there may be many degrees of heat in nature, beyond that of boiling water, it is probable there may be some, whose violence, thus assisted by weight of the *Air*, may be sufficient to tear asunder the solid globe. *Mem. de l'Acad. An. 1703.*

This elastic power of the *Air*, is the second great source of the effects of this important fluid.—In virtue hereof, it insinuates into the pores of bodies, carrying with it this prodigious faculty of expanding; and that so easy to be excited: whence it must necessarily put the particles of the bodies it is mixed withal, into perpetual oscillations. In effect, the degree of heat, and the *Air*'s gravity and density, and consequently its elasticity and expansion, never remaining the same for two minutes together; there must be an incessant vibration, or dilatation and contraction, in all bodies.

This reciprocation we observe in several instances, particularly in plants, the tracheæ or *Air*-vessels whereof, do the office of lungs: for the contained *Air* alternately expanding and contracting, as the heat increases or diminishes, by turns presses the vessels, and eases them again; and thus promotes a circulation of their juices.

Hence, we find, that no vegetation or germination will proceed in vacuo.—Indeed, beans have been observed to grow a little tumid therein; and this has led some to attribute that to vegetation, which was really owing to no other than the dilatation of the *Air* within them.

From the same cause it is, that the *Air* contained in the bubbles in ice, by its continual action, bursts the ice: and thus glasses and other vessels frequently crack, when their contained liquors are frozen. Thus, also, entire columns of marble sometimes cleave in the winter-time, from some little bubble of included *Air*'s acquiring an increased elasticity.

From the same principle arise all putrefaction and fermentation; neither of which will proceed, even in the best disposed subjects, in vacuo.

In this we have a singular instance of the wonderful efficacy of *Air*, that it can change the two kingdoms, and convert vegetable substances into animal, and animal into vegetable.

In effect, all natural corruption and alteration seems to depend on *Air*; and metals, particularly gold, only seem to be durable and incorruptible, in virtue of their not being pervious to *Air*.—Accordingly, names slightly wrote in the sand, or dust, on the tops of high mountains, have been known to remain 40 years, without being in the least altered or effaced.

Effects of the different ingredients of the AIR.—*Air* not only acts by its common properties of gravity, and elasticity, but there are numerous other effects, arising from the peculiar ingredients wherewith it consists.

Thus, 1^o, it not only dissolves and attenuates bodies by its pressure and attrition, but as a chaos containing all kinds of menstrua, and consequently having wherewithal to dissolve all kinds of bodies.

It is known, that iron and copper readily dissolve, and become rusty in *Air*, unless well defended with oil.—Boerhaave assures us, he has seen pillars of iron so reduced by *Air*, that one might crumble them to dust between the fingers; and for copper, it is converted by the *Air* into a substance much like the verdegrease produced by vinegar.

Mr. Boyle relates, that in the southern English colonies, the great guns rust so fast, that after a few years lying in the *Air*, large cakes of crocus martis may be easily beat off them.—Acofta adds, that in Peru the *Air* dissolves lead, and considerably increases its weight.—Yet gold is generally esteemed indissoluble by *Air*; being never found to contract rust, though exposed to it ever so long. The reason hereof is, that sea salt, which is the only menstruum capable of acting on gold, being very difficult to vssaltize; there is but a small proportion of it in the atmosphere. In the chymists laboratories, where aqua regia is preparing; the *Air* becoming impregnated with an unusual quantity of this salt; gold contracts a rust like other bodies.

Stones also undergo the common fate of metals.—Thus, Purbeck stone, wherewith Salisbury cathedral consists, is observed gradually to become softer, and moulder away in the *Air*; and the like Mr. Boyle relates of Blackington stone. He adds, that *Air* may have a notable operation on vitriol, even when a strong fire could act no further on it. The same author has even found the fumes of a sharp liquor to work more suddenly and manifestly on a certain metal, when sustained in the *Air*, than the menstruum it self did which emitted fumes, on those parts of the metals it covered; in this he seems to refer to the Effect of the effluvia of vinegar on copper. See SUPPLEMENT, article COPPER.

2^o, *Air* volatilizes fixed bodies. Thus sea-salt being first calcined, then fused by the fire, and when fused exposed to the *Air* to liquify; when liquified set to dry again, then fused again; and, the operation thus repeated: will by degrees be almost wholly evaporated; nothing remaining but a little earth behind.

Helmont mentions it as a mighty arcanum in chymistry to render fixed salt of tartar volatile: but the thing is easily effected by *Air* alone; for if some of this salt be exposed to the *Air* in a place replete with acid vapours, the salt draws the acid to it self, and when saturated therewith, is volatile.

3^o, *Air* also fixes volatile bodies.—Thus, though spirit of nitre, or aqua-fortis readily evaporate by the fire; yet, if there be any purified urine near the place, the volatile spirit will be fixed, and fall down in form of aqua secunda.

4^o, Add, that *Air* brings many quiescent bodies into action, *i. e.* excites their latent powers.—Thus, if an acid vapour be diffused through the *Air*, all the bodies wherewith it is a proper menstruum, being dissolved thereby, are brought into a state proper for action. See ACID, &c.

In chemistry, not only the presence or absence of the *air*, but even its being barely open, or inclosed, is of great consequence.—Thus, camphire fired in a close vessel, runs wholly into flowers; whereas, if during the process, the cover be removed, and a candle applied, the whole flies off in fume. So to make sulphur inflammable, it requires a free *air*; in a close ecurbit, it may be sublimed a thousand times without kindling; whereas being put under a glass bell, and a fire applied, it rises into spirit of sulphur per campanam: So an ounce of charcoal, inclosed in a crucible well luted, will remain without loss for fourteen days in the intensest heat of a melting furnace; though the thousandth part of the fire in open *air* will presently turn it into ashes.—Helmont adds, that the charcoal remains all that while without any alteration of its black colour; but the minute *air* is let in, it falls instantly into white ashes. The same holds of the parts of all animals and vegetables; which can only be calcined in open *air*: in close vessels they never become any other than black coals.

The *air* is liable to abundance of alterations, not only in respect to its mechanical properties, gravity, density, &c. but also in respect of the ingredients it consists of.—Thus, in places abounding with marcasites, a fretting vitriolic salt is observed to predominate in the *air*, which rots the hangings, and is often seen lying on the ground in a whitish efflorescence.—At Fahlun in Sweden, noted for copper-mines, the mineral exhalations affect the *air* so sensibly, that their silver coin is frequently discoloured in their purses; and the same effluvia change the colour of bras.—Mr. Boyle was assured by a gentleman who possessed some ground wherein there were several veins of metals, and other minerals, that he had frequently seen pillars of fumes ascending thence; some having no scent, some an ill one, and some few a good one.—In Carniola, Campania, &c. where there are mines of sulphur, the *air* at times becomes very unwholesome; whence frequent epidemic diseases, &c.—It is added, that the mines near the cape of Good Hope, emit such horrible fumes from the arsenic that abounds there, that no animal can live near them; so that such as have at any time been opened, were obliged to be immediately closed up again.

The effluvia of animals also have their effect in varying the *air*; as is evident in contagious diseases, plagues, murrains, and other mortalities which are spread by the *air*.

The like is observed in vegetables.—Thus, a good part of the clove-trees which grew plentifully in the island of Ternate, being felled at the solicitations of the Dutch, in order to heighten the value of that fruit; such a change ensued in the *air*, as shewed the salutary effect of the effluvia of the clove-trees, and their blossoms: the whole island, soon after they were cut down, becoming exceeding sickly.

This, a physician who had been upon the spot, and from whom Mr. Boyle had the relation, attributed to the noxious steams of a volcano there; the ill quality whereof, had been corrected by the aromatic effluvia of those spicy blossoms.

The *air* is also liable to alterations from the season of the year.—Thus, few subterraneous effluvia are emitted in the winter; by reason the pores are locked up by the frost, or covered by snow; the subterraneous heat being all the while at work, and preparing a fund, to be discharged the ensuing spring.—Hence it is, that if the same seed be sown in the same soil, in autumn and spring, and the degree of heat be the same, a very different effect will be found; and for the like reason, rain-water gathered in the spring, is found to have a peculiar virtue in respect to corn; which being steeped therein, affords a much larger quantity of spirits than otherwise.—Hence also, we see why a very severe winter, is usually followed by a wet spring and fruitful summer; and *vice versa*.

Again, from the winter's solstice to the summer's, the sun's rays growing still more and more perpendicular; their impulse on the earth's surface becomes more and more powerful; by which the glebe or soil is more and more relaxed, softened and putrified; till he arrives at the tropic: where, with the force of a chemical agent, he resolves the superficial parts of the earth into their principles, water, oil, salt, &c. which are all swept away into the atmosphere.

And hence we conceive the nature of meteors, which are either collections of such effluvia, or dispersions thereof.—These meteors, too, have considerable effects on the *air*; and thus thunder is known to put liquors upon fermenting afresh.

In effect, whatever alters the degree of heat; will make a proportionable alteration in the matter of the *air*. Mr. Boyle suggests something farther on this head, *viz.* that the salts, &c. which in a warm state of weather were kept in a fluid, and mixed together, so as to be in a condition to act conjointly; upon a remission of the warmth, may lose their fluidity and motion, shoot into crystals, and thus separate again.

The height or depth of the *air* makes a farther alteration, the exhalations being few of them able to ascend above the tops of high mountains, as appears from those plagues, where

the inhabitants of one side of a mountain have all perished without the least disorder on the other side.

Nor must drought and moisture be denied their share in varying the state of the atmosphere.—In Guinea, the heat with the moisture, conduce so much to putrefaction, that the purest white sugars are often full of maggots; and their drugs soon lose their virtue, and many of them grow verminous. It is added, that in the island of St. lago, they are obliged to expose their sweet-meats daily to the sun, to exhale the moisture they had contracted in the night, which would otherwise occasion them to putrify.

On this principle depends the structure and office of the hygrometer.

These diversities in the *air* are found to have an influence on the operations, experiments, &c. of philosophers, chemists, and other operators.

Thus, it is very difficult to procure oil of sulphur per campanam in a clear dry atmosphere, its parts being then more ready to escape into the *air*: but in a thick, moist *air*, the oil comes in abundance.—So, all salts melt easiest in a cloudy *air*; and when melted, act most forcibly. And all separations succeed best in such weather.—If salt of tartar be exposed in a place where any acid spirit is floating in the *air*, it will imbibe the same; and of fixed become volatile. Hence, the experiments made of salts at London, where the *air* is plentifully impregnated with sulphur exhaled from sea-coal, prove different from those made on the same subjects in other parts of the kingdom, where wood, turf, &c. are the usual fuel. Hence also, metalline utensils, &c. rust much sooner at London, than in other parts, where there are fewer acid corrosive corpuscles in the *air*; and fermentation, which is easily raised and carried on in a place free of sulphur, is impracticable in places where sulphurous exhalations abound.—If pure well-fermented wine be carried into a place where the *air* is replenished with the fumes of new wine then fermenting; it will begin to ferment afresh. So salt of tartar swells, and as it were ferments, when carried into a place where spirit of nitre, vitriol, or sea-salt is preparing.—It is matter of common observation among brewers, distillers, vinegar-makers, &c. that at the time when the several plants life to be in flower, the respective juices ferment, and each process succeeds the best.—Add, that stains caused by vegetable juices, are observed to be best taken out of linen, at the time when the several plants that afford them are in their prime. This, Mr. Boyle observes, has been experienced in the stains of juice of quinces, hops, &c. one of which latter, eluding all the endeavours that could be used to get it out, has vanished of it self the next hop-season.

After all, some of our more curious and penetrating naturalists, have observed certain effects of *air*, which do not appear to follow from any of the properties, or the materials above recited.—On this view, Mr. Boyle has composed an express treatise of *Suspensions about some unknown properties of the air*.—The Phænomena of fire and flame in vacuo, seem, according to him, to argue some odd unknown vital substance diffused through the *air*, on account whereof that fluid becomes so necessary to the subsistence of flame: but whatever this substance be, it should seem by its sudden wasting or spoiling, that the quantity thereof is very inconsiderable, in proportion to the bulk of *air* it impregnates with its virtue; in regard, when the flame can no longer subsist in it, the *air*, upon examination, is not found to have undergone any alteration in any of its known properties.

Other instances to countenance such suspicions, are, the appearance and growth of salts in many bodies, which either afford them not at all, or not in that plenty, unless exposed to the *air*. Mr. Boyle mentions some marcasites dug from under ground, which being kept in a dry room, were soon covered over with a vitriolic efflorescence, and in a little time, by the operation of the *air* on them, were in great part crumbled into a powder exceeding rich in coppers; though they had probably lain many ages entire under ground: so, the earth or ores of allom, and many other minerals, robbed of their salt, metals, or the like, it is said will in tract of time recover them; and the like is observed of the cinders of sea-coal and at the iron works. See SUPPLEMENT, article IRON.

Mr. Boyle adds, that some lime in old wells has in time gained a large efflorescence of a nitrous nature, from which salt-petre was procurable. Add, that the colcothar of vitriol is not naturally corrosive, nor can any salt be procured from it, even by the assuision of water; but being exposed awhile to the *air*, it yields a salt, plentifully.

The existence of such hidden properties, is also argued, from the accels of the *air* rendering antimonial medicines emetic, and disposed to produce faintings and heart-burnings; and from its speedy corrupting and mouldering of trees dug from under ground, which had for ages remained firm, and almost impervious to the ax.

To say no more, the silks in Jamaica, if exposed to the *air*, soon rot; even while they preserve their colour: whereas, where

If kept from the *air*, they hold their firmness and dye: and the sable taffety worn at Brafil, becomes in a few days of an iron grey colour in the *air*; but in the shops preserves its hue: and some leagues beyond Paraguay, white people soon grow tawny; but as soon recover their native colour, upon removing out of that quarter.—These, out of a great number of instances tending the same way, may convince us, that notwithstanding all the discoveries hitherto made concerning *air*, there still remains a field for future inquiries. Whether *air* be convertible into water, or water into *air*, is also a problem among philosophers.

AIR, in medicine, &c. makes one of the six non-naturals. From observations on bleeding in rheumatism, and after taking cold, it is evident, the *air* can enter with all its qualities, and vitiate the whole texture of the blood, and other juices.

From the palsies, vertiges, and other nervous affections caused by damps, mias, &c. it is evident that *air* thus qualified can relax and obstruct the whole nervous system. And from the colics, fluxes, coughs, and consumptions produced by damp, moist, and nitrous *air*, it is evident it can corrupt and spoil the noble organs, &c.—See farther under the article ATMOSPHERE.

The salubrity of frequently changing the *air* induced Dr. Henshaw to contrive a method of doing it without removing from place to place, by means of an air-chamber fitted for the purpose. See his *Aero-chalin*. c. 5. *ap. Phil. Transf.* N^o 133. p. 834.

Dr. Desaguliers has lately contrived a machine for the like service, viz. for changing the *air* of a sick person's room, by either drawing out the foul, or forcing in fresh *air*, by what he calls a centrifugal wheel, without opening either door, or window: an expedient which may be of considerable use in hospitals, mines, &c.—Something of it is said to have been actually put in practice over the house of commons, to draw away the hot steam from the candles, breath, sweat, &c. of so many persons in hot weather. Vid. *Phil. Transf.* N^o 437. p. 41.

Innate AIR, is a fine aerial substance, supposed, by some anatomists, to be inclosed in the labyrinth of the inner ear, and to minister to the due conveyance of sounds to the sensory. But the existence of such *innate air*, has of late been called in question, and even disapproved. See EAR.

AIR, in music, signifies the melody, or the infection of a musical composition. See MELODY.

The word is also used for a tune, or song it self, that is, for a composition whose movements are just and equal; and the times, especially the first of such measure, well marked—being usually to be played pretty quick, and lively; unless there be something to indicate the contrary: as, *largo*, or *affettuosa*, &c.

Thus we say an *air* of Lully: Handel's *airs* with their symphonies and accompaniments, are made into concertos for the violin, &c.

AIRS, in horsemanship, denote the artificial or practised motions of a managed horse.

Such are the demi-volt, curvet, capriole, croupade, balotade, and step and leap; also, advancing, jerking, and bounding.

Some authors take *airs* in a more extensive sense; and divide them into *low*, and *high*.

The *low airs* include the natural paces, as walking, trotting, galloping, and terra-a-terra. See PACE, TROT, GALLOP, &c. — To which may be added, prancing, sidling, stopping, and turning.

The *high*, or *raised airs*, are all such motions as rise higher than the terra-a-terra; as the demi-volt, curvet, &c.

AIR-PUMP, a machine, by means whereof the *air* may be exhausted out of proper vessels. See AIR.

The use and effect of the *air-pump*, is to make, what we popularly call, a *vacuum*; but this, in reality, is only a degree of rarefaction sufficient to suspend the ordinary effects of the atmosphere.

By this machine, therefore, we learn, in some measure, what our earth would be without an atmosphere; and how much all vital, generative, nutritive, and alterative power, depend thereon.

The principle on which the *air-pump* is built, is the elasticity of the *air*; as that on which the common, or water-pump is founded, is the gravity of the same *air*.

The structure of the *air-pump* is, in it self, more simple even than that of the water-pump.—The latter supposes two principles, gravity and elasticity likewise: so that the water-pump must first be an *air-pump*, i. e. it must rarify the *air* before it can raise the water.—In effect, water being a dormant unelastic fluid, needs some external agent to make it ascend; whereas *air* ascends in virtue of its own elastic activity: its natural tendency is, to separate and leave a vacuum; and all that remains to art, is to prevent the ambient *air* from supplying the place of what thus spontaneously flies away.

To make water ascend, the force wherewith it is pressed downwards, is either to be diminished or increased in one part, more than another; like a balance in e-

quilibrium, one of whose scales may be made to raise, either by diminishing its own weight, or increasing that of the other: the water, therefore, recedes from the common centre of gravity, by the very power wherewith it tends towards it, indirectly or secondarily applied; for that two similar centripetal forces being made to act contrary to each other, what in the one over-balances the other, must have the effect of a centrifugal force.—Whereas, the principle whereby *air* rarefies or diminishes, does not respect the centre of the earth, but the centres of its own particles; being no other than a certain implanted power, whereby they immediately tend to recede from each other.

The invention of this noble instrument, to which the present age is indebted for so many fine discoveries; is ascribed to Otto de Guericke, the celebrated count of Magdebourg; who exhibited his first public experiments therewith, before the emperor and the states of Germany, at the breaking up of the imperial diet at Ratibon, in the year 1654.

Dr. Hook and M. du Hamel, indeed, ascribe the invention to Mr. Boyle; but that ingenious author frankly confesses de Guericke to have been beforehand with him. Some attempts, he assures us, he had made upon the same foundation, before he knew any thing of what had been done abroad: but the information he afterwards received from Schottus's *Mechanica Hydraulico-Pneumatica*, published in 1657, wherein was an account of de Guericke's experiments, first enabled him to bring his design to any thing of maturity.—From hence, with the assistance of Dr. Hook, after two or three unsuccessful trials, arose a new *air-pump*; more easy and manageable than the German one: and hence, or rather from the great variety of experiments that illustrious author applied it to, the engine came to be denominated, *Machina Boyleana*.

Structure and use of the AIR-PUMP.—The basis or essential part in the *air-pump*, is a metalline tube, answering to the barrel of a common pump, or syringe; having a valve at the bottom, opening upwards: and a moveable piston or embolus, answering to the sucker of a pump, furnished likewise with a valve opening upwards.—The whole, duly fitted to a vessel, as a recipient.

The rest, being only circumstances chiefly respecting convenience, has been diversified and improved from time to time, according to the several views and address of the makers.—That of Otto de Guericke, being less artful, laboured under several defects, in respect of the force necessary to work it, which was very great; and the progress very slow: beside that it was to be kept under water; and allowed of no change of subjects for experiments.

Mr. Boyle, by degrees, removed several of these inconveniences; and alleviated others: but still the working of his pump was laborious, by reason of the pressure of the atmosphere, a great part of which was to be removed at every extraction, after a vacuum was nearly arrived at.—But this inconvenience has been since removed by Mr. Hawksbee, who by adding a second barrel and piston to the former, to rise as the other fell, and fall as it rose; made the pressure of the atmosphere on the descending one, of as much service as it was of disservice in the ascending one.

Some of the Germans have also brought the *air pump* to do the opposite office of a condenser: but this is not to make the instrument so much the better, as more complex.

The structure of the *air-pump*, as now made among us, with all its advantages, is represented in Tab. *Pneumatica*, fig. 16.

It consists of two brazen barrels or cylinders, represented by *a a a*; which communicate with each other by a canal passing between them at *d d*; and with the receiver *o o o*, by means of the hollow wire *b b*, one end whereof opens into the canal of communication, and the other into a like canal *n n*; which penetrating the plate *i i i*, opens into the receiver.

Within the cylinders are two emboli, or suckers made of brass, and fitted with cork and leather to the cavities of the barrels, so as exactly to fill the same; each being furnished with its valve, and terminating at top in a rack *e e*, by which it is to be worked.

At the bottom of either barrel is another valve, by which the *air* may pass out of the communicating canal *d d*, and consequently out of the hollow wire and the receiver it self, into the cylinder, below the piston; from whence by the valves of the piston it may proceed into the upper space of the cylinder, and thus into the open *air*.

For the application of this mechanism.—The winch *b b* being turned upward and downward; its spindle *f*, catching by its teeth into the racks, will raise and depress the two pistons, alternately.—Now the consequence of depressing a piston, is, that the *air* before inclosed between it and the bottom of the cylinder, being thus crowded into a less compass, will, by its elastic force, which now exceeds the pressure of the atmosphere, push up the valve of the piston, and thus escape; till what little remains be of the same density with the external *air* incumbent on the valve.

* W. Vream, a late pneumatic operator, made an improvement in Hauksbee's *air-pump*, by reducing the alternate motion of the hand and winch to a circular one. In his method, the winch is turned quite round, yet the pistons are raised and depressed alternately: By which the trouble of shifting the hand backward and forward, as well as the loss of time, and the shaking of the pump, are prevented. See the contrivance for this purpose described in *Clarke's motion of fluids*, p. 154.

This done, and the same piston being again raised in its turn, from the bottom of the cylinder to the top; the little *air* before left, will of necessity expand itself, so as to possess the whole space of the cylinder thus deserted by the piston: upon which, its force or pressure upon the valve at the bottom of the cylinder, being now inconsiderable; the other, denser *air* of the receiver, hollow wire, and canal of communication, by their superior elastic force, will lift up the valve, and thus pass into the cylinder of rarefied *air*, till both be of the same degree of density.

And thus is the *air* in the receiver diminished at each elevation of the piston, by the quantity of a cylinder-full; abating for what little remained between the depressed piston, and the bottom: so that by thus repeating the operation again and again; the *air* in the receiver is at length rarefied to such degree, that its density does not exceed the thin *air* remaining in the cylinder when the piston is raised: which done, the effect of the *air-pump* is at an end; the valve cannot now be opened, or if it could, no *air* would pass it; there being a just equilibrium between the *air* on each side. To judge of the degree of exhaustion, there is added a gage, *ll*, consisting of a tube, whose upper orifice communicates with the receiver; the lower being immersed in a basin of mercury, *m m*.—Hence, the *air* in the tube rarefying as fast as that in the receiver; in proportion as the exhaustion advances, the mercury will be raised by the pressure of the column of external *air*, prevailing over that of the column of *air* included; till the column of *air*, and mercury together, become a balance to that of the external *air*. When the mercury is thus risen to the same height as it stands in the barometer, which is indicated by the scale of inches added to the gage; the instrument is a just Torricellian tube; and the vacuum may be concluded to be as perfect as that in the upper end of the barometer.

To let *air* again into the exhausted receiver, the cock *n* is to be turned; which makes a communication with the external *air*; upon which the *air* rushing impetuously in, the mercury in the gage immediately subsides into the basin.

To the *air-pump* belongs a large apparatus of other vessels, accommodated to the divers kinds of experiments.

Laws of Rarefaction in the receiver of an AIR-PUMP.—*1*°, For the proportion of *air* remaining at any time in the receiver, we have the following general theorem.—‘In a vessel exhausted by the *air-pump*, the primitive or natural *air* contained therein, is to the *air* remaining, as the aggregate of the capacity of the vessel and of the pump, (*i. e.* the cylinder left vacant in an elevation of the piston, with the wire and other parts between the cylinder and the receiver) raised to a power whose exponent is equal to the number of strokes of the piston, to the capacity of the vessel alone raised to the same power.

M. Varignon gives an algebraical demonstration of this theorem, in the *Memoires de l'Acad. R. an. 1693. p. 233. seq. It. an. 1705. p. 397. seq.* but it may be also demonstrated pneumatically, thus:—Calling the *air* remaining after the first stroke, the *first residual*; that after the second, the *second residual*, &c. and remembering that the *air* in the receiver is of the same density as that in the cylinder, when the piston is raised: it is evident, that the quantity of *air* in the receiver, is to the quantity of *air* in the cylinder, wire, &c. as the capacity of the receiver to that of the cylinder, &c. and consequently, the aggregate of the *air* in the receiver and the cylinder, *i. e.* the whole primitive *air*, is to the *air* in the vessel alone, *i. e.* to the first residual *air*, as the aggregate of the capacity of the receiver and the cylinder, to the capacity of the receiver alone.—After the same manner it may be proved, that the quantity of first residual *air*, is to the second residual, as the aggregate of the capacity of the receiver and cylinder to the capacity of the vessel alone. And the same proportion does the second residual bear to the third, and so of the rest.—Hence, the product of the primitive *air* into the first, second, third, fourth, &c. residuals, is to the product of the first residual into the second, third, fourth, fifth, &c. as the product of the capacity of the receiver and cylinder together, multiplied as oft into itself as the number of strokes of the piston contains units; is to the factum arising from the capacity of the receiver alone, multiplied so often by itself: that is, as the power of the aggregate of the capacity of the receiver and cylinder together, whose exponent is the number of strokes of the piston, to the capacity of the vessel alone, raised to the same power.—Consequently the primitive *air* is to the last residual, in the ratio of those powers. Q. E. D. 2°, The number of strokes of the piston, together with the

capacity of the receiver and cylinder with the wire, &c. being given; to find the ratio of the primitive *air* to the *air* remaining;

Subtract the logarithm of the capacity of the receiver, from that of the sum of the capacity of the receiver and the cylinder; then, the remainder being multiplied by the number of strokes of the piston, the product will be a logarithm, whose natural number shews how oft the primitive *air* contains the remainder required.

Thus, if the capacity of the receiver be 460, that of the cylinder 580, and the number of strokes of the piston 6; the primitive *air* will be found to the remaining *air*, as 146 to 1.

For, suppose the capacity of the vessel = *v*; that of the cylinder and vessel together, = *a*; the number of strokes of the piston = *n*; and the remaining *air* = *r*. Since the primitive is to the remaining *air* as a^n to v^n ; the primitive *air* will also be to the remaining *air*, as a^n : v^n to 1. Consequently, if the remaining *air* be 1, the logarithm of the primitive *air* is $a - v \times n$.

3°, The capacity of the receiver and the barrel being given; to find the number of strokes of the piston required to rarefy the *air* to a given degree.

Subtract the logarithm of the remaining *air* from the logarithm of the primitive *air*; and the logarithm of the capacity of the receiver, from that of the aggregate of the capacity of the receiver and cylinder; then, dividing the former difference by the latter, the quotient is the number of strokes required.

Thus, if the capacity of the cylinder be supposed 580; that of the receiver 460; and the primitive *air* to the remaining *air*, as 1464 to 10: the number of strokes required will be found to be 6.

Besides the effects, and phenomena of the *air-pump*, recounted under the articles VACUUM, AIR, &c. we may add some others; which related at large, make the substance of Mr. Boyle's *Physico-Mech. Exper. As.*—That the flame of a candle in vacuo usually goes out in a minute, though it sometimes lasts two, but the wick thereof continues ignited after; and even emits a smoke, which ascends upwards.

—That a kindled charcoal is totally extinguished in about five minutes, though in open *air* it remain alive half an hour, that it goes out by degrees, beginning from the top and the outfiles.—That red-hot iron is not affected by the absence of the *air*; and yet that sulphur or gunpowder will not be lighted thereby, but only fused.—That a match, after lying seemingly extinct in vacuo, a long time; revives again upon the re-admission of the *air*.—That a flint and steel strike sparks of fire as copiously in vacuo as out of it; and that the sparks move in all directions, upwards, downwards, &c. here as in the *air*.—That magnets and magnetic needles, are the same in vacuo as in *air*.—That smoke in an exhausted receiver, the luminary being extinct, gradually settles to the bottom in a darkish body, leaving the upper part clear and transparent; and that inclining the vessel sometimes on one side, and sometimes on another, the fume keeps its surface horizontal, after the nature of other fluids.—That the syphon does not run in vacuo.—That water freezes in vacuo.—That heat may be produced by attrition in the exhausted receiver.—That camphire will not take fire in vacuo; and that gun-powder, though some grains of a heap be kindled by a burning-glass in vacuo, will not give fire to the contiguous grains.—That glow-worms lose their light, in proportion as the *air* is exhausted; and at length become totally obscure: but upon the re-admission of *air*, presently recover it all.—That vipers and frogs swell much in vacuo, but will live an hour and half, or two hours; and though seemingly stark dead in that time, come to life again in some hours in the *air*.—That snails survive ten hours; and efts or slow-worms, two or three days; leaches five or six.—That oysters will remain alive in vacuo 24 hours without harm.—That the heart of an eel taken out of the body, continues to beat in vacuo, more nimbly than in *air*; and this for a good part of an hour.—That warm blood, milk, gall, &c. undergo a considerable intumescence, and ebullition in vacuo.—That a mouse, or other animal, may be brought, by degrees, to survive longer in a rarefied *air*, than naturally it does.—That *air* may retain its usual pressure, after it is become unfit for respiration.—And that silk-worms eggs will hatch in vacuo.

AIRY, or AIRIE, of hawks. See AERY.

AIRY Triplicity, among astrologers, the signs of Gemini, Libra, and Aquarius. See TRIPPLICITY.

ASIAMENTA, in law. See the article EASEMENT.

AJUSTING. See the article ACCOMMODATION.

AJUTAGE, or ADJUTAGE, in hydraulics, part of the apparatus of an artificial fountain, or jet d'eau; being a sort of tube, fitted to the mouth, or aperture of the vessel: through which the water is to be played, and by it determined into this, or that figure.

* The word is French, formed of the verb *ajuter*, to add, adapt, adjust.

It is chiefly the diversity in the *ajutages*, that makes the different kinds of fountains.—And hence, by having several *ajutages*

ajutages to be applied occasionally, one fountain comes to have the effect of many.

Mariotte inquires into the best kind of *ajutages*, or spouts for jets d'eau, affirming from experiment, that an even polished round hole, in the end of the pipe, gives a higher jet than either a cylindrical, or a conical *ajutage*; of which yet the latter is the better. *V. Traité du Mouven. des Eaux*, part 4. *Phil. Trans.* N° 181. p. 121.

The various sorts of *ajutages*, their structure, application, &c. See under the article FOUNTAIN.

A KOND, an officer of justice in Persia, who takes cognizance of the causes of orphans, and widows; of contracts, and other civil concerns.—He is the head of the school of law, and gives lectures to all the subaltern officers; he has his deputies in all the courts of the kingdom, who, with the second *sadra*, make all contracts.

A L, an Arabic particle, prefixed to words, to exalt, or give them a more emphatical signification.—As, in *Alkoran*, *Algebra*, &c.

A L, or A L D, in our ancient writings, signifies as much as *old*, *ancient*.—This, being prefixed to the names of places, expresses their antiquity; as Aldborough, Algate, &c.

ALA, a Latin term, literally signifying *wing*.

ALA is also used, in anatomy, for several parts of the body which bear some resemblance to the figure of a wing.

Thus, the lobes of the liver are sometimes called *Ala*.

The soft, spongy bodies in the pudendum muliebri, usually called the *Nymphæ*, are also denominated *Ala*.

The two cartilages of the nose which form the nostrils, are also called *Ala*.

And the same denomination is given to the tip of the auricle. See AURICLE.

A LA is also used in botany, for the angle which the leaves, or the stalks or pedicles of the leaves, form with the stem, or branches of the plant from which they arise. See LEAF, &c. This Angle is usually acute, and always is directed upwards.

A LA is sometimes also applied to the angle formed by the branches themselves, with the stem; which is also observed to be very regular and uniform.

ALABASTER*, in natural history, a kind of stone, softer than marble, yet harder than plaster of Paris: used for the making of figures, and other ornaments of sculpture. See SUPPLEMENT, article ALABASTRITES.

* Some derive the word from the Latin *albus*, because of the whiteness of this stone.—Others, from the Greek *αλαβαστρος*, which they form from the privative *α* and *λαβαστρος*, to take; this stone being too smooth and slippery for the hand to fasten hold of it.

It is found of all colours; some extremely white, and shining, which is the most common; some redish or tawney; and some is called *Onyx* from its colour, which resembles that of the onyx, though very different from it in its nature.

Alabaster cuts very smooth and easy, and is much used among sculptors, for little statues, vases, and columns.

They sometimes also employ it as plaster of Paris: in order to which, they burn and calcine it; after which, mixing it up with water to a thin consistence; it is cast into a mould, where it readily coagulates into a firm body. See PLASTER.

Alabaster, Mr. Boyle observes, being finely powdered, and thus set in a basin over the fire; will, when hot, assume the appearance of a fluid, by rolling in waves, yielding to the smallest touch, and emitting vapour; all which properties it loses again, on the departure of the heat, and discovers itself a mere incoherent powder. See FLUID, and FLUIDITY.

The *alabaster*-box of precious ointment, mentioned in St. Matthew XXVI. 7. Mark XIV. 3. and Luke VII. 37. has given the critics and interpreters some pain.—To suppose it a vase of *alabaster*, does not seem consistent with its breaking so easily, as is intimated by St. Mark.

F. Kircher, in his *Oedip. Egypt.* notes, that *Alabaster*, *Alabastrum*, was not only used for a vase of odoriferous liquor, but also for an Egyptian measure, containing nine *Kolbi*, or Egyptian pounds; amounting, according to his computation, to twenty-four Roman sextaries, or pounds.

ALABASTRA, in a plant, are those little herbaceous leaves which encompass the bottoms of flowers, particularly the rose. See CALIX, &c.

A LÆ, in the military art, the two wings, or extremes of an army, ranged in form of battle.

A LÆ *Vespertilionum*. See VESPERTILIONUM.

ALAISSÉE, in heraldry, the same with HUMETTY.

A-LA-MIRE, in music. See NOTE, and GAMMUT.

ALAMODE*, in commerce, a thin, light, glossy black silk, not quilled or crossed; chiefly used for women's hoods, and men's mourning scarves.

* The name is French, though not given in the country to this fabric, for which they have no other name but *velvet noir lustré*.

ALANORARIUS*, in our ancient customs, a keeper or

manager of spaniels, or setting-dogs, for the sport of hunting, hawking, &c.

* The word is formed from the Gothic, *alav*, a greyhound.

ALARES, in antiquity, are supposed by some authors to have been a kind of militia, or soldiery among the Romans; so called from *ala*, a wing, because of their lightness, and swiftness in the combat.

Others, make them a people of Pannonia; but others with more probability, takes *alares* for an adjective, or epithet; and apply it to the Roman cavalry; because placed in the two wings, or *ala* of the Army; for which reason, a body of horse was called *ala*.

ALARES *Musculi*, in anatomy. See the article PTERYGOIDEUS.

ALARM*, properly denotes a sudden apprehension, conceived from some noise, or report, which makes men run to their arms, and stand on their guard.

* The word is French, formed from the Italian, *all'arme*, to arms; whence *guidare all'arme*, *q. d.* to call to arms.

ALARM-POST, is the ground appointed to each regiment, by the quarter-master-general, for them to march to, in case of an alarm.

In a garison, the *alarm-post* is the place where every regiment is ordered to draw up, on ordinary occasions.

ALB, ALBE, ALBA, a robe, or vestment of white linen, hanging down to the feet; wherein the Romish priests perform divine service.

The *alb* corresponds to the surplice among us.—It takes its name from its colour, *albus*, white.

ALBA FIRMA, or ALBUM, was a yearly rent, payable to the chief lord of a hundred; so called, because paid wholly in white money, or silver, and not in corn, which was called *black-mail*.

ALBIGENSES, a sect, or party of reformers about Tholouse, and the Albigeois, in Languedoc; who, in the XIIth century, became remarkable for their opposition to the discipline, and ceremonies of the church of Rome. See REFORMATION.

They were also known by various other names; as, Petrobrussians, Arnoldists, Cathari, Patarins, Publicans, Tifficans, Bons-hommes, Passagers, &c.

It is pretended, they received their opinions from Bulgaria; which having been infected by the Paulicians of Armenia, diffused the same into Italy, Germany, &c. and that Peter Bruys was the first that brought them into Languedoc, about the year 1126. See PETROBRUSSIAN.

The Romanists tax the *Albigenses* with abundance of heterodox opinions; as, for instance, that there are two Gods, the one infinitely good, and the other infinitely evil: that the good God made the invisible world, and the evil one that which we live in; with the rest of the Manichean tenets.

But this seems to be one of those pious frauds allowed particularly in that church, which esteems it a kind of merit to blacken heretics.

However this be, the *Albigenses* grew so formidable in a little time, that a holy league, or croizade was agreed upon among the catholics; and war denounced against them, the pope himself raising the first standard.—In 1229, a peace was struck up, and an inquisition established at Tholouse, from which time the *Albigenses* dwindled by little and little, till the times of the reformation; when such of them as were left, fell in with the Vaudois, and became conformable to the doctrine of Zuinglius, and the discipline of Geneva. See WALDENSES.

ALBUGINEA*, in anatomy, the outermost coat, or tegument of the eye; otherwise called *adnata*, and *conjunctiva*.

* It takes the name *albuginea* from its whiteness; it being this that forms what we call the *album*, or, white of the eye. See EYE.

ALBUGINEA is also applied to the membrane immediately encompassing the testicles.

ALBUGO, or ALBUM *Oculi*, the same with *albuginea*, or the white of the Eye. See EYE, ALBUGINEA, &c.

ALBUGO also denotes a disease of the eye, wherein the horny tunic loses its native colour, and becomes white and opaque.

The *albugo* is the same with what is otherwise called *Leucema*, *λευκεμα*. See LEUCOMA.

ALBUM *Græcum*, dogs white dung, is a medicinal drug, in the present practice, used with honey, to cleanse and deterge, chiefly in inflammations of the throat; and that principally outwardly, as a plaster: but, as Dr. Quincy observes, seldom to any great purpose.

ALBUMEN *Ovi*, the white of an egg. See EGG.

It is used in medicine, as being of a glutinous or binding nature, on which account it is often mixed with bole armoniac, &c. to prevent any strained part from rising into a tumour, and restore it to its tone or elasticity.—It is also an ingredient in some mixtures for consolidating fresh wounds, and preventing too great a loss of blood.

ALBURN, or AUBURN *Colour*, a whity brown, or mixt colour, composed of whity brown.

ALCAICS, in the ancient poetry, a name common to several kinds

kind of verses; so called from the poet Alcaeus, the inventor thereof.

The first species of *Alcaics*, consist of five feet; of which the first may be either spondee, or iambic; the second, is an iambic; the third, a long syllable; the fourth, a dactyl; and the fifth, a dactyl, or amphimacer; as these of Horace,

*Omnes eadem cogimur, omnium
Versatur urna, serius, ocius
Sors exitura,*

The second species of *Alcaics*, consists of two dactyls, and two trochees: as,

Exilium impositura cymbæ.

Besides these two kinds of verses, which are properly called *Dactylic Alcaics*, there is a third sort, called simply *Alcaic*; whereof the first is an *Epiuric*, the second and third are *Choriambus's*, and the fourth a *Bacchius*; as,

Cur timet flammam Tiberim tangere? cur solivum?

The *ALCAIC Ode* consists of four strophes, each of which contains four verses; the two first are *Alcaic* verses of the first kind; the third an iambic dimeter hypercatalectic, i. e. of four feet and a long syllable: as,

Sors exitura, & nos in aeternum.

The fourth is an *Alcaic* of the second kind.—The entire *Alcaic* strophe is as follows:

*Omnes eadem cogimur, omnium
Versatur urna, serius, ocius
Sors exitura, & nos in aeternum
Exilium impositura cymbæ.*

ALCAID*, or **ALCAYDE**, among the Moors, a governour of a city, or castle in Barbary, under the emperor of Morocco.

* The Word is formed of the particle *al*, and the verb *ἄνωγναι*, *had*, or *akad*, to govern, rule, administer.

The jurisdiction of the *alcald* is sovereign, both in civil, and criminal concerns; and all fines and punishments lie wholly at his pleasure.

ALCALDE, or **ALCADE**, in the Spanish policy, a judge, or minister of justice; answering to a provost among the French. See **PROVOST**.

The Spaniards borrow their *alcaldes* from the Sarscen *alcald*.

ALCALI, **ALCALY**, or rather **ALKALY**. See **ALCALY**. **ALCALIZATION**, or **ALKALIZATION**. See the article **ALKALIZATION**.

ALCANNA, a cosmetic powder much used in the Levant, made of the leaf of a species of shrub, frequent in Barbary.

ALCANNA, by the Turks called *Knab*, is greenish in the powder, but by infusion in water yields a red colour.—The Turkish and Jewish women use it to dye the nails of their fingers and toes, and sometimes also their hair. *V. Mem. Acad. R. Scien. an. 1732. p. 426.* See **SUPPLEMENT**, article **ALCANNA**.

ALCANTARA.—*Order of ALCANTARA*, an ancient military order, denominated from a city of that name in the province of Estremadura in Spain.

Alphonius IX. having recovered *Alcantara* from the Moors, in the year 1212; committed the Custody and defence thereof, first to the knights of Calatrava; and, two years afterwards, to the knights of the Pear-tree, another military order instituted in 1170, by Gomez Fernand, and approved by pope Alexander III. under the rule of St. Benedict: upon which they changed their name, and took the denomination of knights of *Alcantara*.

After the expulsion of the Moors, and the taking of Granada; the sovereignty of the order of *Alcantara*, and that of Calatrava, was settled in the crown of Castile, by Ferdinand and Isabella. See **CALATRAVA**.

In 1540, the knights of *Alcantara* sued for leave to marry; which was granted them.

ALCHYMY*, or **ALCHEMY**, a higher, or more refined kind of chymistry, employed in the more mysterious researches of the art. See **CHYMISTRY**.

* The word seems compounded of the Arabic augmentative particle, *al*, and the Latin *chymia*, Egyptian *khemia*, or Greek *χημια*, chymistry. Tho' some object to this origin, and deny the Arabic any share in the composition of the word; urging, that *alchemia* occurs in an author who wrote before the Europeans had any commerce with the Arabians, or the Arabians any learning, i. e. before the time of Manomet.

The name *alchymy* however is really of no ancient standing: the first time it occurs, is in Julius Firmicus Maternus, an author who lived under Constantine the great, and who in his *Mathesis*, 3. 55. speaking of the influences of the heavenly bodies, affirms, "that if the moon be in the house of Saturn, at the time a child is born, he shall be skilled in *alchymy*."

The great objects or ends pursued by *alchymy*, are, 1^o, The making of gold; which is attempted three different ways: by separation; by maturation; and by transmutation; which last is to be effected by means of what they call the *philosopher's stone*.

With a view to this end, *alchymy*, in some ancient writers, is also called *πρωτικη*, *poetice*, and *χρυσωποιτικη*, *chryso-poetice*

g. d. the art of making gold.—And hence also the artists themselves are called *ποιηται*, *makers*, and *χρυσωποιται*; *gold-makers*.

2^o, An universal medicine, adequate to all diseases. See **ELIXIR**.

3^o, An universal dissolvent, or alkahest. See **ALKAHEST**.

4^o, An universal ferment; or a matter which being applied to any seed, shall increase its fecundity to infinity; if, e. gr. it be applied to gold, it shall change the gold into the philosopher's stone of gold; if to silver into the philosopher's stone of silver, i. e. into a matter which transmutes every thing into silver; and if to a tree, the result is the philosopher's stone of the tree, which transmutes every thing it is applied to into trees.

The origin and antiquity of *alchymy* are much controverted.—If regard may be had to legend and tradition, it must be as old as the flood; nay, Adam himself is represented by the *alchymists* as an adept. A great part, not only of the heathen mythology, but of the Jewish and Christian revelations, are also supposed to refer hereto: thus, Suidas will have the secret of the philosopher's stone couched in the fable of the Argonauts; and others find it in the books of Moses, &c.

But, if the æra of the art be examined by the monuments of history; it will lose a deal of this fancied antiquity.—The learned Dane, Ol. Borrichius, has taken immense pains to prove it known to the ancient Greeks and Egyptians. Her. Conringius, on the contrary, with equal address, undertakes to shew its novelty.

In effect, not one of the ancient poets, philosophers, or physicians, from Homer till four hundred years after Christ, mention any such thing.—The first author who speaks of making gold, is Zosimus the Panopolite, who lived towards the beginning of the fifth century, and who has an express treatise upon the divine art of making gold and silver, still extant in manuscript in the French king's library. The next is ÆNEAS GAZZUS, another Greek writer, towards the close of the same century, in whom we have the following passage: "Such as are skilled in the ways of nature, can take silver and tin, and changing their nature, turn them into gold." The same writer tells us, he was "wont to file himself *χρυσωμοσ*, gold-melter, and *χημικος*, chymist."—Hence we may gather, there was a notion some such art in being in that age; but, as neither of these authors relate how long it had been known before, their testimony will not carry us back beyond the age wherein they lived.

We do not find any earlier, plainer traces of the universal medicine: not a syllable of any such thing in all the physicians and naturalists, from Moses to Geber the Arab, who is supposed to have lived in the seventh century. In that author's work, intitled, *The Philosopher's Stone*, mention is made of "a medicine which cures all lepras:" this passage some authors suppose to have given the first hint of the matter; though Geber himself, perhaps, meant no such thing: for, by attending to the Arabic style and diction of this author, which abounds in allegory, it appears highly probable, that by man he means gold, and by lepras or diseases, the other metals, which are all impure in comparison of gold.

Suidas accounts for this total silence of old authors in respect of *alchymy*, by observing, that Diocletian procured all the books of the ancient Egyptians to be burnt; and that it was in these the great mysteries of chymistry were contained.—Conringius calls this history in question, and asks how Suidas, who lived but five hundred years before us, should know what happened eight hundred years before him? to which Borrichius answers, that he had learnt it of Eudemus, Helladius, Zosimus, Pamphilus, &c. as Suides himself relates.

Kircher asserts, that the theory of the philosopher's stone's delivered at large in the table of Hermes; and that the ancient Egyptians were not ignorant of the art, but declined to prosecute it. They did not need to transmute gold, they had ways of separating it from all kinds of bodies, from the very mud of the Nile, and stones of all kinds. But, he adds, these secrets were never wrote down or made public, but confined to the royal family, and handed down traditionally from father to son.

The chief point advanced by Borrichius, and on which he seems to lay the greatest stress, is the attempt of Caligula, mentioned by Pliny, for procuring gold from ornament. *Hist. Nat. L. XXXIII. c. 4.*—But this, it may be observed, makes very little for that author's pretensions; there being no transmutation, no hint of any philosopher's stone, but only a little gold was extracted or separated from the mineral.

The principal authors in *alchymy*, are Geber, Friar Bacon, Ripley, Lully, John and Isaac Hollandus, Basil Valentine, Paracelsus, Van Zuchten, and Sendivogius.

ALCMANIAN*, in the ancient poetry, a kind of lyric verse, or metre, consisting of two dactyls, and two trochees. Such, e. gr. is—*Virginibusque puerisque canto.*

* The word is formed from *Alcman*, the name of an ancient Greek poet, in great esteem for his Erotics, or amorous compositions.

ALCOHOL*, or **ALKOOL**, in chemistry, an Arabic term, chiefly understood of the purest spirit of wine, raised, or rectified by repeated distillations to its utmost subtilty, and perfection; so that if fire be put thereto, it burns wholly away, without leaving the least phlegm or feces behind. See **SUPPLEMENT**, article **ALCOHOL**.

* The word is formed from the Arabic or Hebrew קאל *kaal*, to attenuate, subtilize.

ALCOHOL is sometimes also used for a very fine, impalpable powder.

ALCORAN, or **AL KORAN**, the Mahometan gospel; or revelations, doctrine, and prophecies of the pretended prophet Mahomet.

The word *alcoran* is Arabic, and literally denotes either reading, or collection; but it is in the first of these senses that the *alcoran* of Mahomet seems best understood: Mahomet purposing to have his book called *Reading*, by way of eminence; in imitation of the Jews and Christians, who call the New and Old Testament, *Writing*, *Scripture*, הכתובים, *books*, ספרים, on the same account.

The Mussulmen also call it אלפסקין *Asfarkan*; from the verb פסק *Pharaka*, to divide, or distinguish: either by reason it makes the distinction between what is true, and false, or between what is lawful to do, and what not; or else on account of its containing the divisions, or heads of the law: in which, again, they imitate the Hebrews, who give divers books the like name פרקים *Perakim*, q. d. *capita*, *capitula*, chapters, heads; e. gr. פרקי אבות *Capita Patrum* the *alcoran* is also denominated *aldibich*, advertisement, or remembrance; as serving to retain or retrieve the knowledge of the law.

It is the common opinion among us, that Mahomet, assisted by one Sergius, a monk, composed this book; but the Mussulmen believe it as an article of their faith, that the prophet, who they say was an illiterate man, had no hand in it; but that it was given him by God, who, to that end, made use of the ministry of the angel Gabriel; that however it was communicated to him by little and little, a verse at a time, and in different places, during the course of twenty-three years.—‘And hence, say they, proceeds that disorder and confusion visible in the work;’ which, in truth, is so great, that all their doctors have never been able to adjust it. For Mahomet, or rather his copist, having put all these loose verses promiscuously in a book together, it was impossible ever to retrieve the order wherein they were delivered.

Those twenty-three years which the angel employed in conveying the *alcoran* to Mahomet, are of wonderful service to his followers; inasmuch as they furnish them with an answer to such as tax them with those glaring contradictions wherewith the book is full: those contradictions they piously ascribe upon God himself; alledging, that in the course of so long time, he repealed and altered several doctrines and precepts, which the prophet had before received of him.

M. d’Herbelot thinks it probable, that when the heresies of the Nestorians, Eurychians, &c. had been condemned by ecumenical councils; many bishops, priests, monks, &c. being driven into the deserts of Arabia and Egypt, furnished the impostor with passages, and crude ill-conceived doctrines out of the Scriptures: and that it was hence, that the *alcoran* became so full of the wild and erroneous opinions of those heretics.

The Jews, also, who were very numerous in Arabia, contributed their quota to the *alcoran*; nor is it without some reason that they boast, twelve of their chief doctors to have been the authors of this detestable work.

The *alcoran*, it is to be observed, while Mahomet lived, was only kept in loose sheets: his successor, Abubeker, first collected them into a volume, and committed the keeping thereof to Haphsa, the widow of Mahomet, in order to be consulted as an original. And there being a good deal of diversity between the several copies already dispersed throughout the provinces; Ottoman, successor of Abubeker, procured a great number of copies to be taken from that of Haphsa; at the same time suppressing all the others not conformable thereto.

The chief differences, in the present copies of this book, consist in the points; which were not in use in the time of Mahomet and his immediate successors, but were added since, to ascertain the reading; after the example of the Massorettes, who put the like points to the Hebrew text of Scripture.

The work is divided into *suras*, or chapters; and the *suras* are sub-divided into little verses, which are all composed in a broken interrupted style, resembling prose rather than verse.—The division into *suras* is but of a late standing: the usual number of them is sixty.

There are seven principal editions of the *alcoran*; two at Medina, one at Mecca, one at Coufa, one at Bassora, one in Syria, and the common, or vulgate edition. The first contains 6000 verses; the others surpassing this number by 200, or 236 verses: but the number of words and letters is the same in all, viz. 77639 words, and 323015 letters.

The number of commentaries on the *alcoran*, is so large, that

the bare titles would make a huge volume.—Ben Ofchair has wrote the history thereof, intitled, *Tarikh Ben Ofchair*. The principal among them are Reidhaori Thaalebi, Zamahefchari, and Bacai.

Beside the *alcoran*, which is the basis of the Mahometan faith, they have also a book containing their traditions, which they call *Sonna*.

The Mahometans have a positive theology, built on the *alcoran* and tradition; as well as a scholastical one, built on reason.—They have likewise their casuists, and a kind of canon law; wherein they distinguish between what is of divine, and what of positive right.

They have their beneficiaries too, chaplains, almoners, and canons, who read a chapter every day out of the *alcoran* in the mosques; and have prebends for so doing.—The habit of the mosque, is what we call the parson of the parish; and the febeics are the preachers, who take their text out of the *alcoran*.

ALCORAN, among the Persians, likewise signifies a kind of tower, or steeple; very high and narrow; surrounded without by two or three galleries, one over another; whence the moravites a sort of priests repeat their prayers thrice a day, with a very loud voice; making the tour of the gallery all the while, that they may be the better heard all around.

ALCOVE*, in building, a part of a chamber, separated from the rest by an estrade, or partition of columns, and other corresponding ornaments; in which is placed a bed of state, and sometimes seats, to entertain company.

* The word is divided from the Spanish *aloba*; and that from the Arabic *elcaaf*, a cabinet, or sleeping place; or from *elcoba*, a tent.

ALCYON. See the article **HALCYON**.

ALDEBARAN, an Arabian name, for a fixed star of the first magnitude, in the eye of the sign, or constellation taurus, or the bull; and hence popularly called *The Bull’s Eye*. Its longitude, latitude, &c. see among the rest of the constellation **TAURUS**.

ALDERMAN, an associate to the mayor, or civil magistrate of a city or town, for the better administration of his office.

The *aldermen* are an order of Magistrates, in our cities, and most of the municipal, or incorporate towns; who form a kind of council, and regulate things relating to the policy of the place.—They sometimes also take cognizance of civil and criminal matters; but that very rarely, and only in certain cases.

Their number is not limited; but in some places is more, in some less, from six to twenty-six.

Out of these are annually elected the mayors, or chief magistrates of places; who, at the expiration of their mayoralty, return again into the body of the *aldermen*, whose delegates they were before.

The twenty-six *aldermen* of London, preside over the twenty-six wards of the city.

When any of them die, the wardmore return two, out of which the lord mayor and *aldermen* chuse one. Chamberl.

All the *aldermen* that have been lord mayors, and the three eldest *aldermen* who have not yet arrived at that dignity, are by charter justices of the peace.

Formerly, there were also *aldermen* of the merchants, of hospitals, of hundreds, &c. See **SENATOR**.

ALDERMAN*, among our ancient Saxon ancestors, was the second of the three orders, or degrees of nobility.

* The word in its original, is *Ealdorman*, compounded of *Eald*, old, or *Eldon*, elder, and *man*, q. d. *Elderman*.—A late writer, with some probability, supposes that among the ancient Germans, the chief of each clan, tribe, or branch, was called *Ealderman*, not as denoting him *old*, but as denoting him the representative of the *eldest* brother, according to the scheme of paternal government, which obtained in that nation.—As a village generally consisted but of one tribe or branch of a family, the chief or head of such tribe or branch, who, as such, had a sort of jurisdiction over the village, was called the *Ealderman* of the Village.

Thomas Eliensis, in the life of St. Ethelred, interprets *alderman* by prince, or count; *Egelwinus qui cognominatus est Alderman, quod intelligitur princeps, five comes*.—Matthew Paris, in lieu of *alderman*, uses the word *justiciarius*; and Spelman observes, that it was the Norman kings, who, instead of the Saxon *alderman*, introduced the word *justice*.

Atheling was the first rank of nobility, *alderman* the second and *thane* the lowest. See **ATHELING**, and **THANE**.

The *alderman* was the same as our earl, or count; which appellation, after king Athelstane’s time, took place in lieu of *alderman*.

ALDERMAN, in the time of king Edgar, was also used for a judge or justice.

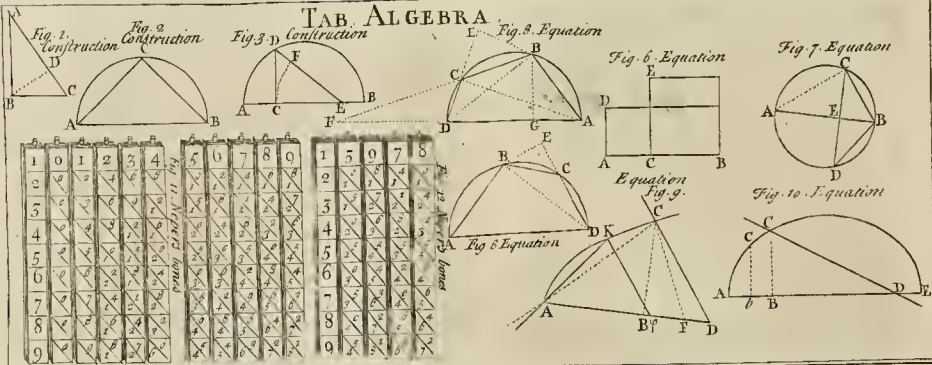
In this sense, Alwin son of Athelstane, is styled *Aldermanus totius Angliæ*; which Spelman interprets, *Capitalis justiciarius Angliæ*.

ALE, a popular drink, made from malt.

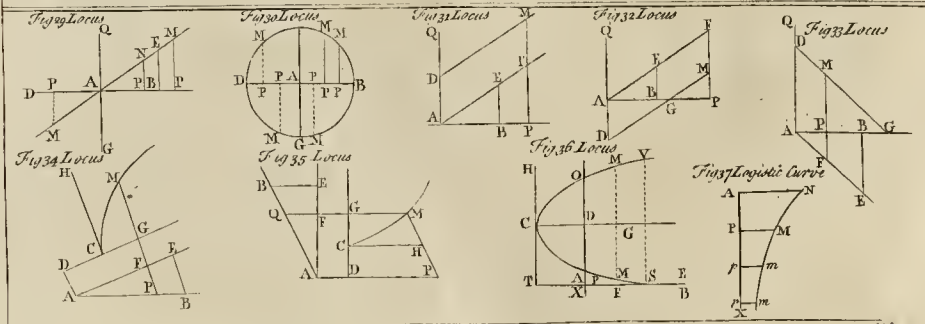
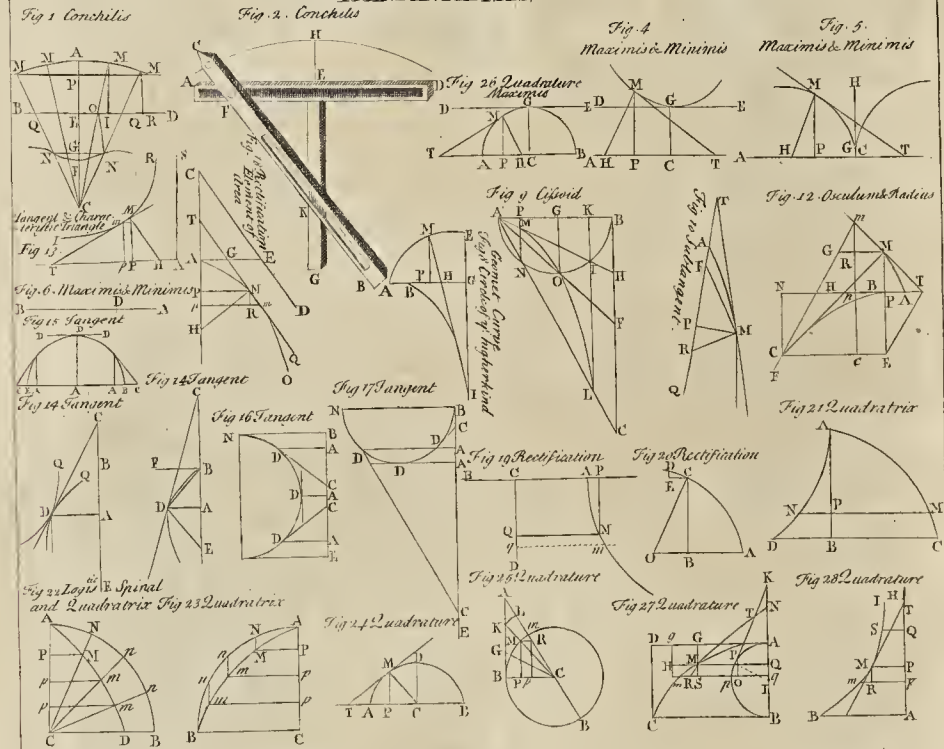
For the method of brewing *ale*, see **BREWING**.

Mr. Williams

TAB. ALGEBRA



TAB. ANALYSIS



Ale is chiefly distinguished from beer, another potable liquor made from the same ingredients, by the quantity of hops used therein; which is greater in beer, and therefore renders the liquor bitter, and fitter to keep.

The brewers also distinguish pale, or fine *ale*, brown *ale*, &c. Their several properties, effects, &c. see under the article MALT-Liquor.

The *Zythum*, and *Carmi* mentioned by Tacitus, as the beverage of the ancient Germans, are supposed by Matthiolus, to correspond to our *ale*, and beer.

ALE, *Cerevisia*, is also a denomination given to divers medicated liquors, or diet-drinks, whereof *ale* is the basis, or vehicle.

The medicated *ales*, make a large article in our old dispensaries. Such are the *cerevisia oxydrica*, for the eyes; *cerevisia anti-arthritis*, against the gout; *cerevisia cephalica*, for the head; *cerevisia epileptica*, &c.

Gill ALE, is prepared by infusing the dry leaves of *hedera terrestris*, i. e. ground-ivy, in malt-liquor; which hereby becomes impregnated with the virtues of that simple; and is therefore reputed astringent, and vulnerary; good in disorders of the breast, and against obstructions of the viscera. Gill is an English name of ground-ivy.

Dr. Butler's purging **ALE**, is prepared of polypody, fena, faraparilla, aniseeds, scurvygrass, agrimony, and maiden-hair, put up in a bag, and hung in a vessel of *ale*.

We also meet in some dispensaries with syrup of *ale*, made by boiling that liquor to a consistence; this is used against obstructions in the kidneys, and the fluor albus.

ALE-Beer. See the article BEER.

ALE-BERRY, is *ale* boiled with bread, and mace; sweetned, strained, and drank hot.

ALE-CONNER, an officer in the city of London, whose business is to inspect the measures of the publick houses.—There are four of them, and they are chosen by the common-hall of the city.

ALE-SILVER, a rent, or tribute yearly paid to the lord mayor of London, by those who sell *ale* within the city.

ALE-MEASURE. See the article MEASURE.

ALE-TASTER, is an officer appointed, and sworn in every court-leet, to look that there be a due size, and goodness of bread, *ale*, and beer, sold within the jurisdiction of the leet.

ALECTORIA*, in natural history, a stone said to be found in the stomach, liver, or rather gall-bladder of old cocks.

* The word is derived from *αλεκτορ*, a cock.

It is ordinarily of the figure of a lupine, and seldom exceeds the bigness of a bean.—It has abundance of virtues attributed to it, but most of them are fabulous. See SUPPLEMENT, article *Alectorius Lapis*.

ALECTOROMANTIA*, an ancient kind of divination, performed by means of a cock.

* The word comes from the Greek *αλεκτορ*, a cock, and *μαντις*, divination.

This art was in use among the Greeks; and the usual manner of it was this.—A circle was made on the ground, and divided into twenty-four equal portions, or spaces: in each of which spaces was written one of the letters of the alphabet, and upon each of these letters was laid a grain of wheat.

This done, a cock was turned loose in the circle, and careful observation was made of the grains he pecked.—The letters corresponding to those grains, were afterwards formed into a word; which word was to be the answer desired.

It was thus that Libanius and Jamblichus sought who should succeed the emperor Valens; and the cock answering to the spaces *ΘΕΟΔ*, they concluded upon Theodore, but by a mistake instead of Theodosius.

ALEMBIC*, or LIMBEC, a chemical vessel, consisting of a matrass or body, fitted with a roundish head, terminating in a sloping tube, for the condensed vapours to pass through in distillation.

* The word is formed of the Arabic particle *al*, and the Greek *αμβξ*, a sort of earthen culinary vessel, mentioned by Athenæus, and Hesychius. Though Matthæus Sylvaticus, in his *Pandetta Medicinæ*, asserts the word *alembic* to be Arabic, and that it literally denotes the upper part of a distilling vessel.

Alembic is popularly understood of the whole instrument of distillation with all its apparatus; but in the proper sense of the word, it is only a part hereof, viz. a vessel usually of copper, whereto a concave, globular, metalline head is closely luted; so as to stop the rising vapours, and direct them into its rostrum, or beak.

The heat of the fire raising the volatile parts of the subject exposed in the bottom of the vessel; they are received into its head, where they are condensed, either by the coldness of the ambient air, or by water externally applied; and become a liquor, which runs out at the beak into another vessel called the recipient.

The head, or capital of the *alembic*, is sometimes incompassed with a vessel full of cold water, by way of refrigeratory; though this intention is now more commonly answered by a worm-tub.

There are divers kinds of *alembics*: as an *open alembic*, where the head, and cucurbit are two separate parts; and a *blind alembic*,

or blind head, where the capital is sealed hermetically upon the cucurbit.

ALEXANDRIN, or **ALEXANDRIAN**, in poetry, the name of a kind of verse, which consists of twelve, or of twelve and thirteen syllables, alternately; the rest, or pause, being always on the sixth syllable.

It is said to have taken its name from a poem on the life of Alexander, intitled, the *Alexandriad*; written, or at least translated into this kind of verse by some French poets: though others will have it so denominated from one of the translators, Alexander Paris.

This verse is thought by some very proper in the epopee, and the more sublime kinds of poetry: for which reason it is also called *Heroic Verse*.

It answers in our language to the hexameters in the Greek, and Latin.—Chapman's translation of Homer, consists wholly of *Alexandrians*.

ALEXIPHARMIC*, in medicine, expresses that property which a remedy, either simple or compound, hath to resist, or destroy every thing of a poisonous, and malignant nature.

* The word is derived from the Greek *αλεξω*, *arceo*, I drive or expel; and *φαρμακον*, *pharmakon*, poison.

The ancients had a notion that there was a poison in all malignant diseases, and in the generality of those whose cause was unknown. Whence *alexipharmic* became a denomination for all remedies and antidotes against malignant diseases.

Alexiterial, *cardiac*, *antidote*, *alexipharmic*, and *counterpoison*, are all terms nearly of the same signification.

Alexipharmics are ordinarily divided into such as are general; and those more particular, supposed only to combat some particular disease.—But this division is founded more on speculation, than experience.

Alexipharmic medicines in general contain a great number of volatile parts, and such as render the mass of blood fluid. The greatest part of them are aromatic, and pungent to the taste.—Among the rest, it is true, there are some acid plants and juices; but these are only reckoned in the number, on account of their use in malignant, and colliquative fevers.

Alexipharmics chiefly act by exciting, or increasing a diaphoresis, or perspiration; by which the noxious matter is thrown off.

Alexipharmics, whether simple or compound, are also esteemed perservatives against malignant, and pestilential fevers: but they are to be used with caution; some of them being only proper in condensations, and others only in colliquations of the blood.

ALEXIPHARMIC Waters, &c. See WATER, &c.

ALEXITERIAL*, in medicine, a term of the same import with *alexipharmic*; but chiefly applied to the milk-water of that name.

* It is formed from the Greek *αλεξω*, *arceo*, I drive away; or *epitalor*, I assist.

ALFET, anciently signified a large cauldron, in which boiling water was put, for the accused to plunge his hand in up to the elbow, by way of trial or purgation.

ALGAROT, or **ALGAREL**, in the Arabian chemistry, a powder prepared of butter of antimony; being in reality no more than the regulus of that mineral, dissolved in acids, and separated again by means of several lotions with lukewarm water, which imbibes those acids.

This is also called *Mercurius Vitæ*, or simply *Emetic Powder*.—It purges violently both upwards, and downwards. And is more properly called antimonium mortis.

By collecting all the lotions, and evaporating two third parts, what remains is a very acid liquor, called *Spirit of philosophical Vitriol*.

ALGEBRA*, a method of resolving problems by means of equations.

* Menage derives the word from the Arabic *aljabran*, which signifies the restitution of any thing broken; supposing that the principal part of *algebra* is the consideration of broken numbers.—Others rather borrow it from the Spanish *algebra*, a person who re-places dislocated bones; adding, that *algebra* has nothing to do with fraction; in that it considers broken numbers as if they were intire, and even expresses its power by letters, which are incapable of fraction.—Some, with M. d'Herbelot, are of opinion, that *algebra* takes its name from Geber, a celebrated philosopher, chemist, and mathematician, whom the Arabs call *Giaber*; and who is supposed to have been the inventor.—Others, from *Goff*, a kind of parchment, made of the skin of a camel, whercon *Ali* and *Giofar Sadek* wrote in mystic characters the fate of Mahometanism, and the grand events that were to happen till the end of the world.—But others, with more probability, derive it from *Geber*, a word whence, by prefixing the particle *al*, we have formed *algebra*, which is pure Arabic, and properly signifies the reduction of broken numbers to a whole number.—However, the Arabs, it is to be observed, never use the word *Algebra* alone, to express what we mean by it; but always add to it the word *Macablah*, which signifies *opposition* and *comparison*.—Thus *algebra-macablah*, is what we properly call *algebra*.

Some

Some authors define *algebra* the art of solving all problems capable of being solved: but this is rather the idea of analysis, or the analytic art.

The Arabs call it, the *Art of restitution and comparison*; or, the *Art of resolution and equation*.—Lucas de Burgo, the first European who wrote of *algebra*, calls it, the *Rule of restoration, and opposition*.—The Italians call it, *regula rei & census*, that is, the rule of the root and the square; the root with them being called *Res*, and the square *Census*.—others call it *Specious arithmetic*; others *Universal arithmetic*.

Algebra is a peculiar kind of arithmetic, which takes the quantity sought, whether it be a number, or a line, or any other quantity, as if it were granted; and by means of one or more quantities given, proceeds by consequence, till the quantity at first supposed to be known, or at least some power thereof, is found to be equal to some quantity or quantities which are known, and consequently itself is known.

Algebra is of two kinds, *numeral*, and *literal*. *Numeral*, or *vulgar ALGEBRA*, is that of the ancients, which only had place in the resolution of arithmetical questions.

—In this, the quantity sought is represented by some letter or character; but all the given quantities are expressed by numbers.

Literal, or *specious ALGEBRA*, or the *new ALGEBRA*, is that wherein the given or known quantities, as well as the unknown, are all expressed or represented by their species, or letters of the alphabet.

This eases the memory and imagination of that vast stress or effort, required to keep several matters necessary for the discovery of the truth in hand, present to the mind: for which reason this art may be properly denominated *metaphysical geometry*.

Specious Algebra, is not, like the numeral, confined to certain kinds of problems; but serves universally for the investigation or invention of theorems, as well as the solution and demonstration of all kinds of problems, both arithmetical, and geometrical.

The letters used in *algebra*, do each separately represent either lines or numbers, as the problem is arithmetical or geometrical; and together, they represent planes, solids and powers more or less high, as the letters are in a greater or less number.—For instance, if there be two letters, *a b*, they represent a rectangle, whose two sides are expressed, one by the letter *a*, and the other by *b*; so that by their mutual multiplication, they produce the plane *ab*. Where the same letter is repeated twice, as *a a*, they denote a square.—Three letters *a b c*, represent a solid, or a rectangled parallelepiped, whose three dimensions are expressed by the three letters *a b c*: the length by *a*, the breadth by *b*, and the depth by *c*: so that by their mutual multiplication they produce the solid *abc*.

As the multiplication of dimensions is expressed by the multiplication of letters, and as the number of those may be so great as to become incommodious; the method is, only to write down the root, and on the right hand to write the index of the power, that is, the number of letters whereof the power to be expressed does consist; as, a^2 , a^3 , a^4 , a^5 : the last of which signifies as much as *a* multiplied five times into itself; and so of the rest.

For the symbols, characters, &c. used in *algebra*, with their application, &c. see the articles CHARACTER, and QUANTITY &c.

For the method of performing the several operations in *algebra*, see ADDITION, SUBTRACTION, and MULTIPLICATION.

As to the origin of this art, we are much in the dark.—The invention is usually attributed to Diophantus, a Greek author, who wrote thirteen books, though only six of them are extant, first published by Xylander, in 1575; and since commented on and improved by Gaspar Bachet, of the French academy; and since by M. Fermat.

And yet *algebra* seems to have been not wholly unknown to the ancient mathematicians, long before the age of Diophantus: we see the traces, the effects of it in many places; though, it looks as if they had designedly concealed it.—Something of it there seems to be in Euclid, or at least in Theon upon Euclid, who observes that Plato had begun to teach it.—And there are other instances of it in Pappus, and more in Archimedes and Apollonius.

But the truth is, the analysis used by those authors is rather geometrical than *algebraical*; as appears by the examples thereof which we find in their works: so that we make no scruple to say, that Diophantus is the first, and only author among the Greeks who has treated of *algebra* professedly.

This art, however, was in use among the Arabs much earlier than among the Greeks. And it is said that the Arabs too borrowed it from the Persians, and the Persians from the Indians.—It is added, that the Arabs carried it into Spain; whence, some are of opinion, it passed into England, before Diophantus was known among us.

The first who wrote on the subject in this part of the world, was Lucas Pacciolus, or Lucas de Burgos, a Cordelier;

whose book, in Italian, was printed at Venice in 1494.—This author makes mention of Leonardus Pisanus, and some others, of whom he had learned the art; but we have none of their writings.—He adds, that *algebra* came originally from the Arabs; and never mentions Diophantus: which makes it probable, that that author was not at that time known in Europe.—His *algebra* goes no further than simple and quadratic equations.

After Pacciolus appeared Stifelius, a good author; but neither did he advance any farther.

After him, came Scipio Ferreus, Cardan, Tartaglia, and some others; who reached as far as the solution of some cubic equations.—Bombelli followed these, and went a little farther.—At last came Nunnius, Ramus, Schoner, Salgnac, Clavius, &c. who all of them took different courses, but none of them went beyond quadratics.

About the same time, Diophantus was first made public; whose method is very different from that of the Arabs, which had been followed till then.

In 1590, Vieta entered on the stage, and introduced what he called his *Specious arithmetic*, which consists in denoting the quantities, both known and unknown, by symbols or letters.—He also introduced an ingenious method of extracting the roots of equations, by approximations; since much facilitated by Raphson, in his *Analysis Equationum*.

Vieta was followed by Oughtred, who in his *Clavis Mathematica*, printed in 1631, improved Vieta's method; and has invented several compendious characters, to shew the sums, differences, rectangles, squares, cubes, &c.

Mr. Harriot, another Englishman, contemporary with Oughtred, left several treatises at his death; and among the rest, an *Analysis*, or *algebra*, which was printed in 1631; where Vieta's method is brought into a still more commodious form, and this is much esteemed to this day.

In 1657, Des Cartes published his geometry, wherein he made use of the literal calculus and the *algebraic* rules of Harriot; and as Oughtred in his *Clavis*, and Marin, Ghetaldus, in his books of *mathematical composition and resolution* published in 1630, applied Vieta's arithmetic to elementary geometry, and gave the construction of simple and quadratic equations; so Des Cartes applied Harriot's method to the higher geometry, explaining the nature of curves by equations, and adding the constructions of cubic, biquadratic, and other higher equations.

Des Cartes's rule for constructing cubic and biquadratic equations, was further improved by Tho. Baker, in his *Clavis Geometrica Catholica*, published in 1684; and the foundation of such constructions, with the application of *algebra* to the quadratures of curves, questions de maximis et minimis, the centrobary method of Guldinus, &c. was given by R. Slusius, in 1668; as also by Fermat, in his *Opera Mathematica*; and Roberval, in the *Mém. de Mathem. & de Physique*; and Barrow, in his *Leit. Geomet.*—In 1708, *algebra* was applied to the laws of chance and gaming, by R. de Montmort; and since by de Moivre, and James Bernoulli.

Thus much for the progress of *algebra*.—The elements of the art were compiled and published by Kerley in 1671; wherein the specious arithmetic, and the nature of equations are largely explained, and illustrated by variety of examples: the whole substance of Diophantus is here delivered; and many things added concerning mathematical composition and resolution, from Ghetaldus. The like has been since done by Prestet in 1694; and by Ozanam in 1703.—But these authors omit the application of *algebra* to geometry; which defect is supplied by Guisnee in a French treatise expressly on the subject, published in 1704; and l'Hospital in his *Analytical Treatise of the conic Sections*, in 1707.—The rules of *algebra* are also compendiously delivered by Sir I. Newton, in his *Arithmetica Universalis*, first published in 1707; which abounds in select examples, and contains several rules and methods invented by the author.

Algebra has been also applied to the consideration and calculus of infinities; from whence a new and extensive branch of knowledge has arose, called the *Doctrine of Fluxions*, or *Analysis of Infinities*, or the *Calculus Differentialis*. See FLUXIONS.—The authors on this subject, see under the article ANALYSIS.

ALGEBRAICAL, something that relates to *algebra*. Thus we say, *algebraical* characters, or symbols, curves, solutions, &c. See CHARACTER.

ALGEBRAICAL Curv, is a curve, wherein the relation of the abscisses to the semiordinates, may be defined by an *algebraical* equation.

These are also called *geometrical lines*, or *curves*. *Algebraical* curves stand contradistinguished to mechanical or transcendental ones. See MECHANICAL, and TRANSCENDENTAL.

ALGEBRAICAL Solution. See the article RESOLUTION.

ALGENEB, or **ALGENIB**, in astronomy, a fixed star of the second magnitude, on the right side of Perseus.—Its longitude, latitude, &c. see among the rest of the constellation PERSEUS.

ALGOL, or *Medusa's Head*, a fixed star of the third magnitude, in the constellation Perseus.—Its longitude, latitude, &c. See under the article **PERSEUS**.

ALGORITHM, an Arabic term, which some authors, and especially the Spaniards, make use of to signify the practical operation of the several parts of specious arithmetic, or algebra.

Sometimes it is also used for the practice of common arithmetic, by ten numeral figures.

Algorithm is properly the art of numbering truly, and readily; and comprehends the six common rules of arithmetic.—It is sometimes called *Logistica Numeralis*.

We say, the *algorithm* of integers, the *algorithm* of fractions, the *algorithm* of surds, &c.

ALGUAZIL, in the Spanish policy, a serjeant or official of a judge, or magistrate appointed to see his decrees executed.

ALHANDAL*, a term in the Arabian pharmacy, signifying colocyth.—The troches of *Alhandal*, *Trochisci Alhandali*, are a kind of troches, composed of colocyth, bdellium, and gum tragacanth. See **TROCHE**.

* The word is formed of the Arabic *Handal*, or *Handbal*, a name for colocyth.

They are esteemed good purgatives, and are used on divers occasions.

ALIDADE*, or **ALIDADE**, the index or label of an astronomical, or geometrical instrument, for taking of heights, or distances.

* The word is Arabic, where it signifies the same thing.—In Greek and Latin, it is called *dioptra*, *Dioptra*, and *Linea Fiducie*, fiducial line.

The *alidade* is a kind of ruler, moveable on the centre of the instrument; and carrying two sights, which are erected perpendicularly at the two extremities of it. See the article **SIGHTS**.

ALICATICA, an ancient Arabian weight.

ALIEN, in law, a stranger; or person born out of the king's allegiance; or under the jurisdiction of some other sovereign; and not naturalized, or made a denizen.

Of these there are two kinds, *viz.* *alien friends*, who are of those countries which are at peace and league with us; and *alien enemies*, who are of countries at war with us.

A man born out of the land, so it be within the limits of the king's obedience beyond the seas; or of English parents out of the king's obedience, so the parents at the time of the birth be of such obedience, is no *alien*, but a subject of the king: Stat. 2. 25 Edw. III. commonly called the Statute *De nativ. ultra mare*.

Add, that if one born out of the king's allegiance come and dwell in England; his children begotten here are not *aliens*, but denizens.

Scavage, package and hallage, payable to the city of London, are properly *aliens duties*.

On what footing *aliens* are permitted to import foreign commodities into Great Britain. See **DUTY**.

ALIEN PRIORIES, a subordinate kind of monasteries in England, belonging to, and dependant on other monasteries in foreign countries.

ALIENATION, **ALIENATIO**, in law, the act of making a thing another man's; or the altering, and transferring the property, and possession of lands, tenements, or other things, from one man to another.

To *alienate*, or *alien*, in mortmain, is to make over lands or tenements to a religious community, or other body politick. See **MORTMAIN**.

To *alienate* in fee, is to sell the fee-simple of any land, or other incorporeal right.

Crown lands are only *alienable* under a faculty of perpetual redemption.

The council of Lateran, held in 1123, forbids any clerk to *alienate* his benefice, prebend, or the like.

ALIENATIO A FAMILIA. See **ABDICATION**.

ALIENATION-OFFICE, is an office to which all writs of covenants and entry, upon which fines are levied and recoveries suffered; are carried, to have fines for *alienation* set and paid thereon.

ALIFORMES* *Musculi*, a pair of muscles, arising from the pterygoid bone, and ending in the neck of the lower jaw, towards the internal feat of the head.

* They are thus called from the Latin *ala*, wing, and *forma*, shape; as resembling wings.

ALIFORMES Processus, in anatomy, the prominences of the os cuneiforme. See **CUNEIFORME**.

ALIMENT*, **ALIMENTUM**, in a physical sense, is whatever may be dissolved, and turned into chyle, by the liquor of the stomach, or the natural heat; so as to be afterwards converted into blood, for augmenting the body, or repairing the continual expence of parts.

* The word is Latin, formed of the verb *alere*, to nourish.

ALIMENTARY, **ALIMENTAL**, something that relates to aliment, or food.

The ancient physicians hold that every humour consists of two parts; an *alimentary*, and an excrementitious one.

ALIMENTARY DUCT, *Ductus Alimentalis*, is a name given, by Dr. Tyfon and some others, to that part of the body through which the food passes, from its reception into the mouth, to its exit at the anus; including the gula, stomach, and intestines.

Dr. Morgan considers the whole *alimentary* tube, (including the stomach, intestines, and lacteals,) as constituting one gland; of the like nature, structure, and use with the other glands of the body.

Every gland has its vasa deferentia, secretoria, and expurgatoria, together with its common ventricle, where the matter, brought thither, is first prepared by digestion, &c.—In this grand, primary concoctive gland, the gula, from the mouth of the oesophagus to its vasa deferentia the stomach, is its common receptacle, the lacteals are its vasa secretoria, or recipient strainers, and the intestines from the pylorus to the anus constitute its vas expurgatorium, or common expurgatory duct.

The actions therefore of this, as of every other gland, are principally four, *viz.* solution, separation, glandular colature or secretion, and evacuation or expurgation. *V. Mech. Pract. of Phys.* p. 27.

ALIMENTARY DUCT is sometimes also understood of the thoracic duct.

ALIMENTARY LAW, *Lex Alimentaria*, was an old law among the Romans, whereby children were obliged to find sustenance for their parents.

ALIMENTARI PURI, &c. were certain children, maintained and educated by the munificence of the emperors, in a sort of public places, not unlike our hospitals.

Trajan was the first that brought up of these *alimentary* boys. He was imitated by Adrian. Antoninus Plus did the same for a number of males, at the solicitation of Faustina; and hence, in some medals of that emperor, we read *PVELLAE FAVSTINIANAE*.—Alexander Severus did the like, at the request of Mammaea; and the males thus educated were called *Mammearia*.

ALIMONY, **ALIMONIA**, properly signifies nourishment, or maintenance; but in a more modern sense, in law, it denotes that portion, or allowance which a married woman sues for, upon any occasional separation from her husband, wherein she is not charged with elopement or adultery.

This was anciently called *Rationabile Essequium*, reasonable maintenance, and was recoverable only in the spiritual court; but now it is recoverable also in chancery.

ALIQUEANT PART, is that which will not measure or divide any number exactly, but some remainder will still be left.—Or, an aliquant part, is that which being taken any number of times, is always either greater or lesser than the whole. See **PART-MEASURE**, &c.

Thus, 5 is an aliquant part of 12; for being taken twice, it falls short, and when taken three times it exceeds 12.

The aliquant parts of a pound, or 20 s. are

- 3 s. an aliquant part composed of a 10th and 20th.
- 6 s. of a 5th and a 10th.
- 7 s. of a 4th and a 10th.
- 8 s. of two 5ths.
- 9 s. of a 4th and a 5th.
- 11 s. of a half and a 20th.
- 12 s. of a half and a 10th.
- 13 s. of a half, a 10th and 20th.
- 14 s. of a half and a 5th.
- 15 s. of a half and a 4th.
- 16 s. of a half, a 5th, and 10th.
- 17 s. of a half, a 4th, and 10th.
- 18 s. of a half and two 5ths.
- 19 s. of a half, a 4th, and 5th.

To multiply by aliquant parts, see the article **MULTIPLICATION**.

ALIQUEOT* *Part*, is such part of any number, or quantity, as will exactly measure it, without any remainder.—Or, it is a part, which being taken a certain number of times, becomes equal to the whole, or integer.

* The word is formed of the Latin *aliquoties*, any number of times.

Thus, 3 is an aliquot part of 12; because being taken four times, it will just measure it.

The aliquot parts of a pound of 20 s. are

- | | |
|--------------------------|------------------------|
| 10 s. make half of 20 s. | 2 s. 6 d. an eighth. |
| 5 s. a fourth. | 1 s. 8 d. a twelfth. |
| 4 s. a fifth. | 1 s. 4 d. a sixteenth. |
| 2 s. a tenth. | 1 s. 3 d. a sixteenth. |
| 1 s. a twentieth. | 10 d. a twenty-fourth. |
| 6 s. 8 d. a third. | 5 d. a forty-eighth. |
| 3 s. 4 d. a sixth. | |

To multiply by the help of aliquot parts, see the article **MULTIPLICATION**.

ALKAHEST, or ALCAHEST, in chymistry, a most pure and universal menstruum, or dissolvent, wherewith some chymists have pretended adequately to resolve all bodies into their first matter, and perform other extraordinary and unaccountable operations.

The two eminent adepts, Paracelsus and Helmont, expressly declare, that there is a certain fluid in nature, capable of reducing all sublimary bodies, as well homogeneous as mixed, into their ens primum, or original matter whereof they are composed; or into an uniform equable and potable liquor, that will unite with water and the juices of our bodies, yet will retain its feminal virtues; and if mixed with it self again, will thereby be converted into pure elementary water.—Whence they also imagined, it would at length reduce all things into water.

This declaration, seconded by the asseveration of Helmont, who religiously swears himself possessed of the secret, has excited the succeeding chymists and alchymists to the pursuit of so noble a menstruum. Mr. Boyle was so fond of it, that he frankly acknowledges he had rather have been master thereof than of the philosopher's stone.

Indeed, it is not difficult to conceive, that all bodies might originally arise from some first matter, which was once in a fluid form.—Thus, the primitive matter of gold is, perhaps, nothing more than a ponderous fluid, which from its own nature, or a strong attraction between its parts, afterwards acquires a solid form.—And hence, there does not appear any absurdity in the notion of an universal ens, that resolves all bodies into their ens genitale.

The *alkahest* is a subject that has been canvassed by an infinite number of authors; as Pantaleon, Philalethes, Tachenius, Ludovicius, &c.—Boerhaave says, a library might be collected of them; and Weidenfeldt, in his treatise *De Secretis Adeptorum*, has given us all the opinions that have been entertained about it.

The term *alkahest* is not peculiarly found in any language: Helmont declares he first observed it in Paracelsus, as a word that was unknown before the time of that author, who in his second book, *De viribus Membrorum*, treating of the liver, has these words: *Est etiam alkahest liquor, magnam hepatis conseruandi & confortandi*, &c. “There is also the liquor *alkahest*, of great efficacy in preserving the liver; as also in curing hydropical and all other diseases arising from disorders of that part. If it have once conquered its like, it becomes superior to all other hepatic medicines; and though the liver itself were broken and dissolved, this medicine should supply its place.”

It is this single passage of Paracelsus, that excited the succeeding chymists to an inquiry after the *alkahest*; there being but one other indirect expression about it in all his works.

Now it being a frequent practice with this author to transpise the letters of his words, and to make use of abbreviations, and other ways of concealment; as in tartar, which he would write *Sutatar*; for *Nitrum*, *Matrin*, &c. it is supposed *alkahest* may be a word thus disguised.—Hence some imagine it formed of *alkali est*; and accordingly, that it was the alkaline salt of tartar volatilized. This seems to have been Glauber's opinion; who indeed performed surprizing things with such a menstruum upon subjects of all the three kingdoms.

Others will have it the German word *algeist*, q. d. wholly spirituous, or volatile; others are of opinion, that *alkahest* is taken from *salz-geist*, which signifies spirit of salt; for the universal menstruum, it is said, is to be wrought from water; and Paracelsus himself calls salt the centre of water, wherein metals ought to die, &c.—In effect, spirit of salt was the great menstruum he used on most occasions.—The commentator on Paracelsus, who gave a Latin edition of his works at Delft, assures that the *alkahest* was mercury, converted into a spirit.—Zwelfer judged it to be a spirit of vinegar rectified from verdigrise.—And Starkey thought he discovered it in his soap.

There have been some synonymous and more significant words used for the *alkahest*.—The elder Helmont mentions the *alkahest* by the compound name of *Ignis-aqua*, fire-water: but he here seems to mean the circulated liquor of Paracelsus; which he terms *fire*, from its property of consuming all things; and *water*, on account of its liquid form.—The same author calls it *Ignis-gebernae*, infernal fire; a word also used by Paracelsus: he also intitles it *Summum & felicissimum omnium salium*, the highest and most successful among salts; which having obtained the supreme degree of simplicity, purity, and subtilty, alone enjoys the faculty of remaining unchanged and unimpaired by the subjects it works on, and of dissolving the most stubborn and untractable bodies, as stones, gems, glass, earth, sulphur, metals, &c. into real salt, equal in weight to the matter dissolved; and this with as much ease as hot water melts down snow.—This salt, continues he, by being several times cohobated with Paracelsus's *Sal circulatum*, loses all its fixedness; and at length

becomes an insipid water, equal in quantity to the salt it was made from.

Helmont is express that this menstruum is intirely the product of art, and not of nature.—“Though, says he, a homogeneous part of elementary earth may be artificially converted into water, yet I deny that the fame can be done by nature alone; for no natural agent is able to transmute one element into another.” And this he offers as a reason why the elements always remain the same.—It may let some light into this affair, to observe that Helmont, as well as Paracelsus, took water for the universal instrument of chymistry, and natural philosophy; and earth for the unchangeable basis of all things: that fire was designed as the efficient cause of all things: that feminal impressions were lodged in the mechanism of earth; and that water, by dissolving and fermenting with this earth, as it does by means of fire, brings every thing forth; whence originally proceeded the animal, vegetable, and mineral kingdoms; even man himself being thus at first created, agreeably to the account of Moses.

The great character or property of the *alkahest*, we have observed, is to dissolve, and change all sublimary bodies; water alone excepted.—The changes it induces proceed thus: 1^o, The subject exposed to its operation, is converted into its three principle, salt, sulphur, and mercury; and afterwards, into salt alone; which then becomes volatile; and at length is wholly turned into insipid water.—The manner of application is by touching the body proposed to be dissolved, e. gr. gold, mercury, sand, or the like, once or twice with the pretended *alkahest*; and if the liquor be genuine, the body will on this be converted into its own quality of salt.

2^o, It does not destroy the feminal virtues of the bodies dissolved thereby.—Thus, gold is, by its action, reduced to a salt of gold; antimony to a salt of antimony; fassron to a salt of fassron, &c. of the same feminal virtues, or characters with the original concrete.—By feminal virtues, Helmont understands those virtues which depend upon the structure or mechanism of a body, and which makes it what it is. Hence, an actual and genuine aurum potable might readily be gained by the *alkahest*, as converting the whole body of gold into salt, retaining its feminal virtues, and being withal soluble in water.

3^o, Whatever it dissolves, may be rendered volatile by a sand-heat: and if after volatilizing the solvent, it be distilled therefrom, the body is left pure insipid water, equal in quantity to its original self, but deprived of its feminal virtues.—Thus, if gold be dissolved by the *alkahest*, the metal first becomes salt, which is potable gold; but when the menstruum by a further application of fire is distilled therefrom, it is left mere elementary water. Whence it appears, that pure water is the last production or effect of the *alkahest*.

4^o, It suffers no change or diminution of force by dissolving the bodies it works on, and therefore sustains no reaction from them; being the only immutable menstruum in nature.

5^o, It is incapable of mixture, and therefore remains free from fermentation and putrefaction; coming off as pure from the body it has dissolved, as when first put thereon; without leaving the least foulness behind.

ALKALINE, or ALKALIZATE Bodies, among chymists, are such as have their pores naturally so formed, that they are fit to be pierced, and put into motion by the points of an acid poured upon them.

ALKALIZATION, ALKALIZATIO, in chymistry, the act of impregnating a liquor with an alkaline salt.

This is done either to make it a better dissolvent, for some particular purposes; or to load the phlegm, so as it may not rise in distillation, whereby the spirituous parts may go over more pure.

ALKALY, ALKALI, or ALCALY, in chymistry, a name originally given by the Arabians, to a salt extracted from the ashes of a plant called *Kali*: and by us, *glass wort*; because used in the making of glass.

Afterwards, the term *alkaly* became a common name for the lixivious salts of all plants; that is, for such salts as are drawn by lye from their ashes.

And hence, again, in regard the original *alkaly* was found to ferment with acids; the name has since become common to all volatile salts, and all terrestrial substances which have that property.

ALKALY, then, in its modern extensive sense, is any substance, which being mixed with an acid, an ebullition and effervescence ensues thereon.

And hence arises the grand division of natural bodies into the two opposite classes of *acids* and *alkalies*.

Boerhaave scarce takes this circumstance to be enough to constitute any determinate class of bodies.—In effect, *alkalies* are not of one similar homogeneous nature: but there are two several sorts of them.

The first are obtained from vegetable and animal substances, by calcination, distillation, putrefaction, &c. such are spirit of urine,

rise, spirit of hartshorn, salt of tartar, &c.—The second are of the terrestrial kind; as shells, chalk, &c.

These two species of alkalies, Boerhaave observes, differ widely from each other; having scarce any thing in common, but their being effervescible with acids.—The one is a class of native, fixed, scentless, insipid, mild, astringent bodies: the other a set of such as are volatile, odorous, sapid, caustic, aperitive, and are procured by art.

Hence, adds the same author, mere effervescence with acids, must be allowed to be of itself insufficient to determine the nature of an *alkaly*: and that such a name, which properly denotes a caustic fiery substance, should not be affixed to any mild and gentle body, as chalk, &c. but other properties and considerations are to be taken in, and particularly their taste, the manner of procuring, and the change of colour they produce in bodies.

With regard to this last circumstance, those liquors which being poured on syrup of violets, change it to a green-colour, are *alkalies*; as those which turn it red, are acids.—

Thus oil of tartar turns it of a kindly green; and oil of vitriol of a carmine red: and if to the syrup thus made red by oil of vitriol, oil of tartar be poured, it turns that part where-with it comes in contact, green; leaving the rest red: and the like holds of oil of vitriol, poured on syrup made green by oil of tartar.

To the like effect M. Homberg observes, that ‘a mere heat and bubbling arising upon the admixture of a body with an acid, does not seem an adequate criterion of the *alkaline* nature; since distilled oils of all kinds are found to do thus much; and that many of them with more vehemence than *alkalies* themselves; so as sometimes even to take fire, which *alkalies* never do.’

To the definition and character of an *alkaly* therefore, M. Homberg adds this circumstance; ‘that after the action, the mixture coalesces and shoots into a salt, or saline matter.’

—This excludes the oils above-mentioned; which do not, after effervescence, unite with the acids into a saline substance, but rather compose a resinous one.

All lixivious salts have these characters of *alkaly*.—And not only lixivious, but also all urinous salts, which are constantly found to imbibe acids with great eagerness, and after ebullition, to unite and crystallize with them.

Hence we have two kinds of *alkaly* Salts, viz. *fixed*, or *lixivious alkalies*; and *volatile*, or *urinous ones*.

But beside *alkaly* salts, there are an infinity of other bodies, not saline; which answer to the characters of *alkaly*, i. e. which produce much the same effects with acids, as the *alkaly* salts above mentioned.—And these *alkaline* matters are in other respects of different natures.

Some, e. gr. are merely earthy; as quick-lime, marble, chalk, &c.—Others are metalline; among which, some have their peculiar and appropriate acids to act on them, as gold, tin, and antimony, which only dissolve with aqua regia; silver, lead, and mercury, with aqua fortis; and the others with other sorts of acids, as iron, copper, zink, bismuth, &c.—There are others of the animal class; consisting, 1^o, Of stony matters found in the viscera of certain species; as the calculus humanus, bezoards, crabs eyes, &c.—2^o, Testaceous matters and shells; as pearls, oyster-shells, cuttle-fish bones, the shells or coats of lobsters, crabs, &c.—3^o, The parts of animals, which by length of time, or some other cause, are become stony, or even earthy; as the fossil unicorn's horn, &c.—And lastly, almost all stony marine plants, as coral, &c.

After all, the *alkaline* property in fixed salts does not appear to be native, but rather producible by art.—This opinion seems to have been first started by Helmont: before him, it was the standing opinion, that fixed *alkalies* pre-existed in mixed bodies; and were only separated or extricated from the parts of the compound. Helmont advanced, that they did not thus pre-exist in their *alkaline* form, but were productions of the fire, by whose violent action, part of the salt which in the concrete is all volatile, lays hold of some part of the sulphur of the same body; and both melting together, are fixed into an *alkaly*: which fixation he exemplifies, by what happens when salt-petre and arsenic, though both volatile, being exposed to the fire, are fluxed by the operation thereof, and made to fix each other.

Some late chymists, and particularly M. Geoffroy, carry the point something further, and assert, that all *alkaly* salts whatever, both fixed and volatile, are wholly the effect of fire; in that before any action of the fire, they did not pre-exist in the mixt wherein they afterwards appeared.

Notwithstanding all the seeming opposition and hostility between acids and *alkalies*, they may be converted into one another; at least, acids are convertible into *alkalies*; as is shewn at large by M. Geoffroy in a discourse express, in the *Mém. de l'Acad.* an. 1717, where the nature, and origin of *alkalies* is ingeniously explained.

Alkaly salts, according to this author, are only acids concentrated in little molecules of earth, and united with certain particles of oil, by means of fire.

When an acid, which we conceive in the general as a small, solid, pointed spiculum, happens to be absorbed or concentrated in a proper portion of earth; the whole becomes denominated a *saline*, compound, neutral, or intermediate salt; by reason the acid, thus inclosed in a sheath, cannot excite the same favour as when disengaged therefrom; and yet excites a saline taste: and for this reason is compound, &c.

Now, fire is the only agent capable of disengaging the acid, from the earth it is thus invested withal. Upon this, the acid being lighter than the earth, rises, and evaporates; leaving the earth at the bottom of the vessel; which for this reason is called *fixed*, in contradistinction to the acid, which is *volatile*. This earth, thus bereaved of its acid, is left with its pores open and empty, which before were filled; and withal, in sustaining the action of fire, it necessarily retains some of the particles thereof, which give it an acrimonious taste, that mere earth could never have.—From this taste it is called *salt*; and from its pores being open, and thus disposed to admit and imbibe new acids, it is called *alkaly salt*.

Now, it is not to be imagined, that an earth which has once been impregnated with acids, can ever be perfectly divested thereof; there will still remain some, though much less than before. So that an *alkaly* may be conceived as only a too small quantity of acid, inclosed in too large a quantity of earth.

The visible and sensible fire is not the only agent capable of separating acids from their earth; fermentation has the same effect, in virtue of that pure active fire produced or concerned therein. *Alkalies*, therefore, are the production, either of the one, or of the other fire; and the same may be said of the acids disengaged therefrom; it being the dis-union of the parts of the same salt occasioned by fire that produces both, the acids as well as the *alkalies*. All the difference is, that the *alkaly* imbibes and retains certain corpuscles of the fire, whereas nothing foreign is superadded to the acid.

On this principle every acid is volatile, and every *alkaly* should be fixed, if the *alkaly* were only earth: but, in regard the little acid still remaining in the *alkaly*, may be united with a portion of oil, as well as a portion of earth; and oil is known to be volatile: the compound, that is, the *alkaly*, must be volatile, in case the oil prevail therein.

In this case, the *alkaly* is found to have a strong, penetrating, urinous taste and smell; and is what we call a *volatile urinous alkaly salt*.

These things well considered; it will be easy to assign what must ensue upon the separations, or new unions of the parts of a mixt.

An acid, it is evident, may become an *alkaly*, in that after having been separated from its matrix, it may be restored in a small quantity to another matrix, either wholly earthy or earthy and oleaginous.—In the first case, it will become a fixed *alkaly*; in the second, it may be, a volatile *alkaly*, if in the supposed matrix the proportion of oil prevail over that of earth; and in this case it will be urinous.

Again, what before was a fixed *alkaly*, may become volatile and urinous, by depositing or letting go part of its earth, and taking oil in its stead.

These transmutations are not found equally easy and practicable in the three different kinds of mixts, or the three kingdoms; by reason of the diversity of circumstances that must concur thereto.—They are much the most rare and difficult in the mineral realm; by reason, no doubt, that the parts of minerals are more closely tied together, and have, as it were, less play. The only instance chymistry hath hitherto produced, of a mineral acid's being converted into a fixed *alkaly*, is in the operation of fixing salt-petre.

The vegetable kingdom, it is observed, furnishes a very large quantity of fixed *alkaly* salt; and very little volatile *alkaly*: the animal kingdom, on the contrary, affords a deal of volatile *alkaly* salt, and but little fixed. The fossil kingdom affords a very little native fixed *alkaly* salt, as the Egyptian natrum, and the salts procured by lotion from saline earths about Smyrna and some other places of the East; and the chymists have also found a method of converting nitre into a fixed *alkaly*: but no body hath hitherto produced a volatile *alkaly* from the acids of the mineral kingdom.—And yet, if acid salts of the vegetable kind be convertible either into fixed or volatile *alkalies*, why may not mineral acids be susceptible of the same change? since vegetable acids are originally no other than mineral ones: for, from whence but the earth should plants derive their acid juice?

In effect, M. Geoffroy has at length shewn the operation feasible, by an actual transformation of the same acid, nitre, into a volatile urinous *alkaly*. See the *Mém. de l'Acad.* ubi supra.

By the way, it is to be noted, that the instance of Egyptian natrum or nitre, furnishes an objection against the general assertion of all *alkalies* being artificial, or produced by fire: Mr. Boyle, who had some of this salt sent him by the English ambassador at the Porte; found that vinegar would work briskly on it, even in the cold; ‘Whence, says he, it appears, that the Egyptian nitre, acknowledged to be a native salt, and made only by the evaporation of the superfluous water of the Nile, is yet of a lixivious nature, or at least abounds with particles that are so, though produced with-

out any precedent incineration, and the matter of it exposed to no violence of the fire, to make it afford an *alkali*." *Prodicil. of Chym. Princ.*—He adds, "However, he does not know any other body in nature, except this, wherein the *alkaline* properties are not produced." *Ibid.*—And proceeds to give instances of *alkalies* being made from sea salt, and other acids; and shews, "how the same body, without the addition of any other salt, may by varying the manner of the fire's application, be made either to afford little else than acids, or a greater or less quantity of *alkali*." *Ibid.*

Hypothesis of ALKALY and acid.—Tacherius and Sylvius de la Bœe, followed by the tribe of vulgar chymists, strenuously assert that *alkali* and acid to be the only universal principles of all bodies; and by means hereof, they account for the qualities of bodies, and the rest of the phenomena of nature; particularly these in the animal economy.—In a word, *alkali* and acid are substituted in the stead of matter and motion.

Mr. Boyle and Leibniz attack this hypothesis with great force of argument.—In effect, it is at best but precarious to affirm, that acid and *alkaline* parts are found in all bodies.

When the chymists see aqua fortis dissolve filings of copper, they conclude, that the acid spirits of the menstruum meet in the metal with an *alkali*, upon which they work; but how unsafe a way of arguing this is, appears hence, that spirit of urine, which is allowed a volatile *alkali*, and accordingly makes a great conflict with aqua fortis, readily dissolves filings of copper, and that even more generously than the acid liquor.—So, when they see the magistery of pearl or coral, prepared by dropping oil of tartar into the solution of these bodies made with spirit of vinegar; they ascribe the precipitation to the fixed *alkali* of the tartar, which mortifies the activity of the spirit of vinegar: whereas, the precipitation would no less ensue, if, instead of the *alkalitate* oil of tartar, that strong acid, oil of sulphur per campanam, were used.

It may also be doubted, whether it be just to suppose, that when an acid is discovered in a body, the operation of that body on another, abounding with an *alkali*, must be the effect of a conflict between these two principles?—For, an acid body may do many things, not simply as an acid, but on account of a texture or modification, which endows it with other qualities as well as acidity. Thus, when the chymists see an acid menstruum, as aqua fortis, spirit of salt, oil of vitriol, &c. dissolve iron, they presently ascribe the effect to an acidity in the liquors; though well deglugged urinous spirits, which they hold to have a great sympathy to acids, will also readily dissolve crude iron even in the cold.

Further, the patrons of this hypothesis, seem arbitrarily to have assigned offices to each of their two principles; as the chymists do to each of their tria prima; and the Feripatetics to each of their four elements.—But it is not enough to say, that an acid, for instance, performs these things, and an *alkali* these; and that they divide the operations and phenomena of natural bodies between them: affections of such moment ought not to be received, without further proof.

Indeed, the very distribution of salts into acids and *alkalies*, has somewhat arbitrary in it; there being not only several things wherein the acids agree with *alkalies*, but also several things wherein each differs from it.—To say nothing of the diversity of fixed and volatile *alkalies* above-mentioned; some, as salt of tartar, will precipitate the solution of sublimate into an orange-tawny; others, as spirit of blood and hartshorn, precipitate the same solution into a milky substance; and oil of tartar very slowly operates upon filings of copper, which spirits of urine and hartshorn will readily dissolve on the fire. And among acids themselves the difference is no less; for some of them will dissolve bodies which others will not: and this even where the menstruum that will not dissolve the body, is reputed much stronger than that which does; as deglugged spirit of vinegar will dissolve lead reduced to minute parts in the cold, which is an effect that chymists expect not from spirit of salt. Nay, one acid will often precipitate what another has dissolved, and *contra*; as, spirit of salt will precipitate silver out of spirit of nitre. And, the properties peculiar to some particular acids; as that spirit of nitre or aqua fortis, dissolves camphire into an oil, and coagulates common oil into a consistent substance like tallow; and though it will both corrode silver, copper, lead, and mercury, and keep them dissolved, it quickly lets fall almost the whole body of tin. It is no wonder that the definitions given of acid and *alkali* should be inaccurate and superficial; since the chymists themselves do not seem to have any determinate notion or sure marks, whereby to know them distinctly.—For, to infer, that, because a body dissolves another, which is dissoluble by this, or that known acid, the solvent must also be acid; or to conclude, that, if a body precipitates a dissolved metal out of a consensually acid menstruum, the precipitant must be an *alkali*, is precarious: since filings of silver will be dissolved by some *alkalies*, viz. spirit of sal ammoniac, &c. as well as by acids; and bodies may be precipitated out of acid menstrua, by other acids, and by other liquors when in them appears not the least *alkali*. Add, that a solution of bismuth

made in aqua fortis, would be precipitated both by spirit of salt, and by common water.—Nor does that other criterion of acids and *alkalies*, viz. the heat, commotion, and bubbles excited upon their being put together, appear more determinate; since almost any thing fitted variously and vehemently to agitate the minute parts of a body, will produce heat in it.—Thus, though water be neither an acid nor an *alkali*, it will quickly grow very hot, not only with the highly acid oil of vitriol, but with the *alkalitate* salt of tartar.

Neither is the production of bubbles on the mixture, though accompanied with a hissing noise, a certain sign; such production not being a necessary effect of heat, excited by conflict, but depending on the peculiar disposition of the bodies put together, to extricate, produce, or intercept particles of air.—Hence, as oil of vitriol, mixed in a due proportion with fair water, may be brought to make the water very hot, without exciting bubbles, so Mr. Boyle has found, that *alkalitate* spirit of urine, drawn with four kinds of quick-lime, being mixed with oil of vitriol moderately strong, would afford an intense heat, whilst it produced either no manifest bubbles at all, or scarce any; though the urinous spirit was strong, and in other trias operated like an *alkali*: and though with the spirit of urine made *per se*, in the common way, oil of vitriol will produce a great hissing, and a multitude of conspicuous bubbles. On the other side, some acid spirits, as that of verdegrease, made pure, poured on a large of tartar, will frequently make a conflict, and produce a large froth; though not accompanied with any manifest heat.

Many make the taste the touchstone whereby to try acids and *alkalies*: but there are a multitude of bodies, wherein we can so little discern by the taste which of the principles is predominant, that one would not suspect there was a grain of either of them therein: such are diamonds, most gems, and many ignoble stones; gold, silver, mercury, &c. There are also bodies abounding with acid or *alkalitate* salts; which either have no taste at all, or a quite different one from that of these chymical principles.—Thus, though glass be in great part composed of a fixed *alkali*, it is insipid on the palate: and crystals of silver and lead, made with aqua fortis, and containing numerous acid particles of the menstruum, manifest nothing of acidity in the mouth; the latter having a saccharine sweetness, and the former an extreme bitterness. And even in vegetable substances of a manifest taste, it is not easy to know by that, whether it be the acid or the *alkaline* principle which predominates in them: as, in the essential oil of spices, and the gross empyreumatic oils of wood; and even in alcohol of wine, which some contend to be an acid, and others, an *alkali*. See ACID. *Imperfect. of Chym. Doct. of Qual.*

ALKEBLA, or ALKIBLA. See the article KEBLA.

ALKEKENGI, a medicinal fruit, or berry, produced by a plant of the same denomination; popularly also called the *winter-cherry*: of some use as an abstergent, dissolvent, and diuretic.

The plant is properly a species of solanum, or nightshade; whence it is frequently called in Latin by that name, with the addition or epithet of *vesicarium*, to express the bladders the fruit is contained in.—It is sometimes also called *holicacabum*.

The fruit is celebrated for its lithontriptic quality; and prescribed to cleanse the urinary passages of gravel, and other obstructions. Its detensive quality also recommends it against the jaundice, and other disorders of the viscera.

The *Trochisci Alkekengi*, prepared from it, are but little prescribed in the modern practice.

ALKERMES, in medicine, &c. a term borrowed from the Arabs, denoting a celebrated remedy, of the form and consistence of a confection; whereof the kernels are the basis.

The other ingredients are rose-water, sugar, ambergrease, musk, cinnamon, aloes wood, pearls, and leaf-gold, &c.—But the sweets are usually omitted.

The *Confectio Alkermes* is chiefly made at Montpellier, which place supplies most parts of Europe therewith. It is said to be better made there than it can be elsewhere; the reason of which doubtless is, that the drug, which gives it the denomination, is no where found so plentifully as there. The manner of preparing the grain for making the confection is described in the *Philos. Transact.* N^o 20. p. 362. See also Ray, *Trav.* p. 392.

It is much used as a cordial; especially, says Dr. Quincy, among female prescribers, and in complaisance to them: but that author decries its value in that intention, and thinks it ought only to be regarded as a sweetener.

ALKOOL. See the article ALCOHOL.

ALKORAN. See the article ALCORAN.

ALLANTOIS*, ALLANTOIDES, in anatomy, a thin, smooth membranous substance, or vesicle, investing the fetus of divers animals, and replete with urinous liquor conveyed to it from the urachus.

* The word is derived from *αλλαν*, *faricimen*, a gut; and *αιδο*, *farina*, shape; because in many brutes, it is in the shape of a gut-padding, though in some others it is round.

The *allantois* makes part of the secundine.—It is conceived as an urinary tunic, placed between the amnion and chorion, which by the navel and urachus receives the urine that comes out of the bladder.

It is a point controverted among anatomists, whether the *allantois* be found in the human species?—M. Drelincourt, professor of anatomy at Leiden, in an express dissertation on this membrane, maintains it peculiar to the ruminating kind.

Dr. Hale, on the contrary, has given an accurate description of the human *allantois*; and assigned the reason why even those who believed its existence had not before fully found it out; and also an answer to those who yet deny its reality. See *Philosop. Transact.* N^o 271.

ALLAY. See the article ALLOY.

ALLEGATION is used for the producing of acts, or instruments to authorize a thing.

Allegation, in a literary sense, denotes the act of citing, or quoting an author, or passage of some book.

ALLEGIANCE, the legal faith, and obedience, which every subject owes to his prince.

This was anciently called *ligeantia*, or *ligence*; from the Latin *ligare*, and *aligare*, to bind, *q. d. ligamen fidei*.

Oath of ALLEGIANCE is an oath given in England to the king, in quality of a temporal prince or sovereign; to distinguish it from the oath given to him as primate, or supreme head of the church, which is called the *Oath of Supremacy*.

The Quakers are dispensed with not taking the oath of *allegiance*; and in lieu thereof are only enjoined a declaration.

ALLEGORICAL, something containing an *allegory*.

The divines find divers senses in scripture; as a literal, a mystical, and an *allegorical* sense.

The prophecies, in particular, delivered in the Old Testament, are said to be many of them accomplish'd in the new; not in their primary and literal, but in their secondary, or *allegorical* sense. See PROPHECY.

The fathers, and other ancient interpreters of scripture, are almost all *allegorists*; as Origen, Clemens Alexandrinus, St. Augustin, Gregory Nazianzen, &c. See further under the article TYPE.

ALLEGORY, ALLEGORIA, a figure in rhetoric, whereby we make use of terms which in their proper signification mean something else than what they are brought to denote: or, it is a figure, whereby we say one thing, expecting it shall be understood of another, to which it alludes.

An *allegory* is properly a series, or string of metaphors.

Such is that beautiful *allegory* in Horace, Lib. I. Od. 14.

*O Navis, refectum in mare te novi
Fluctus, &c.*

Where the *ship* is usually held to stand for the *republic*; *waves*, for *civil war*; *port*, for *peace and concord*; *ears*, for *soldiers*; and *mariners*, for *magistrates*.

The Old Testament is supposed by many to be a perpetual *allegory*, or typical representation of the mysteries of the New.

In effect, *allegories* have a good share in most religions.—The Jews, we know, abound with them: Philo Judæus has three books, of the *allegories* in the history of the six days.

Nor are the heathens without *allegories* in their religion: it may even be said, that the use hereof is of a much earlier standing in the Gentile, than in the Jewish world.—

Some of their philosophers undertaking to give a rationale of their faith, and to shew the reason and scope of their fables, and the ancient histories of their gods, found it necessary to put another construction on them, and maintain, that they signified something very different from what they seemed to express.—And hence came the word *allegory*: for a discourse that in its natural sense, *allos aggrævus*, signifies something other than what seems intended by it, makes what we properly call an *allegory*.

This shift they had recourse to, in order to prevent people from being shocked with those absurdities which the poets had introduced into their religion; and to convince the world, that the gods of Greece had not been those vile persons which their histories represented them to be. By this means, the history, as well as the religion of Greece, was at once converted into *allegory*; and the world left to seek for them both in a heap of fables, few of which have been solved to any purpose to this day.

The Jews finding the advantages of this way of explaining religion; made use of it to interpret the sacred writings, so as to render them more palatable to the Pagans.

The same method was adopted by the primitive writers of Christianity. See PROPHECY.

ALLEGRO, in music, a word used by the Italians to denote one of the six distinctions of time. See TIME.

Allegro expresses a sprightly, quick motion, the quickest of all excepting presto.

The usual six distinctions succeed each other in the following order: grave, adagio, largo, vivace, *allegro*, and presto.

It is to be observed, that the movements of the same name, as adagio or *allegro*, are swifter in triple than in common time.—The triple $\frac{3}{4}$ is usually *allegro*, or vivace; the triples $\frac{3}{8}$, $\frac{3}{16}$, $\frac{3}{32}$, are most commonly *allegro*.

ALLELUJAH. See the article HALLELUJAH.

ALLEMAND, ALMAIN, a kind of grave, solemn music, where the measure is good, and the movement slow.

ALLER good, in our ancient writers.—The word *aller* serves to make the expression of superlative signification.—So, *aller good* is the greatest good. Sometimes it is wrote *alder*.

ALLERION *, or ALERION, in heraldry, a sort of eagle, represented without either beak, or feet.

* The name is French; and is said to have been introduced for the word *Eaglet*: it is added, that the practice of calling eaglets, *allerions*, and of representing them spread, without feet and beaks, is not above an hundred years old, and is of French invention, introduced to represent the Imperialists as subdued. Hence, Menage derives the word from *aquilaris*, a diminutive of *aquila*.

The *allerion*, represented *Tab. Heraldry Fig. 1.* appears much the same with the martlet, except that the wings of the latter are close, and it is represented, as it were, passant; whereas the *allerion* is spread, and is represented, in pale. Add that, among our heralds, the martlet has a beak, which the *allerion* wants.

ALLEU, or ALLODE, in our ancient customs. See ALLODIAL, and ALLODIUM.

ALLEVIARE, in old records, to levy or pay an accustomed fine or composition. See LEVY.

ALLEVIATION * denotes the art of making a thing lighter, and easier to bear or endure.

* The word is originally Latin, compounded of *ad*, to, and *levis*, light.

In which sense *alleviation* is synonymous with *lightening*, and stands opposed to *aggravation*.

ALLEY *, in gardening, a strait parallel walk, bordered or bounded on each hand with trees, shrubs, or the like.

* The word *ally* is derived from the French verb *aller*, to go; the ordinary use of an *ally* being for a walk, passage, or thorough-fare from one place to another.

Alleys are usually laid either with grass or gravel.

An *Alley* is distinguished from a *path*, in this; that in an *alley* there must always be room enough for two persons at least, to walk a-breast: so that it must never be less than five feet in breadth; and there are some who hold that it ought never to have more than fifteen.

Counter-ALLEYS are the little *alleys* by the sides of the great ones.

Front-ALLEY is that which runs strait in the face of a building.

Transverse-ALLEY, that which cuts the former at right angles.

Diagonal-ALLEY is that which cuts a square, thicket, parterre, &c. from angle to angle.

Sloping-ALLEY is that which, either by reason of the lowness of the point of sight, or of the ground, is neither parallel to the front, nor to the transverse *alleys*.

ALLEY in *Zizæac* is that which has too great a descent, and which, on that account, is liable to be damaged by floods; to prevent the ill effects whereof, it has platbands of turf run across it from space to space, which help to keep up the gravel.

This last name is likewise given to an *alley* in a labyrinth, or wilderness, formed by several returns of angles, in order to render it the more solitary and obscure, and to hide its exit.

ALLEY in *Perspective* is that which is larger at the entrance than at the exit; to give it a greater appearance of length.

ALLEY of *Compartment* is that which separates the squares of a parterre.

ALLIANCE *, the union or connection of two persons, or two families, by means of marriage; otherwise called *affinity*.

* The word seems formed of the Latin *adligatio*, *q. d.* a tying together.

The law of the twelve tables forbids all *alliance* between persons of unequal rank and condition.—And, in Portugal, we are told, the daughters of the nobility are prohibited to *ally* with such as have never been in the wars.

ALLIANCE is also extended to the leagues or treaties concluded between sovereign princes and states, for their mutual safety and defence.

The *triple alliance*, between England, Holland, and Sweden, is famous.—So is the *quadruple alliance*, between England, Holland, the Emperor, and the King of France.

In which sense, we say, *allies*, for confederates: the king and his *allies*; the *allies* of the treaty of *Hanover*, &c.

Though the title of *allies*, *socii*, of the Romans, was a sort of servitude, it was much coveted. Ariarathes, we are told by Polybius,

bis, offered a sacrifice to the gods by way of thanksgiving for having obtained this alliance. The reason was, that thence-forwards people were sure not to receive any injuries except from them.

There were divers sorts of *allies*: some only united to them, by a participation of the privileges of Romans, as the Latini and Hernici; others by their very foundation, as the colonies; others by the benefactions they received from them, as Masaniſſa, Eumenes, and Attalus, who owed their kingdoms to Rome; others by free treaties, which last by a long alliance became subjects, as the kings of Bithynia, Cappadocia, Egypt, and most of the cities of Greece: lastly, others by compulsive treaties, and the law of subjection, as Philip and Antiochus. For they never granted peace to an enemy, without making an alliance with him; that is, they never subdued any people without using it as a means of subduing others. V. *Confid. sur les cauf. de la grand. des Rom. c. 6. p. 62, seq.*

ALLIGATION*, in arithmetic, a rule or operation, whereby questions are resolved, relating to the mixture of divers commodities or ingredients together, with the value, effect, &c. thereof in composition.

* The word is formed of the Latin *alligare*, to tie together, by reason, perhaps, of a sort of vincula, or circular ligatures, ordinarily used to connect the several numbers together.

Alligation is of two kinds, *medial* and *alternate*.

ALLIGATION Medial is, when from the several quantities and rates of divers simples given, we discover the mean rate of a mixture compounded out of them.

The several cases hercof, will come under the following rules.

The quantity of the ingredients, and the prices of each being given; to find the price or value of some part of the mixture. — Multiply the ingredients severally by their own prices, and divide the sum of those products by the sum of the ingredients, and the quotient answers the question.

The prices of the several ingredients, and the sum paid or received for the mixture being given; to find what quantity of each was bought or sold. — Divide the sum paid or received, by the sum of the particular prices; the quotient is the answer.

The ingredients of a mixture being given, to augment or diminish the mixture proportionally. — Sum up the ingredients; then say, as that sum is to the augmentation or diminution, so is the quantity of each parcel of the mixture, to the quantity of the mixture desired.

The nature, quality, &c. of the several ingredients of a mixture being given, to find the temperament or degree of fineness resulting from the whole. — Place the several quantities of the mixture in rows; against which place orderly their several qualities or fineness; and multiply each quantity by its own quality or degree of fineness: then, as the sum of the quantities is to their products, so is unity, to the quality or fineness of the mixture.

The quantities of a mixture being given; to find the particular quantities of any ingredient in any part of the mixture. — If the mixture be of only two things, say, as the total of the ingredients in the composition, is to the part of the mixture proposed; so is the quantity of the ingredient proposed in the whole composition, to the quantity of the ingredient in the part desired. — If the mixture consists of more ingredients, repeat the work for each.

Given the total of a mixture, with the whole value, and the values of the several ingredients; to find the several quantities mixed, though unequally. — Multiply the total of the mixture by the least value, subtract the product from the total value; and the remainder is the first dividend: then take the said least value from the greatest valued ingredient, and the remainder is the first divisor. The quotient of this division shews the quantity of the highest-priced ingredient, and the other is the complement to the whole. And when more ingredients than two are in the composition, the divisors are the several remains of the least value, taken from the other: the dividends are the remains left upon the divisions, till none remain there; which will be one short of the number of ingredients: and this defective ingredient is to be supplied as a complement; and in division, no more must be taken in every quotient, than that there may remain enough for the other divisors; and the last to leave nothing remaining. See **DIVISION**.

ALLIGATION alternate is, when the rates or qualities of divers simples are given; and the quantity of each is required necessary to make a mixture of the given rate or quality.

Alligation alternate shews the due proportion of several ingredients; and counter-changes the places of such excesses or differences as arise between the mean price and the extremes; ascribing that to the greater extreme, which proceeds from the lesser; and contrarily.

The rules which obtain in *alligation alternate* are as follow: Every greater extreme is to be linked with one lesser.

If either of the extremes be single, and the other extremes plural; the single extreme is to be linked to all the rest.

If both greater and lesser extremes be not plural, they may be linked so diversly, that several differences may be taken,

and a variety of answers be made to the question, yet all true: but if one of the extremes be single, there can be but one answer.

The numbers being linked, take the difference of each from the mean of common price; and place this difference against the number it is linked to, alternately.

Every number, linked with more than one, must have all the differences of the numbers it is linked to, set against it.

These differences resolve the question, when the price of every one of the ingredients is given without their quantities; and the demand is to mix them so as to sell a certain quantity at a mean rate.

But when the quantity of one, with the price of all the ingredients is given; and the demand is to know the quantities of the other ingredients; then, the rule of three is to be used.

And when the price of every ingredient is given, without any of their quantities, and the demand is to make up a certain quantity to be sold at a mean rate; then all the differences added together will be the first number in the rule of three; the whole quantity to be mixed, the second number; and each difference apart, the several third numbers: and so many sorts mixed, so many operations of the rule of three.

We shall add an example, wherein both the kinds of *alligation* have place. — Suppose a mixture of wine of 119 quarts, required to be made of wines of the following prices, 7*d.* 8*d.* 14*d.* and 15*d.* per quart; and so, as that the whole may be afforded at 12*d.* per quart.

Having linked 8 to 14, and 7 to 15, and counterchanged their differences from the common price, 12*d.* the sum of their difference is found to be 14; by which dividing 119, the quotient is 8 $\frac{1}{2}$, or 8 $\frac{1}{2}$, or for convenience in operation $\frac{17}{2}$.

8	2	17	2	17
14	3	21	4	34
7	4	28	5	35
15	5	35	6	42
14		119		8 $\frac{1}{2}$

ALLOTH, in astronomy, a star in the tail of the great bear, whose observation is much used at sea.

The longitude, latitude, &c. of *alioth*, see among the rest of *URSA Major*.

To find the latitude, or elevation of the pole by this star. See **LATITUDE**, and **POLE**.

ALLOCATION, **ALLOCATIO**, the admitting or allowing of an article in an account; and passing it as such. See **ACCOUNT**.

ALLOCATION is also an allowance made upon an account; used in the exchequer. See **ALLOCATION**.

ALLOCATIONE Pacienda, a writ directed to the lord treasurer and barons of the exchequer, upon the complaint of some accountant; commanding them to allow him such sums as he hath in execution of his office lawfully expended.

ALLODIAL, in ancient customs. See **ALLODIUM**.

Terra ALLODIA, or **ALLODIAL land**, is that whereof a person has the absolute property; or which he holds without paying any service or acknowledgment to any superior lord.

Such an inheritance is *allodial*, i. e. it is not subject to any charge, service, &c.

In this sense, *allodial* stands opposed to *feudal*, or *beneficiary*.

ALLODIUM*, or **ALLEUD**, land held of a man's own right.

* The origin of the word is infinitely controverted. Casseneuve says, it is almost as obscure as the head of the Nile. Few of the European languages, but one etymologist or other has derived it from: yet some, not improbably, take it for a primitive French word without etymon.

Bollandus explains *allodium*, to be *prædium*, seu *quævis possessio libera jurisque proprii*, & non in feudum clientelari onere accepta.

After the conquest of the Gauls, the lands were divided in two manners, viz. into benefices, *beneficia*, and *allodia*. Benefices, consisted in lands given by the king to his officers and soldiers; either for life, or for a time fixed.

Allodia, or *alleuds*, were such lands as were left in property to the ancient possessors. — The sixty-second title of the Salic laws is, *de alleudis*; where the word signifies hereditary lands, or those derived from a man's ancestors. Whence, *allodium* and *patrimonium* are frequently used indiscriminately.

In the ancient capitulars of Charlemain and his successors, we find *allodium* constantly opposed to *fee*; but, toward the period of the second race of kings, it lost the prerogative; the feudal lords obliging the proprietors of *allodial* lands to hold of them for the future. The same change also happened in Germany, &c.

The usurpation of the feudal lords over the *allodial* lands went so far, that they were almost all either subjected to them, or converted into fees: whence the maxim, *nulla terra sine domino*, no land without a lord.

ALLOM. See the article ALLUM.

ALLONGE *, in fencing, a thrust, or pass at the enemy. See PASS.

* The word is French, formed of the Verb *allonger*, to lengthen out a thing.

ALLOTING, or ALLOTMENT of goods, in matters of commerce, is when a ship's cargo is divided into several parts, bought by divers persons, whose names are wrote on as many pieces of paper, which are applied by an indifferent person to the several lots or parcels; by which means the goods are divided without partiality; every man having the parcel which the lot with his name on is appropriated to. See INCH OF CANDLE.

ALLOY *, or ALLAY, in matters of coinage, &c. a proportion of a baser metal, mingled with a finer, or purer.

* The word seems derived from the French, *loy*, law; in regard the alloy is fixed by law.

Such is the quantity of copper mingled with gold and silver, in the coining of species of those metals. The original intention of alloy was, to give the minted metal a due hardness, that it might not waste with wearing; and to increase its bulk and weight, so as to countervail the charges of coinage.

Gold or silver, that has more of this than it ought to have, is said to be of a coarser or worse alloy, or below standard.

The proportion of alloy for standard gold is two carats in a pound troy of gold—and for sterling silver, 18 pennyweight alloy in a pound troy of silver.

The alloy used in gold-coins is silver and copper; that in silver coins is copper alone.

ALLUM *, ALLOM, or ALUM, a kind of mineral salt, of an austere taste, leaving in the mouth a sense of sweetness, accompanied with a considerable degree of astringency.

* The word *allum* comes from the Greek *αλμ*, salt; or perhaps from the Latin *lumen*, light; because it gives lustre to colours.

The ancient naturalists allow of two sorts of *allum*; the one *native*, the other *facitious*.—The *native* was found in the island of Milo, being a kind of whitish salt, very light, friable and porous; and streaked with filaments.

The *facitious allum* is prepared in different manners, according to the different materials whereof it is made. Hence arise, *red, roman, and citron allums*.—To which add *saccharine, and burnt allums*.

England, Italy, and Flanders, are the countries where *allum* is principally produced.

The English *rache allum, alumen rupeum*, is made from a bluish mineral stone, frequent in the hills of Yorkshire and Lancashire. This stone they calcine on a hearth or kiln; then steep it successively in several pits of water: then boil it for about twenty four hours: lastly, letting it stand for about two hours, the impurities subside, and leave a pure liquor; which, removed into a cooler, and some urine being added to it, begins, in three or four days, to gather into a mass; which being roached, *i. e.* taken out, washed, and melted over again, is fit for use.

At Whitty in Yorkshire the process of making *allum* is as follows. The mineral stone, before it is calcined, being exposed to the air, will moulder in pieces, and yield a liquor whereof coppers may be made; but being calcined, it is fit for *allum*.—As long as it continues in the earth, or in water, it remains a hard stone.—Sometimes a liquor will issue out of the side of the ore, which by the heat of the sun is turned into a natural *allum*.

In the *alum-works* at Civita Vecchia, the process, as described by M. Geoffroy, is somewhat different.—The stone, which is of a ruddy hue, being calcined, they boil and dissolve the calc in water; which imbibing, the salt, *i. e.* the *allum*, separates itself from the useless earth. Lastly, leaving the water thus impregnated with salt to stand for some days, it crystallizes of itself, like tartar about a but, and makes what they call *Reche, or Roman allum*.

At Solfatara, near Puzzuoli, there is a considerable oval plain, the soil whereof is wholly saline; and so hot, that the hand cannot long endure it.—From the surface hereof, in summer time, there arises a sort of flour, or starchy dust; which being swept up, and cast into pits of water at the bottom of the plain, the heat of the ground, *i. e.* of certain subterraneous spiracles, over which the coppers are placed, without any other fire, evaporates the water, and leaves an *allum* behind.

Allum is made at Cypella in Thrace, by gently calcining the stone, and letting it dissolve afterwards in the air by the dews and rains; then boiling and crystallizing the impregnated waters. *Belon, in Ray's Trav. t. 2. p. 351.*

Allum dissolves in water; what remains undissolved at bottom is a sort of calx, which dissolves readily enough in oil, or spirit of vitriol.—And hence there arises some doubt, whether *allum*, as it does not leave an earth behind, does properly belong to the class of salts?—Mr. Boyle assures us, that

alum ore, robbed of its salt, does in tract of time recover it again from the air.

The Swedish *allum* is made of a mineral which contains a great deal of sulphur and vitriol, not to be taken away but by calcination or distillation. The matter remaining in the iron vessels used in separating the sulphur from the mineral, being exposed to the air for some time, becomes a kind of bluish ashes, which they lixiviate, crystallize, and thus obtain the *allum*.

Allum is of some use in medicine, in quality of an astringent; but, being apt to excite vomiting, is not much used inwardly, and rarely without some smooth aromatic, as a corrector.—It is used outwardly in astringent lotions, and is an ingredient in several dentifrices, and cosmetics.

It is a principal ingredient in dying and colouring; neither of which can be well performed without it.—It serves to bind the colour upon the stuffs, and has the same uses there, that gum water and glutinous oils have in painting. It likewise disposes stuffs to take the colour, and adds a degree of briskness and delicacy to it; as we see visibly in cochineal, and the scarlet-grain.

This effect of *allum* seems also owing to its styptic, or astringent quality, by which it binds the finer parts of colours together, and prevents their exhaling. Hence also it preserves paper that has been dipped in its water, from sinking when wrote upon.

Saccharine ALLUM bears a near resemblance to sugar.—It is a composition of common *allum* with rose-water, and whites of eggs, boiled together to the consistence of a paste, and thus moulded at pleasure. As it cools, it grows hard as stone. It is used as a cosmetic.

Burnt ALLUM, *alumen ustum*, is *allum* calcined over the fire, and thus rendered whiter, more light, and easily pulverized.

Plume ALLUM, *alumen plumosum*, is a sort of saline mineral, of various colours, most commonly white bordering on green; resembling Venetian talc, except that instead of scales, it rises in threads or fibres, resembling those of a feather; whence its name, from *pluma*, feather.

Some will have this to be the *lapis amianthus* of the ancients. See SUPPLEMENT articles ALUMEN and AMIANTHUS.

ALLUM-WATER. See the article WATER.

ALLUMINOR, in some ancient statutes, one who by trade coloureth, or paints upon paper, or parchment.

ALLUSION *, ALLUSIO, in rhetoric, a figure whereby something is applied to, or understood of, another, by reason of some similitude of name, or sound.

* The word is formed of the Latin *ad*, and *ludere*, to play.

Camden defines *allusion* a dalliance, or playing with words like in sound, but unlike in sense; by changing, adding, or subtracting a letter, or two; whence words resembling one another become applicable to different subjects.

Thus the Almighty, if we may use sacred authority, changed Abram, *i. e.* high father, into Abraham, *i. e.* father of many.—Thus the Romans played on their tripping emperor Tiberius Nero, by calling him Biberius Mero: and thus in Quintilian the four fellow Placidus is called Acidus.

Allusions come very near to what we popularly call puns.

ALLUVION *, ALLUVIO, in the civil law, a gradual addition or accretion made along the sea-shore, or the banks of large rivers.

* The word is formed of the Latin *ad* and *lavio*; I wash to; compounded of *ad*, and *lavio*.

The civil law places *alluvion* among the lawful means of acquisition; and defines it to be a latent, imperceptible accretion.—Hence, where any considerable portion of ground is torn away at once, by an inundation; and joined to some neighbouring estate; this is not acquired by right of *alluvion*, but may be claimed again by the former owner.

ALLY. See the article ALLIANCE.

ALMACANTARS, ALMACANTARAS, or ALMICANTARATH, in astronomy. See ALMUCANTARS.

ALMACANTARS Staff. See ALMUCANTARS Staff.

ALMAGEST, the name of a celebrated book, composed by Ptolemy; being a collection of many of the observations and problems of the ancients, relating both to geometry and astronomy.

In the original Greek it was called *αριθμητική πρώτων, q. d.* greatest construction, or collection; which last word *mezistē*, joined to the particle *al*, gave occasion to its being called *almagest* by the Arabians, who translated it into their tongue about the year 800, by order of the caliph *Al Ma'mun*.—The Arabic word is *almagesti*.

Ricciolus has also published a body of astronomy, which he intitles, after Ptolemy, the *New Almagest*; being a collection of ancient and modern observations and discoveries in that science.

ALMANAC, a calendar or table, wherein are set down the days, and feasts of the year, the course of the moon, &c. for each month of the year.

The original of the word is much controverted among Grammarians.—Some derive it from the Arabic particle *al*, and *manab*, to count.—Others, and among them Scaliger, rather derive it from *al*, and *manax*, the course of the months: which is contradicted by Golius, who advances another opinion; he says, that, throughout the east, it is the custom for subjects, at the beginning of the year, to make presents to their princes; and, among the rest, the astrologers present them with their ephemerides for the year ensuing; whence those ephemerides came to be called *almanba*, i. e. handbills, or new-years gifts.—To say no more, Vertegan writes the name *almon-ac*; and makes it of Saxon original: our ancestors, he observes, used to carve the courses of the moon, of the whole year, upon a square stick, or block of wood, which they called *al-monaght*, q. d. *al-moon-beed*.

The modern *almanac* answers to the *fasti* of the ancient Romans.

The necessities for making an *almanac*, the reader will find under the article CALENDAR.

Henry III. of France very prudently decreed, by an ordinance of 1579, that 'No *almanac*-maker should presume to give predictions relating to civil affairs, either of states or private persons, in terms either express or covert.'

In the *Philosoph. Collect.* we have a perpetual *almanac*, described by Mr. R. Wood.

ALMANDIN, or ALABANDIN, a precious stone, of the ruby kind; something softer than the oriental ruby; and, as to colour, partaking more of that of the granat than the ruby.

It is ranked among the richest of stones; and takes its name from Alabanda, a city of Caria, whence Pliny says it was brought. See SUPPLEMENT, article ALMANDINE.

ALMARIA, in our ancient records, the archives of a church, or the like.

ALMERY. See the article AMBRY.

ALMOIN, in law. See the article FRANK-almoin.

ALMOND*, *amygdala*, a kind of medicinal fruit, inclosed in a thick rind, and under a thin skin; the whole being contained under a thick, pulpy, oily husk.

* The word *almond* comes from the French *amande*; which Menage derives from the Latin *amandala*, a term occurring in the capitulars of Charlemain: others rather derive it from the Greek *αμυγδαλα*, which signifies the same thing.

The *almond* is the produce of a pretty tall tree, of the nut-bearing kind, resembling a peach-tree; frequent in Germany, France, and the neighbouring countries; as also in Barbary, &c.—Its flowers are pentapetalous, and ranged in the rose manner: the pistil becomes a fleshy fruit, containing a seed, which is the *almond*; and which drops out when the fruit is arrived at maturity.

Almonds are chiefly of two kinds, *sweet* and *bitter*.

Sweet ALMONDS, *amygdale dulces*, are of a soft, grateful taste; and are reputed cooling, healing, emollient, and nutritive: they are much prescribed in emulsions, and found of good effect in all disorders from choleric and acrimonious humours.—The oil of sweet *almonds*, drawn without fire, is a safe and useful remedy in nephritic pains. It is also of good repute for colicness, and for gripes in children.

For the manner of procuring the oil of sweet *almonds*, see the article OIL.

Bitter ALMONDS, *amygdale amaræ*, are held aperient, detensive, and diuretic; and on those accounts they are commended in obstructions of the liver, spleen, uterus, &c.—Some esteem them good to take off the effects of drunkenness. Accordingly, Plutarch relates, that Drusus's physician, a stout drinker, took down at every cup five bitter *almonds*, to allay the heat and fumes of the wine.

The expressed oil of bitter *almonds* is as tasteless as that of the sweet; it is much used to soften and deterge the wax out of the ear.—Some affirm, that bitter *almonds*, bruised, kill or stupify fowl; so that they may be taken with the hands: which, they say, is a secret practised among the Bohemians: and that the husks, remaining after the oil is expressed, have the same effect.

Almonds give the denomination to a great number of preparations in confectionary, cookery, &c. whereof they are the basis; as *almond* cakes, *almond* cream, *crisped almonds*, *almond* milk, *almond* paste, *almond* snow, &c.—With sweet *almonds* blanched (that is, put into warm water a while, which makes them slip their skins) and water, is made *almond* milk, frequently used as a cooler in emulsions, &c. *V. Hought. Collect. N.º. 434.*

ALMONDS, *amygdale*, in anatomy, denote two glands of the fauces, more properly called *almonds* of the ears; but ought rather to be denominated *almonds* of the throat.

They are two round glands, placed on the sides of the basis of the tongue, under the common membrane of the fauces, with which they are covered.

Each of them has a large oval sinus, which opens into the fauces; wherein are contained a great number of lesser ones,

which discharge through the great sinus a mucous and slippery matter into the fauces, larynx, and œsophagus, for the moistening and lubricating of those parts.

When the œsophagus muscle acts, it compresses the *almonds*; and as they are subject to inflammation, they frequently are the occasion of what the common people call a *fore throat*.

ALMOND, or ALMAN-Furnace, is a peculiar kind of furnace, used in refining; to separate all kinds of metals from cinders, parts of melting-pots, tests, bricks, &c.

The *almond-furnace*, called also the *fiveep*, is usually six foot high, four wide, and two thick; it is built of brick, and having a hole in the middle of the top, eight inches over, which grows narrower towards the bottom, where, on the fore-part it ends in a point, encompassed with a semi-circle of iron, to keep in the melted metal.—About the middle of the back there is another hole, to receive the nose of a pair of bellows, which require the continual strength of two men to work.

The matter, then, on which the operation is to be performed, being beat small, they kindle charcoal in the furnace, to anneal it; and when hot, they throw in two or three shovels of coals to one of the forementioned stuff; and so proceed during the whole work, putting lay upon lay of one and the other. After eight or ten hours the metal begins to run; and when the receiver below is pretty full, they ladle it out with an iron ladle, and cast it in sows, in cavities or forms made with ashes.

ALMONER, anciently also wrote AMNER, an officer in a king's, prince's, or prelate's household, whose business is to distribute alms to the poor.

The *lord almoner*, or *lord high almoner* of England, is an ecclesiastical officer, usually a bishop; who is to visit and relieve the sick, poor widows, prisoners, and others, in necessity; for which purpose he has the forfeiture of all deadlands, and the goods of felo's de fe, which he is to dispose of to the poor.

He has likewise, by an ancient custom, a privilege to give the first dish from the royal table, to whatsoever poor person he pleases, or, instead thereof, an alms, in money.

He also distributes to twenty-four poor men, nominated by the parishioners of the parish adjacent to the king's place of residence, to each, four pence a-day in money, and an alms of bread and small beer; each person first repeating the Creed and the Lord's-Prayer, in presence of one of the king's chaplains, deputed by the *lord almoner* to be his *sub-almoner*; who is also to scatter new-coined two-pences in the towns and places through which the king passes in his progress.

He has also the charge of several poor pensioners to the crown, below stairs; consisting of such as have spent their youth, and become superannuated in the king's service; or the widows of such household servants as died poor, and were not able to provide for their wives and children, whom he duly pays.

Under the *lord almoner* besides the *sub-almoner*, there is a yeoman, and two groomers of the *almshouse*, chosen by his lordship.

ALMONRY, or AUMBRY, the office or lodgings of the almoner; also the place where the alms are given. See AMBRY.

ALMS, *elemosyna*, something given out of charity or pity to the poor.

The ecclesiastics were anciently subsisted wholly on *alms*.—The *alms* of the primitive Christians were divided into three parts; one whereof belonged to the bishops, another to the priests, and a third to the deacons and subdeacons.—Sometimes they divided them into four; the last whereof went to the poor, and to the repairing of churches.

Chrodegang, bishop of Metz, in the seventh century, enjoins, in the forty-second chapter of his rule, that a priest to whom any thing was offered for saying of mass, or for confession; or a clerk, for singing of psalms, or hymns; should not receive it on any other condition than as *alms*.

M. Tillemont observes, upon the Theodosian Code, p. 257. that from the time of the fourth century there were women employed to collect *alms* for the prisoners. In all probability these were the deaconesses of the churches.

St. Paul, in his second epistle to the Corinthians, C. IX. explains the manner of collecting *alms* in the assemblies of the primitive Christians.—This practice they had borrowed from the Jewish synagogue, where it still obtains. Leo de Modena describes it in the first book of the *ceremonies and customs* of those of his nation, C. XIV.

The Romanists also extend the term *alms*, to what is given to the church, or to other pious uses.—Hence, what the church holds on this footing is called *tenure in alms*. See AUMONE.

ALMSFECH, or ALMSFECH, among our Saxon ancestors, *alms-money*; that is, Peter-pence, anciently paid in England on the first of August; called also *romesheeb*, *romesheeb*, and *heortþingene*. See PETER-pence.

ALMS-HOUSE, a petty hospital; or an edifice built by a person in a private capacity, and endowed with a revenue, for the maintenance of a certain number of poor, aged, or disabled people.

ALMUCANTARS*, in astronomy, are circles parallel to the horizon, imagined to pass through all the degrees of the meridian.

* The word is formed of the Arabic *almucantar*.

As the meridians pass through the several degrees of the equator; the *almucantars* pass through those of the meridian of any place.

The *almucantars* are the same thing with regard to the azimuths and horizon, that the parallels are with regard to the meridians and horizon.

They serve to shew the height of the sun and stars; and are described on many quadrants, &c. being also called *parallels of altitude*. See **PARALLEL** of altitude.

ALMUCANTARS-Staff, is an instrument usually made of pear-tree or box, having an arch of fifteen degrees; used to take observations of the sun, about the time of its rising and setting; in order to find the amplitude, and consequently the variation of the compass.

ALNAGE*, or **AULNAGE**, *q. d.* ell-measure; the measuring of woollen manufactures with an ell, and the other functions of the *alnager*. See **ALNAGER**.

* The word is French, formed of *aune*, or *aine*, an ell.

All the attempts which our fore-fathers made for regulating of manufactures, when left to the execution of any particular officer, in a short time resolved into a tax on the commodity, without respect to the goodness thereof.—As is most notorious in the case of *alnage*, which was intended for a proof of the goodness of the commodity; and to that purpose a seal was invented, as a sign that the commodity was made according to the statute: which seals, it is said, may now be bought by thousands, and put on what the buyers please.—*Sir Jos. Child. Disc. on Trade, p. 2, seq.*

ALNAGER, **ALNEGER**, or **AULNEGER**, *q. d.* *mesurer by the ell*; signifies a sworn public officer, who by himself or deputy, is to look to the assize of woollen cloth made throughout the land, *i. e.* the length, width, and work thereof; and to the seals for that purpose ordained.

There are now three officers relating to the *alnage*, or regulation of cloth; all which were anciently comprised in one person.—These bear the distinct names of *searcher*, *measurer*, and *alnager*.

A duty being imposed on woollen cloths, for the maintenance of an office to look to that manufacture, and the loyalty, as they call it, of the stuffs produced therein; the *alnager* who had the direction of the whole, is now become only the collector of that duty, or subsidy granted to the king: though he still hold the ancient denomination, because the collection of that subsidy was committed to him.—Nor was he abridged of his measuring and searching, till by his own neglect it was thought proper to separate the two offices. So that there is now a peculiar measurer, distinct from the *alnager*, or collector, to allow the assize of the length and breadth of every cloth made in England and Wales.

ALOES, in medicine and pharmacy, the inspissated juice of a plant of the same name; much used as a purgative remedy.

The *aloe*-plant grows in divers parts of the East and West-Indies; and is also found in some countries of Europe, as Spain, and particularly the mountains of Sierra Morena.—Its leaves are green, very thick, hard, and prickly, yielding a kind of strong threads, whereof laces may be made. Out of the middle of the leaves arises a stem, which bears the flowers, and the fruit, the seed whereof is very light and hemispherical.

Dioscorides, Pliny, and the ancient naturalists, seem only to have been acquainted with one species of *aloe*; which is the *aloe vulgaris* above described: but the late travels into Asia, Africa, and America, have occasioned the discovery of a vast many more sorts, unknown to antiquity. Mr. Bradley assures us, he had in his time seen above sixty several kinds in the physic-garden at Amsterdam, and the number is greatly increased since. So that the name *aloe* is now become the denomination of a very large genus.—Among the number, however, there are not above twelve that yield the purgative juice above mentioned.

The juice or extract of *aloes*, is usually distinguished into three kinds.—The first, which is called *succotrine*, as being brought from *Succotra*, is the purest and most transparent; being friable, inodorous, black in the lump, but of a beautiful yellow colour when broken.—It is brought in skins from the Levant and East-Indies.

The second is called *hepatic*, because of its liver-colour: it is resinous, smells somewhat like myrrh, has a yellow colour when pounded, and is brought from China.—Some confound this with the following sort; as, in effect, there are but two sorts commonly known in our shops.

The third is the most impure, the blackest, and the strongest.—It was formerly used by the Indians to pitch their vessels withal: and is of little use among us, excepting for horses and cattle; for which reason it is called *caballine*, *i. e.* horse-*aloes*—It is prepared in Jamaica and Barbadoes, and brought over in large goulds.

Some have imagined, that these differences of *aloes*, were owing only to the greater, or less purification of the juice:

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but this is a mistake; it having been found that no dissolutions, or purifications, how often soever repeated, will change hepatic into succotrine, nor caballine into the true hepatic *aloes*.

The manner of procuring *aloes* is very easy, there being nothing to do but to cut the leaves of the plant, and to expose the juice that oozes out of them either spontaneously or by pressing, to the sun, till it becomes of a proper consistence.

Aloes is extremely bitter, and purgative, whence some have called it *fil naturæ*; externally applied, either in substance or tincture, it prevents putrefaction and gangrene.—Its bitterness makes it so nauseous, that it is rarely used in liquid forms, but it is generally made into pills, whereof half a dram is an ordinary dose.—Scarce any of the official purging pills are without this in their composition.

Its cathartic virtue is best employed in watery, cold, and corpulent constitutions, as it heats and attenuates; being bad for thin and hectic constitutions. It is accounted efficacious in promoting the menses; and is also good to destroy worms.—Guy Patin decries *aloes* as a forty and noxious drug, which heats and dries the liver, disposes towards a dropy, causes the piles, &c. *Lett. Choif. 126.*

Mr. Bouldue, by his analysis of *aloes*, has found that the succotrine scarce contains half the resin or sulphurous part, but one third more of the saline part, than is found in the hepatic. Hence the succotrine comes to be preferable for internal uses, and the hepatic for external.

ALOE Rogata, is a preparation of the succotrine *aloes*, made by dissolving it in juice of damask roses, and evaporating it to the consistence of a paste. Then, more juice is added, and the evaporation repeated, again and again.—This is held a gentler and safer cathartic than the *aloes* alone.

ALOES also gives the denomination to a kind of fragrant Indian wood; much used in the East as a perfume: thus called from its exceeding bitterness, which resembles that of the *aloes* juice.

The *aloes* wood is infinitely valued; and divers strange fables have been invented as to the origin of the tree that yields it; some feign that it grew in paradise, and was only conveyed to us by means of the rivers overflowing their banks, and sweeping off the trees in their way. Others suppose it to grow on inaccessible mountains; where it is guarded by certain wild beasts, &c.—The Siamese ambassadors to the court of France, in 1686, who brought a present of this wood from their emperor, first gave the Europeans any consistent account of it.

The tree grows in China, Lao, and Cochinchina; and is much about the size and figure of our olive-trees.—The trunk consists of three sorts of wood, very different in colour, and properties: immediately under the bark it is said to be black, compact, and heavy, and this is called by the Portuguese, *paço d'aguila*, *q. d.* eagle-wood.—That next under this, is of a tan-colour, light and veiny, resembling rotten-wood; and called *calambo*.

The heart, or innermost part, is called *tambac*; and is more valued by the Indians than gold itself. It affords a very strong, but agreeable smell; and is used as a perfume; and is withal held a sovereign remedy against the palsy, deliquiums, weaknesses, &c.

It is the *calambo* alone that is known among us.—It is brought in small bits of a very fragrant scent; especially when cast on the fire. The best is of a blackish purple colour, and so light as to swim on water: it is hot and drying, and is esteemed a great strengthener of the nerves.

Some pharmaceutical writers make a distinction between *aloes*, *lignum aloes*, and *xylo aloes*; which may amount to the three orders of the wood above mentioned: though among us they are the same thing, as their names import.

ALOETICS*, medicines wherein aloes is the chief, or fundamental ingredient. See **ALOES**.

* The word is formed of *aloe*, which is by some further derived from *alos*, the sea, that plant being chiefly found near the sea-coasts.

ALOGIANS*, **ALOGI**, or **ALOGIANI**, a sect of ancient heretics, who denied that Jesus Christ was the *logos*, or eternal word; and on this ground also rejected the gospel of St. John, as spurious.

* The word is compounded of the privative *α*, and *λογος*, *q. d.* without *logos*, or word.

Some ascribe the origin of the name, as well as of the sect of *Alogians*, to Theodore of Byzantium, by trade a carrier, who having apostatized under the persecution of the emperor Severus, to defend himself against those who reproached him therewith, said, that it was not God he denied, but only man. Whence his followers were called in Greek *αλογος*, in regard they rejected the word. But others, with more probability, suppose the name to have been first given them by Epiphanius in the way of reproach.

Moor **ALONGST**. See the article **MOOR**.

ALOOFF, a sea-term, signifying as much as, keep your luff: being a word of command from him that commands, to the man at the helm, to keep the ship near the wind, when she falls upon a quarter-wind.

ALOPECIA, in medicine, a total falling off of the hair from certain parts, occasioned either by the defect of nutritious

juice, or by the vitious quality thereof corroding the roots of it, and leaving the skin rough and colourless.

* The word is formed from *αλοπις, ουλπις*, a fox; whose urine, it is said, will occasion baldness; or because it is a disease which is common to that creature.

ALPHA *, the name of the first letter of the Greek alphabet.

* The word is originally Hebrew, formed from *aleph*, the name of the first letter in the Hebrew alphabet.

The Greek *alpha* answers to what in English we call simply A. See the article A.

Alpha, according to Plutarch, was placed at the head of all the letters, by reason in the Phœnician language it denotes an ox; which with regard to use and service, is the first among beasts.

ALPHA, in composition, denotes, sometimes, *privation*, in the same sense with *αρις*, without; sometimes augmentation, as *αγαν*, much; and sometimes union, as *αμα*, together. See A.

ALPHA is also used as a letter of order, to denote the first; and of number, to signify one; but when it was a numerical letter, a little stroke, or an acute accent was drawn above it thus 'A, to distinguish it from the meer A, which was a letter of order.

ALPHA and Omega, in the divine writings, signify the beginning and the end, or the first and last, (*viz.* before and after all things) and therefore the hieroglyphic of God is formed of these two letters A and Ω.

ALPHABET *, the several letters of a language, disposed in their natural, or accustomed order.

* The word is formed from the names of the two first letters of the Greek alphabet, *alpha, beta*; which were borrowed from those of the Hebrew, *aleph, beth*.

In the English alphabet we reckon 26 letters, *viz. a b c d e f g h i j k l m n o p q r s t u v w x y z*. See each under its proper article, A, B, C, &c.

But as there is a much greater number of different sounds in our language; it is not without reason that some grammarians maintain, that there ought to be a greater number of letters: as also, that the double letters, *x, y* and *w*, and the superfluous ones, *k* and *g*, should be retrenched.

The French alphabet only contains 23 letters.—Pauquier indeed maintains it to consist of 25, by reason he adds the two double letters *œ* for *et*, and *9* for *us*; but those are only abbreviations. The abbé d'Angleau, on better grounds, reckons 34 different sounds in the French tongue; and urges, that the alphabet ought of consequence to consist of 34 different characters, setting aside the double letters *x* and *y*, and the superfluous one *q*.

The difference between languages, with respect to the number of letters, in their alphabets, is very considerable: the Hebrew, Chaldee, Syriac, and Samaritan alphabets, have each 22; the Arabic 28; the Persian 31; the Turkish 33; the Georgian 36; the Coptic 22; the Muscovite 43; the Greek 24; the Latin 22; the Slavonic 27; the Dutch 26; the Spanish 27; the Italian 20; the Indians of Bengal 21; the Baramas 19.

The Æthiopic has no less than 202 letters in its alphabet, there being 7 vowels, which they combine with each of their 26 consonants; to which they add 20 other aspirated syllables.—The like is said of the Tartarian; each of their letters is a syllable; having one of the vowels joined to its consonant; as *la, le, li, &c.*

The Chinese have no alphabet, properly speaking; except we call their whole language their alphabet; their letters are words, or rather hieroglyphics, and are in number about 80,000.

In effect, alphabets were not contrived with design, according to the just rules of reason and analogy; but have been successively framed, altered, &c. as occasion offered.—And hence many grievous complaints as to their deficiencies; and divers attempts to establish new, and more adequate ones in their place. Bishop Wilkins charges all the alphabets extant with great irregularities, with respect both to the order, number, power, figure, &c.—As to the order, it appears inartificial, precarious and confused; in that the vowels and consonants are not reduced into classes, with such order of precedence and subsistence as their natures will bear.—Even the Hebrew order is not free from this imperfection.

As to number, they are both redundant, and deficient: redundant, either by allotting several letters to the same power, and sound; as in the Hebrew *ד* and *ד*, and the ordinary Latin *e* and *h*, *f*, and *ph*: or by reckoning double letters among the simple elements of speech; as in the Hebrew *כ*; the Greek *ξ* and *ψ*, the Latin *qu, x, et*, and the *j* consonant, or *jod*.—Deficient in divers respects, especially in regard of vowels, of which there are seven or eight kinds commonly used; though the Latin alphabet only takes notice of five; whereof two, *viz. i* and *u*, according to our English pronunciation, are not properly vowels, but diphthongs.

Add, that the difference among vowels in respect of long and short, is not sufficiently provided for: the ancients, we know, used to express a long vowel by doubling its character; as

amaabam, naata, ree, sedes, sanctissimis; though the vowel *i*, instead of being doubled, was frequently prolonged, as *ædilis, pliso, vlyus*.—The ways used in English for lengthening and abbreviating vowels, *viz.* by adding *e* quiescent to the end of a word, for prolonging a syllable; and doubling the following consonant, for the shortening of a vowel, as *vane vamm, vore varr*, &c. or else by inserting some other vowel, for the lengthening of it, as *meat met, read red*, &c. are all improper; in that the sign ought ever to be where the sound is.

As to their powers, again, these are not always fixed to the same signification: the vowels, for instance, are generally acknowledged to have each of them several sounds: *vocales omnes plurifone*, says Lippius; and Vossius assures us, the ancients used their vowels very different ways, *aliquando tenuis exilisque, nunc crassius, nunc intermedio sono*. Thus the power of the vowel *e* is expressed in writing no less than six several ways, *viz.* by *e*; as in *be, me, she, ye*:—by *ee*, in *thee, free, we*:—by *ie*, in *field, yield, shield, chief*:—by *ea*, in *near, dear, bear*; by *ei*, in *people*:—by *i*, in *privilege*. So is the power of the vowel *a*; as in *all, out, aw, fault, caught*: which are all only various ways of writing the same long vowel; besides the other distinct ways of expressing the same vowel when used short: again, the power of the vowel *o* is written five ways; *o*, as in *to, wo, move*:—*oe*, as in *doe*:—*oo*, in *shoo, moon, noon*:—*ou*, in *could, would*:—*oo*, in *two*; and so of the rest.—Nor are the consonants of more determinate powers: witness the different pronunciation of the same letter (*c*) in the same word, *circos*, and of *g* in *negligence*.—To say no more, the letters *c, f, i*, are used alike, to denote the same power; and the letter *s* is commonly used for *z*: and which is yet worse, some letters of the same name and shape, are used at one time for vowels, and at another for consonants; as *j, v, w, y*; which yet differ from one another, says Bishop Wilkins, *sicut corpus et anima*.

From this confusion in the power of letters, there arise divers irregularities; as, that some words are distinguished in writing, which are the same in pronunciation, *e. gr. Cessio and Sessio*, &c. and others are distinguished in pronunciation, which are the same in writing; as *give, dare, and give, vinculum*, &c. Hence also the Latin *male*, is a dissyllable, and the English *male*, is a monosyllable.

The names also, in most alphabets, are very improperly expressed by words of divers syllables; as *alpha, beta*, &c. in which respect, the Roman and our English alphabets, which only name the letters by their powers, have a great advantage over the rest.

Lastly, their figures are not well concerted; there being nothing in the characters of the vowels answerable to the different degrees of apertion: nor in the consonants, analogous to the agreements or disagreements thereof.

All these imperfections are demonstrated in the natural alphabet attempted by Dr. Wallis, Dr. Holder, &c. (see NATURAL ALPHABET) and are endeavoured to be obviated in the *universal alphabets*, or characters of Mr. Lodowic, Bishop Wilkins, &c. See *Universal CHARACTER*.

In the French king's library, is an Arabic work, intitled, *Sephat Alacham*; containing divers sorts of imaginary alphabets, which the author distributes into prophetic, mystical, philosophical, magical, talismanical, &c.

Monsieur Leibnitz had it in view to compose an *Alphabet of Human Thoughts*. *Mém. de l'Acad. R. An. 1716*.

It is no wonder that the number of letters in most languages should be so small, and that of the words so great; since from a calculation made by Mr. Prestet, it appears, that allowing only twenty-four letters to an alphabet, the different words or combinations that may be made out of those twenty-four letters, taking them first one by one, then two by two, three by three, &c. would amount to the following number, 1391724288, 887252999425, 128493402200.

It may be here observed, that every combination may make a word, even though that combination have not any vowel in it; because the *e* mute or quiescent insinuates itself imperceptibly between the consonants, or after the consonants, where there are but two, the latter of which would not be heard without it.—The use of this silent *e* is very remarkable in the Armenian, Welch, and Dutch languages; wherein the generality of words have several consonants together.

Nor must it be omitted, that every single letter may make a word: which is very apparent, where that letter is a vowel; words of that kind being found in most languages. Thus, *a* and *o* make words in the Greek; *a, o*, in the Latin; *a, i, o*, in English; *a, o, y*, in French; *a, e, i, o*, in Italian; *a, y*, in Spanish; *a, o*, in the Portuguese; *a*, in most languages, and even in the Dutch and Swedish. Any consonant also becomes a word, by adding an *e* mute to it in pronunciation.

In fine, though a considerable number of the possible combinations of twenty-four letters were retrenched, yet the number remaining would still be immense, and vastly superior to that of the words in any language known.

Of all known languages, the Greek is looked upon as one of the most copious, the radices of which are only esteemed about

about 3244; but then it abounds exceedingly in compounds, and derivatives. Bishop Wilkins thinks these may be moderately computed at about ten thousand.

Hermannus Hugo, indeed, asserts, that no language has so few as 100000 words; and Varro is frequently quoted by learned men, as if he affirmed that there are in the Latin no less than 500000; but upon inquiring into the scope of the passage, Bishop Wilkins observes, that this number is not intended by him to express the just number of words in the Latin; but the great variety made thereof, by the inflection and composition of verbs.—To this purpose he lays it down, that there are above one thousand radical verbs in the Latin; and that each verb admits of five hundred several varieties: he further supposes, that each of these may be compounded with nine prepositions; as *cessit, recessit, accessit, decessit, praecessit, processit, successit, &c.* which amounts to five millions. See WORD.

ALPHABET, in matter of polygraphy, is a duplicate of the key or cipher, which each of the parties corresponding are to keep by them.

It is properly an *alphabet* of the usual letters disposed in their order; opposite to, or underneath which, are the secret characters corresponding thereto, with the blank or useless letters, and the other signs or symbols serving to obscure, and render it difficult to decipher. See DECRYPTING.

ALPHETA, in astronomy, a fixed star in the northern crown; otherwise called *lucida corona*.

Its longitude, latitude, &c. see among the rest of the constellation CORONA Septentrionalis.

ALPHONSIN, is the name of a surgeon's instrument, used in the extraction of bullets from the body.

The *alphonisus*, so called from its inventor Alphonsus Ferrer, a physician of Naples, consists of three branches which are closed together by means of a ring.—The instrument, thus closed, being conveyed into the wound to the bullet, the operator draws back the ring towards the handle, upon which the branches opening themselves, lay hold of the ball: after this he pushes the ring again from the haft, whereby the branches grasp the bullet so firmly, that it must needs come out with them. *Bib. Anat. Med. t. 1. p. 517.*

ALPHONSINE Tables. See the article TABLE.

ALPHOS, in medicine a distemper described by Celsus, under the name of *vittilis*; wherein the skin is rough, and becomes sprinkled as it were with drops of white.

ALPINE. See the article CISALPINE.

ALRAMECH, or ARAMECH, in astronomy, the Arabic name of a star of the first magnitude, otherwise called *Arcturus*. See ARCTURUS.

AL T *, in music. See DIAGRAM, and SCALE.

* The word is formed of the Latin, *altus*, high,

ALTAR, ALTARE, ARA, a place or pile whereon to offer sacrifice to some deity.

The Jews had their brazen altar, for burnt-offerings, and a golden altar, or altar of incense.

Among the Romans, the altar was a kind of pedestal, either square, round, or triangular; adorned with sculpture, with basso relievo's, and inscriptions, whereon were burnt the victims sacrificed to idols.

According to Servius, those altars set apart for the honour of the celestial gods, and gods of the higher class, were placed on some pretty tall pile of building; and for that reason were called *altaria*, from the words *alta* and *ara*, a high elevated altar.—Those appointed for the terrestrial gods, were laid on the surface of the earth, and called *arae*.—And on the contrary, they dug into the earth, and opened a pit for those of the infernal gods, which they called *βεδρεαι, λακκοι, scrobiculi*. But this distinction is not every where observed: the best authors frequently use *ara* as a general word, under which are included the altars of the celestial and infernal, as well as those of the terrestrial gods. Witness Virgil, *Ecl. 5.*

En quatuor arae.

Where *arae* plainly includes *altaria*; for whatever we make of Daphnis, Phoebus was certainly a celestial god. So Cicero, pro Quint. *Aras delubraque Pecosas in Graecia vidimus.*

The Greeks also distinguished two sorts of altars; that whereon they sacrificed to the gods, was called *βωμω*, and was a real altar; different from the other, whereon they sacrificed to the heroes, which was smaller, and called *σκηνα*. Pollux makes this distinction of altars in his *Onomasticon*: he adds, however, that some poets used the word *σκηνα*, for the altar whereon sacrifice was offered to the gods.—The septuagint version does sometimes also use the word *σκηνα*, for a sort of little low altar, which may be expressed in Latin by *craticula*; being a hearth, rather than an altar.

The Jews also gave the name *altars* to a kind of tables, occasionally raised in the country or field, whereon to sacrifice to God.—In such a place, he built an altar to the lord.

ALTAR, is sometimes also used among Christians, for a square table, placed on the eastern side of a church, raised a little above the floor, and set apart for the celebration of the Eucharist.

Its form is not borrowed, either from that of the heathen altars, or even from that of the Jews in the temple; but in regard the Eucharist was instituted by Jesus Christ at supper, and upon a table, the modern altar is made in form of a table; and when it is more usually, and even more significantly denominated *Communion Table*.

In effect, the denomination *altar* is founded on this supposition, that the Eucharist is a proper sacrifice: which, though the standing doctrine of the church of Rome, is utterly denied by most of the Reformed.

In the primitive church, the altars were only of wood; as being frequently to be removed from place to place.—But the council of Paris, in 509, decreed, that no altar should be built but of stone.

At first there was but one altar in each church; but the number soon increased; and from the writings of Gregory the Great, who lived in the sixth century, we learn, that there were sometimes in the same church twelve or thirteen.—In the cathedral of Magdeburg there are no less than 49 altars.

The altar is sometimes sustained on a single column, as in the subterranean chapels of St. Cecilia at Rome, &c. and sometimes, by four columns, as the altar of St. Sebastian of Crypta Arenaria; but the customary form, is, to be a mass of stone-work, sustaining the altar-table.

These altars bear a resemblance to tombs: in effect, we read in church-history, that the primitive Christians chiefly held their meetings at the tombs of the martyrs, and celebrated the mysteries of religion thereon. For which reason, it is a standing rule to this day in the church of Rome, never to build an altar, without inclosing the relics of some saint therein.

In lieu of proper altars, the Greeks in process of time made use of antimenia. See ANTIMENSIUM.

ALTAR of Prothesis, is a name given by the modern Greeks to a smaller, preparatory kind of altar, whereon they bless the bread, before it be carried to the large altar, where the solemn liturgy is performed.

F. Gear maintains, that the table of prothesis was anciently in the sacristy, or vestry; which he makes appear from some Greek copies, where sacristy is made use of in lieu of prothesis. See SACRISTY.

ALTAR is also used, in church-history, for the oblations, or contingent incomes of a church.

In ancient days, they distinguished between the church and the altar.—The tithes, and other settled revenues, were called the church, *ecclesia*; and the other incidental incomes, the altar.

ALTAR, *Ara*, in astronomy, one of the constellations of the southern hemisphere; not visible in our climate. It consists of seven stars; whereof five are of the fourth magnitude and two of the fifth.—Some call it the *Center*.

Ministers of the ALTAR. See the article MINISTERS.

ALTARAGE, includes not only the offerings made upon the altar, but also the profit that arises to the priest on account of the altar.

ALTERANT, or ALTERATIVE, in medicine, a property, or power in certain remedies, whereby they induce an alteration in the body, and dispose it for health or recovery, by correcting some indisposition, without occasioning any sensible evacuation.

Under alterants, therefore, come all medicines which are not evacuations.

It is a point much questioned by some, whether there really be any such thing as an alterant in this sense; i. e. any thing which tends to cure a disorder otherwise than by eliminating or expelling some peccant matter?

Quincy has made it probable, that remedies usually reputed alterants, act in the same manner on the remoter, and more intimate parts of the habit, as emetics, purgatives, &c. do on the stomach and intestines.

Dr. Morgan denies that there is the least ground from any observations or experiments, to conclude that medicines by any alterative or specific operation on the blood can transform any morbid matter, or præternatural ferment into good blood, and humours: or that any such corrupt virulent matter, being once formed and fixed, there can be any remedy for it, otherwise than by throwing it out of the body by some of the natural evacuations. V. *Morg. Mechn. Praef. Phys. p. 53.*

Alteratives, therefore, are better defined, such medicines as have no immediate sensible operation, but gradually gain upon the constitution, by changing the humours from a state of distemperature to health.

ALTERATE. See the article SESQUIALTERATE.

ALTERATION, ALTERATIO, in physic, the act of changing the circumstances and manner of a thing; its general nature and appearance remaining the same.—Or, it is an accidental, and partial change in a body; without proceeding so far, as to make the subject quite unknown, or to take a new denomination thereupon.—Or, it may be defined, the acquisition or loss of such qualities as are not essential to the form of the body.

Thus,

Thus, a piece of iron, which before was cold, is said to be altered, when it is made hot; since it may still be perceived to be iron, is called by that name, and has all the properties thereof.

By this, alteration is distinguished from generation and corruption; those terms expressing an acquisition or loss of the essential qualities of a thing.

The modern philosophers, after the ancient chymists and corporularians, hold all alteration to be effected by means of local motion: according to them, it always consists either in the emission, accession, union, separation, or transposition of the component particles.

Aristotle makes a peculiar kind of motion, which he calls the Motion of Alteration.

ALTERCATION*, a debate or contest between two friends, or acquaintance.

* The word comes from the Latin *altercari*; which anciently signified to converse or hold discourse together.

Thus, we say they never come to an open quarrel; but there is continually some little alteration or other.

ALTERN Base, a term in trigonometry, contradistinguished from true base, thus—In an oblique triangle, the true base is either the sum of the sides; in which case, the difference of the sides is called the altern base: or, the true base is the difference of the sides; in which case, the sum of the sides is called the altern base.

ALTERNATE, or ALTERNATIVE, is understood of several things which succeed, or are disposed after each other by turns.

We say, an alternate or alternative office or trust, which is that discharged by turns: so, two general officers, who command each his day, are said to have the command alternately.

In botany, the leaves of a plant are said to be alternate, or placed alternately, when there is a correspondence between the two sides of a branch; the leaves of the one, standing a little above those of the other, not one opposite to the other.

ALTERNATE, in arithmetic. See ALLEGATION.

ALTERNATE Angles, in geometry, are the internal angles made by a line cutting two parallels, and lying on the opposite sides of the cutting line; the one below the first parallel, and the other above the second.

Thus, x and u , and z and y , (*Tab. Geometry, fig. 46.*) are alternate angles.

There are also two external angles, alternately opposite to the internal ones. See OPPOSITE.

Alligation ALTERNATE. See ALLEGATION.

ALTERNATE Ratio, or Proportion, is where the antecedent of one ratio is to its consequent, as the antecedent of another, to its consequent; the very same ratio, in this case, holding alternately in respect of the antecedents to each other, and the consequents to each other.

Thus, if $A : B :: C : D$; then, alternately, $A : C :: B : D$. See PROPORTION.

ALTERNATE, in heraldry, is used in respect of the situation of the quarters. See QUARTER.

Thus, in quarterly, *cartelè*, the first and fourth quarters are alternate; and are usually of the same nature. And the like holds of the second and third.

ALTERNATIONS, a term sometimes used to express the divers changes, or alterations of order, in any number of things proposed.

This is also called permutation, &c. and is easily found, by a continual multiplication of all the numbers, beginning at unity.

Thus, if it be required to know how many changes or alterations can be rung on six bells; multiply the numbers 1, 2, 3, 4, 5, 6, continually one into another; and the last product gives the number of changes.

ALTERNATIVE, is particularly used for the choice of two things proposed.—In this sense, we say, to take the alternative of two propositions.

ALTIMETRY*, ALTIMETRIA, the art of taking or measuring altitudes or heights; whether accessible or inaccessible. See ALTITUDE.

* The word is compounded of the Latin *altus*, high, and *metrum*, metior, to measure.

Altimetria makes the first part of geometry; including the doctrine and practice of measuring both perpendicular and oblique lines; whether in respect of height, or depth.

ALTITUDE, ALTITUDO, in geometry, the third dimension of body; considered with regard to its elevation above the ground—called also height or depth.

ALTITUDE of a Figure, is the distance of its vertex, from its base, or the length of a perpendicular let fall from the vertex to the base. See FIGURE, BASE, and VERTEX.

Thus, KL (*Tab. Geometry, fig. 10.*) being taken for the base of the rectangle-triangle, KLM : the perpendicular KM , will be the altitude of the triangle.

Triangles of equal bases and altitudes, are equal; and parallelograms, whose bases and altitudes are equal to those of triangles, are just the double thereof.

ALTITUDE, in optics, is usually considered as the angle subtended between a line drawn through the eye, parallel to the horizon, and a visual ray emitted from an object to the eye.

For the laws of the vision of altitude, see VISION.

If through the two extremes of an object, S and T , (*Tab. Optics, fig. 13.*) two parallels, TV and SQ be drawn; the angle TVS , intercepted between a ray passing through the vertex S , and terminating the shadow thereof in V , makes, with the right line TV , what is called, by some writers, the Altitude of the Luminary.

ALTITUDE, in cosmography, is the perpendicular height of an object, or its distance from the horizon, upwards.

Altitudes are divided into accessible and inaccessible. See ACCESSIBLE, and INACCESSIBLE.

There are three ways of measuring altitudes, viz. geometrical, trigonometrically, and optically.—The first is somewhat indirect and unartful; the second is performed by means of instruments for the purpose; and the third by shadows.

The instruments chiefly used in measuring of altitudes, are the quadrant, theodolite, geometric quadrat, or line of shadows, &c. the descriptions, applications, &c. whereof, see under their respective articles, QUADRANT, THEODOLITE, and QUADRAT.

To take Accessible ALTITUDES. To measure an accessible altitude, geometrically.—Suppose it required to find the altitude AB , (*Tab. Geometry, fig. 88.*) plant a staff DE perpendicularly in the ground, of such height as may equal the height of the eye. Then, laying prostrate on the ground, with your feet to the staff; if E and B prove in the same right line with the eye C ; the length CA is equal to the altitude AB .

If some other lower point, as F , prove in the line with E and the eye; you must remove the staff, &c. nearer to the object: on the contrary, if the line continued from the eye over E , mark out some point above the altitude required; the staff, &c. are to be removed farther off, till the line CE rake the very point required.—Thus, measuring the distance of the eye C from the foot of the object A ; the altitude is had; since $CA = AB$.

Or thus.—At the distance of thirty, forty, or more feet plant a staff DE , (*fig. 89.*) and at distance herefrom, in C , plant another shorter one, so as that the eye being in F , E and B may be in the same right line therewith. Measure the distance between the two staves, GF ; and between the shortest staff and the object, HF ; as also, the difference of the heights of the staves, GE .—To GF , GE and HF ; find a fourth proportional BH .—To this add the altitude of the shorter staff, FC . The sum is the altitude required, AB .

To measure an accessible altitude, trigonometrically.—Suppose it required to find the altitude AB , (*Tab. Trigonometry, fig. 23.*) chuse a station in E ; and with a quadrant, theodolite, or other graduated instrument duly placed, find the quantity of the angle of altitude ADC .

Measure the shortest distance of the station from the object, viz. DC , and this of consequence is perpendicular to AC .

Now, C being a right angle, it is easy to find the line AC ; since, in the triangle ACD , we have two angles, viz. C and D , and a side opposite to one of them, CD , to find the side opposite to the other: for which we have this canon.

—As the sine of the angle A , is to the given side opposite thereto, DC ; so is the sine of the other angle D , to the side required CA . See TRIANGLE.

To the side thus found, adding BC , the sum is the perpendicular altitude required.

The operation is best performed by logarithms. See LOGARITHM.

If there happen an error in taking the quantity of the angle A , (*fig. 24.*) the true altitude BD will be to the false one BC ; as the tangent of the true angle DAB , to the tangent of the erroneous angle CAB .

Hence, such error will be greater in a greater altitude than in a less: and hence also, the error is greater if the angle be lesser, than if it be greater. To avoid the inconveniences of both which, the station is to be pitched on at a moderate distance: so as the angle of altitude, DEB , may be nearly half right.

Again, if the instrument were not horizontally placed, but inclined; *e. gr.* to the horizon in any angle: the true altitude will be to the erroneous one, as the tangent of the true angle, to that of the erroneous one.

To measure an accessible altitude optically, by the shadow of the body. See SHADOW.

To measure an accessible altitude by the geometrical quadrat.—Suppose it required to find the altitude AB , (*Tab. Geom. fig. 90.*) chusing a station at pleasure in D , and measuring the distance thereof from the object, DB ; turn the quadrat this and that way, till the top of the tower A , appear through the sights.

If, then, the thread cut the right shadows, say, as the part of the right shadow cut off, is to the side of the quadrat; so is the distance of the station DB , to the part of the altitude AE .—If the thread cut the versed shadows, say, as the

side of the quadrat is to the part of the versed shadow cut off, so is the distance of the station DB, to the part of the altitude AE.

AE, therefore, being found in either case, by the rule of three; and the part of the altitude BE added thereto; the sum is the altitude required.

To measure an inaccessible ALTITUDE, geometrically.—Suppose AB, (fig. 89.) an inaccessible altitude, so that you cannot measure to the foot thereof. Find the distance CA, or FH, as taught under the article DISTANCE: then proceed with the rest as in the article for accessible distances.

To measure an inaccessible altitude, trigonometrically.—Choose two stations, G and E, (Tab. Trigonom. fig. 25.) in the same right line with the required altitude AB, and at such distance from each other, DF, as that neither the angle FAD, be too small, nor the other station G too near the object, AB.—With a proper instrument, take the quantity of the angles ADC, AFC, and CFB. See ANGLE.—And also measure the interval FD.

Then, in the triangle AFD, we have the angle D, given by observation; and the angle AFD, by subtracting the observed altitude AFC, from two right angles; and consequently the third angle DAF, by subtracting the other two from two right ones: and also the side FD; from whence the side AF is found by the canon above laid down, in the problem of accessible altitudes: and again, in the triangle AFC, having a right angle C, an observed angle F, and a side AF; the side AC, and the other CF, are found by the same canon. Lastly, in the triangle FCB, having a right angle C, observed angle CFB, and a side CF; the other side CB, is found by the same canon.

Adding, therefore, AC, and CB; the sum is the altitude required, AB.

To find an inaccessible altitude, by the shadow, or the geometrical quadrat.—Choose two stations in D and H, (Tab. Geom. fig. 90.) and find the distance DH or CG: observe what part of either the right or versed shadow is cut by the thread.

If the right shadows be cut in both stations, say, As the difference of the right shadows in the two stations, is to the side of the square; so is the distance of stations GC to the altitude EA.—If the thread cut the versed shadow at both stations, say, As the difference of the versed shadows marked at the two stations, is to the lesser versed shadow; so is the distance of the stations GC, to the interval GE.—Which being had; the altitude EB is also found by means of the versed shadow in G; as in the problem for accessible altitudes. Lastly, if the thread in the first station G, cut the right shadows; and in the latter, the versed shadows: say, As the difference of the product of the right shadow into the versed, subtracted from the square of the side of the quadrat, is to the product of the side of the quadrat into the versed shadow; so is the distance of the stations GC, to the altitude required AE.

The utmost distance at which an object may be seen, being given; to find its altitude.—Suppose the distance DB, (Tab. Geography, fig. 9.) turn this into degrees; by which means, you will have the quantity of the angle C: from the secant of this angle subtract the whole sine BC; the remainder will be AB, in such parts, whereof BC is 1000000.—Then say, As 1000000 is to the value of AB in such parts, so is the semidiameter of the earth BC 19695539, to the value of the altitude A Bin Paris feet.

Suppose, e. gr. the altitude be required of a tower AB, whose top is visible at the distance of five miles: then will DCB 20', from whose secant 10000168, subtracting the whole sine 1000000; the remainder AB is 168, which will be found 331 Paris feet.

ALTITUDE of the Eye, in perspective, is a right line let fall from the eye, perpendicular to the geometrical plane.

ALTITUDE, in astronomy, is the distance of a star, or other point in the mundane sphere, from the horizon.

This altitude may either be true or apparent.—If it be taken from the rational, or real horizon; the altitude is said to be true or real: if from the apparent, or sensible horizon; the altitude is apparent.—Or rather, the apparent altitude is such as it appears to our observation; and the true, is that from which the refraction has been subtracted. See TRUE, APPARENT, &c.

The altitude of a star, or other point, is properly an arch of a vertical circle, intercepted between the assigned point and the horizon. See VERTICAL.—Hence,

Meridian ALTITUDE.—The meridian being a vertical circle; a meridian altitude, that is, the altitude of a point in the meridian, is an arch of the meridian intercepted between it and the horizon.

To observe the meridian altitude of the sun, of a star, or other phenomenon, by means of the quadrant, see MERIDIAN ALTITUDE.

To observe a meridian altitude by means of a gnomon, see GNOMON.

The sun's altitude may also be found without a quadrant, or

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any the like instrument, by erecting a pin or wire perpendicular, as in the point C, (Tab. Astronomy, fig. 62.) from which point you had described the quadrantal arch AF. Make CE equal to the height of the pin or wire; and through E draw ED parallel to CA, and make it equal to CG, the length of the shadow; then with a ruler, laid from C to D, intersect the quadrant in B; and BA is the arch of the sun's altitude, when measured on the line of chords.

M. Parent suggests a new method of taking altitudes at sea, by a common watch.—'Tis obvious, that in an oblique sphere, the difference between the rising and setting of two stars, on the same meridian, is greater, as they are further distant from one another.

Now, the astronomical tables furnishing us with tables of the right ascensions and declinations of all the fixed stars; it is easy, after observing the difference of time between the rising of two stars, to distinguish that part of the difference which accrues from their different position, from that which arises from the obliquity of the sphere.—But such difference is the precise height of the pole of the place of observation.

Indeed, the ship not being immoveable, but changing place between the two observations; seems to lay the method under some difficulty: but to this Mr. Parent answers, that a small alteration either of the ship's longitude or latitude, will make no sensible error; and that if the have gone a large distance between the two observations, it is easy reckoning how much it is, and accordingly allowing for it. See SAILING.

In taking of altitudes from the visible horizon, where great exactness is required, an allowance is to be made for refraction, and the height of the observer's eye above the surface of the sea.

ALTITUDE of the Pole, is an arch of the meridian, intercepted between the pole and the horizon.

The altitude of the pole coincides with the latitude of the place.

—To observe the altitude or elevation of the pole, see ELEVATION, and POLE.

ALTITUDE of the Equator, is the complement of the altitude of the pole to a quadrant of a circle. See ELEVATION of the Equator.

To find the ALTITUDES of the stars, &c. by the globe. See GLOBE.

ALTITUDE of the Nonagesimal, is the altitude of the 90th degree of ecliptic, reckoned from the orient, or east point. See NONAGESIMAL.

Refraction of ALTITUDE, is an arch of a vertical circle, as S, (Tab. Astronomy, fig. 28.) whereby the altitude SE, of a star or other body, is increased by means of the refraction.

Parallax of ALTITUDE, is the difference CB, (Tab. Astronomy, fig. 27.) between the true and apparent place of a star; or, the difference BC, between the true distance of a star AB, and the observed distance AC, from the zenith A.

The parallax diminishes the altitude of a star, or increases its distance from the zenith.—To find the parallax of altitude, &c. see PARALLAX.

ALTITUDE of Motion, is a term used by Dr. Wallis, for the measure of any motion, estimated according to the line of direction of the moving force.

Circles of ALTITUDE. See the article CIRCLES.

Parallels of ALTITUDE. See the article PARALLELS.

Quadrant of ALTITUDE. See the article QUADRANT.

ALTO & BASSO, or in ALTO & in BASSO, in law, signifies the absolute reference of all differences, small and great, high and low, to some arbitrator or indifferent person.

—Patet universis per presentes quod Willielmus Tylar de Ynton, & Thomas Govor de Alvestre, posterius se in Alto & in Basso, in arbitrio quatuor Hominum, viz. de quadam querela pendente inter eos in curia.—Nos a terram nostram altè & basse ipsius domini Regis iussimus voluntati. Du Cang.

ALTO Relievo. See the article RELIEVO.

ALUDELS, in chemistry, subliming pots, or vessels used for the sublimation of mineral flowers.

Aludels, are a range of earthen tubes or pots without bottoms; fitted, one over another, and diminishing as they advance towards the top.—The lowest is adapted to a pot, placed in the furnace, wherein the matter to be sublimed is lodged.—And at the top is a head, to retain the flowers which ascend highest.

ALVEARIUM, in anatomy, the bottom of the concha, or hollow of the auricle, or outer ear. See EAR.

The alvearium auriculæ is a cavity, terminating at the meatus auditorius, wherein that bitter, yellowish excrement is collected, called cerumen, or ear-wax.

ALVEOLI, in anatomy, those little sockets in the jaws, wherein the teeth are set.

The alveoli are lined with a membrane of exquisite sense, which seems to be nervous, and is wrapt about the roots of each tooth; from whence, and from the nerve, proceeds that pain called odontalgia, or tooth-ach.

ALVIDUCA*, a term used by some writers for laxative or purgative medicines.

* The word is compounded of *alvus*, and *duco*, I draw.

ALUM, ALUMEN. See the article **ALLUM.**

ALVUS, among anatomists, is sometimes used to express the lower belly, or venter.

ALVUS, is more usually taken among physicians for the state, and condition of the fæces, or excrements contained within that cavity.

Thus, when a person is laxative, it is called *alvus liquida*; and when costive, *alvus adstricta*.

AMABYR, or AMVABYR, in some ancient customs, the price of a maidenhead; or a sum of money to be paid the lord upon marrying a maid of his manor.—This custom is said to have anciently obtained in Wales, where *amabyr* was paid to the prince: also in the honour of Clun belonging to the earl of Arundel, till earl Henry in the time of queen Mary, in consideration of sixty pounds, released it to all his tenants by the name of the custom, of *amabyr* and *chevage*.

AMAIN, or AMAYNE, a sea-term, used by a man of war, to his enemy; and signifying, *yield*.

Hence, *to strike amain*, is, to lower, or let fall the top-sails.

AMALGAMA*, or **AMALGAM**, in chymistry, a mass of mercury, united and incorporated with a metal. See **MERCURY**, and **METAL**.

* The word *amalgama* is formed of the Greek *αμα*, *simul*, together, and *μαζωω*, *juncture*, to join.

The *amalgama* of mercury with lead, is a soft, friable substance, of a silver colour.

By washing and grinding this *amalgam* with fair warm water in a glass mortar, the impurities of the metal will mix with the water; and by changing the water, and repeating the lotion again and again, the metal will be further and further purified.—Boerhaave mentions it as one of the greatest secrets in chymistry, to contrive to bring off the liquor at last as clear and uncoloured as when first poured on the *amalgama*; which he says might afford a method of making the nobler metals, or procuring them from the baser.

This philosophical way of purifying metals, may be easily applied to all the metals, except iron and copper.

AMALGAMATION, in chymistry, the operation of making an *amalgama*, i. e. of dissolving and incorporating some metal, especially gold, with mercury.

This operation is denoted among chymists by the letters **AAA**.

Amalgamation is performed by fusing, or at least igniting the metal; and in this state adding a proportion of mercury thereto; upon which they mutually attract, and incorporate with each other.

All metals, except iron and copper, spontaneously unite and *amalgamate* with mercury; but gold with the greatest facility; silver the next; then lead, and tin; copper does it with difficulty, and iron scarce at all. See **METAL**, &c.

The *amalgamation* of gold is usually performed by heating the laminæ or plates of that metal red hot; after which, quicksilver is to be poured upon them, and the mixture is to be stirred with a little iron rod, till it begins to rise into smoke.—It is then thrown into a vessel full of water, where it coagulates and becomes manageable.

This *amalgamation* is in great use among goldsmiths, and gilders, who by this means render gold fluid and ductile for their purposes.—Such mixture or *amalgama* being laid on any other metal, for instance, copper; and this afterwards placed on the fire to evaporate; the gold will be left alone on the surface of the copper: which makes what we call *gilding*.

The blackness adhering to the *amalgama* may be washed away with water; and a deal of the mercury may be pressed out through a linen cloth: and the rest being evaporated in a crucible, the gold remains behind in an impalpable powder.—Gold retains about thrice its own weight of mercury.

AMATORII Musculi, in anatomy, an appellation sometimes given to those muscles of the eyes which give them a cast sideways, and assist in that particular look by some called *egling*.

When the *abductor* and *humilis* act together, they give this oblique motion.

AMAUROSIS*, in medicine, a deprivation of sight; the eye remaining fair, and seemingly unaffected.

* The word is Greek, *αμαυρωσις*, q. d. darkness; formed of *αμαυρωω*, *obsuro*, I darken.

Amaurosis is the same with what the Latins more usually call *gutta serena*. See **GUTTA SERENA**.

AMAXOBII, or rather **HAMAXOBII**. See the article **HAMAXOBII**.

AMAZON, in antiquity, denotes a bold, courageous woman; capable of daring, hardy achievements.

AMAZONS, in a more peculiar sense, denote an ancient nation of warlike women, who founded an empire in Asia Mi-

nor, near the river Thermodoon, along the coasts of the Black Sea.

The *Amazons* are said to have formed a state out of which men were excluded. What commerce they had with that sex, was only with strangers; they killed all their male children, and cut off the right breasts of their females, to make them more fit for the combat.—From which last circumstance it is that they are supposed to take their name, viz. from the privative *α*, and *μασται*, *mamma*, breast.

It is a point controverted even among ancient writers, whether ever there really were such a nation of *Amazons*?—Strabo, Ptolemy, and others, absolutely deny it: on the contrary, Herodotus, Pausanias, Diodorus Siculus, Troglus Pompeius, Justin, Pliny, Meli, Plutarch, &c. expressly assert it.

Hippocrates mentions a law among the *Amazons*, whereby they were doomed to remain virgins, till such time as they had slain three men of their enemies.—He adds, that the reason of their cutting off the right breast, was to make the right arm the stronger; as supposing this would now receive the whole nutriment, which would otherwise have been divided between both.

Some authors relate, that instead of killing, they only twisted the legs of their male children; to prevent their being able to contend with them for the mastery.

M. Petit, a French physician, published a Latin dissertation in 1685, to prove that there really was a nation of *Amazons*: it contains abundance of curious inquiries, relating to their habit, their arms, the cities built by them, &c.—On medals, the *Amazons* bust is usually armed with a little ax, called *bipennis* or *securis*, borne on the shoulder, and a buckler, in form of a half-moon, by the Latins called *pelta*, on the left arm.—Hence that of the poet:

*Non tibi Amazonia est pro me sumenda securis,
Aut excisa levi pelta gerenda manu.*

Ov. Ex. Pent.

Some modern geographers and travellers mention *Amazons* still in being.—John de los Sanctos, a Portuguese capuchin, in his description of Ethiopia, speaks of a race of *Amazons* in Africa. And Æneas Sylvius gives us a very precise account of a republic of real *Amazons*, in Bohemia, which lasted nine years; founded by the courage of a maid named Valafca.

AMBAGES, *circumlocution*; an indirect discourse or phrase tending to express or shew something by a compass of words or sentiments fetched from afar.

AMBARVALIA, in antiquity, a feast, or ceremony among the Romans; celebrated annually, to expiate their grounds, and procure of the gods a happy harvest.

At these feasts, they sacrificed a bull, a sow, and a sheep; which, before the sacrifice, were led in procession thrice around the fields; whence the feast is supposed to have taken its name: from the Greek *αμφο*, about; or the Latin *ambio*, I go round, and *arvum*, field.—Though, others write it *ambarbalia*, and *ambarbia*, and deduce it from *ambire urbem*, to go round the city.

From the beasts offered in sacrifice, the ceremony was also called *Suoveturilia*.

It is not certain whether this feast was fixed, or moveable; nor whether it was celebrated once or twice a year; authors being of different opinions on both these heads.

The *ambarvale carmen*, was a prayer preferred on this occasion; and wherof we have the formula preserved in Cato, C. 141. *De Re Rustica*.

The priests who chiefly officiated at the solemnity, were called *Fratres Arvales*.

AMBASSADOR. See the article **EMBASSADOR**.

AMBE, in anatomy, a superficial jutting out of a bone. See **BONE**.

The word is also used as the name of an ancient surgical instrument, with which they reduced dislocated bones.—The *ambe*, or *commander*, is mentioned by Hippocrates, and has its partizans among the moderns, especially for replacing the arm. *V. Bibl. Anat. Med. t. 1. p. 667*.

AMBER*, *Succinum*, or *Karabe*, in natural history, &c. a yellow transparent substance, of a gummos or bituminous form or consistence, of a resinous taste, and a smell like oil of turpentine; chiefly found in the Baltic sea, along the coasts of Prussia, &c. and of use in medicine, and other arts.

* The word is originally Arabic, *ambar*, or *anbar*, which signifies the same.

Naturalists are infinitely divided as to the origin of *amber*, and what class of bodies it belongs to: some referring it to the vegetable, others to the mineral, and some even to the animal kingdom.—Its natural history, and its chemical analysis, afford something in favour of each opinion.

Pliny describes it as “a resinous juice, oozing from aged pines, and firs; (others say, from poplars, wherof there are whole forests on the coasts of Sweden) and discharged thence into the sea; where undergoing some alteration, it is thrown in this form upon the shores of Prussia; which lie very low: he adds, that it was hence the ancients gave it the denomination *succinum*; from *succus* juice.” *Nat. Hist. Lib. XXXVII. c. 3*.

This opinion of the ancient naturalist, seems confirmed by observations of many of the modern ones; particularly of the learned Father Camelli. *Philos. Transact.* N^o 290. Some have imagined it a concretion of the urine of a beast; others, the foam of the lake Cepheis, near the Atlantic; others, a concretion formed in the Baltic sea, and in some fountains where they say it is found swimming like pitch. Others suppose it a bitumen, trickling into the sea from subterraneous sources; and there concreted into this form, and thrown ashore by the waves.

This last opinion was a long time the most popular; and seemed to have the best ground: but this, too, is now discarded; as good amber having been found in digging at a considerable distance from the sea, as that gathered on the coast.

Others suppose amber a compound substance.—Prussia, say they, and the other countries which produce amber, are moistened with a bituminous juice, which mixing with the vitriolic salts abounding in those places, the points of those salts fix its fluidity, whence it congeals: and the result of that concretion makes what we call amber; which is more or less pure, transparent, and firm, as those parts of salt and bitumen are more or less pure, and are mixed in this, or that proportion.

The chemists are as much divided on this head as the naturalists. Amber being found by distillation to yield an acid spirit, which precipitates into a salt; is inferred, by some, to be of a mineral nature; this being a circumstance peculiar to that kingdom, and never found in the distillation of vegetables: to which may be added, that amber dissolves in alcohol, not in water; and melts at the fire, and is inflammable; which are characters, that seem to refer it to the class of sulphurs, or bitumens.

Others, on the contrary, argue it to be of the vegetable kind, from its resolving into the same principles with vegetables; viz. water, spirit, salt, and oil.—Boerhaave resembles it to camphire, which is a concrete oil of the aromatic plants of hot countries, elaborated by heat into a crystalline form.

There are several indications which discover where amber is to be found.—The surface of the earth is there covered with a soft scaly stone; and vitriol in particular always abounds there, which is sometimes found white, sometimes reduced into a matter like melted glass, and sometimes figured like petrified wood.

Amber assumes all figures in the ground; that of a pear, an almond, a pea, &c. In amber, there have been said to be letters found very well formed; and even Hebrew, and Arabic characters.—Within some pieces of amber, have likewise been found leaves, insects, &c. included; which seems to indicate either that the amber was originally in a fluid state; or that having been exposed to the sun, it was once softened, and rendered susceptible of the leaves, insects, &c. which came in its way. The latter of these seems the more agreeable to the phenomenon, in regard those insects, &c. are never found in the centre of the pieces of amber, but always near the surface. It is observed by the inhabitants of the places where amber is produced, that all animals, whether terrestrial, aerial, or aquatic, are extremely fond of it; and that they frequently find pieces of it in their excrements, and in their bodies when opened.

The most remarkable property of amber, is, that, when rubbed, it draws or attracts other bodies to it; and this, it is observed, it does, even to those bodies which the ancients thought it had an antipathy to; as oily bodies, drops of water, sweat of human bodies, &c.

Add, that by friction it is brought to yield light pretty copiously in the dark; whence it is reckoned among the native phosphori.

Amber is reputed of some medicinal efficacy; being used in suffumigations, to remove defluxions; and in powder, as an alterant, absorbent, sweetener, and astringent.

In times of the plague, those who work in amber at Koningsberg are said to be never infected; whence it is held a preservative.—It is also esteemed a lithontriptic, diuretic, and promoter of the menses.

Some distinguish amber with regard to its colours, into yellow, white, grey, and black.—But the two latter are properly of a different nature and denomination; the one called *jet*, the other *ambergris*. See AMBERGRIS, and JET.

The white is most valued for medicinal uses, as being best digested, of the most odoriferous smell, and containing the greatest quantity of volatile salt.—The yellow is most prized by those who work it into beads, and other toys, by reason of its transparency.

Kerkring pretends to be master of the secret of making coffins of amber, without destroying its transparency. It is probable he took the hint from the Ethiopians, who bury their dead in glasses. An Ethiopian, tho' black, makes a fine figure in a Venice crystal; much more would he do in a cover of yellow amber.

The amber gathered on the Prussian coasts, yields that price a handsome revenue.—Authors make mention of many other places where it is also found, as on the banks of the Po; the coasts of Marseilles; and divers parts of Asia, Africa, and even America: but Hartman, who has wrote the history

of the Prussian amber, *Succini Prussici Historia*, &c. treats all these accounts as fables, and denies amber to be found any where but in the northern countries of Europe, viz. in Poland, Silesia, and Bohemia, rarely; Jutland, Holstein, Denmark, oftener; more frequently still on the coasts of Samogitia, Courland, Livonia, and Pomerania; but most of all, in Prussia, in the country called Sambia, from Neve Tiff to Uranta Urug. See SUPPLEMENT, articles AMBAR, SUCCINUM, and CARABE.

Spirit of AMBER, is an acid liquor, procured from amber, by pulverizing and distilling it with a sand-heat, with or without the addition of tobacco-pipes, bricks, sand, &c.

It is chiefly used externally in rheumatic pains and aches; and internally, in inveterate glects, &c.

Oil of AMBER, is a fine, transparent, ponderous, yellow oil; procured after the spirit, by increasing the degree of fire.—

This, by rectification, becomes a good antihysteric, and emmenagogue; being very subtle and penetrative.

Volatile Salt of AMBER.—The principal chemical production of amber, is a peculiar acid salt; which rises after the oil, and fixes in the neck of the retort, &c.

It is a good cephalic, and detergent: and Quincy says, it extremely attenuates, and cuts, and penetrates the most remote and minute recesses; and thus scours, as it were, the whole nervous system. Its chief tendency, he adds, is to secretion, and what it carries along with it, is by urine. It also contributes, with alexipharmics, to promote a diaphoresis; and is scarce ever omitted in prescription for chronic cases, as epilepsies, palsies, &c.

The great consumption of this medicine, and the small proportion that amber yields of it, occasions it to be frequently adulterated with sal ammoniac, nitre, cream of tartar, salt of coral, &c.

Tincture of AMBER, is procured by digestion in spirit of wine with a sand-heat.—It is prescribed with the same intentions as the salt of amber.

Black AMBER, *Gagater*. See the article JET.

Liquid AMBER, is a kind of native balsam, or resin, like turpentine; of a pleasant smell, somewhat like ambergris.

It flows liquid, from an incision made in the bark of a fine large tree in New Spain (called, by the natives, *ajofol*) but it hardens as it grows older, and is brought to us in barrels.

It is reputed an excellent balsam; it mollifies, consolidates, and is good against the sciatica, weakness of the nerves, &c.

Balsam of liquid AMBER. See the article BALSAM.

AMBERGRIS, AMBER-GREASE, AMBERA GRISIA, a fragrant drug, that melts almost like wax; and is commonly of a greyish or ash-colour, and is used both as a perfume and a cordial.

It is found on the sea-coasts, in several countries; as, a long the southern, and eastern parts of Africa, Madagascar, the Maldives, some parts of the Mediterranean; and in the West Indies, about the islands of Bermudas, and Jamaica; also on the coasts of Carolina, and the western coasts of Ireland, &c. It is sometimes, whitish, brownish, and streaked with yellow, blackish, &c.

There is a great variety of opinions among naturalists with regard to its origin and production: to rehearse them all, would make a volume. Klobius recites eighteen; to which we could add half as many more.—The principal may be reduced to these which follow.

1^o, Some take it for the excrement of a bird, called in the Madagascar language *ajchibobuch*; which being melted by the heat of the sun, and washed off the shore by the waves, they say is swallowed by whales; who return it back in the condition we find it. Or, as Barboza relates, from the Moorish inhabitants of the Maldives; the excrements above mentioned are altered and refined by lying on the rocks, exposed to the sun, moon, and air; from whence they are afterwards washed off by the rising sea. They add, that the whales frequently swallow pieces thereof: that those pieces we meet withal of a black colour, took that hue in the stomach of those animals; that the brown are such as have floated long on the water; and the white, such as have only been a short time there, which they value the most. *Ramusio*, Tom. I. fol. 313.—To this opinion does Klobius also adhere.

2^o, Others speak of it as the excrement of a cetaceous fish; because sometimes found in the intestines, and sometimes in the faeces themselves, of such animals.—Justus Klobius, in his history of amber, describes the animal; which he says is a whale, and called the *trunk*: adding, that the sperma ceti is taken out of the head of the same creature.—Others, with the Persians, suppose the fish that yields the *ambergris*, a sea-calf; others, with the Africans, make a peculiar species of fish, named *ambraean*; others a crocodile, by reason its flesh is perfumed, &c.

But, to both these hypotheses it is objected, that we have no instance of any excrement capable of melting like wax. Add, that if it were the excrement of a whale, it should rather be found in such places where those animals abound, as about Greenland, &c. than about the Maldivian islands, Soffala, Melinda, Cape Comorin, &c. where no whales are found.

3^o, Others take it for a kind of wax, or gum, which distils from

from trees, and drops into the sea, where it congeals, and becomes *ambergris*.

4°. Others, and particularly many of the orientals, imagine it springs out of the bottom of the sea, as naphtha does out of some fountains.—They add, that the only springs hereof are in the sea of Omus, between the Arabian and Persian gulphs. Edrifsi, who is of this opinion, in the first climate of his geography, mentions pieces of *ambergris*, on those coasts weighing a full quintal.—Paludanus and Linschotten also speak of it as a sort of bitumen, gradually working up from the bottom of the sea, and hardening in the sun.

5°. Others take it for a sea-mushroom, tore up from the bottom by the violence of tempests; it being observed, that *ambergris* is never found but during the south-west monsoons, after storms.

6°. Others assert it a vegetable production, issuing out of the root of a tree, whose roots always shoot toward the sea, and discharge themselves into the same.—This account we have in the Philosophical Transactions, from one of the Dutch factors at Batavia: and the same is confirmed by Mr. Boyle, *Of Tastes and Odors*.

7°. Others suppose it a spongy kind of earth, which the working of the sea washes from off the rocks, where, being lighter than water, it floats.—Others are of opinion, that it is a bituminous matter; that it is at first liquid, and runs into the sea, and that it is there condensed and reduced into a mass.

8°. Others maintain, that *ambergris* is made from the honey-combs which fall into the sea from the rocks, where the bees had formed their nests.—This opinion seems to have something of experience: on its side; several persons having seen pieces that were half *ambergris*, and half plain honey-comb: and others, again, having found large pieces of *ambergris*, which when broke, honey-comb, and honey too, were found in the middle. *V. Tredway, Phil. Transf. ap. Lowth. p. 492.*

9°. Dr. Boylston, and Mr. Dudley in the Philosophical Transactions, assert that the *ambergris* is a true, animal concrete, formed in balls, in the body of the male sperma-ceti whale, and lodged in a large oval bag, over the testicles, at the root of the penis. *V. Phil. Transf. N.º. 385, and 387.*

It is certain, the whale-catchers in those parts have divers times found *ambergris* in their sperma-ceti whales, and that chiefly in the larger, and older sort: and 'tis from the informations of Mr. Atkins, and other whale-catchers, that Mr. Dudley chiefly drew his account.—But, besides that it is added, that it is not one sperma-ceti whale in 100, that is found to have *ambergris*; Mr. Neumann absolutely denies it to be an animal substance, as not yielding, in the analysis, any one animal principle.—It may indeed he says be found in whales, but it must have been swallowed by them.

Mr. Neumann, chemist to the king of Prussia, after an ample recital of all the different opinions advanced by others, gives us his own; which is, that *ambergris* is a bitumen, issuing out of the earth into the sea; at first of a viscous consistence, but hardening, by its mixture with some liquid naphtha, into the form wherein we find it. *V. Phil. Transf. N.º. 433. p. 350. N.º. 434. p. 371. N.º. 435. p. 417.*

The pieces frequently seem composed of divers strata, laid one over another; with stones and other bodies inclosed therein; and the strata are sometimes full of little shells, which seem a species of concha anatifera: whence it may be conjectured, that the *ambergris* has originally been in a fluid state; or at least, that it has been dissolved; and in that state has formed itself afresh, and involved such bodies as happened to be in its way.

It is of considerable use among perfumers, who melt it over a gentle fire, and make extracts, essences, and tinctures of it.—It would be of more use in physic too, were not its smell apt to occasion vapours.

We have various instances in authors, of vast pieces of this matter: the largest that has been known in Europe, was brought by the Dutch East-India company, toward the close of the last century; and kept in their house for some years. It was almost round; measured two foot in diameter, and weighed an hundred and eighty-two pounds. The great duke of Tuscany offered fifty thousand crowns for it. See SUPPLEMENT, article AMBERGRIS.

AMBER-SEED, or *Musk-seed*, is a seed somewhat like the dilly of a bitterish taste, and brought dry to us from Martinico and Egypt.—The Egyptians use it internally, as a cordial, to fortify the heart, stomach, and head, and to provoke lust.—It gives a grateful scent to the breath, after eating; but it is not proper for those who are inclinable to vapours.

AMBIDEXTER *, one who uses both hands alike, the left as well as the right, or in cases where only the use of one is necessary.

* The word is Latin, *ambidextra*, compounded of *ambo*, both; and *dexter*, right-hand; by analogy to the Greek *αμφιδέξιος*, which signifies the same.

Women, according to the observation of Hippocrates, are never *ambidextrous*. But this is denied by some moderns, who give instances of the contrary; though it is owned, they are

but few in comparison of what are found in the other sex.

AMBIDEXTER, in a legal sense, denotes a person who takes money from both of the two contending parties, to further them in their cause.—In this sense the word may be applied to a judge, juror, a solicitor, or the like.—The penalty on a juror in such case, is to forfeit *decies tantum*, ten times as much as he receives.

AMBIENT *, a term applied to such things as incompass others round about.

* The word is formed of the Latin *ambire*, to encompass, go round.

Thus, the bodies situate around any other body, are called *ambient*, and often the *circum-ambient* bodies.—The whole body of air, because it incompasses all things on the face of the earth, is often by physical writers called, by way of eminence, the *ambient*, or *ambient* air. See CIRCUM-AMBIENT.

AMBIGENAL *Hyperbola*, in geometry, is that which has one of infinite legs inscribed, and the other circumscribed. See HYPERBOLA.

AMBIGUOUS *, something dubious, obscure, or which may be taken in different senses. See EQUIVOCAL.

* The word is formed of the Latin *ambo*, both, and *ago*, I drive; *q. d.* that which keeps the mind wavering, or in suspense; not knowing which side to chuse.

The answers of the ancient oracles were always *ambiguous*.

AMBIT, AMBITUS, of a figure, in geometry, denotes the perimeter; or the sum of all the lines, that constitute, or include it.

AMBITUS, among the ancient Romans, the act of soliciting, or making interest for offices, or honours.

The candidates, in this case, went about the city; and into all public places, and assemblies, to beg voices; which was called *Ambitus*; *amb*, in the ancient Latin, signifying *circum*, about, or round, and *ire*, to go.

The AMBITUS was the great trade of Rome, and demanded a constant supply of great sums of money. Tully assigns this as the cause of the high rate of interest, and tells us it had raised it from 4 to 8 per cent. *Cit. Ep. 2. ad Quinct. Frat.*—Bribery was come to the pitch of 80729*l.* per tribe; and there being no less than thirty-five tribes, it is obvious, how expensive this corruption was grown.—It is also well known where it ended. *Arbut. Diff. p. 213.*

AMBLE, AMBLING, in horsemanship, a peculiar kind of pace, wherein a horse's two legs of the same side, move at the same time.

The *ambling* horse changes sides at each remove; two legs of a side being always in the air, and two on the ground, at the same time: an *amble* is usually the first natural pace of young colts; which, as soon as they have strength enough to trot, they quit.—There is no such thing as an *amble*, in the manage; the riding-masters allowing of no other paces, beside walk, trot, and gallop: their reason is, that a horse may be put from a trot to a gallop, without stopping him; but not from an *amble* to a gallop, without such stop; which loses time, and interrupts the justness and cadence of the manage.

There are various practices and methods of discipline, for bringing a young horse to *amble*: some chuse to toil him in his foot-pace through new-ploughed lands; which naturally inures him to the stroke required in the *amble*. But its inconveniences are, the weakness and lameness that such disorderly toil may bring on a young horse.

Others attempt it by sudden stopping, or checking him in the checks, when in a gallop; and thus putting him into an amazement, between gallop and trot; so that losing both, he necessarily stumbles upon an *amble*.—But this is apt to spoil a good mouth and rein; and exposes the horse to the danger of an hoof-reach, or sinew-strain, by over-reaching, &c.

Others prefer *ambling* by weights, as the best way; and to this end, some overload their horse with excessively heavy shoes; which is apt to make him interfere, or strike short with his hind feet.—Others fold leaden weights about the fetlock pasterns; which are not only liable to the mischiefs of the former, but put the horse in danger of incurable strains, crushing of the coronet, and breeding of ring-bones, &c.—Others load the horse's back with earth, lead, or the like matterly substance; but this may occasion a swaying of the back, overstraining of the fillets, &c.

Some endeavour to make him *amble* in hand, ere they mount his back by means of some wall, smooth pall or rail, and by checking him in the mouth with the bridle-hand; and correcting him with a rod on the hinder hoofs, and under the belly, when he treads false. But this is apt to drive a horse to a desperate frenzy, before he can be made to understand what they would have of him; and to rear, sprout out his legs, and make other antic postures, which are not easily quitted again. Others think to effect it by a pair of hind shoes with long spurs or plates before the toes; and of such length, that if the horse offers to trot, the hind-foot beats the fore-foot. But this occasions wounds of the back flexors, which often bring on an incurable lameness.

Some attempt to procure an *amble*, by folding fine, soft lissis frait about his gambrels, in the place where he is gartered

for a stifle strain; and turn him thus to grafs for two or three weeks, and afterwards take away the lilt.—This is a Spanish method, but disapproved; for though a horse cannot then trot but with pain, yet the members must be sufferers; and though the *amble* be gained, it must be slow and unightly; because attended with a cringing in the hind parts.—In effect, *ambing* by the tramel, as practised by us, appears the nearest to nature, and the best and most assured way.

There are divers errors however usually practised in this method: as, that the tramel is often made too long, and so gives no stroke; but makes a horse huckle and thuffle his feet confusedly; or too short, which makes him volt and twitch up his hind feet so suddenly, that by custom it brings him to a string-halt; from which he will scarce ever be recovered. Sometimes the tramel is misplaced, and to prevent falling put about the knee, and the hind hoof.—In which case, the beast cannot give any true stroke, nor can the fore-leg compel the hind to follow it: or if, to evade this, the tramel be made short and strait, it will press the mainfinew of the hind-leg, and the fleshy part of the fore-thighs; so that the horse cannot go without halting before, and cringing behind.

As to the matter of the tramel; some make it all of leather, which is inconvenient; in that it will either stretch or break, and thus confound the certainty of the operation. In a true tramel, the sides-ropes are to be so firm, as not to yield a hair's breadth; the hose soft; and to lie so close, as not to move from its first place; and the back-band flat, no matter how light, and to descend from the fillet so as not to gall.

When the horse by being trameled on one side, has attained to *amble* perfectly in the hand; it is to be changed to the other side, and that is to be likewise brought to rule. When, by this changing from one side to another, with a half tramel, the horse will run and *amble* in the hand readily and swiftly, without snapping and stumbling; which is ordinarily done by two or three hours labour; the whole tramel is to be put on, with the broad, flat, back-band, and both sides trameled alike.

AMBLYGON*, or **AMBLYGONIUM**, in geometry, denotes a triangle, one of whose angles is obtuse, or consisting of more than ninety degrees.

* The word is Greek; composed of *αμβλυος*, obtuse, and *γωνια*, angle.

AMBLYOPY*, **AMBLYOPIA**, in medicine, a disease of the eyes, otherwise called, *gutta serena*, and *amaurosis*. See *GUTTA Serena*, &c.

* The word comes from *αμβλυος*, obtusus, dull, and *σπορα*, *σπορα*, *σπορα*, I see.

AMBO* or **AMBON**, a kind of pulpit or desk, in the ancient churches, where the priests and deacons stood to read or sing part of the service, and preach to the people: called also *Analogium*.

* The term is derived from *ambonus*, to mount.—The *Ambos* was mounted upon two sides; whence some also derive the appellation from the Latin *ambo*, both.

The *ambo* was ascended by steps; which occasioned that part of the office performed there to be called the *Gradual*.—The gospel was read at the top of the *ambo*; the epistle a step lower.

AMBROSIA*, in the heathen theology, &c. a delicious kind of food, whereon the gods were supposed to feed.

* The word is compounded of the privative particle *a*, and *βροτος*, mortal; in regard it rendered those who fed thereon immortal, or because it was the food of the immortals.

Lucian, rallying the poetical gods, tell us, that *ambrosia* and *nectar*, of which one is the meat and the other the drink of the gods, were not so excellent as the poets describe them; since these deities would leave them for blood and fat, which they come to suck from the altars like flies.

AMBROSIAN Rite, or office, denotes a particular office or formula of worship, used in the church of Milan; which is sometimes also called the *Ambrosian church*.

The denomination takes its rise from St. Ambrose, archbishop of Milan in the fourth century, who is usually supposed to have been the author of this office. Yet some are of opinion the church of Milan had an office different from that of the Roman, and other churches of Italy, before the time of that father. In effect, till the time of Charlemagne, each church had its several office; and when in afterwards the pope took on him to impose the Roman office on all the other churches of the west, that of Milan sheltered itself from the imposition, under the name and authority of St. Ambrose; from which time, the phrase *Ambrosian rite* has obtained, in contradistinction to the Roman rite.

We also meet with the *Ambrosian chant*, or song; which was distinguished from the Roman, in that it was stronger and higher.

The public library of Milan, is also called the *Ambrosian library*.

AMBR Y, the place where the arms, plate, vessels, and every thing belonging to house-keeping were formerly kept.

Hence, probably the *ambry* at Westminster, was so called because formerly set apart for that use; or rather, from *ambryner*, a house adjoining to an abbey, in which the charities

were laid up, and distributed to the poor. See *ALMS*, and *ALMONRY*.

AMBULATION, or walking. See the article *EXERCISE*.

AMBULATION, in physic, is used by some for the spreading of a gangrene or mortification.

AMBULATORY*, a term anciently applied to such courts, &c. as were not fixed to any certain place; but held sometimes in one place, and sometimes in another.—In opposition to sedentary courts.

* The word is formed of the Latin *ambulare*, to walk.

The court of parliament was anciently *ambulatory*; so also were the courts of king's bench, &c.

We sometimes also say, in a moral sense, a man's will is *ambulatory*, to the time of his death; meaning, that he has it always in his power to revoke it.

The Poles, even the nobility and court, find no pleasure but in the *ambulatory* or rambling life. *Dalerac*. T. 2. Op. 76. c. 4.—It is in vain men have pretended to fix themselves in cities: the continual desire in the inhabitants to be travelling out of them, this way or that, shews, that the itinerant or scenetic life is the life of nature.

AMBURBIUM*, or **AMBURBIALE Sacrum**, in antiquity, a religious feast, or ceremony, practised among the Romans; wherein they made processions around their city.

* The word is compounded of *ambio*, I go round; or of *amb*, or *ambu*, an ancient preposition, signifying around, and *urbis*, a city.

Scaliger, in his notes on Festus, followed by many others, maintains the *amburbia* to be the same with *ambarvalia*. See *AMBARVALIA*.

Hence, also, we have *amburbiales victimae*, the victims carried along in the procession; and afterwards sacrificed.

AMBUSCADE, **AMBUSH**, **AMBUSHMENT**, a body of men, who lie hid in a wood, &c. in readiness to rush out upon, or inclose an enemy unawares.—Or, the place wherein such a corps hide themselves.

AMBUSTIO, in medicine, a bum. See *BURN*, and *BURNING*.

AMEL, or *Enamel*. See the article *ENAMEL*.

AMEN, a church term, used as the conclusion of all solemn prayers, &c. and signifying, *so be it*, or *fiat*.

The Hebrews had four kinds of *amen*. That just mentioned they called *amen pass*; which was accompanied with the greatest attention and devotion: in this sense, the word has passed into almost all languages, without any alteration.

Some authors are of opinion, that the word *amen* is formed of the initial letters of these words, *Adonai, Melech, Neeman, Dominus Rex Fidelis*; an usual expression among the Jews, when they would give weight or sanction to any thing they said. In effect, it is known, that to express the words אֲדֹנָי מֶלֶךְ נֵעֵמָן *Adonai Melech Neeman*, in the ordinary way of abbreviations; the rabbins only take the initial letters; which, joined together, are really the letters of the word אָמֵן *amen*.

On the other hand, there are some of their cabbalists, who, according to their usual manner of finding a hidden meaning in words, which they call *notaricon*, out of the letters of the word *amen* form the whole phrase, *Adonai, Melech, Neeman*.

Yet it is certain also, that the word *amen* was in the Hebrew tongue before ever there were any such things as cabballa or cabbalists in the world: as appears from Deuteronomy, Chap. XXVII. ver. 15.

The primitive of the word *amen* is the verb *aman*, which, in the passive voice, signifies to be true, faithful, constant, &c.

—Hence came the noun אָמֵן *amen*, which signifies, *truth*. And, lastly, of this noun *amen* they made a kind of affirmative adverb, which, when placed at the end of any phrase or proposition, signifies, *so be it*, *be it true*, *I acquiesce in it*, &c.

Thus, in the passage above cited from Deuteronomy, Moses ordered the Levites to cry aloud to the people, Cursed is he that makes any graven or molten image, &c. and all the people shall say, *Amen*; i. e. yes, may he be cursed, we desire, we agree to it.—But at the beginning of a phrase, as in several passages of the new testament, it signifies truly, verily.

—When it is redoubled, or repeated twice together, as is always done by St. John, it has the effect of a superlative; agreeably to the genius of the Hebrew tongue, and her two daughters, the Chaldee and Syriac.—In this sense we are to understand *amen, amen, dico vobis*. The evangelists usually preserve the Hebrew word *amen*, in their Greek *amen*; though St. Luke sometimes renders it by *ambros*, *truly*, or *veri*, *certainly*.

AMENABLE, or **AMAINABLE**, is applied in our law-books to a woman, who is supposed to be governable by her husband.

AMEND, or **AMENDE**, in the French customs, a mulct, or pecuniary punishment, imposed by a sentence of the judge; for any crime, false prosecution, or groundless appeal.

AMENDE HONORABLE denotes an infamous kind of punishment, used in France, &c. on traitors, parricides, sacrilegious persons, and other heinous criminals,

It consists in this, that the offender is delivered up to the common hangman, who having seized him to his shirt, and put a rope about his neck, and a wax taper in his hand, leads him to the court, where he is to beg pardon of God, the king, the court, and his country.

Sometimes the punishment ends here; and sometimes death of the galleys are added.

The phrase *amende honorable*, is also used by way of allusion; where a person is condemned to come into court, or into the presence of some person injured, and make an open recantation, ask pardon, &c.

AMENDMENT, in law, the correction of an error committed in a process, and copied before judgment.

If the error be committed in giving judgment, viz. if a wrong judgment be given; there, they cannot amend it; but the party aggrieved must bring his writ of error.—However, where the fault appears to be in the clerk who writ the record, it may be amended; chiefly if it be in matter of fact, not in a point of law.

AMERCEMENT, or **AMERCIAMENT**, in law, a pecuniary punishment imposed upon offenders, at the discretion of the court; frequently also called *miseriordia*.

There is this stated difference between fines and *amercements*; that fines are punishments certain, and determined by some statutes; but *amercements* are arbitrary impositions, proportioned to the fault, and wholly at the mercy of the court.—Manwood, in his *Forest-Laws*, makes another difference; as if an *amercement* were a more easy and merciful penalty, and a fine a more sharp and grievous one.

In the new terms of the law, *amercement* is said to be properly a penalty assessed by the peers or equals of the party *amerced*, for an offence done; for which he puts himself upon the mercy of the lord.

Amerciament royal is used by some to denote a pecuniary punishment laid upon a sheriff, coroner, or such like officer of the king, by justices, for some offence or abuse in his office.

AMERICAN Ocean. See the article OCEAN.

AMERICAN Weights. See the article WEIGHTS.

AMETHYST, in natural history, a precious stone, of a violet colour, bordering on purple.

Plutarch says, the *amethyst* takes its name from its colour; which, according to him, resembles that of wine mixed with water; and not from its preventing drunkenness: which, however, was a common opinion, and gave occasion to its being hung about the necks of great drinkers.—Those who ascribe this virtue to the *amethyst*, derive its name from the privative *a*, and *μθυσκα* to inebriate. See GEM.

There are divers sorts of *amethysts*.—The Oriental, which is the hardest, the rarest, and most valuable, and which is of a deep purple colour; the German, which is of a violet colour; and the Spanish, which has the colour of a pansy.

There are some orientals also of a paler colour, and others white, and like the diamond.—There are also beautiful ones found in the Pyreneans, and in the mountains of Auvergne.

Amethysts are dug in a hill named St. Sigmound, two leagues from Vic^t in Catalonia.—They find the stones by following a vein of reddish or black earth, or a vein in the rock so coloured. They are all hexangular, and pointed like crystal. There are three sorts: the best are the blackest or deepest violet; others are almost quite white; and some few are tinged with yellow. Sometimes there is a great number found sticking together, like the Bristol diamonds; but these are never good: the best are found loose in the chinks of the rock, in a fatty reddish or yellowish earth. They rake out this earth with long narrow knives which enter the chinks, and then crumble it with their fingers to feel for the stones. V. Ray. Trav. p. 402.

The occidental *amethyst* is not extremely hard; but may be cut with a leaden wheel, smeared with emery moistened in water.—It is polished on a pewter wheel with tripoli.—It is easily engraven on, either in creux or relieve. See SUPPLEMENT, article AMETHYST.

AMETHYST, in heraldry, signifies the purple colour in the coat of a nobleman, which, in gentlemen's escutcheons below that degree, is called *purpure*; and in those of sovereign princes, *mercury*.

AMIABLE Numbers, denote numbers which are mutually equal to the whole sum of each other's aliquot parts.—Such are the numbers 284 and 220. See NUMBER.

AMIANTHUS Lapis, in natural history, the same with asbestos. See ASBESTOS.

AMICTUS, in our ancient writers, the uppermost of the six garments worn by priests.—It was tied round the neck, *Ne inde ad linguam transfat mendacium*; and covered the breast and heart, *Ne vanitates cogitet*.

AMISS Drawing, see the article DRAWING.

AMISSA Lex. See the article LEX.

AMITERE Legem Terræ, a law-phrase, signifying, the forfeiture of the right of swearing in any court or cause; or the becoming infamous. See LAW.

This is the punishment of a champion overcome, or yielding in the combat; of jurors found guilty in a writ of attain^t; and of persons outlawed.

AMMA, or **HAMMA**, a girdle, or truss used in ruptures; to hinder the intestines from bearing down too much.

AMMI, or **Semen AMMEOS**, a kind of aromatic seed, of some use in medicine; the produce of a plant of the same name, called in English *bishops-wood*.

The seed is brought from the Levant; it is found to contain a great deal of essential oil, and volatile salt; and to be attenuating, aperitive, hysterical, carminative, cephalic, and alexipharmic; being one of the four lesser hot seeds.—It expels wind, provokes the menses, &c.

According to Lemery, the plant takes its name *ammi* from *ammi*, *arena*; its seed being very like grains of sand.

AMMON, or **HAMMON**, in antiquity, an epithet given to Jupiter in Libya; where was a celebrated temple of that deity under the denomination of *Jupiter Ammon*.

There has been a great dispute about the origin of this name.—Some derive it from the Greek *αμμος*, sand; in regard the temple was situate in the burning sands of Lybia; others borrow it from the Egyptian *amam*, a ram; as having been first discovered by that animal.—Others will have *Ammon* to signify the sun; and the horns wherewith he is represented, the funbeams.

However this be, *Jupiter Ammon* was usually represented under the figure of a ram; though in some medals he appears of a human shape, having only two rams horns growing out beneath his ears.

Cornu AMMONIS, in natural history. See CORNU AMMONIS.

AMMONIAC.—*Gum AMMONIAC*; or, as it is sometimes, though improperly, called *ARMONIAC*, is a kind of gum, brought from the East-Indies; and said to ooze from an umbelliferous plant.

Dioscorides says, it is the juice of a kind of ferula growing in Barbary; and that the plant that produces it was called *agalilis*.

Pliny calls the plant whence it flows, *metopion*, the gum takes its name from the temple of *Jupiter Ammon*, in which it grows.

It ought to be in dry drops, white within, yellowish without, easily fusible, resinous, somewhat bitter, and of a very sharp taste and smell, somewhat like garlic.

The good *ammoniac* is of a pale colour, and not mixed with any scrapings of wood, stone, or sand; this by the Greeks was called *σφαγμα*, fragment.—The other, which is full of stones or sand, was called *πορεμα*, that is, mixture.

Some say, this gum served the ancients for incense in their sacrifices.

It enters several medicinal compositions, as an attenuant and detergent, against disorders arising from viscidities, and grumes.—Outwardly applied, it is resolute and suppurative; and, as some say, will of itself draw out splinters, &c.

Some dissolve the gum in vinegar, and other liquors, and call these *lac ammoniaci*; much used in asthma, and obstructions of the lungs. It is frequently also given in Pills.

Sal AMMONIAC is also a kind of salt; more usually wrote *ARMONIAC*. See *ARMONIAC*.

AMMUNITION *, in general, signifies all sorts of warlike stores and provisions, more especially powder and ball.

* The word is formed of the Latin *amontio*, which, according to Du Cange, was used in the corrupt state of that language for *subsistence*.

AMMUNITION Bread, is what is provided for, and distributed daily to the soldiers of an army or garrison.

Such an officer has so many rations of *ammunition-bread*, &c.

AMNESTY *, or **AMNISTY**, a kind of general pardon, which a prince grants to his subjects, by a treaty, or edict; wherein he declares, that he forgets and annuls all that is past, and promises not to make any farther inquiry into the same.

* The word is Greek, *αμνηστια*, *amnestia*; which was the name of an ancient law of this kind, passed by Thra^symbalus upon the expulsion of the thirty tyrants out of Athens.—Andocides, an Athenian orator, whose life is written by Plutarch, and of whom we have an edition, of the year 1575; gives us, in his oration upon *mysteria*, a formula of the *amnestia*, and the oaths taken thereupon.

Amnestias are usually practised upon reconciliations of the sovereign with his people, after rebellions, general defections, &c.—Such, *e. gr.* was the act of oblivion granted at king Charles's restoration.

AMNIOS *, or **AMNION**, in anatomy, the innermost membrane, wherewith the fetus of the womb is immediately invested.

* The word seems to be derived from the Greek *αμωρ*, a lamb, *q. d. pellis ovina*, lambs-skin.

The *Amnios* is a white, soft, thin, transparent membrane; making part of the secundine, and lying under the chorion.

It contains a limpid liquor, like a thin jelly-broth; with which

which the stomach of the fetus being always found full, it is supposed to be the matter of its nourishment.

On its outside lies the allantois, or urinary membrane. In some subjects, the urinary membrane and chorion stick so close to one another, that they appear to be but one. The *Amnion* hath all its vessels from the same origin as the chorion.

AMOMUM, in the ancient botany, a small and rich aromatic fruit, growing in bunches like grapes, valued highly for its medicinal virtues.

The commentators on Pliny, and Dioscorides, have never been able to agree upon the ancient *amomum*; the generality of them pitch on fruits different from ours.—Some will have the rose of Jericho pass for it.—F. Camelli is positive he has discovered the real *amomum* of Dioscorides, and that it is the Tugus, or Birao, or Caropi, growing in the Philippine islands; the grains or berries whereof, are worn by the natives about their necks; both on account of their agreeable odour, and of their supposed virtue in preserving from infection, curing the sting of the scolopendra, &c. *Phil. Transact.* N^o 248. Scaliger is confident, that the *amomum* of the ancients was not a fruit; but the wood it self, which bore some resemblance to a bunch of grapes, and was particularly used in embalming of bodies: and hence, says he, the term *mummy* was given to the bodies of Egyptians, embalmed with it.

The modern *amomum*, used in the shops, under the denomination of *amomum vulgare*, or *amomum officinarum*, appears to be the seed of the *sfon* or *sum* of the ancients, answering to what in English we call *bastard stone-parley*.

The true *amomum* of the ancients resembles the muscat grape; and grows like it, in clusters; it is about the bigness of a large chick-pea, round, membranous, and divided into three cells, which contain several brown, angular grains; of a very strong aromatic taste, and smell, and is of the cardamom kind.

This fruit is brought from the East-Indies; and makes part of the composition of venice-treacle.—It is of a hot, spicy taste, and smell. *Vid. Rauwolf. Trav.* p. 85.

Besides this, there is likewise another paler seed, which bears the name *amomum*; but neither this nor the former are in much use in physic.

AMORTIZATION*, or **AMORTISEMENT**, in law, the act of turning lands into mortmain, i. e. of alienating or transferring them to some corporation, guild, or fraternity, and their successors.

* The word is formed of the French *amortir*, to extinguish, put out, &c. See **EXTINGUISHMENT**.

The term is also used for the licence or privilege which the king or superior lord grants, to enable such corporation, &c. thus to receive lands in mortmain: which otherwise they cannot do.—There is always supposed to be some fine, or acknowledgement paid the king, or the lord, in consideration hereof; to make them satisfaction for several incidental dues and profits, which would have fallen to them in the common way; which are hereby cut off.

This practice was borrowed from the ancient *Lex Papiria*, whereby it was forbidden to consecrate any land to religious uses, without the consent of the people.

AMOVING, the act of removing or expelling another from his place, office or the like.—We have a statute for *amoving* papists out of London and Westminster, and ten miles round the same. *1 W. and M. c. 9.*

AMOVING a guardian, amovendo custode. See **CUSTODE**.

AMPELITES, cannel coal, in natural history, a black, bituminous substance that dissolves in oil; used to blacken the eye-brows, and the hair withal: called also *pharmacitis*. See **SUPPLEMENT**, article **AMPELITES**.

AMPHIARTHROSIS*, in anatomy, a neutral or dubious kind of articulation; distinguished from the diarthrosis, in that it has no conspicuous motion; and from the synarthrosis, in its not being without sensible motion.

* The word is derived from *αμφι*, both, and *arthrosis*, articulation; the *amphiarthrosis* being compounded of both the other parts.—Whence some also call it *diarthrosi-synarthroidalis*.

Of this kind is the articulation of the ribs, with the vertebrae; and that of the carpus with the metacarpus, &c.

AMPHIBIOUS*, in natural history, a term applied to a sort of animals which live both on land and in the water; that is, which breathe the air, but pass part of their time in the water, as affording them their chief food.

* The word comes from the Greek *αμφι*, utrimque, both ways, and *βίωσις*, vita, life; as living in either place.

Such are the frog, castor, otter, tortoise, sea-calf, crocodile, &c.—Most of the *amphibious* kind, the castor and otter excepted, have peculiar provisions in their structure, to fit them for so various a way of living; particularly in the heart, lungs, foramen ovale, &c.

The term **AMPHIBIOUS**, is sometimes also extended to men, who have the faculty of living a long time under water.

We have divers instances of such *amphibious* men; the most remarkable is of a Sicilian, named the *ssa-cola*. Kircher relates, that by a long habitude from his youth, he had so accustomed himself to live in water, that his nature seemed to

be quite altered: so that he lived rather after the manner of a fish, than a man. The pearl fishers also arrive at a surprising art of this kind. See **PEARL-FISHING**.

AMPHIBIOUS Plants. See the article **PLANTS**.

AMPHIBLESTROIDES*, in anatomy, a tunic, or coat of the eye, more usually called *retina*.

* The word is Greek, *αμφιβλεστροειδης*, compounded of *αμφιβλεστρος*, *rete*, net, and *ειδης*, form; by reason of its net-like texture: whence the Latins also call it *retiformis*.

AMPHIBOLOGY*, or **AMPHIBOLIA**, in grammar, a fault in language, whereby it is rendered obscure, and liable to be understood in a double sense. See **AMBIGUOUS**.

* The word comes from the Greek, *αμφιβολω*, ambiguous, and *λογος*, discourse.

Amphibology is chiefly used in respect of a phrase; as equivocal is in respect of a word.

Of this kind was that answer which Pyrrhus received from the oracle; *Αίο Τε, Ηακίδα, Romanos vincere posse*: where the *amphibology* consists in this, that the words *Τε* and *Romanos*, may either of them precede, or either of them follow the words *posse vincere*, indifferently. See **ORACLE**.

The English language usually speaks in a more natural manner, and is not capable of any *amphibologies* of this kind: nor is it so liable to *amphibologies* in the articles as the French and most other modern tongues.

AMPHIBRACHYS*, the name of a foot in the Latin and Greek poetry; consisting of three syllables, the first and last whereof are short, and that in the middle long.

* The word comes from *αμφι*, circum, and *βραχυς*, brevis, q. d. a foot short at both ends, and long in the middle.—Among the ancients it is also called *janicus*, and *solitius*. *Diom.* iii. p. 473.

Such are the words *αναρε, αβιρε, πατερνα, ομαρε, &c.*

AMPHICTYONS, **AMPHICTYONES**, in antiquity, the deputies of the cities and people of Greece, who represented their respective nations in a general assembly; having a full power to concert, resolve, and appoint what they should think fit, for the service of the common cause.

The *Amphictyones*, in good measure, were the same with the states general of the United Provinces; or rather, with what in Germany they call the diet of the empire.

The first assembly of this kind was held by the direction of *Amphyktion*, the third king of Athens, who proposed by that means to bind the Greeks more firmly together; so as to render them a terror to the barbarous nations their neighbours.—These met twice a year at Thermopylae, in the temple of Ceres, which was built in a large plain, near the river Asopus; and were called *Amphyktionians* from the name of the founder.

Pausanias, in his list of the ten nations which composed that assembly, mentions only the Ionians, Dolopians, Thebans, Aenianians, Magnesian, Melians, Phthians; Dorians, Phocians, and Locrians. He says nothing of the Achaeans, Eleans, Argians, Messenians, &c. Alcibiades also gives an account of the cities admitted into it, in his oration, *De falsa Legatione*.

Acrisius afterwards instituted a new council of *Amphictyones*, on the model of the ancient ones; who met twice a year in the temple of Delphos.—Each kind were indifferently called *αμφικτυονες*, *Πυλαγοροι*, *ἱεροσυνηται*, and their assembly *Πυλααι*. The Romans never thought fit to suppress the meeting of the *Amphictyons*.—Strabo even assures us, that they assembled in his time.

AMPHIDROMIA, in antiquity, a feast celebrated the fifth day after the birth of a child.

AMPHIMACER*, a foot in the ancient poetry, consisting of three syllables; the first and last whereof are long, and that in the middle short. See **FOOT**, &c.

* The word comes from the Greek *αμφι*, circum, and *μακρος*, longus, by reason both extremes are long.

Such are the words *ομνιων, καστιας, ηραμιατων, &c.*—This foot is also called *eraticus*, and sometimes *sejennius*. *Diom.* iii. p. 475. *Quintil.* l. 9. c. 4.

AMPHIPOLES, in antiquity, archons, or chief magistrates of the city of Syracuse. See **ARCHON**.

They were first established by Imoleon, after his expulsion of Dionysius the tyrant.—They governed Syracuse for the space of three hundred years; and Diodorus Siculus assures us, they subsisted even in his time.

AMPHIPROSTYLE*, in the ancient architecture, a kind of temple, which had four columns in front, and as many behind.

* The word is derived from the Greek *αμφι*, about, *προ*, before, and *στυλος*, column.

AMPHISCII*, in geography and astronomy, the people who inhabit the torrid zone.

* The word comes from *αμφι*, about, and *σκια*, shadow.

They are thus denominated, as having their shadow turned sometimes one way and sometimes another, i. e. at one time of the year to the north, and at another to the south. See **SHADOW**.

The *amphitelli* are called also *ascii*. See ASCII.
AMPHISMILA*, or **AMPHISMELA**, an anatomical knife, edged on both sides.

* The word is formed from *αμφι*, *utrimque*, on both sides, and *σπίλον*, knife.

AMPHITHEATRE*, a spacious building, of an oval figure, having its area or arena incompassed with several rows of seats, rising gradually one over another; with portico's both within and without side.

* The word is derived from the Greek *αμφι*, about; and *θεατρον*, theatre; which comes from *θεατρον*, *specio*, contemplor; so that an *amphitheatre*, strictly speaking, is a place whence a person may see all around him.

Among the ancients, the *amphitheatre* was appointed for the exhibiting of spectacles or shews to the people: as, the combats of gladiators, and those of wild beasts.

Their theatre was built in form of a semicircle, only exceeding a just semicircle by one fourth part of the diameter; and the *amphitheatre* was nothing else but a double theatre, or two theatres joined together: so that the longest diameter of the *amphitheatre* was to the shortest, as 1½ to 1. See THEATRE.

There are *amphitheatres* still standing at Rome, at Pola (1), at Nîmes, &c.—The *amphitheatre* of Vespasian, called the Coliseum, and that at Verona in Italy, are the most celebrated now remaining of all antiquity (2). See COLISEUM.—Remains of *amphitheatres* are shewn also at Arles, Bourdeaux, &c.

(1) The *amphitheatre* at Pola, an ancient republic of Istria, is very entire, it consists of two orders of Tuscan pillars, one over the other.—The lower have pedestals, which is extraordinary; this order having scarce ever more than bases to support them. *Vernus*, in *Key's Travels*, t. 2. p. 355.

(2) The *amphitheatre* of Titus is computed to have been capable of holding 85,000 spectators.—That of Verona is the best preserved; for, though most of the great and best stones of the outside are picked out; yet the great vault, on which the rows of the seats are laid, is entire: the rows also (which are 44 in number) are entire. Every row is a foot and a half high, and as much in breadth; so that a man sits conveniently in them: and allowing, for a seat, a foot and a half, the whole will hold 23,000 persons.

Pliny mentions an *amphitheatre* built by Curio, which turned on large iron pivots; so that of the same *amphitheatre* two several theatres were occasionally made, whercon different entertainments were sometimes presented at the same time.

AMPHORA, in antiquity, an earthen vessel, which served as a kind of liquid measure, among the ancient Greeks and Romans*

* It is called in Homer *Αμφιφορευς*, and by syncope *Αμφορευς*; on account of its two anse or handles for carriage.—It is the same with the *quadrantal*.

The *amphora* was the twentieth part of the culeus, and contained forty-eight sextaries; amounting to about seven gallons one pint English wine-measure. *Arbuth.* Suetonius tells us of a man who stood for the questorship, and who drank an *amphora* of wine at one meal, with the emperor Tiberius.

AMPHORA was sometimes also used as a dry measure, containing three bushels; the standard whereof was kept at Rome in the capitol, to prevent false measures.

AMPHORA is also used to denote the largest liquid measure in use among the Venetians. The *amphora* contains four bigots, seventy-six mullachi, or two boats or muids.

AMPLIFICATION, in rhetoric, part of a discourse or speech, wherein a crime is aggravated, a praise or commendation heightened, or a narration enlarged by an enumeration of circumstances; so as to excite the proper emotions in the souls of the auditors.

Such is that passage in Virgil, where, instead of saying merely that Turnus died, he *amplifies* his death.

—*At illi solentur frigore membra,
 Vitaque cum gemitu fugit indignata sub umbras.*

Amplification, according to Cicero, is a vehement argumentation; a forcible affirmation, that persuades by moving the passions.

Some authors define *amplification*, after Isocrates, to be a discourse which makes great things of little; or which raises and exaggerates little things so as to make them appear great.—But, in this sense, *amplification* should rather become a sophist or juggler, than an orator.

The masters of eloquence make *amplification* to be the soul of discourse.—Longinus speaks of it as one of the principal means which contribute to the sublime; but he censures those who define it a discourse which magnifies things; this equally agreeing to the sublime, the pathetic, &c.—The same author distinguishes *amplification* from the sublime by this, that the latter consists wholly in the elevation of words and sentiments, whereas the former consists also in their multitude: the sublime is sometimes found in a single thought; but *amplification* cannot subsist, excepting in abundance.

There is likewise a difference between the *amplification*, and the proof; in that the one serves to clear the point, and the other to heighten, and exaggerate it.

There are two general kinds of *amplification*; the one of things, the other of words.—The first is produced in divers manners; as, 1^o, By a multitude of definitions: thus it is Cicero *amplifies* on history: *Historia est testis temporum, lux veritatis, vita memoria, magistra vita, nuntia vetustatis.*—2^o, By a multitude of adjuncts; of which we have a fine instance in Virgil's lamentation for Cæsar's death, by enumerating the many prodigies and monsters that either preceded or succeeded it.—*Fox quoque per lucos vulgo exaudita flentes, ingens & simulacra motis pallentia miris visa sub obscurum noctis; pœdusque locuta, insaudium, sstunt amnes, terræque debiscunt, & mœstum illicbrymat templis ebur, æraque judant.*—3^o, By a detail of causes and effects.—4^o, By an enumeration of consequences.—5^o, By comparisons, similitudes, and examples. See COMPARISON, &c.—6^o, By the contrast of antithets, and by rational inference.

Amplification by words is effected six ways.—1^o, By using metaphors.—2^o, By hyperboles.—3^o, By synonyms.—4^o, By splendid and magnificent terms; as that of Horace; *scandit aratas vitigla naues, cura nec turmas equitum relinquit, ocyor cervis, & agente nimbos, ocyor curva.*—5^o, By periphrases, or circumlocutions.—6^o, By repetition.—To which may be added, by gradation.

AMPLITUDE of the range of a projectile, denotes the horizontal line subsending the path in which it moved: See PROJECTILE.

AMPLITUDE, in astronomy, an arch of the horizon, intercepted between the true east or west point thereof, and the centre of the sun, or a star at its rising or setting.

Amplitude is of two kinds; eastern, or ortive; and western, or occiduous.

Eastern, or rising AMPLITUDE, *amplitudo ortiva*, is the distance between the point wherein the star rises, and the true point of east, wherein the equator and horizon intersect.

Western, or setting AMPLITUDE, *amplitudo occidua*, is the distance between the point wherein the star sets, and the true point of west in the equinoctial.

The eastern and western *amplitude* are also called *northern* and *southern*, as they fall in the northern or southern quarters of the horizon.

The complement of the eastern or western *amplitude* to a quadrant, is called the *azimuth*.

To find the sun's or a star's *amplitude*, either rising or setting, by the globe. See GLOBE.

To find the sun's *amplitude*, trigonometrically; having the latitude, and the sun's declination given.—Say, As the cosine of the latitude is to radius, so is the sine of the present declination to the sine of the *amplitude*.—Suppose, *s. gr.* the latitude 15° 30', and the common 11° 50';

Sine comp.	74,30	57310
Sine of declin.	11,50	9,31184
		9,88494

amplitude required 50° 7'.

Magnetical AMPLITUDE is an arch of the horizon, contained between the sun, at its rising, and the east or west point of the compass; or, it is the difference of the rising or setting of the sun, from the east or west points of the compass.

It is found by observing the sun, at its rising or setting, by an azimuth compass. If the compass has no variation, the *magnetical amplitude* would be the same as the true one.

AMPUTATION, in chirurgery, the operation of cutting off a limb, or other part of the body, with an instrument of steel.

In cases of mortification, recourse is frequently had to *amputation*.

The usual method of performing it, in the instance of a leg, is as follows.—The proper part for the operation being four or five inches below the knee; the skin and flesh are first to be drawn very tight upwards, and secured from returning by a ligature two or three fingers broad: above this ligature another loose one is passed, for the gripe; which, being twisted by means of a stick, may be strained to any degree at pleasure.

Then, the patient being conveniently situated, and the operator placed to the inside of the limb; which is to be held by one assistant above, and another below the part designed for the operation; and the gripe being sufficiently twisted, to prevent too large an hæmorrhage, the flesh is, with a stroke or two, to be separated from the bone with the dismembering-knife. Then the periosteum being also divided from the bone with the back of the knife, saw the bone afunder with as few strokes as possible.—When two parallel bones are concerned, the flesh that grows between them must likewise be separated before the use of the saw.

This being done, the gripe may be slacken'd; to give an opportunity for searching for the large blood-vessels, and securing the hæmorrhage at their mouths, either by the actual cautery, the ligature, stitching them up, applying virriol buttons, or the like. After this a dry pledget of lint, or one dipped in spirit of wine, and sprinkled with diaspente, may

be applied to the stump. Then loosen the first ligature, and pull both the skin and flesh, as far as conveniently may be, over the stump, to cover it; and secure them with the cross-sitch, made at the depth of half, or three quarters of an inch in the skin.

It remains, to apply over the whole stump two large pledgets, dipped in oxyerate and dried, and afterwards charged with astringents; and over these to apply a plaster of the deminio, or simple diachylon; and over all these, an ox-bladder, wetted in oxyerate; and finally, over all, a cross-cloth pretty tight, secured with rollers.

After all this, the gripe may be slackened, so as to be made easy to the patient; or even entirely taken away, after he is put to bed; in which he must lie with the stump somewhat raised; and an assistant for twelve or fourteen hours keeping fast the dressing with his hand, to prevent any violent hæmorrhage.—In three or four days the dressing may be removed; and proper digestives, mixed with astringents, applied: having an actual cautery, or some powerful styptic, in readiness, in case of a violent hæmorrhage at the first opening. M. Sabourin, surgeon of Geneva, is recorded in the history of the royal academy of sciences, an. 1702, for an improvement in the method of amputation, proposed to that academy.—The whole secret consists in saving a piece of flesh and skin, a little lower than the place where the section is to be; wherewith the stump is to be afterwards covered.—The advantages hereof, are, that in less than two days time, this flesh unites with the extremes of the divided vessels, and so saves the necessity either of binding the ends of those vessels with thread, or of applying caustics or astringents; which are methods very dangerous, or at least very inconvenient. Add, that the bone thus covered up, does not exfoliate.

AMSDORFIANS, in church-history, a sect of Protestants, in the sixteenth century; so denominated from their leader *Amstorf*.

Saunders, *Her.* 186. represents them as maintaining, that good works were not only unprofitable, but even opposite and pernicious to salvation.—The *Amstorfians* were rigid confessionists.

AMULET*, **AMULETUM**, a kind of external medication, to be worn about the neck, or other part of the body; to prevent, or remove diseases.

* The word *amulet* is formed of the Latin *amuletum*, *amulmentum*; of *amuliri*, to remove, drive away.

Such are quills of quick-silver, or arsenic, which some hang on the neck, or wear under the shirt against the plague, and other contagious diseases; as also the blood stones worn by others against hæmorrhages; and that worn by the women of the East-Indies to bring the menses.

Amulets are also frequently no other than a sort of spells, or charms; consisting of quaint words and characters, supposed to have the virtue of warding off ill.—Pliny makes frequent mention of them.

The Greeks called these kind of remedies *φουλαδρια*, *phylacteries*; *αμυλητια*, *peripta*; *αμυλητια*, *παραμυλητια*, *σφραγισ*, and *εμυλητια*.—The Latins call them *amuleta*, *appenja*, *penacula*, &c.

The council of Laodicea forbids ecclesiastics to wear such *amulets* and *phylacteries*, on pain of degradation. St. Chrysostom and St. Jerom are likewise zealous against the same practice. *Hoc apud nos*, says this last father, *superstitiosa muliercule, in parvulis Evangelis & in crucis ligno & ipsiusmodi rebus quæ habent quidem zelum Dei sed non juxta scientiam, usque hodie fastitant*. See Kirch. *Oedip. Egypt.*

Amulets are now much fallen from the repute they were anciently in; yet the great Mr. Boyle alleges them as an instance of the ingress of external effluvia into the habit; in order to shew the great porosity of the human body.—He adds, that he is persuaded some of these external medicines do answer; for that he himself having once been subject to bleed at the nose, and reduced to use several remedies to check it, found the mors of a dead man's skull, though only applied so as to touch the skin till the mors was warm thereby, the most effectual of any.

A memorable thing of this kind was communicated to Zwelfer, by the chief physician to the states of Moravia, who having prepared some troches of toads after Helmont's manner, not only found that being worn as *amulets* they preserved him and his domestics and friends from the plague; but being put on the plague-forges of others, they were greatly relieved, and even saved thereby.

The same Mr. Boyle shews how the effluvia even of cold *amulets*, may in tract of time pervade the pores of a living animal; by supposing an agreement between the pores of the skin, and the figure of the corpuscles. Bellini has demonstrated the possibility of the thing in his last propositions, *de Febribus*: and the like is done by Dr. Wainwright. Dr. Keil, &c.

AMULET, in cookery. See the article **OMELET**.

AMURCA, in pharmacy, a medicine made of the refuse or recement of expressed olives.—It is an astringent. See **OLIVE**.

AMY*, in law, the person next of kin to an orphan, or infant; who is to be intrusted for him: properly called *prochein amy*. See **PROCHEIN**, &c.

* The word is French, and literally signifies *Friend*.

AMYGDALÆ. See the article **ALMOND**.

AMYGDALATE, an artificial milk, or emulsion, made of blanched almonds, &c.

AMYLUM. See the article **STARCH**.

AMYNTICA emplastra, in pharmacy, defensive, or strengthening plasters.

ANA, *an*, in medicine, denotes an equal quantity of any things, whether in liquid or dry measure.

Hence *anatica proportio* is used by some writers to signify the *ratio*, or *proportion of equality*.

ANA, in matters of literature, a Latin termination, adopted into the titles of several books in other languages.—*Ana's* or *books in ana*, are collections of the memorable sayings of persons of learning, and wit; much the same with what we otherwise call *table-talk*.

Wolffius has given the history of books in *ana*, in the preface to the *Casauboniana*: he there observes, that though such titles be new, the thing it self is very old; that Xenophon's books of the deeds and sayings of Socrates, as well as the dialogues of Plato, are *Socratiana*: that the apothegms of the philosophers, collected by Diogenes Laertius; the sentences of Pythagoras, and those of Epictetus; the works of Athenæus, Stobæus, and divers others, are so many *ana's*. Even the *Gemara* of the Jews, with several other oriental writings, according to Wolffius, properly belong to the same class. To this head of *ana* may likewise be referred the *Orphica*, the *Pythagoræa*, *Æsopica*, *Pyrrhonica*, &c.

The *Scaligerana* was the first piece that appeared with a title in *ana*. It was composed by Jan de Vassan, a young Champans, recommended to Jos. Scaliger by Casaubon. Being much with Scaliger, who was daily visited by the men of learning at Leyden, de Vassan wrote down whatever things of any moment he heard Scaliger say.—And thus arose the *Scaligerana*, which was not printed till many years after at Geneva in 1666. *Patin, Lett.* 431.—Soon after came the *Perroniana*, *Thunana*, *Naudæana*, *Patavinana*, *Soveriana*, *Leinagiana*, *Anti-menagiana*, *Furteriana*, *Chevræana*, *Leibnitiana*, &c. to *Arlequiniana*.

ANABAPTISTON. See the article **ABAPTISTON**.

ANABAPTISTS*, a religious sect, whose distinguishing tenet is, that children are not to be baptized, till they arrive at years of discretion; as holding it requisite, that they give a reason of their faith, before they can receive a regular baptism.

* The word is compounded of *ana*, *denu*, again; and *βαπτίζω*, *I baptize*; or *βαπτιζω*, *I wash*; it being their practice to re-baptize such as had been baptized in their infancy.

There were *Anabaptists* even in the primitive church; that is, there were heretics who baptized a second time: such were the Novatians, Cataphrygians, and Donatists.

There were also in the third century several catholic bishops in Asia and Africa, who held the baptism of heretics invalid; and therefore re-baptized such as were converted to orthodoxy.—But these ancient re-baptists were not called *Anabaptists*.

In the twelfth century, the Waldenses, Albigenses, and Petrobrussians, are also recorded as of the same belief; but neither was this denomination given them.

Those properly called *Anabaptists*, are a sect of Protestants, who first appeared in the sixteenth century, in some provinces of Germany, particularly in Westphalia, where they committed several outrages.—They taught, that baptism was not to be conferred on children; that it is unlawful to swear, or to bear arms; that a true christian cannot be a magistrate, &c.

It is not known who was the author of this sect: some charge it on Carlostad; others on Zuinglius. Cochläus says it was Balthazar Pacimontanus, who began to teach in 1527; and was burnt, at Vienna some time afterwards.—Mezorius affirms it was first broached by Pelargus, in 1522; who was seconded by Stubner, Bodenstein, Carlostadius, Westenberg, Quiccou, Didymus, More, &c.

But the common opinion fathers it on Thomas Munster, or rather Munzer, of Zwickau, a city of Misnia; and Nich. Storck or Pelargus, of Stalberg in Saxony; two persons originally disciples of Luther, from whom they took occasion to separate, on pretence that his doctrine was not perfect enough; that he had only carried the reformation half-way; and that, to arrive at the true essential religion of Christ, immediate revelation must be added to the dead letter of scripture: *ex revelationibus divinis judicandum esse dicebat*, & *ex bibliis*, *Munerus*.—In effect, if these two persons were not the first inventors of the doctrine; they appear, at least, to have been the first teachers, and propagators thereof.

Sleidan furnishes the best account of the origin of the *Anabaptists*, in his *Historical Commentaries*.—Luther, he observes, had preached up so strenuously for the evangelical liberty, that the peasants of Suabia flocking together, leagued themselves

against the ecclesiastical powers, on pretence of defending the evangelical doctrine, and shaking off the yoke of servitude: *obduti causa quasi & evangelii doctrinam tueri, & servitutum ab se profugare vellent.* Luther wrote them several exhortations to lay down their arms, but in vain: they retorted his own doctrine upon him: maintaining, that having been made free by the blood of Jesus Christ, it was injurious to the name of Christian, that they had hitherto been reputed servants: *quod hoc signis sint habiti velut conditione servi.* Accordingly they proclaimed every where, that they only took up arms, by reason they esteemed themselves obliged thereto by the commandment of God.

Luther finding all his exhortations ineffectual, published a book, wherein he invited all the world to take up arms against those fanatics, who thus abused the word of God.—He was obliged to write a second, soon after, to justify his conduct; which to many appeared too severe, and even cruel.

The *Anabaptists*, however, to the number of forty thousand, ravaged all the places wherever they came. John of Leyden, who headed them, declared himself their king; and never stirred out or appeared in public, without a large retinue of principal officers: two young men always rode immediately after him, the one bearing in his hand a crown, and the other a naked sword.—Their pretence was to establish the new reign of Jesus Christ on earth, by force of arms; condemning all use of arms for other purposes.

Calvin wrote a treatise against the *Anabaptists*, still extant in his *Opuscula*.—What they chiefly supposed their great doctrine on, was those words of our Saviour, *He that believes and is baptized, shall be saved*, Mark c. xvi. v. 16. As none but adults are capable of believing, they argued, that no others were capable of baptism: especially as there is no passage in all the New Testament, where the baptism of infants is clearly enjoined. Calvin and other writers against them are pretty much embarrassed to answer this argument; and are obliged to have recourse to tradition, and the practice of the primitive church. In this point they have apparently the advantage over them; mention being made of infant-baptism by Origen; the author of the questions attributed to Justin; a council held in Africa, spoke of by St. Cyprian, where the baptism of infants, immediately after they were born, was expressly enjoined; and several other councils, of Autun, of Mafon, of Giron, of London, of Vienna, &c. besides other fathers, as Irenæus, Jerom, Ambrose, Augustin, &c.

It must be added, that very considerable arguments may be drawn against the *Anabaptists* even from scripture: children, we are told, are capable of the kingdom of heaven; Mark x. 14; Luke xviii. 16. and our Saviour made such be brought near him, and blessed them. Yet, he assures us in St. John iii. 5. that unless a man be baptized he cannot enter the kingdom of God. Whence it follows, that children, inasmuch as they are capable of entering into heaven, are also capable of being baptized.—The *Anabaptists* answer, that those here spoken of by our Saviour were grown big, since they could come to him; and consequently were capable of an act of faith; but this is contrary to the express terms of scripture, which in St. Matthew and St. Mark, calls them *paidia*; and in St. Luke, *βηβη*, little children: The same St. Luke writes, that they were brought to Jesus; which is a presumption that they were not yet able to walk.

Another argument much insisted on is drawn from those words of St. Paul to the Romans, c. V. v. 17. “If by one man’s offence death reigned; much more they who receive abundance of grace and of the gift of righteousness, shall reign in life by one, Jesus Christ.” For, if all become criminal by one; then are children criminal: consequently, if all are justified by one, then are children justified: but this cannot be without faith; and consequently children may have the faith required for the receiving of baptism, i. e. an actual faith, preceding the sacrament, as a disposition requisite thereto. This faith they have, not of themselves, but by others, viz. their parents, or their god-fathers or godmothers, who answer for them. Nor is there any thing in the whole dispensation, but what is very equitable: it being but just, that as they had sinned in the will of another, they might also be justified by the will of another.

The *Anabaptists* adopted several other dogmata from the Quakers, &c. touching the incarnation, &c. But those who now retain the name have abandoned the greatest part thereof; and, in lieu of the fanatic zeal of the ancient founders of the sect, have given into an exemplary simplicity in their actions, discipline, dress, &c. not much unlike the modern Quakers.

As they multiplied, they divided into a great number of sects; which took particular denominations, either from the leaders thereof or the peculiar opinions which they superadded to the general system of *Anabaptism*.—The principal were the Muncerians, Catharists, Enthusiasts, Silents, Adamites, Georgians, Independants, Huttes, Melchiorites, Nullipedians, Mennonites, Bulchodians, Augustinians, Servetians, Monasterians, Libertins, Deceiticians, Sempromites, Po-

lygamites, Ambrosians, Clancularians, Manifestarians, Babelarians, Pacificators, Pastoricides, Sanguinarij, &c.

ANABASIS*, in antiquity, the couriers who travelled on horseback, or in chariots, for the greater expedition. See **COURIER** and **POST**.

* The word comes from Greek *αναβασις*, *adventus*, mounting.

ANABASIS*, *Αναβασις*, is a Greek word, signifying ascention.

ANABASIS, in medicine, the state of a disease in its growth.

* *Αναβασις* is derived from *αναβαινω*, to ascend.

ANABIBAZON, in astronomy, the *Dragon’s Tail*; or the southern node of the moon, where she passes the ecliptic from north to south latitude.

ANABROSIS*, in medicine, otherwise called *diabrosis*, the issuing of blood at a hole worn in a vein by corrosion.

* The word is Greek, *α.α.βροσις*, q. d. *επιβη*.

ANACALYPTERIA*, *Ανακαλυπτερια*, in antiquity, feasts celebrated among the heathens, on the day that the bride was permitted to lay aside her veil, and to be seen in public.

* They were thus called from the Greek, *ανακαλυπτειν*, to discover, uncover.

ANACAMPIC, signifies as much as *reflecting*; and is frequently used in reference to echoes, which are said to be sounds produced *anacampically*, or by reflection.

Hence also *anacampicis* is by some used for the science of reflected rays; otherwise called *catoptrics*.

ANACARDINA Confessio. See the article **CONFESSIO**.

ANACATHARTIC*, is usually understood of a vomit or a purging medicine, that works upwards.

* The word comes from *ανα*, *supra*, upwards; and *καθαίρω*, *purgo*, I purge.

ANACEPHALÆOSIS*, in rhetoric, a recapitulation; or a short and summary repetition of the heads of a discourse.

* The word comes from the Greek *ανα*, which in composition signifies *again*, and *κεφαλη*, *head*.

ANACHORET*, **ANACHORETA**, a hermit, or devout person, living alone in some desert; to be further out of the reach of the temptations of the world, and more at leisure for meditation.

* The word comes from the Greek *αναχωρησ*, I retire into a bye-place.

Such were St. Anthony, St. Hilariion, &c. Paul the hermit was the first of the tribe of *anachorets*.

Anachorets, popularly *anchorites*, are very numerous among the Greeks; consisting principally of monks, who not caring for the fatigues and offices of the monastery, purchase a little spot of ground, with a cell, whither they retreat, and never appear in the monastery again, excepting on solemn days. These are sometimes also called *ascetes*, and *solitaries*. See **ASCETIC**, &c.

The *anachorets* of Syria and Palestine retire into the most obscure and unfrequented places; hiding themselves under rocks and mountains, and living on the spontaneous productions of the earth.

There have also been *anachorets* in the west: Peter Damian, who was of the order of hermits, frequently speaks of them with great praise. He represents them as by far the most perfect sort of monks; holding them in much higher opinion and veneration than the Cœnobites, or monks residing in monasteries.

Many of these retire, with the leave of their abbots, and have an allowance from the monastery.—The people, in regard of their piety, present them with good sums of money, which they carefully hoard up, and at their death, bequeath it to the monastery they had belonged to.

ANACHRONISM*, in matters of chronology, an error in computation of time; whereby an event is placed earlier than it really happened.

* The word is compounded of the Greek *ανα* *sursum*, *supra*, *retrosum*, higher, backwards; and *χρονος*, *tempus*, time.

Such is that of Virgil, who placed Dido in Africa at the time of Æneas; though in reality, she did not come there till 200 years after the taking of Troy.—An error on the other side, whereby a fact is placed later and lower than it should be, is called a *parachronism*.

ANACLATICS, that part of optics which considers refracted light.

Anacletics are the same with what we more usually call *dioptrics*.

ANACLETERIA*, in antiquity, solemn feasts celebrated in honour of kings and princes, when they came of age, and took upon them the administration of their state, and made a solemn declaration thereof to the people.

* The word is formed of *ανα*, and *κατα*, *aves*, I call.

ANACREONTIC, in the Greek and Latin poetry, something invented by Anacreon; or in the manner and taste of Anacreon.

Anacreon, a poet of Teios, who lived upwards of 400 years before Christ, was famous for the delicacy of his wit; and

the exquisite, yet easy and natural, turn of his poetry.— We have several of his odes still extant; and few of the modern poets but have written *anacreontics* in imitation thereof. They are most of them composed in verses of seven syllables; or rather, of three feet and an half, spondees and iambus's, though sometimes anapaests.

Hence, verses in that measure are usually called *anacreontics*, or *anacreontic verses*.

ANADIPILOSIS, *Ἀναδιπίωσις*, denotes a repetition of the last word of the former verse or member in the beginning of the next: *e. gr.*

*Addit se faciam timidisque supervenit Ægle,
Ægle Naiadam pulcherrima—
—sequitur pulcherrimus after,
After equo fidens*

If children then heirs, heirs of God and joint heirs with Christ.

ANADIPILOSIS, in medicine, denotes the redoubling or return of the paroxysm of a fever, chiefly of a femittentian.

This is otherwise called *epanalepsis*, and *epanadipliosis*.

ANAGLYPHICE *, or **ANAGLYPTICE**, denotes that species of sculpture wherein the strokes or figures are prominent or embossed.

* The word comes from the Greek *αναγλυφω, exculpo*.

ANAGOGICAL *, *Transporting*, something that raises the mind to things eternal, and divine; the great objects of the next life.

* The word is derived from the Greek *αναγωγη, ravisio*: *carrying away, overturning*; which is formed of the preposition *ana, sursum*, upwards, and *αγωγη, leading*; of *αγω, duco*.

The term is principally used in speaking of the divers senses of scripture.—The literal sense is the first, and natural sense: the mystical sense is founded on the natural sense, from whence it is taken by analogy or comparison, by similitude or resemblance of one thing to another; and is divided into several kinds.

Where it regards the church, and matters of religion, it is called the *allegorical* sense.

Where it regards our morals, it is called the *tropological* sense.

And where it regards eternity, or the life to come, it is called the *anagogical* sense.

ANAGOGY, **ANAGOGE**, a rapture, or elevation of the soul, to things celestial, and eternal.

ANAGRAM *, **ANAGRAMMA**, a transposal of the letters of a name; with a combination thereof in some new manner, so as to exhibit one or more words, either to the advantage, or disadvantage of the person to whom it belongs.

* The word is formed from the Greek *ανα, backwards*, and *γραμμα, letter*.

Thus, the *anagram* of Galenus is *angelus*; that of Logica, *caligo*; that of Altitudo, *fidulitas*; that of Sir Edmund-Bury Godfrey, *I find murdered by rogues, or by Rome's rude finger die*; that of Loraine, is *alerion*; on which account it was, that the family of Loraine took alerions for their armoury.

—Calvin, in the title of his *Institutions*, printed at Strasburg in 1539, calls himself *Aleuinus*, which is the *anagram* of Calvinus, and the name of an eminently learned person in the time of Charlemain, who contributed greatly to the restoration of learning in that age. Barclay, in his *Argenis, anagrammatizes* Calvinus by a less credible name, *Ufualca*: and Rabelais, to be revenged of the same Calvin, who had made an *anagram* of his name, found in that of Calvin, *Jan. Cal.*

Such as keep close to the definition of *anagram*, take the liberty to omit or retain the letter H, and that letter only; but such as stand up for the poetical licence, make bold sometimes to use E for Æ, V for W, S for Z, and C for K; and *vice versa*.

This way of writing was scarce known among the ancients: Daurat, a French poet in the reign of Charles IX. is usually said to be the first that broached it: yet Lycophron, who wrote under Ptolemy Philadelphus, about 280 years before Christ, appears to have been no stranger to the art of making *anagrams*. Canterus, in his *Prolegomena* to Lycophron, gives us two of his pieces in this kind; the first on the name of king Ptolemy, *Πτολεμαϊος*, in which he found *απο μελιτος, of honey*; to insinuate the sweetness and mildness of that prince; the second was on queen Arsinoe, *Ἀρσινος*, of whom he made *ἰσ ἡσος, Juno's violet*.

The Cabalists among the Jews are professed *anagrammists*; the third part of their art, which they call *chemara*, *i. e.* changing, being nothing but the art of making *anagrams*, or of finding hidden and mystical meanings in names: which they do by changing, transposing, and differently combining the letters of those names.—Thus, of *יהוה* the letters of Noah's name, they make *יהוה grace*: and of *משיח* the *Messiah*, they make *יהוה shall rejoice*.

There are two manners of making *anagrams*; for, 1^o, some only consist in dividing a single word into several: Thus the anagram of the god Terminus, mentioned by Aulus Gellius, lib. XII. c. 6. is founded on the *anagram TER MINUS*: and thus Sufineamus yields *sus tinea rous*.—This kind alone seems to have been used among the Romans.

The second, is where the order and situation of the letters is changed: such are those above mentioned; and also these, *Roma, Maro, Amor; Julius, Livius; Corpus, Porcus, Proculus, Spurcus*.

To find all the *ANAGRAMS* any name will admit of algebraically, see the articles *CHANGES* and *COMBINATION*.

The finest and happiest of all the *anagrams* extant, is that on the question put by Pilate to Jesus Christ; *Quid est veritas?* which *anagrammatically* make, *Est vir qui adest*: the *anagram*, here, is the best, and justest answer that could possibly be given.

Besides the ancient kind of *anagram*, there have been new ones invented; as, the mathematical *anagram*, invented in 1680; by which the abbot Cateelan found, that the letters of the name of Lewis XIV. made *vrai herois*, *i. e.* true hero.

We are now likewise furnished with the numerical *anagram* more properly called *chronogram*; where the numeral letters (*i. e.* such as in the Roman ciphering stood for numbers) taken together, according to their numerical values, express some epocha: of which kind is that dithich of Godart on the birth of the late French king, in the year 1638, on a day wherein there was a conjunction of the eagle with the lion's heart:

*eXorlens DeLphIn agVILæ CordiſſiVe LeonIs
CongressV gELLas ſhe LatItlagVe refICt.*

ANALECTA *, a Greek term, used for a collection of small pieces or compositions.

* The word is formed of *αναλεγω, I gather*.

ANALEMMA *, a planisphere, or projection of the sphere, on the plane of the meridian, orthographically made, by straight lines and ellipses; the eye being supposed to be at an infinite distance, and in the east or west points of the horizon.

* The word is derived from the Greek *αναλεμμα* of *αναλαμβάνω, refumo, I take backwards*.

ANALEMMA, is also used for a gnomon, or astrolabe, consisting of the furniture of the same projection, drawn on a plate of brass, or wood; with an horizon, or cursor fitted to it.

Its use is for finding the time of the sun's rising and setting, the length of the longest day in any latitude, and the hour of the day.

The *analemma* is also of considerable use among diallists, for laying down the signs of the zodiac, with the length of days, and other matters of furniture, upon dials.

ANALEPTICS *, in medicine, restoratives; or remedies proper to restore the body, when wasted or emaciated, either by the continuance of a disease, or by the want of food.

* The word is Greek, *αναλεπτικός*, derived of *αναλαμβάνω, I re-establiſh, restore*.

ANALOGICAL Syllogism. See the article *SYLLOGISM*.

ANALOGY *, a certain relation, proportion, or agreement, which several things, in other respects different, bear to each other.—Such is that between the bull in the heavens, and the animal fo called on earth.

* The word is Greek, *αναλογία*, which the Latins usually render by *comparatio*, and *proportionalitas*.

Among geometricians, *analogy* is frequently used for a similitude of ratio's; called also *proportion*.

Reasonings by *analogy* may serve to explain and illustrate, but not to prove any thing; yet is a great deal of our philosophizing no better founded.

In matters of language, we say, new words are formed by *analogy*, *i. e.* new names are given to new things, conformably to the established names of other things of the like nature and kind.—The difficulties and obscurities in a language are chiefly to be cleared up by *analogy*.

The schoolmen define *analogy* to be a resemblance, joined with some diversity: its foundation, according to them, is hid in the proportion of several things, considered as that proportion proceeds upon different considerations.

Thus, a found animal, a found food, and a found proposition, agreeing in this, that they have a common denomination, but the reason or quality whereon the denomination is founded, different; are said to have an *analogy*, or to be *analogous*. Accordingly, *analogous* things are defined to be such as have a common name, but the thing immediately signified by that common name, different; yet with some correspondence or relation discernible therein.

Philosophers usually distinguish three kinds of *analogy, viz.*—of inequality, where the reason of the common denomination is the same in nature, but not in degree or order: in which sense, animal is *analogous* to man, and brute.—Of attribution; where though the reason of the common name be the same, there is a difference in its habitude or respect thereto: in which sense, healthy is *analogous* both to a man, and an exercise.—Of proportionality; where, though the reasons

of the common name do really differ, yet they bear some proportion to each other: in this sense, the gills of fishes are said to be *analogous* to the lungs in terrestrial animals: and thus, the eye and the understanding are said to bear an *analogy* to each other.

ANALOGISM, ANALOGISMUS, in logic, denotes an argument from the cause to the effect.

ANALYSIS*, in logic, a method of applying the rules of reasoning, to resolve a discourse into its principles; in order to a discovery of its truth, or falshood.—Or it is an examination of some discourse, proposition, or other matter, by searching into its principles, and separating and opening its parts; in order to consider them more distinctly, and arrive at a more precise knowledge of the whole.

* The word is Greek *αναλυσις*, which literally signifies, *resolution*; formed of *ανα*, and *λυω*, *λυω*, *λυω*, I loosen, I resolve.

Analysis makes one great branch, or species of method; called also *resolution*.

ANALYSIS, in mathematics, a method of solving, or resolving mathematical problems.

There are two general methods of finding truth in mathematics; *synthesis*, and *analysis*.—*Analysis* is the demonstration, or consideration of the consequences drawn from any proposition; in which a man proceeds till he comes to some known truth, by means whereof, he may be able to give a solution of the problem.

The method of *analysis* consists more in the judgment and readiness of apprehension, than in any particular rules, where pure geometry is made use of, as it was among the ancients; but at present algebra is principally used on this occasion, which furnishes certain rules to perform or arrive at the end proposed.

This method, under its present improvements, must be allowed the apex or height of all human learning; being the great instrument or means whereby so many surprizing discoveries have been of late years made, both in mathematics, and philosophy.—It furnishes the most perfect instances, and examples of the art of reasoning; gives the mind a surprizing readiness at deducing and discovering things unknown, from a few data; and, by using signs for ideas, presents things to the imagination, which otherwise seemed out of its sphere.—By this, geometrical demonstrations may be wonderfully abridged; and a long series of argumentations, wherein the mind cannot without the utmost effort and attention discover the connection of ideas, are hereby converted into sensible signs, and the several operations required therein, effected by the combination of those signs.—But what is yet more extraordinary, by means of this art, a number of truths are frequently expressed by a single line, which in the common way of explaining and demonstrating things, would fill whole volumes.—Thus, by mere contemplation of one single line, whole sciences may sometimes be learnt in a few minutes time; which otherwise could scarce be attained in many years.

ANALYSIS is divided, with regard to its object, into that of *finite*, and that of *infinite*.

Analysis of finite Quantities, is what we otherwise call *specious arithmetic*, or *algebra*. See *Specious ARITHMETIC*.

Analysis of Infinites, called also the *new ANALYSIS*, is particularly used for the *Method of Fluxions*, or the *Differential Calculus*. See *FLUXIONS*.

ANALYSIS, is also used in chymistry, for the decomposing of a mixt body; or the reduction thereof into its principles.

To *analyze* bodies, or resolve them into their component parts, is indeed the chief object of the art of chymistry.—The *analysis* of bodies is principally effected by means of fire.

All bodies, by a chymical *analysis*, resolve into water, earth, salt, sulphur, and mercury; though every body does not afford all these parts; but some more, some fewer of them, according to the kingdom they belong to.

The *analysis* of vegetables is easy; that of fossils, particularly of metals, and semi-metals, difficult.

The many *analyses* that have been made of plants by Bourdelin, and others, have generally proved useless with regard to any discoveries of the properties and virtues of the plants analyzed. The most salutary plants, in this way of treatment, yield much the same principles as the most poisonous. The reason apparently is, that the too great action of the fire in distillation changes the plants and their principles: on this account, instead of distillation, M. Boulduc has made his *analyses* by decoction only. *Vid. Mem. Acad. R. Scienc. an. 1734. p. 139. hist. 63.*

Some bodies of the fossil tribe consist of particles so very minute, and so firmly united, that the corpuscles thereof need less heat to carry them off, than to separate them into

their principles: so that the *analysis* is impracticable in such bodies.—Hence arises the difficulty of *analyzing* sulphur.

The anatomical dissection of an animal, is also a kind of *analysis*.

ANALYSIS is also used for a kind of syllabus, or table of the principal heads or articles of a continued discourse; disposed in their natural order and dependency.

Analyses are more scientific than alphabetical indexes; but they are less used, as being more intricate.

ANALYTIC, ANALYTICAL, something that belongs to, or partakes of the nature of, *analysis*.

Thus, we say, an *analytical* demonstration; *analytical* enquiry; *analytical* table, or scheme; *analytical* method, &c.

The *analytic* method stands opposed to the *synthetic*.—As 'in mathematics, says Sir I. Newton, so in natural philosophy, the investigation of difficult things by the *analytic* method ought to precede the method of composition. This 'analysis consists in making experiments, and observations, 'and in drawing general conclusions therefrom by induction; 'and admitting of no objections against the conclusions, but 'such as are drawn from experiments and other certain 'truths. And though the arguing from experiments and observations by induction be no demonstration of general 'conclusions, yet it is the best way of arguing which the 'nature of the things admits of; and may be esteemed so 'much the stronger, as the induction is more general. And 'if no exception occur from phenomena, the conclusion 'may be pronounced generally. By this way of *analysis*, we 'may proceed from compounds to their ingredients; from 'motions to the forces producing them; and, in general, 'from effects to their causes, and from particular causes to 'more general ones, till the argument end in the most general.—This is the *analytic* method.

'The *synthetic* consists in assuming the causes discovered 'and established as principles; and by them explaining the 'phenomena proceeding from them, and proving the explanations.' See *SYNTHESIS*.

ANALYTICS, ANALYTICA, the science or doctrine, and use of *analysis*.

The great advantage of the modern mathematics above the ancient is, in point of *analytics*.

The authors on the ancient *analytics* are enumerated by Pappus, in the preface to his seventh book of mathematical collections; being, Euclid, in his *Data*, and *Porismata*; Apollonius, de *Sectione Rationis*; Apollonius, in his *Conics*, *Inclinations*, and *Tactons*; Aristeus, de *Lociis solidis*; and Eratosthenes, de *metris Proportionalibus*. But the ancient *analytics* were very different from the modern.

To the modern *analytics*, principally, belong algebra; the history of which, with the several authors thereon, see under the article *ALGEBRA*.

The chief writers upon the *analysis* of infinites are, its inventor, Sir Isaac Newton, in his *Analysis per Quantitatum Series, Fluxiones & Differentias, cum enumeratione Linearum tertii ordinis*; and de *Quadratura Curvarum*; and M. Leibnitz, in *Act. Eruditor.* an. 1684: the Marquis de l'Hopital, in his *Analyse des infinites petites*, 1696: Carre in his *Methodes pour la mesure des Surfaces, la dimension des Solides, &c. par l'application du calcul integral*, 1700: G. Manfredi, in a posthumous piece, de *Constructione Equationum differentialium primi gradus*, 1707: Nic. Mercator, in *Logarithmotechnia*, 1668; Cheyne, in *Methodus Fluxionum inversa*, 1703; Craig, in *Methodus figurarum linearum rectis & curvis comprehensarum Quadraturas determinandi*, 1685; and de *Quadratura figurarum curvilinearum & locis*, &c. 1693: Dav. Gregory, in *Exercitatio Geometrica de dimensione figurarum*, 1684; and Nieuwentijt, in *Considerationes circa analyses ad quantitates infinitè parvas applicatas, principia*, 1695.—The sum of what is found in l'Hopital, Carre, Cheyne, Gregory, and Craig, is collected into one volume, and very well explained, by C. Hayes, under the title of, *A Treatise of Fluxions*, &c. 1704.—And the substance of most of the rest in Pere Reynau's *Analyse démontrée*, 2 vol. 4°. 1728.

ANALYTICS is also used by some for a part of logics, which teaches to decline and construe reason, as grammar does words. See *LOGIC*.

ANAMORPHOSIS*, in perspective and painting, a monstrous projection; or a representation of some image, either on a plane or curve surface, deformed; which at a certain distance shall appear regular, and in proportion.

* The word is Greek; compounded of *ανα*, and *μορφωσις*, *formatio*, of *μορφη*, *form*.

To make an *anamorphosis*, or monstrous projection on a plane,—Draw the square ABCD, (*Tab. Perspective, fig. 19. N.º. 1.*) of a bigness at pleasure, and subdivide it into a number of areolas, or lesser squares.—In this square, or recticle, called the *craticular prototype*, let the image to be distorted be drawn.—Then draw the line *a b* (*fig. 19. N.º. 2.*)=AB; and divide it into the same number of equal parts, as the side

side of the prototype AB; and in E, the middle thereof, erect the perpendicular EV, so much the longer; draw VS perpendicular to EV, so much the shorter, as the image is desired to be more distorted. From each point of division draw right lines to V, and join the points a and S, by the right line aS. Through the points defg draw lines parallel to ab; then will abcd be the space that the monstrous projection is to be delineated in; called the *craticular ectype*.

Lastly, in every areola, or small trapezium of the space abcd, draw what appears delineated in the correspondent areola of the square ABCD: by this means you will obtain a deformed image, which yet will appear in just proportion to an eye distant from it the length FV, and raised above the height VS.

It will be diverting to manage it so, that the deformed image do not represent a mere chaos; but some other image: thus, we have seen a river with soldiers, waggons, &c. marching along the side of it; so drawn, that when viewed by an eye in the point S, it appears to be the satirical face of a man.

An image also may be distorted mechanically, by perforating it here and there with a needle, and placing it against a candle or lamp; and observing where the rays which pass through these little holes fall on a plane or curve superficies; for they will give the correspondent points of the image deformed: by means whereof, the deformation may be completed.

To draw the Anamorphosis, or deformation of an image, upon the convex surface of a cone.—It is manifest from the former case, that all here required is, to make a craticular ectype on the superficies of the cone, which shall appear, to an eye duly placed over its vertex, equal to the craticular prototype.

Let the base ABCD, therefore, of the cone (fig. 20.) be divided by diameters into any number of equal parts, that is, the periphery thereof; and let some one radius be likewise divided into equal parts; and through each point of division draw concentric circles: thus will the craticular prototype be made.—With double the diameter AB, as a radius, describe the quadrant EFG, (fig. 21.) so as the arch EG be equal to the whole periphery: then this quadrant, folded duly up, will form the superficies of a cone, whose base is the circle ABCD.

—Divide the arch AB into the same number of equal parts as the craticular prototype is divided into, and draw radii from each of the points of division. Produce GF to I, so that FI=FG; and from the centre I, with the radius IF, draw the quadrant FKH; and from I to E draw the right line IE. Divide the arch KF into the same number of equal parts as the radius of the craticular prototype is divided into; and draw radii through each of the points of division, from the centre I meeting FF, in 1, 2, 3, &c. Lastly, from the centre F, with the radii, F 1, F 2, F 3, &c. describe the concentric arches.—Thus will the craticular ectype be formed, the areola whereof will appear equal to each other.

Hence, what is delineated in every areola of the craticular prototype, being transferred into the areola of the craticular ectype; the image will be distorted or deformed: yet an eye being duly raised over the vertex of the cone, will perceive it in just proportion.

If the chords of the quadrants be drawn in the craticular prototype, and chords of their fourth part in the craticular ectype, all things else remaining the same; you will have the craticular ectype in a quadrangular pyramid.

And hence it will be easy to deform any image, in any other pyramid, whose base is any regular polygon.

Because the eye will be more deceived, if from contiguous objects it cannot judge of the distance of the parts of the deformed image; therefore, these kinds of deformed images are to be viewed through a small hole.

ANANAS, in natural history, by some called *nanas*, by others *jayama*, and by us popularly the *pine-apple*, on account of the resemblance it bears to the cones of pines and firs; is a fine Indian fruit, which grows on an herbaceous plant with leaves like those of the aloe.

The fruit is adorned on the top with a little crown. The pulp is fibrous, but dissolves in the mouth; having the delicious taste of the peach, the quince, and the muscadine grape, all together.

—F. du Tertre describes three kinds of *ananas*: Boerhaave enumerates six. They make a wine from the juice, which is almost equal to Malmsey sack, and will intoxicate as soon. It is good to strengthen the heart and nerves, against nausea, to refresh the spirits, and it excites urine powerfully; but is apt to occasion abortion in women.—They sometimes make a confection of the *ananas* on the spot, which they bring hither whole; and which is found of good service to restore a decayed or aged constitution.

The *ananas*, or West-India pine-apple, is generally allowed, both for its rich and delicious flavour, and its beautiful colour, to be the king of fruits.—Great endeavours have of late been used to cultivate the plant in Europe; in which they have succeeded, and there are now produced delicious fruits of this kind, in several gardens in England. See SUPPLEMENT, article ANANAS.

ANAPÆST*, **ANAPÆSTUS**, a foot in the Greek and La-

tin poetry, consisting of two short, and one long syllable. See FOOT.

* The word is derived from *αναπισ*, *contra feris*, because in dancing this measure, the ground was struck in a contrary order from what it was in the dactyl. Whence also the Greeks called it *αντακροσος*. *Diom. lib. p. 474.*

Such are the words *Legent*, *Sapient*, *Κενη*. *Anapestic verses*, i. e. verses wholly composed of such feet, were much in vogue among the ancients.

ANAPHORA*, in rhetoric, a figure whereby one or more words are repeated in the beginning of several sentences or verses.

* The word is Greek, *αναφορα*, signifying *relation*, or *repetition*.

Such, e. gr. is this of the psalmist: The voice of the lord is powerful: the voice of the lord is full of majesty: the voice of the lord shaketh the wilderness.

ANAPLEROTICS*, in medicine, such remedies as incarnate, and fill up ulcers and wounds with new flesh.

* The word comes from the Greek *αναπληρωσις*, *I fill up*. *Anaplerotics* are the same with what we otherwise call *incarnatives*. See INCARNATIVE.

ANARCHY*, the want of government in a nation, where no supreme authority is lodged, either in the prince or other rulers; but the people live at large, and all things are in confusion.

* The word is derived from the Greek privative *α*, and *αρχη*, *command*, *principality*.

ANASARCA *Ανασαρξια*, in medicine, a sort of universal dropsy, wherein the whole substance of the body is stuffed or bloated with pituitous humours.

The *anasarca* is the same with what is otherwise called *leucoplegmatia*.—It is considered by some as a very great degree of a cachexia.

In an *anasarca*, the legs swell at the beginning, especially towards night, and then pit remarkably: the urine is pale, the appetite decays; at length the swelling rises higher, and appears in the thighs, belly, breast, and arms. The face becomes pale and cadaverous; the flesh soft and lax; and a difficulty in respiration comes on, attended with a slow fever. See SUPPLEMENT, article ANASARCA.

ANASTOMASIS*, or **ANASTOMOSIS**, in anatomy, is sometimes used to express such aperture of the mouths of the vessels as lets out their contents.

* The word is formed of the Greek *ανα*, *per*, through, and *στομα*, *or*, mouth.

ANASTOMASIS is more frequently used to denote the opening of two vessels into one another; or the union and juncture of the mouths of two vessels, whereby they come to communicate with one another.

There are various *anastomases* of this kind, e. gr. of an artery with an artery, a vein with a vein, and of a vein with an artery. See ARTERY, and VEIN.

The circulation of the blood in the fetus is effected by means of the *anastomases*, or inoculations of the vena cava with the pulmonary vein; and of the pulmonary artery with the aorta.

The circulation is also performed in adults by the *anastomases*, or continuations of the capillary arteries with the veins.

After the circulation of the blood through the heart, lungs, and large blood-vessels, was demonstrated by Harvey, it was only guessed how the extremities of the arteries transmitted the blood to the veins; till Leewenhock's microscopes had discovered the continuations of the extremities of those vessels, in fishes, frogs, &c.—However, there were not wanting those who doubted of the like continuations of the extremities of the arteries and veins in human bodies, and quadrupeds; since those animals it had hitherto been chiefly seen in satisfactorily, were either such fish, or amphibious kinds, as have but one ventricle in their hearts, and whose blood is actually cold; beside that in them it does not circulate with such rapidity, as in animals whose hearts have two ventricles.

This difference in the principal organs of circulation moved Mr. Cowper to make experiments on animals whose organs differ only from the human in their gross figure, and not in their intimate structure.—The result was a plain discovery of the like inoculations of the arteries and veins, in the omentum of a cat.

George Frederic Francus, of Frankenzau, a physician of Copenhagen, published, in the year 1705, a learned and copious work, intitled, *Anastomasis Retecla*.

ANASTOMATICS*, or **ANASTOMATIC** medicines, are such as have the faculty of opening and dilating the cavities of the vessels; and by that means of making the blood circulate the more freely.

* The word comes from the Greek *αναστομα*, *I open*, *unstop*. **ANATHEMA***, in an ecclesiastical sense, denotes an excommunication, attended with execrations and curses. See EXCOMMUNICATION.

* In this sense the word is usually written in Greek, *Αναθημα*; to distinguish it from an offering to the gods, called *Αναθημα*: though it is certain several of the Greek fathers do not observe this distinction, but use *Αναθημα* indifferently for either.

There are two kinds of *anathemas*; the one *judiciary*, the other *abjuratory*.

The former can only be pronounced by a council, a pope, bishop, or other qualified person; and differs from a simple excommunication in this, that an excommunication only prohibits the criminal from entering within the church, or from holding communion with the faithful; whereas an *anathema* cuts him off from the body, the society, and even the commerce of the faithful, and delivers him over to the devil.

The latter kind of *anathema* usually makes a part of the ceremony of abjuration; the convert being obliged to *anathematize* the heresy he abjures. See **ABJURATION**.

The critics and commentators are divided about the manner wherein St. Paul wishes to be *anathema* for his brethren, Romans, chap. ix. 3. Some render it by *accursed for*, others by *separated from*, &c.

ANATOCISM*, **ANATOCISMUS**, an usurious contract, wherein the interests arising from the principal sum are added to the principal it self, and interest exacted upon the whole.

* The word is originally Greek, but is used by Cicero in Latin; whence it is deduced into most other languages. It comes from the preposition *ana*, which in composition signifies *repetition* or *duplication*, and *tocos*, *usury*.

Anatocism is what we properly call *interest upon interest*, or *compound interest*.

This is the worst kind of usury, and has been severely condemned by the Roman law, as well as by the common laws of most other countries.

ANATOMICAL Injections. } See { **INJECTION.**
ANATOMICAL Repository. } **REPOSITORY.**
ANATOMICAL Theatre. } **THEATRE.**

ANATOMY*, the art of dissecting, or artificially taking to pieces, the solid parts of animal bodies; in order to an exact discovery of their structure and economy.

* The word is Greek, *anatomein*, q. d. *section*, or *cutting*; formed of *ana* *topos*, *dissec*, *I cut asunder*.

Anatomy makes a great branch of that division of medicine called *physiology*.

It is sometimes divided, with regard to its end, into *speculative* and *practical*; a division of very little use and moment.—It is also divided, with regard to its subject, into *human* and *comparative*.

Comparative ANATOMY, is that which considers brutes, and other animals, and even vegetables; chiefly with a view to illustrate the human structure.

Human, which is absolutely and properly denominated **ANATOMY**, is that employed on the human body; by some called also *anthropology*.

The subject of *anatomy*, viz. the body, is variously divided into parts, *organical*, and *inorganical*; *similar*, and *dissimilar*; *spermatie*, &c.

Its more obvious division is into *solids* and *fluids*, or into the containing and contained parts.

Under the solids come the bones, muscles, nerves, arteries, veins, cartilages, ligaments, membranes, &c.—Under the fluids, come chyle, blood, milk, fat, lymph, &c. See each under its proper article.

The ancient writers of *anatomy*, Hippocrates, Democritus, Aristotle, Galen, and others, looked upon this as the most important part of physic, and that, without which the uses of the part of an human fabric, and consequently the causes of diseases incident thereto, could no way be discovered. And yet this art, useful as it is, was entirely discontinued for several ages; till in the sixteenth century it began to flourish afresh.—The dissection of an human body was looked upon as sacrilege before that time; and we have seen a consultation which the emperor Charles V. appointed to be held by the divines of Salamanca, in order to be satisfied, whether or no it were lawful, in point of conscience, to dissect a dead carcase?—We may add, that to this day the use of anatomy and skeletons is forbid in Muscovy; the first as inhuman, the latter as subservient to witchcraft: and Olearius assures us, that one Quirin, a German chirurgeon, being found there with a skeleton, hardly escaped with life; and the skeleton, after being solemnly dragged about the streets, was burnt in form. *Boyle's Usefulness of Philosophy*.

Vesalius, a Flemish physician, who died in 1564, was the first who set *anatomy* on any tolerable footing. He was seconded by Carpus, Sylvius, Fernelius, Fallopius, Eustathius, Fabricius, Pareus, Bauhinus, Hoffman, Riolanus, &c.

These were succeeded by others, to whom some of the finest discoveries in *anatomy* are owing.—Asellius, in the year 1622, discovered the lacteal veins; and in 1628, the immortal Harvey published his admirable discovery of the circulation of the blood.—Pecquet discovered the reservoir of the chyle, and the thoracic duct, in 1651.—Rudbecks, a Swede, and Bartholine, a Dane, found out the lymphatic vessels, in 1650, and 1651. Wharton, in 1655, disco-

vered the lower salival ducts; and Steno the upper salival ducts, those of the palate, the nostrils, and eyes, in 1661. Wirtfungus, in 1642, discovered the pancreatic duct.

—Willis, who came after him, published an *anatomy* of the brain, and nerves, in a manner much more exact than had been done before him; yet he had omitted some considerable things, which were afterwards observed by Vicquens.—In effect, Glisson treated particularly of the liver; Wharton of the glands; Havers of the bones; Graaf of the pancreatic juice, and the parts of generation; Lower of the motion of the heart; Thurston of respiration; Peyer, of the glands of the intestines; Brown, of the muscles; and Drelincourt, of the conception of the ova in women, the placenta, and the membranes of the fetus.

Malpighi, who died in 1694, is one of those to whom *anatomy* owes the most: he made a great number of discoveries in the lungs, brain, liver, spleen, glands, and lymphatics, by help of the microscope, &c. Nor must it be omitted that Kuyfch, who died in 1727, has let great light into many of the finer and more intricate parts of the human frame, particularly the glands; by means of his injections.

Magnet, and Le Clerc, two physicians of Geneva, have given us a *Bibliotheca Anatomica*; containing all the new discoveries that have been made in this art.—The best systems of the art, as it now stands, are those of Verheyen, Drake, Keil, Heister, Winslow, Albinus, &c.

ANATOMY is sometimes used to denote the subject to be anatomized. Thus (by 39 H. VIII. cap. 22.) the company of barbers and surgeons may have and take yearly four persons condemned, adjudged, and put to death for felony, for *anatomies*; and to make incision of the same dead bodies.

ANATOMY is also used for an artificial representation of the structure and parts of the human body in metal, plaster, wax, or the like.—In this sense we say, the wax-work *anatomy*: R. Dickenson, statuary, finished a human *anatomy* in plaster of Paris, representing a man standing upright, with his skin flea'd off.

ANATOMY of Plants. See **PLANT**.

ANATRON, or **NATRON**, a kind of native salt-petre, or nitre found in Egypt.

ANATRON, is also used for the salt, and scum of the composition of glass, when in fusion.

When pounded, it yields a kind of powder; which being dissolved in the air, or in a proper liquor, becomes common salt, after coagulation.

ANATRON is likewise the name of a nitrous juice, which condenses in vaults, arches, and other subterraneous places.

ANATRON is also used by some writers for a compound salt, made of quicklime, alum, vitriol, common salt, and nitre; used as a flux to promote the fusion and purification of metals.

ANBURY, or **AMBURY**, a kind of wen, or spongy wart, growing upon any part of a horse, or cow, and being full of blood.

ANCESTORS*, *progenitors*; or those from whom a person is descended.

* The word is derived from the Latin *ancestor*, wrote, by contraction, for *antecessor*, q. d. *goer before*.

The law distinguishes between *ancestor*, and predecessor; the former being applied to a natural person, as such an one, and his *ancestor*; and the latter to a body politic or corporate, as a bishop, and his predecessors.

Disability by the act of ANCESTOR. See **DISABILITY**.

ANCESTREL, in law, something relating to a man's ancestors.—Thus,

Homage ANCESTREL, signifies homage that hath been done or performed by one's ancestors.

Action ANCESTREL. See **ACTION**.

ANCHILOPS, in medicine, denotes an abscess, or collection of matter between the great angle of the eye, and the nose.

The same abscess when broken is no longer denominated *anchilops*, but *egilops*. See **ÆGLOPS**.

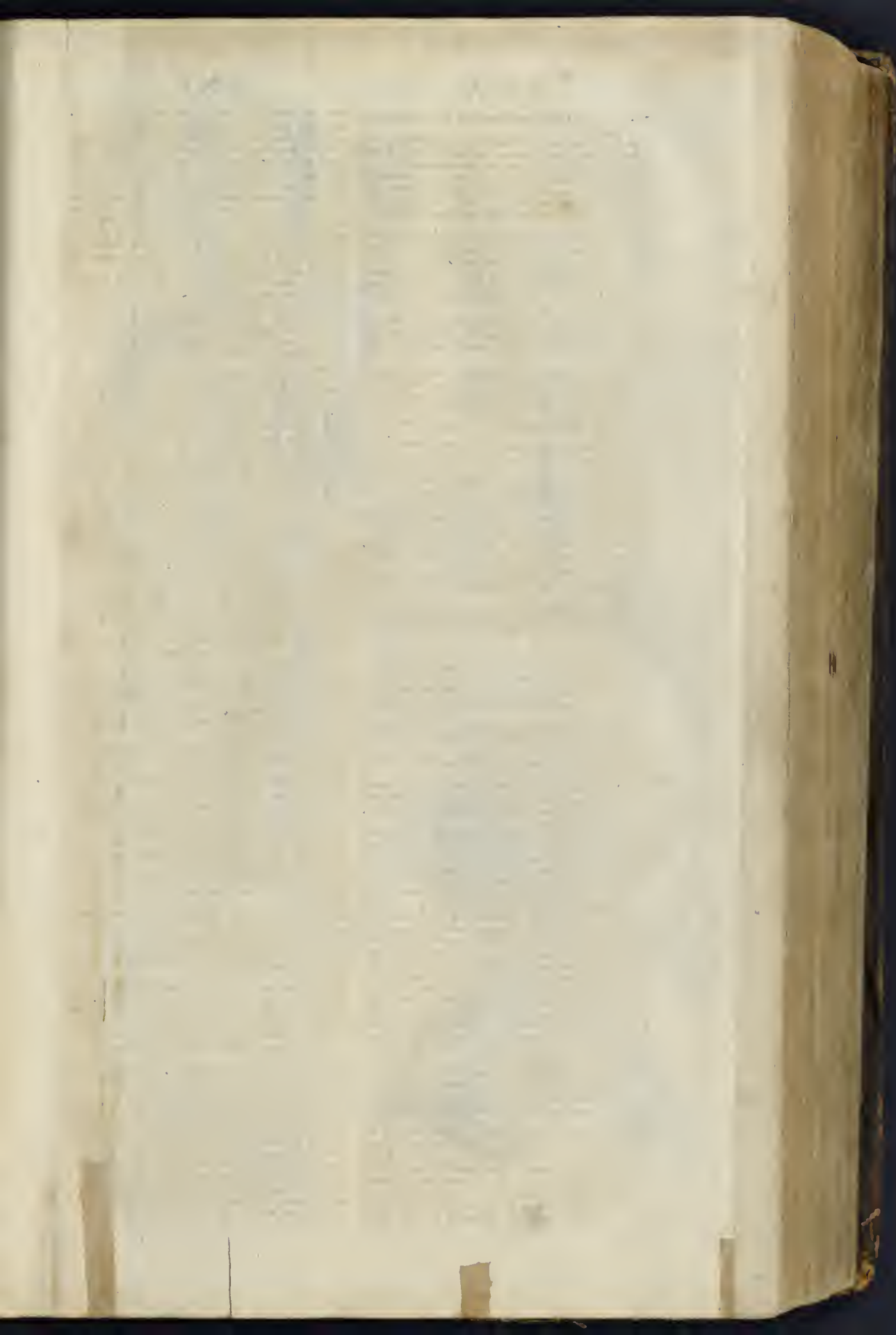
ANCHOR*, **ANCHORA**, an instrument used at sea, and in rivers, to retain and fasten a vessel by.

* The word comes from the Latin *ancora*, or *anchora*, of the Greek *αγκυρα* which comes from *αγκυρα*, *incurva*, crooked.

An *anchor* is a large, strong piece of iron, crooked at one end, and formed into two bars, resembling a double hook; and fastened at the other end by a cable.

The goodness of the *anchor* is a point of great importance; the safety and conservation of the vessel depending principally thereon.—Great care is to be taken, that the metal it is made of be neither too soft nor too brittle; the latter rendering it liable to break, and the former to strain.

Travellers tell us of people in the Indies who make use of wooden *anchors* in their navigation.—The inhabitants of the island of Ceylon, in lieu of *anchors*, use huge round stones; and, in other places, their *anchors* are a kind of machines of wood, laden with stones.



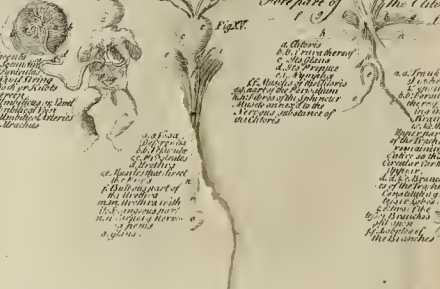
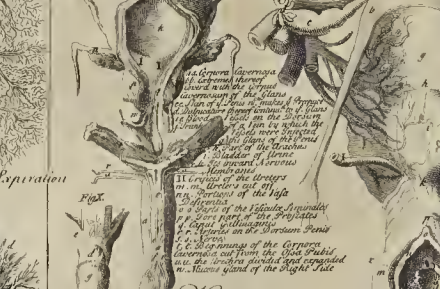
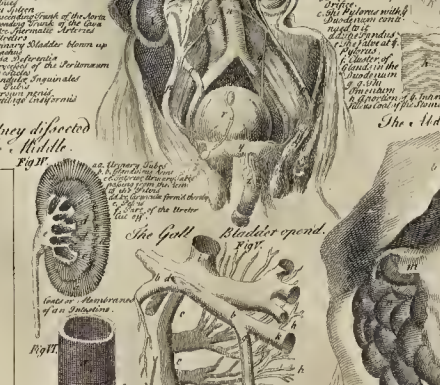
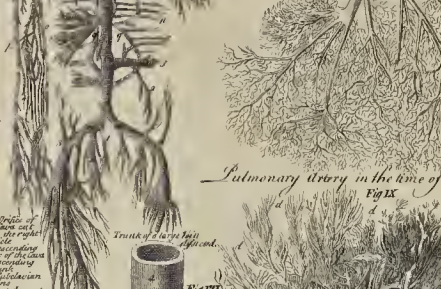
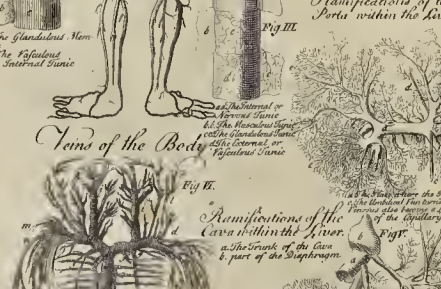
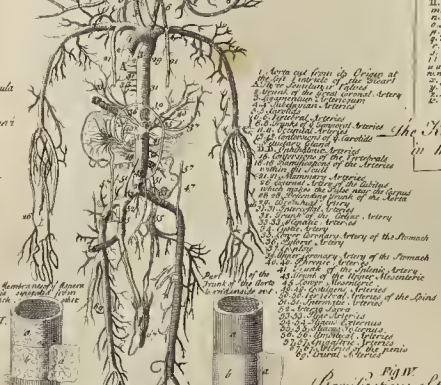
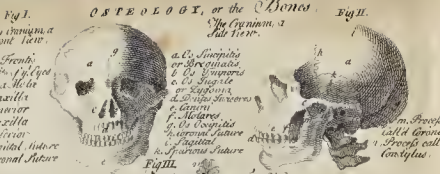


Fig. 13. A diagram of the teeth, showing the upper and lower arches.

Fig. 14. A diagram of the teeth, showing the upper and lower arches.

Fig. 15. A diagram of the teeth, showing the upper and lower arches.

OSTEOLOGY, or the Bones

ANGIOLOGY, or the Vessels

SPLANXNOLOGY, or the Viscera

Fig. 1. A front view of a human skull with anatomical labels. Fig. 2. A side view of a human skull with anatomical labels.

Fig. 1. A diagram of the arterial system of the body, showing the heart and major arteries.

Fig. 1. A diagram of the abdominal cavity, showing the stomach, liver, and other organs.

Fig. 3. A front view of a human skeleton with anatomical labels. Fig. 4. A side view of a human skeleton with anatomical labels.

Fig. 2. A diagram of the venous system of the body, showing the heart and major veins.

Fig. 2. A diagram of the abdominal cavity, showing the stomach, liver, and other organs.

Fig. 5. A front view of a human skeleton with anatomical labels. Fig. 6. A side view of a human skeleton with anatomical labels.

Fig. 3. A diagram of the lymphatic system of the body, showing the lymph nodes and vessels.

Fig. 3. A diagram of the abdominal cavity, showing the stomach, liver, and other organs.

Fig. 7. A front view of a human skeleton with anatomical labels. Fig. 8. A side view of a human skeleton with anatomical labels.

Fig. 4. A diagram of the nervous system of the body, showing the brain, spinal cord, and nerves.

Fig. 4. A diagram of the abdominal cavity, showing the stomach, liver, and other organs.

Fig. 9. A front view of a human skeleton with anatomical labels. Fig. 10. A side view of a human skeleton with anatomical labels.

Fig. 5. A diagram of the respiratory system of the body, showing the lungs and airways.

Fig. 5. A diagram of the abdominal cavity, showing the stomach, liver, and other organs.

Fig. 11. A front view of a human skeleton with anatomical labels. Fig. 12. A side view of a human skeleton with anatomical labels.

Fig. 6. A diagram of the digestive system of the body, showing the stomach, intestines, and other organs.

Fig. 6. A diagram of the abdominal cavity, showing the stomach, liver, and other organs.

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The parts of an *anchor*, are 1^o, The *ring*, into which the cable is fastened: 2^o, The *beam*, or *shank*, which is the longest part of the *anchor*: 3^o, The *arm*, which is that which runs down into the ground: at the end of which is, 4^o, The *fluke*, or *flukes*, by some called the *palm*; being that broad and picked part, with its barbs, like an arrow-head, which fastens into the ground: 5^o, The *stock*, a piece of wood fastened to the beam, near the ring, serving to guide the fluke, so that it may fall right, and fix in the ground. There are three kinds of *anchors* commonly used: the *kedger*, the *grapnel*, and the *stream-anchor*. See *STREAM-ANCHOR*, and *KEDGING*.

Aubin in his dictionary of sea-affairs, printed at Amsterdam in 1702, observes, that the *anchor* of a large heavy vessel is smaller, in proportion, than that of a lesser and lighter one. The reason he gives, is, that though the sea employs an equal force against a small vessel as against a great one, supporting the extent of wood upon which the water acts to be equal in both; yet the little vessel, by reason of its superior lightness, does not make so much resistance as the greater; the defect whereof must be supplied by the weight of the *anchor*. But the validity of this reason we will not be answerable for.

Weighing ANCHOR. See the article *WEIGHING*.

ANCHOR, in architecture and sculpture, denotes an ornament in form of an *anchor*, or arrow's-head; frequently carved on the echinus, or quarter-round, in the Tuscan, Doric, and Ionic capitals, as well as in the bed-moulding of the Doric, Ionic, and Corinthian corniches.—See *Tab. Archit. fig. 10*.

The *anchors* are usually intermixed with representations of eggs; whence the echinus itself is popularly called *eggs and anchors*. See *ECHINUS*, and *QUARTER-ROUND*.

ANCHOR, a measure. See *ANKER*.

ANCHORAGE, ground fit to hold a ship's *anchor*, so that the may ride safely.

The best ground for a ship to anchor in is stiff clay, or hard sand; and the best riding at anchor is when a ship is land-locked, and out of the tide.

ANCHORAGE, in law, denotes a duty taken of ships for the pool of the haven, where they cast anchor.

The ground in all ports and havens being the king's, no man can let an anchor fall in any port, without paying for it to the king's officer appointed by patent.

ANCHORED, or *ANKERD*, or in heraldry.—A cross *anchored*, or *ancree*, is a form of cross, so called, because the four extremities resemble the flouke of an anchor.

This cross is so like the cross moline, that the resemblance has occasioned many mistakes in heraldry. See *CROSS*.

*ANCHOVY**, in matters of commerce, &c. a little fish, much used by way of sauce, or seasoning.

* The word is derived from the Spanish *anchova*, or rather from the Italian, *anchio*, which signifies the same.

Scaliger describes the *anchovy* as of the herring kind, about the length of a finger, having a pointed snout, a wide mouth, and no teeth, but gums as rough as a saw.—Others make it a sort of sardine, or pilchard: but others, with better reason, hold it a peculiar species, very different from either.

The *anchovy* is caught in the months of May, June, and July, on the coasts of Catalonia, Provence, &c. at which season, it constantly repairs up the straits of Gibraltar, into the Mediterranean. Collins says, they are also found in plenty on the western coasts of England and Wales. *Coll. Salt. and Fish. p. 101*.

The fishing for them is chiefly in the night-time; when a light being put out on the stern of their little fishing-vessels, the *anchovies* flock round, and are caught in the nets.

When the fishery is over, they cut off the heads, take out their gall and guts; and then lay them in barrels and salt them.

—The common way of eating *anchovies* is with oil, vinegar, &c. in order to which they are first boned, and the tails, fins, &c. slipped off.—Being put on the fire, they dissolve in almost any liquor. Or they are made into sauce by mincing them with pepper, &c. *V. Hought. Collect. N^o 550. t. 2. p. 309*.

ANCHYLOPS, in medicine. See *ANCHILOPS*.

*ANCIENT**, or *ANTIEN*, in its usual sense, denotes a thing, which existed in times long ago.

* The word comes from the French *ancien*, of the Italian *anciano*, and that of the Latin *antiquus*, which denotes the same.

In which sense *ancient* stands opposed to *modern*. See *MODERN*. *Ancient* differs from *antique* as the genus from its species. See *ANTIQUÉ*.

We say *ancient* nations, *ancient* architecture, sculpture, philosophy, &c. *ancient* manners, ceremonies, poets, physicians, and the like.

ANCIENT Academy. See the article *ACADEMY*.

ANCIENT Astronomy. See the article *ASTRONOMY*.

ANCIENT Character. See the article *HEBREW*.

ANCIENT Coins. See the article *COINS*.

ANCIENT Comedy. See the article *COMEDY*.

ANCIENT Hours. See the article *HOURS*.

ANCIENT Medals, &c. See the article *MEDALS*, &c.

ANCIENT Money. See the article *MONEY*.

ANCIENT Roman Year. See the article *YEAR*.

ANCIENT Tenure.—Barons by *ancient* tenure. See *BARON*.

ANCIENT Weights. See the article *WEIGHT*.

ANCIENT is sometimes also opposed to *young*, or *new*.—The French say, the *ancient* bishop of such a city, when he has resigned his see, and a new one is put in his place: the *ancient* bishop of Frejus, now cardinal de Fleury.

ANCIENTS in church-discipline. See the article *ELDERS*.

ANCIENTS, in Inns of court, imports a distinction of a certain degree. Thus,—The society of Gray's-inn consists of benchers, *ancients*, barristers, and students under the bar: Here the *ancients* are the elder barristers.

In the Inns of chancery there are only *ancients*, and students or clerks; and among the *ancients*, one is yearly the principal, or treasurer.—In the Middle-temple, *ancients* are such as have gone through, or are past their reading.

ANCIENT is sometimes also used in a military sense, for the colours, or an ensign.

ANCIENT, in the naval armament, is the flag, or streamer, borne in the stern of a ship.

ANCIENT Demesne, or *Denain*, in law, is a tenure, whereby all manors belonging to the crown in William the conqueror's and St. Edward's time, were held. See *TENURE*.

The numbers, names, &c. heretofore were entered by the conqueror, in a book called *domesday-book*, yet remaining in the exchequer; so that such lands as by that book appeared to have belonged to the crown at that time are called *ancient demesne*. See *DOMESDAY*.

The tenants in *ancient demesne* are of two sorts; one who hold their lands frankly by charter; the other by copy of court-roll, or by the verge, at the will of the lord, according to the custom of the manor.

The advantages of this tenure are, 1. That tenants holding by charter cannot be rightfully impleaded out of their manor; and, when they are, they may abate the writ, by pleading the tenure. 2. They are free from toll for all things relating to their livelihood, and husbandry; nor can be impanelled on any inquest.

These tenants held originally by plowing the king's land, plashing his hedges, and the like services, for the maintenance of his household; and it was on this account that such liberties were given them, for which they may have writs of montra-verunt to such as take the duties of toll, &c.

No lands are to be accounted *ancient demesne*, but such as are held in focage.

ANCIENTY, in some ancient statutes, is used for elderhip or seniority.

The eldest sister can demand no more than, her other sisters, beside the chief mesne by reason of her *ancienty*.

ANCON, *ἄγκων*, in anatomy, denotes the curvature or flexure of the arm whereon we rest in leaning.

This is otherwise called *olecranon*. See *OLECRANON*.

ANCON, in architecture, is used to denote the corners or quoins of walls, cross beams, or rafters.

ANCONÆUS Musculus, in anatomy, the sixth muscle of the elbow; so called, as being situate behind the folds of the *ancon*, or elbow.—See *Tab. Anat. (Myol.) fig. 7. n. 46*.

It arises from the back part of the extremities of the humerus, passes over the elbow, and is inserted into the lateral and internal part of the cubitus about three or four fingers breadth above the olecranon.—Its use is to assist in extending the arm.

ANCONY, in the iron mines, a bloom wrought into the figure of a flat iron bar, about three foot long, with two square rough knobs, one at each end. See *IRON*.

ANCREE, in heraldry, the same with *anchored*. See *ANCHORED*.

*ANCYLE**, in antiquity, denotes a small kind of brazen shield, said to have fallen from heaven into the hands of Numa Pompilius, at the same time that a voice was heard, that Rome should be mistress of the world, while the preserved that shield.

* Authors are divided as to the orthography and origin of the word: Camerarius and Muretus will have it Greek, and suppose it formed from *ἀγκύλη*, crooked: agreeably to this system, they write *ancyle*, and *ancylia*, with a y. It is certain we find *ἀγκύλη* in Plutarch; and Juba in his history will absolutely have the word to be of Greek extraction: but this orthography seems overturned both by medals and manuscripts, where the word is written *ANCILIA*, Varro derives the name *ancilla*, *ab ancisu*, and supposes this denomination given to a kind of shields, because cut in, or indented on both sides, after the manner of the Thracian *pelta*. Plutarch himself gives this figure to the *ancilla*, but he differs from Varro, in this, that he pretends the *pelta* were not in this shape, but quite round, and without indenting. Ovid seems also to say, that the *ancile* was round, and that it came hence to be denominated *ancile*, *g. d. ancilum*, of *an*, and *caelo*, cut equally round. Other etymons are also mentioned by Plutarch; one from *ἀγκων*, elbow, by reason the *ancile* was borne on the elbow.

Though there was but one *ancyle* that fell from heaven; yet were there twelve preveſed: Numa, by the advice, as it is ſaid, of the nymph Egeria, having ordered eleven others, perfectly like the firſt, to be made by Veturius Mamurius; that if any ſhould attempt to ſteal it, as Ulyſſes did the Palladium, they might not be able to diſtinguiſh the true *ancyle* from the falſe ones.

Theſe *ancylæ* were preſerved in the temple of Mars; and were committed to the care of twelve prieſts or *Salii*, inſtituted for that purpoſe.

They were carried every year, in the month of March, in proceſſion all around Rome; and the thirtieth day of that month they were again depoſited in their place.

ANCYLÆ, is alſo uſed in anatomy, for the contraction of the ham.

ANCYLOBLEPHARON, *Inveſatio*, or *Adglutinatio Palpebrarum*, a diſeaſe wherein the eye-lids are ſtuck faſt, or glued together.—The cure, is by manual operation. *V. Bibl. Anat. Med. T. 2. p. 278.*

ANCYLOGLOSSUS, *Αγκυλογλωσσος*, one that is tongued, or has an impediment in his ſpeech, ariſing from a contraction of the franium of the tongue.

ANCYLOSIS, a diſeaſe in the junctures of a human body; where the nervous liquor that ſhould lubricate the bones, and make their motions eaſy, growing too thick, clogs up, and as it were cements the bones, and contracts the joint.

* The word is derived from the Greek *αγκυλωσις*, which comes from *αγκυλη*, a hardneſs, or contraction of a joint.

ANCYROIDES, *Αγκυροειδης*, is uſed by ſome writers in anatomy for the proceſs or ſhooting forth of the ſhoulder-bone, in form of a beak; or otherwiſe called *coracoides*.

ANDABATÆ, in antiquity, a kind of gladiators, who fought hand-wiſked; having on a ſort of helmet that covered the eyes, and even the face. See GLADIATOR.

They were called, *andabate*, *quaſi ανδρατα*, *aſenſores*, becauſe they fought mounted on horſeback, or out of chariots.

ANDREW.—Knights of St. Andrew, or the thistle. See THISTLE.

ANDREW'S CROSS, is a badge wore in the hat, by the people of Scotland, on the day of the feaſt of that ſaint.

It conſiſts of blue and white ribbands, diſpoſed into a croſs, or ſtilt; and is intended as a commemoration of the crucifixion of St. Andrew, the tutelary ſaint of Scotland.

ANDROGYNUS*, or ANDROGYNOUS, an hermaphrodite, or one born with two ſexes, being male and female in the ſame perſon. See HERMAPHRODITE.

* The word comes from the Greek *ανδρῆγενος*, a compound of *ανης*, man, and *γενος*, woman, *g. d.* man-woman.

Many of the rabbins are of opinion, that Adam was created *androgynous*; that he was male on one ſide, and female on the other; and that he had even two bodies, the one of a man, and the other of a woman: ſo that God to create Eve, only ſeparated thoſe two from each other. *V. Manſſ. Ben-Israël, Maimonid. &c. ſp. Heidegg. Hiſt. Patriarch. tom. 1. p. 128.*

Plato tells us, that in the beginning certain people were born double, and with both ſexes; but that this duplicity of members giving them too much ſtrength and vigour, they became inſolent, and even declared war againſt the gods.—Upon which, Jupiter, to tame their pride, ſplit each of them into two; but ſo as that each moiety ſtill retained a ſtrong paſſion to be reunited: and hence that philoſopher derives the natural love between the two ſexes. *Conviv. p. 1185. ed. 1602.*

The aſtrologers alſo give the appellation *androgynous* to ſuch of the planets as are ſometimes hot, and ſometimes cold; as mercury, which is reputed hot and dry when near the ſun, and cold and moiſt when near the moon.

ANDROIDES*, an automaton, in the figure of a man; which, by virtue of certain ſprings, &c. duly contrived, walks, ſpeaks, and performs other external functions of a man. See AUTOMATON.

* The word is compounded of the Greek *ανης*, *ανδρεος*, man, and *ειδος*, form.

Albertus Magnus is recorded as having made a famous *androides*. ANDROLEPSY*, ANDROLEPSIA, in antiquity.—If an Athenian were killed by a citizen of ſome other place; and ſuch city reſuſed to deliver up the criminal to puniſhment; it was held lawful to take three inhabitants of that city, and puniſh the homicide in them.—This the Greeks, called *androlepsia*, and the Romans *clavigatio*. See CLAVIGATIO.

* The word is formed of *ανης*, man, and *λεψαιω*, *capio*, I take.

Some authors alſo uſe *androlepsia* for reprimals. See REPRIZAL.

ANDROMACHI Theriaca, or Treacle of ANDROMACHUS, in pharmacy, is a capital alexipharmic compoſition; called alſo *Venice Treacle*. See THERIACA.

ANDROTOMY, or ANDRATOMY, the anatomy or diſſection of human bodies. See DISSECTION.

It is thus called in oppoſition to *zootomy*, which is uſed to denote that of brutes.

Anatomy is the genus, and comprehends all diſſections in general, whether of men, beaſts, or plants; and *androtomy* and *zootomy* are the ſpecies. See ANATOMY.

ANECDOTES*, ANECDOTA, a term uſed by ſome authors, for the titles of *Secret Hiſtories*; that is, of ſuch as relate the ſecret affairs and tranſactions of princes; ſpeaking with too much freedom, or too much ſincerity, of the manners and conduct of perſons in authority, to allow of being made public.

* The word is Greek, *ανεκδοτα*, *g. d.* things not yet known, or hitherto kept ſecret.

Procopius gives this title to a book which he publiſhed againſt Juſtinian and his wife Theodora; and he ſeems to be the only perſon among the ancients, who has repreſented princes ſuch as they are in their domeſtic relation.—Varillas has publiſhed *anecdotes* of the houſe of Medicis.

ANECDOTES is alſo an appellation given to ſuch works of the ancients as have not yet been publiſhed.

In which ſenſe, M. Muratori gives the name *Anecdota Græca* to ſeveral writings of the Greek fathers, found in the libraries, and firſt publiſhed by him.—F. Martene has given a *Theſaurus Anecdotarum Novus*, in folio, 5 vol.

ANELE, or ANIL, the ſame with *indigo*. 23 El. c. 9.

ANEMIUS* *Furnus*, among chemiſts, a wind-furnace; uſed to make fierce fires for melting, &c.

* The word is formed of the Greek *ανημος*, wind.

ANEMOMETER*, a machine wherewith to meaſure the ſtrength of the wind.

* The word is compounded of the Greek *ανημος*, wind, and *μετρος*, meaſure.

The *anemometer* is variously contrived. In the Philoſophical Tranſactions we have one deſcribed, wherein the wind being ſuppoſed to blow directly againſt a flat ſide or board which moves along the graduated limb of a quadrant, the number of degrees it advances ſhews the comparative force of the wind.

Wolſius gives the ſtructure of another, which is moved by means of ſails, ABCD (*Tab. Pneumaticæ, fig. 17.*) like thoſe of a wind-mill; which raiſe a weight, L, that, ſtill the higher it goes, receding farther from the centre of motion, by ſliding along an hollow arm KM, fitted on to the axis of the ſails, becomes heavier and heavier, and preſſes more and more on the arm, till being a counterpoize to the force of the wind on the ſails, it ſtops the motion thereof. An index, then, MN, fitted upon the ſame axis at right angles with the arm, by its riſing or falling points out the ſtrength of the wind, on a plane divided like a dial-plate into degrees.

M. d'Ons en Bray, has invented a new *anemometer*, which of itſelf expreſſes on paper, not only the ſeveral winds that have blown during the ſpace of twenty-four hours, and at what hour each began, and ended, but alſo the different ſtrengths, or velocities of each. *V. Mem. Acad. Scienc. an. 1734. p. 169.*

ANEMOSCOPE*, is ſometimes uſed for a machine invented to foretel the changes of the wind.

* The word is derived from the Greek *ανημος*, wind, and *σκοπεω*, I look, or conſider.

It has been obſerved, that hygroſcopes made of cat's-gut, &c. prove very good *anemoscopes*; ſeldom failing, by the turning of the index about, to foretel the ſhifting of the wind. See HYGROSCOPE.

The *anemoscope* uſed by the ancients ſeems, by Vitruvius's deſcription of it, to have been intended rather to ſhew which way the wind actually blew, than to foretel into which quarter it would change.

Oto de Guericke alſo gave the title *anemoscope* to a machine invented by him, to foretel the change of the weather, as to fair and rain.

It conſiſted of a little wooden man, who roſe and fell in a glaſs tube, as the atmosphere was more or leſs heavy.—Accordingly, M. Comiers has ſhewn, that this *anemoscope* was only an application of the common barometer. See BAROMETER. *V. Merc. gal. 1683. Act. erud. 1684. p. 26.*

ANEURYSM*, ANEURYSMA, in medicine, a ſoft, throbbing, ruddy tumour, occaſioned by a dilatation, or by a wound of an artery.

* The word comes from the Greek *ανευρισμα*, *dilata*, I dilate.

Aneurysm is a diſeaſe of the arteries, in which, either by a preternatural weakneſs of any part of them, they become exceſſively dilated; or, by a wound through their coats, the blood is extravafated among the adjacent cavities.

Aneurysms uſually proceed from an artery being accidentally cut, or pricked in bleeding; or from ſome preternatural diſtenſion, or obſtruction, or a corroſion of its coats, &c. *V. Mem. Acad. R. Scienc. an. 1732. p. 592.*

If an artery happen to be cut, the blood guſhes out impetuoſly, by ſarts, and is not eaſily ſtopped; and an inflammation and diſcolouration of the part ſucceeds, with a tumour, and inability to move the part. The ſymptoms are nearly

the same case of a corrosion of the coats of the artery, only in this case they are less violent.

If the blood cease to flow from the wounded artery, and pour itself between the interstices of the muscles; recourse is had to manual operation; which being neglected, the extirpation of the limb frequently becomes unavoidable.—An *Aneurysm*, from a distension of the canal, is seldom fatal; though reckoned, when large, incurable; the chief inconveniences are, the magnitude of the tumour, and the pulsation.

M. Littre gives us the history of an *aneurysm* of this kind, in the aorta; the cause whereof he attributes to an extraordinary diminution of the cavity of the axillary and subclavian arteries. *Hist. de l'Acad. R. an. 1712.*—Another history of an *aneurysm* of the same part we have, by Mr. Lafage, in the Philosph. Transactions. It was occasioned by some violent shocks the patient received on the breast, which threw him into spitting of blood, and soon after formed the tumour, whereof he died. Upon dissection, the *aneurysm* was found so big, that it filled the whole cavity of the thorax on the right side. N^o 265.

ANGARIA is used, in a general sense, for any burthen, or incumbrance forcibly imposed on persons.

Some define *angariae*, by personal services, which a party is compelled to discharge in his own person, or to serve at his own expence.—Or, such services imposed on lands, whereby a person is obliged to work for another, either with his horse, his ass, or the like.

ANGEOGRAPHIA *, the knowledge, or description of all kinds of ancient instruments, vessels, and utensils, both domestic, military, and nautical.

* The word is compounded of *αγγιον*, *vaz*, vessel, and *γραφω*, *scribo*, I describe.

Angiographia also includes the consideration of the weights, measures, &c. used by the several nations. See MEASURE, WEIGHT, VESSEL, &c.

ANGIOLOGY *, ANGIOLOGIA, in anatomy, the history, or description of the vessels in a human body; *e. g.* the nerves, veins, and lymphatics.—See *Tab. Anat. Part II.* See also the article VESSEL.

* The word is derived from *αγγιον*, a vessel, and *λογος*, speech, or discourse.

Angiology is a branch of *sarcology*. See SARCOLOGY.

ANGEL, a spiritual, intelligent substance; the first in rank and dignity among created beings.

The word *angel* is not properly a denomination of nature, but of office; denoting as much as *munus*, messenger, a person employed to carry one's orders, or declare his will.—Thus it is St. Paul represents *angels*, Heb. I. 14. where he calls them *ministering spirits*; and for the same reason the name is given, in the prophet Malachi, c. II. 7. to priests; and by St. Matthew, c. XI. 10. to St. John Baptist. Jesus Christ himself, according to the septuagint, is called in Isaiah, c. IX. 6. the *angel* of the mighty council; a name, says Tertullian, *De Carne Christi*, c. IV. which speaks his office, not his nature.—So the Hebrew word used in scripture, for *angel*, is also a name of office, and not of nature *מלאך* q. d. *legate, envoy, minister*: and yet custom has prevailed inasmuch, that *angel* is now commonly taken for the denomination of a particular nature.

* And, in the opinion of most commentators, we are to understand this denomination to belong to Christ, in several other places of scripture; Ravand says, 30. See Gen. XLVIII. 16. Exod. XXIII. 20. Jud. II. 1. Dan. X. 13. XII. 1. Mal. III. 1. Judg. Rev. XII. 7.

The existence of *angels* is supposed in all religions, though it is incapable of being proved a priori.—Indeed, the ancient Sadducees are represented as denying all spirits; and yet the Samaritans and Caraites, who are reputed Sadducees, openly allow them: witness Abulfaid, the author of an Arabic Version of the Pentateuch; and Aaron, a Caraites Jew, in his comment on the Pentateuch; both extant in manuscript in the king of France's library.

In the Alcoran, we find frequent mention of *angels*.—The Musselmans believe them of different orders or degrees, and to be destined for different employments, both in heaven, and on earth. They attribute exceeding great power to the *angel* Gabriel; as, to be able to descend in the space of an hour from heaven to earth; to overturn a mountain with a single feather of his wing, &c. The *angel* Isracl, they suppose, appointed to take the souls of such as die; and another *angel*, named Ebraphil, they say, stands with a trumpet ready in his mouth to proclaim the day of judgment.

The heathen philosophers and poets were also agreed as to the existence of intelligent beings, superior to man; as is shewn by St. Cyprian, in his treatise of the vanity of idols, from the testimonies of Plato, Socrates, Trifmegistus, &c.

Some Christian writers, after Lactantius, *Instit. lib. 1. c. xv.* allege the enigmata, and the operations of magic, as convincing proofs thereof. St. Thomas produces other con-

siderations, in behalf of the opinion. *lib. II. contra gentes*: c. xlvii.

Authors are not so unanimous about the nature as about the existence of *angels*.—Clemens Alexandrinus believed they had bodies; which was also the opinion of Origen, Casarius, Tertullian, and several others. Athanasius, St. Basil, St. Gregory Nicene, St. Cyril, St. Chrysostom, &c. hold them to be mere spirits.

Ecclesiastical writers make an hierarchy of nine orders of *angels*. See HIERARCHY.

ANGEL is more particularly understood of a spirit of the ninth and lowest class, or order of the hierarchy, or heavenly choir.

The scripture makes mention of the devil and his *angels*.—We also say, the fallen *angels*, guardian *angels*, &c.

In the apocalypse, the denomination *angel* is also given to the pastors of several churches; who are called, The *angel* of the church of Ephesus; the *angel* of the church of Smyrna, &c.

Du Cange adds, that the same name was anciently given to certain popes, and bishops; by reason of their singular sanctity, &c.

ANGEL is also used in commerce, for an ancient gold coin struck in England; so called from the figure of an *angel* impressed upon it.

Its value in 1 Hen. VI. was 6s. 8d. in 1 Hen. VIII. 7s. 6d. in 34 Hen. VIII. 8s. in 6 Edw. VI. it was 10s. in 2 Eliz. it was 10s. and in 23 Eliz. the same.—And the *half angel*, or, as it was sometimes called, the *angelot*, was the moiety of this; and the *quarter angelot*, proportionable. V. Lownd. *Ess. Amend. Silv. Coin*, p. 38. *Jeqq.*

The *angel* now subsists no otherwise than as a money of account; denoting 20s.

The French have also had their *angels*, *semi-angels*, and *angelots*; but they are now disused.

ANGELIC, or ANGELICAL, something belonging to, or that partakes of, the nature of *angels*. See ANGEL.

We say an *angelical* life, &c.—St. Thomas is styled the *angelical doctor*.—The *angelical* salutation is called by the Romanists *Ave Maria*; sometimes simply *angelus*, or the *pardon*.

The Greeks distinguish two kinds of monks: those who profess the most perfect rule of life are called *monks of the great* or *angelical habit*.—The use of Rome has been sometimes denominated the *angelical* see.

ANGELIC ART. See the article ART.

ANGELIC GARMENT, ANGELICA VESTIS, among our ancestors, was a monkish garment, which laymen put on a little before their death, that they might have the benefit of the prayers of the monks.

It was from them called *angelical*, because they were called *angeli*, who by these prayers *animæ salutis succurrunt*.

—Hence, where we read the phrase *monachus ad succurrendum* in our old books, it must be understood of one who had put on the habit when he was at the point of death.

ANGELICA, a medicinal plant, thus named, on account of its great virtue as an alexipharmic, or counterpoison.

It is of a sweet smell, and aromatic taste; and is loaded with a highly exalted oil, and volatile salt.—It is reputed cordial, stomachic, cephalic, aperitive, sudorific, vulnerary, resists poison, &c. though the chief intention wherein it is now prescribed among us, is, as a carminative.—Its root is in the most esteem; though the leaves are also used in distillation, &c.

The seeds have the same virtue with the root, and are of a more agreeable taste.

ANGELICA-WATER is one of the compound waters of the shops; thus called from the *angelica* root, which are the basis thereof.

ANGELICA, *Αγγικον*, was also a celebrated dance among the ancient Greeks, performed at their feasts.

It was thus called, from the Greek *αγγελος*, *munus*, messenger; by reason, as Pollux assures us, the dancers were dressed in the habit of messengers.

ANGELICI, an ancient order of knights, instituted in 1191, by Hæcius Angelus Flavius Comnenus, emperor of Constantinople.

They divided into three classes; but all under the direction of one grand master.—The first, were called *Torquati*, from a collar which they wore, and these were fifty in number.—The second were called the *Knights of Justice*, and were ecclesiastics.—And the third were called *Knights Servitors*.

Justiniani will have this order to have been instituted in the year 313, by Constantine; and supposes the occasion thereof to have been the appearance of an angel to that emperor, with the sign of a cross and these words, *In hoc signo vinces*: but, that there was such a thing as any military order in those days, is a mere fable.

ANGELICI were also a sect of ancient heretics.—St. Augustine supposes them thus called from their yielding an extravagant worship to angels, and such as tended to idolatry; though Epiphanius derives the name from their holding that the world was created by angels.

ANGERONALIA, in antiquity, solemn feasts, held by the Romans, the 21st of December, in honour of Angerona, or Angeronia, the goddess of patience and silence.

Festus and Julius Modestus, quoted by Macrobius, *Saturn.* l. 1. c. 10. derive the name from *angina*, quinancy; and suppose the goddess to have been thus denominated, by reason the puffed over that disease.—Others suppose it formed from *angor*, grief, pain; to intimate that the gave relief to those afflicted therewith. Others deduce it from *angos*, I press, I close; as being reputed the goddess of silence, &c.

ANGINA*, in medicine, an inflammation about the muscles of the larynx, or pharynx, attended with an acute fever, difficulty of swallowing, and danger of suffocation.

* The word is derived immediately from the Latin *ang*, I vex, formed of the Greek *αγγελος*, *strangula*.

The *angina* is the same with what we popularly call *quinzy*, or *quinancy*. See *QUINZY*.

ANGLE, ANGULUS, in geometry, the aperture or mutual inclination of two lines, which meet, and form an *angle* in their point of intersection.

Such is the *angle* BAC, (*Tab. Geometry*, fig. 91) formed by the lines AB, and AC, meeting in the point A.—The lines AB and AC, are called the *legs* of the *angle*; and the point of intersection, the *vertex*.

Angles are sometimes denoted by a single letter affixed to the vertex, or angular point, as A; and sometimes by three letters, that of the vertex being in the middle, as BAC.

The measure of an *angle*, whereby its quantity is expressed, is as arch, DE, described from its vertex A, with any radius at pleasure, between its legs, AC and AB. See *ARCH*, and *MEASURE*.

Hence *angles* are distinguished by the ratio of the arches which they thus subtend, to the circumference of the whole circle. See *CIRCLE* and *CIRCUMFERENCE*.—And thus, an *angle* is said to be of so many degrees, as are the degrees of the arch DE.

Hence also, since similar arches, AB and DE, fig. 87. have the same ratio to their respective circumferences; and the circumferences contain each the same number of degrees; the arches AB, and DE, which are the measures of the two *angles* ACB, and DCE, are equal; and therefore the *angles* themselves must be so too.—Hence, again, as the quantity of an *angle* is estimated by the ratio of the arch, subtended by it to the periphery; it does not matter what radius that arch is described withal: but the measures of equal *angles* are always either equal arches or similar ones; and contrarily.

It follows, therefore, that the quantity of the *angle* remains still the same, though the legs be either produced or diminished.—And thus similar *angles*, and in similar figures, the homologous or corresponding *angles* are also equal.

The taking of *angles* is an operation of great use and extent in surveying, navigation, geography, astronomy, &c.

The instruments chiefly used for this purpose are quadrants, theodolites, circumferents, &c.

Mr. Hadley has invented a new and excellent instrument for taking *angles*, useful where the motion of the object, or any circumstance causing an unsteadiness in the common instruments, renders the making observations difficult or uncertain. *V. Phil. Transf.* N° 420. p. 147. item. N° 425. p. 341.

To measure the Quantity of an ANGLE.—1°. On paper.—Apply the centre of a protractor on the vertex of the *angle* O; (*Tab. Surveying*, fig. 29) so that the radius O p lie on one of the legs: the degree shewn in the arch, by the other leg of the *angle*, will give the *angle* required.—To do the same with a line of chords, see *CHORD*.

2°. On the ground.—Place a surveying instrument, *e. gr.* a semi-circle, (*fig. 16.*) in such manner as that a radius thereof CG may lie over one leg of the *angle*, and the centre C over the vertex.—The first is obtained by looking through the sights F and G, towards a mark fixed at the end of the leg; and the latter, by letting fall a plummet from the centre of the instrument.—Then, the moveable index HI being turned this way and that, till through its sights you discover a mark placed at the extreme of the other leg of the *angle*: the degree it cuts in the limb of the instrument shews the quantity of the *angle*.

To take the *angle* with a quadrant, theodolite, plain table, circumferentor, compass, &c.

To plot or lay down, any given *angle*; i. e. the quantity of the *angle* being given, to describe it on paper. See *PLOTTING*.

To bisect a given *angle*, as HIK, (*fig. 92.*) from the centre I, with any radius at pleasure, describe an arch LM. From L and M, with an aperture greater than LM, strike two arches, mutually intersecting each other in N. Then, drawing the right line IN, we have HIN=NIK.

To trisect an *angle*. See *TRISSECTION*.

ANGLES are of various kinds, and denominations.—With regard to the form of their legs, they are divided into *Rectilinear*, *Curvilinear*, and *Mixed*.

Rectilinear, or *right-lined ANGLE*, is that whose legs are both right lines: as BAC (*Tab. Geometry*, fig. 91.)

Curvilinear ANGLE is that whose legs are both of them curves.

Mixed, or *Mixtilinear ANGLE*, is that, one of whose sides is a right line, and the other a curve.

With regard to their quantity, *angles* are again divided into *right*, *acute*, *obtuse*, and *oblique*.

Right ANGLE is that formed by a line falling perpendicularly on another; or that which subtends an arch of 90 degrees.

—Such is the *angle* KLM, (*fig. 93.*)

The measure of a right *angle*, therefore, is a quadrant of a circle; and consequently all right *angles* are equal to each other.

Acute ANGLE is that which is less than a right *angle*, or than 90°—as AEC, (*fig. 86.*)

Obtuse ANGLE, is that greater than a right *angle*, or whose measure exceeds 90°—as AED.

Oblique ANGLE is a common name both for acute and obtuse *angles*.

With regard to their situation in respect of each other, *angles* are divided into *contiguous*, *adjacent*, *vertical*, *alternate*, and *opposite*.

Contiguous ANGLES, are such as have the same vertex, and one leg common to both.—Such are FGH, and HGI, (*fig. 94.*)

Adjacent ANGLE is that made by producing one of the legs of another *angle*.—Such is the *angle* AEC, (*fig. 86.*) made by producing a leg ED, of the *angle* AED, to C.

Two *adjacent angles*, *x* and *y*, or any other number of *angles* made on the same point E, over the same right line CD, are together equal to two right ones; and consequently, to 180°.—And hence, one of two contiguous *angles* being given, the other is likewise given: as being the complement of the former to 180°.

Hence also, to measure an inaccessible *angle* in a field; taking an adjacent accessible *angle*, and subtracting the quantity thereof from 180°, the remainder is the *angle* required.

Again, all the *angles* *x*, *y*, *o*, E, &c. made around a given point E, are equal to four right ones; and therefore all make 360°.

Vertical ANGLES are those whose legs are continuations of each other.—Such are the *angles* *o* and *x*, (*fig. 86.*)

If a right line AB, cut another, CD, in E, the vertical *angles* *x* and *o*, as also *y*, and E, are equal.—And hence, if it be required to measure, in a field, or any other place, an inaccessible *angle*, *x*; and the other vertical *angle*, *o*, be accessible: this latter may be taken in lieu of the former.

Alternate ANGLES.—See *ALTERNATE*.—Such are the *angles* *x* and *y*; (*fig. 36.*)

The alternate *angles* *y* and *x* are equal. See *OPPOSITE ANGLES*.

Opposite ANGLES. See *OPPOSITE*.—Such are *u* and *y*, and also *z* and *y*.

External ANGLES are the *angles* of any right-lined figure made without it, by producing all the sides severally.

All the external *angles* of any figure, taken together, are equal to four right *angles*: and the external *angle* of a triangle is equal to both the internal and opposite ones, as is demonstrated by Euclid, *lib. 1. prop. 32.*

Internal ANGLES are the *angles* made by the sides of any right-lined figure within.

The sum of all the internal *angles* of any right-lined figure is equal to twice as many right *angles* as the figure hath sides, excepting four. This is easily demonstrated from Euclid, *prop. 32. lib. 1.*

The external *angle* is demonstrated to be equal to the internal opposite one; and the two internal opposite ones are equal to two right ones.

Homologous ANGLES are such *angles* in two figures, as retain the same order from the first, in both figures.

ANGLE at the Periphery is an *angle* whose vertex and legs do all terminate in the periphery of a circle.—Such is the *angle* EFG, (*fig. 95.*)

Angle in the SEGMENT is the same with that at the periphery.

It is demonstrated by Euclid, that all the *angles* in the same segment are equal to one another; that is, any *angle* EHG, is equal to any *angle* EFG in the same segment EFG.

The *angle* at the periphery, or in the segment, is comprehended between two chords EF and FD, and stands on the arch ED. See *CHORD*, &c.

The measure of an *angle* without the periphery G, (*fig. 96.*) is the difference between half the concave arch LM, whercent

It stands, and half the convex arch NO intercepted between its legs.

ANGLE in a Semi-circle is an angle in a segment of a circle, whose base is a diameter thereof.

It is demonstrated by Euclid, that the angle in a semi-circle is a right one; in a segment greater than a semi-circle, it is less than a right one; and in a segment less than a semi-circle, it is greater than a right one.

Since an angle in a semi-circle stands on a semi-circle, its measure is a quadrant of a circle; and therefore is a right angle.

ANGLE at the centre is an angle whose vertex is in the centre of a circle, and its legs terminated in the periphery thereof.—Such is the angle CAB (fig. 95.)

The angle at the centre is comprehended between two radii, and its measure is the arch BC.

Euclid demonstrates, that the angle at the centre BAC is double of the angle BDC, standing on the same arch BC.—And hence, half of the arch BC is the measure of the angle at the periphery.

Hence also, two or more angles HLL, and HMI (fig. 97.) standing on the same or equal arches, are always equal.

ANGLE without the centre, HIK, is that whose vertex K is not in the centre, but its legs HK and IK are terminated in the periphery.

The measure of an angle without the centre is half of the arches HI and LM, whereon it and its vertical K do stand.

ANGLE of Contact is that made by the arch of a circle and a tangent in the point of contact.—Such is the angle HLM, (fig. 43.) See CONTACT.

The angle of contact, in a circle, is proved by Euclid to be less than any right-lined angle: But from hence it does not follow, that the angle of contact is of no quantity, as Peletarius, Wallis, and some others have imagined. *V. Wall. Algeb. p. 71—105.*—Sir Isaac Newton shews, that if the curve HAE (fig. 98.) be a cubic parabola, the angle of contact, where the ordinate DF is in the subtriple ratio of the abscissa AD, the angle BAF, contained under the tangent AB in its vertex, and the curve, is infinitely greater than the circular angle of contact BAC; and that, if other parabola's of higher kinds be described to the same axis and vertex, whose abscissas AD are as the ordinate DF's, DF's, DF's, &c. you will have a series of angles of contact going on infinitely, of which any one is infinitely greater than that next before it.

ANGLE of a Segment is that made by a chord with a tangent, in the point of contact.—Such is the angle MLH (fig. 43.)

It is demonstrated by Euclid, that the angle MLC is equal to any angle MAL in the alternate segment MAL.

For the Effects, Properties, Relations, &c. of ANGLES, when combined into Triangles, Quadrangles, and polygonous Figures, see TRIANGLE, QUADRANGLE, SQUARE, PARALLOGRAM, POLYGON, FIGURE, &c.

EQUAL ANGLES } see the articles { EQUAL.
SIMILAR ANGLES } SIMILAR.

ANGLES are again divided into plane, spherical, and solid.

Plane ANGLES are those we have hitherto been speaking of: which are defined by the inclination of two lines in a plane, meeting in a point.

Spherical ANGLE is the inclination of the planes of two great circles of the sphere.

The measure of a spherical angle is the arch of a great circle at right angles to the planes of the great circles forming the angle intercepted between them.—For the properties of spherical angles, see SPHERICAL ANGLE.

Solid ANGLE is the mutual inclination of more than two planes, or plane angles, meeting in a point, and not contained in the same plane.—For the measure, properties, &c. of solid angles, see SOLID ANGLE.

We also meet with other less usual sorts of angles among some geometers; as,

Horned ANGLE, *angulus cornutus*, that made by a right line, whether a tangent or secant, with the periphery of a circle.

Lunular ANGLE, *angulus lunularis*, is that formed by the intersection of two curve lines; the one concave, and the other convex. See LUNE.

Cuspid ANGLE, *angulus ciffoides*, is the inner angle made by two spherical convex lines intersecting each other. See CUSPID.

Siftraid ANGLE, *angulus siftroides*, is that in figure of a siftrum. See SISTRUM.

Pelecid ANGLE, *angulus pelecoides*, is that in figure of a hat-chet. See PELECOIDES.

ANGLE, in trigonometry. See TRIANGLE and TRIGONOMETRY.

For the lines, tangents, and secants of angles. See SINE, TANGENT, and SECANT.

ANGLE, in mechanics.—*Angle of Direction*, is that comprehended between the lines of direction of two conspiring forces. See DIRECTION.

ANGLE of Elevation is that comprehended between the line of

direction of a projectile, and a horizontal line.—Such is the angle ARB, (Tab. Mechanics, fig. 47.) which is comprehended between the line of direction of the projectile AR, and the horizontal line AB.

ANGLE of Incidence is that made by the line of direction of an impinging body, in the point of contact.—Such is the angle DCA, (fig. 63.)

ANGLE of Reflection is that made by the line of direction of the reflected body, in the point of contact from which it rebounds.—Such is the angle ECF.

ANGLE, in optics—*Visual or Optic angle*, is the angle included between the two rays drawn from the two extreme points of an object to the centre of the pupil.—Such is the angle ABC, (Tab. Optics, fig. 69.) comprehended between the rays AB, and BC.

Objects seen under the same, or an equal angle, must always appear equal.

ANGLE of the Interval, of two places, is the angle subtended by two lines directed from the eye to those places.

ANGLE of Incidence, in catoptrics, is the lesser angle, made by an incident ray of light, with the plane of a speculum; or, if the speculum be concave or convex, with a tangent in the point of incidence.—Such is the angle ABD (fig. 26.)

Every incident ray, AB, makes two angles, the one acute, ABD, the other obtuse, ABL; though sometimes both right.—The lesser of such angles is the angle of incidence.

ANGLE of Incidence, in dioptrics, is the angle ABL, (fig. 56.) made by an incident ray, AB, with a lens or other refracting surface, HL.

ANGLE of Inclination is the angle ABD, contained between an incident ray, AB, and the axis of incidence, DB. See Axis, &c.

ANGLE of Reflection, } in catoptrics. See REFLECTION.
 Reflected ANGLE, }

ANGLE of Refraction, } in dioptrics. See REFRACTION.
 Refracted ANGLE, }

ANGLE, in astronomy—**ANGLE of commutation**. See COMMUTATION.

ANGLE of Elongation, or, **ANGLE at the earth**.

Parallactic ANGLE. See PARALLACTIC ANGLE.

ANGLE at the Sun, the Inclination is the Angle RSP, (Tab. Astronomy, fig. 25.) under which the distance of a planet P, from the ecliptic PR, is seen from the sun.

ANGLE of the East. See NONAGESIMAL.

ANGLE of Obliquity, of the ecliptic. See OBLIQUITY, and ECLIPTIC.

The angle of inclination of the axis of the earth, to the axis of the ecliptic, is 23°, 30'; and remains inviolably the same in all points of the earth's annual orbit. By means of this inclination, such inhabitants of the earth as live beyond 45° of latitude have more of the sun's heat, taking all the year round; and those who live within 45° have less of his heat, than if the earth always moved in the equinoctial.

ANGLE of Longitude is the angle which the circle of a star's longitude makes with the meridian, at the pole of the ecliptic.

ANGLE of right Ascension is the angle which the circle of a star's right ascension makes with the meridian at the pole of the world. See RIGHT ASCENSION.

ANGLE, in navigation.—**ANGLE of the Rhumb**, or **Loxodromic ANGLE**. See RHUMB and LOXODROMY.

ANGLES, in fortification, are understood of those formed by the several lines used in fortifying, or making a place defensible.

These are of two sorts; *real*, and *imaginary*.—*Real angles* are those which actually subsist and appear in the works.—Such are the *flanked angle*, the *angle of the epaule*, *angle of the flank*, and the *re-entering angle of the counterscarp*.—*Imaginary or occult angles* are those which are only subservient to the construction, and which subsist no more after the fortification is drawn.—Such are the *angle of the centre*, *angle of the polygon*, *flanking angle*, *salient angle of the counterscarp*, &c. Savin. Nouv. Ecol. milit. p. 36, and 38.

ANGLE of, or, at, the Centre is the angle formed at the centre of the polygon, by two semi-diameters drawn thither from the two nearest extremities of the polygon.—Such is the angle CKF (Tab. Fortificat. fig. 1.)

ANGLE of the Circumference is the mixt angle made by the arch drawn from one gorge to the other.

ANGLE of the Counterscarp is that made by the two sides of the counterscarp, meeting before the middle of the curtain.

ANGLE of the Curtin, or *of the Flank*, is that made by, or contained between, the curtain and the flank; such is the angle BAE.

ANGLE of the Complement of the Line of Defence, is the angle arising from the intersection of the two complements one with another.

Diminished ANGLE is the angle which is made by the meeting of the exterior side of the polygon with the face of the bastion.—Such is the angle BCF.

ANGLE of the Polygon is the angle GHM, intercepted either between the two internal sides GH, and HM, or the two external sides.

ANGLE of the Epaul, or Shoulder, is that formed by the flank and the face of the bastion.—Such is the angle ABC.

ANGLE of the Interior Figure is the angle GHM, made in H, the angle of the bastion, by the meeting of the innermost sides of the figure GH and HM.

Flanking ANGLE outward, or ANGLE of the Tenaille, is that made by the two rasant lines of defence, i. e. the two faces of the bastion when prolonged.

ANGLE flanking inward is the angle CIH, made by the flanking line with the curtain.

ANGLE flanked, by some called the **ANGLE of the Bastion**, is the angle BCS, made by the two faces of the bastion, BC, CS; being the outermost part of the bastion, and that most exposed to the enemy's batteries, and therefore by some called the **point of the bastion**.

ANGLE of the Flank is that formed by the flank and the curtain.

ANGLE forming the Flank is that consisting of one flank, and one demi-goige.

ANGLE forming the Face is that composed of one flank and one face.

ANGLE of the Triangle, in fortification, is half the angle of the polygon.

ANGLE of the Mount is that made before the curtain, where it is interjected.

Re-entering, or Re-entrant ANGLE, is that whose vertex is turned inwards, towards the place.

Sallient ANGLE is that which advances its point toward the field.

ANGLE of the Tenaille, or the outward flanking angle, called also the **angle of the meat, or the dead angle**, is made by the two lines schanit in the faces of the two bastions, extended till they meet in an angle towards the curtain.—This always turns its point in towards the work.

ANGLE of a wall, in architecture, is the point or corner where the two sides or faces of a wall meet.

ANGLES of a Battalion, in the military art, are those soldiers placed where the ranks and files terminate. See **BATTALION**.

The angles of a battalion are said to be **blunted**, when the soldiers at the four corners are removed, so that the square battalion becomes octagonal: This was an evolution very common among the ancients, though now disused.

ANGLES, in anatomy, are understood of the canthi, or corners of the eye, where the upper eye-lid meets with the under.

That next the nose is called the **great or internal**, and that towards the temples, the **less or external angle or canthus**. See **CANTHUS**.

ANGLES, in astrology, denote certain houses of a figure, or scheme of the heavens.—Thus the horoscope of the first house is termed the **angle of the east**.

ANGLICANÆ Guttae. See the article **GUTTAE**.

ANGLICANUS Sudor. See the article **SUDOR**.

ANGLICISM, a word or phrase in the English idiom; or a manner of speech peculiar to the English tongue. See **IDIOM** and **ENGLISH**.

ANGLING, the art of catching fish by means of a rod, with a line, hook and bait fitted thereto.

There are several prudential rules observed by thorough anglers; such as, not to wear any white or shining apparel, but be clothed in a dark sky-colour: to invite the fish to the place intended for **angling**, by casting in from time to time proper foods, as boiled corn, worms, and garbage: to keep them together in the time of **angling**, by throwing in grains of ground malt; or sinking a box of worms, with small holes for them to creep slowly out at, &c. To draw salmon or trout together, they use a composition of fine clay incorporated with blood, and malt ground.

To learn what bait is best for any fish at any time; after having caught one, they slit his gills, and take out the stomach; and thus find what he list fed on.

The several methods of **angling** for salmon, trout, carp, tench, perch, pike, dace, gudgeon, roach, flounder, &c. See under the articles **SALMON-FISHING**, **TROUT-FISHING**, &c.

ANGLING Fly. See the article **FISHING Fly**.

ANGLING Hook. See the article **FISHING Hook**.

ANGLING Line is either made of hair, twisted; or of silk; or the Indian weed.—The best colours are the sorrel, white and grey; the two last for clear waters, the first for muddy ones. Nor is the pale watery green despicable: this colour is given artificially, by steeping the hair in a liquor made of alum, foot, and the juice of walnut-leaves boiled together.

ANGLING Rod. See **FISHING Rod**.
In **angling**, they observe, after having struck a large fish, to keep the **rod bent**; which will hinder him from running to the utmost length of the rod-line, by which he would be enabled to break his hold, or the hook.

ANGUINEAL Hyperbola. See **HYPERBOLA** and **CURVE**.

ANGULAR, something that relates to, or hath, **angles**. See **ANGLE**.

Angular objects at a distance appear round; the little inequalities disappearing at a much less distance than the bulk of the body.

ANGULAR Motion is a compound kind of motion, wherein the moveable both slides and revolves at the same time. Such is the motion of the wheel of a coach, or other vehicle.

The phenomena, &c. of such motion, see accounted for under the article **ROTA Aristotelica**.

ANGULAR Capital.
ANGULAR Column.
ANGULAR Niche.
Acute ANGULAR Section.

} See the articles
CAPITAL.
COLUMN.
NICHE.
ACUTE.

ANGULAR Motion, in astronomy, is the increase of the distance between any two planets, revolving round any body as the common centre of their motion.

The quantity of this motion is expressed by two right lines, drawn from the said centre to the revolving bodies; which will open wider, and consequently the angle will grow greater, as the revolving bodies part farther and farther from one another.

ANGUSTICLAVIA*, or **ANGUSTUS CLAVUS**, in antiquity, a tunica, embroidered with little purple studs, worn by the knights.

* The word is compounded of *angustus*, narrow, small; and *clavus*, nail or stud: in regard those ornaments were smaller in this garment than in the *Laticlavia*, which was worn by the senators.

ANHELITUS* signifies a shortness and thickness of breath: as in an asthma. See **RESPIRATION** and **ASTHMA**.

The word is Latin, formed of the verb *anheo*, I puff and blow.

ANIL, in natural history, the shrub from whose leaves and stalks indigo is prepared. See **INDIGO**.

ANIMA*, a soul; whether rational, sensitive or vegetative. See **SOUL**.

* The word is pure Latin, formed of the Greek *ανιμας*, ventus, wind, or breath.

ANIMA Articularum is a denomination sometimes given to hermodactyls; on account of their efficacy in disorders of the joints. See **HERMODACTYLE**.

ANIMA Hepatis, soul of the liver; a term applied by the chymists to the *sal martis*, salt of iron or steel, on account of its use in distempers of that part.

It is more usually prescribed under the name of *vitriolum martis*.

ANIMA Mundi, q. d. soul of the world, or of the universe, denotes a certain pure, ethereal substance or spirit, diffused, according to many of the ancient philosophers, through the mass of the world, informing, actuating, and uniting the divers parts thereof into one great, perfect, organical, and vital body or animal.

Plato treats at large of the *ψυχης του κοσμου*, in his *Timæus*; and is even supposed to be the author of the dogma: yet are interpreters much at a loss about his meaning. Aristotle, however, taking it in the common and obvious sense, strenuously opposes it.

Seranus, on Plato's *Timæus*, explains this doctrine thus: 'Our philosopher will have the universe *ζωον ενδιαιτητον εναντιον*, consisting of body and spirit; the spirit he makes to be that analogy, or symmetry, whereby things of different nature are amiceably associated in the grand compages of all things.'

In which sense the *anima mundi* signifies as much as the form of the universe.

Others will have the *anima mundi* to signify I know not what ignific virtue, or vivific heat, infused into the chaos, and disseminated through its whole frame; for the conservation, nutrition, and vivification thereof.

Hence that of the poet:

Igneus est ollis vigor & cælestis origo—Virg. *Æn.* 4. 730.

Others suppose Plato, by his *anima mundi*, to have meant God, or the spirit of God; and to have taken the hint from Moses, who, in his account of the first day's creation, says, *The spirit of God moved on the face of the deep*.

The modern Platonists explain their master's *anima mundi* by a certain universal, ethereal spirit, which in the heavens exists perfectly pure, as retaining its proper nature; but on earth, pervading elementary bodies, and intimately mixing with all the minute atoms thereof, it assumes somewhat of their nature; and becomes of a peculiar kind.—

So the poet:

Spiritus intus alit, totosque infusa per artus

Mens agit molem, & magno se corpore miscet.

They add, that this *anima mundi*, which more immediately resides in the celestial regions as its proper seat, moves and governs the heavens in such manner, as that the heavens themselves

themselves first received their existence from the fecundity of the same spirit : for that this *anima*, being the primary source of life, every where breathed a spirit like itself, by virtue whereof various kinds of things were framed conformable to the divine ideas.

The notion of an *anima mundi* is rejected by most of the modern philosophers ; though M. du Hamel thinks, without any great reason ; for the generality of them admit something very much like it. Thus the Peripatetics have recourse to celestial influxes, in order to account for the origin of forms, and the secret powers of bodies.

The Cartesians have their subtle matter, which answers to most of the uses and intentions of Plato's *anima mundi* ; being supposed to flow from the sun and the other heavenly bodies, and to be diffused through all the parts of the world, to be the source or principle of all motion, &c.

Some later philosophers in the place of these substitute fire ; and others a subtle elastic spirit or medium diffused through all the parts of space.

The principal thing objected, on the Christian scheme, against Plato's doctrine of the *anima mundi*, is, that it mingles the deity too much with the creatures ; confounds, in some measure, the workman with his work, making this, as it were, a part of that, and the several portions of the universe for many parts of the Godhead.— Yet is the same principle asserted by Seneca, Epist. 92. *Tantum hoc quo continemur, & unum est, & Deus. Et facti ejus sumus, & membra*—

ANIMA Pulmonum, was used for crocus, or saffron ; by reason of its supposed great use in diseases of the lungs.

ANIMADVERSION * sometimes signifies *correction* ; and sometimes remarks or observations made on a book, &c. and sometimes, a serious consideration and reflection on any subject, by way of criticism.

* The word is formed of the Latin *animadvertere*, to animadvert : of *animus*, the mind, and *adverto*, I turn to, or toward.

ANIMAL *, a being, which, besides the power of growing, increasing, and producing its like, which vegetables likewise have, is further endowed with sensation, and spontaneous loco-motion.

* The word is derived from the Latin *anima*, soul ; and literally denotes something endowed with a soul.

An *animal*, respect being only had to the body, not the soul, may be defined with Boerhaave to be an organical body, consisting of vessels and juices, and taking in the matter of its nutriment, by a part called a *mouth* ; whence it is conveyed into another called the *intestines*, into which it has roots implanted, whereby it draws in its nourishment, after the manner of plants.

According to this definition, an *animal* is distinguished from a fossil, in that it is an organical body ; and from a vegetable by this, that it has its roots within itself, whereas a plant has them without itself.

In effect, the intestines of an *animal* are, in reality, no more than its earth, or the body it adheres to ; into which it sends forth its roots, that is, the lacteal vessels, which thence draw the matter of its life and increase.

An *animal* is better defined from its mouth than its heart ; since we do not know whether the whole tribe have such a part ; for as several have sixteen hearts, particularly the silk-worm, and some even sixty : so it is possible, others may have none at all.

Nor can any general character of an *animal* be taken from the brains, the lungs, or the like, since we know of many quite destitute thereof.

The genuine characteristic, then, of an *animal* is to be free and at large with respect to the subject it derives its nourishment from : for every thing is taken in by the mouth ; and the mouth does not adhere to anything : whereas all plants are connected, in some manner or other, to the body which furnishes them food.

Hence it follows, that a foetus, while it remains in the mother's womb, is a real plant ; as being connected by the funicular umbilicalis to the placenta, and by the placenta to the uterus, from whence it receives its nutriment.—If it did not derive its food by the said funiculus, but by its mouth, it were an *animal* ; and if it drew it by both, it would be a zoophyte, or plant-animal.

Some have defined *animals* from their loco-motion, as being capable of shifting from place to place ; and plants, from their sticking fast to the same subject : but on this principle, oysters, mussels, cockles, &c. would be almost excluded from the class of *animals*, in as much, as they usually adhere, or grow to rocks, &c. yet it is certain, that those creatures are real *animals*, as they have mouths and stomachs to take in their food, and lacteal and mesenteric veins to receive it, and sometimes can even move from place to place on occasion.— Indeed, mussels seem an exception from the former definition.

If, as is said, that anomalous creature breathes, and receives its nourishment, not at the mouth, but by the anus : the part which we account its head, though without either eyes, ears, or tongue, or any other apparatus, save a hole, which we

may call its mouth, is an immoveable part ; being fastened to one of the shells, so that it cannot seek for food, but the food must come to seek it. This food is water, which, as the shells open, enters in at the anus of the mussel, which opens at the same time ; and passing thence into certain canals, between the inner surface of the shell and the outer surface of the *animal*, is said to be conveyed thence into its mouth, by a certain motion, which the *animal* can produce at pleasure.

We chuse therefore with Dr. Tyfon, to fix the criterion of an *animal* in a ductus alimentalis, i. e. a gula, stomach, and intestines : all which make but one continued canal.

All *animals*, according to the most probable and received opinion, come from eggs, and are there inclosed, as it were in epitome, till the feed of the male penetrate their covering, and stretch them, so as they become ready for hatching.

There then enters into their vessels a chylous juice ; which, being pushed forwards by the spirits, circulates through the whole habit of the little body, nourishes and dilates it by little and little, and thus produces what we call *growth*.

This circulation, repeated several times, refines and attenuates the juices, till at length they become of a red colour, and are converted into what we call *blood*.—This natural operation bears a great resemblance to several chymical processes, by which, in attenuating and dissolving oily or sulphureous substances, they assume a red colour.

The philosophers comprehend man under the species of *animals* * ; and define him, a reasonable *animal* : though among naturalists, &c. the term *animal* is usually restrained to irrationals.

* Man, says Lister, is as very an animal as any quadruped of them all : and most of his actions are resolvable into instinct, notwithstanding the principles which custom and education have superinduced. *Journ. to Paris*.

St. Augustin relates, that a great many scrupulous persons in his time extended that prohibition of the law, *Thou shalt not kill*, to all *animals* : they grounded their opinion on some passages of scripture wherein God speaks of *animals* as if they had some principle of reason : declaring that he will require the blood of man at the hand of beasts, Gen. c. ix. Adding in the same place, that he makes a covenant not only with man, but with every living creature.

Pliny relates, that in Africa the species of *animals* are various and changeable ; for that the great scarcity of water bringing all sorts of beasts to the same pools to drink, the males often mix with the females of other species : infomuch that it was become a proverb in Greece, that *Africa was always producing some new monster*.—Hist. Nat. l. 8. c. 16.—But this is no ways warranted by the observations of modern naturalists ; according to Dr. Shaw, the ordinary course of things is much the same in Barbary as elsewhere ; each species, as far as ever he could be informed, keeping inviolably to itself. If we except the mule and the kumzah, which are procreated from animals under the direction of mankind, and not properly left to themselves, few, if any, instances can be produced in favour of the ancient proverb, *Semper aliquod novi Africam afferre*.—V. Shaw. Trav. p. 261.

ANIMALS are ordinarily divided into *terrestrial, aquatic, volatile, amphibious, insects*, &c.

Terrestrial animals, are either *quadrupeds*, or *reptiles*.—Quadrupeds have either the feet cloven, as the bullock ; or entire, as the horse ; or divided into several toes or claws, as the dog, lion, &c. The other divisions will be found under the words **FISH, BIRD**, &c.

For a general account of the various kinds of *animals*, we shall here subjoin Mr. Ray's scheme.

Animals are either,

<p>{ <i>Sanguineous</i>, that is, such as have blood, which breathe either by</p> <p style="margin-left: 20px;">{ Lungs, having either</p> <p style="margin-left: 40px;">{ Two ventricles in their heart, and those either</p> <p style="margin-left: 60px;">{ Viviparous.</p> <p style="margin-left: 60px;">{ Aquatic, as the whale kind. See WHALE.</p> <p style="margin-left: 60px;">{ Terrestrial, as quadrupeds.</p> <p style="margin-left: 60px;">{ Oviparous, as birds.</p> <p style="margin-left: 40px;">{ But one ventricle in the heart, as frogs, tortoises and serpents.</p> <p>{ Gills, as all sanguineous fishes, except the whale kind.</p>	<p>{ <i>Exanguineous</i>, or without blood, which may be divided into</p> <p style="margin-left: 20px;">{ Greater ; and those either</p> <p style="margin-left: 40px;">{ Naked.</p> <p style="margin-left: 40px;">{ Terrestrial, as naked snails.</p> <p style="margin-left: 40px;">{ Aquatic, as the poulp, cuttle-fish, &c.</p> <p style="margin-left: 40px;">{ Covered with a tegument, either</p> <p style="margin-left: 60px;">{ Cruftaceous, as lobsters and craw-fish.</p> <p style="margin-left: 60px;">{ Testaceous, either</p> <p style="margin-left: 80px;">{ Univalve, as limpets.</p> <p style="margin-left: 80px;">{ Bivalve, as oysters, mussels, cockles, &c.</p> <p style="margin-left: 80px;">{ Turbinate, as periwinkles, snails, &c.</p> <p>{ Lesser, as insects of all sorts.</p>
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Vickarous hairy animals, or quadrupeds, are either
 Hooded, which are either
 { Whole-footed, or hoofed, as the horse and ass:
 { Cloven-footed, having the hoof divided into
 { Two principal parts, called *bifcula*, either
 { Such as chew not the cud, as swine.
 { Ruminant, or such as chew the cud, divided into
 { Such as have perpetual and hollow horns:
 { Beef-kind,
 { Sheep-kind,
 { Goat-kind.
 { Such as have solid, branched, and deciduous horns,
 { as the deer kind.
 { Four parts, or *quadrifcula*, as the rhinoceros and hippo-
 { potamus.
 { Claw'd, or digitate, having the foot divided into
 { Two parts or toes, having two nails, as the camel-
 { kind.
 { Many toes or claws, either
 { Undivided, as the elephant
 { Divided, which have either
 { Broad nails and an human shape, as apes.
 { Narrower and more pointed nails, which in re-
 { spect of their teeth, are divided into such as have
 { Many fore-teeth or cutters in each jaw:
 { The greater, which have
 { A shorter snout and rounder head, as the cat-kind.
 { A longer snout and head, as the dog-kind.
 { The lesser, the weasel or weasel kind.
 { Only two large and remarkable fore-teeth, all which are phy-
 { tivorous, and are called the hare-kind.

For particulars relating to animals, their number, analogous
 structure, sagacity, instinct, &c. See CREATION, ARK,
 HEAD, NECK, TAIL, FOOT, HORN, HOOF, SPOUR,
 INSTINCT, &c.

ANIMALS consist of *solids*, or firm parts, as flesh, bones, mem-
 branes, &c. and *fluids*, as blood, &c.—Of an intermediate
 kind may perhaps be reckoned fat, &c.

The solids are mere earth, bound together by some oily hu-
 mour; and accordingly they are reducible by fire into such earth
 again.

Thus a bone being perfectly purged of all its moisture, by
 calcination, is found a mere earth, which the least force will
 crumble into dust, for want of the natural gluten: yet the
 same bone, by immersing it in water or oil, becomes firm and
 strong again; and more so in oil than in water. And thus cu-
 pels are made of animal earth, which will sustain the utmost
 effect of fire.

The fluid parts of *animals* are the cruder as they are less dis-
 tant from the lacteals, and absorbent vessels.—Thus chyle
 is little else but a vegetable juice; but in its farther progress,
 it gradually lays aside its vegetable characters, till after a num-
 ber of circulations it becomes a perfect animal juice under the
 denomination of blood, from whence the other humours are
 all derived.

Animal substances are distinguished from those of vegetables
 by two circumstances: the first, that when burnt they are
 found perfectly insipid; all animal salts being volatile and
 flying off with heat: the contrary of which is found in
 vegetables, which constantly retain some fixed salt in all
 their ashes.

The second, that no sincere acid is contained in any animal
 juice; nor can any acid salt be extracted from the same: the
 contrary of which is found in all vegetables.

Yet are *animals* reconverted into their vegetable nature, by
 putrefaction.

Oviparous ANIMALS. } See the articles { *OVIPAROUS.*
Rapacious ANIMALS. } *RAPACIOUS.*
Generation of ANIMALS. } *GENERATION.*

ANIMALS make the subject of that branch of natural history
 called *Zoology*.

The structure of *animals*, with their disorders, remedies, &c.
 make the subject of anatomy, medicine, &c.

ANIMALS make the principal matter of heraldry; both as bear-
 ings, and as supporters, &c.

It is an established rule among the heralds, that in
 blazoning, *animals* are always to be interpreted in the
 best sense; that is, according to their most noble and
 generous qualities, and so as may redound most to the ho-
 nour of the bearers.

Thus the fox, being repeated witty, and wital given to fish-
 ing for his prey; if this be the charge of an escutcheon, we
 are to conceive the quality represented to be his wit and
 cunning, not his theft.

Guillim adds, that all savage beasts are to be figured in
 their fiercest action; as, a lion erected, his mouth
 wide open, his claws extended, &c. Thus formed, he
 is said to be *rampant*—A leopard, or wolf is to be
 portrayed going, as it were, pedetentim: which form
 of action, saith Chastellaneus, fits their natural disposition,
 and is termed *passant*.—The gentler kinds are to be
 set forth in their noblest and most advantageous action;
 as, a horse, running or vaulting, a grey-hound cour-

ing, a deer tripping, a lamb going with smooth and
 easy pace, &c.

Every *animal* is to be moving, or looking, to the right
 side of the field; and it is a general rule, that the right
 foot be placed foremost, because the right side is reckoned
 the beginning of motion: add, that the upper part is nobler
 than the lower; so that things constrained either to look up
 or down, ought rather to be designed looking upwards.—It
 must be noted, that notwithstanding these solemn precepts of
 Guillim, and the other masters of armory, we find by expe-
 rience, that there are lions passant, couchant, and dormant,
 as well as rampant, and that most *animals* in arms look down,
 and not up.

ANIMAL is also used adjectively, to denote something that be-
 longs to, or partakes of, the nature of an animal body.
 Thus we say *animal food*, *animal economy*, &c.

ANIMAL *Actions* are those peculiar to animals; or which be-
 long to animals, as such.
 Such are sensation, and muscular motion. See SENSATION,
 &c.

ANIMAL *Motion* is the same with what we call *muscular*
motion.

It is divided into two branches; natural or involuntary, and
 spontaneous.

ANIMAL *Functions*, among physicians. See FUNCTION.
 Moralists frequently oppose the *animal* part, which is the sen-
 sible, fleshy part of man, to the rational part, which is the
 understanding.

ANIMAL *Saration* is the act whereby the divers juices of the
 body are secreted or separated from the common mass of
 blood, by means of the glands.

The theory of animal secretion is one of the improvements in
 physic, for which we are indebted to geometrical reasoning.
 —The sum of what our late writers on this subject have
 shewn, may be reduced to the following heads:

1. Different juices may be separated from the common
 mass of blood, by means of the different diameters of the
 orifices of the secretory ducts. For all particles, whose dia-
 meters are less than those of the ducts, will pass through
 them; so that any matter may be evacuated by any of the
 glands, provided the diameters of its particles be made lesser
 than those of the secretory duct, either by a comminution of
 the matter to be separated, or by an enlargement of the sepa-
 rating passage.

2. By the different angle which the secretory duct makes
 with the trunk of the artery. For all fluids press the sides
 of the containing vessels in a direction perpendicular to its
 sides; which is evident in the pulsation of the arteries, it
 being to that pressure that the pulsation is wholly owing. It
 is likewise evident, that the blood is urged forward by the
 force of the heart; so that the motion of secretion is
 compounded of both these motions. Now the lateral pres-
 sure is greater when the direct velocity is so, but yet not in
 proportion to such velocity: for the lateral pressure is con-
 siderable, even when the fluid is at rest; being then in pro-
 portion to the specific gravity of the fluid: and in a fluid like
 the blood in the arteries, which is thrown in a right direction,
 or a direction parallel to the axis of the vessel, the lateral
 pressure will be in a proportion compounded of both:
 from whence it will follow, that if two particles of equal
 diameters, but of unequal specific gravities, arrive, with the
 same velocity, at an orifice capable of admitting them, yet
 they will not both enter it and pass, because their motion
 of direction will be different: so that the diversity of the
 angles which the ducts make with the trunk of the artery,
 is altogether necessary to account for all the possible diversity
 of secreted fluids, even supposing their diameters and figures
 to be the same.

3. By the different velocities with which the blood arrives
 at the orifices of the secretory ducts.—For since the secretions
 are made in a fluid form; no possible reasons can be as-
 signed, why some *animals* have a soft loose texture of the so-
 lid parts, and why one part of the body is of an easily sepa-
 rated texture, and others of a firmer, but this different ve-
 locity of the blood at the orifices of the secretory ducts, where-
 by the particles secreted for nourishment, and action, are
 drove or impacted into the vacuola that receive them, with
 a greater or less force; it being difficult to imagine that such
 a diversity in texture can altogether proceed from the diffe-
 rent solidities and contacts of the constituent parts. See fur-
 ther under the article SECRETION.

ANIMAL *Spirits* are a fine subtle juice or humour, in animal
 bodies; supposed by many to be the great instrument of mus-
 cular motion, sensation, &c.

The ancients distinguished spirits into three kinds, viz. *ani-
 mal*, vital, and vegetative: but the moderns have reduced
 them to one sort, viz. *animal*; about the nature of which,
 and the matter whence they are formed, great disputes have
 arisen among anatomists, though their very existence has
 never been fairly proved.

As it is hard to define what could never yet be brought under
 the judgment of our senses, all that we shall here offer concern-
 ing them, is, that they must needs be extremely subtle bodies,
 which

which escape all manner of examination by the senses, though ever so well assisted; and pervade the tracts of the nerves, which yet have no discoverable cavity or perforation; nor could ever by any experiment be collected; yet are constantly moving in vast quantities, as they must of necessity be, to perform all those mighty operations which are ascribed to them.—However, the antiquity of the opinion claims some reverence.

By the help of these, we are furnished with a vast number of precarious solutions of great phenomena; and without them we must leave a great chasm in the philosophical history of animal bodies.

They are supposed to be separated in the brain, from the subtiler parts of the blood: and thence carried, by the nerves, to all parts of the body, for the performance of all animal and vital functions.

ANIMAL Hunger.

ANIMAL Oeconomy.

ANIMAL Oil.

} See the articles { HUNGER.
OECONOMY.
OIL.

ANIMALCULE, ANIMALCULUM, a diminutive of animal; expressing such a minute creature as is either scarce, or not at all, discernable by the naked eye.

Such are those numerous insects which crowd the water in the summer months; changing it sometimes of a deep or pale red colour, sometimes of a yellow, &c. These often seem to be of the shrimp kind, and the most common one is called by Swammerdam, *Pulex aquaticus arborefens*. The cause of their concurrence at this time, Mr. Derham observes, is to perform their coit. He adds, that they afford a comfortable food to many water animals.—The green scum, on the top of stagnant waters, is often nothing else but prodigious numbers of another smaller order of animalcules; which in all probability serve for food to the pulices aquatici.

The microscope discovers legions of animalcules in most liquors, as water, wine, vinegar, beer, dew, &c. In the Philosophy. Transact. we have observations of the animalcules in rain-water, in several chalybeate waters, infusions of pepper, bay-berries, oats, barley, wheat, &c. See MICROSCOPE.

The human seed has been observed by divers authors to contain great numbers of animalcules; which gave occasion to the system of generation *ab animalculo*.

ANIMATE, ANIMATED, something endued with life, or a living soul.

In mechanics, *animate power* is used to denote a man, or brute; in contradistinction to *inanimate powers*, as springs, weights, &c.

ANIMATED Mercury, among chymists, signifies quicksilver impregnated with some subtle and spirituous particles, so as to render it capable of growing hot when mingled with gold.

ANIMATED Needle, a needle touched with a load-stone. See NEEDLE, MAGNET, &c.

ANIMATION signifies the informing of an animal body with a soul.

Thus the fetus of the womb is said to come to its *animation*, when it begins to act as a true animal; or after the female that bears it is *quick*, as the common way of expression is.

The common opinion is, that this happens about forty days after conception. But Jer. Florentinus, in a Latin treatise entitled, *Homo dubius, sive de baptisimo abortivorum*, shows this to be very precarious.

ANIME, or Gum ANIMÆ, in pharmacy, a kind of gum, or resin; whereof there are two kinds, the *western*, and *eastern*.

The western flows from an incision of a tree in New Spain, called *courbaril*; it is transparent, and of a colour like that of frankincense: its smell is very agreeable, and it easily consumes in the fire.

The eastern gum *anime* is distinguished into three kinds: the first is white; the second blackish, in smell like myrrh; the third pale, resinous, and dry.

All the several kinds of *anime* are used in perfumes, by reason of their agreeable smell; they are also applied externally in cold disorders of the head and nerves, and in palsies and catarrhs; but they are little known among us; inasmuch that our apothecaries usually sell *bdellium* for gum *anime*.

A NISCALPTOR, in anatomy, a muscle, otherwise called *latissimus dorsi*. See LATISSIMUS DORSI.

ANISE-SEED, a medicinal seed, produced by an umbelliferous plant of the same name, common in some gardens.

It has a sweetish taste, intermixed with something pungent and bitter, is reputed an aromatic, and prescribed not barely as a carminative against wind, but also as a pectoral, stomachic, and digestive.

It yields, by distillation, a white cordial oil, called *essence of aniseed*, of a very strong penetrating smell, and efficacious in its medicinal operation; it being also used by the confectioners to scent their pomatums, &c.

In distilling the *anise-seed* for the oil, there is produced a limpid water called *anise-feed water*, which has much the same virtues with the oil.

ANKER, ANCHOR, a liquid measure chiefly used at Amsterdam, &c.

The *anker* is the fourth part of the awm, and contains two stekans: each stekan consists of sixteen mingles; the mingle being equal to two Paris pints.

ANNALS, ANNALES, an historical account of the affairs of a state, digested in the order of years.

The difference between *annals* and history is variously assigned by various authors.—Some say that history is properly a recital of things which the author has seen, or been a by-stander to. What they build upon is, the etymology of the word; history in the Greek, signifying the knowledge of things present, and in effect, *historia* properly signifies to *see*. On the contrary, *annals*, say they, relate to the transactions of others, and such as the writer never saw.

Of this opinion the great *annalist*, Tacitus himself, seems to have been; in regard the first part of his work, which treats of former times, he calls *annals*; whereas, when he comes down to his own times, he changes his title, and calls it *history*.

Aulus Gellius is of a different opinion, and pretends, that history and *annals* only differ from one another as the genus does from the species; that history is the genus, and implies a narration or recital of things passed; and that *annals* are the species, and are also a recital of things passed, but with this difference, that these last are digested into certain periods, or years.

The same author gives us another opinion, which he says he borrows from Sempronius Asellio: according to that writer, *annals* are a bare relation of what passes each year; whereas history relates not only the transactions themselves, but also the causes, motives, and springs thereof. The *annalist* has nothing to do but to lay down his facts, but the historian reasons and descants on them.

Of this last opinion seems Cicero to be, when speaking of *annalists*, he says, *Unam dicendi laudem putant esse brevitate, non exornatores rerum, sed tantum narratores*. He adds; that history, in its original, was the composition of *annals*.

The same Cicero relates the origin of *annals*: to preserve the memory of transactions, the *pontifex maximus*, says he, wrote what passed each year; and exposed it on a table, in his own house, where every one was at liberty to read it.—This they called *annales maximi*; and this custom was kept up till the year of Rome 620.

Several other writers, in imitation hereof, took to this simple and naked way of relating facts; and were hence denominated *annalists*.—Such were Cato, Pictor, Piso, Antipater, &c.

The *annals of Gratius* is a book finely wrote, and contains very good things. It is not so particular as Strada, but it is more profound, and comes much nearer to Tacitus. *Patin. Lett. Obsif.* 120.

Lucas Holstenius, canon of St. John de Lateran, assured Naudé, that he was able to shew 8000 fullhoods in Baronius's *annals*, and prove them from MSS. in the Vatican library, of which he had the custody. *Patin. Lett. Obsif.* 165.

ANNATES, ANNATA, in ecclesiastical writers, denotes a year's income, due anciently to the pope upon the death of any bishop, abbot, or parish-priest; and to be paid by his successor.

Annates are so called from the Latin *annus*, year, because their rate is after the value of one year's purchase.

Annates are the same with what of latter days are called *primities*, or first fruits.—With this only difference, that first-fruits with us are paid to the king.

The first pope that imposed *annates* in England seems to have been Clement V. who, according to Matthew of Westminster, exacted *annates* of all the vacant benefices in the kingdom for the space of two years, or, according to Walsingham, for three years. His successor John XXII. introduced the like in France.

Yet Polydore Virgil, and some others, take *annates* to be of a much elder standing; and to have obtained long before they were paid to the pope.—'Tis certain at least, that from the twelfth century there were bishops and abbots, who, by some peculiar custom or privilege, took *annates* of the benefices depending on their diocese or abbey.

Matthew Paris, in his history of England, for the year 746, relates, that the archbishop of Canterbury, in virtue of a grant or concession of the pope, received *annates* of all the benefices that became vacant in England.—But in after-times the holy see thought fit to take these away from the bishops and archbishops, and appropriate them to themselves.—And from the popes, the parliament under Henry VIII. took them and gave them to the crown, 25 H. 8. c. 20. Finally Queen Anne restored them to the church, by appropriating them to the augmentation of poor livings.

ANNEALING, or, as it is popularly called, *Nealing*. See the article **NEALING**.

One fine use of silver, says Mr. Boyle, was only discovered since the art of *annealing* upon glass came to be practised.—For prepared silver, or even the crude metal, being burnt on a glass plate, will tinge it of a fine yellow, or golden colour. And there are several mineral earths, and other coarse matters, of use in this art, which, by means of fire, impart transparent colours to glass, and sometimes very different ones from those of the bodies themselves.

ANNEALING Furnace. See the article **FURNACE**.

ANNEXATION, in a legal sense, the act of joining or uniting some less considerable thing to a greater.

ANNEXED, something joined to or dependant on another.—Thus we say, such a farm, such an advowson, is *annexed* to such a fee, such a manor, &c. Charles VIII. in the year 1486, *annexed* Provence to the crown of France.

ANNIENTED*, or rather **ANNIATED**, a term sometimes used in law-books, in the sense of frustrated, or annulled.

* It is of French original; being formed of the verb *annantir*, to bring to nothing, or to annihilate.

ANNIHILATION*, the act of reducing a substance into nothing; or of totally destroying and taking away its existence.

* The word is compounded of *ad*, to, and *nil* nothing.

Annihilation stands opposed to creation: the one supposes something made out of nothing, the other nothing made out of something.

All *annihilation* must be metaphysical or supernatural: bodies naturally admit of changes and alterations in their form; but not of *annihilation*.

Some philosophers object against this notion of *annihilation*; in that it supposes an act required thereto: whereas, according to them, *annihilation* must ensue upon God's merely ceasing to act, or to create a thing. For, if the conservation of a thing be a continued creation thereof, as is almost universally allowed; it is evident a thing can no longer endure, than while God continues thus to create.

ANNIHILATION is also used in a moral sense.—The capital of the South Sea is reduced to one half; and unless care be taken to prevent male-practices of factors, &c. another *annihilation* will soon become necessary: especially as the dividend on the stock is reduced from six to three per cent. which is one per cent. less than is paid the company by the government.

ANNI Nubiles, among law-writers, the legal age, at which a maid becomes fit for marriage; which is at twelve years.

ANNIS communibus. See the article **COMMUNIBUS**.

ANNISEED. See the article **ANISE-SEED**.

ANNIVERSARY* is properly the yearly return of any remarkable day: anciently also called a *year-day*, or *mind-day*, that is, a memorial-day.

* The word is formed from *annus* and *verto*, in regard of its returning every year.

ANNIVERSARY Days, *dies anniversarii*, among our ancestors more particularly denote those days wherein the martyrdoms of the faints were yearly celebrated in the church; as also days whereon, at every year's end, men were wont to pray for the souls of their deceased friends.—*Anniversaria dies ideo repetitur defunctis, quoniam nescimus qualiter eorum causa habeatur in alia vita*.—This was the reason given by Alcuin in his divine offices.

ANNO Domini, q. d. in the year of our lord; the computation of time from the epocha of the incarnation of Jesus Christ.

ANNOISANCE, or *Nusance*, in law, a hurt or offence, either to a public place, as a high-way, bridge, or common river; or to a private one, by laying any thing that may breed infection, by incroaching, or by the like means. See **NUSANCE**.

ANNOISANCE is also used for a writ brought upon this transgression. See **NUSANCE**.

ANNOTATION*, a succinct commentary, or remark on a book, or writing; in order to clear up some passage, or to draw some induction, or consequence from it.

* The word is formed of the Latin *adnotatio*; of *ad* and *nota*, note.—The critics of the last age have made learned *annotations* on the scriptures, classics, &c.

ANNUAL, something which returns every year, or closes at the end of the year.

Thus we say, an *annual*, or yearly feast, office, commission, rent, revenue, income, &c.

The *annual motion* of the earth, see proved under the article **EARTH**.

ANNUAL is sometimes used for the yearly rent, or income of a prebendary, &c.

ANNUAL Argument of Longitude. See **ARGUMENT**.

ANNUAL Epactis. See the article **EPACT**.

ANNUAL Equation of the mean motion of the sun and moon, and of the moon's apogee and nodes.

The *annual equation* of the mean motion of the sun depends on the eccentricity of the earth's orbit; and is $16\frac{1}{2}$ of those parts, whereof the mean distance between the sun and the earth is 1000: whence by some, it is called the *equation of the centre*, and when greatest, is 1 degree $56'$, $20''$.

The greatest *annual equation* of the moon's mean motion is $11'$, $40''$ of its apogee $20'$, and of its node $9'$, $30''$.

These four *annual equations* are always proportionable; so that when any of them is at the greatest, the three others are also greatest; and *vice versa*.—Hence the *annual equation* of the centre (of the sun) being given, the other three corresponding *equations* will be given; so that one table (that is, of the central *equation*) may serve for all.

ANNUAL Leaves, are such leaves of plants, as come up afresh in the spring, and perish in winter.—These stand opposed to *ever-greens*.

ANNUAL plants, called also simply *annuals*, are such as only live their year, i. e. come up in the spring, and die again in autumn: and accordingly are to be recruited every year.

ANNUALIA, yearly oblations anciently made by the relations of deceased persons, on the day of their death.

This day they called *year-day*, &c. and on it, mass was celebrated with great solemnity.

ANNUENTES* *Musculi* in anatomy, a pair of transverse muscles, at the root of the vertebrae of the back, called also by Mr. Cowper, *Recti interni minores*, because they lie under the *Recti majores*. See **RECTI**,

* They are called *annentes*, from *annere*, to nod towards, because they help to nod the head, or draw it directly downwards and forwards. See **HEAD**, **MUSCLE**, &c.

ANNUITY, a yearly rent or revenue, paid either for term of life, or of years, or in fee and for ever.

In common law, the difference between a rent, and an *annuity* consists in this, that rent is payable out of land; whereas an *annuity* charges only the person of the grantor: and that, for the recovery of a rent, an action lies; whereas for that of an *annuity*, there only lies a writ of *annuity* against the grantor, his heirs and successors. Add, that *annuities* are never taken for assets; as being no freeholds in law.

The computation of the value of *annuities* on lives, &c. belongs to political arithmetic. See **POLITICAL arithmetic**.

Dr. Halley, in his observations on the Breslaw bills of mortality (Phil. Trans. ap. Lowth. 3. p. 669.) shews, that it is 80 to 1, a person of 25 years of age does not die in a year.—That it is 5 $\frac{1}{2}$ to one; a man of 40 lives 7 years; and that one of 30 may reasonably expect to live 27 or 28 years. So great a difference is there between the life of man at different ages, that it is 100 to 1, one of 20 lives out a year; and but 38 to 1, that one of 50 doth so.

Whence, and from some other observations, he constructed the following table; shewing the value of *annuities* for every fifth year of life to the 70th.

Age.	Years Purchase.	Age.	Years Purchase.
1	10,28	40	10,57
5	13,40	45	9,91
10	13,44	50	9,21
15	13,33	55	8,51
20	12,78	60	7,60
25	12,27	65	6,54
30	11,72	70	5,32
35	11,12		

ANNULAR, **ANNULARIS**, something that relates to, or resembles a ring, by the Latins called *annulus*.

ANNULAR Cartilage, or **ANNULARIS**, is the second cartilage of the larynx, being round, and investing the whole larynx; called also *cricoides*.

ANNULAR Ligament, *Ligamentum ANNULARE*, is a strong ligament, encompassing the carpus or wrist; after the manner of a bracelet.

Its use is to connect or bind the two bones of the arm together; and also to restrain the tendons of the several muscles of the hand and fingers, and prevent their flying out of their places, when in action.

The ligament of the tarsus is also denominated *annular ligament*. See **TARSUS**.

Add, that the sphincter muscle of the anus is also called *annularis*, or *annular muscle*; from its figure.

ANNULAR Process or *Protuberance*, is a process of the medulla oblongata; thus called by Dr. Willis, in regard it furrounds the same, much like a ring. See **MEUDLLA Oblongata**.

ANNULAR is also an epithet given the fourth finger; popularly called the *ring finger*. See **FINGER**.

ANNULET, *little ring*; in heraldry, is a difference or mark

of distinction, which the fifth brother of any family ought to bear in his coat of arms. See DIFFERENCE.

Annulets are also part of the coat-armour of several families: they were anciently reputed a mark of nobility, and justification; it being the custom of prelates to receive their investiture *per baculum & annulum*.

ANNULETS, in architecture, are small square members, in the Doric capital; placed under the quarter round.—See *Tab. Archit. fig. 28, lit. q. and fig. 24. lit. n. and fig. 1.*

They are also called *Fillets, Listsels, &c.*

ANNULET is also used for a narrow flat moulding, common to other parts of a column, *viz.* the bases, &c. as well as the capital; so called, because it encompasses the column round.—In which sense *annulet* is frequently used for *baguette* or little astragal.

ANNULLING *, the abolishing of an act, procedure, sentence, or the like.

* The word is compounded of *ad* and *nullus*, none; *q. d.* annulling.

ANNUNCIATE, ANNUNTIADA, or ANNUNTIATA, a denomination common to several orders, both religious and military; instituted with a view to the annunciation.

The first religious order of this kind was instituted in 1232, by seven Florentine merchants.—These are also called *Servites, q. d. Servants.*

The second was a nunnery at Bourges, founded by Joan queen of France, after her divorce from Lewis XII.

The third was also a nunnery, founded by a Genoese lady in 1600.—The fourth was a friary, founded by cardinal Torrecremata, at Rome; which last are grown so very rich, that they give fortunes of sixty Roman crowns to above 400 girls, on the anniversary of the annunciation.

Knights of the ANNUNCIATA, or ANNUNTIADA, was a military order, instituted in 1409, by Amadeus, duke of Savoy.

It was at first called the order of the true lovers knots; in memory of a bracelet of hair presented to the founder by a lady: but, upon the election of Amadeus VIII. to the pontificate, it changed its name for that of the *annunciata*.

ANNUNCIATION *, the tidings which the angel Gabriel brought to the holy virgin, of the mystery of the incarnation.

* The word is compounded of the Latin *ad* and *nuncio*, I tell; I declare; of *nuncio*, messenger.—The Greeks call it *Εωαγγελισμος*, good tidings; and *χαρισθημος*, salutation.

ANNUNCIATION is also the name of a feast, celebrated annually on the 25th of March, popularly called *Lady-day*, in commemoration of that wonderful event.

This feast appears to be of great antiquity in the Latin church. Among the sermons of St. Augustin, who died in 430, we have two on the *annunciation, viz.* the 17th and 18th of *sanctis*: and yet there are much earlier testimonies of its use in the Greek church. Proclus, who died in 446; Chryostom, in 407; and even Gregory Thaumaturgus, in 295; have all of them discoursed on the *annunciation*. Rivet, Perkins, and some other Protestant writers after them, have indeed questioned the authentickness of the two homilies of Gregory Thaumaturgus, on the *annunciation*; but Vossius acknowledges them the genuine productions of that father.

Add, that some authors are of opinion, that the feast was originally solemnized in honour of our Saviour; and that the holding it in the name and honour of the virgin is of a much later standing.

Several of the eastern churches celebrate the *annunciation* at a different season from those of the west.—The Syrians call it *bascharach, q. d.* search, inquiry; and mark it in their calendar, for the first day of December. The Armenians hold it on the 5th of January; thus anticipating the time, to prevent its falling in Lent: but the Greeks make no scruple of celebrating the festival even in Lent.

The Jews also give the title *annunciation* to part of the ceremony of their passover, *viz.* that, wherein they explain the origin and occasion of that solemnity.—This explanation they call *חגגה*, Haggada, *q. d.* the *annunciation*.

ANNULUS, a ring. See the article RING.

ANODYNE *, in physic, is understood of such remedies, as calm and assuage pain.

* The word is derived from the privative *a* and *adno*, delect, to be in pain.

Anodynes are of two kinds, the first, *proper*, called also *paregorics*.

The second *spurious*, or improper, which rather stupefy than alleviate; acting only by inducing a stupor, drowsiness or sleep.

These are more properly called *narcotics, hypostics, or opiates*.

The true *anodynes* are applied externally, to the part affected.—Such among the class of simples are the onion, lily, root of mallows, leaves of violets, elder, &c.

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We have also certain compound medicines in the shops, prepared with this intention, and called by this name.—Such is the *anodyne balsam*, made of Castile soap, camphor, sassafras, and spirit of wine; digested in a sand-heat. It is recommended not only for procuring ease in the most racking extremities of pain, but also for assisting in discharging the peccant matter that occasioned it. This balsam is much the same with the modern *opodeldoc*.

ANPOINTED. See the articles CHRIST, and MESSIAH.

Lord's-ANPOINTED. **ANOMALISTICAL Year**, in astronomy, called also *periodical year*, is the space of time wherein the earth passes through her orbit.

The *anomalistical*, or common year, is somewhat greater than the tropical year; by reason of the precession of the equinox. See PRECESSION.

ANOMALOUS *, *irregular*; something that deviates from the ordinary rule and method of other things of the same kind.

* The word is not compounded of the privative *a*, and *nomos*, law, as is usually imagined; for whence, on such supposition, should the last syllable *al*, arise? but it comes from the Greek *ανωμαλος*, *uneven, rough, irregular*, formed of the privative *a*, and *ωμος*, plain, even.

ANOMALOUS verbs, in grammar, are such as are irregular in their conjugations; deviating from the rules or formula's observed by others.

There are *anomalous verbs*, or irregular inflexions of verbs, in all languages.—In the English, all the irregularity in our *anomalous verbs* lies in the formation of the preter tense, and passive participle; though this only holds of the native Teutonic or Saxon words, and not of the foreign words, borrowed from the Latin, French, &c.

The principal irregularity arises from the quickness of our pronunciation, whereby we change the consonant *d* into *t*, cutting off the regular ending *ed*.

Thus for *mixed*, we write *mixt* or *mix'd*, for *dwell'd* or *dwell'd*; for *snatched* *snatcht*, &c.—But this properly is rather of the nature of a contraction than an irregularity; and is complained of by some of our politer writers as an abuse much to the disadvantage of our language, tending to disfigure it, and turn a tenth part of our smoothest words into clusters of consonants: which is the more inexcusable, in that our want of vowels has been the general complaint of the best writers.

Another irregularity relates to the preter tense, and passive participle.—Thus *give*, if it were regular, or formed according to the rule, would make *gived* in the preter tense, and the passive participle; whereas it makes *gave* in the preter tense, and *given* in the passive participle.

ANOMALY, in grammar, denotes an irregularity in the accidents of a word, whereby it deviates from the common rules or paradigms, whereby other words of the like kind are governed.

ANOMALY, in astronomy, is the distance of a planet from the aphelion or apogee: or it is an irregularity in the motion of a planet, whereby it deviates from the aphelion or apogee.

Kepler distinguishes three kinds of these *anomalies*; mean, eccentric, and true.

Mean or Simple ANOMALY, in the ancient astronomy, is the distance of a planet's mean place from the apogee.

In the modern astronomy, it is the time wherein the planet moves from its aphelion A, to the mean place or point of its orbit I. (*Tab. Astronomy, fig. 1.*)

Hence, as the arch, or the angle, or the elliptic area ASI, is proportional to the time wherein the planet describes the arch AI; that area may represent the mean *anomaly*. Or thus, the area SKA found by drawing a line LK, through the planet's place, perpendicular to the line of the apides PA, till it cuts the circle DA, and drawing the line SK; may represent the mean *anomaly*; for this area is every where proportional to the former area SIA, as is demonstrated by Dr. Gregory, lib. 3. *Elem. Astron. Physic. Math.—V. Phil. Trans. N° 447. p. 218.*

ANOMALY of the eccentric, or of the centre, in the new astronomy, is an arch of the excentric circle AK, (*fig. 1.*) included between the aphelion A, and a right line KL, drawn through the centre of the planet I, perpendicularly to the line of the apides AP. See EXCENTRIC.

In the ancient astronomy, it is an arch of the zodiac, terminated by the line of the apides, and the line of the mean motion of the centre.—See the methods of finding the *anomaly of the excentric*, in *Phil. Trans. N° 447. p. 218.*

True or equated ANOMALY is the angle at the sun, ASI, which a planet's distance from the apellum, AI, appears under; or it is the angle or area, taken proportional to the time in which the planet moves from the mean place I, to its aphelion A.

And hence, in the sun's motion, it will be the distance of his true place from the apogee.

The true *anomaly* being given, the mean one is easily found: but it is difficult to find the true *anomaly* from the mean one given.

The geometrical methods of Wallis and Newton, by the protracted cycloid, are not fit for calculation; nor yet the method

thod of series, as being too laborious. Hence astronomers are forced to have recourse to approximation. Ward, in his *Astronomia Geometrica*, takes the angle ASI, at the focus where the fun is not, for the mean anomaly; which will nearly represent it, if the orbit of the planet be not very excentric; and thus easily solves the problem. But this method does not hold of the orbit of Mars, as being more excentric than those of the other planets.

Sir Isaac Newton shews how to effect even this; and when his correction is made, and the problem solved according to Ward's hypothesis, Sir Isaac affirms, that even in the orbit of Mars, there will scarce ever be an error of above a second.

ANOMOEANS*, **ANOMOEI**, in church history, ancient heretics, who denied any similitude between the essence of the father and that of the son. See **TRINITY**.

* The word is Greek, composed of the privative *α*, and *ἴσους*, similar, resembling, *q. d.* different, dissimilar.

Anomoeans was the name whereby the pure Arians were distinguished in the fourth century, in regard that they not only denied the consubstantiality of the word, but even asserted, that he was of a nature different from that of the father: In contradistinction to the Semi-Arians, who indeed denied the consubstantiality of the word, but who owned at the same time, that he was like the father.

The Semi-Arians condemned the *Anomoeans* in the council of Seleucia, and the *Anomoeans* condemned the Semi-Arians in their turn, in the councils of Constantinople and Antioch; creating the word *ἴσους* out of the formula of Rimini, and that of Constantinople, and protesting that the Word had not only a different substance, but also a will different from that of the father. Whence they came to be called *ἰσμοιοι*.

ANONYMOUS*, something that is nameless; or to which no name is affixed.

* It is derived from the Greek *ἄνωνμος*, without name, formed of the privative *α*, and *ωνμα*, nomen, name.

The term is chiefly applied to books which do not express their author's name, and to authors whose names are unknown. Decker, advocate of the imperial chamber of Spire; and Placcius of Hamburg, have given treatises of *anonymous* books. —Burr. Goth. Struvius, treats of learned men who have endeavoured to divine the authors of *anonymous* books.

ANOREXY, **ANOREXIA***, in medicine, an inappetency, or loss of appetite.

* The word is compounded of the privative *α*, and *επιθυμια*, *appeto*, I desire.

Anorexia is properly a longer continuance than is natural, without a desire to eat.

If the thought or the sight of proper food create a sickness in the stomach, or a tendency to vomit; the case is more properly called a *nausea*.

Anorexia is chiefly considered as a symptom of some other disorder, from which the curative indications are to be taken, and afterwards stomachics used.

ANSÆ*, **ANSÆS**, in astronomy, those apparently prominent parts of the planet Saturn's ring, discovered in its opening, and appearing like handles to the body of that planet.

* The word is Latin; and literally signifies *handles*, or *cars*, of divers utensils.

ANSCOTE, in our ancient law books, the same with *anblete*. See **SCOT**.

ANSEL *Weight*. See **AUNSEL** *Weight*.

ANSELM's *Art*. See the article **ART**.

ANSES. See **ANSÆ**.

ANSPESSADES, or **LANSPESSADES**, a kind of inferior officers in the foot, below the corporals, and yet above the common centinels.

* The word is formed of the Italian *lancia spezzata*, *q. d.* broken lance; which was occasioned hence, that they were originally disbanded gendarmes, who, for want of other subsistence, sued for a place of some distinction in the infantry.

There are usually four or five in each company.

ANSWER, in a law sense, &c. See **REJOINER**.

FOREIGN ANSWER. See the article **FOREIGN**.

ANTA*, in the ancient architecture, a square column, or pilaster, placed at the corners of the walls of temples, and other edifices.

* These took their name, according to Mr. Perrault, from the preposition *ante*, before; because placed before the walls and coins of buildings to secure, or strengthen them.

The *antæ* stood out of the wall, with a projecture equal to one eighth of their face, provided there were no ornament that had a greater projecture; but it was a rule that the projecture of the *antæ* should always equal that of the ornaments.

ANTAGONIST*, **ANTAGONISTA**, among the ancients denotes an adversary in battle.

* The word is formed from the Greek *ἄντι*, *contra*, against, and *ἀγωνίζομαι*, I contend, or struggle.

In this sense the word is rather used in speaking of sportive combats, or games, than in serious fighting.

ANTAGONIST also denotes one of the parties in literary combats or disputes.

ANTAGONIST *Muscles*, in anatomy, are those which have opposite functions.

Such are the flexor and extensor of any limb, the one whereof contracts it, and the other stretches it out.

We have some solitary muscles, without any *antagonists*; as the heart, &c.

ANTANACLISIS*, a figure in rhetoric; whereby the same word is repeated, but in a different and sometimes doubtful signification.—As, Let the dead bury the dead.

* The word comes from the Greek *ἄντι*, and *ἀντιπᾶν*, *repercutio*, I strike again.

ANTANAGOGE, *ἀντιπαρονομα*, a figure in rhetoric, when not being able to answer the accusation of the adversary, we return the charge, by loading him with the same or other crimes.

ANTARCTIC * *Pole*, denotes the southern pole, or end of the earth's axis.

* The word is composed of *ἄντι*, *contra*, and *ἄρκτος*, *ursa*, bear, as being opposite to the *arctic pole*.

The stars near the *antarctic* pole never appear above our horizon.

ANTARCTIC *Circle* is one of the lesser circles of the sphere, parallel to the equator, at the distance of 29 deg. 30. min. from the fourth pole.

It takes its name from its being opposite to another circle, parallel likewise to the equator, and at the same distance from the north pole, called the *arctic circle*. See **ARCTIC** *Circle*.

ANTARES, in astronomy, the scorpion's heart; a fixed star of the first magnitude, in the constellation scorpion.—Its longitude, latitude, &c. see among the rest of the constellation **SCORPIO**.

ANTECEDENT*, in the schools, something that precedes, or goes before another, in respect of time.

* The word is compounded of the Latin preposition *ante*, before; and *cedens*, of *cedere*, to go.—In which sense it stands opposed to *subsequent*.

ANTECEDENT *Decree* is a decree preceding some other decree, or some action of the creature, or the provision of action.—It is a point much controverted, whether predestination be a decree *antecedent* to faith, or subsequent thereto.

ANTECEDENT *Will*, or *Desire*, is that which precedes some other will or desire, or some knowledge or provision.—Thus we say, God by a sincere, but *antecedent* desire, wills all men to be saved: that is, this sincere desire of God precedes, and does not suppose, the knowledge of their faith and repentance.

By the way it must be noted, that the term *antecedent* is only applied to God in respect of the order of nature, not of an order of succession; for that God, by reason of his infinite perfections, sees and foresees both at the same time: after the same manner he also wills, and that not successively, one thing after another.—Yet does not this hinder, but that God may will one thing on occasion of another, or have such a desire on occasion of such a provision; which divines call the *order of nature*, in contradistinction to that of time.

ANTECEDENT *Necessity*. See the article **NECESSITY**.

ANTECEDENT, in logic, denotes the first proposition of enthymeme, or of an argument which only consists of two members.

In opposition hereto, the latter is called the *consequent*. See **CONSEQUENT**, **CONCLUSION**, &c.

Thus in the argument *cogito, ergo sum*, I think, and therefore I exist, *cogito* is the *antecedent*; being thus called because it precedes the *ergo*, or the *copula* of the argument.

ANTECEDENT of a *Ratio* denotes the first term, or that which is compared with the other. See **RATIO** and **TERM**.

Thus, if the ratio be *a: b*, or of *a to b*; *a* is said to be the *antecedent*.

ANTECEDENT *Signs* are such symptoms of disorder as appear before a distemper is so formed as to be reducible to any particular class, or proper denomination.

ANTECEDENT in grammar, the word which a relative refers to.

ANTECEDENCY, **ANTECEDENCE**. See **ANTECEDENT** and **ANTECEDENTIA**.

ANTECEDENTIA, among astronomers.—When a planet appears to move westward, contrary to the order or course of the signs; as from Taurus towards Aries; it is said to move in *antecedentia*.

On the contrary, when it goes eastward or forward, from Aries towards Taurus; it is said to move in *consequentia*. See **PRECESSION** of the equinox.

ANTECESSOR, one that goes before, or that leads another. See **PRECURSOR**, **PREDECESSOR**, &c.

The term is particularly used in some universities for a public professor, who teaches, or lectures the civil law.

ANTECHAMBER*, or **ANTICHAMBER**, an outer chamber, before the principal chamber of an apartment; where the servants wait, and where strangers stay, till the person to be spoken withal is at leisure, &c.

* The word is formed of the Latin *ante camera*. See **CHAMBER**.

ANTECHRIST. See the article **ANTICHRIST**.

ANTEDATE, a spurious date, prior to the true date of a writing, instrument, act, deed, or the like. See **DATE**.

ANTEDILUVIAN, or **ANTIDILUVIAN**, something that existed or happened before the deluge.

In this sense, those generations from Adam, till Noah's flood, are called *antediluvians*; and those since descended from Noah, to the present time, are called *postdiluvians*.

Dr. Burnet, and Dr. Woodward differ very widely about the *antediluvian* world; the former imagines its face and appearance to have been smooth, equable, and in all respects different from what we now find it to be.

The latter, on the contrary, endeavours to prove, that the face of the terraqueous globe before the deluge was the same as it is now, *viz.* unequal, distinguished into mountains, and dales, and having likewise a sea, lakes, and rivers; that this sea was salt as ours is; was subject to tides, and possessed nearly the same space and extent that it now does, and that the *antediluvian* world was stocked with animals, vegetables, metals, minerals, &c. that it had the same position, in respect of the sun, which ours now hath, its axis not being parallel, but inclined, as at present, to the plane of the ecliptic; consequently, that there were then the same succession of weather, and the same vicissitudes of seasons, as now.

ANTEJURAMENTUM, or **PRÆJURAMENTUM**, by our ancestors also called *juramentum calumnie*; a oath which both the accuser and accused were anciently obliged to make before any trial or purgation.

The accuser was to swear, that he would prosecute the criminal; and the accused was to make oath, on the very day that he was to undergo the ordeal, &c. that he was innocent of the fact with which he was charged.

If the accuser failed, the criminal was discharged; if the accused, he was understood to be guilty, and was not to be admitted to purge himself by the ordeal.

ANTEPAGMENTA, or **ANTIPAGMENTA**, in the ancient architecture, the jambs of a door, or lintels of a window.

The word is also used for the entire *chambrane*, *i. e.* the door-case, or window-frame.

ANTEPENULTIMA*, or **ANTEPENULTIMATE**, in grammar, the third syllable of a word, reckoning from the latter end; or the last syllable except two.

* The word is compounded of the preposition *ante*, before; and *penultimate*, last but one.

It was upon this syllable, that the Greeks placed their acute accents.—The *antepenultimate* of a dactyle is always long.

ANTEPRÆDICAMENTA, **ANTEPRÆDICAMENTA**, in logic, certain previous matters, requisite to a more easy and clear apprehension of the doctrine of predicaments or categories. See **PREDICAMENT**.

Such are definitions of common terms; as equivocal, univocal, &c. See **DEFINITION**, **DIVISION**, &c.

They are thus called, because treated by Aristotle, before the predicaments; that the thread of the discourse might not afterwards be interrupted.

ANTERIOR*, or **ANTERIOUR**, something before another, chiefly in respect of place.

* The word is Latin, formed of the preposition *ante*, before.

In which sense the term amounts to the same with *prior*, and stands opposed to *posterior*.

ANTERIOR RAMUS. See the article **RAMUS**.

ANTESTATURE, in fortification, a small retrenchment, made of pallisades, or sacks of earth, set up in haste, to dispute with the enemy the remainder of a piece of ground, part whereof hath been already gained.

ANTHELIX, in anatomy, the inner circuit of the auricle; thus called from its opposition to the outer circuit, called the *helix*.

ANTHELMINTICS*, medicines good to destroy worms.

* The word is compounded of *anti*, contra, against, and *helix*, curvis, worm.

ANTHEM, a church song, performed in cathedral and other service, by the choristers, divided for that purpose into choruses, who sing alternately.

The word was originally used both for psalms, and hymns, when thus performed.

Socrates represents St. Ignatius as the author of this way of singing among the Greeks; and St. Ambrose among the Latins.—Theodoret attributes it to Diodorus and Flavian.

Analarus Fortunatus has wrote expressly of the order of *anthemi*, *de antiphonarum ordine*.

At present the term is used in a somewhat narrower sense, being applied to certain passages taken out of the Psalms, &c. and often accommodated to the particular solemnity in hand.

ANTHERÆ, in pharmacy, a term used by some authors for the yellow, or ruddy globules in the middle of certain flowers, as of lilies; *Galton*, &c.

Some confine the *anthera* to the yellowish globules in the middle of roses.—These are held more affecting than the rest of the plant.

Others apply the name **ANTHERÆ** to those little tufts or knobs which grow on the tops of the stamina of all other flowers; more usually called *opices*. See **APICES**.

ANTHESPHORIA*, in antiquity, a feast celebrated in Sicily, in honour of Proserpine.

* The word is derived from the Greek *ανθη*, flower, and *φωσ*, I carry, in regard that goddess was forced away by Pluto, when she was gathering flowers in the fields. Yet Felus does not ascribe the feast to Proserpine; but says it was thus called, by reason ears of corn were carried on this day to the temples.

Anthesphoria seems to be the same thing with the *floriferum* of the Latins; and answers to the harvest-home among us.

ANTHESTERIA*, in antiquity, was a feast celebrated by the Athenians, in honour of Bacchus.

* The most natural derivation of the word is from *ανθη*, *flor*, a flower; it being the custom at this feast to offer garlands of flowers to Bacchus.

Some are of opinion it took its name from the month *anthestivion*, wherein it was celebrated.—Others pretend, that this was not the name of any particular feast, but that all the feasts of Bacchus were called *anthesteria*.

The *anthesteria* lasted three days, the eleventh, twelfth, and thirteenth day of the month; each of which days had a name suited to the proper office of the day.—The first day of the feast was called *ανθηστια*, *i. e.* opening of the vessels, in regard on this day they tapped the vessels, and tasted the wine.—The second they called *ανθηστια*, *congia*, the name of a measure, containing the weight of about ten pounds; on this day they drank the wine prepared the day before.—The third day they called *ανθηστια*, *kettles*; on this day they boiled all sorts of pulse in kettles; which, however, they were not allowed to taste, as being all to be offered to Mercury.

ANTHOLOGION*, a church book in use among the Greeks. See **GREEK**.

* It was called *ανθολογιον*, *q. d.* *florilegium*, or a collection of flowers. See **ANTHOLOGY**.

The *anthologion* is a sort of breviary or mass-book, containing the daily offices addressed to our Saviour, the virgin, and the principal saints; with other common offices of prophets, apostles, martyrs, pontiffs, and confessors, according to the Greek rite. See **BREVIARY**, **MASS**, and **OFFICE**.

ANTHOLOGY*, **ANTHOLOGIA**, a discourse or treatise of flowers; or of beautiful passages from any authors.

* Thus called from *ανθη*, *flor*, a flower, and *λογος*, *sermo*, discourse.—Though others chuse rather to derive *anthology* from *ανθη*, *flor*, a flower, and *λεγω*, I gather; and use it to signify a collection of flowers.

ANTHOLOGY is frequently used for a collection of epigrams of divers Greek poets.

ANTHONY—Knights of St. *Anthony*, an order of Knighthood, established in 1382, by Albert of Bavaria, &c. who had then taken a resolution to make war against the Turks.

The knights of this order wore a collar of gold, with a hermit's girdle, to which hung a crutch and a little bell.

Some authors mention another order of St. *Anthony* in Ethiopia, instituted in 370.

St. **ANTHONY'S FIRE**. See **ERYSIPELAS**.

ANTHORA*, a medicinal plant, of the aconite kind, having yellow flowers, resembling helmets; growing chiefly on the mountains in Switzerland and Savoy.

* This is otherwise called *antibara*, as being reputed an antidote against the thora; sometimes *aconitum salutariferum*, in English the *helmet flower*. See **ACONITE**.

The root is chiefly in use. It is of a warm bitterish taste, and is reputed a cardiac and alexipharmic, much of the same qualities with *contrayerva* root; on which account some also denominate it the *German contrayerva*, though it now only obtains in few official compositions.

ANTHOS, *ανθος*, in its original Greek, signifies flower; but by way of excellency is appropriated to rosmary, so as to express only that plant.

ANTHOSATUM Acetum. See **ACETUM**.

ANTHRACOSIS*, a disease of the eyes, occasioned by a corrosive ulcer, either in the bulb of the eye, or the eyelids, covered with skin, and attended with a general swelling of the parts adjoining.

* The word is Greek *ανθρακωσις*, and denotes an inflammation resembling a coal; *ανθραξ* signifying a coal. See **ANTHRAX**.

ANTHRAX *, Ἀνθραξ, literally signifies a coal; and figuratively, a scab or blotch, made by a corrosive humour, which, as it were, burns the skin, and occasions sharp pricking pains.

* The *anthrax* is the same with what is otherwise denominated *carbo* and *carbunculus*.

ANTHROPOLOGY *, **ANTHROPOLOGIA**, a discourse, or treatise upon man, or human nature; considered as in a found, or healthy state.

* The word is compounded of ἀνθρωπος, man, and λογος, discourse.

Anthropology includes the consideration both of the human body and soul, with the laws of their union, and the effects thereof, as sensation, motion, &c.

ANTHROPOLOGY is particularly used in theology, for a way of speaking of God, after the manner of men; by attributing human parts and passions to him; as eyes, hands, ears, anger, joy, &c.

We have frequent instances of *anthropology* in holy Scripture, by which we are only to understand the effect, or the thing which God does, as if he had hands, &c.

ANTHROPOMANCY *, **ANTHROPOMANTIA**, a method of divination, performed by inspecting the viscera of a person deceased.

* The word is compounded of ἀνθρωπος, man, and μαντια, divination.

ANTHROPOMORPHITE *, in a general sense, one who attributes to God the figure of a man.

* The word comes from the Greek ἀνθρωπος, man, and μορφη, shape.

ANTHROPOMORPHITES were a sect of ancient heretics, who, taking every thing spoken of God in the Scriptures in a literal sense, imagined he had real hands, feet, &c.—They also held, that the patriarchs saw God in his proper divine substance, with their natural eyes.

The passage they chiefly insisted on was that in Genesis, where it is said, that God made man after his own image.—The orthodox, who held the contrary, viz. that God is incorporated and without any bodily form, the Anthropomorphites branded by the name of *Origenists*, by reason Origen taught how to allegorize those expressions.

Epiphanius calls the Anthropomorphites *Audiani*, or *Oadiani*, from Audius the supposed founder of the sect, who lived about the time of Arius, in Mesopotamia. St. Augustin calls them *Vadiani*.

ANTHROPOPATHY *, a figure, expression or discourse, whereby some passion is attributed to God, which properly belongs only to man.

* The word is compounded of ἀνθρωπος, man, and παθος, passion.

Anthropopathy is frequently used promiscuously with anthropology; yet in strictness they ought to be distinguished, as the genus from the species.—Anthropology may be understood of any thing human attributed to God; but *anthropopathy*, only of human affections, passions, sensations, &c.

ANTHROPOPHAGI *, people who feed on human flesh.

* The word is compounded of the Greek ἀνθρωπος, man, and φάγειν, edere, to eat.

The Cyclopes, the Lestrygons, and Scylla, are all represented in Homer as anthropophagi, or man-eaters: and the female phantoms, Circe and the Syrens, first bewitched with a shew of pleasure, and then destroyed.—This, like the other parts of Homer's poetry, had a foundation in the manners of the times preceding his own. It was still in many places, the age spoken of by Orpheus,

*When men devour'd each other like the beasts,
Gorging on human flesh.*

Some remains of the usage subsisted much longer, even among the most civilized nations, in the practice of offering human sacrifices.

The primitive christians were accused of *anthropophagia* by the heathens: of celebrating Thyeitea epula, and allowing Oedipodet concubitus; as appears from Tatian, Tertullian in his *Apologeticis*, cap. VII. and Salvan de *Provid.* lib. IV. They affirmed, that, in the mysteries of their religion, the christians killed a child, and feasted on its flesh. This calumny was grounded on their misunderstanding what they had heard of the Eucharist, and the Communion.

ANTHROPOPHAGIA, the act or habit of eating human flesh.

Some authors trace the original of this barbarous custom as high as the deluge; and attribute it to the giants.—Pliny mentions Scythians and Sauromatans; Solinus, Ethiopians; and Juvenal, Egyptians; who accustomed themselves to this horrible repast. *Vid. Plin. hist. nat. l. 4. c. 12. l. 6. c. 17. 30. l. 7. c. 2. Solin. Polyb. c. 33.*—Livy tells us, that Hannibal made his soldiers eat human flesh, to render them more fierce and daring in battle.—In the southern parts of Africa, and in some parts of America, this horrid practice is said still to obtain.

ANTHROPOPHAGY, in effect, seems not to have been the vice of any country, or nation, but of the age. Before the arts of

life had reached and softened them, most nations practised it. Orpheus is said to have been the first who drew men from this savage custom; which gave rise to the fable of his taming lions, and tygers.

*Sylvestres homines, sacer, interpretisque deorum
Cædibus et victu sacro deterruit Orpheus:
Dicitur ob hoc lenire tygres, rapidisque leones.* Hor.

Some physicians vainly think they have discovered the principle of *anthropophagy*; and that it consists in an acrid atrabiliary humour, which, being lodged in the coats of the ventricle, produces this voracity. And they give several instances of this inhuman hunger, even among their own patients.—M. Petit has disputed the question, whether or no *anthropophagy* be contrary to nature?

ANTI, ἄντι, is a preposition used in composition with several words both in Greek, Latin, English, &c. in different senses. In English, it sometimes signifies before; as in antichamber, a place before the chamber.—In which case it has the same meaning with the Latin, *ante*, before.

Sometimes again it signifies *contrary*, or *opposite*: and is then derived from the Greek *anti*, *contra*, against.

In this latter sense, the word makes part of the name of various medicines, to denote some peculiar or specific virtue in them against certain diseases; such *e. gr.* are antivenereals, antiscorbutics, antinephritics *, &c.

* Patin speaks of a quack in his time, at Paris, who made no scruple to sell anti-eclyptic, and anti-cometic medicines; preservatives, forsooth, against the noxious effects of eclipses, and comets. *Litt. Chroiq. 344.*

The preposition is frequently however omitted on these occasions, without any alteration of the sense; as in nephritics, arthritics, asthmatics, &c.

ANTI, in matters of literature, is a title given to divers pieces written by way of answer, to others, whose names are usually annexed to the *Anti*.

See the *Anti* of M. Baillet; and the *Anti-Baillet* of M. Menage; there are also *Anti-Menagiana*, &c. Cæsar the dictator wrote two books by way of answer to what had been objected to him by Cato; which he called *Anti-Catonis*; these are mentioned by Juvenal, Cicero, &c.—Vives assures us, he had seen Cæsar's *Anti-Catonis* in an ancient library.

ANTIADÉS, a term used by some writers for the glandules, and kernels, more commonly called *tonsils* and *almonds of the ears*. See **TONSIL**.

ANTIADIAPHORISTS *, **ANTIADIAPHORISTÆ**, opposite to the *adiaphorists*. See **ADIAPHORIST**.

* The word is compounded of the Greek *anti*, *contra*, against, and ἀδιαφορος, indifferent.

This name was given, in the fourteenth century, to the rigid Lutherans, who disavowed the episcopal jurisdiction, and many of the church ceremonies, retained by the moderate Lutherans. See **LUTHERAN**.

ANTIBACCHIUS, in the ancient poetry, a foot, consisting of three syllables; the two first whereof are long, and the third short.

Such are the words *cantare*, *virtute*, *ἔδνησι*, &c.

It is so called as being contrary to the *Bacchius*, the first syllable whereof is short, and the two last long. See **BACCHIUS**. Among the ancients, this foot is also denominated *palimbacchius*, and *saturnius*; and by some *proponticus*, and *theffalus*. *Diom. iii. p. 475.*

ANTICARDIUM *, in anatomy, &c. that hollow part under the breast, just against the heart, commonly called the *pit of the stomach*: called also *serobiculus cordis*.

* The word is compounded of *anti*, *contra*, against, and καρδια, cor, heart.

ANTICHRESIS, in the civil law, a covenant or convention, whereby a person borrowing money of another engages, or makes over his lands or goods to the creditor, with the use and occupation thereof, for the interest of the money lent. This covenant was allowed of by the Romans; among whom usury was prohibited: it was afterwards called *mortgage*, to distinguish it from a simple engagement, where the fruits of the ground were not alienated, which was called *viv gage*.

ANTICHRIST *, in a general sense, denotes an adversary of Christ, or one who denies that the Messiah is come.

* The word is compounded of the Greek *anti*, *contra*, against, and χριστος, Christ.

In this sense, Jews, Infidels, &c. may be said to be *antichrists*. **ANTICHRIST** is more particularly used for a tyrant who is to reign on earth, toward the end of the world; to make the ultimate proof of the elect; and to give a shining instance of the divine vengeance, before the last judgment.

The bible and the fathers all speak of *antichrist* as a single man; though they assure withal, that he is to have divers precursors or fore-runners.—Yet many protestant writers apply to the Romish church, and the pope who is at the head of it, the several marks and signatures of *antichrist* enumerated in the Apocalypse; which would rather imply *antichrist* to be a corrupt society, or a long series of persecuting pontiffs, than a single person.

However, the point having been maturely debated at the council of Gap, held in 1603, a resolution was taken thereupon,

to insert an article in the confession of faith, whereby the pope is formally declared to be *antichrist*.—Pope Clement VIII. we read, was stung to the life with this decision; and even king Henry IV. of France was not a little mortified, to be thus declared, as he termed it, an imp of *antichrist*. The learned Grotius maintains, that Caligula was *antichrist*; but neither does this quadrate with his appearance at the end of the world.

Father Malvenda, a Spanish jesuit, has published a large and learned work, *de antichristo*, in thirteen books.—In the first, he relates all the opinions of the fathers with regard to *antichrist*. In the second, he speaks of the time when he shall appear; and shews, that all the fathers, who supposed *antichrist* to be near at hand, judged the world also was near its period. In the third, he discourses of his origin and nation; and shews, that he is to be a Jew, of the tribe of Dan: this he founds on the authority of the fathers; on that passage in Genesis XLIX. *Dan shall be a serpent by the way*, &c. on that of Jeremy VIII. 16. where it is said, *the armies of Dan shall devour the earth*; and on the Apocalypse, cap. VII. where St. John, enumerating all the tribes of Israel, makes no mention of that of Dan. In the fourth and fifth books, he treats of the signs of *antichrist*. In the sixth, of his reign and wars. In the seventh, of his vices. In the eighth, of his doctrine and miracles. In the ninth, of his persecutions; and in the rest, of the coming of Enoch and Elias, the conversion of the Jews, the reign of Jesus Christ, and the death of *antichrist*, after his having reigned three years and a half.

ANTICHTHONES*, in geography, are those people who inhabit countries diametrically opposite to each other.

* The word is compounded of *anti*, *contra*; and *χθων*, *terra*; earth.—They are sometimes also called by Latin writers *antitigene*.

In which sense *Antichthones* amounts to much the same with what we more usually call *Antipodes*.

ANTICHTHONES is also used in ancient writers to denote the inhabitants of contrary hemispheres.

In which sense *Antichthones* differ from *Anteci* and *Antipodes*. The ancients considered the earth as divided by the equator into two hemispheres, the northern and southern; and all those who inhabited one of these hemispheres were reputed *Antichthones* to those of the other.

ANTICIPATION, the act of preventing, or being beforehand, with a person or thing; or of doing a thing before the time.

Anticipating a payment denotes the discharging it before it falls due.—Such a debt was not yet become due; he *anticipated* the time of payment.

ANTICIPATION, in philology. See **PRÆNOTION**. **Commission of ANTICIPATION**. See **COMMISSION**.

ANTICOR, **ANTICOEUR**, or *avant cœur*, among farriers, is usually described as a preternatural swelling, of the size and figure of an apple, occasioned by a sanguine and bilious humour; and appearing in a horse's breast opposite to his heart. A late writer affirms, that the generality of authors on that subject have been mistaken as to this disease; attributing it to the heart, whence it is by Solleysel called the *swelling of the pericardium*; whereas it is really an inflammation in the gullet and throat; and is the same that in human bodies is called the *angina*, or *sqwinancy*.

ANTICUS.—*Serratus major* **ANTICUS**.

Serratus minor **ANTICUS**.

Peroneus **ANTICUS**.

Tibialis **ANTICUS**.

} See **SERRATUS**,
PERONEUS,
TIBIALIS.

ANTIDACTYLUS, a name given by some to a kind of poetical foot, which is the reverse of a dactyl; as consisting of three syllables, whereof the first two are short, and the Joseph after last long.

ANTIDATE. See **ANTEDATE**.

ANTIDICOMARIANITES*, a sect of ancient heretics, who pretended, that the holy virgin did not preserve a perpetual virginity, but that she had several children by Joseph after our Saviour's birth.

* These are otherwise called *Antidicomarites*, and *Antidicomaritanes*, and *Antidicomarianists*, sometimes also *Antimariani*.

Their opinion was grounded on some expressions of our Saviour, wherein he mentions his brothers and his sisters; and on that text of St. Matthew, where he says, that Joseph knew not Mary till she had brought forth her first-born son. The *Antidicomarianites* were the disciples of Helvidius and Jovinian, who appeared in Rome toward the close of the fourth century.

ANTIDILUVIAN. See the article **ANTEDILUVIAN**.

ANTIDOTE*, a remedy taken either to prevent, or cure some contagious malignant, or other dangerous disease.

* The word is borrowed from the Greek *ἀντιδοτα*, against; and *δοτα*, I give; as being something given against poison, either by way of cure, or preservative.

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ANTIDOTE is also used to signify a medicine taken to prevent the ill effects of some other, for instance, poison.

In which sense the word has the same signification with alexipharmic, alexiterial and counterpoison.

ANTIENENT. See the article **ANCIEN**.

ANTIHECTICS, **ANTIHECTICA**, remedies against heclical disorders.

ANTIHECTICUM Paterii, in pharmacy, a celebrated chymical preparation, made of equal quantities of tin and chalybeated regulus of antimony, by melting them in a large crucible, and putting to them, by little and little, three times the quantity of nitre: the detonation being over, the whole is to be washed with warm water till no saltness remains.

This is a very penetrating medicine, making way into the minutest passages, and searching even the nervous cells; whence its use in heclical disorders, from which it derives its name. It is applied to good purpose in heavinesses of the head, giddiness, and dimness of sight, from whence proceed apoplexies and epilepsies; and in all affections and foulnesses of the vickers of the lower belly, it is reckoned inferior to nothing. Thus it does service in the jaundice, dropries, and all kind of cachexies.—Quincy adds, that there is scarce a preparation in the chymical pharmacy of greater efficacy in most obstinate chronic deslensers.

ANTILOGARITHM, the complement of the logarithm of a sine, tangent, or secant; or the difference of that logarithm from the logarithm of ninety degrees. See **LOGARITHM**, and **COMPLEMENT**.

ANTILOGY*, **ANTIOLOGIA**, a contradiction between two expressions or passages in an author.

* The word is Greek, *ἀντιλογία*, *q. d.* contrary saying.

Tirinus has published a large index of the seeming *antilogies* in the bible, *i. e.* of texts which apparently contradict each other, but which are all explained and reconciled by him, in his comments on the bible.—Dom. Magri, a Maltese of the oratory in Italy, has attempted the like; but he has done little more than rehearse what occurs of that kind in the principal commentators.

ANTIMENSURIUM, *Antimensurium*, a kind of consecrated table-cloth, occasionally used in the Greek church, in places where there is no proper altar.

F. Goar observes, that in regard the Greeks had but few consecrated churches, and that consecrated altars are not things easy to be removed; that church has for many ages made use of certain consecrated stuffs, or linens, called *antimensura*, to serve the purposes thereof.

ANTIMONARCHICAL, something that opposes or stands against monarchy, or kingly government.

Antimonarchical is frequently used in the sense of *republican*.

ANTIMONIALS, in medicine, denote preparations of antimony; or remedies whereof antimony is the basis, or principal ingredient.

Antimonials are chiefly of an emetic tendency; though they may be so qualified as to become either cathartic or diaphoretic, or even only alterative. See **WARD'S PILL**.

Quincy assures us, that there are no medicines in pharmacy to be compared with these in maniacal affections: for that there are no emetics or cathartics of any other tribe that are strong enough for such patients, unless in an over-dose; which might be dangerous.

An *antimonial* cup, made either of glass of *antimony*, or of *antimony* prepared with salt-petre, tho' a substance indissoluble by the stomach, will give a strong cathartic, or emetic quality to any liquor poured into it; without any diminution of its own weight.

ANTIMONY, **ANTIMONIUM**, in natural history, a mineral substance of a metalline nature; having all the seeming characters of a real metal, excepting only malleability.

Antimony is the *stibium* of the ancients; by the Greeks called *στυβιον*.—The reason of its modern denomination *antimony* is usually referred to Basil Valentine, a German monk, who, as the tradition relates, having thrown some of it to the hogs, observed, that, after purging them violently, they immediately grew fat upon it. This made him think, that, by giving his fellow-monks a like dose, they would be the better for it. The experiment however succeeded so ill, that they all died of it; and the medicine thenceforward was called *antimony*, *q. d.* *anti-mook*.

Its singular properties and effects have occasioned it various other denominations; as *perovius*, by reason of its various forms and appearances, *lupus*, *depravator*, *saturum* of the philosophers, *balneum solis*, *lavacrum leproforum*, *radix metalorum*, *magnesia saturni*, &c. all chiefly respecting its faculty of destroying and dissipating whatever metals are fused along with it, except gold; whence its great use in refining and purifying.

Antimony is what we properly call a *semi-metal*; being a fusible substance, composed of some undetermined metal, combined with a sulphurous and stony substance.

It is found in mines of all metals; but chiefly in those of silver and lead: that in gold mines is usually held the best.—It

has also its own peculiar mines; particularly in Hungary, Transylvania and Germany, and in several provinces of France; as also, within us in some parts of Cornwall.

Antimony is found in clods of several sizes, bearing a near resemblance to black lead; only that it is lighter and harder: whence also it is called *marcasite of lead*; and its metalline part has been by some supposed to be of that species.

Its texture is somewhat particular, being full of little shining veins or threads, like needles; brittle as glass.—Sometimes there are veins of a red or golden colour intermixed, from which it is called *male antimony*; that without them being denominated *female*.—It fuses in the fire, though with some difficulty.

When dug out of the earth, it is put into large crucibles, fused by a violent fire, and then poured into cones, or antimonial horns, which make the common or crude *antimony* of the shops; the apex whereof is always the best and purest part, as the basis or broadest part is the foulest.

Antimony is supposed by many of the chymists to contain the seminal principles of all kind of metals; and accordingly the character whereby it is denoted in their writings is the same with the character of the earth; to denote that *antimony* is a kind of microcosm.

The uses of *antimony* are very numerous, and important.—It is a common ingredient in specula, or burning concaves, serving to give the composition a finer texture.—It makes a part in bell-metal; and renders the found more clear.—It is mingled with tin to make it more hard, white and sound; and with lead, in the casting of printers letters, to render them more smooth and firm. It is also a general help in the melting of metals, and especially in casting of cannon balls.

Antimony, is particularly used in pharmacy, under various forms, and with various intentions, chiefly as an emetic.—Its medicinal virtue is supposed to arise from the sulphurous part in its composition, which being dissolved by any proper menstruum, sets at liberty an active volatile salt, or some other unknown principle, to which its operation is chiefly owing.

Before the fourteenth century, *antimony* had no place in medicine; otherwise than as an ingredient in some cosmetics for blackening the eye-brows: but about that time Basil Valentine, having found a method of preparing and correcting the dangerous qualities of its sulphur, published a book, intitled, *Curus triumphalis antimonii*, wherein he maintained it a sure remedy for all diseases.—But, in spite of all he could say in its behalf, though confirmed by experience, *antimony* remained in a general neglect, upwards of an hundred years; till about the beginning of the sixteenth century, when it was brought into vogue by Paracelsus.—The parliament of Paris, immediately upon this restoration, condemned the use of it in form; and a physician named Benier, having been found delinquent herein, was expelled the faculty. It seems, a great deal of mischief had been done by it, for want of knowing the proper ways of giving it; so that the arrest of parliament represents it as a mere poison, incapable of being corrected by any method of preparation, and not to be taken inwardly, without the utmost damage.

Several learned men complained of so severe and unjust a prohibition; and by a course of happy experiments at length brought it into esteem again: whence in spite of all the invectives made against *antimony*, by divers authors, it was at length replaced, in the year 1637, by publick authority, among the number of purgative drugs; and was inserted accordingly in the pharmacopœia, published by the faculty the same year.

Patri did all he could to decry *antimony*: in his letters we find an unusual vehemence expressed against it.—He had even compiled a large register of persons whom the physicians had killed by it; which he called the *Martyrology of antimony*.

Butter of ANTIMONY, is a white, and thick liquor; otherwise called *icy oil of antimony*. It is usually prepared of crude (though sometimes of regulus of) *antimony*, and corrosive sublimate, by pulverizing, mixing, and distilling them by a gentle heat: upon which the butter rises into the neck of the retort; from which, when full, it is to be melted down into a receiver, by the application of live coals.

It is of a very fiery, corrosive nature, so as to be a poison when used internally. Externally it is applied as a caustic, to stop gangrenes, and cure caries, cancers, &c.

This butter may be converted into an oil, called also *rectified butter of antimony*; by gently distilling it a second time; which renders it more fluid, subtle, volatile, and efficacious.—This digested with thrice its weight of alcohol, makes the purple tincture of *antimony*, a secret highly valued by Mr. Boyle, as an excellent vomit.

The same butter precipitates, by warm water, into a white, ponderous powder, or calx, called *mercurius vitæ*, and powder of *algarot*: which is a very violent emetic.

Oil butter of *antimony* is also prepared the bezoar mineral; by dissolving the rectified butter with spirit of nitre: then drying the solution, and applying more spirit of nitre, and re-

peating this a third time. The white powder remaining at last, kept nearly red-hot for half an hour, is the bezoardicum mineral.

Ceruss, or *Calx of ANTIMONY*, is the regulus distilled with spirit of nitre, in a sand-furnace; what remains after the fumes are all spent is a white powder; which, being washed sweet, is the ceruss required.—It is diaphoretic; and by many is set on a footing with the mineral bezoar.

Cinnabar of ANTIMONY is prepared of mercury, sulphur, and *antimony* mixed and sublimed in a luted bolt-head, and a naked fire.—It is a good diaphoretic and alterative.

There is also a cinnabar of *antimony* procured after the butter of *antimony* has done rising, by increasing the degree of fire.—This sublimed a second time, makes a yet better cinnabar.

Clyssus of ANTIMONY. See the article *CLYSSUS*.

Crocus, or *Liver of ANTIMONY*, is the same with what we otherwise call *crocus metallorum*; excepting that this latter is more mild and less emetic; being made by repeated lutions of the former, in warm water, and then drying it again to a powder. See *CROCUS Metallorum*.

It is also called *opaline magnesia*, *terra sancta Rulandi*, *terra auræ*, *terra rubra*, &c.

Crude ANTIMONY, or *antimony in substance*, is the native mineral *antimony*, melted down and cast in cones, as above mentioned.—It is much used in diet-drinks and decoctions of the woods, and in compositions against the scurvy, as a diaphoretic, and deobstruent.

Diaphoretic ANTIMONY is prepared of *antimony* powdered and mixed with three times the quantity of nitre; and the mixture thrown at several times into an ignited crucible: upon which, a detonation ensues. What remains being kept in fusion a quarter of an hour, turns into a white mass called *antimonium diaphoreticum nitratum*, or *diaphoretic antimony with nitre*; the *antimony* being hereby bereaved of its emetic and purgative virtue, and rendered only diaphoretic.

If the air have access to it, it will again become emetic.

There is also a kind of sweet diaphoretic *antimony*, made of the former, by pulverizing, boiling it in water, and filtering the decoction: upon which a white powder will be left in the filtre; which being washed by repeated affusions of warm water, and dried, is the *dulcified diaphoretic antimony*.—This is given as an alexipharmic in malignant fevers, small pox, &c. particularly in a case of delirium. It is also applied in scorbutic and venereal disorders: but the learned Boerhaave absolutely decries it, as a mere metalline calx, destitute of all medicinal virtue, and only fit to load and choak up the body, by its inactivity and weight.

Diaphoretic nitre of ANTIMONY is made by exhaling the solution of the preceding preparation over a gentle fire to a dryness; upon which, there remains a salt composed of nitre, and the sulphur of the *antimony*, called *nitrum antimoniatum*.—It is no other than a sort of sal prunellæ, or sal polychrestum; and accordingly is found aperitive, cooling, diuretic; and good in inflammatory fevers, &c.

Flower of ANTIMONY, is *antimony* pulverized, and sublimed in an aludel; the volatile parts whereof then stick to the subliming pot.

This also is a powerful vomitive; and is of singular efficacy in maniac cases; being the Herculean remedy by which some have gained so much reputation.

Another sort of flowers are made of the regulus of *antimony* with sal-ammoniac sublimed as before; which make a remedy somewhat gentler than the former.—Helmont also gives us a preparation of purging flowers of *antimony*.

Glass of ANTIMONY, *vitrum antimonii*, is crude *antimony*, ground and calcined by a vehement fire, in an earthen crucible; till it cease to fume, which is a proof that its sulphur is evaporated.—The calx is then vitrified in a wind furnace; upon which it becomes transparent, studdy, and shining.

This is the strongest emetic of any preparation of *antimony*. See *EMETIC*.—Yet, if dissolved in spirit of urine, it ceases to be either emetic or cathartic; even though the menstruum be afterwards drawn from it.

Magistery of ANTIMONY is crude *antimony*, digested with aqua regia eight or ten days; to which, water is then put, but poured off again ere it settle: this to be repeated till there remain nothing behind but a yellowish powder; which, being suffered to settle, and the water decanted off, becomes by repeated ablutions, an insipid magistery. Its operation is rather cathartic than emetic, though sometimes only sudorific.

Regulus of ANTIMONY, or purification of *antimony*. See *REGULUS of antimony*.

Of this are made the pillule perpetuæ, vinum emeticum, &c.

Golden sulphur of ANTIMONY is made of the scoria which arise in preparing the regulus; by boiling it, filtering the hot decoction, and adding distilled vinegar: upon which the whole coagulates, changes into a brown colour, emits a hercoraceous

teous odor, and precipitates a red powder. The whole mass being washed by repeated affusions of water, till the liquor come away senseless and insipid, and then dried, it becomes a red powder, called the *golden sulphur*, or *precipitate of antimony*; either on account of its own colour, or the yellow one it gives to glass, metals, &c.—It either proves emetic, cathartic, diuretic, or sudorific, as its force happens to be determined.

Prepared ANTIMONY is either crude *antimony* levigated, or that which has undergone some chymical process, whereby its nature and powers are altered or abated; and this differently, according to the circumstances of the preparation.

Antimony, says Mr. Boyle, alone, or associated with one or two other ingredients, by a variety of operations and compositions, might be brought to furnish a whole apothecary's shop: It will answer the physician's intention, whether he wants to employ a cathartic, or an emetic, a diuretic, diaphoretic, deobstruent, bezoardic, or cordial.

Revised ANTIMONY, *antimonium resuscitatum*, is prepared of flowers of *antimony* and sal-ammoniac, digested in distilled vinegar; then exhaled, and the remainder sweetened by ablation.—It is emetic, and sometimes also sudorific; and is good in maniacal cases, &c.

All these preparations of *antimony*, how severe soever alone, may yet be so managed, as to operate little or nothing at all in the prime vice, nor be perceived till the are got into the smallest vessels.—And then it is they are qualified to combat the gout, pox, evil, &c.

ANTINOMY*, **ANTINOMIA**, a contradiction between two laws, or between two articles of the same law. See **LAW**.

* The word is derived from the Greek *anti*, *contra*, and *nomos*, *lex*, *law*.

ANTINOMY sometimes also signifies an opposition to all law.

Whence a sect of enthusiasts, who are for carrying gospel-liberty above all moral regards, and who slight the motives of virtue as insufficient to salvation, are called *Antinomians*; and sometimes *Anomians*.

ANTINOUS, in astronomy, a part of the constellation *aquila*, or the eagle. See **AQUILA**.

ANTIPAGMENTS, **Antipagmenta** See **ANTEPAGMENTS**.

ANTIPATHY*, **Antipathia**, a natural enmity or aversion of one body to another.—In which sense the word stands opposed to *sympathy*.

* The word is compounded of the Greek *anti*, *contra*, against, and *πάθος*, *passion*.

Such an aversion is commonly said to be between the salamander and the tortoise, the vine and the elm, the toad and the weazel, the sheep and the wolf, the olive and the oak, &c.

Porta (*Mag. natur.* 20. 7.) and Merfenne (*Quest. Comment. in Genes.*) give other more extraordinary, not to say ridiculous instances; as, that a drum made of a wolf-skin, will break another made of a sheep-skin: that hens will fly at the sound of a harp strung with fox-gut strings, &c. See other matters relating to this head, under the articles **SOUND**, **MUSIC**, **TUNE**, **TARANTULA**, &c.

Mr. Boyle mentions "a lady, who having a strange *antipathy* to honey; and her physician conceiving it in great measure imaginary, mixed a little honey in a medicine applied to her foot: but he soon repented his curiosity; for it caused a strange disorder in her, which ceased however upon removing of the medicine. *Ussul. Philosph.*"—Dr. Mather relates, that "a gentlewoman in New-England swooned upon seeing any one cut their nails with a knife; but was not the least affected, if the same was done with a pair of scissars." *Phil. Transact.* N^o. 339.

The Peripatetics account for *antipathies*, from certain occult qualities inherent in the bodies.

Some think that the term *antipathy*, can only be applied to any certain purpose, when used with the restriction of modern philosophers; among whom it signifies no more than a *vis centrifuga*, or repelling power. See **SUPPLEMENT**, article **ANTIPATHY**.

ANTIPERISTALTIC*, in anatomy, a motion of the intestines contrary to the peristaltic motion. See **PERISTALTIC**.

* The word is derived from the Greek *anti*, against, *πίπτω*, about, and *σπαστικός*, that which hath the power of compressing.

As the peristaltic motion is a contraction of the fibres of two intestines from above, downwards; the *antiperistaltic* motion is their contraction from below, upwards.

ANTIPERISTASIS*, in philosophy, the action of two contrary qualities; one whereof, by its opposition, excites and heightens the force of the other.

* The word is Greek, *Antiperistasis*; formed of *anti*, *contra*, against, and *περιστάσις*, to stand round: *q. d.* circumstantia, or the renitency against any thing that surrounds or besieges another.

Antiperistasis, is usually defined, "the opposition of a contrary quality, whereby the quality it opposes becomes heightened, or intended: or the action whereby a body, attacked by another, collects itself, and becomes stronger

"by such opposition: or it is an intention of the activity of one quality, caused by the opposition of another." Thus cold, say the school-philosophers, on many occasions, exalts the degree of heat, and dryness that of moisture.

Thus it is, that quick-lime is set on fire by the affusion of cold water: and so water becomes warmer in winter than in summer, by *antiperistasis*: and to the same cause it is owing, that thunder and lightning are excited in the middle region of the air, which is continually cold.

This *antiperistasis* was a principle of great use and extent in the Peripatetic philosophy.—"Tis necessary," according to the authors of that class, "that cold and heat be both of them endued with a self-invigorating power, which each may exert when surrounded by its contrary; and thereby prevent their mutual destruction. Thus it is supposed, that in summer the cold, expelled from the earth and water by the sun's scorching beams, retires to the middle region of the air, and there defends itself against the heat of the superior and inferior air. And thus, also, in summer, when the air about us is sultry hot, we find that cellars and vaults have the opposite quality: so in winter, when the external air freezes the lakes and rivers, the internal air, in the same vaults and cellars, becomes the sanctuary of heat; and water, fresh drawn out of deep wells and springs, in a cold season, not only feels warm, but manifestly smokes."

Mr. Boyle has canvassed this doctrine thoroughly, in his history of cold.—It is certain, that *a priori*, or considering the reason of the thing abstracted from the experiments alleged to prove an *antiperistasis*, it appears highly absurd: since, according to the course of nature, one contrary ought to destroy, not to strengthen another: beside, that it is an axiom, that natural causes act as much as they can; which, as to inanimate creatures, must be allowed physically demonstrative; in regard that these act not by choice, but by a necessary impulse.

It is commonly indeed alleged, as a proof of a power nature has given bodies of fixing their contraries, that drops of water, falling on a table, collect into little globules, to avoid the contrary quality in the table, and keep themselves from being swallowed up by the dry wood: but this we can account for on more intelligible principles, *viz.* the power of attraction, and repulsion. As to the *antiperistasis* of cold and heat, the Peripatetics talk of those qualities being surrounded by their opposites, as if each of them had an understanding and foresight, that in case it did not gather up its spirits, and guard against its antagonist, it must infallibly perish: but this is to transform physical agents into moral ones.

In effect, not only reason, but experiment also, concludes against the notion of an *antiperistasis*: the leading argument urged in behalf of it is, the heating of quick lime in cold water: now, who can sufficiently admire at the laziness and credulity of mankind, who have so long and generally acquiesced in what they might so easily have found to be false; for if, instead of cold water, the lime be quenched with hot water, the ebullition will always be far greater than if the liquor were cold.

Again; in freezing a basin to a joint stool, with a mixture of snow and salt, by the fire-side, it is pretended, that the fire so intends the cold, as to enable it to congeal the water that stagnated upon the surface of the stool, betwixt that and the bottom of the vessel. But how little need there is of an *antiperistasis* in this experiment, appears hence, that Mr. Boyle has purposely made it with good success, in a place where there neither was, nor ever probably had been a fire.

The patrons of an *antiperistasis* usually plead that aphoristical saying of Hippocrates, "The vicera are hottest in winter," in behalf of their opinion: but the only proof usually brought of such greater heat, is, that men then have a greater appetite; so that the aphorism supposes digestion to be made in the stomach by heat, which is easily refuted.

Another argument, urged in favour of an *antiperistasis*, is borrowed from the production of hail, which is presumed to be generated in summer only, not in winter; and, according to the schools, is made in the lowest region of the air, by the cold of the falling drops of rain being so highly intended by the warmth they meet with in the air near the earth, as to congeal into a solid form.

As to the refreshing coldness which subterraneous places afford in summer, it may be denied that they are then really colder than in winter; though, if the contrary were allowed, it would not necessarily infer an *antiperistasis*.—It is certain, the sinking of waters, drawn from deep places in frosty weather, does not necessarily infer such water to be warmer than at other times when it does not smoke; since that effect may proceed, not from the greater warmth of the water, but from the greater coldness of the air. For a man's breath in a cool summer, or in mild winter weather, becomes very visible; the

cold ambient air suddenly condensing the fuliginous steams discharged by the lungs; which, in warmer weather, are readily diffused in imperceptible particles through the air. See the articles, **COLD** and **EFFLUVIA**.

ANTI-PHONY, **ANTIPHONA**, the answer made by one choir to another, when the psalm or anthem is sung between two.

Among the number of ecclesiastical books, formerly used in the church, and abolished by parliament at the reformation, we meet with *antiphoners*, or *antiphonaritis*. 3 & 4 Ed. VI. c. 10.

ANTI-PHRASIS*, a sort of figurative expression, which has a contrary meaning to what it carries in appearance.—Or, a kind of irony, wherein we say any thing and mean the contrary.

* The word is derived from the Greek *αντι*, and *φρασις*, of *επειρο*, I speak.

Sancilius defines *antiphrasis* to be a form of irony, whereby we say a thing, by denying what we ought rather to affirm it to be: *antiphrasis est ironia quedam forma, cum dicimus negando id quod debuit affirmari*.—As when we say it did not displease me, or, he is no fool; meaning, I was pleased with it, or he is a man of sense.—On this principle, the *antiphrases* ought to be ranked among the figures of sentences, and not among those of words.

It is a common error, to make *antiphrases* consist in single words; as when we say, that the *Parææ* are thus called by *antiphrasis*, because they spare no body, *parææ quia nemini parcunt*.—St. Jerom, in his epistle to Riparius against Vigilantius, says, he ought rather to be called *dormitantius per antiphrasim*, than *vigilantius*, because he opposed the Christians holding wakes at the tombs of the martyrs.

Sancilius holds it improper to call these *antiphrases*; by reason phrasim is not applicable to a single word, but signifies *orationem, aut loquendi modum*.

ANTIPODES*, in geography, a relative term, understood of such inhabitants of the earth as live diametrically opposite to one another.

* The word comes from the Greek *αντι*, against, and *πους*, *πους*, a foot.

The *Antipodes* are those who live in parallels of latitude equally distant from the equator, the one toward the north, the other to the south; and under the same meridian, though 180°, or just half of that meridian, distant from one another.

The *Antipodes* have the same degree of heat and cold; and the same length of night and day; but at contrary times: it being midnight with one, when it is noon with the other; and the longest day with one, when shortest with the other.

Again, as the horizon of any place is 90° distant from the zenith thereof; *Antipodes* have the same horizon. See **HORIZON**.—And hence when the sun rises to one, he sets to the other.

Plato is said to have first started the notion of *Antipodes*; and likewise to have given them the name: as he conceived the earth to be of a spherical figure, it was easy for him to infer that there must be *Antipodes*.

Many of the ancients, and particularly Lactantius and Augustin, laughed at the notion.—The latter of those fathers is strangely perplexed to think how men and trees should hang pendulous in the air, their feet uppermost, as he thought they must do in the other hemisphere.

And if we may believe Aventine, Boniface archbishop of Mentz and legate of pope Zachary, in the eighth century, declared a bishop of that time, called Virgilius, heretic, for maintaining that there was such a thing as *Antipodes*.

But this piece of history is controverted by the authors of the *Mem. de Trevoux*; as having been made use of, it seems, by some persons, to shew, that the church has been mistaken in its decisions.—The only account extant of the matter, upon which the tradition is founded, is a letter of pope Zachary to Boniface; wherein he says, “If it be proved that he maintains, that there is another world, and other men under the earth; another sun, and another moon; expel him the church, in a council; after first divesting him of the priest-hood, &c.” The authors above cited endeavour to prove that this threatening was never executed; and that Boniface and Virgilius afterwards lived together in good understanding; and that Virgilius was even canonized by the same pope. *Mem. de Trev. an. 1708*.

They farther assert, that, were the story true, the pope had done nothing contrary to truth and equity: in regard the notion of *Antipodes* was very different in those days, from what it is now.—“For besides the demonstrations of the mathematician, say they, the philosophers too added their conjectures; and asserted, that the sea made two great circles around the earth, which divided it into four parts; that the vast extent of this ocean, and the burning heats of the torrid zone, prevented any communication between those four parts of the earth, so that men could not be all of the same kind, nor proceed from the same original: and this,” say our authors, “was what was meant by the word *Antipodes* in those times.”

As to the sentiments of the primitive Christians with regard to *Antipodes*; some, rather than admit the conclusions of the philosophers, absolutely denied the whole, even the demonstrations of the geometricians relating to the sphericity of the earth: which is Lactantius's way, *Instit. lib. iii. c. 24*. Others only called in question the conjectures of the philosophers: which is St. Augustin's method, *de civit. dei, lib. xvi. c. 9*.—After putting the question, whether there ever were nations of cyclopes, or pigmies, or of people whose feet stood outward, &c. he comes to the point of *Antipodes*, and asks, “whether the lower part of our earth be inhabited by *Antipodes*?”—He made no doubt of the earth's being round, nor of their being a part diametrically opposite to ours; but only disputes its being really inhabited. And the considerations he suggests for that purpose are just enough: As, that they who asserted *Antipodes*, had no history for it; that the lower part of the earth may be covered with water; and that to place *Antipodes* there, of a different origin from us, (as must have been the opinion of the ancients, since they thought it impossible to go from our world to theirs) is to contradict scripture, which teaches, that the whole race descended from one man.—Such are the sentiments of that father.

It may be added, that the Christian fathers were not the only persons who disputed the truth of the *Antipodes*. Lucretius had done it before them at the end of his first book, v. 10, 63, &c. See also Plutarch, *lib. de facie in orbe luna*; and Pliny, who refutes the opinion, *lib. ii. c. 65*.

ANTI-PREDICAMENTS, in logic. See **ANTE-PREDICAMENT**.

ANTI-PTOSIS*, a figure in grammar; whereby one case is put for another. See **CASE**.

* The word comes from the Greek *αντι*, pro, and *πτωσις*, *πτωσις*.

ANTIQUARIUS, **ANTIQUARIUS**, a person who studies and searches after monuments and remains of the ancients; as, old medals, books, statues, sculptures, and inscriptions; and, in general, all curious pieces that may afford any light into antiquity.

Formerly there were several other kinds of *antiquaries*. The librarii or copists, i. e. those who transcribed in fair legible characters what had been before written in notes, were called by this name. See **LIBRARI**.—They were also denominated *calligraphi*.

In the chief cities of Greece and Italy, there were other persons of distinction, called *antiquaries*, whose business it was to shew strangers the antiquities of the place, to explain the ancient inscriptions, and to give them all the assistance they could in this way of learning.

This was doubtless a very curious and useful institution; and might well deserve to be re-established.—Pausanias calls these *antiquaries*, *Ἐθνηγγοί*; the Sicilians called them *mythagogi*.

ANTIQUATED, **ANTIQUATUS**, something obsolete, or grown out of date, or use.

ANTIQUÉ, **ANTIQUUS**, in a general sense, something that is ancient.

ANTIQUÉ is chiefly used among architects, sculptors, and painters; who apply it to such pieces of buildings, sculpture, painting, &c. as were made at the time when the arts were in their greatest perfection, among the ancient Greeks and Romans, viz. from the age of Alexander the great to the time of the emperor Phocas, about the year of Christ 600, when Italy became over-run by the Goths and Vandals.

In this sense the word stands opposed to modern.—Thus we say, an *antique* building, or a building after the *antique*; an *antique* bust, or bas-relievo; the *antique* manner, taste, &c.

ANTIQUÉ is sometimes also contradistinguished from *ancient*, which denotes the lesser degree of antiquity, when the art was not in its utmost purity.

Thus, *antique* architecture is frequently distinguished from *ancient* architecture.

Some writers also use the compound, **ANTIQUO-MODERN**, in respect of old Gothic churches, and other buildings; to distinguish them from those of the Greeks and Romans.

ANTIQUITY, **ANTIQUITAS**, is used to denote the times or ages past long ago.

Thus we say, the heroes of *antiquity*, the marks, or footsteps, of *antiquity*, monuments of *antiquity*, &c.

ANTIQUITY is also used to denote the works or remains of ancient times. See **MONUMENT**, **REMAINS**, **RUINS**, &c. Thus we say, a fine, curious piece of *antiquity*; Italy, France, and England abound in *antiquities*.

ANTIQUITY is also used to denote the great age of a thing, or its duration from times of old.

In this sense we say, the *antiquity* of a kingdom, a custom, or the like: most nations lay claim to an *antiquity* much greater than they can truly warrant. The present age may be said to be the *antiquity* of the world; which was but a new thing in what are commonly called the ancient days.

Plato tells us of an account which an Egyptian priest gave to Salon, in which the Athenians were said to be 9000 years old, and those of Sais 8000. Pomponius Mela makes a still larger account out of Herodotus, viz. of 320 kings before Amalris, and upwards of 12000 years. Diodorus Siculus tells us of

23000 years from the first king of Egypt, to the expedition of Alexander: and Diogenes Laertius, out of other authors, more than doubles that account. When Alexander entered Egypt, the priests shewed him out of their sacred histories an account of the Persian empire which he had lately conquered, and the Macedonian which he had received by birth, each of 8000 years. Whereas nothing can be more certain, from the best historical accounts, than that the Persian empire was not then 300 years old, nor the Macedonian 500; and no wonder their catalogues should be ridiculously incredible, when the Egyptians make their first kings reign 12000 years a-piece; and the Assyrians theirs about 4000, as in the article *Saras*.

The Chaldees in Alexander's time affirmed they had taken observations of the celestial motions for 470000 years; and withal had calculated the natiivities of all the children born in that space. But those observations being curiously searched into by Callisthenes, appointed by Aristotle for that purpose, were found to go no further than 1900 years before Alexander; as Porphyry himself declares, who was no friend to Moses's account.

ANTISCIUM, in geography, the people who inhabit on different sides of the equator; and who of consequence, at noon, have their shadows projected opposite ways.

* The word comes from the Greek *anti*, against, and *scium*, shadow.

Thus the people of the north are *antisicii* to those of the south; the one projecting their shadows at noon towards the north pole, and the others towards the south pole.

Antisicii are frequently confounded with *Anteci*, who, inhabiting opposite sides of the equator, have the same elevation of the pole.

The *Antisicii* stand contradistinguished from *Perisicii*, &c.

ANTISCIUM is sometimes also used, among astrologers, for two points of the heavens equally distant from the tropics.—Thus the signs *leo* and *taurus* are held *Antisicii* to each other.

ANTISCORBUTICS, medicines proper for the cure of the scurvy.

ANTISIGMA, *αντισημα*, among the ancient grammarians, signifies one of the notes or sentences affixed to those verses whose order was to be changed.

ANTISPASTUS, a poetical foot, consisting of four syllables, whereof the first is short, the second and third long, and the fourth short.

ANTISPODIUM. See the article *SPodium*.

ANTISTITUM is a term used in ancient chronicles for an abbey or monastery.

ANTISTROPHE, a kind of dance in use among the ancients; wherein they stepped sometimes to the right, and sometimes to the left, still doubling their turns or conversions.

The motion towards the left, they called *antistrophe*; from *anti*, against, and *στροφη*, of *στροφω*, I turn.

Hence.
ANTISTROPHE is also used in lyric poetry, in speaking of the ode, which is usually divided into the *strophe*, *antistrophe*, and *epode*. See *ODE*.

The *antistrophe* is a kind of echo, or replication to the *strophe*; and the epode is a launching out from them both. See *STROPHE* and *EPODE*.

ANTISTROPHE is also a figure in grammar, whereby two terms or things, mutually dependent one on another, are reciprocally converted.

As if one should say, the master of the servant, and the servant of the master.

ANTITACTE, or **ANTITACTICUM**, in antiquity, a kind of Gnostics, who owned that God, the creator of the universe, was good and just; but asserted wishal, that one of his creatures had created evil, and had engaged us to follow it, in order to set us in opposition to God the creator; and that it becomes our duty to oppose this author of evil, in order to avenge God of his enemy.

* Hence the name; which is derived from the Greek *αντιτακτα*, *Isiphe*, I am contrary.

ANTITHENAR, in anatomy, a name given to divers muscles, otherwise called *adductors* or *adducter muscles*. See *ADDUCTOR*.

* The word is Greek, compounded of *anti*, against, and *θηναγ*; by reason those muscles act as antagonists to the *ibenera*, or abductors.

ANTITHESIS, in rhetoric, a setting two things together by way of opposition to each other, that the different qualities of each may appear the more strongly.

Such is that of Cicero, in the second *Catilinarian*: "On the one side stands modesty, on the other impudence; on the one fidelity, on the other deceit; here piety, there sacrilege; here continency, there lust, &c." —Such also is that of Augustus to some seditious young men, *audite, juvenes, senem, quem juvenem foveo audire. —* Such again is that of Seneca, *curae levem hinc unum, ingentes stupent.* And that of Virgil, *sternere si ne que superos, aberantia moribus.*

St. Augustin, Seneca, Salvia, and many other ancient writers, seem greatly to affect *antitheses*; but among the moderns they are generally decried. Desmarsets represents them as the favourites of young writers.—Perius long ago declaimed against the impertinent use of *antithesis*.

—*Crimina raris*

Librat in antithesis, *doctus possuisse figurat.*
ANTITHESIS is also a figure in grammar, whereby one letter is substituted in the room of another, as *illi* for *illu*.

ANTITHET, **ANTITHETON**, an opposite, or contrary; something disposed by way of antithesis.

ANTITHETARIUS, a term occurring in the title of a chapter in the laws of canutus, but not in the chapter itself.

The meaning of the word is, a man who endeavours to discharge himself of the fact of which he is accused, by recriminating, i. e. by charging the accuser with the same fact.

ANTITRAGUS, in anatomy, part of the auricle opposite to the tragus.

ANTITRINITARIANS, heretics who deny the holy trinity, and teach, that there are not three persons in the God-head.

Thus the *Samofatenians*, who do not believe the distinction of persons in God; the *Arians*, who deny the divinity of the Word; and the *Macedonians*, who deny that of the Holy Spirit; are all properly *Antitrinitarians*.

Among the moderns, *Antitrinitarians* are particularly understood of Socinians, called also Unitarians.

The *bibliotheca antitrinitariorum*, or *antitrinitarian library*, is a posthumous work of Christopher Sandius, an eminent *Antitrinitarian*; wherein he gives a list, digested in order of time, of all the Socinian or modern *Antitrinitarian* authors, with a brief account of their lives, and a catalogue of their works.

ANTITYPE, a Greek word, properly signifying a type or figure correspondent to some other type.

The word *antitype*, *αντιτυπος*, occurs twice in the new testament, viz. in the epistle to the Hebrews, IX. 24. and in St. Peter, 1 Ep. III. 21. where its genuine import has been much controverted.—The former says, that "Christ is not entered into the holy places made with hands, which are αντιτυπος, the figures or antitypes of the true; now to appear in the presence of God for us."—Now *τυπος*, as is elsewhere observed, signifies the pattern by which another thing is made; and as Moses was obliged to make the tabernacle, and all things in it, according to the pattern shewed him in the mount; the tabernacle so formed was the *antitype* of what was shewn to Moses: any thing therefore formed according to a model or pattern, is an *antitype*.

In the latter passage, the apostle, speaking of Noah's flood, and the deliverance of only eight persons in the ark from it, says *ο και ημας αντιτυπος του σωτηρι βαπτισματος, baptism, being an antitype to that, now saves us; not putting away the filth of the flesh, but the answer of a good conscience towards God &c.* The meaning is, that righteousness, or the answer of a good conscience towards God, now saves us by means of the resurrection of Christ, as formerly righteousness saved those eight persons by means of the ark, during the flood.—The word *antitype*, therefore here signifies a general similitude of circumstances; and the particle *α*, *substantive*, refers, not to the immediate antecedent, *υδατος*, water, but to all that precedes.

ANTITYPE, among the ancient Greek fathers, and in the Greek liturgy, is also applied to the symbols of bread and wine in the sacrament.

Hence it has been argued by many Protestants, that the Greeks do not really believe the doctrine of transubstantiation; in regard they call the bread and wine *antitypes*, *αντιτυπος, q. d.* figures, similitudes, and this even after the consecration.

Clement, in his constitutions, St. Cyril, and Gregory Nazianzen, and several other ancient writers, make no scruple of using the term on the same occasion; as is allowed by Leo Allatus, Suicer, &c.

M. Simon replies to Dr. Smith, who had made this observation of the Greeks calling the species, *antitypes*, after consecration; that the Greek church does not hold the consecration completed till after the prayer called *invocation of the Holy Spirit*, which comes after the passage of the liturgy, where the bread and wine are called *antitypes*.

Add, that Marcus Ephesius, the leader of the party against the Latins, at the council of Florence, makes use of this very passage in the Greek liturgy to prove, that the consecration does not consist wholly in the words, *this is my body*; but also in the prayer or benediction which the priest rehearses afterwards, invoking the Holy Spirit.

ANTLER, among hunters, the first of the pearls that grow about the bur of a deer's horn.

There are also *fur-antlers*, *brow-antlers*, &c.

ANTOECI, in geography, those inhabitants of the earth who live under the same meridian, and at the same distance

from the equator; the one towards the north, and the other to the south. See EARTH.

* The word is formed of the Greek *anti*, *contra*, and *ares*, I dwell, inhabit.—The *Antaci* are contradistinguished from the Peraci.

Hence, the *Antaci* have the same longitude and the same latitude, only of a different denomination. They lie in the same femicircle of the meridian, but in opposite parallels.

The inhabitants of Peloponnesus are *Antaci* to the Hottentots of the cape of Good hope.—*Antaci* are frequently confounded with Antifcii. See ANTISCII.

The *Antaci* have precisely the same hours of the day and night; but exactly opposite seasons: when it is 12 a-clock in the longest summer day with one; it is 12 a-clock of the shortest winter's day with the other: and hence the night of the one is always equal to the day of the other.

Hence also those stars which never rise to any given place, to the *Antaci* and Antipodes thereof never set; and *vice versa*.—And if the *Antaci* turn their faces toward each other, or the Antipodes look both toward the equator, the stars will rise to the one on the right hand, and to the other on the left.

ANTONINE Column. See the article COLUMN.

ANTONOMASIA *, a figure in rhetoric, whereby a noun appellative is used instead of a proper name, or *vice versa*.

* The word is compounded of the Greek *anti*, for, and *νομα*, name.

Thus we say, the philosopher, instead of Aristotle; the orator, for Cicero; the apostle, for St. Paul; the prophet, for Moses, &c.—Thus also we call a voluptuous person, a Sardanapalus, &c. And thus the French say Henry the great, meaning Henry IV. of France.

ANTRUM *Higlinarianum* is a cavity discovered within the sinus of each maxillary bone.

Surgeons sometimes mistake this for a caries of the bone; finding they can penetrate so deep into it with a probe. *Roysh. of Bibl. Anat. Med. t. 3. p. 204.*

ANTRUM *Pylori*, a large cavity at the bottom of the pylorus. See PYLORUS.

ANVIL, a smith's utensil, serving to place the work on, to be hammered or forged.

The face or uppermost surface of the *anvil* must be very flat and smooth, without flaws; and so hard that a file will not touch it.—At one end there is sometimes a pike, bickern or beak-iron, for the rounding of hollow work.—The whole is usually mounted on a firm wooden block. *Max. Mechan. Exerc. p. 3.*

ANUS, in anatomy, the lower extremity of the intestine rectum; or the orifice of the fundament.—See *Tab. Anat. (Splanch.) fig. 9. lit. u.*

The Gabionites sent golden *emeralds* back with the ark, to be cured of a disease which afflicted them in the anus. 1 Sam. c. 6.

Muscles of the ANUS are the sphincter, levator, and scalptor, or latissimus dorsi.

Diseases of the ANUS are fistula's, and the proccentia, or prolapsus *ani*; to which may be added the hemorrhoids or piles.

Speculum ANI. See the article SPECULUM.

ANUS is also used for a small hole in the third ventricle of the brain, which leads into the fourth ventricle of the cerebellum.

AONIDES, in mythology. See the article MUSE.

AORISTUS *, *Αοριστος*, in the Greek grammar, an indefinite or indeterminate kind of tense, which sometimes expresses the present, sometimes the future, but most frequently the past time.

* The word is compounded of *α*, privative; and *οριστος*, to bound or limit.

The Greeks have two *aoristus*'s; the Latins have none.

AORTA *, in anatomy, an artery, which rises immediately out of the left ventricle of the heart; and is distributed thence through all the parts of the body.—V. *Tab. Anat. (Angeiol.) fig. 1. n. 1. and fig. 3. (Splanch.) fig. 12. lit. r. and o. and fig. 1. lit. n. and Angeiol. fig. 1. n. 28.*

* The word is formed of the Greek *αορτη*, which signifies a vessel, bag, cist, &c.

The *aorta* is divided into two grand trunks, called the *ascending* and *descending*; *aorta ascendens* and *descendens*.

The *aorta* is otherwise called the *great artery*; as being the trunk, out of which the other arteries all spring; and the great conduit or canal whereby the blood is conveyed throughout the body.

Obstructions, or petrifications of the coats of the *aorta* as it rises from the heart, are so frequent, that some think it a constant case.—Mr. Cowper, however, has an express discourse, to shew, that whenever such ossification happens in man, it is a disease, and incommodes the part in the due execution of its office.

Of this he gives us several instances; one, in which an intermission of pulse was produced; in another a cold-

ness of the extremes; with a gangrene, &c. Phil. Transact. N.º 299.

APAGMA, a term used by some writers in chirurgery, for the thrusting of a bone or other part out of its proper place.

APAGOGE *, *Απαγωγή*. See ABDUCTION.

* The word is compounded of *απο*, from; and *αγω*, to bring or draw.

APAGOGICAL *Demonstration* is such as does not prove the thing directly, but shews the impossibility and absurdity which arises from denying it.

Hence it is also called *reductio ad impossibile*, or *ad absurdum*.

APANAGE *, APENAGE, APPANAGE, APANNAGE, or APENNAGE, in the French laws, the fortune of a king's younger son; or a settled portion of lands, &c. assigned for the subsistence of the cadets, or younger sons of a sovereign prince.

* Nicod and Menage derive the word from the Latin *panis*, bread, which frequently includes all other sorts of provision necessary for subsistence. Du Cange takes it to have been formed of the base Latin, *apanare*, *apanamentum*, and *apanagium*, which amounts to the same thing; those words, being apparently formed of *panis*.

Some will have the *apanages*, at their first institution, to have been only pensions, or annual payments of a certain sum of money.—The younger sons of England have no certain *apanages*, as in France; but only what the good pleasure of the king bestows upon them.

Even in France, during the first and second races of kings, the right of primogeniture and *apanages* were unknown; but the domains were divided pretty equally among all the children.

Great inconveniences arising hence; it was at length found proper to put off the younger born with counties, duchies, or other districts; on condition of their paying homage and fealty for the same, and of their reverting, in defect of heirs male, to the crown.

This has happened accordingly to the first and second branch of the dukes of Burgundy.—The duchy of Orleans is the *apanage* of the second son of France.

APARTMENT *, a portion of a large house, wherein a person may lodge separately; having all the conveniences requisite to make a complete habitation.

* The word comes from the Latin *apartimentum*, of the verb *partiri*, to divide; or, as some imagine, a *parte mansoris*, making part of the dwelling.

A complete *apartment* must consist of a hall, a chamber, an antichamber, a closet, and a cabinet or wardrobe.

APATHY *, in a moral sense, denotes an insensibility; or a privation of all passion, all emotion, or perturbation of mind.

* The word is formed of the privative particle *α*, and *παθος*, passion.

The Stoics affected an entire *apathy*: their wisdom was to enjoy a perfect calmness or tranquillity of mind, incapable of being ruffled, and above the reach of any sense either of pleasure or pain.

In the first ages of the church, the Christians adopted the term *apathy*, to express a contempt of all earthly concerns; a state of mortification, such as the gospel prescribes. And hence we find the word often used among the devout writers: Clemens Alexandrinus, in particular, brought it exceedingly in vogue; thinking hereby to draw the philosophers to Christianity, who aspired after such a sublime pitch of virtue.

Quietism, is only *apathy* disguised under the appearance of devotion.

APATURIA *, in antiquity, a solemn feast celebrated by the Athenians in honour of Bacchus.

* The word is usually derived from the Greek *απατην*, fraud.

It is said to have been instituted in memory of a fraudulent victory, obtained by Melanthus king of Athens over Xanthus king of Bœotia, in a single combat, which they agreed upon, to put an end to a debate between them relating to the frontiers of their countries.—Hence Budeus calls it *system deceptionis*, the feast of deceit.

Other authors give a different etymology of this feast, from what we have now related: they tell us, that the young Athenians were not admitted into the tribes on the third day of the *apaturia*, till their fathers had first sworn, that they were their own children; and that, till that time, they were supposed, in some measure, to be without fathers, *απατρεις*; whence the feast, say they, took its name.

Xenophon, on the other hand, informs us, that the relations and friends met on this occasion, and joined with the fathers of the young people who were to be received into the tribes; and that from this assembly the feast took its name: that in *απατურια*, the *α*, far from being a privative, being here a conjunctive, and signifies the same thing with *μας*, together.

This feast lasted four days: the first day, those of the same tribe made merry together; and this they called *δρυσια*. The second day, which they called *ααγγουσια*, they sacrificed to Jupiter and Minerva. The third day, which they called

αἰετός, such of their young men and maids as were of age were admitted into their tribes. The fourth day they called ἑταῖρος.

APECHEMA, Ἀπέχημα, in medicine, the same with *Contraffissure*. See **CONTRAFFISSURE**.

APELLITÆ, heretics in the primitive church, who taught, that Christ left his body dissolved in the air; and so ascended into heaven without it.

APENNAGE. See the article **APANAGE**.

APEPSY*, **APEPSIA**, in medicine, denotes crudity, or a want of digestion.

* The word is formed from the privative particle *a* and πepsis, cognus, I concoct.

Apopsia may be defined a defect in the stomach, which prevents the aliment taken in from affording a proper chyle for supplying the blood, and nourishing the body.

APERIENS*, **APERIENT**, or **APERITIVE**, in medicine: See **APERIENTS**.

* The word is Latin; being the participle of the verb *aperire*, to open; *q. d.* opening.

Crocus maris **APERIENS**, opening saffron of iron, is a preparation of iron-plates or filings, made by exposing them to the rain or dew, till they contract a rust; which is the medicine required. See also **AIR**, &c.—It is a good *aperient*.

APERIENS palpebram rectus, in anatomy, is a muscle, which, rising in the orbit of the eye, near the entrance of the optic nerve, passes over the atollent muscle of the eye, and is at last inserted into the whole superior part of the upper eye-lid, which it serves to open.

APERIENTS, or **APERITIVE Medicines**, are such as open the obstructed passages of the small vessels, glands, and pores; and by that means promote a due circulation of the contained juices.

Aperients, then, coincide with what we otherwise call *openers*, *anatomics*, and *deobstruents*. See **DEOBSTRUENT**, &c. The five lesser *aperient*, or opening roots, are grafs, madder, eryngo, capers, and chammoec.

The greater *aperient*, or opening roots, are smallage, fennel, asparagus, parslay, and butcher's broom.

APERTA Toga. See the article **TOGA**.

APERTIONS, in architecture, are the openings in a building; as doors, windows, stair-cases, chimneys, outlets and inlets for light, smoke, &c.

The *apertions* should be as few as may be; it being a rule that all openings are weakenings.

APERTURE*, **APERTURA**, the opening of any thing; or a hole, cleft, or vacant place, in some otherwise solid or continuous subject.

* The word comes from the Latin *apertura* of *aperire*, to open.

In geometry, *aperture* is used for the space left between two lines which mutually incline towards each other to form an angle.

In optics, *aperture* is the hole next the object-glass of a telescope, or microscope; through which the light and image of the object come into the tube, and are thence carried to the eye.

APERTURE is also understood of that part of the object-glass it self which covers the former, and which is left pervious to the rays. See **TELESCOPE**.

A great deal depends on having a just *aperture*.—To find it experimentally; apply several circles of black smutted paper, each bigger than other, upon the face of the glass, from the breadth of a straw to such as leave only a small hole in the glass; and with each of these, separately, view several distinct objects; as the moon, stars, &c. That through which they appear the most distinctly, is to be pitched upon.

M. Auzout affirms, that he found that the *apertures* of telescopes ought to be nearly in the subduplicate ratio of their lengths: but Huygens, who first introduced the use of *apertures*, assures us he found by experience, that the *aperture* of an object-glass, *e. gr.* of 30 foot, is to be determined by this proportion: as 30 to 3, that is, as 10 to 1, so is the root of the distance of the focus of any glass multiplied by 30, to its *aperture*: and the focal distances of the eye-glasses are to be proportional to the *apertures*.—A table of *apertures* for telescopes of various lengths, &c. see under the article **TELESCOPE**.

The greater or less *aperture* of an object-glass, it is to be noted, does not increase or diminish the visible area of the object; all that is effected by this, is the admittance of more or fewer rays, and consequently the more bright or obscure appearance of the object.

Hence, in viewing Venus through a telescope, a much less *aperture* is to be used than for the Moon, Jupiter, or Saturn, because her light is so vivid and glaring.—Which consideration does a little invalidate and disturb M. Auzout's proportion, as is shewn by Dr. Hook, Phil. Transact. No 4.

APERTURA Testamentum, in ancient law-books, signifies the breaking open a last will and testament. See **WILL** and **TESTAMENT**.

APERTURA Feudi denotes the loss of a feudal tenure, by default of issue to him to whom the feud or fee was first granted. See **FEU**.

APETALOUS*, in botany, something without petals or flower-leaves. See **PETALA**, and **LEAF**.

* The word comes from the privative particle *a*, and πταλον, folium, a leaf.

APEX, the vertex or summit of any thing. See **VERTEX**, **APICES**, &c.

APHÆRESIS, Ἀφαίρεσις, in grammar, a figure, whereby something is taken away from the beginning of a word.

Thus ciconia, by *aphæresis* is wrote conia; contemnere, temnere; omittere, mittere, &c.

A like retrenchment at the end of a word is called *apocope*. See **APOCOPE**.

APHELION*, or **APHELIUM**, in astronomy, that point of the earth's or a planet's orbit, in which it is the farthest distant from the sun that it can be.

* The word comes from the Greek ἄστρον, from; and ἥλιος, sun.

Thus a planet being in A, (*Tab. Astron. Fig. 1.*) its utmost distance from the sun S; is said to be in its *aphelion*.

In the system or supposition of the sun's moving round the earth; the same point is called *apogee*. The *aphelion* stands opposed to the *perihelion*.

The *aphelia* of all the primary planets are at rest; excepting that those planets nearest the sun, *viz.* Mercury, Venus, the Earth, and Mars, being acted upon by Jupiter and Saturn, their *aphelia* move a small matter in consequence with respect to the fixed stars, and this in the sesquuplicate ratio of the distances of those planets from the sun.

Hence, if the *aphelion* of Mars move 35 minutes in consequence in respect of the fixed stars in 100 years; the *aphelia* of the Earth, Venus and Mercury, will move in 100 years, 18 min. 36 sec. 11 min. 27 sec. and 4 min. 29 sec.

The method of finding the place of the *aphelion* is, by observing several of the greater digressions of the planet from the sun; till by two or three repeated observations it be found to remain at a stand.—In the Philof. Transact. No. 128. we have a geometrical method of finding the *aphelia* of the planets, given by Dr. Halley.

Kepler places the *aphelion* of Saturn for the year 1700, in 28° 3'. 44". of Sagittarius: De la Hire, in 29° 14'. 41".

—The *aphelion* of Jupiter in 8° 10'. 40". of Libra: De la Hire in 10° 17'. 14".—The *aphelion* of Mars in 0° 51'. 29". of Virgo: De la Hire in 0° 35'. 25".—The *aphelion* of the Earth in 8° 25'. 30". of Cancer.—The *aphelion* of Venus in 3° 24'. 27". of Aquarius: De la Hire in 6° 56'. 10".—And the *aphelion* of Mercury in 15° 44'. 29". of Sagittarius: De la Hire in 13° 3'. 40".

The annual motion, according to Kepler, of the *aphelion* of Saturn, is 1'. 10". of Jupiter, 47". of Mars, 1'. 7".—Of Venus, 1'. 18". and of Mercury, 1'. 45". According to de la Hire, that of Saturn is 1'. 22". of Jupiter 1'. 34". of Mars 1'. 7".—Of Venus 1'. 26". and of Mercury 1'. 39".

APHONIA*, Ἀφονία, in medicine, the state of a person who is dumb, or destitute of speech. See **DUMBNESS**.

* The word is compounded of the privative particle *a*, and φωνή, vox, voice; *q. d.* a loss of speech, or voice.

Menjotius has a dissertation exprès de *Aphonia*.

APHORISM*, a maxim, general rule, or principle of a science; or a brief sentence, comprehending a great deal of matter in a few words.

* The word comes from the Greek ἀφορισμός, of ἀφορίζω, *separe, seligo*, I separate, I chuse, *q. d.* a choice or select sentence.

The term is chiefly used in medicine and law.—We say the *aphorisms* of Hippocrates, of Sanctorius, of Boerhaave, &c. *aphorisms* of the civil law, &c.

APHRONITRE*, **APHRONITRUM**, a kind of nitre, mentioned by the ancients; supposed to be the spume, or the lightest and subtlest part thereof, emerging to the top.

* The word is compounded of the Greek ἀφρός, froth; and νίτρον, nitre.

Some modern naturalists rather take the ancient *aphronitre* to have been a native salt-petre, gathering like an efflorescence on old walls, &c. now called *salt-petre of the rock*. See **SUPPLEMENT**, Article **APHRONITRUM**.

APHTHÆ*, in medicine, little ulcers or pimples rising in the mouth, the palate, gums, and at the root of the tongue; attended with inflammation, and a difficulty of swallowing.

* The word seems derived from the Greek φθίω, I corrupt; or from ἀψίω, accendo, I kindle.

Sucking children are particularly subject to *aphthæ*, when either the nurse's milk is corrupted, or the child's stomach becomes unfit for digestion: for, in these cases, the sharp acrimonious parts of the milk rising up, easily exulcerate those tender and delicate parts.

There are some *aphthæ* white, others red, others livid and blackish: the white and red sorts are the least dangerous, and the most easily cured; the livid and black often prove mortal.

When

When they happen in grown persons, they are owing to thin, ferous, and sharp humours returned from the several parts of the body to the mouth.—A liniment of mel rosatum and oil of vitriol is esteemed a good remedy for the *aphthæ*: plantane-water is also in use on the same occasion.

APHTHARTODOCETÆ*, Αφθαρτοδοκῆται, a sect of heretics, sworn enemies of the council of Chalcedon.

* The word is derived from the Greek αφθαρτος, incorruptible; and δοκω, I opine, I imagine; and was given them, because they imagined the body of Jesus Christ was incorruptible and impassible, and not capable of death.

They arose among the Eutychians, and made their first appearance in the year 535.

APIARY*, bee-houfe; a place where bees are kept; and furnished with all the apparatus necessary for that purpose.

* The word comes from the Latin *apis*, a bee.

The *apiary* should be screened from high winds on every side, either naturally or artificially; and well defended from poultry, &c. whose dung is offensive to bees.

APICES*, *summits*, in botany, little knobs growing on the tops of the stamina, or chives in the middle of flowers.

* The word is Latin; being the nominative plural of *apex*, the top or summit of any thing.

They are commonly of a roundish figure.—By the microscope they have been discovered to be, as it were, a sort of capsulæ feminales, or seed-vessels, containing in them small globular, and often oval particles of various colours, and exquisitely formed; called the *farina fecundans*. See **FARINA Fecundans**.

These particles are a kind of male sperm, which, falling down into the flower, fecundates and ripens the seed. See further under the article *Generation of PLANTS*.

APOBATERION, Αποβατηριον, among the ancients, a farewell speech, or poem, made by a person on his departure out of his own country, or some other place where he had been kindly received, and entertained.

Such is that of Æneas to Helenus and Andromache, Æn. Lib. III.—The *apobaterion* stands opposed to the *epibaterion*. See **EPIBATERION**.

APOCALYPSE*, ΑΠΟΚΑΛΥΨΙΣ, *revelation*; the name of the last book in the canon of scripture.

* The word is formed of the Greek αποκαλυπτω, I reveal, I discover.

The *Apocalypse* contains discoveries, or revelations relating to many important mysteries of the christian faith, made to the apostle St. John, in the isle of Pathmos, during his banishment there under the persecution of Domitian.

This, of all the books of the New Testament, is that, about which the ancient fathers, and the practice of the church, were the most, and the longest divided.—When it was first universally received as canonical, is not easy to decide.—St. Jerom relates, that the Greek church doubted of its authenticity even in his days: St. Basil and Gregory Nazianzen absolutely reject it; and the council of Laodicea never mention it in their canon of the sacred writings. Some attributed it to the heretic Cerinthus; and others, to another John, disciple of St. John.—Dionysius Alexandrinus censures it as written in bad Greek, and even finds solecisms and barbarisms in it, in abundance: though he allows it to contain a mystic sense, which, he says, he admires even where he does not understand it.

On the other hand, St. Justin, Irenæus, Theophilus Antiochenus, Melito, Apollonius, Clemens Alexandrinus, and Tertullian, make no doubt of its being canonical. The third council of Carthage, held in 397, placed it in the canon of the New Testament; and the churches both of the east and west have acknowledged it ever since.

The Alogians are represented by ecclesiastical writers, as great declaimers against the *Apocalypse*, many of the flights whereof they turned into ridicule; particularly the visions of the seven trumpets, the four angels bound on the river Euphrates, &c.—St. Epiphanius defends it against them: the book, he observes, is not a mere history, but a prophecy; so that it is no wonder the author should express himself after the manner of the prophets, whose style is usually figurative.

Of all their objections against the authority of this book, that seems the best grounded which is drawn from those words in cap. ii. ver. 18. *Write to the angel of the church of Thyatira*: there was not, say they, any christian church at Thyatira at that time.—St. Epiphanius, who grants them this point, is forced to have recourse to the prophetic spirit; as if St. John had foreseen there would be a church there in course of time.

Some late authors have made a good amendment to St. Epiphanius's answer: it is probable, in the time of that father, the catalogue of the bishops, with other acts, which shew that there had been a church established there from the time of the apostles, might not be known. Grotius adds,

that though there was not, indeed, any church of Gentile converts at Thyatira when St. John wrote; yet there was one of Jews, as there had been another at Thessalonica before St. Paul preached there.

Several orthodox writers have rejected the *Apocalypse* as a book which countenanced the reveries of Cerinthus, touching the carnal reign of Christ on earth. See **CERINTHIAN**.

Though Dionysius Alexandrinus (*ap. Euseb. Hist. Eccl. 7. 25.*) allowed the *Apocalypse* for an inspired writing; yet he took it for the work of another John, different from St. John the Evangelist; which he endeavours to make appear from the diversity of style.—But we all know how precarious the arguments are, which are drawn from the mere consideration of style.—It is true, in most of the ancient Greek copies, both printed and manuscript, we find the name *John the Divine*, at the head thereof; but they who put this title meant no more thereby than to denote the apostle St. John, whom the Greek fathers call *the Divine*, by way of eminence, to distinguish him from the other Evangelists.

There have been several other works published under the title of *Apocalypses*.—Sozomen mentions a book used in the churches of Palestine, called the *Apocalypse*, or *Revelation of St. Peter*. He also mentions an *Apocalypse* of St. Paul; which the Coptæ retain to this day.—Eusebius also speaks of both these *Apocalypses*.—St. Epiphanius mentions an *Apocalypse* of Adam: Nicephorus, an *Apocalypse* of Edras: Gratian and Cedrenus, an *Apocalypse* of Moses, another of St. Thomas, and another of St. Stephen: St. Jerom, an *Apocalypse* of Elias.

Porphyry, in his life of Plotin, makes mention of the *Apocalypses* or revelations of Zoroaster, Zostrian, Nicotæus, Allogenes, &c.

APOCHYLISMA, in pharmacy, denotes an inspissated vegetable juice; answering to what the shops call a *Rob*. See **ROB**.

APOCOPE*, a figure in grammar, wherein part of the end of a word is cut off; as in *dic* for *dice*, *fac* for *face*, *nil* for *nihil*, *hyp* or *hyppo* for *hypochondriacal*.

* The word is derived from the Greek αποκοπιω, to cut off; which is compounded of the preposition απο, and the verb κοπιω, I cut.

A like retrenchment at the beginning of a word is called *apheresis*.

When the *apocope* is marked with a superior comma, (called an *apostrophus*) the word is said to be *apostrophated*: as *thro'* for *through*.

APOCRISIARIUS*, in antiquity, an officer appointed to carry or deliver the messages, orders, and answers of a prince or emperor.

* The word is formed from the Greek αποκρισις, *respondum*, answer.—Hence he is usually called in Latin, *responsalis*, *q. d.* answerer.

The *apocrisarius* afterwards became the emperor's chancellor, and kept the seal.—In the barbarous Latin we sometimes meet with *aservata*, secretary, for *apocrisarius*. Zosimus defines *apocrisarius*, secretary for foreign affairs; being the same with what Vopiscus in the life of Aurelian calls *notarius secretorum*.

The title of *apocrisarius*, became at length appropriated, as it were, to the pope's deputy or agent, who resided at Constantinople to receive the pope's orders, and the emperor's answer.

St. Gregory was *apocrisarius* of pope Pelagius, at the time when he composed his morals on Job.—The *apocrisarius* did the office of the modern nuncio's. See **NUNTIO**—Sometimes, however, he had the rank and quality of the pope's legate.

The heresy of the Monothelites, and afterwards that of the Iconoclastes, broke off the custom of having a papal *apocrisarius* at Constantinople.

APOCRUSTICS*, Αποκρυστικα, in medicine, remedies indued with a repelling and astringent power, whereby they prevent the too great afflux of humours to a part diseased.

* The word is derived from αποκρυσσω, *pulso, pello*, I drive.

Apocrustics are usually cold and astringent, and consist of large particles, wherein they differ from drawing medicines, which are hot, and consist of more subtle parts.

APOCYPHAL, something dubious; or that comes from an uncertain author, whereon much credit cannot be reposed.

We say, an *apocryphal* book, passage, history, &c. meaning, such as are of suspected authority.—In matters of doctrine, the writings of heretics, schismatics, &c. are all held *apocryphal*.

Vossius observes, that, with regard to the sacred books, none are to be accounted *apocryphal*, except such as have neither been admitted into the synagogue, nor the church, so as to be added to the canon, and read in public.

For this reason also, the books of Sibyls were anciently called

apocryphal, as being committed to the trust of the decemviri alone; and for the like reason the annals of the Egyptians and Tyrians were called by the same name.

Before the septuagint version, the books of the Old Testament were all *apocryphal* in this sense.—But in process of time, the sense of the word was changed, and those books alone were called *apocryphal*, which were of doubtful or suspected authority.

In the original meaning of the word, all the writings deposited in the temple were called *apocryphal*; by reason they were kept secret from the people.

When the Jews published their sacred books, they only gave the appellations of *canonical* and *divine* to such as they thus made public; and such as were still retained in their archives they called *apocryphal*, for no other reason, but because they were not public; so that they might be really sacred and divine, though not promulgated as such.

Thus, in respect of the Bible, all books were called *apocryphal*, which were not inserted in the Jewish canon of Scripture; and it is in this sense that St. Epiphanius is to be understood, when he says, that the *apocryphal* books are not put in the ark among the other inspired writings.

There has been a great dispute between the Romanists and the Reformed, about the authority of those books, now called, by the latter, *apocryphal*; as Judith, Tobit, Esdras, Maccabees, &c. the one having the opinions of many of the primitive fathers for their vouchers, and the others, the tradition of their church.

* The word is derived from the Greek *αποκρυφειν*, to hide; because the origin of such books was unknown, or because they contain some mysteries not fit to be known.

M. Simon contends, that they must have been read in Greek, even by the apostles themselves; which he infers from divers passages in their writings.—He adds, that the church received them with the other books of Scripture, from the Hellenist Jews; and that if the churches of Palestine never admitted them, it was not for their accounting them *apocryphal* in the sense the word is now used, but because they read none but what were writ in Hebrew.

To this may be opposed the authority of the greatest part of writers in all ages, till the council of Trent; which makes a precise distinction between the books now called *apocryphal*, and those contained in the Jewish canon.

APODICTICAL * *Argument*, or *syllogism*, signifies a clear, convincing proof, or demonstration of a thing.

* The word is formed of the Greek *αποδεικνυμι*, I demonstrate, I shew clearly.

APOGEE *, **ΑΠΟΓΕΙΟΝ**, in astronomy, that point in the orbit of the sun, or a planet, which is furthest distant from the earth.

* The word is formed of the Greek *απο*, ab, from; and *γειον*, or *γειω*, earth.—In the corrupt Latin, *apogee* sometimes signifies a grotto, or subterraneous vault.

The *apogee* is a point in the heavens, at the extreme of the line of the apides; in which the sun, or a planet, is at the greatest distance that it can be at, from the earth, in its whole revolution.

The opposite point hereto is called the *perigee*. See **PERIGEE**.

The ancient astronomers, regarding the earth as the centre of the system, chiefly considered the *apogee* and *perigee*: the moderns, making the sun the centre, change the *apogee* and *perigee* for *aphelion* and *perihelion*. See **APHELION**, and **PERIHELION**. See also **SYSTEM**.

The quantity of the motion of the *apogee* may be found by comparing two observations thereof made at a great distance of time; converting the difference into minutes, and dividing it by the number of years elapsed between the two observations. The quotient gives the annual motion of the *apogee*.—Thus, from an observation made by Hipparchus in the year before Christ 140, whereby the sun's *apogee* was found 50', 30" of π ; and another made by Ricciolus, in the year of Christ 1646, wherein it was found 79', 26", of ω ; the annual motion of the *apogee* is found to be 1', 2".

APOGEE of the Moon. See the article **MOON**.

APOGEE of the Equant is its farthest distance from the earth; or that point where the circumference of the equant is intersected by the line of the apides, in the remotest part of the diameter.

So the perigee of the equant is the opposite point, or the nearest part of the diameter.

The mean *apogee* of the epicycle, is a point where the epicycle is cut above, by a right line drawn from its centre, to the centre of the equant, or the point of the epicycle most remote from the earth.

APOGRAPH *, **ΑΠΟΓΡΑΦΗΜ**, a copy or transcript of some book or writing.

* The word is formed of *απο*, ab, from; and *γραφεω*, scribo, to write.

In this sense, *apograph* stands opposed to *autograph*; as a copy to an original.

APOLLINARISTS, **APOLLINARIANS**, ancient heretics, VOL. I.

who denied that Jesus Christ assumed true flesh, or a rational human soul.

Apollinaris of Laodicea, their leader, invested Christ with I know not what fanciful kind of flesh, which he supposed to have existed with the sun from all eternity.—He also distinguished between the soul of Christ, and what the Greeks call *νοη*, mind or understanding; and from this distinction he took occasion to assert, that Christ assumed a soul without its understanding, and that this defect was supplied by the Word *; though some of his followers held that Christ had no human soul at all.

* Apollinaris distinguished between the soul and the mind, the $\psiυχη$ and the *νοη*; acknowledging, that the word assumed the body, and the soul, $\psiυχη$, of man, but not *νοη*, the mind or spirit; but that the Word it self supplied the place thereof.—“This then, according to Bp. Pearson, was the difference between the Arian and Apollinarian heresies; that the latter asserted, that God assumed the nature both of the flesh and soul of man; but the former, that only of the flesh. So that there are two things observable in the Apollinarian heresy: their philosophy, whereby they make man consist of three distinct parts, body, soul, and spirit or mind; and their divinity, whereby they only make the human nature of Christ consist of two of those, *viz.* body and soul.”—But the Bishop, it is to be noted, seems to depart a little from the current of ecclesiastical writers, in supposing, that Apollinaris allowed Christ to have assumed a true body. *Vid. Niceph. Hist. Ecl. l. 2. c. 12. Vincent Lirin. &c.*

Apollinaris further taught, that the souls of men were propagated by other souls, as well as their bodies.—Theodoret charges him with confounding the persons of the Godhead; and with giving into the errors of Sabellius; and Basil accuses him of abandoning the literal sense of scripture, and taking up wholly with the allegorical sense.

This heresy was very subtle, and overspread most of the churches of the east; it was condemned in a synod of Alexandria, under St. Athanasius, in the Year 362. It was subdivided into several different heresies, the chief whereof were the Dimocrites.

APOLLINARIAN Games, *Apollinarianes Ludi*, in antiquity, games at Rome, celebrated yearly in honour of Apollo, on the fifth day of July, under the direction of the praetor, in the Circus maximus.

The tradition goes, that, at the first celebration hereof, the people were suddenly invaded by the enemy, and obliged to take to their arms: upon which occasion a cloud of darts and arrows falling upon their enemies, the Romans soon returned victors to their sports.

APOLLONIAN Hyperbola, and **Parabola**. See **HYPERBOLA** and **PARABOLA**.

APOLOGETIC, **APOLOGETICAL**, something said or written, by way of excuse or *apology*, for any action or person.

The *Apologetic* of Tertullian is a work full of strength and spirit; such as in all respects became the character of that father.—He there vindicates the Christians from all that had been objected to them, particularly from the abominable crimes said to be perpetrated at their meetings, and their want of love and fidelity to their country. The ground of this last accusation was, their refusing to take the accustomed oaths, and swear by the tutelary gods of the empire.—Tertullian addresses his *apologetic* to the magistrates of Rome; the emperor Severus being then absent.

APOLOGUE *, **ΑΠΟΛΟΓΟΣ**, a moral fable; or a feigned relation, intended to inform and amend the manners. See **FABLE**.

* Jul. Scaliger derives the name *απολογος*, inasmuch as the *apologue* means something more than what at first sight it expresses.

Such are the fables of *Aesop*; whence, moral fables are usually denominated *Aesopic Fables*.

Father de Colonia makes it essential to the *apologue*, that it contain what passes among brutes; and distinguishes it from the *parable* by this, that the latter, though feigned, might possibly be true, which the former cannot; since brutes cannot speak.

APOLOGY *, **ΑΠΟΛΟΓΙΑ**, *defense*; a discourse or writing in vindication of a person.

* The word is formed of the Greek *απολογειν*, to refute, or repel with words.

APONEUROSIS *, *Απνευρωσις*, among anatomists, the spreading or expansion of a nerve, or tendon, breadth-wise; in manner of a membrane.

* The word is compounded of the Greek *απο*, ab, from; and *νευρον*, a nerve.

APONEUROSIS sometimes also signifies the cutting off a nerve, or tendon.—And in some writers we find it used for a tendon itself.

APOPHLEGMATIZANTS * denote medicines proper to purge the head and brain of superfluous phlegm or ferrous humours.

* These are also, by many writers, denominated *apophlegmatizans*.—The word is compounded of *απο*, from; and *φλεγμα*, phlegm.

APOPHYGE*, in architecture, that part of a column where it begins to spring out of its base, and shoot upwards.

* The word in its original Greek signifies *flight*; whence the French also call it *escapote, coigne, &c.* and we, sometimes, the *spring* of the column.

The *apophyge*, in its original, was no more than the ring or fertil heretofore fastened at the extremities of wooden pillars, to keep them from splitting; which afterwards was imitated in stone-work.

APOPHYSIS*, in anatomy, a protuberance of a bone; or a part eminent, and jutting out beyond the rest.

* The word is Greek, *αποφύσις*, and literally denotes a production outwards: formed *απο το αποφύσις*, to arise from, or out of.

APOPHYSES Mammillares are the beginnings of the olfactory nerves, as far as the os cribrosum, where they divide into little fibres, which pass through those bones, and spread themselves throughout the upper part of the nose.

ΑΠΟΦΥΣΙΣ Mammillares, or *Mastoides*, also denotes one of the external eminences of the os petrosum.

APOPLECTIC, relating to an apoplexy.—Thus we say, an *apoplectic hit*, an *apoplectic water, &c.*

APOPLEXY* in medicine, a sudden privation of all the senses, and all the sensible motions of the body, excepting those of the heart and lungs; attended with a great deprivation, or suspension of the principal faculties of the soul.

* The word comes from the Greek *αποπληξίς*, to strike, or smother; this denoting striking suddenly, and, as it were, like a thunder-bolt.

Apoplexy differs from *comus, lethargy, and coma*, in regard, that in those three distempers the stupor is not so profound, nor is all sensation quite destroyed.

It differs from *syncope*, in that there is no sensible pulse in this last; whereas in an *apoplexy*, the pulse is perceptible almost till death.

It differs from an *epilepsy*, in regard all motion is not abolished in that, as in this: and it differs from the *palsy*, inasmuch as the palsy is not attended with any stupor, nor does it deprive the patient of sense and perception.

The *apoplexy* may be occasioned by an interruption of the passage of the blood towards the brain; or by any thing that hinders the influx of the animal spirits into the organs of sense, and the parts of voluntary motion: sometimes it is owing to an abundance of phlegm, and sometimes to a viscid pituita, wherewith the brain is oppressed; as is observable in winter *apoplexies*, and in those of old people. It sometimes also comes from a melancholic acid humour that coagulates the blood, or from too gross a lymph, which stops up the nerves; or a plethora, which oppresses them; or excrecencies within hide the cranium, pressing the vessels; or from a polypus, blocking up the carotids, &c. *V. Bayle, de Apopl.* See **BRAIN**.

In dissecting persons dead hereof, clotted extravasated blood is usually found in one or both ventricles of the brain. See *Philos. Transact.* N^o 173, 313, &c.

Hippocrates distinguishes two kinds of *apoplexies*, the one *strong*, the other *weak*; only differing in the greater, or less difficulty of respiration, and pulsation: in the former the pulse and breath seem almost entirely stopped, in the latter there are considerable remains of them.

The more modern authors distinguish *apoplexies*, from their cause, into *sanguineous and pituitous*; to which may be added *lymphatic, polypus, serous, atrabilary, &c.*

The fit of an *apoplexy* is usually preceded by a violent pain in the head, a dimness and loss of sight or memory: sometimes by an universal indolence; and sometimes by a flux of pituitous matter by the nose and mouth.—It is attended with a snoring and difficulty of breathing; sometimes with a fever, rarely with a foaming at the mouth, frequently with a sweat, hemorrhoids, or diarrhoea.

To prevent an *apoplexy*, wine and hard labour are to be avoided; there is to be no eating to excess; nor no sleeping after dinner: exercise is to be kept up, and care and chagrin to be kept under. To cure an *apoplexy*, medicines must be used that occasion large evacuations; and nothing of opiate or astringent kinds meddled withal.—During the fit, copious bleeding in the jugulars is to be used, and the patient laid on his back; applying strong volatiles to the nose; also blow up strong sternutories, and rub the temples with cephalic mixtures.—A hot iron may also be applied near the vertex or occiput; and an epispastic to the neck; to which are to be added powerful purgatives, clysters, &c.—Cupping and scarification on the head are commended by some in lieu of venesection.

The disease sometimes degenerates into a paralysis.—And sometimes only half the head is affected; in which case the disease is called simply a hemiplegia. See **SUPPLEMENT.** Article *Apoplexy*.

APORON*, or **ΑΠΟΡΙΜΕ**, a problem difficult to resolve; and which has never been resolved, though it be not, in itself, impossible.

* The word is derived from the Greek *απορος*, which signifies something very difficult, and impracticable; being formed from the privative *α*, and *πορος*, passage.

Such we conceive the quadrature of the circle; the duplicature of the cube; the trisection of an angle, &c.

When a question was proposed to any of the Greek philosophers, especially of the sect of academists; if he could not give an answer, his answer was, *απορις*, *q. d.* I do not conceive it, I cannot see through it, I am not able to clear it up.

APORRHOEA*, **ΑΠΟΡΡΟΗΣ**, in philosophy, sulphurous effluvia or exhalations, emitted from the earth, and subterraneous bodies.

* The word is formed from the Greek *απορροια*, *δύσμη*, to flow from. See **ΜΕΤΕΩΡΟΙ**, &c.

APOSEPARNISMUS, **Αποσπαρτισμός**, a species of fracture of the skull, or other bone, wherein a piece is taken clearly off, as if cut out with a hatchet: from the Greek *αποσπαρσις*, an ax, or hatchet. *V. Bibl. Anat. Med. T. 1. p. 559, & 581.*

APOSIOPESIS*, in rhetoric, otherwise called *reticency*, and *suppression*: a figure, by which a person really speaks of a thing, at the same time that he makes a shew as if he would say nothing of it. See **PRETERITION**.

* The word comes from the Greek *αποσιωπησις*, to hold one's peace.

APOSTACY*, a deserting, or abandoning of the true religion.

* The word is borrowed from the Latin *apostatari*, or *apostare*, to despoil, or violate any thing.—Hence, *apostatare leges* anciently signified to transgress the laws.—*Qui leges apostatavit terre sue reus sit apud regem.* LL. Edw. Confess. The Latin *ap-statari*, again, comes from the Greek *απο*, from; and *στασις*, *sto*, to stand.

Among the Romanists, *apostacy* also signifies the forsaking of a religious order, whereof a man had made profession; without a lawful dispensation.

The ancients distinguished three kinds of *apostacy*; the first, a *supererogation*, is committed by a priest or religious, who abandons his profession, and returns to his lay state; the second, a *mandatis Dei*, by a person of any condition, who abandons the commands of God, though he retains his faith; the third, a *fide*, by him whom not only abandons good works, but also the faith.

There is this difference betwixt an *apostate*, and a *heretic*; that the latter only abandons a part of the faith, whereas the former renounces the whole.

A late writer charges the English clergy with an *apostacy*, or falling away from the doctrines of the reformation.

APOSTATA Captivata, a writ which anciently lay against one, who, having entered and professed some order of religion, broke out again, and wandered the country, contrary to the rules of the order.

APOSTHUME*, or **ΑΠΟΣΤΗΜΑ**, in medicine, a preternatural tumor; called also *abscess*, and *impotibulum*. See **ABSCESS**.

* The word is formed of the Greek *αποσπασμα*; which comes from the verb *αποσπασμα*, *abscido*, I depart from one place and fix in another; alluding to the manner wherein the tumor is usually formed of a transfused humor.

A POSTERIORI.—Demonstration a *posteriori*. See **DEMONSTRATION**.

APOSTLE*, **ΑΠΟΣΤΟΛΟΣ**, one of the twelve disciples of Jesus Christ, commissioned by him to preach his Gospel, and propagate it to all the parts of the earth.

* The word *apostle*, *αποστολος*, originally signifies a person *delegated, or sent*; from the verb *αποσπασμα*, *mitti*; in which sense it occurs in Herodotus, and other profane authors.—Hence, in the New Testament, the term is applied to divers sorts of delegates; and to the twelve disciples by way of eminence.

Certain false preachers of the Gospel anciently disputed with St. Paul his quality of *apostle*; by reason none but those who had seen Jesus, and been witnesses of his actions, could be said to be sent by him.—In answer to these sophistical doctors, who had seduced the churches of Galatia; he begins his epistle to them with these words, *Paul an apostle, not of men nor by man, but by Jesus Christ and God the father*: by which he signified that he had his mission immediately from God; and of consequence was a true *apostle*.

St. Paul is frequently called the *apostle*, by way of eminence; and the *apostle of the Gentiles*, by reason his ministry was chiefly made use of for the conversion of the Gentile world, as that of St. Peter, was for the Jews.—The several *apostles* are usually represented with their respective badges or attributes: St. Peter, with the keys; St. Paul, with a sword; St. Andrew, with a cross or saltire; St. James minor, with a fuller's pole; St. John, with a cup and winged serpent flying from it; St. Bartholomew, with a knife; St. Philip, with a long staff, whose upper end is formed into a cross; St. Thomas, with a lance; St. Matthew, with a hatchet; St. Matthias, with a battle-ax; St. Simon major, with a pilgrim's staff and a gourd bottle; St. Simon, with a saw; and St. Thaddeus, with a club.

APOSTLE was also an appellation given to the ordinary travelling ministers of the church.—Thus St. Paul, in the epistle to the Romans, xvi. 7. lays, *Salute Andronicus and Junia, my kinsmen and fellow prisoners, who are of note among the apostles.*

APOSTLE was also a title given to those sent by the churches to carry their alms to the poor of other churches.—This usage they borrowed from the synagogues, who called those whom they sent on this message, by the same name; and the function or office itself *αποστολη*, *apostle*, *q. d.* mission.—Thus St. Paul, writing to the Philippians, tells them, that E-paphroditus their *apostle* had ministered to his wants, chap. II. 25.

APOSTLE is also used for a person who first planted the Christian faith in any place.

Thus St. Dionysius of Corinth is called the *apostle of France*; St. Xavier the *apostle of the Indies*, &c.—In the East-Indies, the jesuit missionaries are also called *apostles*.

In some ages of the church, the pope was peculiarly denominated the *apostle V. Sidon. apollin. Lib. VI. Ep. 4.*

APOSTLE, in the Greek liturgy, is particularly used for a book containing the epistles of St. Paul, printed in the order wherein they are to be read in churches, through the course of the year.—Another book of the like kind, containing the gospels, is called *Ευαγγελιον*, Gospel.

The *Apottle*, of late days, has also contained the other canonical epistles, the acts of the *apostles*, and the revelations. Hence it is also called, *Actis of the Apostles*, *Πραξεις αποστολων*; that being the first book in it.

APOSTLE, is also used among the Jews, for a kind of officer actually sent into the several parts and provinces in their jurisdiction, by way of visitor, or commissary; to see that the laws were duly observed, and to receive the moneys collected for the reparation of the temple, and the tribute payable to the Romans.

The Theodosian Code, Lib. XIV. *De Judeis*, calls those *apostoli, qui ad exigendum aurum atque argentum a patriarcha certis tempore diriguntur.* The Jews call them *מפדלן*, *Scheldin*, *q. d.* envoys, or messengers.—Julian the apostate remitted the Jews the *Apottle*, *Αποστολη*; that is, as he himself explains it, the tribute they had been accustomed to send him.

These *apostles* were a degree below the officers of the synagogues called *patriarchs*, and received their commissions from them.—Some authors observe that St. Paul had bore this office; and that it is this he alludes to in the beginning of the epistle to the Galatians: as if he had said, Paul, no longer an *apostle* of the synagogue, nor sent thereby to maintain the law of Moses, but now an *apostle* and envoy of Jesus Christ, &c.—St. Jerom, though he does not believe that St. Paul had been an *apostle* of this kind; yet imagines, that he alludes thereto, in the passage just cited.

In the arsenal of Bremen, there are twelve, sees of cannon called the *twelve apostles*, on a supposition that the whole world must be convinced, and acquiesce in the preaching of such *apostles*.

APOSTOLIC, **APOSTOLICAL**, something that relates to the *apostles*, or descends from them. See **APOSTLE**.

Thus we say, the *apostolical* age, *apostolical* doctrine, *apostolical* character, constitutions, traditions, &c.—The Romanists call their church, the *catholic and apostolical church*; and thus appropriate a title to Rome, which anciently was held in common with it by several other churches.

APOSTOLIC, in the primitive church, was an appellation given to all such churches as were founded by the *apostles*; and even to the bishops of those churches, as being the reputed successors of the *apostles*.—These were confined to four, *viz.* Rome, Alexandria, Antioch, and Jerusalem.

In after-times, other churches assumed the same quality, on account, principally, of the conformity of their doctrine with that of the churches which were *apostolical* by foundation, and because all bishops held themselves successors of the *apostles*, or acted in their dioceses with the authority of *apostles*.

The first time the term *apostolical* is attributed to bishops, as such, is in a letter of Clovis, to the council of Orleans, held in 511; though that king does not there expressly denominate them *apostolical*, but (*apostolica sede dignissima*) highly worthy of the *apostolical* see. In 581 Guntram calls the bishops met at the council of Macon, *apostolical* pontiffs, *apostolici pontifices*.

In progress of time, the bishop of Rome growing in power above the rest; and the three patriarchates of Alexandria, Antioch and Jerusalem falling into the hands of the Saracens; the title *apostolical* became restrained to the pope, and his church alone.—Though some of the popes, as St. Gregory the great, not contented to hold the title by this tenure, began, at length, to insist, that it belonged to them by another and peculiar right, as being the successors of St. Peter.

And hence a legion of *apostolicals*; *apostolical* see, *apostolical*

nuncio, *apostolical* notary, *apostolical* brief, *apostolical* chamber, *apostolical* vicar, &c.

APOSTOLICAL Constitutions. } See { CONSTITUTION.
APOSTOLICAL Tradition. } See { TRADITION.

APOSTOLICI, **APOSTOLI**, or **APOSTLES**, was a name assumed by two different sects of heretics, on account of their pretending to imitate the manners and practice of the *apostles*.

The first *Apostolici*, otherwise called *Apotactitæ* and *Apoctactici*, rose out of the Encratites, and Cathari, in the third century. They made profession of abstaining from marriage, and the use of wine, flesh, money, &c.

The other branch of *Apostolici* were of the twelfth century. These also condemned marriage, but allowed of concubinage; they set aside the use of baptism; and in many things imitated the Manichees.—St. Bernard wrote against this sect of *Apostolici*.

APOSTOLORUM Unguentum, the *Apostles* ointment, in pharmacy, is a kind of detergent, or cleansing unguent, composed of twelve drugs; the number of the *Apostles*, whence its name.

It was invented by Avicenna, and is otherwise called *unguentum generis*.—The principal ingredients are turpentine, resin, wax, gum ammoniac, birth-wort roots, olibanum, bellium, myrrh, and galbanum, opopanax, verdigraese, litharge, oil of olives, and vinegar.

APOSTROPHE*, in rhetoric, a figure, whereby the orator, in an extraordinary commotion, turns his discourse from the audience, and directs it to some other person, or thing.

* The word is Greek *αποτροφη*, *avertio*; formed of *απο*, *ab*, from, and *τροφη*, *verto*, to turn.

Thus Cicero, in his oration for Milo, addresses himself to the great patriots who had shed their blood for the public; and calls them to the defence of his client. So the same orator in his first *Catilinarian* directs himself to Jupiter the protector of the city and empire, and beseeches him to repel the parricide, &c.

The *apostrophe* is frequently also addressed to inanimates, as toms, monuments, deities, &c.—Cicero's *apostrophe* to Tullero, in his oration for Ligarius, is judged one of the finest passages in his works.

That *apostrophe* of Demosthenes, wherein he addresses himself to the Greeks slain at the battle of Marathon, is also famous.

Cardinal Perron says, it has procured the orator as much glory, as if he had raised them from the dead.

APOSTROPHE, or **APOSTROPHUS**, in grammar, also denotes a note or character placed over a letter, in lieu of a vowel, to denote that the vowel is cut off, and not to be pronounced.

As *co'n for even*; *th' angelic host*, for the *angelic*, &c.—The affectation of frequent *apostrophes*, so usual among some late English writers, is a great abuse.

APOTACTITÆ*, or **APOTACTICI**, an ancient sect, who affecting to follow the evangelical counsels of poverty, and the examples of the *Apostles*, and primitive Christians, renounced all their effects and possessions.

* The word is Greek, formed from *αποτακτικαι*, *αποτακται*, or *αποτακται*, to renounce.

It does not appear that they gave into any errors during their first state: some ecclesiastical writers assure us, they had divers holy virgins, and martyrs under the persecution of Diocletian, in the fourth century: but they afterwards fell into the heresy of the Encratites, and taught, that the renouncing of all riches was not only a matter of counsel and advice, but of precept and necessity.—And hence the sixth law in the Theodosian Code joins the *Apotactitæ* with the Eunomians and Arians.

APOTHECARY*, a person who professes the practice of pharmacy, or that part of physic which consists in the preparation and compulsion of medicines.

* The word is derived from the Greek *αποθεκω*, *shop*, the place where he makes up, and exposes his medicines to sale.

Nich. Langius has a large volume expressly against the *apothecaries*, their quid pro quo's, their ignorance in the materia medica, and suffering themselves to be so easily imposed on by foreign merchants, druggists, &c. who supply them with adulterated drugs, one sort for another, old effete exhausted ones for new ones just imported from the Levant, &c.

The *apothecaries* in England are obliged to make up their medicines according to the formula's prescribed in the college dispensatory.

Their shops are subject to the visitation of the censors of the college; who are empowered to destroy such medicines as they think not good.

To his Majesty belong two *apothecaries*: the salary, to the first, 320 l. to the second, 275 l.—To the household belong also two.

Bartholin complains of the too great number of *apothecaries* in Denmark: though there are but two allowed in all Copenhagen, and one in every other considerable town.—What would

would he have said of London, where there are said to be upwards of 2000.

Whether the people of London be gainers in point of health by this army of *apothecaries*, is much to be doubted: but we find many complaints of the too great influence of the *apothecaries*: physicians seem generally of opinion, that it is in the power of the *apothecaries* either to introduce them into families, or to keep them out. Hence it is, that the doctor looks on the *apothecary*, either as the person by whom he was first recommended, or as the man whose kind word is necessary to continue him in the good opinion of the family he is called to: in order therefore to shew his gratitude for the past favours, or to engage the future services of this worthy gentleman, the doctor thinks himself obliged to prescribe ten times more physic than his patient has really occasion for.

—If a conscientious physician offers to leave a sick man's chamber without putting pen to paper, the *apothecary* commonly informs the patient, by way of friendship, that whenever his physician does not prescribe he need not give him any fee. A patient who loves his money is apt enough to take such an hint; and, if the doctor is not a man of a very dull apprehension, he takes care not to commit the same fault a second time.—Happy would it be for the miserable patients here in town, if the load of unneccessary physic which they swallow down, though it does them no good, did them no harm; it would be no great matter if their pockets alone smarted for their folly; but, alas! this is not the case; their lives, or at least their constitutions, often pay for it. To confess the truth, a physician who would do good must always follow nature, but never run before it. And whenever he gives his patient two or three unneccessary doses of physic, from that time he no longer sees those symptoms of nature, which in all cases are our surest guides: he sees no other symptoms but such as chiefly result from his own drugs; and then I need not tell you what must be the consequence; he goes on in a fort of circle, creating distempers one day, and applying remedies to them the next. It is strange, to what a height *apothecaries* have found means to carry their favourite polypharmacy, considering what a few simple easy medicines will answer all the purpose of their vast shops. The physicians of Paris, towards the beginning of the 17th century, began to oppose the growing evil. Patin was one of the warmest. They went so far, as at length to exclude the ministry of the *apothecaries* in almost all cases. A valet, or a chambermaid, prepared and administered the purges, clysters, &c. The book seller of the *Medicin Charitable*, (which they had procured to be wrote for the purpose) made up and sold most of the medicines directed in it; and even the physicians, when they wanted, sent to him for them. Patin, lett. 17. à Belin.

If you would keep the *apothecaries* under, says Guy Patin, (writing to M. Falconet, a physician of Lyons) you need only put them in mind of the *Medicin Charitable*, with which, when it was only worth two sous, we ruin'd the *apothecaries* of Paris.—Give 'em to understand, that cassia, rhubarb, and syrup of pale roses, are to be had at the grocer's, with which remedies alone we can do without their assistance. Mess. Marecot, Pietre, Duret, &c. introduced into the families in Paris a facile, parable physic, which has delivered them from the tyranny of those *cuisiniers arabesques*. Pat. Lett. Chisif. 21.

APOTHEOSIS *, in antiquity, a heathen ceremony, whereby their emperors and great men were placed among the Gods.

* The word is derived from the preposition *απο*, and *θεο*, *Deus*; God.

After the *apothesis*, which they also called *deification* and *consecration*, temples, altars, and images *, were erected to the new deity; sacrifices, &c. were offered, and colleges of priests instituted. *Dia* 473, 56, 59. *Suet. Aug.* 5. *Tib.* 40. *Paterc.* 1. *Ovid. Pont.* 4.

* Images were erected to them with the attributes of divinity, (*Lucan* 7. *Dia* 53. *Capitolin. Antonin.*) And to demolish them was deemed treason, (*Penul. l.* 6. *D. ad leg. Jul. maj.*) And even the senate decreed that oaths should be taken in their Names, (*Dia* 44, 59, 60. *Tac. Ann.* 1.) Vid. Kirchm. de san. Rom. 4. 14.

It was one of the doctrines of Pythagoras, which he had borrowed from the Chaldees; that virtuous persons, after their death, were raised into the order of the Gods. And hence the ancients deified all the inventors of things useful to mankind; and those who had done any important service to the commonwealth.—Tiberius proposed to the Roman senate the *apothesis* of Jesus Christ, as is related by Eusebius, Tertullian, and St. Chryostom. Juvenal rallying the frequent *apotheses*, introduces poor Atlas, complaining that he was ready to sink under the burthen of so many new Gods as were every day added to the heavens.

Seneca ridicules the *apothesis* of Claudius with admirable humour.—Herodian, l. 4. in speaking of the *apothesis* of Severus, gives us a very curious description of the cere-

monies used in the *apothesis* of the Roman emperors.—After the body of the deceased emperor, says he, had been burnt with the usual solemnities, they placed an image of wax, perfectly like him, but of a sickly aspect, on a large bed of ivory, covered with cloth of gold, in the vestibule of the palace. The greatest part of the day, the senate sat ranged on the left side of the bed, dressed in robes of mourning; the ladies of the first rank sitting on the right side, in plain and white robes, without any ornaments.—This lasted for seven days successively, during which, the physicians came from time to time to visit the sick, always making their report that he grew worse; till at length they published it, that he was dead.

This done, the young senators and Roman knights took the bed of state upon their shoulders, carrying it through the *via sacra*, to the old forum, where the magistrates were used to divest themselves of their offices. There, they set it down between two kind of amphitheatres, in the one whereof were the youth, and in the other the maidens of the first families in Rome, singing hymns set to solemn airs, in praise of the deceased. These hymns ended, the bed was carried out of the city into the campus martius, in the middle of which place was erected a kind of square pavilion, the inside whereof was full of combustible matters, and the outside hung with cloth of gold, and adorn'd with figures of ivory, and various paintings.

Over this edifice were several others, like the first in form and decoration, but less; always diminishing and growing slenderer towards the top.—On the second of these was placed the bed of state, and a great quantity of aromatic perfumes, and odoriferous fruits and herbs were thrown all around; after which, the knights made a procession or cavalcade in solemn measures around the pile; several chariots also run round it, those who conducted them being clad in purple robes, and bearing the images of the greatest Roman emperors and generals.

This ceremony ended, the new emperor came to the catafalco or pile, with a torch in his hand; and at the same time fire was set to it, on all sides; the spices and other combustibles kindling all at once.

While this was doing, they let fly from the top of the building, an eagle, which mounting into the air with a fire-brand, carried the soul of the dead emperor along with it into heaven, as the Romans believed; and thenceforward he was ranked among the gods.—It is for this reason, that the medals, wherein *apotheses* are represented, have usually an altar with fire upon it; or else an eagle taking its flight into the air, and sometimes two eagles.

APOTOME *, in mathematics, the remainder or difference of two incommensurable quantities.

* The word is derived from the Greek verb *αποτμω*, *absindo*, I cut off.

A An *apotome* in geometry is an irrational residue, as CB, arising, when from a rational line AC, called *a*, you cut off a rational part AB, called *b*, only commensurable in power to the whole line AC.—It may be expressed thus, $a - \sqrt{b}$.

C **APOTOME**, in music, is the part remaining of an entire tone, after a greater semi-tone has been taken from it. The proportion in numbers of the *apotome* is, that of 2048 to 2187.

The Greeks thought that the greater tone could not be divided into two equal parts; for which reason they called the first part *αποτμηον*, and the other *σημιμα*; in this imitating Pythagoras and Plato.

APOZEM *, *Αποζυμα*, in medicine, a form of remedy, otherwise called a *decotion*. See **DECOCTION**.

* The word is derived from the Greek *αποζω*, *firvofacio*, I make hot.

Apozems are a class of liquid medicines, composed of the juices of divers plants, roots, woods, flowers, leaves, fruits, and seeds, drawn out by boiling in water, and sweetned and clarified. An *apozem* differs from a *syrup*, in thickness and consistence; the *syrup* being more dense and viscous than the *apozem*, from the quantity of sugar.

It differs from a *julep*, in that it is thicker and more viscous; and is not made with distilled waters, as *juleps* are, but only with common water.

There are purging *apozems*, cephalic *apozems*, hepatic *apozems*, antarthritic, diuretic, styptic, &c. *apozems*.

APPANAGE, or **APPENAGE**. See **APANAGE**.

APPARATOR. See the article **APPARITOR**.

APPARATUS properly signifies a formal preparation for some public and solemn action.

We say, the *apparatus* of a feast, coronation, &c. The prince made his entry with great *apparatus* and magnificence.

APPARATUS is also used for the utensils, and appendages belonging to some more considerable machine.—As, the furniture or *apparatus* of an air-pump, microscope, &c.

APPARATUS is sometimes also used in chirurgery, for the bandages, medicaments and dressings of a part; or the several

several matters applied for the cure of a wound, ulcer, or the like.

There is no judging of the quality of a hurt, till after taking off the first apparatus, or coverings.

APPARATUS is frequently used for the operation of cutting for the stone.

For this there are three sorts of apparatus; viz. the small (1), great (2), and high apparatus (3): which see described under the article LITHOTOMY.

(1) *The Small APPARATUS*, thus called from the few instruments it requires, was invented and described by Celsus.—Here, the two force-pieces are thrust up the fundament till they come against the stone, and drive it to the neck of the bladder; from which it is extracted through an incision in *perinæo*.

(2) *The Great APPARATUS*, invented by John de Romanis, a physician of Cremona, in the year 1500; is performed also by making an incision in the *perinæum*. This is denominated *great*, from the number of instruments used in it.

(3) *The High APPARATUS*, said to have been invented by Peter Franco, a surgeon of Provence in 1560, has been little used among us till of late.—In this method an incision is made above the os pubis, along the *linea alba*, into the fund of the bladder; through which the stone is extracted.

To these may be added the lateral operation, invented by Friar Jacques. *Vid. Hist. Acad. R. Science. an. 1699. p. 34.*

APPARATUS is also used as a title of several books composed in form of catalogues, bibliothecæ, dictionaries, &c. for the ease, and convenience of study.

The Apparatus to Cicero, is a kind of concordance, or collection of Ciceronian phrases, &c.—*The apparatus sacer* of Posselin, is a collection of all kinds of ecclesiastical authors printed in 1611, in three volumes.—Glossaries, comments, &c. are also frequently called *Apparatus*'s.

APPARENT, that which is visible, or evident to the eye, or the understanding.

APPARENT *Altitude*. See the article ALTITUDE.

APPARENT *Conjunction* of the planets is, when a right line, supposed to be drawn through the centre of two planets, does not pass through the centre of the earth, but through the eye of the spectator.

Heir APPARENT. See HEIR *Apparent*.

APPARENT, or *sensible Horizon*, is that great circle which limits our sight; or the place where the heavens and the earth seem to meet.

This may be conceived as a cone, whose vertex is the eye, and its base the circular plain which terminates our prospect.—It determines the rising and the setting of the sun, moon, and stars.

APPARENT *Magnitude* of an object is the magnitude thereof such as it appears to the eye.

The *apparent* or seeming magnitude is measured by the optic angle.

Thus the *apparent* magnitude of an object is said to be so many degrees as the optic or visual angle subtends.

The *apparent* magnitudes of distant objects are usually said to be as their distances, reciprocally.

In strictness, however, it may be demonstrated, that the *apparent* magnitudes of the same object AC, (*Tab. Opticæ. fig. 69.*) seen at different distances, viz. at the places D and B; that is, the angles ADC and ABC are in a ratio less than the reciprocal ratio of the distances DG and BG; but when the object is very remote, viz. when the optic angles ADC and ABC are not above one or two degrees, they are nearly in that ratio reciprocally.

APPARENT *Magnitude* or *Diameter* of the sun, moon, or any planet, is the quantity of the angle that their diameters appear under, to an observer on the surface of the earth.

The *apparent* diameters of the celestial luminaries are subject to some diversity.—That of the sun is observed to be least when he is in cancer, and greatest when in capricorn.

In the moon there is a twofold increase and decrease of the *apparent* diameter; the one, when she is in conjunction with the sun; and the other when in her quadratures.

The greatest *apparent* diameter of the sun, according to Cassini, is 32', 10"; and the least 31', 38".—According to de la Hire, the greatest is 32', 43"; and the least 31', 38".

The greatest *apparent* diameter of the moon, according to Kepler, is 32', 44"; and the least 30', 00".—And according to de la Hire, the one is 33', 30"; and the other 29', 30". See SUN and MOON.

The *apparent* diameter of Saturn's ring, according to Huygens, is 1', 8", when least.

The *apparent* diameters of the other planets, see under the article DIAMETER.

If the distances of any two very remote objects, for example, two planets, be equal, their true diameters are proportional to the *apparent* ones; and if the *apparent* diameters be equal, the true diameters will be as the distances from the eye.—Hence, when neither the distances nor the *apparent* diameters are equal,

Vo L. I.

the true diameter will be in a ratio compounded of the direct ratio of the distances, and of the direct ratio of the *apparent* diameters.

There is a farther very observable difference between the *apparent* magnitudes or diameters of the sun and moon when in the horizon, from what they are in the meridian; the reason whereof has long perplexed the philosophers. See MOON.

APPARENT *Motion*, *Time*, &c. See MOTION, TIME, &c.

APPARENT *Place* of any object, in optics, is that wherein it appears, when seen through one or more glasses.

The *apparent place* is different from the *real* one; for when, by refraction through glasses, that parcel of rays which falls on the pupil of the eye, from each point of any near object, is made to flow as close together as that which comes from a distant one; or when, by the same means, the rays coming from distant objects are made to diverge as much as if they flowed from near ones; then the eye must necessarily see the *place* of the object changed: which change is its *apparent place*.

If an object be placed nearer to a convex glass than is the distance of its focus, its *apparent place* may be determined: but if the object be in the focus of the glass, the *locus apparens* of the object cannot be determined; only that it will appear vastly remote.

Nor can the *locus apparens* be determined, if the object be beyond the focus of a convex glass: but if the object be further distant from a convex glass, than its focus, and the eye lie beyond the distinct base, its *apparent place* will be in the distinct base. See the article LENS.

APPARENT *place* of a star, &c. is a point in the surface of the sphere, determined by a line drawn from the eye through the centre of the star.

The true or real place is determined by a line drawn from the centre of the earth, through the star or planet.

APPARTITION, in astronomy, denotes a star's or other luminary's becoming visible, which before was hid.

In which sense the word stands opposed to *occultation*.

The heliacal rising is rather an *appartition* than a proper rising. See HELIACAL.

Circle of perpetual APPARTITION. See CIRCLE of perpetual *Appartition*.

APPARTITOR, or APPARTITOUR, or APPARATOR, a beadle in an university, who carries the mace before the masters, and the faculties. See BEADLE, and UNIVERSITY.

APPARTITORS also denote messengers, who cite men to appear in the ecclesiastical courts.

Among the Romans, *appartitores* were the same with sergeants or tip-staffs among us; or rather *appartitor* was a general term, and comprized under it all the ministers and attendants of the judges and magistrates, appointed to receive and execute their orders.—And hence, they say, the name was derived, viz. from *apparere*, to be present, to be in waiting.

Under the name *appartitores* were comprehended the *scribæ*, *accessi*, *interpretes*, *præcones*, *viatores*, *lictores*, *flatores*, and even the *carnicies* or hangmen.

They were usually chosen out of the freed-men of the magistrates; and their condition was held in so much contempt, that, as a mark of ignominy, the senate appointed a city that had revolted from them to furnish them with *appartitores*.

There were also a kind of *appartitores* of cohorts, called *esortales*, or *conditionales*, as being attached to a cohort, and doomed to that condition.—The *appartitores* of the pretors, *pretoriani*, were those who attended the pretors, or governors of provinces; and who, on their master's birth-day, were always changed, and preferred to better posts.—Add, that the pontifices had also their *appartitores*, as appears from an inscription of an ancient marble in the *via appia*:

APPARTITORI
PONTIFICVM
PARMVLRARIO.

APPEAL in law, signifies the removal of a cause from an inferior judge to a superior; or the having recourse to a superior judge to rectify what is amiss in a sentence passed by an inferior.

Appeals lie from all the ordinary courts of justice to the house of lords, who judge in *dernier ressort*; i. e. no appeal lies from them.

There are *appeals* from ecclesiastical justice to secular.—The first instance of this is that of Paulus Samosatensis; who, being condemned and deposed by the second council of Antioch, refused to surrender the episcopal house to Domnus, who had been elected his successor; and *appealed* to the emperor.

APPEAL is also used in common law in the same sense with *accusatio* among the civilians. For as, in the civil law, cognizance of criminal cases is taken either upon inquisition, accusation, or denunciation; so, in ours, it is taken either upon indictment, or *appeal*.

Indictment comprehends both inquisition and denunciation.—*Appeal* or *accusatio* is a lawful declaration of another man's crime (which, by Bracton, must be felony at the least) be-

fore a competent judge, by one that setteth his name to the declaration, and undertakes to make it good on the penalty that may otherwise ensue.

An *appeal* is commenced two ways; either by *Writ*, or by *Bill*.

APPEAL by Writ is, when a writ is purchased out of chancery by one to another; to this end, that he *appeal* a third of some felony committed by him, finding pledges that he shall do it, and deliver this writ to the sheriff to be recorded.

APPEAL by Bill is, when a man of himself gives up his accusation in writing to the sheriff or coroner; offering to undergo the burden of *appealing* the person therein named.

This practice is drawn from the Normans, as appears from the grand customary, wherein is a solemn discourse both of the effects of this *appeal*, viz. the order of the combat, or the trial by inquest; which, by our law, was in the choice of the defendant.

APPEAL of Mayhem is an accusing of one that hath maimed another.—But this being heretofore no felony, the *appeal* thereof was but in manner of an action of trespass; so that there was nothing recovered but the damages.

Bracton calls this, *appellum de plagis mayhemio*, and has a whole chapter of it.—In king John's time, there is recorded an *appeal* against a Jew, *qui fecit ementulari quendam nepotem suum*.

APPEAL of wrong imprisonment is used by Bracton for an action of wrong or false imprisonment.

APPEAL is more particularly used for a private accusation of a murderer, by one who had interest in the murder'd party; or of any felon by one of his accomplices in the fact.

If an appeal of murder or felony be used by any common person against a peer; he shall be tried by Commoners, and not by his peers.

The person who brings an *appeal* is called the *appellant*; and the person appealed, the *appellee*.

APPEARANCE, the exterior surface of a thing; or that which first strikes the sense, or the imagination.

The academics maintain, that the sensible qualities of bodies are only *appearances*; and the like doctrine is held by some later philosophers.

Our errors arise chiefly from a too hasty and precipitate assent of the will, which acquiesces too easily in the *appearances* of truth.

APPEARANCES in physiology. See PHASMATA.

APPEARANCE, in perspective, is the representation or projection of a figure, body, or the like object, upon the perspective plane.

The *appearance* of an objective right line is always a right line. See PERSPECTIVE.—The *appearance* of an opaque body and a luminary being given, to find the *appearance* of the shadow; see SHADOW.

APPEARANCE of a star or planet. See APPARITION.

APPEARANCES, in astronomy, &c. are more usually called *phenomena* and *phases*.

In optics we use the term *direct appearance* for the view or sight of an object by direct rays; without either refraction or reflection.

To *save APPEARANCES* is to discharge one's duty seemingly, or acquit himself of the formalities and externals thereof; so as to save his character, and avoid giving scandal or offence.

APPEARANCE, in law, is the defendant's engaging to answer a cause or action entered against him in some court of judicature.

Appearance, in the king's-bench, is the defendant's filing either of common or special bail, if the action be by bill.—If it be by original, the appearance must be with the philazer of the county where the arrest was.

Appearance, in the common-pleas, must be entered with the philazer there; but if it be by bill, with the prothonotary.

APPELLATIVE*, or *Noun APPELLATIVE*, in grammar, a common name; or a name which belongs or is applicable to all things of a certain kind.

* The word is formed of the Latin, *appellare*, to call, or name a thing.

Such are the names, *man, angel, horse, plant, tree, &c.* *Appellatives* stand opposed to *proper* names, which belong only to individuals; as Peter, Gabriel, Bucephalus, &c. See PROPER Name.

APPENAGE. See the article APANAGE.

APPENDANT, in law, is understood of such things as by time of prescription have belonged, appertained, and been joined, to some other principal thing.

Thus an hospital may be *appendant* to a manor; a common of fishing, to a freehold; a seat in a church, to a house; or the like.

Abvowson APPENDANT. } See the articles } ADVOWSON.
Common APPENDANT. } COMMON.

APPENDIX, or APPENDAGE, a thing accessory to, or dependant on another.

The term is chiefly used in matters of literature, for an additional discourse, placed at the end of any piece, or writing; to explain or prosecute something there left deficient, or to draw conclusions therefrom.—In which sense the word coincides with *supplement*.

APPENDIX, in anatomy, is a part, in some measure, detached from another part to which however it adheres, or is contiguous.

There are membranous *appendices*, of various figures, in most of the inner parts of the body.

The cœcum is by some writers called *appendix*, or *appendicula vermiciformis*.

APPENDIX is more particularly used in the same sense with *epiphysis*.

APPENSA*, or **APPENDED Remedies**, such as are outwardly applied, by hanging about the neck.

* The word comes from the Latin *ad* and *pendo*, I hang to.

Such are divers amulets, necklaces, phylacteries, &c. See APPURTENANCES, or APPURTENANCES. See APPURTENANCES.

APPETITE*, **APPETITUS**, **APPETENCY**, in philosophy, a desire of enjoying something wanted; or a complacency in the fruition of a thing present.

* The word comes from the Latin verb *appetere*, to desire, to covet; formed of *ad*, to; and *peto*, I draw.

Some philosophers define *appetite* more generally, an inclination of the soul, towards some object considered as good; or a propensity to an object, in respect of the good that is apprehended in it.

The schoolmen distinguish *appetite* into *voluntary* and *natural*.—The first is the will it self, acting under a competent knowledge or information of the thing in hand: such is the *appetite* or desire of being happy.—The second is a kind of instinct, whereby we are mechanically driven to consult our own preservation.

Natural *appetite* is subdivided into *concupiscible* and *irascible*.

APPETITE, in medicine, is more particularly used to denote a natural periodical call or desire to eat and drink, in order to repair what had been wasted by the several excretions of the body.

A loss or prostration of *appetite* is called *anorexia*. See ANOREXIA.—A preposterous *appetency* of things not proper for food is called *pica*. See PICA.

An immoderate appetite is called *bulimia*, or *fomes canina*, See BULIMIA.—Some, however, distinguish between the *bulimia*, and canine *appetite*; making it the distinguishing character of the latter, that it is attended with a lenty, or other occlial flux.

APPLAUSE*, properly signifies an approbation of some thing, witnessed by clapping of hands.

* The word is formed of the Latin *applausus*, or *plausus*, of the verb *plaudere*, to clap the hands.

The ancient way of *applauding* by clapping the hands is scarce retained any where but in colleges and theatres.—Such a tragedy was acted with great *applause*; such a student maintained a thesis with *applause*, &c.

APPLES, *Poma*. See the articles FRUIT, CIDER, ORCHARD, &c.

Dwarf APPLS. See the article DWARF.

Adam's APPLE, *Pomum Adami*. See POMUM.

APPLE of the Eye. See the article PUPIL.

APPLICATE, **APPLICATA**, **Ordinate APPLICATE**, in geometry, is a right line drawn a-crofs a curve, so as to bisect the diameter thereof.

Applicate is the same with what we otherwise call *ordinate*.

APPLICATION, the act of *applying* one thing to another, by approaching or bringing them nearer together. See APPLY.

Motion is defined by a successive *application* of any thing to different parts of space.

The *application* of a vesicatory to the neck, or other part, produces an irritation of the bladder.

The true and great secret in physic is, how to *apply* a medicine, not how to make it.

APPLICATION is also used for the adjusting, accommodating, or making a thing quadrate to another.

Thus we say, the *application* of a fable, &c.

APPLICATION, in theology, is particularly used for the act whereby our Saviour transfers, or makes over to us, what he had earned or purchased by his holy life, and death.

It is by this *application* of the merits of Christ, that we are to be justified; and entitled to grace, and glory.

The sacraments are the ordinary means, or instruments, whereby this *application* is effected.

APPLICATION is sometimes also used in geometry, for what in arithmetic we call *division*.

APPLICATION also signifies the fitting or applying of one quantity

quantity to another, whose areas, but not figures, are the same.

Thus Euclid shews how, on a right line given, to apply a parallelogram that shall be equal to a right-lined figure given.

APPLY, among mathematicians, sometimes signifies to transfer a line given into a circle, most commonly, or into any other figure; so as its ends shall be in the perimeter of the figure.

APPLY denotes also as much as *divide*, especially among Latin writers; who, as they say, *duc AB in CB*, draw AB into CB, when they would have AB multiplied by CB; or rather when they would have a right-angled parallelogram made of those lines: so they say, *applica AB ad CB*, apply AB to CB, when they would have CB divided by AB; which is thus expressed,

CB

AB

APPLY also signifies to fit quantities, whose areas are equal, but figures different.

APPOINTEE, a foot-soldier, in the French army, &c. who for his long service, and bravery, receives pay above private sentinels. See **ANSPESSADE**.

APPOINTMENT, a pension or salary given by great lords and princes to persons of worth and parts, in order to retain them in their service.

The term is chiefly used among the French.—The king of France gives large *appointments* to several of the officers in his service.

Appointments differ from wages, in that the latter are fixed and ordinary, being paid by the ordinary treasurers; whereas *appointments* are annual gratifications granted by brevet for a time uncertain, and are paid out of the privy purse.

APPORTIONMENT, or **APPORCIONMENT**, **APPORTIONAMENTUM**, in law, a dividing of a rent into two or more parts, or portions, according as the land whence it issues is divided among two, or more proprietors.

Thus if a man, having a rent-service issuing out of land, purchase a part of the land; the rent shall be *apportioned*, according to the value of the land.—So if a man let lands for years, reserving rent, and a stranger after recover part of the lands, the rent shall be *apportioned*.

But a rent-charge cannot be *apportioned*, nor things that are entire; as if one hold land by service, to pay to his lord yearly at such a feast a horse or a rose; there, if the lord purchase a part of the land, this service is totally extinct; because such things cannot be divided without hurt to the whole.—But if part of the land, out of which a rent-charge issues, descends to the grantee of the rent, this shall be *apportioned*.—A man purchases part of the land where he hath common appurtenant, the common shall be *apportioned*: of common appurtenant it is otherwise; and if by the act of the party, the common is extinct. Common appurtenant and appurtenant may be *apportioned* on alienation of part of the land to which it is appurtenant or appurtenant.—Conditions generally are entire, and cannot be *apportioned* by the act of the party; a contract may not be divided or *apportioned*, so as to subject a man to two actions.

APPOSAL of *Sheriffs* is the charging them with money received on their account in the exchequer. 22 & 23 Car. 2.

APPOSER, in law.

APPOSITION, the act of putting or applying one thing to another.

APPOSITION is used in physics, in speaking of bodies which derive their growth from the adjunction or union of neighbouring bodies.

Most bodies of the fossil or mineral kingdom are formed by *juxta-position*, or the *apposition* of parts, brought to join and adhere to each other.

APPOSITION, in grammar, denotes the putting two or more substantives together in the same case, and without any copular conjunction between them.

Thus, Flanders, bloody theatre, horrible scene of war; love, enemy of human quiet; peace, parent of riches, source of faction, &c.

APPRaising *, the act of rating, valuing, or setting a price on goods, by a person who is a competent judge, and is authorized thereto.

* The word is derived from the French *apprécier*, which signifies the same thing.—Hence we also say an *appraiser*, a sworn *appraiser*, an *appraisement*, &c.

APPREHENSION *, in logic, denotes the attention of the mind to an object presented either to our senses, or our imagination.

* The word literally denotes the action of the hand, whereby it takes hold of, and grasps any thing; being formed of the Latin *ad, to*, and *prehendo*, I hold, I catch

In this sense, *apprehension* differs from *notion*, or *idea*, as the

act of the mind whereby a notion or idea is formed differs from an act of the mind whereby we attend to a notion or idea already formed.

APPREHENSION, in law, signifies the seizing a criminal, in order to bring him to justice.

APPRENDRE, in our ancient law-books, a fee or profit to be taken or received.

APPRENTICE, one who is bound by covenant to serve a tradesman or artificer a certain time; usually seven years; upon condition of the master's instructing him in his art or mystery.

Sir Thomas Smith says, that apprentices are a kind of bond-men, or slaves, differing from others only in this, that they are servants by covenant, and for a time. *de Rep. Anglor. Lib. 3.*

Anciently, benchers in the inns of court were called *apprentices of the law*, in Latin *apprenticii juris nobilitates*; as appears by Mr. Selden's notes on Fortescue: and so the learned Plowden files himself. See **BENCHER**.

Sir Henry Finch, in his *Nomotechnia*, writes himself *apprentice de ley*: Sir Edward Coke in his *Instit.* says, *apprenticii legis* in pleading are called *homines constarii*, & in *lege periti*; and in another place, *apprentices* and other counsellors of law.

APPROACH. See **ACCESS** and **APPROXIMATION**.

The curve of *equable Approach*; *Accessus aequalis*, first proposed by M. Leibnitz, has caused some sweat among analysts.—The business is to find a curve, wherein a body descending by the sole power of gravity shall approach the horizon equally in equal times.—This curve has been found by Bernoulli, Varignon, Maupertuis, and others, to be the second cubical parabola, so placed as that its point of regression is uppermost. *Vid. Hist. Acad. R. Science. An. 1699. p. 82. Item An. 1735. p. 129. Mem. p. 333.*

APPROACHES, in fortification, the several works made by the besiegers for advancing or getting nearer to a fortress, or place besieged.—See *Tab. Archit. fig. 21.*

Such are trenches, mines, saps, lodgments, batteries, galleries, epaulments, &c.

APPROACHES, or **Lines of APPROACH**, are particularly used for trenches dug in the ground, and their earth thrown up on the side next the place besieged; under shelter or defence whereof the besiegers may approach, without loss, to the parapet of the covered way; and plant guns, &c. wherewith to cannonade the place.

The lines of *approach* are to be connected by parallels or lines of communication.

The besieged frequently make *counter-approaches*, to interrupt and defeat the enemies *approaches*. See **COUNTER-APPROACH**.

APPROPRIARE ad honorem, in law, signifies to bring a manor within the extent and liberty of such an honour. See **HONOUR**, and **MANOR**.

APPROPRIARE Communam, in law, signifies to discommon, *i. e.* to separate and inclose any parcel of land, which before was open common.

APPROPRIATE, **APPROPRIATED**, in philosophy, is understood of something which is indeed common to several; yet, in some respects, is peculiarly attributed to one.

Thus, creation is common to the Father, Son, and Holy Ghost; and yet is *appropriated* to the Father.

APPROPRIATE, in law, is understood of a church or benefice, the patronage whereof is annexed to some church-dignity, who appoints a vicar to serve the cure; the patron receiving the chief produce of it.

There are computed to be in England 3845 churches *appropriate*, and *impropriate*.

APPROPRIATION, the act of *appropriating*, *i. e.* of applying a church-benefice, which of its own nature is *juris divini* and no person's patrimony, to the proper and perpetual use of some religious community, to enjoy for ever.

Appropriation, is where the advowson of a parsonage is given or belongs to any bishopric, religious house, college, &c. and to their successors; so that the house or body is both patron and parson, and some one of the members officiates as vicar.

It is called *appropriation*, because the profits of the living are appropriated to the use of the patrons; so that parsons, though they are not ordinarily accounted *domini usufructuarii*, having no right of fee-simple; yet, by reason of the perpetuity of their succession, are here reputed owners of the fee-simple, and are therefore called *propriarii*.

To make an *appropriation*, after licence obtained of the king in chancery, the consent of the diocesan, patron, and incumbent, is necessary, if the church be full; if it be void, the diocesan and the patron, upon the king's licence, may conclude it.

To dissolve an *appropriation*, it is enough to present a clerk to the bishop, and he to institute and induct him: for that once done, the benefice returns to its former nature. This is called *disappropriation*.

APPROVEMENT, APPROVEMENTUM, or APPROVIAMENTUM, is sometimes used in ancient writers for an improvement, or rise of the value and worth of a thing. See **VALUE**.

Thus to *approve, approbare*, is to make the best benefit of a thing by increasing the rent, &c. *Cum omnibus approviamentis & aliis pertinentiis suis*, &c.

Hence, in some ancient statutes, bailiffs of lords in their franchises are called their *approvers*.

A bailiff is not to think it below him to approve, *approbare* his master's goods; but of his barley to make malt, of his wool to make cloth, &c.

APPROVEMENT, is more particularly used where a man hath common in the lord's waste, and the lord incloseth part of the waste for himself; leaving sufficient common, with egress and regress, for the commoner.

APPROVER, in our laws, one who, confessing felony in himself, appealeth or impeacheth another or more of his accomplices.

He is also called from the French *approver, comprobare*, because he must prove what he hath alledged in his appeal.— This proof was anciently either by battle, or by the country, at the choice of the appellee.

APPROVERS of the king are those who have the letting of the king's demesnes in small manors, &c. See **DEMESNE**.

APPROXIMATION, in arithmetic, a continual approach still nearer and nearer to a root or quantity sought, without a possibility of ever arriving at it exactly.

We have divers methods of *approximation* delivered by Wallis, Raphson, Halley, Howard, &c. all of them being no other than series's infinitely converging, or approaching still nearer to the quantity required, according to the nature of the series.

It is evident, that if a number proposed be not a true square, it is in vain to hope for a just quadratic root thereof, explicable by rational numbers, integers or fracted; whence, in such cases, we must content ourselves with *approximations*, somewhat near the truth, without pretending to accuracy; and so for the cubic root, of what is not a perfect cube; and the like for superior powers.

This the ancients were aware of, and accordingly they had their methods of *approximation*; which, though scarce applied by them beyond the quadratic or perhaps the cubic root, are yet equally practicable, by due adjustments, to the superior powers also: as is shewn in the *Philosoph. Transact.* N^o. 215.

If there be a non-quadratic or non-cubic number; the former being expressed by $aa+bb$, and the latter by $aaa+bbb$, where aa and aaa are the greatest square and cube in the

proposed numbers; then $\sqrt{aa+bb} = a + \frac{ab}{2aa + \frac{1}{2}b}$; and $\sqrt[3]{aaa+bbb} = a + \frac{ab}{3aaa+bb} = \frac{1}{3}a + \sqrt[3]{\frac{1}{3}aa + \frac{b}{3a}}$, will be easy and expeditious *approximations* to the square and cube root.

To extract the root of an equation by APPROXIMATION.—1^o. For a quadratic equation—suppose the equation $x^2-5x-31=0$; let the root be $8+y$, so that y may denote the fraction, whereby the assumed number either exceeds or comes short of the root: Then

$$\begin{aligned} x^2 &= 64 + 16y + y^2 \\ -5x &= -40 - 5y \\ -31 &= -31 \\ \hline -7 + 11y + y^2 &= 0 \end{aligned}$$

Since the powers of fractions are continually decreasing; and we only here want a root nearly true; y^2 is cast away: upon which,

$$\begin{aligned} -7 + 11y &= 0 \\ y &= \frac{7}{11} = \frac{1}{1} \text{ nearly } = 0.6 \end{aligned}$$

Wherefore $x = 8 + 0.6 = 8.6$

$$\begin{aligned} \text{Suppose } x &= 8.6 + y. \text{ Then} \\ x^2 &= 73.96 + 14.72y + y^2 \\ -5x &= -43.0 - 5y \\ -31 &= -31 \end{aligned}$$

$$\frac{73.96}{1000} - \frac{43.0}{1000} - 31 + 14.72y - 5y = 0$$

Which, being reduced to the same denomination, as here follows

$$\begin{aligned} 73.96 - 4300 - 3100 + (1720 - 500)y &= 0 \\ -0.04 + 1220y &= 0 \\ 12.20y &= 0.04 \end{aligned}$$

$$y = 0.04 : 12.20 = 0.0032$$

Therefore $x = 8.6000 + 0.0032 = 8.6032$

Suppose $x = 8.6032 + y$; Then will

$$\begin{aligned} x^2 &= 7401505024 + 1720640000y + y^2 \\ -5x &= -4301600000 - 500000000y \\ -31 &= -310000000 \\ \hline &= 0.000094976 - 12.20640000y - 0 \\ y &= 0.000094976 : 12.20640000 \\ &= 0.000077808 \end{aligned}$$

Therefore $x = 8.603200000 + 0.000077808 = 8.603277808$.

Suppose, again, the root of a cubic equation $x^3 + 2x^2 - 23x - 70 = 0$ be required by *approximation*; here let the root be $5 + y$, since the terms are omitted wherein y^2 and y^3 are found; there is no necessity for expressing them in the transformation of the equation. Wherefore, we find

$$\begin{aligned} x^3 &= 125 + 75y + \dots \\ + 2x^2 &= 50 + 20y + \dots \\ - 23x &= 115 - 23y \\ - 70 &= -70 \\ \hline -10 + 72y &= 0 \\ y &= \frac{10}{72} = 0.1 \end{aligned}$$

Therefore $x = 5 + 0.1 = 5.1$

$$\begin{aligned} \text{Suppose } x &= 5.1 + y. \text{ Then will} \\ x^3 &= 132.651 + 78.030y + \dots \\ + 2x^2 &= 52.020 + 20.400y \\ - 23x &= -117.300 - 23.000y \\ - 70 &= -70.000 \\ \hline -2.629 + 75.430y &= 0 \\ 75.430y &= 2.629 \end{aligned}$$

$$y = 2.629 : 75.430 = 0.0348$$

Wherefore $x = 5.1 + 0.048 = 5.1448$.

And after the same manner might one proceed to infinity.

APPU, in the manage, *q. d.* rest or stay upon the hand; is the reciprocal effort between the horse's mouth and the bridle-hand; or the sense of the action of the bridle on the hand of the horseman.

A just *appui* of the hand is the nice bearing up or stay of the bridle; so that the horse, being awed by the sensibility and tenderness of his mouth, dares not rest too much upon the bit-mouth, nor check or beat upon the hand to withstand it.

A dull, obtuse *appui*, is when a horse has a good mouth, but his tongue is so thick, that the bit cannot work, or bear upon the bars; the tongue not being so sensible as the bars; though the like effect is sometimes owing to the thickness of his lips.—A horse is said to have no *appui*, when he dreads the bit-mouth; is too apprehensive of the hand, and cannot bear the bit.—He is said to have too much *appui* when he rests or throws himself too much, or too hardly upon the bit.—Horses designed for the army ought to have a full *appui* upon the hand.

APPULSE, in astronomy, the approach of any planet to a conjunction with the sun, or a star.

APPURTENANCES*, or **APPERTINENCES**, in common law, signify things belonging to some other as their principal.

* The word is formed of the Latin *ad*, to, and *pertinere*, to belong.

Appurtenances may either be things corporeal, as hamlets belonging to a chief manor; or incorporeal, as liberties and services of tenants. See **APPENDANT**.

APRICOT-WATER. See the article **WATER**.

APRIL*, the fourth month of the year, according to the common computation, but the second according to that of the astronomers.

* The word is derived from the Latin *aprilis*, of *aprio*, I open; because the earth in this month, begins to open her bosom for the production of vegetables.

In this month the sun travels through the sign taurus.

APRIORI Demonstration. See **DEMONSTRATION**.

APRON, in gunnery, a piece of lead, which caps or covers the vent or touch-hole of a great gun.

APISIS*, or **ANSIS**, in ecclesiastical writers denotes an inner part in the ancient churches, wherein the clergy sat, and where the altar was placed.

* It is supposed to have been thus called because covered with an arch or vault of its own, by the Greeks called *Αψις*, and by the Latins *apsis*; Isidorus with less probability imagines it so called as being the most luminous part; from the Greek word *απσις*, to give light.

Apsis, in this sense, amounts to the same with what is otherwise called *choir, concha, camera*, and *presbyterium*; and stands opposed to the *naeve*, or body of the church.

The ancient *apsis* was of a hemispherical figure, and consisted of two parts; the choir and the sanctuary.—The former had seats or stalls placed around it, wherein the ecclesiasticks were disposed. In the middle or farthest part, was the bishop's throne. The sanctuary was at the opposite end, next the *naeve*, from which it was separated by a grate. See **SANCTUARY**.

In the middle of this was the altar erected on a pulpitum; and over the altar was the cibory, or cup, serving as a cover or canopy to it. *Vid. Cordemoy in Mem. de Trev. Jul. an. 1710. p. 1268, seq.*

Several ceremonies were only to be performed before, or in the face of the *apfis*, as, imposing hands; hair-shirts, &c. on penitents guilty of public offences. Frequent mention is also made of the *faists* in the *apfis*; the bodies of holy bishops, and others, being translated with great ceremony to this part of the church. *Syn. 32. Carib. can. 32. Spelm. in voc.*

Apfis is more particularly used for the bishop's-seat, or throne, in ancient churches.

It seems to have been thus called, because situate in the *apfis* of the church, though some imagine it to have been primarily so named, and to have given the denomination of *apfis* to the part of the church where it stood. *Cordem. ubi supra.*

This was more peculiarly called *apfis gradata*, because raised on steps above the ordinary stalls.—It was also denominated *Exadra*, and of latter times *Tribuna*.

APFIS is also used for a reliquary, or case, wherein the relics of saints were anciently kept.

It took the name *apfis*, from its being round or arched at the top; or perhaps from the place where it was kept.

The *apfis* was commonly placed on the altar: it was usually of wood, sometimes also of gold and silver, with sculptures, &c. *Vid. Spelm. & du Cang. Gloss. in voc.*

APFIS, in astronomy, is applied to two points in the orbits of planets, wherein they are at the greatest, and the least distance from the sun or earth.

The *apfis* at greatest distance is called the *higher* or *summa apfis*; that at least distance, the *lower*, *ima apfis*, or *infima*.

The two *apfides* are also called *auges*. The higher *apfis* is more peculiarly denominated the *aphelion*, or *apogee*; the lower, the *perihelion*, or *perigee*.

The diameter which joins these two points is called the *line of the apfides*, and this passes through the center of the orbit of the planet, and the center of the earth. In the modern astronomy this line makes the longer axis of the elliptical orbit.—Such is the line AP, (*Tab. astron. fig. 1.*) drawn from the aphelion A to the perihelion P. The eccentricity is reckoned in the line of the *apfides*; being the distance between the center of the orbit of the planet, C, and the center of the sun or earth, S, according as the Copernican or the Ptolemaic system is followed. For the motion of the line of the *apfides*, see *APOGEE*.

The motion of a planet from one *apfis* to another, e. g. of the moon, from apogee to perigee, and back again from perigee to apogee, are considered by mechanical philosophers as oscillations, and accounted for from the laws of the pendulum: consequently they must one day cease, when the equilibrium is restored. *Vid. Horreb. Clav. Astronom. c. 20.*

Others apprehend something immechanical in the motion; and propose, as insoluble questions, How the equilibrium was first destroyed; Why not restored again; and whence the breach is continually renewed? *Vid. Mem. de Trev. Avril 1730. p. 709, seq.*—But these are persons unacquainted with the secrets of the Newtonian philosophy. *Vid. Nevut. Prim. l. 1. sic. 9. Herman. Phoron. l. 2. c. 4.** See also *GRAVITATION, PLANET, ORBIT, DISTANCE, and PERIOD*.

AP-THANES, an ancient term for the higher nobility in Scotland. See *THANE*.

APTITUDE, the natural disposition any thing hath to serve for such or such a purpose.—Thus, oil hath an *aptitude* to burn, and water to extinguish fire.

*APTOTE**, *Ἀπτωτος*, in grammar, a noun indeclinable, or which is without any variation of case.

* The word is derived from the Greek privative *α*, and *πτωσις*, *casus*.

Such are the words, *fas*, *nefas*, &c.

APUS, in astronomy the bird of paradise; one of the constellations of the southern hemisphere, not visible in our latitude.

*APYREXY**, *Ἀπυρεξία*, in medicine, the intermission of a fever, or ague.

* The word is formed of the privative particle *α*, and *πυρ*, *ignis*, fire or heat; or *πυρεσσα*, *fabricatio*, to be feverish.

*AQUA**, in natural history, physics, chemistry, medicine, &c. See *WATER*.

* The word is pure Latin, and supposed to be compounded of *a* and *qua*, q. d. from which; alluding to the opinion that water is the basis or matter of all bodies.

AQUA fortis, is a corrosive liquor prepared from nitre, and vitriol; and serving as a menstruum wherewith to dissolve silver, and all other metals except gold.

AQUA fortis is made by distilling purified nitre with calcined vitriol, or rectified oil of vitriol, in a strong heat: the li-

quor, which rises in blood-red fumes, being collected, is the *agua fortis*.

In preparing compound *agua fortis*, some mix either sand or clay, or ashes, with the calcined vitriol and nitre, in order to hinder their melting too readily; and thus prevent the too hasty evaporation: when the fusion is thus prevented, the parts of the salts receive more violent impressions from the fire, are better converted into a volatile spirit, which is the *agua fortis*.

If to the spirit of nitre, &c. thus distilled, sea-salt, or sal-armoniac, be added; it commences *agua regia*, and will no longer dissolve silver, but will now dissolve gold.

Hence, to try whether or no *agua fortis* be pure; put a grain of a solution of silver in *agua fortis*, into a like quantity of the water in question; and if the solution remains without either the water's turning milky, or the silver precipitating, the *agua fortis* is pure.

Aqua fortis is commonly held to have been invented about the year 1300; though others will have it to have been known in the time of Moses.—It is a liquor of various and extensive use.—It is very serviceable to refiners for parting or separating silver from gold.—To the workers in mosaic, for staining and colouring their woods. See *MARQUETRY*.—To dyers, in their colours, and particularly in scarlet.—To other artists, for the colour of bone and ivory; which is done by steeping the matters therein, after first tinging it with copper or verdigrise, &c. See *DYING*.

Some also convert *agua fortis* into *agua regia*, by dissolving in it a fourth of its weight of sal-armoniac, and then stain therewith ivory hafts and bones, of a fine purple colour.—There are, also, book-binders, who throw it on leather, and thereby make fine marble-covers for books.—And there are diamond-cutters, who use it to separate diamonds from metalline powders.—It is, farther, of service in etching copper, or brass plates. See *ETCHING*.—Lastly, Mr. Boyle assures us he has caused canes to be stained like tortoise-shell, by a mixture hereof with oil of vitriol, laid on them at several times, over live coals, to cause it to penetrate the deeper; and, afterwards, giving them a gloss with a little soft wax and a dry cloth. See *SUPPLEMENT, Article Aqua fortis*.

AQUA Marina, AQUE Marine, in natural history, a gem, or precious stone, of a sea-green colour; whence its name.

It is of about the same hardness with the amethyst.

Some of the critics contend for its being the sixth stone in the rationale of the Jewish high priest; called in the Hebrew, *tharbis*; and rendered in Latin by *beryllus, thalassius, &c.* Jonathan and Onkelos call this, in the Chaldee, *כרם*; *cherum jamma*: though the Seventy; St. Jerom, Aquila, Pagninus, the translators of Geneva, and Schindler, render it *chrysolitus*.—Others will have this stone a *turquoise*. And Leo de Juda, and Hutterus translate it *hyacinthus*.

Several of the lapidaries take it, however, to be the *beryl*; which coincides with the first opinion: the *beryl* being only another name for the *agua marina*.—Pliny represents this as related to the *smaragdus*, but of a colour less brisk, and imitating a pure sea-water green. See *SUPPLEMENT, article BERYLL*.

AQUA omnium storum, in pharmacy, signifies the distilled water of cows-dung, when they are at grass.—Some also call cows-urine by this name.—And in English *all flower water*.

AQUA Regia, or *AQUA regalis*, an acid corrosive spirit or water, serving as a menstruum to dissolve gold.

It is thus called because it dissolves gold, which is vulgarly esteemed the king of metals.—It is sometimes also called *agua chrysulca* and *stigia*.—The basis or essential ingredient of *agua regia*, is common or sea-salt; which is the only salt in nature that will operate on gold.

There are divers ways of preparing it; for, in effect, the salt will not fail of its end, in what form soever applied.—The common way is by mixing common salt, or sal-armoniac, or the spirit thereof, with spirit of nitre; or with common *agua fortis*, which is made of nitre and vitriol.

AQUA secunda. See the article *SECUNDA*.

AQUA vitæ, is commonly understood of what we otherwise call *brandy*, or the distilled spirit of wine, either simple or prepared with aromatics, differently according to the different intentions.

Some, however, distinguish between them; appropriating the term *brandy* to what is procured from wine, or the grape; and *agua vitæ* to that drawn after the same manner from malt, &c.

AQUA & igni interditi. See *INTERDICTION*.

AQUÆDUCT, AQUÆDUCTUS, q. d. ductus aquæ, a conduit of water; is a construction of stone or timber, built on an uneven ground, to preserve the level of water, and convey it by a canal from one place to another.—There are *aguæducts* under ground, and others raised above it, supported by arches.—The Romans were very magnificent in their *aguæducts*; they had some that extended an hundred miles. Frontinus, a man of consular dignity, and

who had the direction of the *aqueducts*; under the emperor Nerva, tells us of nine that emptied themselves through 13,594 pipes, of an inch diameter. Vigenere has observed, that, in the space of twenty-four hours, Rome received from these *aqueducts* no less than five hundred thousand hogheads of water.—The *aqueduct*, built by Lewis XIV. near Maintenon, for carrying the river Bure to Versailles, is perhaps the greatest in the world. It is 7000 fathoms long; and its elevation 2560 fathom; containing 242 arcades. V. *Pölsf. Trans. ap. Lewth. l. p. 594.*

AQUEDUCT, AQUEDUCTUS, in anatomy, denotes a bony kind of canal, or passage, in the os petrosum, supposed to contribute to the purposes of hearing.—It is called *aqueduct* not only on account of its form, but, as some also imagine, from its serving to discharge any foreign matters collected in the inner cavities of the ear.—It is sometimes also called, *aqueductus Fallopii*, from the name of its first discoverer.—Several authors confound it with the *tuba Eustachiana*. The *aqueductus Fallopii* is sometimes also called *meatus cæcus*, by others *meatus cochlearis*, and *meatus caprolaris*, by others *canalis particularis*, *meatus auditorius internus*, and *foramen auditorium internum*.

AQUARIANS, AQUARI, a kind of heretics in the third century, who instead of wine used nothing but water in the sacrament.

It is said the occasion of the abuse was owing to the persecution which prevailed in those times: for the Christians, being then obliged to celebrate the sacrament in the night, found it necessary to make use of water, left the smell of the wine should betray them to the heathens. But they afterwards went further, and actually forbid the use of wine in the eucharist, even when it might be used with safety. Epiphanius tells us, the *Aquarians* were the followers of Tatian; and were so called from the word *aqua*, water, because they abstained wholly from wine, and did not use it even in the eucharist.

AQUARIUS, in astronomy, the eleventh sign in the zodiac, reckoning from Aries; from which also the eleventh part of the ecliptic takes its name. See **SIGN** and **CONSTELLATION**. The sun moves through *Aquarius* in the month of January; it is marked thus, ♒.

The poets feign, that *Aquarius* was Ganymede, whom Jupiter ravished under the shape of an eagle, and carried away into heaven, to serve as cup-bearer in the room of Hebe and Vulcan; whence the name.—Others hold, that the sign was thus called, because, when it appears in the horizon, the weather usually proves rainy.

The stars in the constellation *Aquarius*, in Ptolemy's catalogue, are 45; in Tycho's 40; in the Britannic catalogue 99: the longitudes, latitudes, magnitudes, &c. whereof, according to the two former, are given by Hevelius: according to the last, they are as follow:

Names and situations of the stars.	Longitud.	Latitude.	Magn.
Preced. in the handkerchief against the hand.	7 24 06	8 06 41N.	5
	8 38 46	12 24 42N.	5
	9 22 28	11 34 51N.	7
	9 35 02	11 38 47N.	6
	8 44 13	8 16 10N.	4
Subseq. in the handkerchief.			
5.	9 32 57	7 17 53N.	6
	9 19 25	3 51 49N.	6
	9 28 11	3 19 30N.	6
	11 37 44	11 05 06N.	6
	11 54 38	11 49 00N.	6
10.			
	16 00 11	23 02 34N.	6
	12 23 54	10 30 14N.	6
In the preced. hand.	12 04 13	4 47 48N.	5
	14 18 30	6 21 43N.	6
	16 12 10	10 41 41N.	6
15.			
	16 53 23	10 25 12N.	6
	15 50 35	5 45 41N.	7
	15 01 16	2 17 03N.	6
	16 14 35	5 11 33N.	6
	18 10 20	11 14 10N.	6
20.			
	18 13 15	11 03 19N.	5
In the preced. shoulder.	19 04 23	8 38 43N.	3
Under the shoulder as in the armpit.	19 47 16	5 59 14N.	5
	22 50 57	13 12 28N.	6
In the head.	23 38 27	15 21 47N.	6
25.			
	23 56 30	14 13 55N.	6
	25 39 39	15 07 14N.	6
	28 15 21	11 58 21N.	5
	22 22 57	4 37 29S.	6
	26 16 22	5 04 48N.	6
30.			
Low. in the hind. shoulder.	27 47 19	9 10 58N.	5
	28 35 40	10 13 14N.	5
South in the fore-hip.	24 24 01	2 03 15S.	4
Bright one in the hind. shoulder.	29 02 16	10 40 38N.	3
	23 19 59	6 37 49S.	5

Names and situations of the stars.	Longitud.	Latitude.	Magn.
	25 07 12	1 43 12S.	8
	27 04 33	2 59 48N.	6
North in the preced. d. hip.	26 09 58	0 15 37S.	6
	25 38 49	2 52 39S.	6
	23 34 18	9 27 48S.	6
40.			
	27 07 35	1 59 02S.	7
Preced. of two in the poster. side.	28 55 44	2 43 47N.	4
	29 51 55	4 56 30N.	4
Subseq. of the same.	29 42 07	2 23 30N.	5
	24 59 38	10 33 45S.	5
45.			
That in the hind arm.	22 23 11	8 14 49N.	3
	22 11 31	13 39 11S.	5
	28 36 33	3 18 38S.	6
	21 41 48	4 49 11N.	6
North of 3 in the hind. hand	4 16 51	10 29 08N.	5
50.			
That upon the hips.	27 53 23	6 28 36S.	6
Preced. of the rest in the hand.	24 14 31	8 51 30N.	4
	29 32 41	4 48 31S.	6
That in the hind buttock.	21 03 54	1 12 33S.	5
	1 13 00	1 30 46S.	6
55.			
South of two in the fore-leg.	22 12 22	10 51 40S.	5
	25 13 36	6 55 47N.	5
	29 43 32	7 58 37S.	6
Subseq. of 3 in the hand.	6 02 53	8 09 42N.	4
Preced. in the pouring out of the water.	5 06 13	4 07 47N.	5
60.			
North in the fore-leg.	0 54 55	9 56 24S.	6
	5 19 55	1 04 29N.	6
	1 29 54	11 00 46S.	6
Following that to the southward.			
Lower of the northern ones in the hind. leg.	3 39 28	5 54 48S.	5
	5 10 52	2 44 36S.	7
65.			
Upper of north in the hind leg.	4 16 52	5 38 42S.	6
South and subseq. in the pouring out of the water.	7 14 41	0 23 00S.	4
	5 54 23	4 11 08S.	6
South in the hind leg.— <i>Sebat.</i>	4 33 49	8 11 17S.	3
	4 25 11	8 30 04S.	6
70.			
	7 50 34	0 12 44S.	6
Last in the water.— <i>Femoibast.</i>	29 26 59	21 04 54S.	1
First of the contig. in the flexure of the water.	10 04 10	1 40 14S.	6
Second.	10 04 59	1 44 15S.	7
3d, and fourth of the contig.	10 8 41	1 57 45S.	6
75.			
Preced. in the last flexure.	3 59 44	16 34 34S.	5
North.	5 40 53	14 29 07S.	4
Subseq. and fourth of three	5 14 53	15 41 55S.	5
In the second flexure of the water.	12 48 57	1 01 25S.	6
North of three contig. in the water.	11 57 28	3 58 03S.	5
80.			
First behind the second flexure.	12 43 56	2 49 51S.	6
Middle of three.	12 24 17	4 15 45S.	5
Single one more fourth than those.	10 57 45	8 18 02S.	5
South of the contig.	12 28 16	4 45 39S.	5
	11 08 02	10 07 57S.	6
85.			
North } of the three following in the	9 08 43	14 46 26S.	5
Middle } last flexure.	9 35 12	15 34 16S.	5
	10 30 55	16 45 48S.	6
South of those three.	11 04 19	16 30 21S.	5
Over the last flexure but one.	15 20 12	11 02 03S.	5
90.			
	14 09 42	14 40 56S.	6
Preced. that.	14 17 06	14 31 10S.	5
Follow. it.	15 52 17	11 36 22S.	5
Middle, in the same flexure.	14 38 18	15 10 26S.	5
Contiguous to that.	14 51 24	15 43 02S.	6
95.			
Subseq. in the last flexure but one.	15 58 18	16 26 59S.	5
Middle } of informes behind the	19 26 16	16 14 06S.	5
North } last flexure.	21 57 12	15 16 03S.	5
South }	21 12 12	18 45 54S.	5

AQUATIC, something which lives, breeds, or grows, in or about the water.

Thus we have *aquatic* plants, and *aquatic* animals. Trees which grow peculiarly on the banks of rivers, or in marshes, &c. are also called *aquatics*.

The ancient Romans had also their *aquatic* or *aquatic* gods, *dii aquatiles*; called by Catullus, *dii littoralis*: concerning whom we have an inscription in Reinefius, NEPTVNO ET DIS AQUATILIBVS. Cl. l. n. 9. Struv. *Synt. Antiq. Rom. c. l. p. 165.*

To this class belong'd the Tritons, the ministers of Neptune.

AQUATIC ROAD. See the article **ROAD**.

AQUEDUCT. See **AQUEDUCT**.

AQUEOUS, AQUOSUS, something that partakes of the nature of water, or abounds therein. See **WATER**.

Thus

AQU

ARA

Thus milk is said to consist of an aqueous or ferous, and a butyrous part.
The chemists separate the aqueous part or phlegm from all bodies by distillation.

AQUEOUS Bath. See the article BATH.

AQUEOUS Ducts. See the article AQUEOUS.

AQUEOUS Humour, is the first or outermost of the three humours of the eye.

It lies immediately above the tunica aranea, and ciliary ligament, and under the cornea, which it causes to protuberate a little; and is supposed to be furnished by certain ducts provided for the purpose.—It is found so spirituous, that it will not freeze in the severest frost.

Anatomists are divided about the origin and conveyance of this humour.—It is certain, the source must be pretty plentiful, inasmuch as, if by any accident the coats it is contained in be wounded, so that the humour runs out, and the cornea falls or collapses, the wound readily heals, by only closing the eye, and the humour recruits: of which we have numerous instances among physicians.

Dr. Nuck thinks he has discovered the ducts whereby this humour is furnished.

Others denying the reality of those ducts, suppose it immediately derived from the arteries. Dr. Drake admits the ducts, and takes them to be only branches of the excretory ducts of the glandula innominata, and lachrymalis; which, piercing the tunics of the eye, deliver their liquor by ways hitherto unknown.

AQUILA, in natural history, &c. See EAGLE.

AQUILA, in astronomy, a constellation of the northern hemisphere; usually joined with Antinous.

The stars in the constellation *Aquila* and Antinous, in Ptolemy's Catalogue, are 15; in Tycho's, 17; in the Britannic catalogue, 70: the longitudes, latitudes, magnitudes, &c. whereof, according to the two first, are, again by Hevelius; according to the last, they are as follow:

Names and situations of the Stars.	Longitud.	Latitude North.	Magn.
Preced. } of three inform. towards South. Subseq. } Sagittary.	0 1 11	0 1 11	
	4 49 57	14 59 07	4
	6 48 32	14 46 57	5
	8 03 00	25 03 20	5
	8 14 05	22 00 29	6
Preced. } of three inform. before Antinous's foot. North } of two inform. over the eagle's South } tail.	8 04 40	18 13 27	4
	10 26 31	43 27 53	4
	10 31 39	41 02 20	4
	9 14 07	19 37 16	6
	9 17 24	19 33 22	6
10. Mid. of three before Antinous's foot.	10 30 35	16 54 11	5 4
	13 30 29	36 28 51	6
	13 33 55	36 11 45	6 5
Subseq. of the same.	11 44 42	16 53 33	4
Preced. in the eagle's tail.	13 56 58	37 36 43	5 4
15. Preced. in Antinous's heel.	12 17 25	18 52 40	6
Subseq.	12 46 59	18 29 26	6
Bright one in Antinous's foot.	13 02 15	17 37 36	3
Subseq. in the eagle's tail.	15 28 34	36 13 48	3
	15 27 48	33 24 32	6
20. 15 14 45	28 23 48	6	
	14 16 37	14 22 17	5 6
	15 59 34	24 28 45	5
	17 08 30	26 54 11	6
	17 05 48	23 06 48	7
25. Preced. of 3 in the root of the tail.	17 03 34	22 21 55	7
In Antinous's thigh.	18 42 18	33 31 53	6
South in Antinous's leading side.	16 35 51	10 36 09	6
Middle and North in the root of the tail.	17 20 05	21 04 44	6
30. 17 23 33	34 13 27	6	
North in the preceding wing.	19 17 21	24 50 54	3 4
Laft of three in the root of the tail.	20 45 44	33 32 22	6
North in Antinous's leading side.	19 06 40	22 04 17	5
South in the preced. wing.	20 03 35	23 34 00	6
In Antinous's belly.	19 39 55	18 49 10	6
35. That below Antinous's knee.	19 29 24	10 58 21	6
North in the preced. shoulder.	22 27 58	28 42 30	4
Against Antinous's hind knee.	20 31 47	14 23 03	3 4
	21 10 48	18 25 21	6
In the hind side of Antinous.	21 30 47	20 02 59	3 4
40. 21 09 46	16 42 00	6	
South in the preceding shoulder.	23 28 56	26 30 44	5
	22 41 20	20 31 04	6
South in the beginning of the hind wing.	25 52 03	33 02 08	6
	25 52 20	32 39 24	6
45. North. 26 48 33	34 00 06	6	
That immediately preceding the Lucida.	25 44 15	28 22 04	6
Preced. of two in the hind shoulder.	20 37 08	31 16 52	3
	23 18 26	10 05 20	7
Subseq. of the same.	27 36 29	32 19 49	6

Names and situations of the Stars.	Longitud.	Latitude North.	Magn.
Between the shoulders, called Lucida } Aquila.	0 1 11	0 1 11	
	27 23 24	29 19 11	1 2
That over the Lucida.	27 53 01	30 51 20	6 5
In Antinous's hind shoulder.	26 06 54	21 33 23	3 4
	24 33 02	12 05 11	5
	24 44 54	12 24 10	6
55. Subseq. below the Lucida.	26 32 00	20 43 43	6
In the eagle's neck.	28 17 56	28 46 12	5
In the verge of the wing behind the } shoulder.	28 06 44	20 44 20	3
	29 36 57	31 32 17	6
	28 50 17	19 16 01	7
60. In the middle of the head.	0 42 27	27 03 16	6
	29 46 36	19 05 30	7
In Antinous's hind hand.	0 35 30	18 45 55	3
	1 02 33	18 28 07	5 6
Laft of the hind wing.	5 47 33	34 06 12	5
65. 4 17 48	15 16 50	7	
	4 43 44	15 39 39	5
	6 35 14	15 31 49	5
	7 24 03	16 48 56	4
	8 06 58	18 16 36	6

AQUILINE, AQUILINUS, something belonging to an eagle. Hence, *aquiline* nose denotes a hooked nose, or such as is like the beak of an eagle; called also a hawk's nose.

AQUILO, is used by Vitruvius for the north east wind; or that which blows at 45° from the north towards the east point of the horizon. See WIND, NORTH, and POINT.

The poets gave the name *aquilo* to all stormy winds dreaded by the mariners.

AQUOSE Ducts, Ductus AQUOSI Nuckii, are certain ducts in the sclerotic, discovered by Dr. Nuck, whereby the aqueous humour of the eye is supposed to be conveyed into the inside of the membranes which inclose that liquor. But the discovery is not universally allowed. See AQUEOUS Humour.

ARA, the altar, in astronomy, a southern constellation; consisting of eight stars. See ALTAR.

ARAB, ARABIAN. See ARABIC.
The ARAB, or ARABIAN horse, is said to be nursed with camel's milk: there are many strange reports of this beast. The duke of Newcastle assures us, that the ordinary price of one is 1000, 2000, or 3000 pounds; and that the Arabs are as diligent in keeping the geneologies of their horses, as princes of their families. They strike medals on every occasion to keep up the pedigree. The fortune the Arabians give their sons, when arrived at manhood, is, two suits of arms, with two scimiters, and a horse; who always lies in the next room to them.—Yet such of the breed as have been brought into England never proved very extraordinary.

ARABIAN Year. See ARABIAN YEAR.

ARABESQUE, or ARABESK, something done after the manner of the Arabians.

Arabesque, Grotesque, and *Moresque,* are terms applied to such paintings, ornaments of freezes, &c. wherein there are no human or animal figures, but which consist wholly of imaginary foliage, plants, stalks, &c. See GROTESQUE.

The words take their rise from hence, that the Moors, Arabs, and other Mahometans, use these kinds of ornaments; their religion forbidding them to make any images or figures of men, or other animals.

ARABIC, ARABICUS, something that relates to Arabia, or the Arabs. See ARAB.

ARABIC, or ARABIC Tongue, is a branch or dialect of the Hebrew.

Father Angelo de St. Joseph speaks much of the beauty and copiousness of the *Arabic*. He assures us it has no less than a thousand names for a sword; five hundred for a lion; two hundred for a serpent; and eighty for honey.

ARABIC Figures, or Characters, are the numeral characters commonly made use of in arithmetical computations.

The *Arabic* characters stand contradistinguished to the Roman.

The learned are generally of opinion, that the *Arabic* figures were first taught us by the Saracens, who borrowed them from the Indians.—Scaliger was so satisfied of their novelty, that he immediately pronounced a silver medallion he was consulted about, modern; upon his being told of the numeral figures 234, 235, being on it. The common opinion is, that Planudes, who lived towards the close of the thirteenth century, was the first Christian who made use of them. Father Mabillon even assures us, in his work *de Re Diplomatica*, that he has not found them any where earlier than the fourteenth century.

Yet Dr. Wallis insists on their being of a much older standing; and concludes they must have been used in England, at least as long ago as the time of Hermannus Contractus, who lived about the year 1050; if not in ordinary affairs, yet at least in mathematical ones, and particularly in the astronomical tables. *V. Wall. Algebr. c. 4.*

The same author gives us an instance of their antiquity in England, from a mantle-tree of a chimney, in the parsonage house of Helmdon in Northamptonshire, wherein is the following inscription in Basso Relievo, M^o 153, being the date of the year 1133. Philof. Transact. N^o 154.

Mr. Luffkin furnishes a yet earlier instance of their use, in the window of a house, part of which is a Roman wall, near the market-place in Colchester; where between two carved Lions stands an escutcheon, containing the figures 1090. Philof. Transact. N^o 255.

Mr. Haet is even of opinion, that these characters were not borrowed from the Arabs, but from the Greeks; and that they were originally no other than the Greek letters, which we all know that people made use of to express their numbers by. See NUMBER.

Gum ARABIC is the name of a gum which distills from a species of acacia, growing in Egypt and Arabia, called by Botanists *acacia vera*.

It is very common among us, but little is to be met with which is genuine; it is frequently adulterated with our common cherry and plumb-tree gums.—That is accounted best which is in smallest pieces, and almost of a white colour.

It dissolves easily in any aqueous liquor, and is good in all kinds of fluxes; particularly in catarrhs; as it thickens and softens the too acrimonious humours.

ARABIC I, a kind of heretics, who sprung up in Arabia, about the year 207; whose distinguishing tenet was, that the soul died with the body, and also rose again with it. Eusebius, *lib. vi. c. 38*, relates, that a council was called to stop the progress of this rising sect; and that Origin assisted at it; and convinced them so thoroughly of their error, that they abjured it.

ARABICUS Cossus. See the article **COSTUS**.

ARABISM, **ARABISMUS**, an idiom or manner of speaking peculiar to the Arabs, or the Arabic language.

R. Martin maintains, that the γ sometimes expresses an oath, in the Hebrew as well as the Arabic: Abenezra, a perfect master of the Arabic, and who makes great use thereof to explain the Hebrew, does not reject the sentiment, nor yet much approve it: he contents himself barely to rehearse it, which, for so zealous a partisan of *Arabisms*, is enough to shew that he had no great opinion of it.—Father Soucier.

ARABLE Land, anciently called **ARALFA**, is such as is fit for tillage, or plowing; or which is actually plowed up from time to time.

It is thus called from the Latin *arare*, of *aratrum*, a plough. See **PLOUGHING**.

ARABUM Lepra. } See the article } **LEPRA**.
ARABUM Sandaracha. } **SANDARACHA**.

ARAC, or **ARRAC**, a spirituous liquor, imported from the East Indies; chiefly used by way of dram, and in punch.

The nature and composition of this celebrated liquor has been much controverted.—The name *arac*, Mr. Lockyer assures us, is an Indian word for strong waters of all kinds; for that they call our spirits and brandy, *English arac*.—But, what we understand by the name *arac*, is really no other than a spirit procured by distillation, from a vegetable juice called *toddy*, which flows by incision out of the cocoa-nut tree, and some other trees like the birch-juce procured among us.

The *toddy*, Mr. Lockyer adds, is a pleasant drink of itself when new, but purges those not used to it; and, when stale, is heady, and finally makes good vinegar. The English at Madras use it as leaven to raise their bread with.

Goa and Batavia are the chief places for *arac*.—At Goa there are divers kinds; single, double, and treble distilled. The double distilled, which is that commonly sent abroad, is but a weak spirit in comparison with Batavia *arac*; yet on account of its peculiar and agreeable flavour, is preferred to all the other *aracs* of India. This is attributed to the earthen vessels, which alone they use at Goa to draw the spirit; whereas at Batavia they use copper stills.

The Paris *arac*, made at Madras, and the Columbo, and Quilone *aracs*, at other places, being fiery hot spirits, are little valued by the Europeans, and therefore rarely imported; though highly prized among the natives. See **SUPPLEMENT**, article **RACK**.

ARACHNOIDES *, in anatomy, a fine, thin, transparent membrane, which lying between the dura, and pia mater, is supposed to invest the whole substance of the brain, medulla oblongata, and spinal marrow.

* The word is borrowed from the Greek *αραχος*, a spider, or spider's web; and *ιδες*, form: in regard of the fineness of the part, which is supposed to resemble that of a spider's web.

Many anatomists deny the existence of such third meninx, or

membrane; and contend that it ought rather to be looked on as the external lamina of the pia mater, which sends its internal lamella between the folds of the cortical part of the brain.

ARACHNOIDES, or **ARANEA Tunica**, is likewise used for a fine, slender tunic, wherewith the crystalline humour is incased.

This, others call *crystalloides*, and *tunica crystallina*, or *capsula crystallina*.—Many have even doubted of its existence, which is the more extraordinary in that Galen speaks of it, and compares it to a pellicle of an onion; Vesalius resembles it to fine transparent horn.—It is easily found in quadrupeds, especially the sheep, ox, and horse; and tho' it be a little more difficult to discover in man, yet after a person has once seen it, he will readily find it.

What is surprizing, Briggs says not a word of it; and so able an anatomist as Ruysch, was long in suspense about it: it was only by means of his injections that he discovered it in man; and though so easy to discern in a sheep.

The *arachnoides* adheres by its posterior part to the vitreous tunic.—In man it is about twice as thick as a spider's web, at least the fore-part of it; in an ox it is as thick again as in man; and in an horse it is thicker than in an ox.

It has three uses: First, to retain the crystalline in the collet of the vitreous humour, and prevent its changing situation: Secondly, to separate the crystalline from the aqueous humour, and prevent its being continually moistened therewith: Thirdly, the lymphatics furnish a liquor which they discharge into its cavity, wherewith the crystalline is continually refreshed and kept in right order; inasmuch that when this liquor is wanting, the crystalline soon dries, grows hard, and opaque, and may even be reduced to powder. *V. Petit, in Mem. Acad. R. Scie. an. 1730. p. 622. seqq.*

ARÆOMETER *, **ARÆOMETRUM**, an instrument wherewith to measure the density or gravity of fluids.

* The word is formed of the Greek *αραιος*, *rarus*, *tenuis*, thin; and *μετρον*, *measure*.

The *aræometer*, or water-poise, is usually made of glass; consisting of a round hollow ball, which terminates in a long slender neck, hermetically sealed a-top: there being first as much running mercury put into it, as will serve to balance or keep it swimming in an erect position.

The stem is divided into degrees; (as represented *Tab. Pneumaticæ*, fig. 18.) and by the depth of its descent into any liquor, the lightness of that liquor is concluded; for that fluid in which it sinks least, must be heaviest; and that in which it sinks lowest, lightest.

M. Homburg has invented a new *aræometer*, described in *Philof. Transact. N^o. 262*. thus: *A* (fig. 19.) is a glass-bottle or matrafs, with fo slender a neck, that a drop of water takes up in it about five or six lines, or $\frac{1}{4}$ of an inch. Near that neck is a small capillary tube *D*, about six inches long, and parallel to the neck.—To fill the vessel, the liquor is poured in at the mouth *B*, (which is widened to receive a tunnel) till it run out at *D*; that is, till it rise in the neck to the mark *C*, by which means you have always the same bulk or quantity of liquor; and consequently, by means of the balance, can easily tell, when different liquors fill it, which weighs most, or is most intensely heavy.

Some regard, however, is to be had in these trials to the season of the year, and degree of heat and cold in the weather: by reason some liquors rarely with heat, and condense with cold, more than others; and accordingly take up more or less room.

By means of this instrument, the ingenious author has made a table, to shew the different weights of the same bulk of the most considerable chemical liquors, both in summer and winter; as follows:

	oz.	dr.	gr.	oz.	dr.	gr.
The <i>aræometer</i> full of						
Quick-silver	11	00	06	11	00	32
Oil of tartar	01	03	08	01	03	31
Spirit of urine	01	00	32	01	00	43
Oil of vitriol	01	03	58	01	04	03
Spirit of nitre	01	01	40	01	01	70
— salt	01	00	39	01	00	47
Aqua fortis	01	01	38	01	01	55
Vinegar	00	07	55	00	07	60
Spirit of wine	00	06	47	00	06	61
River water	00	07	53	00	07	57
Distilled water	00	07	50	00	07	54

The instrument itself weighed, when empty, one dram twenty eight grains.

ARÆOPAGUS }

ARÆOPAGITIC } See the articles } **ARÆOPAGUS**.

ARÆOPAGITIC } **ARÆOPAGITIC**.

ARÆOSTYLE, **ARÆOSTYLOS**, in the ancient architecture, a sort of intercolumnation, wherein the columns were placed at the distance of eight, or, as some say, ten modules from one another.—See *Tab. Archit. fig. 48*. See also the article **INTERCOLUMNATION**.

In the *aræostyle*, the columns were the widest and openest they

they were ever planted at; whence the name—from the Greek *αριος*, *rarius*, and *επιολομι*, *colimi*.
The *arabyle* is chiefly used in the Tuscan order; at the gates of great cities, and fortresses.

ARAEOTICS, *Αραιωτικα*, in medicine, such remedies as tend to open the pores of the skin, and render them large enough for the morbid matter's being cast off by sweat or insensible perspiration.

To the class of *araeotics* belong diaphoretics, sudorifics, &c.

ARAIGNEE, in fortification, sometimes denotes a branch, return, or gallery of a mine.

ARANEAE Tunica. See **ARACHNOIDES**.

ARATRUM Terra, in our ancient law-books, as much land as can be yearly tilled with one plough.—*Hoc manerium est 30 aratorum.*

ARATURA Terra, an ancient service which the tenant was to do his lord, by ploughing his land.

ARBALET*, a kind of weapon, vulgarly called a *cross-bow*.

* The word is derived from *arbalesta*, i. e. *arcubalista*, a bow with a sling.

The *arbale* consists of a steel-bow, set in a shaft of wood, furnished with a string and a trigger; and is bent with a piece of iron fitted for that purpose.—It serves to throw bullets, large arrows, darts, &c.

The ancients had large machines to throw arrows withal, many at a time, called *arbalists*, or *ballistae*. See **BALLISTA**.

ARBITER, in the civil law, a judge nominated by the magistrate, or chosen voluntarily by two contending parties, on whom they confer a power, by compromise, of deciding their differences according to law.

The Romans sometimes submitted to a single *arbiter*; but ordinarily they chose several; and those always in an uneven number.

In matters wherein the public was concerned, as crimes, marriages, affairs of state, &c. it was not allowed to have recourse to *arbiters*.—Nor was it permitted to appeal from an arbitral sentence; the effect of an appeal being to suspend the authority of a jurisdiction, not of a compact.

Among the moderns, there are properly divers kinds of *arbiters*; some, obliged to go by the rigour of the law; and others are authorized by the contending parties to relax, or give way to natural equity; these are properly called *arbitrators*.

Justinian (*L. ult. c. de receptis*) absolutely forbids a woman from being elected *arbiter*, or rather *arbitress*; as judging such an office unbecoming the sex. And yet pope Alexander III. confirmed an arbitral sentence given by a queen of France.

Cardinal Wolsey was sent by Henry VIII. to Francis I. with full power to negotiate, act, and conclude whatever he thought for his service; and Francis gave him the same power on his behalf: so that he was constituted sole *arbiter* of both their affairs.

ARBITRAGE, or **ARBITREMENT**. See **ARBITRATION**.

ARBITRARY*, in a general sense, that which is not defined, or limited by any certain, express law, or constitution, but is left solely to the judgment, and discretion of another.—The punishment of such a crime is *arbitrary*.—*Arbitrary* fines or mulcts are usually called *amercements*.

* The word is formed from the Latin *arbitrium*, will; whence also *arbiter*, *arbitrator*, &c.

The laws or measures whereby the creator acts are *arbitrary*; at least all the physical laws.

ARBITRARY Power. See **DESPOTISM**, **MONARCHY**, &c.

ARBITRATION, or **ARBITRAGE**, the referring of a cause or quarrel to the decision of one or more indifferent persons, under the quality and denomination of *arbiters* or *arbitrators*.

An arbitrement is either general, that is, including all actions, quarrels, and demands; or special, which includes one or more matters, or facts specified.

ARBITRATOR, an extraordinary judge, or commissioner, in one or more causes between party and party, chosen by their mutual consent.

Among us, two *arbitrators* are usually chose by the contending parties; and in case these cannot agree, a third is added, and is called an *umpire*; in whose decision both sides are bound to acquiesce.

The civilians make a difference between *arbiter*, and *arbitrator*: though both ground their power on the compromise of the parties, yet their liberty is diverse: for an *arbiter* is tied to proceed and judge according to the forms of law; whereas an *arbitrator* is permitted wholly to his own discretion, without solemnity of process, or course of judgment, to hear and accommodate the controversy committed to him; so it be *justa arbitrium boni viri*.

ARBITREMENT. See **ARBITRATION**.

ARBOR in natural history, botany, &c. See **ARBOUR**, and **TREE**.

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ARBOR in chemistry.—**ARBOR philosophica** is a name common to several metallic crystallizations; thus called from their ramifications resembling a tree.

Of this kind, is the **ARBOR Diane**, sometimes also called **ARBOR Luna**, a kind of efflorescence or crystallization, in which aqua fortis incorporated with silver and mercury, being put in water, expands and shoots itself into an appearance of a tree, with branches, leaves, and flowers.

The *arbor Diane* is properly a precipitation of silver with mercury; the operation of making it belongs to the head of amalgamation. See **SUPPLEMENT**, Article **DIANE ARBOR**.

Albertus Magnus is said to have produced a tree before the king of France, while he sat at dinner: this passed at that time for a palingenesis, or resuscitation; but it may more naturally be referred to the species of germinations we are speaking of.

The method of preparing the *arbor Diane* is thus: dissolve one drachm of pure silver in aqua fortis, and to the solution add distilled vinegar and water, of each one ounce; filtrate the mixture, and add an ounce and half of quick-silver; mix and shake the whole some time, in a round glass vessel, the orifice being stopped with the finger: then set the whole to rest, and in twenty-four hours time, it will shoot into branches, &c. of various figures.

ARBOR Martis is a germination of iron, resembling a natural plant.—

The *arbor Martis* is but of late invention; we owe it to the younger Lemery.

The manner of the discovery was this: on a dissolution of iron-silings in spirit of nitre, contained in a glass, he poured oil of tartar per deliquium: upon this the liquor soon swelled very considerably, though with very little fermentation; and was no sooner at rest, than there arose a sort of branches adhering to the surface of the glass, which, continuing to grow, at length covered it all over.

The form of the branches was so perfect, that one might even discover a kind of leaves and flowers thereon; so that this vegetation has as good a title to the appellation of *arbor Martis*, as the former has to that of *arbor Diane*. See *Histoire Acad. Royal. An. 1706.*

ARBOR Genealogica, tree of consanguinity, signifies a lineage drawn out, under the figure or resemblance of root, stock, branches, &c.

ARBOR Porphyriana, among the schoolmen, denotes a scale of beings; or a figure, consisting of three rows or columns of words; the middlemost whereof contains the series of genera and species, and bears some analogy to the trunk; and the extremes, containing the differences, to the branches of a tree.

SUBSTANCE

Thinking Extended

BODY

Inanimate Animate

ANIMAL

Irrational Rational

MAN

This That

PLATO.

The *arbor Porphyriana* is otherwise called *scala predicamentalis*.

ARBOR is also figuratively used in mechanics, for the principal part of a machine, which serves to sustain the rest.—It is also used for a spindle or axis wheron a machine turns.

Arbor of a crane, a mill, windmill, &c. See **CRANE**, **MILL**, &c.

ARBOREUS, **ARBOREOUS**, is applied by some naturalists to such excrescencies, fungus's, moyses, and other parasites, as grow on trees; in contradistinction from such as grow on the ground: such are the *Lichenoidea* and *Agaricks*.

ARBORIS Pecten. See the article **Pecten**.

ARBORIST, **ARBORISTA**, a person skilled in trees; their kinds, forms, natures, &c.

Arborist is an appellation of less extent than *botanist*.

ARBOUR, among gardeners, &c. a kind of shady bower or cabinet, contrived to take the air in; yet to keep out the sun and rain.

Arbours are now gone much into disuse; being apt to be damp, and unwholesome.—They are distinguished into *natural* and *artificial*.

Natural ARBOURS are formed only of the branches of trees, interwoven artfully, and borne up by strong lattice-work, poles, hoops, &c. which make galleries, halls, porticoes, and green vistas naturally covered.

The trees wherewith these *arbours* are formed are usually the female elm, or lime-tree; in regard they easily yield, and, by their great quantity of small boughs, form a thick brush-wood; the lower parts are usually filled up with horn-beam, or the like.

Artificial ARBOURS, and cabinets, are made of lattice-work, borne up by standards, cross-rails, circles and arches of iron. For these *arbours*, they make use of small fillets of oak, which being planted and made frait, are wrought in checkers, and fastened with wire.

ARC^s, or ARK. See the article ARK.

* The words are formed from the Latin *arcus*, a bow.

ARCANUM literally signifies a *secret*; and is therefore very pertinently applied by quacks and impostors in medicine, who conceal their ignorance and fraud under a pretence of secrecy.—Hence legions of *arcana*.

There are also standing official compositions, under the denomination of *arcana*.—Such are the

ARCANUM *Corallinum*, a preparation of red precipitate; made by distilling it with the spirit of nitre; and repeating the distillation again and again, till a fine red powder be procured. This powder boiled in water, and the water poured off, and tartarized spirit of wine put to the powder; two or three cobations are made; which leave a powder, much like the prince's powder; said to be of good use in the gout, dropsy, scurvy, &c. It operates chiefly by stool.

ARCANUM *duplicatum* is prepared of the caput mortuum of aqua fortis, by dissolving it in hot water, filtering, and evaporating it to a cuticle; and then leaving it to shoot.

The *arcannum duplicatum*, or *panacea duplicata* is extolled as a diuretic, and sudorific.—The recipe was purchased at the expence of 500 dollars, by that great virtuoso the duke of Holstein. Schroder, that prince's physician, writes wonders of its great uses in hypochondriacal cases, and in continued and intermitting fevers, stone, scurvy, &c.

ARCANUM *Joviale* is made of an amalgama of mercury and tin, digested in spirit of nitre; the spirit being drawn off, the remaining matter is wetted with spirit of wine, and the spirit burnt away; and this for several times till the pungent taste is wholly gone: what remains is used much with the same intentions as the antisepticum Poterii, and is recommended by some as a sudorific.

ARC-BOUTANT*, in building, a kind of flat arch, or part of an arch, abutting against the feet of an arch, or reins of a vault, to support, and prevent their giving way.

* The name is French; formed of *arc* and *bouter*, to abut.

Arc-boutants are only arched buttresses. See BUTTRESS.

ARCH, ARK, ARCS, a part of any curve line; *e. gr.* of a circle, an ellipsis, or the like.

ARCH of a circle is a part of the circumference thereof, less than a half, or semicircle.—Such is AEB (*Tab. Geometry*, fig. 6.)

The base or line AB, that joins the two extremes of the arch, is called the *chord*; and the perpendicular DE, raised in the middle of that line, the *sine* of the arch. See CHORD and SINE.

All angles are measured by *arches*.—To know their quantity, an *arch* is described, having its centre in the point of the angle. See ANGLE.

Every circle is supposed to be divided into 360 degrees; and an *arch* is estimated according to the number of those degrees it takes up. Thus an *arch* is said to be of 30, of 80, of 100 degrees. See DEGREE.

Concentric ARCHES. See the article CONCENTRIC.

Equal ARCHES are such *arches* of the same or equal circles, as contain the same number of degrees. See EQUAL.—Hence

In the same or equal circles, equal chords subtend equal *arches*.—And hence, again, *arches* intercepted between parallel chords are equal.

A radius, CE, fig. 6. which bisects the chord in D, does also bisect the *arch* in E; and is perpendicular to the chord; and on the contrary. And hence the problem, to bisect an *arch* is solved, by drawing a line CE perpendicular to the chord in D.

Similar ARCHES are those which contain the same number of degrees of unequal circles. See SIMILAR, and LIKE.—Such are the *arches* AB and DE, fig. 87.

Two radii being drawn from the centre of two concentric circles, the two *arches* intercepted between them bear the same ratio to their respective peripheries; and also the two sectors to the areas of their respective circles. See ANGLE.

The distance of the centre of gravity of an *arch* of a circle, from the centre of the circle, is a third proportional to a third part of the periphery and the radius. See CENTRE of GRAVITY.

For the sines, tangents, &c. of *arches*; see SINE, TANGENT, &c.

ARCH in astronomy.—Diurnal ARCH of the sun is part of a circle parallel to the equator, described by the sun in his course betwixt rising and setting. See DIURNAL, DAY, &c. His nocturnal *arch* is of the same kind; excepting that it is described betwixt his setting and rising. See NIGHT, RISING, &c. See also NOCTURNAL.

The latitude and elevation of the pole are measured by an *arch* of the meridian; and the longitude, by an *arch* of a parallel circle. See ELEVATION, LATITUDE, LONGITUDE, &c.

ARCH of progression, or direction, is an *arch* of the ecliptic which a planet seems to pass over, when its motion is according to the order of the signs. See DIRECTION.

ARCH of retrogradation is an *arch* of the ecliptic, described while a planet is retrograde, and moves contrary to the order of the sign. See RETROGRADATION.

ARCH of Station. See STATION and STATIONARY.

ARCH between the centres is an *arch*, as AI, (*Tab. Astronomy*, fig. 35.) passing from the centre of the moon's shadow, A, perpendicular to her orbit GH. See ECLIPSE.

If the aggregate of the *arch* between the centres AI, and the apparent semi-diameter of the moon, be equal to the semi-diameter of the shadow; the eclipse will be total without any duration: if less, total with some duration; and if greater, yet less than the sum of the semi-diameters of the moon and the shadow, partial.

ARCH of vision is the sun's depth below the horizon, at which a star, before hid in his rays, begins to appear again. See POETICAL RISING.

ARCH, in architecture, is a concave structure, raised with a mould bent in form of the *arch* of a curve, and serving as the inward support of any superstructure.—See *Tab. Archit.* fig. 36, and 37.

An *arch*, says Sir Henry Wotton, is nothing but a narrow or contracted vault; and a vault, is a dilated *arch*. See VAULT. *Arches* are used in large intercolumnations of spacious buildings; in porticos, both within and without temples; in public halls, as ceilings, the courts of palaces, cloisters, theatres, and amphitheatres.

They are also used as buttresses and counter-forts, to support large walls laid deep in the earth, for foundations of bridges and aqueducts, for triumphal arches, gates, windows, &c.

Arches are sustained by peers, imposts, &c.

Arches are either circular, elliptical, or frait.

Circular ARCHES are of three kinds, *viz.*

Semicircular ARCHES, those which make an exact semicircle, and have their centre in the middle of the chord of the *arch*; called also by the French builders, *perfect arches*, and *arches en plein centre*.

Scheme ARCHES, those which are less than a semicircle, and consequently are flatter *arches*; containing some, 90 degrees, others 70, and others only 60; called also *imperfect arches*.

ARCHES of the third and fourth point, as some of our workmen call them, though the Italians call them *di terzo* and *quarto acuto*, because they always concur in an acute angle at top.—These consist of two *arches* of a circle meeting in an angle at the top, and are drawn from the division of the chord into three or four parts, at pleasure.—Of this kind are many of the *arches* in old Gothic buildings; but on account, both of their weakness and unsightliness, they ought, according to Sir Henry Wotton, to be for ever excluded out of all buildings.

Elliptical ARCHES consist of a semi-ellipsis; and were formerly much used instead of mantle trees in chimneys.—These have commonly a keystone and chaprels or imposts.

Strait ARCHES are those, whose upper and under edges are frait; as in the others they are curved; and those two edges also parallel, and the ends and joints all pointing towards a centre.—These are principally used over windows, doors, &c.

The doctrine and use of *arches* is well delivered by Sir Henry Wotton, in the following Theorems.—1st, All matter, unless impeded, tends to the centre of the earth in a perpendicular line.

2^{dy}, All solid materials, as bricks, stones, &c. in their ordinary rectangular form, if laid in numbers, one by the side of another, in a level row, and their extreme ones sustained between two supporters; those in the middle will necessarily sink, even by their own gravity, much more if pressed down by any superincumbent weight.—To make them stand therefore, either their figure or their position must be altered.

3^{dy}, Stones, or other materials being figured cuneatim, *i. e.* wedge-wise, broader above than below, and laid in a level row, with their two extremes supported as in the preceding theorem, and pointing all to the same centre; none of them can sink, till the supporters or buttments give way, because they want room in that situation to descend perpendicularly. But this is but a weak structure; in regard the supporters are subject to too much impulsion, especially where the line is long; for which reason the form of frait *arches* is seldom used, excepting over doors and windows, where the line is short.—In order to fortify the work, therefore, we must not only change the figure of the materials, but also their position.

4^{thly}, If the materials be shaped wedge-wise, and be disposed in form of a circular *arch*, and pointing to some centre; in this case, neither the pieces of the said *arch* can sink downwards, for want of room to descend perpendicularly; nor can the supporters or buttments suffer much violence as in the precedent platform: for the convexity will always make the incumbent weight rather rest upon the supporters, than heave them outwards: whence this corollary may be fairly de-

deduced, that the securest of all the *arches* above mentioned is the semicircular; and of all vaults, the hemispherical.

Arch, As semicircular vaults, raised on the whole diameter, are the strongest; so those are the most beautiful, which keeping to the same height, are yet distended one fourteenth part longer than the said diameter: which addition of width will contribute greatly to their beauty, without diminishing any thing considerable of their strength.

It is, however, to be observed, that, according to geometrical strictness, to have the strongest *arches*, they must not be portions of circles, but of another curve, called the *catenaria*, whose nature is such, that a number of spheres disposed in this form will sustain each other, and form an *arch*.

Dr. Gregory even shews, that *arches*, constructed in other curves, only stand or sustain themselves by virtue of the *catenaria* contained in their thickness; so that were they made infinitely slender or thin, they must tumble of course; whereas the *catenaria*, though infinitely slender, must stand, in regard no one point thereof tends downward more than any other. Philofoph. Transact. N^o 231.—See further of the theory of *arches* under the article VAULT.

ARCH is particularly used for the space between the two piers of a bridge.

The chief or *master-arch* is that in the middle; which is widest, and usually highest, and the water under it deepest: being intended for the passage of boats or other vessels.—We read of bridges in the east, which consist of 300 *arches*.

ARCH-Stone. See the articles, KEY-Stone, and VOUSOIR.

Tympan of ARCH. See the article TYMPAN.

Triumphal ARCH is a gate or passage into a city, built of stone or marble, and magnificently adorned with architecture, sculpture, inscriptions, &c. serving not only to adorn a triumph, at the return from a victorious expedition, but also to preserve the memory of the conqueror to posterity.

The most celebrated triumphal *arches*, now remaining of antiquity, are that of Titus, of Septimus Severus, and of Constantine, at Rome, of which we have figures given us by Des Godetz.—One of the gates of Orange is a triumphal *arch* of C. Marius.—The gates, Peyro at Montpellier, and of St. Denis, St. Martin, and St. Antoine at Paris, do also deserve to have been triumphal *arches*.

Mural ARCH. See the article MURAL.

ARCH, in the scripture sense. See the article ARK.

ARCH, or ARCHT, is also a term without any meaning of itself, but which becomes very significant in composition with other words; as it heightens and exaggerates them; and has the force of a superlative, to shew the greatest degree, or eminence of any thing.

* The word is formed of the Greek *αρχος*, beginning; whence *αρχος*, prince, *summus*, prince, or chief.

The we say *arch-fool*, *arch-rogue*, &c. to express folly, and knavery in the utmost degree.—So also *arch-treasurer*, *arch-angel*, *arch-bishop*, *arch-heretic*, &c. to denote such as have a pre-eminence over others.

In English, we usually cut off the final *i*, from *archi*, though with very ill effect; as the words wherewith it is joined, found much harsher on that score, than they would do were it preserved entire, as it is in most other languages.

ARCHÆUS, or ARCHEUS. See the article ARCHEUS.

ARCH-ANGEL*, an intellectual substance or angel, placed in the eighth rank among the blessed spirits which compose the celestial hierarchy.

* The word is compounded of the Greek *αρχος*, prince, and *αγγελος*, angel.

ARCHBISHOP, ARCHIEPISCOPUS, a metropolitan prelate, having several suffragan bishops under him.

Archbishops were not known in the east, till about the year 320; and though there were some soon after this who had the title, yet that was only a personal honour by which the bishops of considerable cities were distinguished.—It was not till of late that *archbishops* became metropolitans, and had suffragans under them.

Athanasius appears to be the first who used the title *archbishop*, which he gave occasionally to his predecessor; Gregory Nazianzen, in like manner, gave it to Athanasius: not that either of them were entitled to any jurisdiction, or even any precedence, in virtue thereof.

Among the Latins, Isidore Hispalensis is the first that speaks of *archbishops*. He distinguishes four orders or degrees in the ecclesiastical hierarchy, viz. patriarchs, *archbishops*, metropolitans, and bishops.

England is divided into two archbishoprics, or provinces.

ARCHBISHOPRIC, ARCHIEPISCOPATUS, the dignity of archbishop; or the province under his jurisdiction.

There are now two *archbishoprics* in England, viz. of Canterbury and York; the prelates whereof are called *primates*, and *metropolitans*; with this only difference, that the former is

called primate of all England, and the latter simply, primate of England.

The archbishop of Canterbury had anciently jurisdiction over Ireland as well as England, and was styled a patriarch, and sometimes *alterius orbis papa*, and *orbis Britannici pontifex*. Matters were done and recorded in his name thus, *anno pontificatus nostri primo*, &c.

He was also *Ligatus natus*. See LEGATE.

He even enjoyed some special marks of royalty; as, to be patron of a bishopric, which he was of Rochester; and to make knights, coin monies, &c.—He is still the first peer of England, and the next to the royal family; having precedence of all dukes, and all great officers of the crown.

He has, by common law, the power of probate of wills and testaments, and granting letters of administration.

He has also a power to grant licences and dispensations in all cases formerly sued for in the court of Rome, and not repugnant to the law of God.

He also holds several courts of judicature; as court of arches, court of audience, prerogative court, and court of peculiar.

The archbishop of York has the like rights in his province, as the archbishop of Canterbury: he has precedence of all dukes not of the royal blood; and of all officers of state, except the lord high chancellor. He has also the rights of a count Palatine over Hexamsire.

ARCH-BUTLER, ARCHIPINCERNA, the great buider or skinker of the empire.

The king of Bohemia is *arch-butler*: and his business as such is to present the first cup at an imperial entertainment; but he is not obliged to officiate with his crown on. He has for vicar or deputy the hereditary prince of Limbourg.

ARCH-CHAMBERLAIN, ARCH-CAMERARIUS, an officer of the empire; much the same with what in England we call *great chamberlain*.

The elector of Brandenburg is *arch-chamberlain* of the empire, being so appointed by the golden bull; and, in that quality, he bears the scepter before the emperor, walking on the left hand of the elector of Saxony. At some solemnities he also serves on horseback like other electors, carrying a bafon with a towel in his hands: which alighting he sets it for the emperor to wafh.—He has his vicar or sub *arch-chamberlain*, who is prince of Hohenzollern, of the house of Brandenburg.

ARCH-CHANCELLOR, ARCH-CANCELLARIUS, a great chancellor, who anciently presided over the notaries, that is, the secretaries of a court.

This office chiefly obtained in France, under the two first races of their kings; and afterwards under the empire: as they had three several territories, Germany, Italy, and Arles; they had three *arch-chancellors*: and hence the three *arch-chancellors* still subsisting in Germany; the archbishop of Mentz being *arch-chancellor* of Germany, the archbishop of Cologne of Italy, and the arch-bishop of Treves of Arles.

Bern. de Mallincrot, in an express treatise de *Archicancellariis Imperii Romani*, shews, that these three archbishops were *arch-chancellors* before they were electors.—We also read of *arch-chancellors* of Burgundy, &c.

ARCH-CHANTOR, ARCHICANTOR, the chief or president of the chantors of a church.

ARCHDEACON, ARCHIDIACONUS, a church officer vested with a jurisdiction over the laity and clergy, next after the bishop, either through the whole diocese, or only a part of it.

The *archdeacon*, sometimes also called *arch-leuite*, was originally the first and eldest of the deacons who attended on the bishop: whence his name.

An *archdeacon* was not known before the council of Nice: his function is since become a dignity; and even set above that of priest: though anciently it was quite otherwise. The *archdeacon* was the bishop's chief minister for all external concerns, and particularly the administration of the temporalities. He took care that order and decency were observed in divine service; looked to the ornaments and utensils of the church; had the direction of the poor, and the inspection of the manners and behaviour of the people: for which reason he was called the *bishop's heart, and eye*; *oculus episcopi*, & *cor episcopi*.

These advantages soon got him the upper hand over priests, who had only spiritual functions. But he had no jurisdiction over them till the sixth century; though by that time he was become superior to the archimandrite, or rural dean.

In the tenth century, *archdeacons* were considered as having jurisdiction in their own right, or attached to their office; with a power of delegating it to others. But from that time measures were taken to lessen their power, by increasing their number.—He whose district lay in the capital city took the quality of *great archdeacon*.

We have sixty *archdeacons* in England: their office is to visit every two years in three, to enquire into reparations and moveables belonging to the church, reform abuses in ecclesiastical

fistical matters, and bring the more weighty affairs before the bishop; besides which, they have also a power to suspend excommunicate, and in many places to prove wills, and in some to institute to benefices.

It is one part of the *archdeacon's* office to induct all clerks into their benefices within his jurisdiction; and, by the act of uniformity, he is now obliged to be in priests' orders.

Many *archdeacons* in old foundations, have, by prescription, their courts and officials as bishops have.

ARCH-DRUID, *ARCHDRUIDA*, the chief or pontiff of the ancient *Druids* in a nation. See *DRUID*.

ARCHDUKE, *ARCHDUX*, a duke vested with some quality, pre-eminence, and authority above other dukes.

The *archduke* of Austria is a very ancient title. There have also formerly been *archdukes* of Lorraine, and Brabant.

Austria was created into a marquisate by Otho, or Henry I. and into a duchy by Frederic I. in 1156; but we do not well know when, nor why the title *archduchy* was given it.—It is commonly held, that duke Frederic IV. first assumed the quality; others say, it was first given by the emperor Maximilian I. in 1459, and ample privileges annexed to it.

The principal privileges of this state are, that the *archduke* shall distribute justice in his own dominions, without appeal; that he shall be judged to have received the investiture of his states, after having demanded it three times; and that he cannot be deprived of his countries, even by the emperor and the states of the empire: that no affair of the empire can be concluded without his participation; and that he have a power of creating counts, barons, and gentlemen, throughout the whole empire: which are privileges to which the other dukes of the empire are entire strangers.

ARCHE, *αρχη*, is a Greek word, importing the *beginning*.

ARCHE, among physicians, is the beginning or first period of a disease.

ARCHED Fountain. See the article *FOUNTAIN*.

ARCHED Legs is an imperfection in a horse, when being in his natural position he has his legs bent forwards; so as his whole leg makes a kind of arch or bow.

This usually arises from excessive labour, whereby the back-finess are made to shrink up, so that the legs remain *arched*, and naturally tremble after a little riding. Though the disorder is natural to some horses.

ARCHERS*, a kind of militia or soldiery, armed with bows and arrows.

* The word is formed of the Latin *arcus*, a bow; whence *arcarius*, and even *arcus*, and *arquite*, as they are also denominated in the corrupt state of that tongue.

Archers were much in use in former times; but they are now laid aside, excepting in Turkey, and some of the eastern countries; where there are companies of *archers* still on foot in their armies: and with which they did terrible execution at the battle of Lepanto.

The name *archer*, however, is still retained even where the thing is lost: thus in France, the officers who attend the lieutenants de police, and provosts, to make captures, seizures, arrests, &c. are called *archers*; though their arms be only halberds or carabines.—In this sense they say, the *archers* of the *grand prévôt de l'hôtel*, of the *prevôt des marchands*; the city *archers*; the *archers du guet*, or of the watch, &c.

—Small parties of *archers*, called also *gens de marcheausse*, are continually patrolling on the great roads, to secure them against robbers.—The Carriages of Lyons, &c. are always escorted by a party of *archers*.

To the diligence of these *archers* or marshals men, it is owing, that persons now travel in all parts of France in the utmost security; there being fewer robberies on the highway in that whole kingdom in a year, than about London in a week.

They have also their *archers des pauvres*, *archers* of the poor; whose office it is to seize such beggars as they find in the streets, and carry them to the hospitals.

ARCHERY, the art or exercise of shooting with bow and arrows.

ARCHERY was greatly encouraged among our ancestors, and many statutes were made for the regulation thereof: whence it was that the English *archers* became the best in Europe. Most of our victories in France were the purchase of the long bow.

—In the stat. 33 H. 8. complaint is made of divers new and crafty games invented, as *loggeting*, *shovegroat*, &c. by reason whereof *archery* was sorely decayed, and divers bowmen and fletchers, for lack of work, were forced to go and live in Scotland.—By this act, all men under 60 years of age are commanded to exercise shooting in long-bows; and to have a bow and arrows always ready.—Children from 7 years old to 17, are also enjoined to be bred up in shooting; and to have always a bow and two shafts in readiness.—Even servants are not excepted; but those who want money to buy a bow are to be supplied by their masters, and the price to be deducted out of their wages.—Aliens are also forbid by it to shoot with a long bow, without especial licence from the king.

By the same law it is forbid to shoot at a standing mark; unless it be for a rover, where the archer is to change his mark at every shot.—Any person above 24 years old is also forbid to shoot with any prick-shaft, or flight, at a mark of eleven score yards or under. 33 H. 8. c. 9.—The former was a provision for making good marksmen at fight; the latter for giving strength and lineus.

ARCHERY in our ancient customs, a service of keeping a bow for the use of the lord, to defend his castle.

ARCHES, or *Cent* of *ARCHES*, is one of the archbishop's courts; to which appeals lie in ecclesiastical matters, from all parts of the province of Canterbury.

This court is thus called, from the *arched* church and tower of St. Mary le Bow, where it was wont to be held. The officers belonging to it are the judge, attorney, registers, advocates, proctors, &c.

The judge of the court of *arches* is called the *dean of the arches*, or the *official of the arches* court, &c. with which officiality is commonly joined a peculiar jurisdiction over thirteen parishes in London, termed a *deanery*, exempt from the authority of the bishop of London, and belonging to the archbishop of Canterbury; of which the parish of Bow is one, and the principal.

Others suppose the denomination and functions of dean of the *arches* to have *arct* hence, that the archbishop's official, or dean, being often employed abroad in foreign embassies, the dean of the *arches* was his substitute in this court.

This judge on any appeal made, forthwith, and without any farther examination of the cause, sends out his citation to the appellee, and his inhibition to the judge from whom the appeal was made.

The advocates, who are allowed to plead in the *arches* court, are to be doctors of the civil law, in one of our universities.

ARCHETYPE*, *ARCHETYPUS*, the first pattern, or model, by which any work is formed, or which is copied after, to make another like it.

* The word is compounded of *αρχη*, beginning; and *τυπος*, type. See *TYPE*.

In this sense the word coincides with *original*, or *prototype*; and stands opposed to *copy*.

Among minters, &c. *archetype* is peculiarly used for the standard or original weight, by which the other weights are to be adjusted and examined.

Philosophers, particularly the Platonists, talk of an *archetypal* world; meaning, the world, such as it existed in the divine mind, or in the idea of God, before the visible creation.

ARCHEUNUCH, *ARCHIEUNUCHUS*, the chief of the eunuchs.

The *archeunuch* was one of the principal officers in Constantinople, under the Greek Emperors.

ARCHEUS*, an obscure term, used chiefly among the ancient chymists, to express I know not what principle of life and motion, the cause of all the effects which we observe in nature.

* The word is derived from *αρχη*, principle.

As the chymists differ in their ideas of a vital cause; the term *archeus* becomes applied to very different things: though most of them conceive it of the nature of fire.

Some use *archeus*, to denote the fire lodged in the centre of the earth; to which they ascribe the generation of metals and minerals, and which they believe to be the principle of life in vegetables.

Others, by the word *archeus*, mean a certain universal spirit, diffused throughout the whole creation, the active cause of all the phenomena in nature.

Others, instead of *archeus*, chuse to call this the *anima mundi*; and others, the *vulcan* or *heat* of the earth.

They add, that all bodies have their share of this *archeus*; and that, when this is corrupted, it produces diseases, which they call *archeal diseases*.

They likewise attribute ideas to it; which for this reason they call *archeal ideas*.

Helmont is a great asserter of the dogma of an *archeus*.—

“No poison says he, can act on a dead carcass: if, therefore, it have any effect, it is by means of the *archeus*.”

“He adds, that if any heterogeneous body happen to be present to the *archeus*, it rises into a fervour, endeavours to expel the hostile matter; and, in order to

“that, exerts all the force of the body.—To cure any disease, therefore, is to pacify, and compose this *archeus*.”

“*archeus*. This *archeus*, he holds, is irritated at the least appearance of any thing heterogeneous; and as its office

“is to watch over the health and safety of the whole body, it is excited at the very shadow of the enemy,

“and at once calls its forces to the charge, raises fevers,

“&c. All, therefore, required to an universal medicine is, something that may readily pacify, and lay this universal fever upon all occasions.” This doctrine of

Helmont,

Helmont, Boerhaave observes, would not be so absurd, did he not ascribe understanding to this *archeus*: setting this aside, the principle which renders poisons deadly, and remedies beneficial, is the circulation of the blood.

ARCHIACOLYTHUS, an ancient dignity, in cathedral churches: the ministers whereof were divided into four orders, or degrees, *viz.* priests, deacons, subdeacons, and *acolythi*; each of which had their chiefs. The chief of the *acolythi* was called *archiacolythus*. See **ACOLYTHUS**, &c.

ARCHIATER*, **ARCHIATRUS**, *Ἀρχαῖος*, properly denotes the chief physician of a prince who retains several.

* The word is formed of the Greek *αρχος*, *principium*, chief, and *ιατρος*, *medicus*, a physician.

ARCHIDAPIFER, or chief fever, is a great officer of the empire.

The elector of Bavaria is *archidapifer*.—The palatine of the Rhine at one time pretended this office was annexed to his Palatinate; but he has since desisted.

ARCHIGALLUS, in antiquity, the high priest of Cybele, or the chief of the eunuch-priests of that goddess, called Galli.

ARCHILOCHIAN, a term in poetry, applied to a sort of verses, whereof *Archilochus* was the inventor.

These consist of seven feet; the four first whereof are ordinarily dactyls, though sometimes spondees; the three last trochees: for instance;

Solvitur arvis hyems grata vice veris & Favoni. Hor.

It is usual to mix iambic verses of six feet, abating a syllable, with *archilochian* verses; this Horace himself has done in the ode now cited.

These verses are called *dactylic*, on account of the dactyls at the beginning.

ARCHILUTE. See the article **ARCILEUTO**.

ARCHIMANDRITE, *Ἀρχιμανδριτης*, the superior of a monastery; amounting to what we now call *abbot*.

Covarruvias observes, that the word literally denotes the chief or leader of a flock; in which sense it may be applied to any ecclesiastical superior: and accordingly, we find the name sometimes attributed to archbishops. But among the Greeks, where it is chiefly used, it is always restrained to the chief of an abby.

M. Simon maintains the word originally to be derived from the Syriac; at least the part *mandrite*, which, by a circution, he makes to signify a solitary, or monk.

ARCHIMEDES'S SCREW. See the article **SCREW**.

ARCHIMIME, **ARCHIMIMUS**, is the same thing, in effect, with *archimimion*, or *mimic*.

The *archimimes*, among the Romans, were persons who imitated the manners, gestures, and speech both of people living and those who were dead.

At first they were only employed on the theatre; but were afterwards admitted to their feasts, and at last to their funerals; where they walked after the corps, counterfeiting the gestures and behaviour of the person who was carrying to the funeral pile; as if he were still alive.

ARCHIPELAGO*, in geography; a sea interrupted by a great number of islands.

* The word is formed by corruption of *Ἀρχιπελάγος*, *g. d.* *Ægean* sea, which, again, is formed of *Ἀρχαῖος* *Πελάγος*, a name originally given it by the Greeks; but for what reason is not agreed on.

The most celebrated *Archipelago*, and that to which the name is in some measure appropriated, is that between Greece, Macedonia, and Asia; wherein are the islands of the *Ægean* sea: which is called the *white sea*, in contradistinction to the *Euxine*, which they call the *black sea*.

The modern geographers mention other *Archipelago's*; as, that of Lazarus, near the coast of Malabar and Malacca; the *Archipelago* of Mexico; and that of the Caribbees, wherein are above 12000 islands; that of the Philippines, called, by some, the *great Archipelago*, containing 11000 islands; and also those of the Molucco's, of Celebes, &c.

ARCHIPHERACITÆ, *Ἀρχιφρακτιται*, ministers in the Jewish synagogues appointed to read and interpret the Perakim, or titles and heads of the law, and the prophets.

The *archipheracita* was not the same with the *archisynagogus*, as Grotius and others have mistakenly imagined; but rather the chief or principal of these appointed to read, explain, and profess the law, in their schools.—And hence the name; which is formed of the Greek *αρχος*, chief; and the Hebrew or Chaldee, פֶּרָקִים, *perak*, division, or chapter.

ARCHISTRATEGUS, *Ἀρχιστρατηγος*, the generalissimo, or captain-general of an army. See **STRATEGUS**.

ARCHITECT*, **ARCHITECTUS**, a person skilled in architecture, or the art of building: who makes plans and designs of edifices, conducts the work, and directs the masons and other artificers employed therein.

* The word is derived from the Greek *αρχος*, *princeps*, and *τεκτων*, *faber*, workman, *g. d.* the principal workman.

The most celebrated *architecti* are, Vitruvius, Palladio, Scamozzi, Serlio, Vignola, Barbaro, Cataneo, Alberti, Viola, Inigo Jones, Bullant, and De Lorme.

Vitruvius enumerates twelve qualities requisite to an *architect*; that he be docil and ingenious; literate; skilled in designing; in geometry; optics; arithmetic; history; philosophy; music; medicine; law, and astronomy*. See **BUILDING**, &c.

* Sure, Martial had never read Vitruvius, when he threw the cryer and the architect into the same class:

Duri si puer ingeni videtur,

Preconem facias, vel Architectum.

ARCHITECTONIC, that which builds a thing up regularly, according to the nature, and intentions thereof.

Thus, that plastic power, spirit, or whatever else it be which hatches the ova of females into living creatures of the same species, is by some called the *architectonic* spirit.

ARCHITECTONIC Machine. See the article **MACHINE**.

ARCHITECTURE, **ARCHITECTURA**, the art of building, *i. e.* of erecting edifices, proper either for habitation, or defence.

Architecture is usually divided, with respect to its objects, into three branches, *civil*, *military*, and *naval*.

Civil ARCHITECTURE, called also absolutely and by way of eminence *architecture*, is the art of contriving and executing commodious buildings for the uses of civil life; as houses, temples, theatres, halls, bridges, colleges, portico's, &c.

Architecture is scarce inferior to any of the arts in point of antiquity.—Nature and necessity taught the first inhabitants of the earth to build themselves huts, tents, and cottages; from which, in course of time, they gradually advanced to more regular and stately habitations, with variety of ornaments, proportions, &c. See Vitruvius's account of the origin of *architecture* under the article **ORDER**.

The ancient writers represent the Tyrians as the first among whom *architecture* was carried to any tolerable pitch; and hence it was that Solomon had recourse thither for workmen to build his temple. Villalpandus, indeed, contends that only under-workmen were sent for from Tyre, artificers in gold, silver, brass, &c. and that the rules of *architecture* were delivered by God himself to Solomon. Hence, he adds, the Tyrians properly speaking learned their *architecture* from Solomon; which they afterwards communicated to the Egyptians; these to the Grecians, and these again to the Romans.

—In effect, the author last cited undertakes to prove, that all the beauty and advantages of the Greek and Roman buildings were borrowed from the Jewish temple. *Tom. ii. Part. ii. Lib. I. pag. iii. C. ix. x.*

To confirm this, Sturmius produces several passages in Vitruvius, where the rules given by that architect, *Lib. vi. C. 11. and Lib. v. C. 1.* quadrate exactly with what Josephus relates of the temple of Jerusalem, *Antiq. Jud. lib. vi. §. viii. &c.*

To what a pitch of magnificence the Tyrians and Egyptians carried *architecture*, before it came to the Greeks, may be learned from Isaiah xxiii. 8. and from Vitruvius's account of the Egyptian Oeci; their pyramids, obelisks, &c.

Yet, in the common account, *architecture* should be almost wholly of Grecian origin: three of the regular orders or manners of building are denominated from them, *viz. Corinthian, Ionic, and Doric*: and there is scarce a part, a single member, or moulding, but comes to us with a Greek name.

Be this as it will, it is certain the Romans, from whom we derive it, borrowed what they had entirely from the Greeks; nor do they seem, till then, to have had any other notion of the grandeur and beauty of buildings, beside what arises from their magnitude, strength, &c.—Thus far they were unacquainted with any order beside the *Tuscan*.

Under Augustus, *architecture* arrived at its glory: Tiberius neglected it, as well as the other polite arts. Nero, amongst a heap of horrible vices, still retained an uncommon passion for building, but luxury and dissoluteness had a greater share in it, than true magnificence.—Apollodorus excelled in *architecture*, under the emperor Trajan, by which he merited the favour of that prince; and it was he who raised the famous Trajan column, subsisting to this day.

After this, *architecture* began to dwindle again; and though the care and magnificence of Alexander Severus supported it for some time, yet it fell with the western empire, and sunk into a corruption, from whence it was not recovered for the space of twelve centuries.

The ravages of the Visigoths, in the fifth century, destroyed all the most beautiful monuments of antiquity; and *architecture* thenceforward became so coarse and artless, that their professed architects understood nothing at all of just designing, wherein its whole beauty consists: and hence a new manner of building took its rise, which is called the *Gothic*.

Charlemagne did his utmost to restore *architecture*; and the French applied themselves to it with success, under the en-

couragement of H. Capet: his son Robert succeeded him in this design; till by degrees the modern *architecture* was run into as great an excess of delicacy, as the Gothic had before done into massiveness. To these may be added, the Arabick, and Morisk or Moorish *architectures*, which were much of a piece with the Gothic, only brought in from the south by the Moors and Saracens, as the former was from the north by the Goths and Vandals.

The architects of the 13th, 14th, and 15th century, who had some knowledge of sculpture, seemed to make perfection consist altogether in the delicacy and multitude of ornaments, which they bestowed on their buildings, with a world of care and sollicitude; though frequently without any conduct or taste.

In the two last centuries, the *architects* of Italy and France were wholly bent upon retrieving the primitive simplicity and beauty of ancient *architecture*; in which they did not fail of success: inasmuch, that our churches, palaces, &c. are now wholly built after the antique.—

Civil Architecture may be distinguished, with regard to the several periods or states thereof, into the *antique, ancient, gothic, modern, &c.*

Another division of *civil architecture* arises from the different proportions which the different kinds of buildings rendered necessary, that we might have some proper for every purpose, according to the bulk, strength, delicacy, richness, or simplicity required.—

Hence arose five orders or manners of building, all invented by the ancients at different times, and on different occasions, viz. *Tuscan, Doric, Ionic, Corinthian, and Composite*; the history, characters, &c. of each whereof see under their respective articles, *TUSCAN, DORIC, IONIC, CORINTHIAN, and COMPOSITE.*

What forms an order is, the column with its base and capital; surmounted by an entablature, consisting of architrave, frieze, and cornice; and sustained by a pedestal.

For a general view of the elements of *architecture*, with the rules which obtain with respect to the matter, form, proportion, situation, foundation, distribution, covering, apertures, &c. See the article *BUILDING.*

For particulars, see *FOUNDATION, WALL, ROOF, WINDOW, DOOR, CEILING, &c.*

There are several arts subservient to *architecture*, as carpentry, masonry, paving, joinery, smithery, glazery, plumbery, plastering, gilding, painting, &c. See *CARPENTRY, MASONRY, PAVING, JOINERY, PAINTING, PLUMBERY, SCULPTURE, GILDING, &c.* See also *TIMBER, STONE, BRICK, TILE, MORTAR, LEAD, GLASS, &c.*

We have no Greek authors at this time extant on *architecture.*

—The first who wrote of it was Agatharchus the Athenian, who was seconded by Democritus and Theophrastus.—Among the Latins, Fufsius, Terentius Varro, Publius Septimius Rufus, and Epaphroditus, all wrote *de re architectonica.*

But, of all the ancients, Vitruvius is the only entire author whose works we have; though Vegetius relates, that there were 700 architects at Rome in his time.—He lived under Augustus, and composed a compleat system of *architecture*, in ten books, which he dedicated to that prince. There are two things censured by the moderns in this excellent work, viz. want of method, and obscurity. The mixture of Latin and Greek also, in Vitruvius, is such, that Leon Baptist Alberti, has observed, he wrote Latin to the Greeks, and Greek to the Latins: he adds, that the work contains abundance of things superfluous and foreign to the purpose.—For this reason, M. Perrault has extracted all the rules out of Vitruvius's prolix work, and has methodized and published them in a little abridgment.—Several authors have also endeavoured to explain the text of Vitruvius, particularly Philander, Barbaro, and Salmasius, in notes added to their several Latin editions; Rivius and Perrault, in the notes to their German and French Versions; and Baldus, in his *Lexicon Vitruvianum* enlarged by de Laet.—The fame M. Perrault has also composed an excellent treatise of the *five orders*, which may be esteemed a supplement to Vitruvius, who left the doctrine of the orders defective.

The authors upon *architecture*, since Vitruvius, are—Leon Battista Alberti, who, in 1512, published ten books of the art of building, in Latin, designed to outvie Vitruvius; in which, however, he has not succeeded: His work has abundance of good things, but it is deficient in the doctrine of the orders.—Seb. Serlio, who wrote seven books of *architecture*, five of which concerning the five orders, were made public in 1602; throughout all which, he religiously keeps to Vitruvius's rules: the seventh was since published in 1575; but the sixth, concerning private buildings, has not yet appeared.—And. Palladio, who wrote four books of *architecture*, containing the fundamental rules of the art, with various instances of all the kinds of works; published in Italian in 1575: the two first books are rendered into High-Dutch, and enlarged with annotations by Boeckler.—Phil. de Lorme, who published nine books of *architecture*, in French in 1567,

—J. Barozzi de Vignola, who, in 1631, made public his rules of the five orders, in Italian; this work has been since translated, with large additions, by Daviler, under the title of *Cours d'architecture*, &c. and since also into High-Dutch, with notes.—

To these are to be added Vincent Scamozzi, in his *Idea of Universal Architecture*, published in 1615, in Italian; Car. Phil. Dieuffart, in his *Theatre of Civil Architecture*, published in High-Dutch in 1697; wherein he not only delivers the rules of *architecture*, but explains and compares the five orders as laid down by Palladio, Vignola, Scamozzi, and others: which same design was also executed in French by R. Freart de Cambray, in a *Parallel of the ancient architecture with the modern*, published in French in 1650, and since translated into English, with additions, by Mr. Evelyn. Fr. Blondel director of the royal academy of painting, &c. in 1698, gave a *Course of architecture*, in French; being a collection from all the celebrated writers upon the subject of the orders, &c.—Nic. Goldman, in a treatise of *Stylometris*, published in Latin and High-Dutch, in the year 1661, has done good service, by reducing the rules and orders of *architecture* to a further degree of perfection, and shewing how they may be easily delineated by means of certain instruments invented by him.

Lastly, the *Elements of architecture* are very ingeniously laid down by Sir H. Wotton.—The same are also reduced by Sturmius, and Wolfius, to certain rules and demonstrations; and thus is *architecture* brought into the form of a mathematical art; by the first, in his *Mathesis Juvenil*, and by the second, in his *Elementa Mathematica*, tom. II. an. 1715.

MILITARY ARCHITECTURE is the art of strengthening and fortifying places, to screen them from the insults of enemies, and the violence of arms.

This we more usually call *Fortification.*

The business of *military architecture*, is, to erect forts, castles, and other fortresses, with ramparts, bastions, &c.

Naval ARCHITECTURE, or *Ship-building*, is that which teaches the construction of ships, galleys, and other floating vessels for the water; with ports, moles, docks, &c. on the shore*.

* How it stood in the days of Homer, may be seen in his *Odysse*. 5. 244.

ARCHITECTURE in perspective, is a sort of building, wherein the members are of different measures and modules, and diminish in proportion to their distance; to make the work appear longer and larger to the view than really it is.

Such is the celebrated pontifical stair-case of the Vatican, built under pope Alexander VII. by the cavalier Bernino.

Counterfeit ARCHITECTURE is that which has its projections painted either in black or white, or coloured after the manner of marble; as is seen practised in the frontispieces and palaces in Italy, and in the pavilions of Marly.

This painting is done in fresco, upon plastered walls; and in oil, on walls of stone.

Under the name of *counterfeit architecture*, which we otherwise call *scenè-work*, is likewise comprehended, that painted on slight boards or planks of wood, whereon the columns, pilasters, and other parts of building, seem to stand out, with a relieve; the whole being coloured in imitation of various marbles, metal, &c. and serving in the decorations of theatres, triumphal arches, public entries, funeral pomps, &c.

ARCHITRAVE*, in building, that part of a column, or order of column, which lies immediately upon the capital.—See *Tab. Archit. fig. 24, 26, 28, 30, and 32, and fig. 49. lit. a.*

* The Greeks call it *Epistyle.* See *EPISTYLE.*

The *architrave* is the lowest member of the entablature.—The *architrave* is supposed to represent the principal beam in timber buildings; whence the name, which is formed of the Greek *αεξω*, chief; and the Latin *trabis*, beam.

The *architrave* is different in the different orders.—In the Tuscan it only consists of a plain face, crowned with a fillet; and is half a module in height. In the Doric and Composite, it has two faces, or fasciæ; and three in the Ionic and Composite; in which last order it is $\frac{1}{2}$ of a module high, though but half a module in the rest.

Architects, however, take a deal of latitude in this part; some using more members than others; and many of them having two or three forms of *architraves*. What we give, is after Vignola. *Architrave* is sometimes also called the *raison-piece*, or *master-beam* in timber-buildings, as portico's, cloisters, &c. In chimneys it is called the *mantle-piece*, and over the jaumbs of doors, or lintels of windows, the Hypertyron.

ARCHITRAVE Corniche. See the article *CORNICHE.*

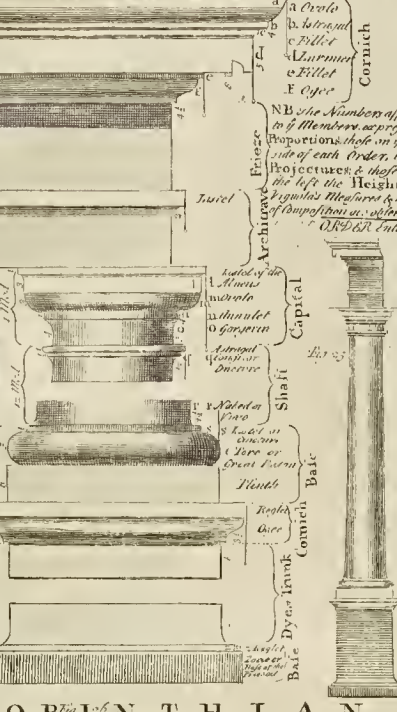
ARCHITRAVE Doors, as those which have an *architrave* on the jaumbs and over the door, upon the cap-piece, if straight; or on the arch, if the top be curved.

Mouldings & Members

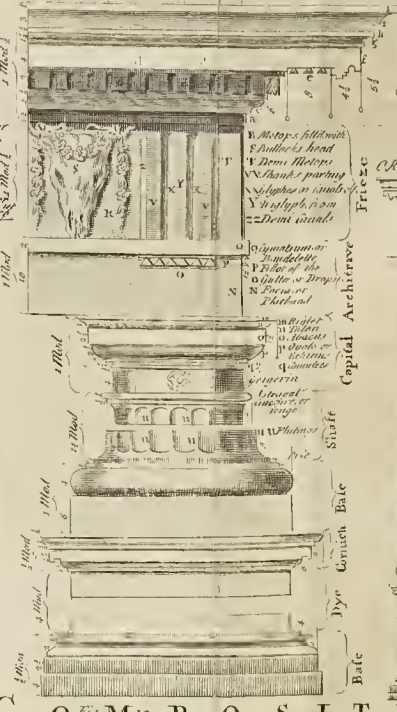
- Fig. 1. *Triglyph or Doric Triglyph*
- Fig. 2. *Triglyph or Doric Triglyph*
- Fig. 3. *Triglyph or Doric Triglyph*
- Fig. 4. *Triglyph or Doric Triglyph*
- Fig. 5. *Triglyph or Doric Triglyph*
- Fig. 6. *Triglyph or Doric Triglyph*
- Fig. 7. *Triglyph or Doric Triglyph*
- Fig. 8. *Triglyph or Doric Triglyph*
- Fig. 9. *Triglyph or Doric Triglyph*
- Fig. 10. *Triglyph or Doric Triglyph*
- Fig. 11. *Triglyph or Doric Triglyph*
- Fig. 12. *Triglyph or Doric Triglyph*
- Fig. 13. *Triglyph or Doric Triglyph*
- Fig. 14. *Triglyph or Doric Triglyph*
- Fig. 15. *Triglyph or Doric Triglyph*

- Fig. 16. *Triglyph or Doric Triglyph*
- Fig. 17. *Triglyph or Doric Triglyph*
- Fig. 18. *Triglyph or Doric Triglyph*
- Fig. 19. *Triglyph or Doric Triglyph*
- Fig. 20. *Triglyph or Doric Triglyph*
- Fig. 21. *Triglyph or Doric Triglyph*
- Fig. 22. *Triglyph or Doric Triglyph*
- Fig. 23. *Triglyph or Doric Triglyph*

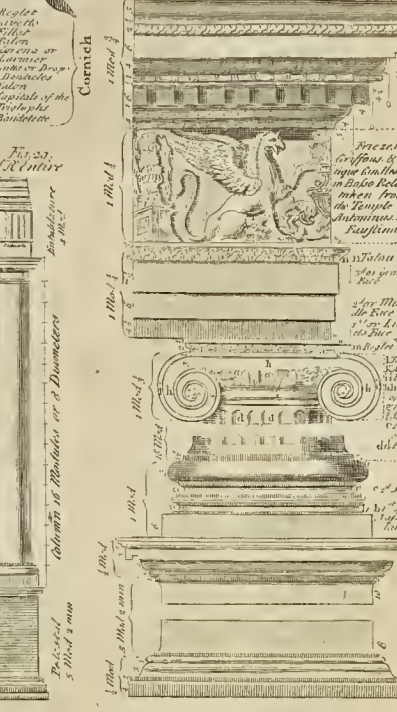
TUSCAN



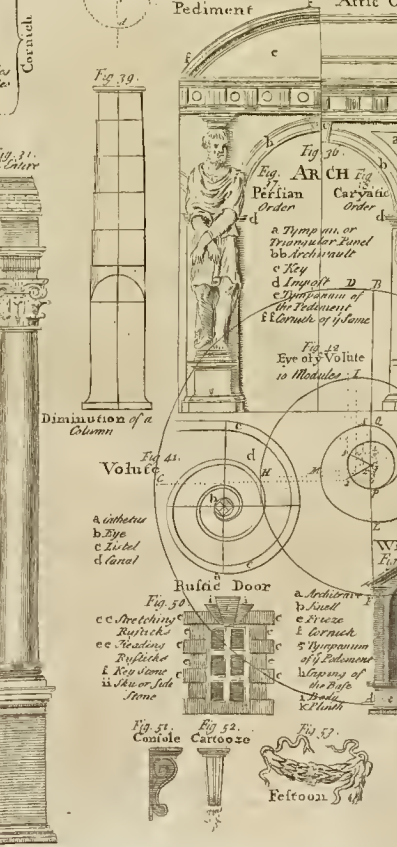
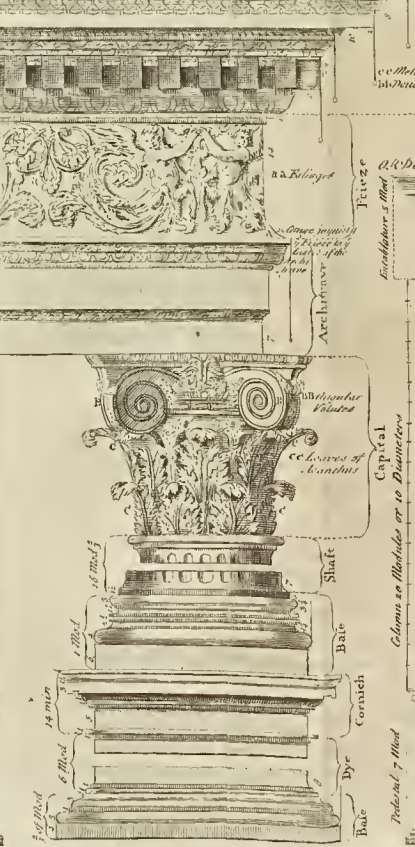
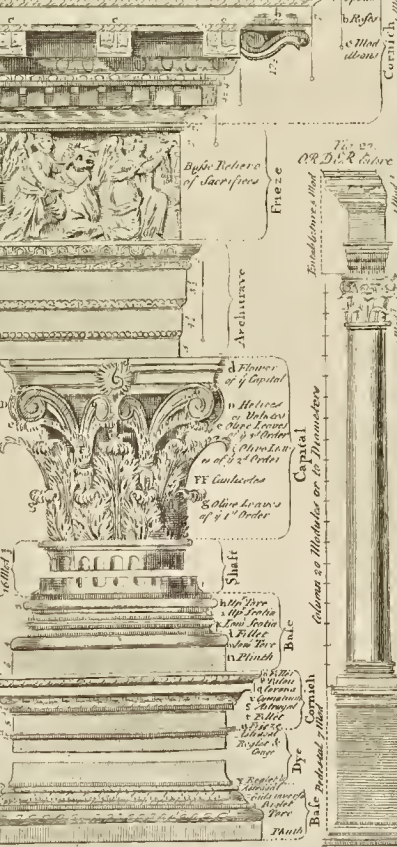
DORIC



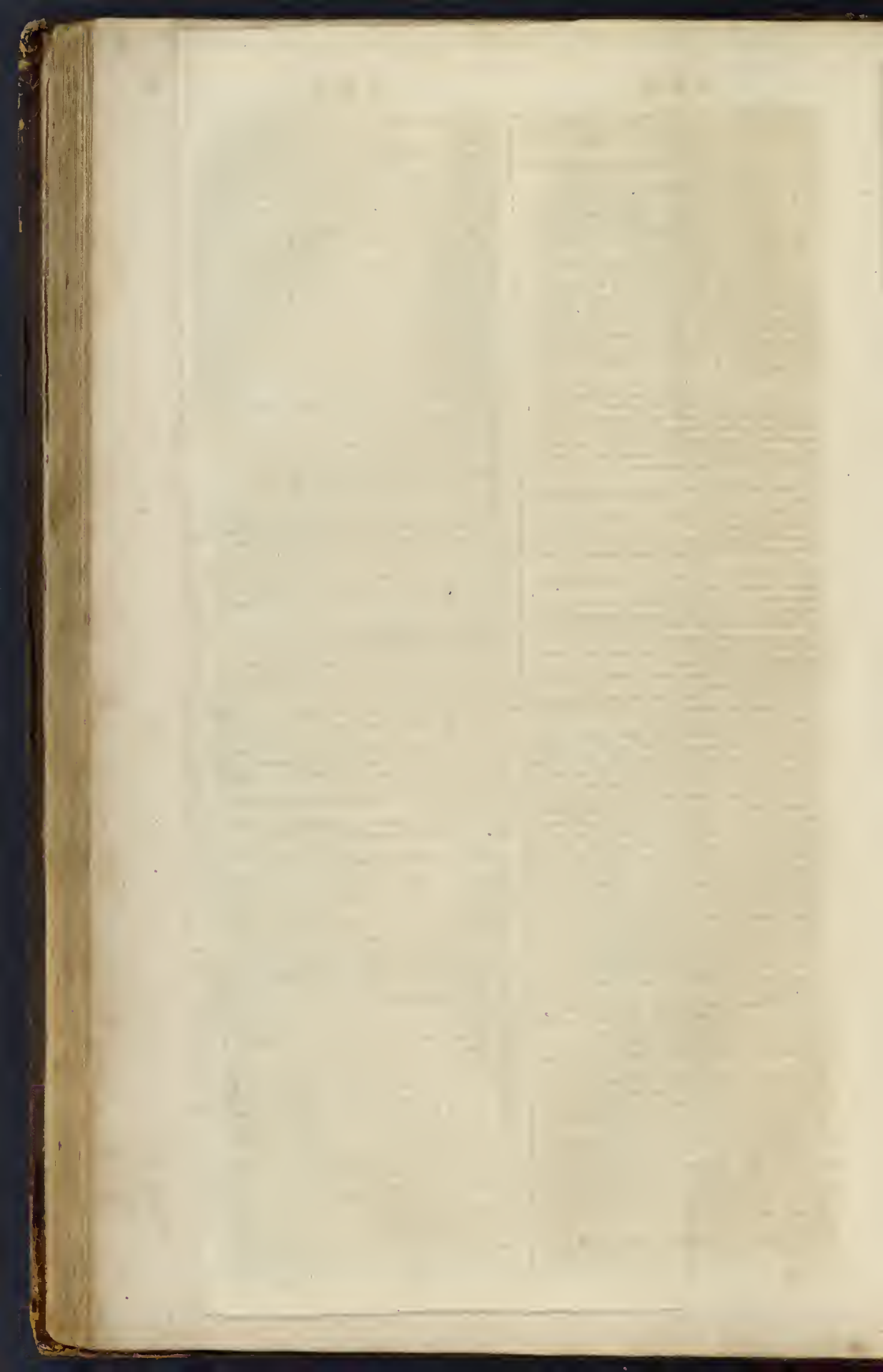
IONIC



CORINTHIAN COMPOSITE



- Fig. 24. *Original of the Corinthian Capital*
- Fig. 25. *Composite Capital side view*
- Fig. 26. *Composite Capital end view*
- Fig. 27. *Composite Capital end view*
- Fig. 28. *Composite Capital end view*
- Fig. 29. *Composite Capital end view*
- Fig. 30. *Composite Capital end view*
- Fig. 31. *Composite Capital end view*
- Fig. 32. *Composite Capital end view*
- Fig. 33. *Composite Capital end view*
- Fig. 34. *Composite Capital end view*
- Fig. 35. *Composite Capital end view*
- Fig. 36. *Composite Capital end view*
- Fig. 37. *Composite Capital end view*
- Fig. 38. *Composite Capital end view*
- Fig. 39. *Composite Capital end view*
- Fig. 40. *Composite Capital end view*
- Fig. 41. *Composite Capital end view*
- Fig. 42. *Composite Capital end view*
- Fig. 43. *Composite Capital end view*
- Fig. 44. *Composite Capital end view*
- Fig. 45. *Composite Capital end view*
- Fig. 46. *Composite Capital end view*
- Fig. 47. *Composite Capital end view*
- Fig. 48. *Composite Capital end view*
- Fig. 49. *Composite Capital end view*
- Fig. 50. *Composite Capital end view*
- Fig. 51. *Composite Capital end view*
- Fig. 52. *Composite Capital end view*
- Fig. 53. *Composite Capital end view*
- Fig. 54. *Composite Capital end view*
- Fig. 55. *Composite Capital end view*



ARCHITRAVE-Windows, of timber, are commonly an ogee raised out of the solid timber, with a lift over it: though sometimes the mouldings are struck and laid on; and sometimes they are cut in brick.

The upper fascia is called the *header*, or *heading architrave*; and the lower the *jack*.

ARCHITYPE. See the article **ARCHETYPE**.

ARCHIVAULT*, in architecture, the inner contour of an arch; or a band or frame adorned with mouldings, running over the faces of the arch-stones, and bearing upon the impost.—See *Tab. Archit. fig. 36, lit. bb. and fig. 40*.

* The word is French, *Archivolte*, where it signifies the same thing; formed of the Latin, *arcus volutus*.

It is different in the different orders.—In the Tuscan, it has only a single face; it has two faces crowned, in the Doric and Ionic; and the same mouldings with the architrave in the Corinthian and Composite.

ARCHIVE*, or **ARCHIVES**, a chamber or apartment wherein the records, charters, and other papers and evidences of a state, house, or community, are preserved; to be consulted occasionally.

* The word comes from the Latin *arca*, a chest or coffer; or the Greek *αρχαιον*, which Suidas uses in the same sense. In some Latin writers we meet with *archarium*.

We say the *archives* of a college, of a monastery, &c. The *archives* of ancient Rome were in the temple of Saturn; the *archives* of the court of chancery are in the rolls-office.—In the code we meet with *archivum publicum, vel armarium publicum, ubi acta & libri exponebantur. Cod. de fid. instrum. auth. ad hęc xxx. q. i. Trev.*

ARCH-LEVITE, **ARCHILEVITA**. See **ARCHDEACON**.

ARCH-MARSHAL, **ARCHIMARISCALLUS**, the grand marshal of the empire.

The elector of Saxony is *archmarshal* of the empire; and in that quality he goes immediately before the emperor, bearing a naked sword.

ARCH-MINISTER, **ARCHIMINISTER**, the prime minister of a prince or state.

Charles the Bald having declared Bofon his viceroy in Italy, under the title of duke, made him also his first minister under that of *archminister*: the word is derived from the Greek *αρχος*, and the Latin *minister*.—Chorier.

ARCHON*, in antiquity, the chief magistrate of the city and commonwealth of Athens.

* The word is Greek, *αρχων*; where it literally signifies a commander, or one that governs.

After the Athenians had abolished monarchy, they created *archons*, who were obliged to render an account of their administration to the people.

Some of these were annual, and others perpetual: Medon, the son of Codrus, was the first of those; and Creon of these.—The occasion of their institution was this: Codrus, king of Athens, having devoted himself, for the good of his people, in the war with the Heraclidae; his sons, Medon and Nileus, disputed the crown betwixt them: the Athenians took this occasion of dissolving their monarchy, and, in lieu of kings, created perpetual governors, under the name of *archons*.—Medon, son of Codrus, was he who first had this charge, and his descendants (from him called *Medontidae*) enjoyed it for 287 years. But a perpetual magistracy seemed to this free people too lively an image of royalty, the very shadow whereof they were resolved to abolish. Accordingly, the administration of an *archon*, which had before been perpetual, (*viz.* in the first year of the seventh Olympiad) they now reduced to ten years; and about 70 years after, to one year; with a view of recovering, as oft as possible, the authority into their own hands, which they never transferred to the magistrats, but with regret.—There were in all thirteen perpetual *archons*, and seven decennial ones; the first whereof was established in the 24th Olympiad.

Under the Roman emperors, several other Greek cities had two *archons*, for chief magistrats; which were the same with the *duumviri* in the colonies, and municipia.

ARCHON is also applied by some authors to divers officers both civil, and religious, under the eastern or Greek empire.

Thus, bishops are sometimes called *archontes*; and the same may be said of the lords of the emperor's court. We also read of the *archon of the antimenia*, *archon of archons*, *grand archon*, *archon of churches*, *archon of the gospel*, *archon of the walls*, &c.

ARCHONTICI, in church-history, a sect of heretics, who arose towards the close of the second century; thus called from the Greek *αρχοντες*, q. d. *principalities*, or *hierarchies of angels*; by reason they held the world to have been created not by the supreme God, but by certain subordinate powers called *archontes*, or angels. The *Archontici* were a branch of Valentianians. See **VALENTINIAN**.

ARCH-PRIEST, **ARCHIPRESBYTER**, a priest, or pres-

byter established in some dioceses, with a pre-eminence over the rest.

Anciently, the *arch-priest* was the first person after the bishop: he was seated in the church next after the bishop; and even acted as his vicar, in his absence, as to all spiritual concerns.

In the sixth century, there were found several *arch-priests* in the same diocese; from which time some will have them to have been called *deans*.

In the ninth century, they distinguished two kinds of cures or parishes; the smaller, governed by simple priests; and the baptismal churches, by *arch-priests*, who, beside the immediate concern of the cure, had the inspection of the other inferior priests, and gave an account of them to the bishop, who governed the chief or cathedral church in person.

There are *arch-presbyters* still subsisting in the Greek church; vested with most of the functions and privileges of *choriepiscopi*, or rural deans.

ARCH-PRINTER, **ARCHITPOGRAPHUS**. See **PRINTER**.

ARCH-PRIOR was a name sometimes given to the master of the order of templars.

ARCH-TREASURER, *Archibthesaurarius*, the great treasurer of the German empire.

This office was created with the 8th electorate, in favour of the elector Palatine, who had lost his former electorate, which was given to the duke of Bavaria; by the emperor Ferdinand II. who took it away from Frederic V. Elector Palatine after the battle of Prague, where he was defeated in maintaining his election to the crown of Bohemia. See **ELECTOR**.

The dignity of *arch-treasurer* is contested between the elector of Brunfwic, now king of Great-Britain, who claims it in virtue of his descent from the elector Frederic; and the present elector Palatine.

ARCILEUTO, **ARCHILUTE**, a long, and large lute, having its bass-strings lengthened after the manner of the theorbo, and each row doubled either with a little octave or an unison.—It is used by the Italians for playing a thorough-bass. *Bruff. p. 10*.

ARCTIC, *Αρκτικός*, in astronomy, an epithet given to the north-pole, or the pole raised above our horizon. See **NORTH**, and **POLE**.

It is called the *arctic* pole, on occasion of the constellation of the little bear, in Greek called *αρκτικός*, the last star in the tail whereof nearly points out the north pole. See **URSA MINOR**.

ARCTIC Circle is a lesser circle of the sphere, parallel to the equator, and 23° 30' distant from the north pole: from whence its name.

This, and its opposite, the *antarctic*, are called the two *polar circles*; and may be conceived to be described by the motion of the poles of the ecliptic, round the poles of the equator, or of the world.

ARCTOPHYLAX, in astronomy, a constellation, otherwise called *Boötes*.

ARCTURUS, in astronomy, a fixed star, of the first magnitude, in the constellation *Arctophylax*, or *Boötes*.

* The word is formed of *αρκτικός*, bear; and *αρκος*, tail, q. d. bear's tail; as being very near it.

Arcturus rises on the first day of September, and sets on the thirteenth day of May; and has been supposed rarely to appear without bringing some storm.

ARCTUS, in astronomy, a name given by the Greeks to two constellations of the northern hemisphere; by the Latins called *Ursa major*, and *minor*, and by us the *greater*, and *lesser bear*. See **URSA major** and *minor*.

ARCUATION is used by some writers in surgery, for an incurvation of the bones; such as we see in the case of rickets, &c.

ARCUATION, in gardening, denotes a method of raising trees by layers.

This, Switzer observes, is now the general method of raising such trees as can't be raised from seed, as the platanus, elm, abele, lime, alder, willow, &c.

The first thing here done is, to procure large and strong mother-plants called *stools*. These, being planted in a trench, will throw out twenty, thirty, forty, or fifty plants a-piece; which may be begun to be laid about the Michaelmas following; at which time, if the stools have been carefully managed, they will have shot five, six, or more main branches out of the root, and on every one of these, as many side or collateral branches.

These main branches are to be bent down to the ground, and when thus laid quite round the stool, and pegged fast down, the small ones may be served in the same manner. Thus the main branches are to be covered over, all except the top; and the small, or sides branches, to be cover'd over two or three inches thick upon the joints. This done, they may be treaded, to make them take root the better.

About the middle of September they may be opened; when it is probable they will have taken root: otherwise they may lie till next spring; and then taking them up, they are to be planted in the nursery.

ARCTUTIO, a machine made of a board covered with pieces of hoops, used in Italy to prevent children from being overlaid and smothered by nurses, or others.

Every nurse in Florence is obliged to lay her child in an *arctutio*, under pain of excommunication.—See a figure and description of the *arctutio*, given by Mr. St. John, in *Phil. Transf.* No 422. p. 256.

AR DENT*, **ARDENS**, something hot, and, as it were, burning.

* The word is formed of the Latin *ardere*, to burn.

ARDENT Fever is a violent burning fever, otherwise called *caufus*. See **FEVER**.

ARDENT Spirits are those distilled from fermented vegetables; thus called, because they will take fire, and burn.

Such are, brandy, spirit of wine, rum, arrack, &c.

ARDERS, fallowings, or plowings of grounds. See **PLOUGHING**, **FALLOW**, &c.

ARDOR Ventriculi, a heat in the stomach, usually expressed by the term *heart-burn*, or *cardialgy*.

A R E, or **A-LA-MIRE**, one of the eight notes in the scale of music. See **NOTE**.

AREA*, in general, denotes any plain surface, whereon we walk, &c.

* The word is Latin, importing more properly a thrashing-floor; and is derived from *arere*, to be dry.

AREA in geometry, denotes the superficial content of any figure.

Thus, if a figure, *e. gr.* a field, be in form of a square, and its side be 40 foot long, its *area* is said to be 1600 square feet, or it contains 1600 little squares, each a foot every way.

Hence, to find the *area* of a triangle, square, parallelogram, rectangle, trapezium, rhombus, polygon, circle, or other figure, is to find the magnitude or capacity thereof in square measure.—To do which, see the article **TRIANGLE**, &c.

To find the *area* of fields, and other inclosures; they first survey or take the angles thereof, then plot them on paper, and thus cast up their contents in acres, roods, &c. after the usual manner of other plain figures.

The law by which the planets move round the sun, is this, that a line or radius, drawn from the centre of the sun to the centre of the planet, always sweeps or describes elliptic *areas* proportional to the times. Thus, the sun being supposed in S, and a planet in A, (*Tab. Astronomy*, fig. 61. N^o 2.) and letting it proceed in any given time, to B, in such progress, its radius AS will have described the *area* ASB. Suppose again, the planet to be arrived to P; then the elliptic space PSD being drawn equal to the other ASB, the planet will move through the arch PD, in the same time as through the arch AB.

Sir I. Newton demonstrates, that whatever bodies do observe such law in their motions about any other body, do gravitate towards such body.

AREA is also used in medicine, for a disease which makes the hair fall.

The *area* is a general kind of depilation, and is distinguished into two species, *alopecia* and *ophiasis*. See **ALOPECIA**, &c.

ARENA* among the Romans, sometimes signified the same with an *amphitheatre*, *viz.* a place where the gladiators had their combats.

* The word is originally Latin, and signifies *sand*, in regard the place was always strewn with sand, to conceal from the view of the people, the blood spilt in the combat.

Properly speaking, *arena* was only the pit, or space in the middle of those places, where the *athletæ* and gladiators performed.

The *arena* was the same thing with regard to the gladiators, that the campus, or field, was to soldiers and armies, *viz.* the place where they fought.—He who fought in the *arena*, was called *arenarius*. See **GLADIATOR**.—Nero is said to have strewn the *arena* with gold dust.

ARENATION is used by some physicians for a kind of dry bath, in which the patient only sits with his feet on hot sand.

AREOLA, or **AREOLA Mamillaris**, in anatomy, the coloured circle which surrounds the nipple. See **BREAST**.

AREOPAGUS, or **ARÆOPAGUS**, *Ἀρειοπάγος*, in antiquity, a sovereign tribunal at Athens; famous for the justice and impartiality of its decrees, to which the Gods themselves are said to have submitted their quarrels.

Authors are divided, as to the reason and origin of the name: some imagine *areopagus* the proper name of the court of justice, which was situate on a hill, in Athens; and that in this court the senate of that illustrious city assembled.—Others say, that *areopagus* was the name of

the whole suburbs of Athens, wherein stood the hill on which the court was built: and the name *areopagus* seems to countenance this last opinion; for it signifies literally, the hill or rock of Mars, from *ἄρειος*, hill, and *ἄγος*, belonging to Mars. In effect, the denomination might either arise hence, that the *areopagus* was built in a place where had been a temple of Mars; or, because the first cause pleaded there was that of this God, who was accused of killing Halirrotius, the son of Neptune, and tried here before twelve Gods, and acquitted by a majority of voices; or finally, because the Amazons, whom the poets feign to have been the daughters of Mars, when they besieged Athens, pitched their tents, and offered sacrifices to the God of war, in this place.

This tribunal was in great reputation among the Greeks; and the Romans themselves had so high an opinion of it, that they trusted many of their difficult causes to its decision. Authors are not agreed about the number of the judges who composed this august court.—Some reckon thirty-one, others fifty-one, and others five hundred: in effect, their number seems not to have been fixed, but to have been more or less in different years.—By an inscription quoted by Volaterranus, it appears they were then three hundred.

At first this tribunal only consisted of nine persons, who had all discharged the office of archons, had acquitted themselves with honour in that trust, and had likewise given an account of their administration before the Logistæ, and undergone a very rigorous examination. Their salary was equal, and paid out of the treasury of the republic: they had three Oboli for each cause.

The *areopagites* were judges for life.—They never sat in judgment but in the open air, and that in the night-time, to the intent that their minds might be more present and attentive, and that no object, either of pity or aversion, might make any impression upon them.—All pleadings before them were to be in the simplest and most naked terms; without exordium, epilogue, passions, &c.

At first they only took cognizance of criminal causes, but in course of time their jurisdiction became of greater extent.—Mr. Spon, who examined the antiquities of that illustrious city, found some remains of the *areopagus* still existing in the middle of the temple of Theseus, which was heretofore in the middle of the city, but is now without the walls.—The foundation of the *areopagus* is a semicircle, with an eplamade of 140 paces round it, which properly made the hall of the *areopagus*. There is a tribunal cut in the middle of a rock, with seats on each side of it, where the *areopagites* sat, exposed to the open air.

This court is said by some to have been instituted by Solon; but others carry it much higher, and assert it to have been established by Cecrops, about the time that Aaron died, *viz.* in the year of the world 2553, maintaining withal, that Solon only made some new regulations in it, increased its power and privileges, and made it superior to the Ephectæ, another celebrated court instituted by Draco.—In effect, Demosthenes himself, in his oration against Ctesiphon, owns himself at a loss on the point: *The institutors of this tribunal*, says he, *whatever they were, whether gods or heroes*.

AREOMETER, } See { **ARÆOMETER**.

AREOSTYLE, } See { **ARÆOSTYLE**.

AREOTICS, } See { **ARÆOTICS**.

ARETOLOGY, **ARETOLOGIA**, that part of moral philosophy which treats of virtue; its nature, and the means of arriving at it.

ARGAL, or **ARGEL**, the hard lees sticking to the sides of wine-vessels; more frequently called *tartar*.

ARGEA, or **ARGEI**, in antiquity, human figures made of rushes, thrown annually by the vestals into the river Tiber, on the day of the ides of May.

This ceremony we learn from Festus and Varro; the latter of whom, however, says they were cast by the priests; unless by *sacerdotibus*, we suppose he meant priestesses. He adds, that the number of figures was thirty.

Plutarch, in his Roman questions, enquires, why they were called *Argæ*? there are two reasons assigned; the first, that the barbarous nation, who first inhabited these parts, cast all the Greeks they could meet with into the Tiber; for *Argians* was a common name for all Grecians: but that Hercules persuaded them to quit so inhuman a practice, and to purge themselves of the crime, by instituting this solemnity.

—The second, that Evander, an Arcadian, and a sworn enemy of the Argians, to perpetuate that enmity to his posterity, ordered the figures of Argians to be thus cast into the river.

ARGENT, in heraldry, signifies the colour white, used in the coats of gentlemen, knights and barons.

Barons and all nobles have the white colour called *pearl*; and sovereign princes have theirs called *luna*.—Without either *argent* or *or*, the heralds say, there can be no good armory.

Argent is expressed in engraving, by the parts being left plain, without any strokes from the graver. The word is French,

French, derived from the Latin *argentum*, silver; this colour being supposed the representation of that metal: whence the Spaniards call this field *campo de plata*, a silver field.

In the doubling of mantles, where the white is supposed to represent a fur, and not a metal, it may be blazoned white.

ARGENTUM Album, mentioned in domestic, signifies, according to Spelman, bullion, or silver uncoined.

In those ancient days, such metal passed as money from one to another in payment.—*Suntur pro ipso hoc metallo pensilli non signata.*

ARGENTUM Dei, God's penny, anciently signified earnest money, or money given to bind a bargain; in some places called *erles*, or *arles*, and by the civilians, and canonists *arba*. *Et cepit de praedicto Henrico tres denarios de argento Dei pro manibus.*

ARGILLA, or **ARGIL**, *Clay*; a general name for all earths used in pottery, brick and tile making, and for the like purposes.

ARGO, in antiquity, a ship or vessel celebrated among the poets; being that wherein the Argonauts made their expedition.

The critics are divided about the origin of the name: some will have it thus called from the person who built it, *Argus*; others, by antiphrasis, from the Greek word *argos*, slow, as being a light sailer; others from the city *Argos*, where they suppose it built; others, from the *Argivoe*, who went on board it, according to the distich quoted from an ancient Latin poet by Cicero, in his first Tusculan;

*Argo, quia Argivi in ea, delesti viri,
Vesti, petebant pellem inauratam arictis.*

Ovid calls *Argo* a sacred ship, *saeram conscendis in argum*; by reason, say some, that Minerva contrived the plan, and even assisted in the building thereof; or rather, on account of a piece of timber in its prow, which, they say, spoke, and rendered oracles.—Several authors make mention of this piece of timber, which is said to have been hewn in the sacred forest of Dodona.

Jason having happily accomplished his enterprize, consecrated the ship *Argo* to Neptune; or, as others say, to Minerva, in the Isthmus of Corinth; where, they add, it did not remain long before it was translated into heaven, and made a constellation.

The generality of authors represent the ship *Argo* as of a long make, resembling the modern galleys; and furnished with thirty benches of rowers.—The scholiast of Apollonius observes, that it was the first long vessel ever made: and Pliny relates the fame, after Philoetaphus, who had affirmed, that Jason was the first that trusted out to sea in a long vessel: *Longa nave Jasonem primum navigasse, Philoetaphus auctor est. Hist. Nat. l. 7. c. 56.*—It could not however be of any great bulk, since the Argonauts were able to carry it on their backs from the Danube to the Adriatic sea.

ARGO Navis, or the *Ship*, in astronomy, is a constellation of fixed stars, in the southern hemisphere, whose stars, in Ptolemy's catalogue, are 8; in Tycho's 11; in the Britanic catalogue 25; the longitudes, latitudes, magnitudes, &c. whereof are as follow:

Names and situations of the stars.	Right Ascension	Longitude	Latitude	Magnitudes
Preced. under the shield in the stern	23 20 10	21	47 26 26	3
Between the sail and lactea	24 57 46	30 30 11	3 4	6
	27 26 26	35 18 03	6	
Subseq. under the shield of the stern	1 34 22	49 14 58	4 5	
	27 32 40	35 09 13	6	
South. in the middle of the stern	1 45 40	46 05 27	5 6	
	29 22 16	37 32 25	5	
North in the middle of the stern	1 44 14	44 58 49	3 4	
	28 43 17	33 08 33	5 6	
10.	29 02 00	34 09 45	4	
Preced. in the top of the stern	3 20 43	42 30 40	4	
	4 10 24	42 53 10	6	
Preced. of two in the yard	0 49 33	22 37 35	4	
Subseq. in the top of the stern	7 05 31	41 10 24	3	
15.	5 32 06	38 20 40	5	
Inform. under the sail, Tycho	4 46 09	35 29 03	6	
In the sail, Tycho	4 15 33	32 06 47	4 5	
	5 44 40	34 44 10	5 6	
	5 13 29	22 24 32	6	
20.	5 32 30	22 28 27	4 3	
Subseq. in the yard	5 46 09	22 30 10	6	
In the mast the lowest of three.	13 39 49	32 55 23	6	
Tycho.	11 13 06	24 28 45	5	
In the mast, upper	11 14 02	30 18 40	6	
Middle in the mast				
25.				

ARGOL, the same with *Tartar*. See **TARTAR**.
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ARGONAUTS, in antiquity, a company of fifty-two, or according to others, fifty-four heroes, who embark'd along with Jason, in the ship *Argo*, for Colchis; with a design to obtain the golden fleece.

Hercules, Theseus, Castor, Orpheus, &c. were of the number of the *Argonauts*.

ARGONAUTS of St. Nicholas was the name of a military order, instituted by Charles III. king of Naples, towards the end of the fourteenth century.

They wore a collar of shells, enclosed in a silver crescent, whence hung a ship with this device, *Non credo tempori, I do not trust time*. Hence these *Argonaut* knights came to be called *knights of the shell*. They received the order of St. Basil, archbishop of Naples, and held their assemblies in the church of St. Nicholas, their patron.

ARGUMENT, **ARGUMENTUM**, in rhetoric, as defined by Cicero, is some probable matter alledged to gain belief.

Logicians, somewhat more scientifically, define *argument*, a medium, from whose connection with two extremes, the connection of the two extremes themselves is inferred.

Arguments are divided, with regard to their source, into those fetched from *reason*, and those from *authority*.

Logicians also divide their *arguments*, with regard to their form, into *sylogisms*, *enthymemes*, *inductions*, &c.

An *Argument in form* is a syllogism framed according to the strict rules of logic.—According to Aristotle, the enthymeme is the *argument* of rhetoric, as the syllogism is that of logic.

—Rhetoric is defined by some, the art of finding *arguments* adapted to persuade, or gain belief.

Rhetoricians divide *arguments*, with respect to the places they are drawn from, into *intrinsic* or artificial; and *extrinsic* or inartificial, or remote.

Artificial, or *intrinsic ARGUMENTS*, by the Greeks called *artifical*, by Cicero *instita*, are the proper invention of him who speaks; or they are those which are taken from the subject treated of; of which there are several kinds, *viz.* genus and species, form, cause, and effect, &c. See each in its place, **GENUS**, &c.

To these some add two other places of *argument*, *viz.* the manners, and the passions.

Inartificial, or *extrinsic ARGUMENTS*, *artifical*, by Cicero called *assumpta*, are those which are borrowed from abroad, and are only applied by the orator to the point in hand; such are laws, common report, books, oaths, torture, and witnesses.

A late author divides the places, or general heads of *arguments*, with regard to their end, into 1^o, those intended to persuade or dissuade, which are chiefly drawn from the considerations of profit, honour, and equity; 2^o, those intended to praise, or dispraise;—And 3^o, those intended to accuse and defend.

Dialectical ARGUMENT, See the article **DIALECTICAL**.

ARGUMENT is also used for a syllabus, or abridgment of the subject of a book, history, comedy, or the like.

We have almost lost the original use of prologues, which was to give the *argument* of the play.

ARGUMENT, in astronomy, is an arch whereby we seek another unknown arch proportional to the first.

Hence **ARGUMENT of Inclination** is an arch of a planet's orbit, intercepted between the ascending node, and the place of the planet from the sun, numbered according to the succession of the signs. See **INCLINATION**.

Menstrual ARGUMENT of Latitude is the distance of the moon's true place, from the sun's true place. See **PLACE**.

By this we find the quantity of the real obscuration in eclipses, or how many digits are darkened in any place. See **ECLIPSE**.

ARGUMENT of the moon's menstrual longitude, or **Menstrual ARGUMENT of the longitude**, is an arch of her eccentric, L. P. (*Tab. Astron. fig. 32.*) intercepted between her true place once equated L; and a right line P Q, drawn through the centre of the eccentric B, parallel to the menstrual line of the apides.

The *annual argument* of longitude is represented by the angle D A H.

ARGUMENTATION, the act of inventing or framing *arguments*, of making inductions, and drawing conclusions. See **ARGUMENT**, **INDUCTION**, **CONCLUSION**, &c. See also **DISCOURSE**, **RATIOCINATION**, &c.

Argumentation, according to Cicero, is the delivering or unfolding of an argument.—The matter of *argumentations* is propositions; the form, their due disposition, with regard to one another, so as a conclusion may be drawn from them. See **PROPOSITION**, **SYLLOGISM**, **ENTHYMEME**, and **SORTES**.

ARGYRASPIDES, or **ARGYROSPIDES**, in antiquity, persons armed with silver bucklers, or bucklers silvered. See **BUCKLER**.

The *Argyraspides*, according to Quintus Curtius, *Hist. iv. 13. 27.* made the second corps of Alexander's army; the first was the phalanx.

According to Justin's account, *Lib. xii. c. 7.* Alexander having penetrated into India, and extended his empire as far as the ocean; for a monument of his glory, ordered the armour of his soldiers, and the housings of his horses, to be adorned with silver.—And hence commanded them to be called *Argyropides*, from the Greek *αργυρος*, silver, and *πους*, buckler.

By this author it should seem that Alexander's whole army were called *Argyropides*.—After that prince's death, the *Argyropides* despised all other chiefs of the army, disdainful to obey any other, having borne arms under Alexander.

ARGYROPOEIA *, in alchymy, the art of making silver, out of other more imperfect metals.

* The word is formed of *αργυρος*, silver, and *ποιω*, I make.

The scope and design of *argyropæia*, and *chrysopeia*, is to make gold and silver. See **TRANSMUTATION**, and **PHILOSOPHERS Stone**.

ARIANS, a sect of ancient heretics, retainers to Arius, a presbyter of the church of Alexandria about the year 320.—who owned Christ to be God, yet maintained him inferior to the father even as to his deity, and his essence to be different from that of the father, and that he was neither co-eternal nor co-equal with him.—Also that the Holy Ghost was not God, but a creature of the son.

The *Arians* were first condemned and anathematized by a council at Alexandria, under Alexander bishop of that city; and afterwards by 380 fathers in the general council of Nice.—After this council they divided into several parties, and factions. Some held that the son was made *ex non entibus*, *ὅτι οὐκ ἦν*, or of nothing; and added, that he was in all respects unlike the father, *κατὰ πάντα ἀνόμοιος τῷ πατρί*. This was the doctrine of Acacius bishop of Caesarea, whose followers were hence denominated *Acaciani* and *Anomæi*. The same was afterwards espoused by Ursacius bishop of Tyre, and Eudoxius bishop of Antioch, afterwards of Constantinople; whence the denominations of *Ursaciani* and *Eudoxiani*. To these also adhered Aetius, and his disciple Eunomius, bishop of Cyzicus; whence the *Aetiani* and *Eunomiani*.—Others held, that the son was like the father, and begot of his substance, though not co-eternal with him: they rejected the terms consubstantiality or homoussia, and substituted that of likeness or similitude in their stead; anathematizing all those who held the son unlike the father, or a creature like other creatures, and made of nothing. Such was the faith of the council of Arimini, and the second council of Nice.—Lastly, others believed orthodoxly of the father and son, but denied the deity of the Holy Ghost, and his consubstantiality with father and son. These were denominated *Semiariani*.

ARIANISM, an ancient heresy in the church, broached by Arius, in the beginning of the fourth century; who denied that the son was God consubstantial, and co-equal with the father; and asserted him to be a creature made out of nothing, and in time.

The Arians owned, that the son was the word, but denied that word to have been eternal; asserting, that it had only been created before all other beings.—They held, that Christ had nothing of man in him, but the flesh, with which the word was joined, which supplied the rest.

This heresy was condemned in the first council of Nice, in 325*; but, notwithstanding that, it was not extinguished: on the contrary, it became the reigning religion, especially in the east, where it obtained much more than in the west**.

* It is even said, that there was an order of Constantine's, that whosoever should meet with any book composed by Arius, and not burn it, should be immediately punished with death. *V. Sacrat. Hist. Eccles. l. 9.*

** By the influence of the emperor Constantius, and the insinuations of the two Arian bishops Valens and Ursinus, who persuaded the western bishops, that peace might be restored by only setting aside those ambiguous Nicene terms, *ὁμοουσιος*, and *ὁμοεσσης*, which were not to be found in scripture, and which afforded great perplexity and scandal to weak minds; they were brought to subscribe an Arian formula of faith, in the council of Armini, which was soon after confirmed in the second council of Nice, and established in the east. At the same time the confession of faith of the first council of Nice was condemned by the second. And thus was the world rendered Arian, as it were by stratagem.—But the pacification held not long: Many, who had subscribed the Arian confession, recanted, returned to the faith of the first Nicene council, and anathematized the second; by which means the war was renewed, and the word Homoussia was recalled, and settled in its former honour, as denoting of *one and the same substance*. The like was endeavoured to be done by the word *ὁμοεσσης*; but this occasioned a new dispute between the Greeks and Latins.

At the time of St. Gregory Nazianzen, the Arians were masters of the capital city of the empire, and frequently up-

braided the orthodox with the smallness of their numbers. Accordingly that father begins his twenty-fifth oration against the Arians, thus: "Where are those who reproach us with our poverty, and define the church by the multitude of people; despising the little flock," &c.

Arianism was carried in the sixth century into Africa under the Vandals; and into Asia under the Goths: Italy, the Gauls, and Spain, were also deeply infected with it. But, having reigned thirty years with great splendor, it sunk almost all at once.

Erasmus seems to have aimed, in some measure, to restore *Arianism*, at the beginning of the sixteenth century, in his commentaries on the New Testament: accordingly, he was reproached by his adversaries, with Arian interpretations and glosses, Arian tenets, &c. To which he made little answer, save that there was no heresy more thoroughly extinct than that of the Arians: *Nulla heresis magis extincta quam Arianorum*. But the face of things was soon changed: Servetus, a Spaniard by nation, published in 1531, a little treatise against the mystery of the Trinity; which once more set the heresy of the Arians on foot in the west.—Indeed he rather shewed himself a Photinian, than an Arian; only that he made use of the same passages of scripture, and the same arguments against the divinity of our Saviour, with the proper Arians.

It is true, Servetus had not, properly speaking, any disciples; but he gave occasion, after his death, to the forming of a new system of *Arianism* in Geneva, much subtler, and more artful than his, and which did not a little perplex Calvin.—From Geneva, the new Arians removed to Poland, where they gained considerable ground; but at length they degenerated, in great measure, into Socinians. See **SOCINIAN**.

The learned Grotius himself seems to have bordered a little on *Arianism*, in his notes on the New Testament; where he mounts the father too high above the son; as if the father alone was supreme God, and the son inferior to him even in respect of his divinity. Though it is rather the doctrine of the Semi-Arians, than of the Arians, that he seems to give into.

ARIES, or the *Ram*, in astronomy, the first of the twelve signs of the zodiac; from which also a twelfth part of the ecliptic takes its denomination.

The stars in the constellation *Aries*, in Ptolemy's catalogue, are 18; in Tycho's 21; in the Britannic catalogue 65; the longitudes, latitudes, magnitudes, &c. whereof, are as follow:

Names and situations of the stars.	Longitude.		Latitude.		Magnit.
	°	'	°	'	
	7	26 58 25	11	04 58	7 6
		26 48 15	9	01 26	7 6
		26 49 04	5	23 59	7 6
Preced. star in the horn.		28 51 00	7	08 58	4
Subf. and more north star in the horn.		29 37 59	8	28 16	3
5.					
	8	0 54 20	10	57 12	
In the neck.	7	29 10 57	5	26 12	6
In the crown of the head.	8	1 22 15	10	47 47	5
	3	26 14	12	31 52	6 7
		4 02 12	12	04 02	6
10.					
That under the Lucida.	2	55 08	9	13 29	6
Informis over the head.	3	19 18	9	57 12	2
	4	40 46	12	05 32	6
	2	43 49	5	56 58	6
	5	03 59	11	57 02	8
15.					
In the nose, the more north of two.	3	46 50	7	22 45	6
	3	25 14	6	08 45	7
	1	49 58	1	46 25	6 7
	5	59 35	11	27 44	6
	5	43 38	10	46 20	7
20.					
In the nose the more south.	4	32 25	5	43 39	6
	4	41 59	5	27 23	7
In the extremity of the foremost foot.	3	00 19	3	33 31	5
	3	50 53	4	09 43	7
	8	7 19 13	4	44 07	6 7
25.					
	6	41 33	2	40 42	6 7
	6	18 40	0	01 15	6 7
Informis, alias 16th of the triangle.	10	14 15	8	49 48	7
	6	20 07	2	44 12	5 6
The north in the loins.	9	48 33	6	07 56	6
30.					
Informis, alias the 17th of the triangle.	11	48 01	10	51 52	5
The fourth in the loins.	9	59 55	4	01 56	6
Informis, alias the 18th of the triangle.	12	35 47	11	17 13	4
	9	45 08	1	44 43	7
In the preced. hind knee.	9	03 43	0	36 24	6
35.					
	8	17 35	3	21 50	7
In extrem. of the hind foot, alias ceteri.	7	37 07	5	34 50	4
Most northern of the informes.	14	00 55	12	28 08	4
	10	52 39	1	56 14	6
Brightest of the informes.	13	51 45	10	25 37	3
40.					

Names and situations of the stars.	S. Longitud.	Latitude.	Magn.
	o " "	o " "	
In the leg.	8 10 47 52	1 06 13	6
In the hindmost knee.	10 35 46	1 19 37	6
	12 09 32	0 58 57	6
In the thigh or hip, the north.	12 32 11	1 28 58	6 7
The fourth.	12 34 24	1 10 03	6
45.			
In the root of the tail.	13 42 08	3 34 37	6
<i>Alias</i> , 20th of the triangle.	14 10 09	4 08 01	5
	16 13 51	8 51 55	7
<i>Alias</i> , 21st of the triangle.	13 44 34	0 46 38	7
50.	16 22 25	8 59 42	7
<i>Alias</i> , 22d of the triangle.	16 39 24	7 29 04	6
	15 03 56	0 16 22	7
	15 30 48	1 05 39	6 7
<i>Alias</i> , 23d of the triangle.	18 37 56	10 54 26	7
<i>Alias</i> , 24th of the triangle.	18 41 07	8 58 26	7 6
55.			
Foremost of the three in the tail.	16 36 18	1 47 34	4
The middle.	17 36 34	2 51 19	5
	20 19 17	8 32 08	7
	20 03 5	0 59 28	7
Last of the tail.	19 03 42	2 34 05	5
60.			
The middle.	20 56 20	8 45 05	6
	19 18 49	2 04 57	6
	20 39 45	5 51 39	6
The third.	19 41 15	2 02 52	7
	8 21 06 22	3 46 01	7

ARIES, also denotes a *battering ram*; or a military engine with an iron head, much in use among the ancients, to batter and beat down the walls of places besieged.

Of this there were three kinds; the first rude and plain, the others artificial and compound.

The first seems to have been no more than a great beam, which the soldiers bore in their arms, and with one end of it, by main force, assailed the walls. This required a great force to work it, yet produced but a small effect.

The second or compound ram is described by Josephus, (*de excid. Hierosol.* 3.) thus: "The ram is a vast long beam, as like the mast of a ship, strengthened at one end with a head of iron, something resembling that of a ram, whence it took its name. This is hung by the middle, with ropes to another beam, which lies across a couple of posts; and hanging thus equally balanced, is, by a great number of men, violently thrust forward, and recoiled backwards, and so shakes the wall with its iron head. Nor is there any tower or wall so thick or strong, as to resist the repeated assaults of this forcible machine."

The third only differed from the former in that it was covered with a *χρυσον* or screen to guard the soldiers, whence it is also called *testudo arietaria*.

M. Felibien describes a fourth sort of *battering ram*, which run on wheels; and was the most perfect and effectual of them all. Vitruvius affirms, that the *battering ram* was first invented by the Carthaginians, while they laid siege to Cadix: theirs was the simple kind first mentioned: Pephaemnos, a Tyrian, afterwards contrived to suspend it with ropes; and finally Polydus, the Thessalian, to mount it on wheels, at the siege of Byzantium, under Philip of Macedon. Yet Pliny assures us, the ram was invented at the siege of Troy; and that it was this that gave occasion to the fable of a wooden horse.

The engine opposed to the *ram* was called *lupus*, the wolf.—Plutarch tells us, that Mark Anthony, in the Parthian war, used a ram of 80 foot long; and Vitruvius assures us, they were sometimes made 106, and sometimes 120 foot long; to this great length, perhaps, the force of the engine was in great measure owing.

The *ram* was managed at once by a whole century of soldiers; so that it played continually, and without intermission; being usually covered with a vine, to protect it from the attempts of the enemy.

ARIETATION. See the article **EARTHQUAKE**.

ARIETUM *Levatio*, an ancient kind of sportive exercise, probably the same with what of later times is called *running at the quintain*. See **QUINTAIN**.

ARISE.—*Licence to ARISE*. See **LICENCE**.

ARISH, a Persian long measure, containing 3197 English feet. *Arith. tab.* 32.

ARISTA, in botany, a long needle-like beard, that grows out from the husk of corn, or grass; called also the *awn*.

ARISTARCHUS, in its original Greek, *αριστος αρχος*, signifies *good prince*; but in its ordinary use among the learned, denote a very severe critic; there having been a learned grammarian of that name, who criticized on the verses of the very best poets, as Homer, &c.

Hence we derive the titles of several books; as *Aristarchus sacer*, the name of Heinsius's notes on the new testament; *Aristarchus anti-bentleianus*, &c.

ARISTOCRACY*, **ARISTOCRATIA**, a form of govern-

ment, where the supreme power is lodged in the hands of the optimates, i. e. of a council, or senate composed of the principal persons of a state, either in respect of nobility, capacity, or probity.

* The word is derived from *αριστος*, *optimus*; and *κρατος*, *imperio*, I command, govern.

The ancient writers of politics prefer the *aristocratical* form of government to all others.—The republic of Venice is an *aristocracy*.

Aristocracy, seems to coincide with *oligarchy*; which, however, is more ordinarily used to signify a corruption of an aristocratical state, where the administration is in the hands of too few; or where some one or two usurp the whole power.

ARISTOLOCHIA, popularly called *Biribwort*; a medicinal plant, used as an ingredient in Venice treacle, and many other compositions.

Cicero derives its name from its inventor Aristolochus: others from its virtues.—These last suppose it formed from *αριστος*, *optimus*, and *λοchia*, *lochbia*, or purgations, in regard it is found of excellent use in bringing down the lochia, or discharges of women newly delivered.

There are four kinds of *aristolochia*, viz. the *round*, *long*, *rampant* or *creeping*, called also *clematitis*, and the *slender*; but only the roots of the two former are used among us.

The *round*, or *aristolochia rotunda*, is of a sub-acrid aromatic taste, and is found very commonly in Languedoc, Spain, and Italy: its root is of particular use in facilitating delivery, provoking the menses, and bringing down the afterbirth; and is externally applied in vulnerary tinctures, and in waters for gangrenes: it is also supposed to have some alexipharmic quality; and is reckoned detergent externally, and suppurative.

The *long-rooted*, *aristolochia longa*, likewise grows in Languedoc; its root is used in electuaries, and in tinctures for the asthma, and to excite the menses; and its decoction, in lotions, to facilitate the delivery of the afterbirth, &c.

Besides these, there are several other kinds of *aristolochia*, in America; one particularly in Virginia, whose roots are used against the bites of venomous beasts, in malignant fevers, and the small-pox.—Its alexipharmic virtue has occasioned it to be called *Viperinum Virginiae* and *Serpentaria Virginiana*. See **SERPENTARIA**.

ARISTOTELIAN, something that relates to the philosopher Aristotle.—Thus we say an *aristotelian* dogma, the *aristotelian* school, &c.

The philosopher from whom the denomination arises was the son of Nicomachus, physician of Amyntas king of Macedonia, born in the year of the world 3566; before Christ, 348; at Stagira, a town of Macedonia; or, as others say, of Thrace; whence he is also called the *Stagirite*.

At seventeen years of age he entered himself a disciple of Plato, and attended in the academy till the death of that philosopher.

Repairing afterwards to the court of king Philip; at his return he found, that Xenocrates, during his absence, had put himself at the head of the academic sect; upon which he chose the Lyceum for the future scene of his disputation.

It being his practice to philosophize walking, he got the appellation *peripateticus*; whence his followers were also called *Peripatetics*.—Tho' others will have him to have been thus named from his constantly attending on Alexander at his recovery from an illness, and discoursing with him as he walked about.

Aristotle was a person of admirable genius, and of great and various learning: Averroes makes no scruple to call him 'the genius of nature, the limit of human understanding;' and declares him sent by providence to teach us all that may be known.—He is accused of too immoderate a desire of fame, which led him to destroy the writings of all the philosophers before him, that he might stand singly and without competitors. And hence, in the schools, Aristotle is called *The Philosopher*. Laertes, in his life of Aristotle, enumerates his books, to the number of 4000; of which scarce above 20 have survived to our age: they may be reduced to five heads; the first, relating to poetry and rhetoric; the second, to logics; the third, to ethics and politics; the fourth to physics; and the fifth to metaphysics. In all which, as there are many things excellent and invaluable, particularly what relates to poetry, rhetoric, and the passions; so there are others, in the other parts, which the improvements of later ages have taught us to explode and despise.

ARISTOTELIAN Philosophy, the philosophy taught by Aristotle, and maintained by his followers.

The *Aristotelian* is otherwise called the *peripatetic philosophy*; the rise and fate whereof, see under the article **PERIPATETICS**.

ARISTOTELIANS, a sect of philosophers otherwise called *Peripatetics*. See **ARISTOTELIAN**, and **PERIPATETIC**.

The *Aristotelians* and their dogma's prevail to this day, in the schools and universities; in spite of all the efforts of the Cartesian, Newtonian, and other corpuscularians.

The principles of Aristotle's philosophy, the learned agree, are chiefly laid down in the four books *de Cælo*; the eight books of *Physical Assultation*, φυσικῆ ἀκροάσεως, belonging rather to logics, or metaphysics, than to physics.—To give an idea, then, of *Aristotelianism*, the reigning system of many ages; and shew Aristotle's method of philosophizing; we cannot do better than produce a specimen of that work.

Those four books he entitles, *de Cælo, ἀπὸ οὐρανόθεν*, because the heavens are the chief of the simple bodies he treats of. He begins with proving, that the world is perfect; which he does thus.—All bodies, says he, have three dimensions; they cannot have more, for the number three, according to Pythagoras, comprehends all: now the world is the assemblage of all bodies, therefore the world is perfect.

In the second chapter, he lays down certain peripatetic axioms; as—that all natural bodies have of themselves a power of moving; that all local motion is either rectilinear, circular, or composed of the two; that all simple motions are reducible to three, the motion of the centre, the motion towards the centre, and the motion about the centre: that all bodies are either simple or compounded; simple are those which have some power within themselves, whereby they move, as fire, earth, &c. compound are such as receive their motion from those others whereof they are compounded.

From these principles he draws several consequences.—A circular motion, says he, is a simple motion: but the heavens move in a circle; therefore the motion of the heavens is simple: but a simple motion can only belong to a simple body; *i. e.* to a body which moves by its own power. Therefore the heavens are a simple body, distinct from the four elements, which move in right lines. This proposition he likewise proves by another argument, thus.—There are two kinds of motions, the one natural, the other violent; the circular motion of the heavens, therefore, is either the one or the other: if it be natural, the heaven is a simple body distinct from the four elements, since the elements do not move circularly in their natural motion: if the circular motion be contrary to the nature of heaven, either that heaven must be some of the elements, as fire, or something else: but heaven cannot be any of the elements; *e. gr.* it cannot be fire; for, if it were, the motion of fire being from below upwards, the heavens would have two contrary motions, the one circular, the other from below upwards, which is impossible. Again; if the heaven be any other thing which does not move circularly of its own nature, it will have some other natural motion, which likewise is impossible; for if it move naturally from below upwards, it will be either fire or air; if from above downwards, it will be water or earth; *ergo*, &c.—A third argument is this.—The first and most perfect of all simple motions must be that of a simple body; especially that of the first and most perfect of all simple bodies: but the circular motion is the first and most perfect of all simple motions, because every circular line is perfect, and no right line is so: for if it be finite, something may be added to it; if infinite, it is not perfect, because it wants an end, and things are only perfect when they are ended. Therefore, the circular motion is the first and most perfect of all motions; and therefore a body which moves circularly is simple, and the first and most divine of simple bodies. His fourth argument is—That all motion is either natural or not; and every motion which is not natural to some bodies, is natural to others: now the circular motion is not natural to the four elements; there must, therefore, be some simple body to which it is natural: therefore the heaven, which moves circularly, is a simple body, distinct from the four elements.—Lastly, the circular motion is either natural or violent to any body; if it be natural, it is evident this body is one of the most simple and perfect; if it be not, it is strange this motion should last for ever.—From all these arguments, therefore, it follows, that there is some body distinct from the circumambient ones, and which is of a nature as much more perfect than they, as it is more remote. Such is the substance of his second chapter.

In the third chapter, he asserts, that the heavens are incorruptible, and immutable; and the reasons he gives for it, are—That they are the abode of the gods, that no person has ever observed any alterations in them, &c.

In the fourth chapter, he attempts to prove, that the circular motion has no contrary: in the fifth, that bodies are not infinite: in the sixth, that the elements are not infinite: in the eighth, he shews that there are not several worlds of the same kind, by this very good argument; that as earth is heavy by nature, if there were any other earth beside ours, it would fall upon our heads, our earth being the centre, to which all heavy bodies tend. In the ninth, he proves it impossible that there should be several worlds, because if there were any body above the heavens, it must be either simple or compound, in a natural or a violent state; none of which is possible, for reasons which he draws from the three kinds of motions above mentioned. In the tenth, he maintains, that the world is eternal, because it is impossible it should have had any beginning, and because it endures for ever. He employs the eleventh in explaining the notion of incorruptibility; and in the twelfth endeavours to shew, that the world

is incorruptible, because it could not have any beginning, and because it endures for ever: all things, says he, subsist either during a finite, or an infinite space: but what is only infinite one way, is neither finite nor infinite; therefore nothing can subsist in this manner.

The reader, we are of opinion, will find this taste of peripateticism sufficient; otherwise it had been easy to have given him his fill. If he requires more, let him have recourse to the articles PRINCIPLE, ELEMENT, FORM, QUALITY, ACCIDENT, SYMPATHY, FUGA VACUI, ANTIPERISTASIS, &c.

It were needless to point out the particular defects in the specimen here laid down; it is easy to observe, that the principles are most of them false and impertinent, and the reasonings absurd and inconclusive; but that the greatest part has no distinct meaning at all.

Such is the philosophy, and such the method of philosophizing, of him who was called the genius of nature, the prince of philosophers, Aristotle.—Yet such was his authority, for many ages in the schools, that when a disputant quoted a passage from him, his opponent durst not say *translat*, but must either deny the passage, or reconcile it to his own cause. *Vid.* Bayl. *Diæ. T. I. p. 469.*

ARISTOTELICA *Retæ.* See the article *ROTA*.

ARITHMETIC, ARITHMETICA, the art of numbering; or, that part of mathematics which considers the powers and properties of numbers, and teaches how to compute or calculate truly, and with expedition and ease.

Some authors chuse to define *arithmetic*, the science of discrete quantity.

Arithmetic consists chiefly in the four great rules or operations of addition, subtraction, multiplication, and division.

It is true, for the facilitating and expediting of computations, mercantile, astronomical, &c. divers other useful rules have been contrived; as, the rules of proportion, of alligation, of false position, extraction of square and cube roots, progression, fellowship, interest, barter, rebate, reduction, tare and tret, &c.—But these are only applications of the first four rules. See these rules under their several heads, *ADDITION*, &c.

We have very little intelligence about the origin and invention of *arithmetic*; history neither fixes the author, nor the time.—In all probability, however, it must have taken its rise from the introduction of commerce; and consequently it should be of Tyrian invention.

From Asia it passed into Egypt, (Josephus says by means of Abraham.) Here it was greatly cultivated and improved; inasmuch, that a large part of the Egyptian philosophy and theology seems to have turned altogether upon numbers. Hence those wonders related by them about unity, trinity; the numbers seven, ten, four, &c.

In effect, Kircher, in his *Œdip. Ægypt.* Tom. II. p. 2. shews, that the Egyptians explained every thing by numbers; Pythagoras himself affirming, that the nature of numbers goes through the whole universe; and that the knowledge of numbers is the knowledge of the deity.

From Egypt *arithmetic* was transmitted to the Greeks, who handed it forward, with great improvements, which it had received by the computations of their astronomers, to the Romans; from whom it came to us.

The ancient *arithmetic*, however, fell far short of that of the moderns: most of what they did to consider the various divisions of numbers; as appears from the treatises of Nicomachus, wrote in the third century of Rome, and that of Boethius, still extant. A compendium of the ancient *arithmetic*, wrote in Greek, by Pselus, in the ninth century from our Saviour, was given us in Latin by Xylander, in 1556.—A more ample work of the same kind was wrote by Jordanus, in the year 1200; published with a comment by Faber Stapulensis in 1480.

Arithmetic, under its present state, is variously divided, into different kinds; *theoretical, practical, instrumental, logaritharithmical, numerical, specious, decimal, dynamical, tetraarithmetical, duodecimal, sexagesimal*, &c.

Theoretical ARITHMETIC is the science of the properties, relations, &c. of numbers, considered abstractedly; with the reasons and demonstrations of the several rules.

Euclid furnishes a theoretical *arithmetic*, in the seventh, eighth, and ninth books of his elements.—Barlaam Monachus has also given a theory for demonstrating the common operations, both in integers and broken numbers, in his *Logistica*, published in Latin by J. Chambers, an Englishman, in 1600.—To which may be added Lucas de Burgo, who, in an Italian treatise published in 1523, gives the several divisions of numbers from Nicomachus, and their properties from Euclid; with the algorithm, both in integers, fractions, extractions of roots, &c.

Practical ARITHMETIC is the art of numbering or computing; that is, from certain numbers given, for finding certain others whose relation to the former is known.

As, if a number be required equal to two given numbers 6 and 8.

The first entire body of *practical arithmetic*, was given by Nich. Tartaglia a Venetian, in 1556, consisting of two books; the former, the application of *arithmetic* to civil uses; the latter, the grounds of algebra. Something had been done before by Stifelius, in 1544; where we have several particulars concerning the application of irrationals, coffics, &c. no where else to be met withal.

We omit other mere practical authors which have come since, the number whereof is almost infinite; as Gemma Frilius, Metius, Clavius, Ramus, Buckley, Diggs, Record, Wingate, Cocker, Leybourn, &c.

The theory of *arithmetic* is joined with the practice, and even improved in several parts, by Maurolycus in his *Opuscula Mathematica*, 1575; Heneschius in his *Arithmetica Perfecta*, 1609, where the demonstrations are all reduced into the form of syllogisms; and Taquet in his *Theoria & Praxis Arithmetica*, 1704.

HARMONICAL ARITHMETIC. See HARMONICAL.

Instrumental ARITHMETIC is that, where the common rules are performed by means of instruments contrived for ease and dispatch; such are several sorts of scales, and sliding-rules; such, more particularly, are Napier's bones, described under their proper article: Sir Sam. Moreland's instrument, the description whereof was published by himself, in 1666; that of M. Leibnitz, described in the *Miscellan. Berlin.* and that of Polenus published in the Venetian Miscellany, 1709.—To these may be added,

Logarithmetical ARITHMETIC, perform'd by tables of logarithms.

The best piece on this subject is Hen. Briggs's *Arithmetica Logarithmica*, 1624.

To this head may also be added, the universal *arithmetical tables of Prosthaphæresis*, published in 1610, by Herwart ab Hohenburg; whereby multiplication is easily and accurately performed by addition, and division by subtraction.

The Chinese have little regard to any rules in their calculations; instead of which, they use an instrument made of a little plate, a foot and half long, across which are fitted ten or twelve iron wires, on which are strung little round balls. By drawing these together, and dispersing them again one after another, they count, somewhat after the manner in which we do by counters; but with so much ease and readiness, that they will keep pace with a man reading a book of account, let him make what expedition he can; and at the end the operation is found done; and they have their way of proving it. *Le Comte.*

Logistical ARITHMETIC. See the article LOGISTICAL.

Numerous ARITHMETIC is that which gives the calculus of numbers of indeterminate quantities; and is performed by the common numeral, or arabic characters.

Specious ARITHMETIC is that which gives the calculus of quantities; using letters of the alphabet instead of figures, to denote the quantities.

Specious arithmetic coincides with what we usually call *algebra*, or *literal arithmetic*.

Dr. Wallis has joined the numeral with the literal calculus; and by means hereof, demonstrated the rules of fractions, proportions, extractions of roots, &c. A compendium of which is given by Dr. Wells, under the title of *Elementa Arithmetica*, An. 1698.

Decimal ARITHMETIC is that performed by a series of ten characters, so that the progression is from 10 to 10.

Such is the common *arithmetic* among us, which makes use of the ten *arabic* figures, 0, 1, 2, 3, 4, 5, 6, 7, 8, 9; after which we begin 10, 11, 12, &c.

This method of computation is not very ancient, being utterly unknown to the Greeks and Romans.—It was introduced into Europe by Gerbert, who was afterwards pope, under the name of Sylvester II. who borrowed it from the Moors of Spain.—No doubt it took its origin from the ten fingers of the hands, which were made use of in computations before *arithmetic* was brought into an art.

The eastern missionaries assure us, that to this day the Indians are very expert at computing on their fingers, without any use of pen and ink, *Let. Edif. & Cur.*—Add, that the natives of Peru, who do all by the different arrangement of grains of maize, out-do any European, both for sureness and dispatch, with all his rules.

Decimal Arithmetic is also used for the doctrine of decimal fractions.

Binary, or Dyadic ARITHMETIC, is that, wherein only two figures, unity, or 1, and 0, are used. See **BINARY ARITHMETIC**.

M. Dancicourt, in the *Miscell. Berol.* gives us a specimen of the use hereof in arithmetical progressions; where he shews, that the laws of progression may be easier discovered hereby, than in any other method where more characters are used.

Tetraçye ARITHMETIC is that, wherein only the figures 1, 2, 3, and 0, are used.

We have a treatise of this *arithmetic*, by Erhard Weigel; but both binary and this are little better than curiosities, espe-

cially with regard to practice; inasmuch, as the numbers may be much more compendiously expressed by decimal *arithmetic*, than by either of them.

Vulgar ARITHMETIC is that conversant about integers and vulgar fractions.

Sexagesimal, or Sexagenary ARITHMETIC is that which proceeds by sixties; or the doctrine of sexagesimal fractions.

Sam. Reyher has invented a kind of sexagenal rods, in imitation of Neper's bones, by means whereof the sexagenary *arithmetic* is easily performed.

Political ARITHMETIC is the application of *arithmetic* to political subjects; as, the strength and revenues of princes, number of inhabitants, births, burials, &c. See **POLITICAL ARITHMETIC**.—Hither also may be referred the doctrine of CHANCES, GAMING, &c.

ARITHMETIC of Infinites is the method of summing up a series of numbers consisting of infinite terms; or of finding the ratios thereof.

This method was first invented by Dr. Wallis; as appears from his *Opera mathematica*, where he shews its use in geometry, in finding the areas of superficies, and the contents of solids, and their proportions.—But the method of fluxions, which is an universal *arithmetic* of infinites, performs all this much easier; and multitudes of other things which the former will not teach.

ARITHMETIC of Rationals and Irrationals. See **RATIONAL, &c.**

ARITHMETICAL Complement of a logarithm, is what the logarithm wants of 10.000000.

Thus the *arithmetical* complement of 7.1079054, is 2.8920946; where each figure but the last is subtracted from 9; and that from 10.

ARITHMETICAL Medium or Mean, } See { **MEDIUM.**
ARITHMETICAL Progression, } **PROGRESSION.**
ARITHMETICAL Proportion, } **PROPORTION.**
ARITHMETICAL Ratio, } **RATIO.**

ARITHMOMANCY*, *Arithmomancy*, a kind of divination, or method of foretelling future events, by means of numbers.

* The word is compounded of *arithmos*, number, and *μαντια* divination.

The gematria, which makes the first species of the Jewish cabbala, is a sort of *arithmomancy*. See **GEMATRIA**.

A R K, or **ARC**, *arcus*, in geometry, astronomy, &c. See **ARCH**.

ARK, ARCA, in the scripture language, denotes a kind of floating vessel built by Noah, for the preservation of the several species of animals from the deluge.

The *ark* has afforded several points of curious enquiry among the critics and naturalists, relating to its form, capacity, materials, time of building, place of resting after the flood, &c.

Noah is computed to have been an hundred years in building the *ark*, viz. from the year of the world 1557, to the flood, which happened in the year 1656: at least, this is the common opinion of the learned. Origin, *lib. iv. contra Cels.* St. Austin, *de Civit. Dei*, *lib. xv. c. 27.* and *contra Faust.* *lib. xii. c. 18.* and in his *Quest. on Gen. v. and xxiii.* Rupert. *lib. iv. in Gen. xx.* assert as much; and are followed by Sallian, Torniel, Spondeus, Pelletier, &c.

Yet Berosus affirms, that Noah only began to build the *ark* seventy-eight years before the flood: Salomon Jarchi, on the other hand, will have it to have been an hundred and twenty years in building, and Tanchuma only fifty-two. See the *Texts*, *Gen. vi.* &c.

Fa. Fournier, in his *Hydrography*, gives into the opinion of the fathers; noting, that the hands employed in it were only Noah and his three sons. To this purpose he alleges the instance of Archias of Corinth, who, with the help of three hundred workmen, built Hiero's great ship in one year. Add, that Noah's eldest son was not born till about the time when the *ark* was begun, and the younger after; so that it was a long time ere they could do their father any service.

—However, for so large a building, a prodigious number of trees must have been required, which would employ a great number of workmen to fell and hew; were it possible for three men to have lain them?

The wood whereof the *ark* was built, is called in scripture

עֵצ הַגֹּפֶר, *ets gopher*, gopher wood: and in the XXX. *עֵצ הַקֶּדָרִים*, square timbers, Onkelos and Jonathan render gopher by קֶדָרִים, *kedras*, cedar: St. Jerom. in the vulgate, by *ligna levigata*, planed wood; and elsewhere, *ligna bituminata*, *q. d.* pitched woods. Kimkhi translates it, *wood most proper to float*; Vatable, *light wood*, which swims in the water without corrupting; Junius, Tremellius, and Buxtorf, a kind of cedar, by the Greeks called *επιπλατα*; Avenarius and Munster, *pine*; Fuller and Bochart, *cyprus*; others, *fir*; Castalio, *turpentine*, &c.—Pelletier prefers the opinion of those who hold the *ark* made of cedar: his reasons are, the incorruptibility of that wood; the great plenty thereof in Asia, whence Herodotus and Theophrastus relate, that the kings of Egypt and Syria built whole fleets thereof,

in lieu of deal; and the common tradition throughout the east imports, that the *ark* is preserved entire to this day on mount Ararat.

The dimensions of the *ark*, as delivered by Moses, are three hundred cubits in length, fifty in breadth, and thirty in height; which, compared with the great number of things it was to contain, seems to many to have been too scanty. And hence an argument has been drawn against the authority of the relation. Celsus long ago laughed at it, calling it *μειστον ὀδοκωτος*, the absurd *ark*. To solve this difficulty, many, both of the ancient fathers and later critics, have been put to very miserable shifts. Origen, St. Augustin, and others, maintain, that by the cubits here spoke of, we are to understand the Egyptian geometrical cubit, equal, according to them, to six vulgar cubits, or nine foot. But the truth is, it does not appear there ever was any such measure as a geometrical cubit either among Egyptians or Jews.—Others account for it, by asserting the stature of mankind, in the first ages to have been much greater than in our days; and consequently the cubit, which is taken from a part of the human body, proportionably larger. But this does not avail, since the same reason will infer an equal augmentation of the size of other animals.—Others suppose the sacred cubit here spoke of, which was a hand's breadth longer than the civil one; but this only affords a small supply; beside, that the sacred cubit does not appear to have been ever used, except in sacred edifices, as the temple and tabernacle.

This difficulty is much better solved by Buteo and Kircher, wherein, supposing the common cubit of a foot and a half, they prove geometrically, that the *ark* was abundantly sufficient for all the animals supposed to be lodged therein.—Snellius computes the *ark* to have been above half an acre in area: Cuneus, Buteo, and others, have also calculated the capacity of the *ark*.—Dr. Arbuthnot computes it to have been 81062 tons.—Father Lamy shews that it was an hundred ten foot longer than the church of St. Mary at Paris, and sixty-four foot narrower; to which his English translator adds, that it must have been longer than St. Paul's church in London, from west to east, broader than that church is high in the inside, and about fifty-four foot in height, of our measure.

The things contained in it were, besides eight persons of Noah's family, one pair of every species of unclean animals, and seven pair of every species of clean animals, with provisions for them all, during the whole year.—The former appears at first view almost infinite, but if we come to a calculus, the number of species of animals will be found much smaller than is generally imagined, not amounting to an hundred species of quadrupeds, nor two hundred of birds; out of which, in this case, are to be excepted such animals as can live in the water.—Zoologists usually reckon but an hundred and seventy species in all; and bishop Wilkins shews, that only seventy-two of the quadruped kind needed a place in the *ark*.

By the description Moses gives of the *ark*, it appears to have been divided into three stories, each ten cubits, or fifteen foot high: and it is agreed on, as most probable, that the lowest story was destined for the beasts, the middle for the fowl, and the upper for the birds, with Noah and his family; each story being subdivided into different apartments, stalls, &c.—Though Josephus, Philo, and other commentators, add a kind of fourth story, under all the rest; being, as it were, the hold of the vessel, to contain the ballast, and receive the filth and feces of so many animals.

Drexellus makes three hundred apartments; father Fournier three hundred thirty-three; the anonymous author of the questions on Genesis, four hundred; Buteo, Temporalis, Arias Montanus, Hostius, Wilkins, Lamy, and others, suppose as many partitions as there were different sorts of animals.—Pelletier only makes seventy-two, viz. thirty-six for the birds, and as many for the beasts: his reason is, that if we suppose a greater number, as three hundred thirty-three, or four hundred, each of the eight persons in the *ark* must have had thirty-seven, forty-one, or fifty stalls to attend and cleanse daily, which he thinks impossible. But there is not much in this; to diminish the number of stalls, without a diminution of the animals, is vain; it being, perhaps, more difficult to take care of three hundred animals in seventy-two stalls, than in three hundred.

Buteo computes, that all the animals contained in the *ark*, could not be equal to five hundred horses; he even reduces the whole to the dimensions of fifty-six pair of Oxen. Father Lamy enlarges it to sixty-four pair, or an hundred and twenty-eight oxen; so that supposing one ox equal to two horses, if the *ark* had room for two hundred fifty-six horses, there must have been room for all the animals. But the same author demonstrates, that one floor of it would suffice for five hundred horses, allowing nine square feet to an horse.

As to the food in the second story, it is observed by Buteo from Columella, that thirty or forty pounds of hay ordinarily suffices an ox for a day; and that a solid cubit of hay, as usually pressed down in our hay-racks, weighs about forty pound; so that a square cubit of hay is more than enough

for one ox one day.—Now it appears that the second story contained 150000 solid cubits; which, divided between two hundred and six oxen, will afford each more hay by two thirds, than he can eat in a year.

Bishop Wilkins computes all the carnivorous animals equivalent, as to the bulk of their bodies and their food, to twenty-seven wolves; and all the rest to two hundred and eighty beeves. For the former he allows 1825 sheep, and for the latter 109500 cubits of hay: all which will be easily contained in the two first stories, and a deal of room to spare.—As to the third story, no body doubts of its being sufficient for the fowls, with Noah, his sons and daughters.

Upon the whole, the learned bishop remarks, that of the two, it appears much more difficult to assign a number and bulk of necessary things to answer the capacity of the *ark*, than to find sufficient room for the several species of animals already known to have been there.—This he attributes to the imperfection of our lists of animals, especially those of the unknown parts of the earth; adding, that the most expert mathematician at this day could not assign the proportions of a vessel better accommodated to the purpose, than is here done; and hence finally concludes, that 'the capacity of the *ark*, which had been made an objection against scripture, ought to be esteemed a confirmation of its divine authority; since, in those ruder ages, men, being less versed in arts and philosophy, were more obnoxious to vulgar prejudices than now; so that had it been an human invention, it would have been contrived according to those wild apprehensions which arise from a confused and general view of things; as much too big, as it has been represented too little.'

ARK of the Covenant, in scripture, denotes a kind of chest, wherein, by God's command, Exod. xxv. 16. were kept the two tables of stone, whereon God had engraven the ten commandments given to Moses on the mount, and held in high veneration among the Hebrews.

The *ark* was deposited in the holiest place of the tabernacle.—It was taken by the Philistines, and detained twenty, some say forty, years, at Kirjath Jearim; but the people being afflicted with emolds on account of it, afterwards returned it with divers presents.—It was afterwards placed in the temple.

Josephus describes it as five palms long, three broad, and as many high; the wood, both within side and without, was lined with plates of gold, and fitted with golden hinges.—The lid or covering of the *ark* was called the *propitiatory*, over which were two figures placed called *Cberubim*, a kind of spirits with wings of a peculiar form never seen but by Moses before the throne of God. It may be added, that some critics take the word *cherub*, כְּרֻב, to be only a transposition of the Hebrew letters of the word *רֶכֶב*, *rechar*, chariot; and that by the Cherubim being placed over the *ark*, we are only to understand, that the *ark* was a sort of chariot, on which God sat.

The Jews, to this day, have a kind of *ark* in their synagogues, wherein their sacred books are deposited, in imitation of the ancient ark of the covenant.—This they call *aron*. Leo of Modena gives a description thereof in his account of the *Customs and Ceremonies of those of his Nation*: 'The Jews, says he, in the eastern side of all their synagogues, have an *ark*, or armory, called *aron*; in memory of the *ark* of the covenant. In this are preserved the five books of Moses, wrote on vellum, with ink made on purpose,' &c.

Tertullian calls this *ark*, *Armarium Judaicum*; whence the Phrase, *to be in the armory of the synagogues*, q. d. in the number of canonical writings.

A R M, *brachium*, a part of the human body, terminating at one end in the shoulder, and at the other in the hand.

Among physicians and anatomists, **ARM** only includes that part between the shoulder and the elbow; the rest, from the elbow to the wrist, being taken into the greater hand; by others called the *fore-arm*. See **HAND**.

The *arm*, in this latter acceptation, has only one large bone, called the *humerus*, or shoulder-bone. See **HUMERUS**. It has five sorts of motions, which are effected by five pair of muscles; upwards, by the deltoides, *supraspinatus*, and *coracobrachialis*; downwards, by the *teres*, *rotundus major*, and *latissimus dorsi*; forwards, by the *pectoralis*; backwards, by the *infraspinatus*; and circularly, by the *transversalis*, *subscapularis*, and *infraspinatus*. See each muscle described under its proper article.

The other part consists of two bones, called *scelis*; viz. the *radius* and *cubitus*, or *ulna*.

The muscles whereby this part is moved, are the *biceps*, *brachiius internus*, *gemellus*, *brachiius externus*, *anconæus*, *pronator radii teres*, and *quadratus*; *supinator longus*, and *brevis*.—See each in its place.—The usual venæctions are in the *arm*.

ARM, in the manage, is applied to a horse, when he endeavours to defend himself against the bit; to prevent obeying, or being checked thereby.

A horse is said to *arm* himself, when he presses down his head,

head, and bends his neck, so as to rest the branches of the bridle upon his brislet; in order to withstand the effort of the bit, and guard his bars and his mouth.

A horse is said to *arm himself with the lips*, when he covers the bars with his lips, and deadens the pressure of the bit.—This frequently happens in thick-lipped horses.—The remedy is by using a bit-mouth, forged with a canon or catch-mouth, broader near the bankers than at the place of its pressure, or rest upon the bars.

For *arming against the bit*, the remedy is to have a wooden ball covered with velvet, or other matter, put on his chaul; which will so press him between the jaw-bones, as to prevent his bringing his head so near his breast.

ARM, is also used in geography for a branch of a sea, or river.

Italy and Sicily are only parted by an *arm of the sea*.—St. George's *arm*, in the Mediterranean, is the Thracian Bosphorus.

Among gardeners, *arm* is sometimes used in respect of cucumbers and melons, in the same sense as branch, of other plants.

ARM is also used figuratively for *power*.—The secular *arm* is the lay or temporal authority of a secular judge; to which recourse is had for the execution of the sentences passed by ecclesiastical judges.

The church sheds no blood: even the judges of inquisition, after they have found the person guilty, surrender him to the secular *arm*.

The council of Antioch, held in 341, decrees, that recourse be had to the secular *arm* to repress those who refuse obedience to the church: for secular *arm*, they here use exterior power.

ARM, in the military art, heraldry, &c. See ARMS, and ARMOUR.

ARM, in the sea-language.—A ship is said to be *armed*, when fitted out and provided in all respects for war.

Also, a cross-bar-shot is said to be *armed*, when some rope-yarn, or the like, is rolled round about one end of the iron bar which runs through the shot, both that the shot may be the better rammed down into the gun, and left the sharp end of the bar should catch into any honey-combs within the cylinder of the piece.

Yard-ARM. See the article YARD.

ARM, in respect of the magnet.—A loadstone is said to be *armed*, when it is capped, cased, or set in iron or steel; in order to make it take up the greater weight; and also to distinguish readily its poles.

It is surprising, that a little iron fastened to the poles of a magnet should so vastly improve its force, as to render it 150 times stronger than when naked. Mr. Butterfield told Dr. Lister, that some loadstones would gain much more, and others vastly less by *arming* than one would expect.—A strong loadstone ought to have thick irons, and a weak one but thin ones: so that a stone may be easily overthod. *L'Isle Journ. to Paris.*

The usual armour of a loadstone, in form of a right-angled parallelepipedon, consists of two thin pieces of steel or iron, of a square figure, and a thickness proportionable to the goodness of the stone: if a weak stone have a strong armour, it will produce no effect; and if the armour of a strong loadstone be too thin, its effect will not be so considerable as when thicker.—The proper thickness is found by filing it thinner and thinner, till its effect is found at the greatest possible strength.

The armour of a spherical loadstone consists of two steel shells fastened to one another by a joint, and covering a good part of the convexity of the stone. This also is to be filed away, till the effect is found the greatest.

Kircher, in his book *de Magnete*, tells us, that the best way, to *arm* a loadstone is, to drill a hole through the stone from pole to pole, and in that, to place a steel rod of a moderate length; which rod, adds he, will take up more weight at the end, than the stone itself *armed* the common way can do.

ARMA *dare*, to give arms, in some ancient charters, signifies to dub, or make a knight.

ARMA *deponere*, to lay down arms, was a punishment anciently enjoined when a man had committed an offence. *Leg. Hen. I.*

ARMA *mutare*, *q. d.* to change arms, was a ceremony used to confirm a league or friendship.

ARMA *molata* were sharp weapons: Pleta calls them *Arma emolita*.

ARMA *reversata*, inverted arms; was a punishment when a man was convicted of treason or felony.

ARMAMENT, a large body of forces, raised and provided with the furniture of war, either for land or sea service.

ARMAN, among farriers, a confection of great efficacy to prevent a total loss of appetite in horses.

ARMARIUM *unguentum*, among hermetical philosophers, a sympathetic ointment, or weapon salve, whereby wounds

are said to have been cured at a distance, by only dressing the weapon. See SYMPATHETIC.

ARMED, in the sea-language, &c. See ARM.

ARMED, in heraldry, is used in respect of beasts and birds of prey, when their teeth, horns, feet, beak, talons, or tufts, are of a different colour from the rest.—He bears a cock, or a falcon, *armed*, or, &c.

ARMENIAN *, *Bole*, *Bolus ARMENA*, a fatty medicinal kind of earth, of three kinds; white, yellow, and red; the last is the most esteemed, it is of considerable use as an absorbent, astringent, and vulnerary.

* It takes the denomination, *Armenian*, $\eta\epsilon\kappa$ *πης* *Αρμενίας* *βυλως*, because brought chiefly out of Armenia, and the neighbouring countries.

The *Armenian bole* is frequently found in the shop-medicines prescribed internally against diarrhoeas, dysenteries, hæmorrhages, catarrhs, and all delusions: externally it is used in strengthening plasters, for luxations of the joints, &c. See SUPPLEMENT, article ARMENIAN BOLE.

ARMENIANS, in respect of religion, a sect; or divorsit among the eastern Christians; thus called from *Armenia*, the country anciently inhabited by them.

The *Armenians*, since the conquest of their country by Scha Abas king of Persia, have had no fixed place of habitation, but are dispersed in divers parts of Persia, Turkey and Tartary, and even some parts of Europe, particularly Poland.—Their chief employment is merchandise, in which they excel.—The cardinal de Richlieu, we are told, had a design to make an establishment of them in France, for promoting the commerce of that country.

With regard to religion, there are two kinds of *Armenians*; the one catholics, and subject to the pope, having a patriarch in Persia, and another in Poland.—The other make a peculiar sect, having two patriarchs in Natolia. They have their printing-house at Marseilles.

The *Armenians* are generally accused of being of the sect of Monophysites, and only allowing of one nature in Jesus Christ. As to the Eucharist, they agree with the Greeks, except in this, that they mix no water with their wine, and use unleavened bread after the manner of the Latins.

They abstain very rigorously from eating of blood, and meats strangled, and are much addicted to fasting; inasmuch that, to hear them talk, one would conclude that almost their whole religion consisted in fasting.

The monastic order is in great repute among them; since one of their patriarchs introduced that of St. Basil; but part of them, which have united with the church of Rome, have changed their ancient rule, for that of the Dominicans.

ARMENIAN Stone, *Lapis ARMENUS*, $\lambda\iota\theta\omicron\varsigma$ *Αρμενικος*, a mineral stone, or earth, of a blue colour, sometimes spotted with green, black and yellow; anciently brought only from *Armenia*, but now found in Germany and Tyrol.

The *Armenian stone* in its harder state bears a near resemblance to *lapis lazuli*, from which it seems only to differ in degree of maturity: they are distinguished by this, that the *lapis Armenus* is softer, and instead of sparks of gold, is often speckled with green.

Boerhaave ranks it among semi-metals; and supposes it composed of a metal and earth. Woodward says, it owes its colour to an admixture of copper.

Its chief use is in Mosaic work, though it has some place also in physic. Both this and the *lapis lazuli* are ores of copper.

ARMIGER, *Armour-bearer*, in modern writers, denotes a title of dignity, rendered in English, by *Esquire*.

ARMILLA *Membranosæ* is a name given by some anatomists, to the annular ligament.

ARMILLARY *, *ARMLLARIIS*, in astronomy, an epithet given to an artificial sphere, composed of a number of metalline circles, representative of the several circles of the mundane sphere, put together in their natural order.

* The word is formed of the Latin *armilla*, a bracelet.

Armillary spheres ease and assist the imagination to conceive the constitutions of the heavens, and the motions of the heavenly bodies.

Such is that represented, (*Tab. Astron. fig. 21.*)—Where P and Q represent the poles of the world, A D, the equator; E L the ecliptic and zodiac, P A G D the meridian, or the solstitial colure, T the earth, F G, the tropic of cancer, H T the tropic of capricorn, M N the arctic circle, O V the antarctic, N and O the poles of the ecliptic, and R S the horizon.

ARMILUSTRIUM, in antiquity, a feast held among the Romans; wherein they sacrificed, armed at all points, and with the sound of trumpets.

Some define *armilustrum* to have been a feast, wherein a general review was made of all the forces in the campus martius.—But this does not come up to the point; for Varro does not derive the word from the Latin *arma* and *lustrare*, to make a review; but from the custom of holding this feast in the place where the reviews were used to be made, or rather from their going round the place armed with bucklers. And he prefers this last opinion, being persuaded that it was from this ceremony, that the place where the sacrifice was offered to the gods, was called *armilustrum*, or *armilustrum*.

a luenda, or a *lustra*, i. e. *quod circumstant ludentes, ancilibus armati*.

The sacrifice was intended as an *ἱκανοποιήσις*, or expiation of arms, and for the prosperity of the arms of the people of Rome; and was celebrated on the fourteenth of the calendar of November.

ARMINGS, in a ship, are the same with *wagel-clothes*, being red clothes, hung about the outides of the ship's upper-works, fore and aft; and before the curbridge heads.

There are some also hung round the tops, and called *top-armings*.

ARMINIANISM, the doctrine of Arminius, a celebrated professor in the university of Leyden; and of the Arminians, a sect which follow him.

The principal article wherein the Arminians differ from the other reformed consists in this, that, thinking the doctrines of Calvin, with regard to free-will, predestination, perseverance and grace, too severe, they have returned to those of the Romish church, and maintain, that there is an universal grace given to all men; that man is always free, and at liberty to reject or embrace grace, &c.

Gomar, Arminius's colleague, stood strenuously up for a particular or special grace, given only to those who are predestinated or elect; and for a positive decree both of election in some, and of reprobation in others. See **PREDESTINATION**, **ELECTION**, **REPROBATION**, &c.

At length, the matter came to a hearing, before the synod of Dort, in 1618 and 1619, where *Arminianism* was condemned in form.—These disputes began in the year 1609. From the schools they passed into the government, and the republic of Holland was once in a fair way to be overturned by them.

ARMINIANS, a religious sect or party, which arose in Holland, by a separation from the Calvinists. See **ARMINIANISM**.

The *Arminians* are sometimes also called *Remonstrants*, by reason of a remonstrance which they preferred to the States General in 1611, wherein the chief articles of their faith were laid down.

The later *Arminians* carried things much farther than Arminius himself, and even came very near to Socinianism.—Especially under Simon Episcopius.—When the Calvinists upbraided them with renewing an ancient hereby already condemned in the Pelagians, and Semi-Pelagians; they replied, that the mere authority of men could not be allowed a legitimate proof any where but in the church of Rome; that it was not enough to shew any opinion had been condemned, without shewing it had been condemned justly: *Nec satis est damnatam olim sententiam esse, nisi damnandam eam, aut jure aut rite damnatam esse, constat*.

On this principle, which the Calvinists cannot well gain-say, the *Arminians* retrench abundance of those called fundamental articles of religion. Not finding them all clearly expressed in Scripture, they despite all the catechisms and formula's of faith, which the former would restrain them to; and accordingly were condemned at the famous synod of Dort, held in 1618, whereat divines from most of the reformed churches were present.

Many among them have quitted the doctrine of their master relating to the points of eternal election and predestination.—Arminius taught, that God elected the faithful out of a foreknowledge of their faith: but Episcopius, and others, think he elects no person from all eternity, and only elects the faithful, at the time when they actually believe. They speak very ambiguously of the preference of God, which was the principal strong-hold of Arminius. They look on the doctrine of the trinity as a point not necessary to salvation; and many of them hold there is no precept in Scripture, by which we are enjoined to adore the Holy Ghost; and that Jesus Christ is not equal to God the Father. In which they approach very near to Arianism. And they generally avoid the word *satisfaction of Christ*, which some charge with Socinianism. Though Episcopius declares, that Jesus Christ has made satisfaction to God, so far as to render him propitious to mankind.

They pres with a great deal of earnestness, a general toleration of all those who profess the Christian religion; maintaining that all Christians are agreed in the essential points: and that as it has never been decided by any infallible authority, which of the many ways is the true one, and the most agreeable to the word of God, they ought all to combine on the same footing, to compose one church, without obliging any to quit their own sentiments, or embrace those of others. Their principal writers are Arminius, Episcopius, and Grotius; to which may be added Curcellæus, who has collected a system of theology out of the large diffusive writings of Episcopius, with the addition of many things of his own.—Though Curcellæus, it must be owned, is ranked by the Socinians among the number of their writers.

ARMIS—*Vt* & **ARMIS**. See the article **Vt**.

ARMISTICE, **ARMISTITTIUM**, a short truce, or a cessation of arms for a small time.

ARMONIA C. or rather **AMMONIA C.** salt, in natural history, a sort of volatile salt; whereof there are two kinds, ancient and modern.

The ancient *sal-armoniaca*, called also *sal cyreniacum*, described by Pliny and Dioscorides, was a native salt, generated in the earth, or rather in the sands, in those large inns or caravanferas, where the crowds of pilgrims coming from all parts to the temple of Jupiter Ammon, used to lodge.—The method of conveyance in those parts being on camels; and those creatures when in Cyrene, a province of Egypt, wherein that celebrated temple stood, urining in the fables, or say some in the parched sands: of this urine, which is remarkably strong, sublimed by the heat of the sun, they say there arose a kind of salt, denominated sometimes from the temple *Ammoniacæ*, and sometimes from the region *Cyrenæ*.

This salt being no longer found in those places, some authors suspect there was never any such thing; and that the ancient as well as modern *sal-armoniaca* was fictitious.—What pleads for the contrary, is, that the salt frequently belched out in large quantities from mount *Ætna*, appears much of the same nature, and answers to most of the characters of the ancient *sal-armoniaca*. The reason no more is produced in Egypt may be, the cessation of these pilgrimages to that ancient idol.

The characters of *sal-armoniaca* are, that it cools water, turns aqua fortis into aqua regia, and consequently dissolves gold; that it sublimes by a strong fire, and affords a pungent urinous favour.

The modern *sal-armoniaca*, called also *aqua celestis*, is by some held to be native, and to trickle out of the ground about mount *Vesuvius*, *Ætna*, &c. in form of a liquor, which, when filtered and inspissated, becomes *sal-armoniaca*.—But it is certain, the common modern *sal-armoniaca* is compound and fictitious; consisting of a mineral, a vegetable, and an animal salt combined together.

Indeed, though there scarce be any drug more common than *sal-armoniaca*, in the modern pharmacy, the public has long been entirely at a loss, both as to the place whence it comes, and how it was made; all they knew for certain, was, that it came from the Levant, and was a volatile urinous salt, penetrated by an acid.—Father Sicard, the Jesuit, has at length removed the veil, in the Missionary's Memoir for November, 1717.—This salt, says that father, in a letter to the count de Tholouse, is made in Egypt, in a sort of ovens contrived for that purpose, the tops whereof are perforated with several longitudinal clefts; and on these clefts are laid several long-necked glass bottles, filled with foot, a little sea-salt, and the urine of cattle; and well stopp'd.

This done, they cover them up with a body of clay and brick, all but the necks, which lie open to the air; and put the fire in the oven, which they keep up for three days and nights.—The phlegm of the materials contained in the bottles, being thus exhale by the heat of the fire; and the acid and alkaline salts abounding therein being thus brought together near the necks of the bottles, they coalesce, harden, and form a whitish mass, which is the *sal-armoniaca*.—It must be added, that all foot is not fit for the purpose, but only that exhaling from fuel made of dung*; whereof, that of camels is esteemed the strongest and best.

* Pere Sicard seems in this point to have been wrong informed: Mr. Lisle assures us, that the mouths of the glasses are luted with a piece of wgt cotton. He adds, that in this state they are placed over the oven or furnace, in a thick bed of ashes, nothing but the neck appearing; and kept there two days and a night, with a continual strong fire. The steam swells up the cotton, and it forms a paste at the vent-hole, hindering thereby the salts from evaporating; which, being confined, stick to the top of the bottle, and are, upon breaking it, taken out in those large cakes, which they send to England. *Shaw's Trav. Append. 55.*

** The boys and girls run about the streets of Kairo, with baskets in their hands, picking up the dung, which they carry and sell to the keepers of the bagnio's; or, if they keep it for their own burning, they afterwards sell the foot at the place where the *sal-armoniaca* is made. All the villages round about Kairo, where they burn little else than dung, bring in their quota; but the best is gathered from the bagnios, where it cruffs upon the walls, about half a finger's breadth. *Lisle ap. Shaw, loc. cit.*

Our chymists have divers ways of preparing a *sal-armoniaca*, in imitation of this.—The common way is by putting one part of common salt, to five of urine; to which some add half that quantity of foot: the whole being put in a vessel, they raise it from it by sublimation a white friable farinaceous substance, which they call *sal-armoniaca*.—M. Lemery suspected, that what is imported to us from abroad, must be made after a different manner; he even concluded that it was made as our common salt is, by lution and evaporation: in which suspicion however it appears, from the foregoing account, he is far from the truth.—We sometimes further purify the salt by dissolution in hot water; which being filtered, and evaporated to a cuticle, shoots into a fine white salt, used in medicine both as a sudorific and a diuretic; it proves also a good aperient in all obstructions.—Its dose is from 20 grains to half an ounce.

There are various preparations of this salt in the modern pharmacy; as, *Sublimata sal-armoniaca* is of like virtue as the purified. *Volatile sal-armoniaca* is made by subliming the *sal-armoniaca* with salt of tartar; used against malignant fevers as a sudorific; as also in pocket smelling-bottles.

Flowers

Flowers of sal-armoniac made of *sal-armoniac*, with sea-salt, decrepitated.—The virtues are much the same as of the sublimed *sal-armoniac*.

Sometimes, instead of the sea-salt, iron or steel are used; which makes what they call *martial flowers of sal-armoniac*, of a very penetrating and deobstruent nature, and recommended in all kinds of obstructions, cachexies, jaundice, dropics, &c.

Spirit of sal-armoniac.—Of this we have various kinds, which derive different denominations and properties from the different additional ingredients the salt is distilled withal: as—*spirit of sal-armoniac with tartar*, with *quick-lime*; with *amber*; with *steel or iron*: *sweet spirit of sal-armoniac*; *acid spirit of sal-armoniac*; *diuretic spirit of sal-armoniac*, &c.

ARMOR, or ARMOUR, a defensive habit, wherewith to cover and secure the body from the attacks of an enemy*.

* In ancient statutes this is frequently called *barneis*. See HARNESS.

Parts of *armour* are, the buckler, cuirassé, helmet, coat of mail, gantlet, &c.

A complete *armor* anciently consisted of a casque or helm, a gorget, cuirassé, gantelets, tasses, braccialets, cuisses, and covers for the legs, to which the spurs were fastened.—This they called *armor cap-a-pie*; and was the wear of the cavaliers, and men at arms.

The infantry had only part of it, *viz.* a pot or head-piece, a cuirassé, and tasses; but all light.—Lastly, the horses themselves had their *armor*, wherewith to cover the head and neck.

Of all this furniture of war, scarce any thing is now retained, except the cuirassé: the gorget or neck-piece, worn by officers, being at present only a badge of honour, and of no defence.

The gallantry of going to the battle naked, without any defensive *armor*, prevailed so far, that the French, during the reign of Louis XIV. were obliged to be continually issuing ordinances to refrain it; in consequence of which, the general officers, and those of the cavalry, were obliged to resume the cuirassé, which yet has been but ill observed.

Coat-ARMOR is the escutcheon of any person, or family, with its several charges, and other furniture, as mantling, crest, supporters, motto, &c.

Thus we say, a gentleman of *coat-armor*; meaning one who bears arms.

ARMORY, or ARMOURY, a store-house of arms, or a place wherein military habiliments are kept, to be ready for use.

There are *armories* in the tower, and in all arsenals, citadels, castles, &c.

ARMORY is also used for a branch of heraldry; being the knowledge of coat-armors, as to their blazons, and various intendments. See HERALDRY.

Master of the ARMORY. See the article MASTER.

Motto of an ARMORY. See the article MOTTO.

ARM-Pit. See the article AXILLA.

ARMS*, ARMA, in a general sense, includes all kinds of weapons, whether for defence, or offence.

* The word is formed from the French *armes*, which Nicod derives from a Latin phrase, *Quod operiantur armes*, by reason they cover the shoulders or sides: but it ought rather to be brought from *arma*, which Varro derives *ab arceis, eo quod arceant hostes*.

ARMS of offence are, the sword, pistol, musquet, bayonet, pike, &c.

ARMS of defence. See under the article ARMOR.

Fire-ARMS. See the article FIRE-ARMS.

What contributed most to render the Romans masters of the world, was, that having successively war'd against all nations, they constantly renounced their own methods, *arms*, &c. whenever they met with better.—Thus Romulus during his war with the Sabines, and bold and warlike nation, adopted their broad buckler, in lieu of the small Argian buckler, which he had used till that time. *Montesi. Confid. sur les Causes de la Grand. des Rom. c. 1. p. 2. seq.*

The principal *arms* of the ancient Britons were, hatchets, scythes, lances, swords, and bucklers: the Saxons, &c. brought in the halbard, bow, arrows, arbalets, &c.

The *arms* of the Highlanders are, the broad sword, target, poniard, and whinyar or durk, &c. 1 *Geo. I. Stat. 2. c. 54*. It is supposed, that the first artificial *arms* were of wood, and were only employed against beasts.—That Nimrod, the first tyrant, turned them against men; and that his son Belus was the first that waged war; whence, according to some, came the appellation *bellum*.—Diodorus Siculus takes Belus to be the same with Mars, who first trained soldiers up to battle.

Arms of stone, and even of brass, appear to have been used before they came to iron and steel.—Josephus assures us, that the patriarch Joseph first taught the use of iron *arms* in Egypt, arming the troops of pharaoh with a casque and buckler.

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By the ancient laws of England, every man was obliged to bear *arms*, except the judges and clergy. Under Henry VIII it was expressly enjoined on all persons to be regularly instructed, even from their tender years, in the use of the *arms* then in fashion, *viz.* the long bow and arrows, 33 H. 8.

ARMS, ARMA, in the eye of the law, are extended to any thing which a man takes in his hand in his wrath, to cast at, or strike another.—So Crompton—*Armorum appellatio non ubique facta & gladius & galeas significat, sed & justes & lapides*. See VI & ARMS

ARMS of courtsey, or parade, were those used in the ancient jousts, and tournaments.

These usually were lances not shod; swords without edge or point; and frequently wooden swords, and even canes.

Basjs of ARMS was a kind of combat in use among the ancient cavaliers.

Place of ARMS, in fortification, &c. See PLACE of ARMS.

ARMS also denote the natural weapons, or parts of defence of beasts; as claws, teeth, tusks of elephants, beaks of birds, &c.

Some animals are sufficiently guarded against all common dangers by their natural clothing, their armature of shells, as the tortoise, &c.—Others, destitute of this guard, are armed with horns; and others with sharp quills, or prickles, as the porcupine and the hedgehog; others with stings &c.

ARMS are also used figuratively for the profession of a soldier. —Thus we say, he was bred to *arms*. See SOLDIER.

Fraternity of ARMS. See the article FRATERNITY.

Law of ARMS. See the article LAW.

Suspension of ARMS. See the article SUSPENSION.

ARMS, or ARMORIES, are also used in heraldry, for marks of dignity and honour, regularly composed of certain figures and colours, given or authorized by sovereigns, and bore in banners, shields, coats, &c. for the distinction of persons, families and states, and passing by descent to posterity.

They are called *arms*, in regard they are bore principally on the buckler, cuirassé, banners, and other apparatus of war.—They are also called *coats of arms*, *coat-armour*, &c. because anciently embroidered on fur-coats, &c. See COAT of arms, &c.

Some will have the name to have been first occasioned by the ancient knights, who in their jousts and tournaments bore certain marks (which were frequently their mistress's favours) in their armour, *i. e.* their helms or shield; to distinguish them from each other.

Three flowers *de lys*, in a field azure, are the *arms* of France. —The *arms* of England are three lions.—In the *arms* of Great-Britain are quartered the *arms* of France, England, Scotland, and Ireland.

There has been a great dispute among the learned about the origin of *arms*.—Favyn will have them to have been from the beginning of the world; Segoin from the time of Noah; others from that of Othris, which is supported by some passages in Diodorus Siculus; others from the times of the Hebrews, in regard *arms* were given to Moses, Joshua, the twelve tribes, David, &c.

Others will have them to have taken their rise in the heroic age, and under the empires of the Assyrians, Medes, and Persians; building upon the accounts of Philostratus, Xenophon, and Quintus Curtius.

Some pretend that the use of *arms*, and the rules of blazon, were regulated by Alexander.—Others will have them to have had their original under the empire of Augustus; others, during the inundations of the Goths; and others, under the empire of Charlemaign.

Chorier observes, that, among the ancient Gauls, each man bore a mark on his buckler, by the sight whereof he might be known to his fellows; and hence he refers the original of the *arms* of noble families.—Camden has observed something like this of the ancient Picts, and Britons, who, going naked to the wars, painted their bodies with blazons, and figures of divers colours, which he supposes to have been different in different families, as they fought divided by kindreds. Yet Spelman says, that the Saxons, Danes, and Normans, first brought *arms* from the north into England; and thence into France.

Upon the whole it is certain, that from time immemorial, there have been symbolical marks in use among men, to distinguish them in armies, and to serve as ornaments for shields and ensigns; but these marks were used arbitrarily as devices, emblems, hieroglyphics, &c. and were not regular *armories*, like ours, which are hereditary marks of the nobility of a house, regulated according to the rules of heraldry, and authorized by princes.

Before Marius, even the eagle was not the constant ensign of the Roman army; but they bore in their standards a wolf, leopard, or eagle indifferently, according to the fancy of the generals.

The same diversity has been observed with regard to the French and English; on which account, authors are divided when they speak of the ancient *arms* of those countries.—In effect,

it appears from all the best authors, that the armories of houses, as well as the double names of families, were not known before the year 1000. And several have even endeavoured to prove, that the use of arms did not begin till the time of the first croisades of the christians in the east.

The truth is, it appears to have been the ancient tournaments that occasioned the fixing of armories.

Henry the Fowler, who regulated the tournaments in Germany, was the first who introduced these marks of honour, which appear to be of an older standing in Germany, than any other part of Europe.—It was then that coats of arms were first instituted; which were a kind of livery composed of several bars, fillets, and colours; whence came the fess, bend, pale, chevron, and lozenge; which were some of the first elements of armories. See CROSS, FESS, BEND, &c.—Those who had never been concerned in any tournament had no arms, though they were gentlemen.

Such of the nobility and gentry as crossed the sea, in the expeditions to the Holy Land, also assumed these tokens of honour to distinguish themselves.

Before these times, we find nothing upon ancient tombs but crosses, with Gothic inscriptions and representations of the persons deceased. The tomb of pope Clement IV. who died in 1268, is the first whereon we find any arms; nor do they appear on any coins struck before the year 1336. We meet with figures, it is true, much more ancient, both in standards and on medals; but neither cities nor princes ever had arms in form; nor does any author make mention of blazoning before that time.

Originally, none but the nobility had a right of bearing arms; but king Charles V. having ennobled the Parisians, by his charter in 1371, he permitted them to bear arms: from whose example, the more eminent citizens of other places did the like.

Camden refers the original of hereditary arms in England to the time of the first Norman kings. He says, their use was not established till the reign of king Henry III. and instances in several of the most considerable families in England, wherein, till that time, the son always bore different arms from the father.—About the same time it became the custom here in England, for private gentlemen to bear arms; borrowing them from the lords of whom they held in fee, or to whom they were the most devoted.

ARMS, at present, follow the nature of titles, which being made hereditary, these are also become so; being the several marks for distinguishing of families and kindreds, as names are of persons and individuals.

Arms make the object of the art of heraldry. See HERALDRY.

ARMS are variously distinguished by the heralds.—

Canting ARMS are those, wherein the figures bear an allusion to the name of the family.—Such are those of the family of la Tour in Auvergne, who bear a tower; that of the family of Prado in Spain, whose field is a meadow.

Most authors hold these the most noble and regular, as is shewn by an infinity of instances produced by Father Varenne and Menetrier.—They are much debased, when they come to partake of the Rebus.

Charged ARMS are such as retain their ancient integrity and value, with the addition of some new honourable charge or bearing, in consideration of some noble action.

Assumptive ARMS. See the article ASSUMPTIVE.

Full or entire ARMS are such as retain their primitive purity, integrity, or value; without any alterations, diminutions, abatements, or the like.

It is a rule, that the simpler and less diversified the arms, the more noble and ancient they are.—For this reason, Garcias Ximenes, first king of Navarre, and his successors for several ages, bore only gules, without any figure at all.

The arms of princes of the blood, of all younger sons and junior families, are not pure, and full; but distinguished and diminished by proper differences, &c. See DIFFERENCE, &c.

ARMS are also said to be *parted, couped, quartered, &c.* See PARTI, &c.

Arms are said to be *false and irregular*, when there is something in them contrary to the established rules of heraldry.—As, when metal is put on metal, or colour on colour, &c.

The laws, and other affairs of arms, with the cognizance of offences committed therein, belong, among us, to the earl-marshal, and college of arms. See COLLEGE of Arms.

ARMS of Patronage. See the article PATRONAGE.

ARMS in falconry denote the legs of an hawk, from the thigh to the foot. See HAWKING.

King of ARMS, }
Herald at ARMS, } sec { KING at Arms.
Pursuivant at ARMS, } HERALD.
College of ARMS, } COLLEGE of Arms.

ARMY, a large body of soldiers, consisting of horse and foot, under the command of a general, with several ranks of subordinate officers under him.

This is to be understood of a land army.—A naval or sea army,

is a number of ships of war, equipped and manned with sailors and marines, under the command of an admiral, with other inferior officers under him.

We say, an army ranged in order of battle.—The march of an army.—The retreat of an army.—The review of an army, &c.

Besiegers are obliged to have an army of observation, to prevent relief being brought into the place, or the siege being raised. *Vid. Savin. Nouv. Ecol. Milit. p. 335. sq.*

An army consists of squadrons and battalions, and is usually divided into three corps; which are ranged in three lines. The first line is called the vanguard; the second, the main body; and the third, the rear-guard, or body of reserve.—The middle of each line is possessed by foot; the cavalry forms the wings on the right and left of each line; and sometimes they also place squadrons of horse in the intervals between the battalions.

When the army is ranged in order of battle, there are five feet distance between every two horses, and three between the foot. But in the shock the file contracts, and its front lessens almost to one half.

In each line the battalions are distant from each other about 180 feet, a distance about equal to the extent of their front; and the same holds of the squadrons, which are about 300 feet distant, the extent of their own front. These intervals are left for the squadrons and battalions of the second line, to range themselves against the intervals of the first line; and those of the third line, against the intervals of the second; that both the one and the other may march more readily through these spaces to the enemy.

There are usually 300 feet left between the first line and the second, and 600 between the second line and the third; that there may be room to rally when the squadrons and battalions are broke. *Savin. Nouv. Ecol. Milit. p. 266.*

Long experience has shewn, that in Europe a prince with a million of subjects cannot keep an army of above ten thousand men, without ruining himself. It was otherwise in the ancient republics: the proportion of soldiers to the rest of the people, which is now as about one to an hundred, might then be as about one to eight. The reason seems owing to that equal partition of lands, which the ancient founders of commonwealths made among their subjects; so that every man had a considerable property to defend, and had means to defend it with. Whereas, among us, the lands and riches of a nation being shared among a few, the rest have no way of subsisting, but by trades, arts, and the like; and have neither any free property to defend, nor means to enable them to go to war in defence of it, without starving their families. A large part of our people are either artisans or servants, and so only minister to the luxury and effeminacy of the great. While the equality of lands subsisted, Rome, though only a little state, being refused the succours which the Latins were obliged to furnish after the taking of the city in the consulate of Camillus, presently raised ten legions within their own walls: which was more, Livy assures us, than they were able to do in his time, though masters of the greatest part of the world. A full proof, adds the historian, that we are not grown stronger; and that what swells our city is only luxury, and the means and effects of it. *Vid. Liv. Dec. 1. l. 7. Confid. sur les Causes de la grand. des Rom. c. 3. p. 24.*

Our armies anciently were a sort of militia, composed chiefly of the vassals and tenants of the lords.

When each company had served the number of days or months enjoined by their tenure, or the customs of the fees they held; they returned home. See TENURE, FEE, &c.

The armies of the empire consist of divers bodies of troops, furnished by the several circles. See EMPIRE and CIRCLE.

The gross of the French armies, under the Merovingian race, consisted of infantry. Under Pepin and Charlemain, the armies consisted almost equally of cavalry and foot: but since the declension of the Carolingian line, the fees being become hereditary, the national armies, says le Gendre, are chiefly cavalry.

The armies of the grand signior consist chiefly of janizaries, spahis, and timariots. See JANIZARY, SPAHI, and TIMARIOT.

Royal ARMY. See the article ROYAL.

ARNODI*, in antiquity, the same with Rhapsodi. See RHAPSODI.

* The word is compounded of the Greek ἀρνός, a lamb, which was their usual reward; and ἀρνώ, song, or singing.

ARNOLDISTS, ARNALDISTS, a kind of sectaries in the XIIIth century; thus called from their chief, Arnold of Breffis, who was a great declaimer against the wealth and vices of the clergy; and who is also charged with preaching against baptism and the eucharist.

After raising great disturbances at Breffis and Rome, he was burnt at this latter place in 1155, and his ashes cast into the Tiber.—His disciples were also called *Publicans* or *Peplacani*.

AROMATIC*, AROMATICUS, is understood of a drug, plant

plant, or the like, which yields a brisk, fragrant smell, and a warm spicy taste.

* The word is formed of the Greek *aroma*, which is compounded of *ari* very, and *os* or *osm*, smell; or rather derived from *ar*, to make fit, accommodate; in regard spices, which are all *aromatics*, are used for the seasoning and preparing of meats.

AROMATICs, or **AROMATIC Medicines**, are either simple or compound.—To this class belong most cardiac, cephalic, and carminative remedies, with many stomatica ones.

Of this kind are frankincense, storax, benjoin, cinnamon, mace, cloves, nutmeg, pepper, &c.—Such also are lavender, majoram, sage, thyme, rosemary, &c.

Aromatics are of particular service in cold cachectic habits, where the load of humours has been forced away by strong detergents and cathartics; as they tend to strengthen the fibres, and prevent a relapse.—Hence also they become of necessary use after purging, and carrying off the waters of a dropsy; or in the intervals thereof, to fortify the springs, and prevent a filling again.

The *Aromaticum Rosatum* is a compound officinal powder, made of red roses, liquorice, aloes wood, yellow Sanders, cinnamon, cloves, mace, gum tragacanth, nutmegs, cardamoms, galangals, spikenard, ambergrace and musk, all mixed together.—It is chiefly prescribed in cordial and cephalic bolus's and electuaries, to strengthen the stomach and head, which all *aromatics* have a tendency to.

Some writers give the title *Aroma Germanicum* to juniper-berries, on account of the great esteem they are in among that people, for their spicy, warm qualities, in which respect they are by many preferred to ginger itself.

AROMATICUM Vinum, } see the articles { **VINUM**.

AROMATICUS Calamus, } see the articles { **CALAMUS**.

ARONDE, in fortification. See **DOVETAIL**, and **QUEUE d'Arond**.

AROURA, *Aquea*, a Grecian measure, of 50 foot. Suid. **AROURA** was more frequently used for a square measure, the half of the plecthon.

The Egyptian *aroura* was the square of 100 cubits. Arbuth. tab. 9. **ARPAGIUS***, or rather **HARPAGIUS**, in some ancient inscriptions, signifies a person who died in the cradle, at least in early youth.—

* The word is formed from the Greek *ἀραγίζω*, *rapiis*, I snatch.—It occurs but rarely in Latin writings: yet we meet with it in Gruter, p. 682. *Iscrip*. 9. in the epitaph of Marcus Aurelius, who died at the age of 9 years, 2 months, and 3 days.—But even this inscription was found in Gaul, where they often made use of a bastard Greek.

The Romans made no funerals for their *arpagii*.—They neither burnt their bodies, nor made tombs, monuments, or epitaphs for them; which occasioned Juvenal to say,

—*Terra clauditur infans*

Et minor igne rogi.

In after times it became the custom to hurn such as had lived to the age of forty days, and had cut any teeth; tho' these they also called *ἀραγίζω*, or *ἀραγίζω*, q. d. *rapti*, ravished.

The usage seems to have been borrowed from the Greeks, among whom, Eustathius assures us, it was the custom never to bury their children either by night or full day, but at the first appearance of the morning; and that they did not call their departure by the name of death, but by a softer appellation, *ἡμῶν ἀπαγωγή*, importing that they were ravished by Aurora, or taken away to her embraces.

ARPENT. See the article **ACRE**.

ARQUEBUSS*, or **HARQUEBUSS**, a large hand-gun, something bigger than our musket; and called by some a caliver. See **HARQUEBUSS**.

* The word is derived from the Italian *arcebusso*, or *arceabubo*, formed of *arco*, a bow, and *bubo*, a hole; because of the touch-hole of an *arquebuss*, which succeeds to the use of the bow among the ancients.

ARQUEBUSS a Grec is a sort of small fort-arm, which carries a ball of about three half ounces; now only used in old Castille, and some garisons of the French.

ARRACK. See the article **ARACK**.

ARRAIATIO Peditum, the ranging or arraying of foot-soldiers. See **MARTIAL LAW**.

ARRAIGN*, or **ARRAIGN**, in law, signifies to set a thing in order, or in its place.

* Spelman is of opinion that the word should be written *arrame*, from *arramere*, derived from the old French *arramer*, i. e. *jurare, promittere, sollemniter profiteri*. Yet in the register we find no such word as *arramere*; but in all the writs of assize, the year-books, &c. it is *arraignavit*: the more natural derivation is from the French *arraigner*, i. e. *ad rationem ponere*, to call a man to answer in form of law; which comes from the barbarous Latin *adrationare*, i. e. *placitare*.—In which sense, to *arraign* a criminal, is *ponere eum ad rationem*.

Thus, he is said to *arraign* a writ of novel disseisin, who prepares and fits it for trial before the justices of the circuit.

To *arraign* the assize is to cause the defendant to be called to make the plaint, and to set the cause in such order, as the tenant may be forced to answer thereto.

A prisoner is also said to be *arraigned*, when he is indicted and brought forth to trial.

ARRAIGNMENT, in law, the act of *arraigning*, that is, of arranging, or setting a thing in order.

ARRANGEMENT, or **RANGEMENT**, the disposition of the parts of a whole, in a certain order.

The modern philosophy shews us, that the diversity of the colours of bodies depends entirely on the situation and *arrangement* of the parts, which reflect the light differently; the diversity of tastes and smells on the different *arrangements* of the pores, which render them differently sensible; and the general diversity of bodies on the different *arrangement* of their parts.

The happy *arrangement* of words makes one of the greatest beauties of discourse.

ARRAS-HANGINGS, a sort of rich tapestry, made at Arras in the county of Artois in Flanders. See **TAPESTRY**.

ARRAY*, in law, the ranking or ordering a jury or inquest of men impanelled on any cause.

* The word may be derived either from the obsolete French *array*, order, or from *array*, a line, stroke, &c.

Hence to *array* a pannel, ann. 3 Hen. V. &c. is to set forth the men impanelled one by another.—The *array* shall be quashed, *ib.*—By the statute, every *array* in assize ought to be made four days before.—Hence also, to challenge the *array*. See **CHALLENGE**.

Battle-ARRAY. See **TACTICS**.

ARRAYERS, or **ARRAJERS**, **ARRAITORES**, is used in some ancient statutes, for such officers as had care of the soldiers armour, and saw them duly accounted in their kinds.

In some reigns, commissioners have been appointed for this purpose. Such were the commissioners of *array*, appointed by king Charles I. in the year 1642.

ARREARS*, **ARRERAGES**, **ARRERAGIUM**, or **ARRIERAGIUM**, the remains of an account; or a sum of money remaining in the hands of an accomptant.

* The word is derived from the French *arriere*, which is formed from *arrire*, and that again from *retro*, behind.

ARREARS, is also used more generally for a remainder of rents or monies unpaid at the due time; whether they be rents of manor, or any other thing reserved: called also in some writers *arrieragium firmarum*.

Reins ARREAR in Lex. See **RIENS**.

ARRENTATION, in the forest law, the licensing an owner of lands in the forest, to enclose them with a low hedge and small ditch, in consideration of a yearly rent.

Saving the arrentations denotes a power reserved to give such licences for a yearly rent.

ARREST*, in common law, the apprehending or restraining of one's person, in execution of the command of some court, or officer of justice.

* The word *arrest*, is originally French, and is used in that language for a decree, or determination of a cause debated to and fro: in which sense it seems derived from the Greek *ἀρρεστος*, *placitum*, the pleasure of the court.

Hence, when a person is legally stopped, apprehended, and restrained of his liberty for debt, &c. he is said to be *arrested*, or put under an *arrest*; which is the beginning of imprisonment.

To *move* or *plead in arrest* of judgment is, to shew cause why judgment should be stayed, though there be a verdict in the cause.

To *plead in arrest of taking the inquest* is, to shew cause why an inquest should not be taken.

ARRESTANDIS Bonis ne dissipentur, a writ which lies for him whose cattle or goods are taken by another, who, during the controversy, makes, or is like to make them away, and will hardly be able to give satisfaction for them afterwards.

ARRESTANDO ipsum, qui pecuniam recepit ad proficiendum in obsequium regis, &c. is a writ which lies for the apprehension of him that hath taken prest-money to serve in the king's wars, and hides himself when he should go.

ARRESTO factio super bonis mercatorum alienigenarum, &c. is a writ which lies for a denizen against the goods of strangers or Persons of another country found within this kingdom, in recompence of goods taken from him in that country, after he hath been denied restitution there.

This answers to what among the ancient civilians was called *clarigatio*, now barbarously *reprisalia*. See **REPRISAL**.

ARRETED, **ARRECTATUS**, is sometimes used in our ancient law-books, for imputed, or laid to.—As, no folly may be *arreted* to one under age.

ARRHABONARIII*, a sect in religion, who held that the eucharist is neither the real flesh and blood of Christ, nor yet the sign of them, but only the pledge or earnest thereof.

* The word is derived from the Greek *ἀρραβων*, *arba*, earnest.

ARRHÆ, or **Argentum Dei**. See **EARNEST**, &c.

ARRHEPHORIA*, a feast among the Athenians, instituted in honour of Minerva, and Harle daughter of Cecrops.

* The word is Greek, *ἀρρηφωρῖα*, which is composed of *ἀρρηφω*, mystery, and *φορῖα*, I carry, on account of certain mysterious things which were carried in procession at this solemnity.

Boys, or as some say, girls, between seven and twelve years of

age, were the ministers that assisted at this feast; and were denominated *Arctophagi*.

This feast was so called *Erythroria*, *Ερυθρορια*, from Herse the daughter of Cecrops, on whose account it is said to have been first established.

ARRIERE, a French term, literally signifying the *hind*, or *posterior* part of any thing; usually wrote in English, abridgedly, *rear*.

ARRIERE-BAN *, or **ARRIERE-Ban**, in the French customs, is a general proclamation, whereby the king summons to the war all that hold of him; both his vassals, *i. e.* the noblest, and the vassals of his vassals.

* M. Cafeneuve takes the word to be composed of *arrière* and *ban*: the *ban*, according to him, denotes the convening of the noblest or vassals, who hold fees immediately of the king; and *arrière*, those who only hold of the king mediately.—

To the provost of Paris belongs the convoking and commanding of the *arrière-ban*.

ARRIERE-FEE, or **FIEF**, is a fee dependant on some other superior one.

Arrière fees commenced at the time when the counts and dukes, rendering their governments hereditary in their families, distributed to their officers certain parts of the royal domains which they found in their provinces; and even permitted those officers to gratify the soldiers under them, with parts thereof.

ARRIERE-GUARD. See the article **REAR-GUARD**.

ARRIERE Vassal, or **Tenant**, the vassal or tenant of another vassal or tenant. See **VASSAL**.

ARROGATION. See **ADROGATION**.

ARRONDIE, in heraldry. **Cross-Arrondie**, or **rounded**, is that whose arms are composed of sections of a circle, not opposite to each other, so as to make the arm bulge out thicker in one part than another; but both the sections of each arm lie the same way, so that the arm is every where of an equal thickness; and all of them terminating at the edges of the escutcheon, like the plain cross.

ARROW, a missile weapon of offence, slender, pointed and barbed, made to be cast or shot with a bow. See **BOW**, and **ARCHERY**.

We say, a flight of *arrows*; *arrows* are also called *shafts*.

ARROW-makers are called *fletchers*, who were formerly, as well as bowyers, persons of great consequence in the commonwealth.—*Arrow-heads* and *quarrels* were to be well boched or braced, and hardened at the points with steel; the doing of which seems to have been the business of the *arrow-smith*. *Vid. Stat. 7. H. 4. c. 7.*

ARROW, in astronomy, trigonometry, &c. See **SAGITTA**. **Wildfire ARROWS**. See **WILDFIRE**.

ARS Notoria. See the article **NOTORIUS**.

ARSENAL *, a royal or public magazine, or place appointed for the making, and keeping of arms necessary either for defence, or assault.

* The word, according to some, is derived from *ars*, *artis*, *fortes*; by others from *ars*, an engine; this being the place where the engines of war are preserved.—Some will have it compounded of *ars* and *senatus*, as being the defence of the senate; others fetch it from the Italian *arsenale*, or from the modern Greek *arsenalis*; but the most probable opinion is, that it is derived from *arsenaa*, which, in the Arabic, signifies an *arsenal*.

The *arsenal* of Venice is the place where the galleys are built and laid up.—The *arsenal* of Paris is that where the cannon or great guns are cast. It has this inscription over the gate—

*Vulcania tela ministrava,
Tela Giganteos debellatura furores.*

There are also *arsenals*, or *store-houses*, appropriated to naval furniture and equipments.—At Marfeilles is the *arsenal* for the galleys; and at Toulon, Rochefort and Brest, are those for the men of war.

ARSENIC *, **ARSENICUM**, in natural history, a ponderous mineral substance, volatile and uninflamable, which gives a whiteness to several metals in fusion, and proves extremely caustic, or corrosive, to animals, so as to become a violent poison.

* The word is compounded of the Greek *arsen*, man, or *arsen*, male, and *nikan*, to overcome, or kill; alluding to its poisonous quality.

In an ancient manuscript ascribed to the sibyls, is a verse which plainly intimates *arsenic*.—*Tetra syllabus sum; prima pars mei virum, secunda victoriam significat.*

Arsenic is by some ranked in the class of sulphurs.

There are divers kinds of *arsenic*; *viz.* yellow, red; and crystalline, or white.

Orpiment is called *Native* or *Yellow ARSENIC*, it is of a yellow, or orange-colour; whence it is also denominated *auripigmentum*.

It is chiefly found in copper-mines, in a sort of gables or stones, of different figures and sizes. Its colour, though always yellow, yet admits of divers shades and mixtures, as a golden yellow, reddish yellow, greenish yellow, &c. It is found to contain a portion of gold, but so little, as not to quit the cost of separating it; but there is beside this a yellow factitious *arsenic* made of the white *arsenic* and sulphur.

Red ARSENIC, is a preparation of the white or crystalline *arsenic*, made by adding to it sulphur and copper.

White or *Crystalline ARSENIC* is the kind chiefly used among us.

Arsenic is made by sublimation from cobalt: the method of which, as practised in Hungary, is given us by Dr. Krieger, in the *Philosophical Transactions*, N^o 293.—The cobalt being beat to powder, and the light sandy part washed off, by a current of water, they put what remains into the furnace; the flame of which passing over the powder, takes along with it the *arsenic* part, in form of a smoke; which being received by a chimney, and carried thence into a close wooden channel, sticks by the way to the sides; and is scraped off, in form of a whitish or yellowish powder.—From what remains of the cobalt, they proceed to make *smalt*. See **SMALT**.

The smallest quantity of *crystalline arsenic*, being mixed with any metal, renders it friable, and absolutely destroys its malleability.

Hence, the refiners dread nothing so much as *arsenic* in their metals; nor could any thing be so advantageous to them, were such a thing to be had, as a menstruum that would absorb, or act on *arsenic* alone; for then their metals would be readily purified, without flying off, or evaporating.

A single grain of *arsenic* will turn a pound of copper into a beautiful white metal looking like silver. This hint many persons have endeavoured to improve on, for the making of silver, but in vain, as the mixture could never be brought to sustain the hammer: some have been hanged for coining species of this spurious silver.

The chymists furnish several preparations of *arsenic*, which all turn on repeated ablutions and sublimations, to blunt the corrosive farts thereof, and change it into a safe medicine, after the manner of sublimation.—Such are *ruby of arsenic*, &c. But it seems appears worth the pains; and whatever home may urge, *arsenic* ought never to be used inwardly in any form, as gnawing and tearing the vessels, and occasioning mortal convulsions.—Its fume taken into the lungs, kills instantly: and the other it is sublimed, says Boerhaave, the ranker it grows.—Butter and cow's milk taken in large quantities, prove good antidotes against *arsenic*. See **SUPPLEMENT** article **ARSENIC**.

Regulus of ARSENIC is the most fixed and compact part thereof, prepared by mixing it with pot-ashes and soap, then fusing the whole, and casting it into a mortar; upon which the heaviest part falls to the bottom.

Caustic oil of ARSENIC, is a butyrous liquor, like butter of antimony, prepared of *arsenic* and corrosive sublimate.—It serves to eat off fungous flesh, and to cleanse carious bones, &c.

ARSENICAL Magnet, *magnes arsenicalis*, is a preparation of antimony, with sulphur and white *arsenic*.

ARSENO-PHELYS *, among the ancient naturalists, the same with *hermaphrodite*.

* The Greeks used the word both in speaking of men and beasts.—It is formed from *arsen* and *phelus*, male and female.

ARSIS and *Thesis*, in prosody, are names given to the two proportionable parts into which every foot, or rhythm is divided. See **FOOT**, &c.

By *arsis* and *thesis* are usually meant no more than a proportional division of the metrical feet, made by the hand or foot of him that beats the time.

As in measuring the quantities of words, the hand is lifted up, as well as let fall; part of the time taken up in measuring the foot, by lifting the hand up, is termed *arsis*, or *elevatio*; and the part, where the hand is let fall, *thesis*, or *positio*. *Vid. Augustin. de Musica*, l. 2. c. 10. *In plaudendo enim quia elevatur & ponitur manus, partem pedis sibi elevatio vendicat, partem positio.*

Fugha per ARSIS & THESIS. See **FUGUE**.

ART, **ARS**, is defined by the schoolmen, a habit of the mind operative or effective according to right reason; or, somewhat more intelligibly, a habit of the mind prescribing rules for the due production of certain effects; or the introducing of changes in bodies from some foreknowledge and design in a person endued with a principle or faculty of acting.

* The word *art* is derived from the Greek *arsen*, virtue, strength.—This is the opinion of Donatus, on the first scene of Terence's *Andria*: *ars enim ars, ars, dila est per lyopen*; and is followed by Scaliger. Others derive *art* from *arsis*, utility, profit; which is found in that sense in *Ætichylus*.

On this footing, *arts* are divided into *active* and *passive*.

—Such as leave no external effect after their operation, as dancing, fiddling, &c. are called *active* or *practical arts*: those which do leave an effect behind them, as painting, &c. are called *passive*, or *effective arts*. *Magn. Moral. lib. 1. cap. 35.*

ART is better defined, after my lord Bacon, a proper disposal of the things of nature by human thought and experience, so

as to make them answer the designs and uses of mankind.

Nature, according to that philosopher, is sometimes free, and at her own disposal; and then she manifests herself in a regular order: as we see in the heavens, plants, animals, &c.—Sometimes she is irregular, and disorderly, either through some uncommon accident, or depravation in matter, when the resistance of some impediment perverts her from her course; as in the production of monsters.—At other times she is subdued and fashioned by human industry, and made to serve the several purposes of mankind.—This last is what we call *art*.—In which sense, *art* stands opposed to nature.

Hence, the knowledge of nature may be divided into the history of generation, of pratergeneration, and of *arts*.—The first considers nature at liberty; the second, her errors; and the third, her restraints.

ART is also used for science or knowledge reduced into practice. Several of the schoolmen hold logic and ethics to be *arts*; inasmuch as they do not terminate in mere theory, but tend to practice.

In this sense, some branches of the mathematics also are *arts*; others, matters of doctrine, or science.—Statics is wholly scientific, as it takes up with the mere contemplation of motion; mechanics, on the contrary, is an *art*, as it reduces the doctrine of statics into practice.

ART is principally used for a certain system or collection of rules, precepts, and inventions or experiments, which, being duly observed, make the things a man undertakes succeed, and render them advantageous and agreeable.

In this sense, *art* is opposed to science, which is a collection of speculative principles, and conclusions.

The nature and origin of *art*, and its distinction from science, are farther considered in the preface to this work.

ARTS, in this sense, may be divided, with respect to their scope and object, into *human*, as medicine; and *divine*, as theology.

Human, again, may be subdivided into *civil*; as law, politics, &c. *military*, as fortification, &c. *physical*, as agriculture, chymistry, anatomy, &c. *metaphysical*, as logics, pure mathematics, &c. *philological*, as grammar, criticism, &c. *mercantile*, to which belong the mechanical arts and manufactures. See each in its place.

ARTS are more popularly divided into *liberal* and *mechanical*.

Liberal ARTS are those that are noble, and ingenious; or which are worthy of being cultivated without any regard to lucre arising therefrom.—Such are *poetry*, *music*, *painting*, *grammar*, *rhetoric*, the *military art*, *architecture*, and *navigation*.

Mechanical ARTS are those, wherein the hand and body are more concerned than the mind; and which are chiefly cultivated for the sake of the profit they bring with them.—Of which kind are most of those which furnish us with the necessaries of life, and are popularly known by the name of *trades*.—Such are *weaving*, *turnery*, *brewing*, *masonry*, *clock-making*, *carpentry*, *joinery*, *foundry*, *printing*, &c.

The *mechanical arts* take their denomination from μηχανή, machine; as being all practised by means of some machine or instrument.

With the *liberal arts* it is otherwise; there being several of them which may be learnt and practised without any instrument all: as *logic*, *eloquence*, *medicine* properly so called, &c.

The *arts* which relate to the sight and hearing, my lord Bacon observes, are reputed liberal, beyond those which regard the other senses, which are chiefly employed in matters of luxury.

It has been well noted by philosophers, that, during the rise and growth of states, the *military arts* chiefly flourish; when arrived at their height, the *liberal arts*; and when on the declining hand, the *vouluptuary arts*.

There are also divers particular *arts*; as the *art* of memory, the *art* of deciphering, the *art* of flying, of swimming, *art* of diving, &c.

Democritus maintained, that men learnt all their *arts* from brutes; that the spider taught them weaving, the swallow building, the nightingale music; and several kinds of medicine.

Term of ART. See the article **TERM**.

Bachelor of ARTS. See the article **BACHELOR**.

Master of ARTS. See **MASTER**, **DEGREE**, **FACULTY**.

ART is also applied to divers imaginary, and even superstitious, doctrines and inventions.—Such are,

Lully's ART, or the *transcendental ART*, this is an art by means whereof a man may dispute whole days on any topic in nature without understanding the least tittle of the thing in dispute; thus called from its inventor Raymond Lully.

It consists chiefly in disposing the several sorts of beings into divers scales or or climaxes, to be run down in a descending progression.—Thus, whatever were proposed to be talked on, they would say, first, it is a being, and consequently, one, true, good, perfect: then, it is either created, or increased. Again, every created being is either body or spirit, &c.

Angelical ART, or the *ART of spirits*, is a method of attaining to the knowledge of any thing desired; by means of angels, or rather of demons.

Under this come the *arts of magic*, *sojery*, *witchcraft*, &c.

Ars Notoria is a pretended manner of acquiring sciences by infusion, without any other application than a little fasting and performing a few ceremonies.

They who make profession of this art, affirm that it was by means hereof that Solomon, in one night's time, acquired all his knowledge.—Delrio shews it to be a criminal curiosity, and founded on a secret compact with the devil. *Disquis. Mag.* p. 11. It was solemnly condemned by the Sorbonne, in 1320.

St. Anselm's ART is a superstitious manner of curing wounds, by barely touching the linen wherewith those wounds had been covered.

Delrio, in his *Disquisitiones Magice*, observes, that some Italian soldiers, who practised this *art*, attributed the invention thereof to St. Anselm; but he assures us withal, that it was really invented by Anselm of Parma, a celebrated magician.

St. Paul's ART is a branch of the *ars notoria*, so called as being supposed to have been taught by St. Paul, after his being taken up into the third heaven.

ART and Part, is a phrase used in the north end of England, and in Scotland.—When any one is charged with a crime, they say he is *art and part* in committing the same; that is, he was both the contriver, and acted a part in it.

Hermetical ART. See the article **HERMETICAL**.

Hysopic ART. See the article **HYSOPIC**.

ARTERIA Aspera. } See the articles } **ASPERA**

ARTERIA Sacra. } **SACRA.**

ARTERIAL, or **ARTERIOUS**, in anatomy, something that relates to the arteries. See **ARTERY**.

The *arterial blood* is supposed more warm, florid, and spirituous than the venal.

ARTERIOSA Vena, φλέβη αρτηριώδης, or *arterial vein*, a denomination given to the pulmonary artery, or that vessel whereby the blood is conveyed from the right ventricle of the heart to the lungs.

Canalis ARTERIOSUS is a tube in the heart of a foetus; which, with the foramen ovale, serves to maintain the circulation of the blood, and to divert it from the lungs.

ARTERIOTOMY *, Αρτηριωτομία, in chirurgery, &c. the operation of opening an artery; or of letting blood with a lancet by the arteries; practised in some extraordinary cases.

* The word is formed of αρτηρία, and τμησις, *scilicet*, I cut.

Arteriotomy is a very dangerous operation, and is seldom used with design, except in the forehead, the temples, and behind the ears, where the arteries are easily closed again by reason of the cranium underneath, which would be very difficult to effect in any other part.—In the other parts it usually proves fatal; and we have numerous instances of persons killed in bleeding, by the opening an artery instead of a vein.

Fernelius (2. 18.) Severinus (*Effic. Med. part.*) Tulpius (*Obs.* 1. 48.) and Catherwood labour hard to introduce *arteriotomy* in apoplectic cases, as much preferable to venesection; but they are not much followed.

ARTERY *, Αρτηρία, in anatomy, a hollow fistulous canal, appointed to receive the blood from the ventricles of the heart, and distribute it to all parts of the body, for the maintenance of heat and life, and the conveyance of the necessary nutriment.—See *Tab. Anat.* (Angeiol) *fig.* 1.

* The word is Greek, αρτηρία: which some imagine derived from ἀρσ, *art*, the fire, and ἄρρησις, *servo*, to keep; but others, who understand the use of the part better, derive it from ἀρσ, I lift, because of its continual throbbing or beating.

The *arteries* are ordinarily composed of three coats or membranes. The first or outermost, nervous or tendinous; being a thread of fine blood-vessels with nerves, for nourishing the other coats. The second muscular, and made up of circular, or rather spiral fibres; of which there are more or fewer frata according to the bigness of the artery: these fibres have a strong elasticity, by which they contract themselves with force, when the power by which they have been stretched out ceases. The third and inmost coat is a fine, dense, transparent membrane, which keeps the blood within its channels, which otherwise upon the dilatation of an artery, would easily separate the spiral fibres from one another. As the *arteries* grow smaller, these coats grow thinner.

All the *arteries* are conical, *i. e.* they begin with the trunk, and, growing less and narrower, end in branches so minute, that they escape the sight, unless assisted with microscope; by

by which, in the tails of tadpoles and very small eels, the extremities of the *arteries* seem, by the swift uninterrupted course of the blood, to be inoculated or continued to the originations of the veins: though by the transparency of those vessels, the actual continuation be not visible.

The coats of the *arteries* are of a very dense, close texture; by which means the blood not being visible through them, they generally appear white. Add, that the blood proceeding from a greater capacity to a less, is thereby somewhat obstructed in its passage; but being forced on by the motion of the heart, it diffends the coats, and thereby occasions a salient motion, called the *pulse*.—By this thickness and whiteness of the *arteries*, with the pulsation observed therein, *arteries* are distinguished from veins.

The pulse of the *arteries*, like that of the heart, consists of two reciprocal motions, a systole or contraction, and a diastole or dilatation: but they keep opposite times; the systole of the one answering to the diastole of the other.

All the *arteries* of the body, we have observed, arise in two large trunks, from the two ventricles of the heart. That from the right ventricle is called the *pulmonary artery*, serving to carry the blood into the lungs: that from the left, the *aorta*, or *great artery*; which, by its numerous ramifications, furnishes all the rest of the body, as far as the remotest stages of circulation.

The *great artery*, after it leaves the heart, divides into two large trunks, called the *ascending*, or upper; and *descending*, or lower trunks.

The ascending trunk, or *aorta ascendens*, conveys the blood to the head, and other upper parts of the body, and is sub-divided into three branches.—The first, the right *subclavian*, whence arise the *carotid*, *vertebral*, *cervical*, *right axillary*, &c.—The second, is the left *carotid*.—The third, the left *subclavian*; whence arise the left *cervical*, *vertebral*, and *axillary*.—See each described in its proper article, SUBCLAVIAN, CAROTID, VERTEBRAL, CERVICAL, AXILLARY, &c.

The descending trunk, or *aorta descendens*, carries the blood to the trunk, and the lower parts of the body.

Out of this arise the *bronchial*, *intercostals*, *cœliac*, *splenic*, *mesenteric*, *emulgent*, *spermatic*, *iliac*, *umbilical*, *epigastric*, *hypogastric*, *crural*, &c. with their several ramifications.—See each in its place.

A draught of the several *arteries*, with their divisions and subdivisions, in their natural order and position, as taken from the life; see in plate *anatomy*, (Angeioli. fig. 6.)

ARTERY is also applied to that fistulous tube, composed of cartilages and membranes, which descends from the mouth to the lungs, for the conveyance and reconveyance of the air, in respiration.

This is particularly called the *aspera arteria*, or *trachea*, and popularly the *wind-pipe*.

ARTHËL, something cast into a court, in Wales, or the marches thereof; whereby the court is letted or discontinued for the time.—The casting of *arthel* is prohibited, 26 H. 8. c. 6.

ARTHRITIS*, Αρθριτις, in medicine, a disease better known under the name of the *gout*.

* The word is formed from the Greek αρθρον, *articulus*, joint; in regard the chief seat of that distemper is in the joints.

ARTHRIC Waters. See the article WATER.

ARTHRODIA*, Αρθροδια, in anatomy, a species of articulation, wherein a flat head of one bone is received into a shallow socket of another.

* The word is formed from the Greek αρθρον, *articulus*, and δεχομαι, *recipio*, I receive.

Such is the articulation of the humerus with the scapula.

ARTHRODIUM in mineralogy, a genus of crystal. See SUPPLEMENT.

ARTHROSIS*, in anatomy, a juncture of two bones, designed for motion; called also *articulation*.

* The word is formed from the Greek αρθρον, *articulus*.

ARTICLE, ARTICULUS, a little part or division of a book, writing, or the like.—Aquinas divides his sum of theology into several questions; and each question into divers *articles*.—Such an account consists of so many *articles*.

ARTICLE is also applied to the several clauses or conditions of a contract, treaty of peace, or the like.

In this sense we say, *articles* of marriage, *articles* of capitulation, preliminary *articles*, &c.—The establishment of an East India company at Ostend is a direct breach of the eighth and ninth *articles* of the treaty of Munster.

ARTICLES of the clergy, ARTICULI cleri, are certain statutes touching persons and causes ecclesiastical, made under Edward II. and III.

ARTICLE of *faith* is by some defined a point of Christian doctrine, which we are obliged to believe, as having been revealed by God himself, and allowed and established as such by the church.

ARTICLE, *Articular*, in anatomy, denotes a joint, or juncture, of two or more bones of the body. See ARTICULATION.

ARTICLE of death, *Articulus mortis*, the last pangs, or agony of a dying person.

The pope usually sends his benediction to the cardinals, &c. in *articulo mortis*.

ARTICLE, in arithmetic, signifies the number 10, or any number justly divisible into ten parts; as 20, 30, 40, &c.—These are sometimes called *decads*, and sometimes *round numbers*. Harris.

ARTICLE, in grammar, denotes a particle used in most languages for the declining of nouns, and denoting the several cases and genders thereof.

The use of *articles* arises chiefly hence, that in languages which have not different terminations, to express the different states and circumstances of nouns, there is something required to supply that office.

The Latins have no *articles*; but the Greeks, and most of the modern languages, have had recourse hereto, for fixing and ascertaining the vague signification of common and appellative names.

The Greeks have their *ι*, the eastern tongues their *be emphaticum*; the Italians their *il, lo, and la*.—The French their *le, la, and les*.—The Germans their *der, das, dat*.

The English also have two *articles, a, and the*: which, being prefixed to substantives, apply their general signification to some particular thing.—Thus we say, *a man*; that is, some man or other: *the man*, that is, that certain man.

Hence it appears, that *a* is used in a larger, and more general sense being applied indifferently to any particular person or thing.—Whereas the distinguishes individually, and shews what particular thing is spoke of.—If the substantive to which the particle *a* is affixed, begin with a vowel, or with an *h*; we write and speak it, *an*: so we say, *an eye, an hour, &c.*

Some grammarians make the *article* a distinct part of speech: others will have it a pronoun; and others, with Mr. Greenwood, a noun adjective. See SPEECH, PRONOUN, ADJECTIVE, &c.

Articles are things of great service in a language, as they contribute to the more neat and precise expressing of several properties and relations which must otherwise be lost. And hence one great disadvantage of the Latin, above other languages which have *articles*; in that the *article* being either expressed, or left out, makes an alteration in the sense, which the Latins cannot distinguish.—Thus when the devil said to our Saviour, *si tu es filius Dei*, it may either be understood, *if thou art a son of God*, or, *if thou art the son of God*.—Scaliger, from the want of *articles* in the Latin, has concluded them useless.

The Italians even prefix *articles* to proper names, which do not naturally need any, in regard they do of themselves signify things individually.—Thus they say, *il Arigio, il Vasso, il Putrocha*.—Even the French join the *article* to the proper names of kingdoms, provinces, &c. as *la Suede, la Normandie*.—And we ourselves do it to the names of certain mountains and rivers; as the *Rhine, the Danube, the Alps, &c.*

Indefinite ARTICLE. The *article a* is said to be *indefinite*, because applied to names taken in their more general and confused signification; as, he travelled with the port and equipage of a prince; where the words *a prince* may be understood of any prince in the general.

Definite ARTICLE. The *article the* is said to be *definite*, or *demonstrative*, as fixing the sense of the word it is put before, to one individual thing. See DEFINITIVE.

Fa. Buffer distinguishes a third kind of *articles* in the French, which he calls *intermediate*, or *partitive*; serving to denote part of the thing expressed by the substantives they are added to: as, *des savans ont cru*, some learned men have supposed, &c. I want, *de la lumiere*, some light, &c.

The use and distinction of the definite and indefinite *articles le or la, and de or du*, make one of the greatest difficulties in the French tongue, as being utterly arbitrary, and only to be acquired by practice.—We may add, that in the English, though the *articles* be so few, yet they are of such frequent use, that they easily discover any stranger, from a natural Englishman.

ARTICULARIS, ARTICULAR, in medicine, an epithet applied to a disease which more immediately infects the articuli, or joints.

The *morbus articularis*, is the same with the Greek αρθριτις, and our *gout*. See GOUT.

ARTICULATE *sounds* are those which express the letters, syllables, &c. of any alphabet, or language. See INARTICULATE.

Brutes cannot form *articulate* sounds, or they cannot *articulate* the sounds of their voice; excepting some few birds, as the parrot, pye, raven, starling, &c.

ARTICULATION, ARTICULATIO, in grammar, a distinct pronunciation of words and syllables.

Articulation is that part of grammar, which treats first of sounds, and letters; then of their combinations, for the composing of syllables and words. Hence he who pronounces his words clearly, and distinctly, is said to pronounce them *articulately*.

ARTICULATION, in anatomy, a juncture or connection of two bones, designed for motion.

There are various forms and kinds of this *articulation*, suited to the several sorts of motion and action.—That which has a notable and manifest motion is called *diarthrosis*.—This is subdivided into *enarthrosis*, *arthrodia*, and *ginglymus*. See each in its place, **ENARTHROSIS**, **ARTHRODIA**, and **GINGLYMUS**.

That which only admits of an obscure motion is called *synarthrosis*. It is subdivided into *symphysis*, *sutura*, *harmonia*, *syssarcosis*, *synchondrosis*, *synneurosis*, *syntenosis*, and *synmenesis*. See **SYMPHYSIS**, **SUTURA**, **HARMONIA**, and **SYNNEUROSI**. See the article **ANIMA**.

ARTIFICIAL, ARTIFICIALS, something made by art; not produced naturally, or in the common course of things.

Art is usually considered as a thing very different from nature; and artificial things from natural ones: whence arises another more grievous error, viz. that art is supposed a different principle built upon nature, and of such power, as to be able, either to perfect what nature had begun, to rectify and amend her when disordered, or to free her when confined; though not utterly to divert or transmute her.—But the truth is, artificial things do not differ from natural ones in nature or form, but only in the efficient: man has no power over nature, beside what he has by motion; in virtue whereof, he can apply natural bodies to, or remove them from, one another. Where such application, or joining of active things to passive ones, is practicable, there may men do any thing; where it is not, nothing. Gold we sometimes see purified by the chemist's fire; and sometimes find it perfectly pure in the sands, nature herself having done the business: so the rainbow is sometimes formed on high in the water of a cloud; and sometimes here below by a sprinkling of water. Nature, therefore, governs all things; under this subordination, of the course of nature, the latitude or evagation of nature, and art, or man super-added to her other works.' Bacon de Augmen. Scient. lib. II.

ARTIFICIAL is also frequently used for *façitious*. Thus we have *artificial sal-armoniac*, *artificial borax*, &c.

ARTIFICIAL Arbours. See the article **ARBOUR**.

ARTIFICIAL Arguments, in rhetoric, are all such proofs or considerations as arise from the genius, industry, or invention of the orator.

Such are definitions, causes, effects, &c. which are thus called, to distinguish them from laws, authorities, citations, and other arguments of that nature, which are said to be *inartificial* arguments.

ARTIFICIAL Baths.	} See the article	BATH.
ARTIFICIAL Camphor.		CAMPHOR.
ARTIFICIAL Cinnabar.		CINNABAR.
ARTIFICIAL Colcothar.		COLCOTHAR.
ARTIFICIAL Conduits.		CONDUIT.
ARTIFICIAL Day.		DAY.
ARTIFICIAL Divination.		DIVINATION.
ARTIFICIAL Earthquakes.		EARTHQUAKE.
ARTIFICIAL Eye.		EYE.
ARTIFICIAL Fire.		FIRE.

ARTIFICIAL Fire-works are compositions of inflammable materials; chiefly used on solemn occasions, by way of rejoicing.

ARTIFICIAL Flying.	} See the article	FLYING.
ARTIFICIAL Forms.		FORM.
ARTIFICIAL Foundation.		FOUNDATION.
ARTIFICIAL Fountain.		FOUNTAIN.

ARTIFICIAL Globe, Spheres, &c. See **GLOBE**, **SPHERE**, &c.

ARTIFICIAL Horizon. See **HORIZON**.

ARTIFICIAL Laccæ. See the article **LACCA**.

ARTIFICIAL Lines, on a sector or scale, are certain lines so continued, as to represent the logarithmic lines, and tangents; which, by the help of the line of numbers, will solve all questions in trigonometry, navigation, &c. pretty exactly.

ARTIFICIAL Litharge. See the article **LITHARGE**.

ARTIFICIAL Numbers are *secants*, *sines*, and *tangents*.—See **SECANT**, **SINE**, and **TANGENT**.

ARTIFICIAL Phosphori.	} See the article	PHOSPHORI.
ARTIFICIAL Ports.		PORT.
ARTIFICIAL Postures.		POSTURE.
ARTIFICIAL Precipitation.		PRECIPITATION.
ARTIFICIAL Rainbow.		RAINBOW.

ARTIFICIAL Road.

ARTIFICIAL Saltpetre.	} See the article	SALTPETRE.
ARTIFICIAL Star.		STAR.
ARTIFICIAL Vermillion.		VERMILLION.
ARTIFICIAL Vortex.		VORTEX.

ARTILLERY, the heavy equipage of war; comprehending all sorts of great fire-arms, with their appurtenances; as cannons, mortars, bombs, petards, musquets, carbines, &c.

In this sense, the word *artillery* coincides with what we otherwise call *ordnance*.

There was no attacking such a place for want of heavy *artillery*.—The Persians, we are told in the embassy of Figueroa, would never, in 1518, have either *artillery* or infantry in their armies, by reason they hindered their charging and retreating with so much nimbleness; wherein their chief military address and glory lay.

The term *artillery* is sometimes also applied to the ancient instruments of war, as the catapultæ, battering rams, &c. See **ARIES**, &c.

Park of ARTILLERY is that place in a camp set apart for the *artillery*, or large fire-arms.

Trails or Train of ARTILLERY is a set or certain number of pieces of ordnance, mounted on carriages, with all their furniture fit for marching. To this frequently belong mortar-pieces, with bombs, carcasses, &c. It is under the direction of the master of the *artillery*.

There are trains of *artillery* in most of the king's magazines; as in the Tower, at Portsmouth, Plymouth, Windsor, &c.

ARTILLERY Company is a band of infantry, consisting of 600 men, making part of the militia or city-guard of London.

Their officers are a leader, two lieutenants, two ensigns, three gentlemen of arms, two sergeants, and a provost marshal *Chamberl.*

ARTILLERY is also used for what we otherwise call *pyrotechnia*, or the art of fire-works, with the instruments and apparatus belonging thereto.

The writers upon *artillery* are, Casimir Simonowitz, a Pole; Buchnerus, Bratunius, Mieth, and S. Remy in his *Memoires d'Artillerie*, which contain an accurate description of all the machines and instruments of war now in use, with every thing that relates thereto.

ARTILLERY foot-level. See the article **LEVEL**.

ARTOTYRITES, or **ARTOTYRITÆ**, a sect in religion; being a branch of the ancient Montanists, who first appeared in the second century, and infested all Gallia.

They used bread and cheese in the Eucharist, or perhaps bread baked with cheese.—Their reason was, that the first men offered to God not only the fruits of the earth, but of their flocks too.

* Hence according to St. Augustin, came their name, which is Greek; being composed of *αροσ*, bread, and *τυρος*, cheese.

ARVALES* Fratres were priests in ancient Rome, who assisted in the sacrifices of the Ambarvalia offered every year to Ceres and Bacchus for the prosperity of the principal fruits of the earth, viz. the corn and wine.

* The word is originally Latin, and is formed from *arvum*, a field; because in their ceremonies, they went in procession around the fields; or, according to Gellius, because they offered sacrifice for the fertility of the fields. Others say, because they were appointed arbitrators of all differences relating to the limits of fields and land-marks.

They were instituted by Romulus, and were twelve in number; all of them persons of the first distinction; the founder himself having been of the body.—They made a college, called *collegium fratrum arvalium*.

The mark of their dignity was a garland, composed of ears of corn, tied with a white ribbon: this, Pliny says, was the first crown in use at Rome.

According to Fulgentius, Acca Laurentia, Romulus's nurse, was the first founder of this order of priests: she, it seems, had twelve sons, who used to walk before her in procession to the sacrifice; one of whom dying, Romulus, in favour of his nurse, promised to take his place; and hence, says he, came this sacrifice, the number twelve, and the name of brother.—Pliny (l. 17. c. 2.) seems to indicate the same thing, when he mentions that Romulus instituted priests of the fields, after the example of Acca Laurentia his nurse.

ARUNDELIAN Marbles. See the article **MARBLE**.

ARUSPICES*, an order of priests among the ancient Romans, who foretold things to come, chiefly by inspecting the entrails of beasts which were killed in sacrifice.

* The word seems more properly written *haruspices*; as being derived from *haruga*, which signifies the entrails of victims; and *aspicer*, to view or consider. Or, as others think, from *hara*, *hostia*, a victim: though some defend the orthography of *aruspices*, deriving the word from *arus*, and *inspicere*, to inspect the altars.—Pa. Pezron is positive it was originally formed of the Celtic *ar*, liver; and *spico*, I look; whence *aspex*: which being a word somewhat rude of pronunciation, they thence formed *aruspex*.

Ipex. In Feitus we meet with *haruiga*, or *hardiga*, which he defines to be a victim whose viscera are considered while yet remaining together. Upon which Mr. Dacier observes, that *haruiga* is formed from *aripis*, *aries*, by inserting the Æolic digamma, before the *i*. It was properly, therefore, at first a ram they sacrificed; but afterwards the name became common to all victims. See *VICTIM*.

The doctrine or discipline of the *aruspices*, was formed into a precise art, called *aruspicina*.

Cato, who was an Augur, used to say, he wondered how one *aruspex* could look at another without laughing in his face. By which you see what opinion he had of the solidity of the *aruspicina*.

ARYTÆNOIDES*, in anatomy, the third and fourth cartilages of the larynx, situate under the thyroids: called also *guitales*.

* The *arytænoides* are thus called on account of the figure of an *aportava*, cwer; which, together, they somewhat resemble: and the name is compounded of that word, and *isōs*, shape, or figure.

ARYTÆNOIDEUS, in anatomy, one of the muscles serving to close the larynx; or otherwise called little *arytænoides*, and *aryartænoides*, as deriving its origin from the posterior and inferior part of the *arytænoides*.

The *arytænoides* has its head in one *arytænoid* cartilage, and its tail in the other; and serves to bring them together, and shut the rima or glottis.

ARYTHMUS*, or **ARHYTHMUS**, in medicine, is used by some for a sinking, or failure of the pulse, so as it can no longer be felt; but it more properly denotes an irregularity, or want of due order and proportion of the pulse.

* The word is formed from the privative particle *a*, and *ῥυθμῶς*, modular, or measure.

AS*, among antiquaries, sometimes signifies a particular weight; in which sense the Roman *as* is the same with the Roman *libra*, or pound.

* The word is by some derived from the Greek *ἀσ*, which, in the Doric dialect, is used for *is*, one, *q. d.* an entire thing; though others will have this money named *as*, quasi *as*, because made of brass.—Budeus has wrote nine books *de asse*, & *ejus partibus*, of the *as* and its parts.

The *as* had several divisions.—The principal were, the *uncia*, or ounce; which was the twelfth part of the *as*: *sextans*, the sixth part of the *as*, or two ounces: *quadrans*, the fourth part of the *as*, or three ounces: *triens*, the third part of the *as*, which was four ounces: *quincunx*, was five ounces: *semis*, half the *as*, that is six ounces: *septunx*, seven ounces: *bes*, two thirds of the *as*, or eight ounces: *dodrans*, three fourths of the *as*, or nine ounces: *dextans*, ten ounces: and *deunx*, eleven ounces.

As was also the name of a Roman coin, which was made of different matters, and different weights, in different ages of the commonwealth.

Under Numa Pompilius, according to Eusebius, the Roman money was either of wood, leather, or shells.—In the time of Tullus Hostilius, it was brass, and was called *as*, *libra*, *libella*, or *pond*, because actually weighing a pound, or twelve ounces.

Four hundred and twenty years after, the first Punic war having exhausted the treasury, they reduced the *as* to two ounces. In the second Punic war, Hannibal pressing hard on them, the *asses* were farther reduced to an ounce a-piece.—Lastly, by the Papirian law, they took away half an ounce more, and reduced the *as* to a bare half ounce: and it is generally thought that it rested here all the time of the commonwealth, and even till Vespasian's reign.

This last was called the *Papirian as*, in regard the law just mentioned was passed in the year of Rome 563, by C. Papirius Carbo, then tribune of the people. Thus, there were four different *as*'s in the time of the commonwealth.

The figure stamped on the *as*, was at first a sheep, ox, or fow. (*Plutarch. Pœpic. Plin. 18. 3.*) And from the time of the kings, a Janus with two faces on the one side, and the rostrum, or prow of a ship on the reverse.*

* The triens and quadrans of copper had the figure of a small vessel called *ratia*, on the reverse. Thus Pliny: *Nota aris, [i. e. assis] fuit ex altera parte Janus geminus, ex altera rostrum navis: in triente vero & quadrante ratia*. Hist. Nat. l. 33. c. 3.—Hence these pieces were sometimes called *Ratiti*.

As was also used to denote any integer, or whole.—Whence the English word *ace*.

Thus *as*, signified the whole inheritance; whence *heres ex asse*, the heir to the whole estate.

So the *jugerum*, or Roman acre of land, being reckoned the integer, was called *as*, and divided like it into 12 *uncia*. See *JUGERUM*.

The *as*, and its parts, or divisions, stand thus:

1	As	12	Unciæ	12	Semis	6	Unciæ
1/2	Deunx	11	1/2	1/2	Quincunx	5	
1/3	Dextans	10	1/3	1/3	Triens	4	
2/4	Dodrans	9	1/4	1/4	Quadrans	3	
3/4	Bes	8	1/4	1/4	Sextans	2	
1/2	Septunx	7	1/2	1/2	Unia	1	

ASAPPES*, or **AZAPES**, an order of soldiers in the Turkish army, whom they always expose to the first shock of the enemy; to the end that being thus fatigued, and their swords blunted, the Saphi's and Janizaries may fall on and find an easy conquest.

* The word is derived from the Turkish *sapp*, which signifies rank, file, order; from whence they have formed *asbabap*, to range in battle.

The *Asappes* are said to be held of so little value, that they frequently serve as bridges for the cavalry to pass over, in bad roads, and as fascines to fill up the ditches of places besieged.—The greatest part of them are natural Turks; they travel on foot, and have no pay, but the plunder they can get from the enemy.

ASARABACKA, or **ASARA-BACARA**, a plant supposed to be mentioned by Pliny and Dioscorides, under the name of *baccharis*, or *nardus rustica*; by us called *asaram*.

Avicenna relates, that it used to be brought from China; that its roots resemble those of gramen, or dog's-grass; but that it has a pretty brisk smell, and bites the tongue when tasted.

—Its leaves were anciently much in use, as an emetic, and cathartic; and in some authors we find a superstitious observance in regard to the gathering of them: they alledge, that if the plant be pulled up forward, it becomes vomitive, but if backwards, purgative. Rulandus and Fernelius frequently prescribe it as a diuretic.

But it is chiefly used among us as a sternutatory, in order to which, it is dried and reduced to a powder, to be taken as a snuff; in which quality it drains the head of mucous humours. See *SUPPLEMENT*, article *ASARUM*.

ASBESTINE, something incombustible, or that partakes of the nature, and qualities of the lapis asbestos. See *ASBESTOS*.—Hence we read of

ASBESTINE Paper and Cloth, which will burn in the fire, be purified by it, and yet not consume.

The ancients are said to have made napkins and towels of it, which, when foul, instead of washing, they threw into the fire to cleanse.

ASBESTOS*, a mineral substance, of a whitish, or silver colour, and a woolly texture; consisting of small threads or delicate fibres, endued with the wonderful property of resisting fire, and remaining unconsumed in the intensest heat.

* The word *ἀσβηστος*, *asbestos*, properly signifies an incombustible body; it is formed of the primitive particle *a* and *σβηστωσι*, *extinguo*.

This languinous mineral is sometimes also call'd *amiantus*, and sometimes *salamandra*, or *salamander's wool*, from the candlewicks said to be made anciently of it. From a pungent quality, which Agricola says it has on the tongue, the word without ascription, it has been by some call'd *alumen*, having the epithet of *plumeum* added to it, taken from its downy filaments, to distinguish it from the other allums; though it is to be observed, the true plume allum is another sort of body, being a real efflorescence of allum.

From its light grey colour, it is called *polia* and *corfoides*; and from its likeness to the hoary fibres of some sorts of mat-weed, *spartapelia*. From the capacity it has of being spun into thread, it is called *linum*, with some distinguishing epithet, taken either from its quality, as *linum asbestinum vivum*, or *incambusibile*; or from the place where it is found, as *linum sassile*, *linum Indicum*, *Creticum*, *Cyprium*, and *Carpathium*, or *Carystium*. Besides the places whence it borrows names, it is also found in Tartary, at Namur in the Low Countries, in Thuringia, among the mines in the Old Noricum, in Egypt, in the mountains of Arcadia, at Putcoli in the island of Corfica, in the island of Anglesey in Wales, and in Aberdeenshire in Scotland, at Montauban in France, and in the kingdom of Siberia.

Naturalists generally reckon it among the stones, whence its appellation of *lapis Asbestos*, &c. but Dr. Plot rather judges it a *terra lapidosa*, or middle substance, between stone and earth. As to its generation, the same author takes it to be a mixture of some salt, and a pure earth without sulphur, co-agulated in the winter, and hardened by the heats in summer. The salt, J. Hellius pretends, is a liquid allum of a milky substance, inclining to yellow, that sweats out of the earth, and smells like rotten cheefe.

The *Asbestos*, or *lapis asbestos*, is really a sort of native, file-stone, which one may split into threads or filaments, very fine, brittle, yet somewhat tractable, silky, and of a greyish silvery colour, not unlike talc of Venice.

It is almost insipid to the taste, indissoluble in water; and, exposed to the fire, it neither consumes nor calcines.—A large burning-glass, indeed, reduces it into little glass globules, in proportion as the filaments separate; but common fire only whitens it.

These filaments are of different lengths, from one inch to ten.—The stone is usually found inclosed within other very hard stones; though sometimes growing to the surfaces of them, and sometimes detached or separate from any.

The *Asbestos*, applied to any part of the body, excites an itching; and yet we read of it as anciently prescribed for diseases

of the skin; and particularly for the itch: unless it were rather the *alumen plumbum* that was meant hereby; for even at this day, they are frequently confounded.

The industry of mankind has found a method of working this untoward mineral, and employing it in divers manufactures, chiefly cloth, and paper.

The manufacture is undoubtedly difficult enough. Pliny calls the *Asbestos, inventurum, textu difficillimum*: Wormius assures us, that the method of making cloth of *Asbestos* is now entirely unknown: in reality, one would scarce imagine the thing practicable, without the mixture of some other pliant matter, as wool, hemp, or flax, along with the *Asbestos*, the filaments of this latter appearing too coarse, and brittle, to make any tolerable fine work. However this be, Bapt. Porta assures us that, in his time, the spinning of *Asbestos* was a thing known to every body at Venice.

Sig. Castagnatta, superintendent of some mines in Italy, is said to have carried the manufacture to such perfection, that his *Asbestos* was soft, and tractable, much resembling lambkin dressed white: he could thicken and thin it at pleasure, and thus either make it into a very white skin, or a very white paper.

This kind of linen-cloth was highly esteemed by the ancients; though then better known, and more common than among us; being held equally precious with the richest pearls: nor is it now of mean value even in the country where it is most generally made, a China cover, (*i. e.* a piece of twenty-three inches and three quarters long) being worth eighty tale, *i. e.* 36*l.* 13*s.* 4*d.* Pliny says, he himself had seen napkins thereof, which, being taken foul from the table, after a feast, were thrown into the fire, and by that means were better covered than if they had been washed in water, &c. But its principal use, according to Pliny was, for the making of shrouds for royal funerals, to wrap up the corps, so as the ashes might be preserved distinct from that of the wood, &c. whereof the funeral pile was composed: and the princes of Tartary, according to the accounts in the Philosophical Transactions, still use it at this day in burning their dead. Some of the ancients are said to have made themselves clothes of it, particularly the Brachmans among the Indians. The wicks for their perpetual lamps, according to Dr. Lister, were also made of it; and some to this day use it for the wicks of such lamps as they would not have any trouble with; because the *Asbestos* never wasting, there is no occasion for shifting the wick. Sepalla canon of Milan had thread, ropes, nets, and paper made of the *Asbestos*. A handkerchief or pattern of this linen was long since presented to the Royal Society, a foot long, and half a foot broad. This gave two proofs of its resisting fire; though in both experiments it lost above three drams in its weight. When taken out red-hot, it did not burn a piece of white paper, on which it was laid. Mr. Vilette pretends, that his large burning concave usually vitrifies the *Asbestos*. See SUPPLEMENT, article ASBESTUS.

ASCARIDES *, *Ascaridis*, in medicine, a slender sort of worms, found in the intestinum rectum, chiefly of children, and frequently voided with their feces; sometimes also adhering to the fundament, or even pendant from it.

* They are thus called from the Greek *ασκαρίς*, I leap, on account of their continual troublesome motion, causing a most intolerable itching.

Ascarides are said to be often the occasion of a prolapsus ani. See PROLAPSIUM.

ASCENDANT, **ASCENDENT**, or **ASCENDING Line**, in genealogy, is understood of ancestors, or such relations as have gone before us; or are nearer the root of the family.

Such are father, grandfather, great uncle, &c.—They are thus called in contradistinction to descendants, or the descending line.

Marriage is always forbid between the *ascendants* and descendants, in a direct line.

ASCENDANT, in astrology, denotes the horoscope; or the degree of the ecliptic which rises upon the horizon, at the time of the birth of any one.

This is supposed to have an influence on the person's life and fortune, by giving him a bent and propensity to one thing more than another.

In the celestial theme, this is also called the *first house*, the *angle of the East*, or *Oriental angle*, and the *significator of life*.—Such a planet ruled in his *ascendant*.—Jupiter was in his *ascendant*, &c.

Hence the word is also used in a moral sense, for a certain superiority which one man has over another, from some unknown cause.

ASCENDENS Obliquus. See the article OBLIQUUS.

ASCENDING, in astronomy, is understood of those stars, or degrees of the heavens, &c. which are rising above the horizon, in any parallel of the equator.

ASCENDING Latitude is the latitude of a planet when going towards the north pole.

ASCENDING Node is that point of a planet's orbit, wherein it passes the ecliptic, to proceed northward. This is otherwise called the *northern node*, and is represented by this character Ω . See NODE, &c.

ASCENDING, Ascendens, in matters of genealogy, &c. See ASCENDANT.

ASCENDING Signs, among astrologers, are those which are upon their ascent or rise, from the nadir or lowest part of the heavens, to the zenith or highest.

ASCENDING, in anatomy, is applied to such vessels as carry the blood upwards, or from lower to higher parts of the body.

The *ascending aorta, aorta ascendens*, is the superior trunk of the artery, which furnishes the head.

The *ascending cava, vena cava ascendens*, is a large vein formed by a meeting or union of the iliacs of one side, with those of the other. See Tab. Anat. (Splanchn.) fig. 1. lit. o. (Angeiol.) fig. 6. lit. cc.

Many of the ancient anatomists called this the *descending cava*; as imagining that the blood descended from the liver by this vein, to supply the parts below the diaphragm. But the moderns have shewn that it has a quite contrary use, and serves for the conveyance of the blood from the lower parts to the heart; whence its appellation *ascendant*.

ASCENSION, ASCENSIO, a rising, or moving upward.

ASCENSION is particularly used for that miraculous elevation of our Saviour, when he mounted to heaven, body and soul, in the sight of his Apostles.

Several errors and heresies relating to the *ascension* of Christ's human body are briefly touched by Tertullian: *Ut & illi erubescant qui adfirmant carnem in calis vacuari sensu, ut vaginam, exempto Christo sedere; aut qui carnem & animam tantundem, aut tantummodo animam, carnem vero non jam.*—The apostles taught, that Christ left his body dissolved in the air, (St. Austin says in the east) and so ascended into heaven without it: as he did not, say they, bring his body from heaven, but received it from the elements of the world; so he returned it again to the world.—The Selencian and Hermian taught, that the body of Christ ascended no farther than the sun, in which it was deposited: from that passage of the Psalms, “in the sun has he placed his tabernacle.” Which opinion Greg. Nazianzen also attributes to the Manichees.

ASCENSION-Day, popularly called *Holy-Thursday*, a festival of the church, held ten days before Whitstide, in memory of our Saviour's *ascension*.

ASCENSION, in astronomy, is either *right* or *oblique*.

Right ASCENSION of the sun, or of a star, is that degree of the equinoctial, accounted from the beginning of Aries, which rises with the sun or star, in a *right sphere*.

Or, *right ascension* is that degree and minute of the equinoctial, counted as before, which comes to the meridian with the sun or star, or other point of the heavens.

The reason of thus referring it to the meridian, is, because that is always at right angles to the equinoctial, whereas the horizon is only so in a *right* or *direct sphere*.

The *right ascension* stands opposed to the *right declension*.

Two fix'd stars, which have the same *right ascension*, *i. e.* are at the same distance from the first point of Aries in a *right sphere*; or, which amounts to the same, are in the same meridian; rise at the same time.—If they be not in the same meridian, the difference between the time when they rise is the precise difference of their *right ascension*.—In an *oblique sphere*, where the horizon cuts all the meridians obliquely, different points of the meridian never rise or set together; so that two stars on the same meridian never rise or set at the same time; and the more oblique this sphere, the greater is the interval of time between them.

To find the *right ascensions* of the sun, stars, &c. trigonometrically, say, As radius is to the cosine of the sun's greatest declination, so is the tangent of the distance from Aries or Libra, to the tangent of *right ascension*.

—To find the *right ascensions* mechanically by the globe; see GLOBE.

The *arch of right ascension* is that portion of the equator intercepted between the beginning of Aries, and the point of the equator which is in the Meridian: or it is the number of degrees contained therein.—This coincides with the *right ascension* itself.—The *right ascension* is the same in all parts of the globe.

We sometimes also say, the *right ascension* of a point of the ecliptic, or any other point of the heavens.

The difference between the *right* and *oblique ascensions* is called the *ascensional difference*. See ASCENSIONAL.

Angle of Right ASCENSION. See the article ANGLE.

Oblique ASCENSION is an arch of the equator intercepted between the first point of Aries, and that point

of the equator which rises together with a star, &c. in an oblique sphere.

The oblique *ascension* is numbered from west to east; and is more or less according to the different obliquity of the sphere.

To find the oblique *ascensions* of the sun, either trigonometrically, or by the globe. See *ASCENSIONAL Difference*, and *GLOBE*.

The arch of *oblique-ascension* is an arch of the horizon intercepted between the beginning of Aries, and the point of the equator which rises with a star or planet in an oblique sphere.—This coincides with the oblique *ascension* itself.—The oblique *ascensions* change according to the latitude of the places.

Refraction of ASCENSION and Defension. See *REFRACTION*. *ASCENSIONAL Difference* is the difference between the right and oblique *ascension* of the same point on the surface of the sphere.

To find the *ascensional* difference trigonometrically; having the latitude of the place, and the sun's declination given, say, As radius is to the tangent of the latitude, so is the tangent of the sun's declination to the sine of the *ascensional* difference.

If the sun be in any of the northern signs, and the *ascensional* difference, as D O, be subtracted from the right *ascension* D, (*Tab. Astron.*, fig. 63.) the remainder will be the oblique *ascension* O.—If he be in a southern sign, the *ascensional* difference being added to the right *ascension*, the sum is the oblique *ascension*: and thus may tables of oblique *ascensions* be constructed for the several degrees of the ecliptic, under the several elevations of the pole.

ASCENSORIUM sometimes occurs in our ancient writers for a stair or step. See *STAIRS*.

ASCENT, *ASCENSUS*, the motion of a body tending from below upwards; or the continual recess of a body from the earth.

In this sense the word stands opposed to *descent*.

The Peripatetics attribute the spontaneous *ascend* of bodies, to a principle of levity inherent in them.

The moderns deny any such thing as spontaneous levity, and shew, that whatever *ascends*, does it in virtue of some external impulse or extrusion. Thus it is that smoke, and other rare bodies, *ascend* in the atmosphere; and oil, light woods, &c. in water: not by any external principle of levity, but by the superior gravity or tendency downwards of the parts of the medium wherein they are.

The *ascend* of light bodies in heavy mediums is produced after the same manner as the *ascend* of the lighter scale of a balance.

—It is not that such scale has an internal principle whereby it immediately tends upwards; but it is impelled upwards by the preponderancy of the other scale; the excess of the weight of the one having the same effect by augmenting its impetus downwards, as so much real levity in the other: by reason the tendencies mutually oppose each other, and that action and reaction are always equal.—See this further illustrated under the articles *SPECIFIC Gravity*, and *FLUID*.

ASCENT of Bodies on inclined Planes. See the doctrine and laws thereof, under the article *Inclined PLANE*.

ASCENT of Fluids is particularly understood of their rising above their own level between the surfaces of nearly contiguous bodies, or in slender capillary glass tubes, or in vessels filled with sand, adhes, or the like porous substances.

This effect happens as well in vacuo as in the open air, and in crooked as well as straight tubes.—Some liquors, as spirit of wine, and oil of turpentine, *ascend* swifter than others; and some rise after a different manner from others. Mercury does not *ascend* at all, but rather subsides.

The phenomenon, with its causes, &c. in the instance of capillary tubes, will be spoke of more at large under the article *CAPILLARY Tube*.

As to planes.—Two smooth polished plates of Glass, metal, stone, or other matter, being so disposed as to be almost contiguous, have the effect of several parallel capillary tubes; and the fluid rises in them accordingly: the like may be said of a vessel filled with sand, &c. the divers little interstices whereof form, as it were a kind of capillary tubes. So that the same principle accounts for the appearance in them all. And to the same may probably be ascribed the *ascend* of the sap in vegetables.

Thus Sir I. Newton.—If a large pipe of glass be filled with sifted ashes well pressed together, and one end dipped into stagnant water, the fluid will *ascend* slowly in the ashes, so as in the space of a week or fortnight, to reach the height of thirty or forty inches above the stagnant water. This *ascend* is wholly owing to the action of those particles of the ashes which are upon the surface of the elevated water; those within the water attracting as much downwards as upwards: it follows, that the action of such particles is very strong; though, being less dense and close than those of glass, their action is not equal to that of glass, which keeps quicksilver suspended to the height of sixty or seventy inches, and therefore acts with a force which would keep water suspended

to the height of about sixty feet.—By the same principle, a sponge sucks in water, and the glands in the bodies of animals, according to their several natures and dispositions, imbibe various juices from the blood.' *Optics*, p. 367. If a drop of oil, water, or other fluid, be laid on a glass plane perpendicular to the horizon, so as to stand without breaking or running off; and another plane, inclined to the former so as to meet a-top, be brought to touch the drop; then will the drop break, and *ascend* towards the touching end of the planes: and it will *ascend* the faster in proportion as it is higher, by reason the distance between the planes is constantly diminishing.—After the same manner, the drop may be brought to any part of the planes, either upward or downward, or sideways, by altering the angle of inclination.

Lastly, if the same perpendicular planes be so placed, as that two of their sides meet and form a small angle, the other two being only kept a-part by the interposition of some thin body; and thus immersed in a fluid tinged with some colour: the fluid will *ascend* between the planes, and this the highest where the planes are nearest; so as to form a curve line, which is found to be a just hyperbola, one of the asymptotes whereof is the line of the fluid, the other being a line drawn along the touching sides.—The physical cause, in all these phenomena, is the same power of attraction.

ASCENT of Vapour. See the article *CLOUD*.

The *ascend* of the vapours of gunpowder, in an exhausted receiver, is a phenomenon, the solution of which nobody, I think, has yet attempted. *V. Philof. Transact.* N^o. 347. p. 420.

ASCENT, in astronomy, &c. See *ASCENSION*.

ASCENT, in logic, denotes a kind of argumentation, wherein we rise from particulars to universals.

As, when we say, this man is an animal, and that man is an animal, and the other man, &c. therefore every man is an animal.—Or fire, water, air, and earth, are four; therefore the number of elements is four.

*ASCETIC**, *ασκητικα*, an ancient appellation given to such persons as, in the primitive times, devoted themselves more immediately to the exercises of piety and virtue in a retired life; and particularly to prayer, abstinence, and mortification.

* The word is derived from the Greek *ασκησ*, *exercet*, I exercise.

Afterwards, when the monks came in fashion, this title was bestowed upon them; especially upon such of them as lived in solitude.

ASCETIC is also a title of several books of spiritual exercises.

—As, the *ascetics*, or devout treatises of St. Basil, archbishop of Cæsarea in Cappadocia.

We also say the *ascetic life*, meaning the exercise of prayer, meditation, and mortification.

A *SECRETIS*. See the article *SECRETARY*.

ASCETERIUM, *ASSISTERIUM*, *ARCHISTERIUM*, &c. are words frequently used among our ancient writers for a monastery.

*ASCII**, in geography, are those inhabitants of the globe, which, at certain times of the year, have no shadow.

* The word is formed of the privative particle *a*, and *σκια*, *umbra*, shadow.

Such are the inhabitants of the torrid zone; by reason the sun is sometimes vertical to them.—To find on what days the people of any parallel are *ascii*. See *GLOBE*.

*ASCITÆ**, in antiquity, a sect or branch of Montanists, who appeared in the second century.

* The word is derived from the Greek *ασκησ*, a bag or bottle:

The *Ascitæ* were so called, because they introduced a kind of Bacchanals into their assemblies, who danced round a bag or skin blown up; saying, they were those new bottles filled with new wine, whereof Jesus Christ makes mention. *Math.* ix. 17.—They are sometimes also called *Ascodrogitæ*.

*ASCITES**, *ασκίτις*, in medicine, a species of dropsy, affecting chiefly the abdomen, or lower belly.

* The word is borrowed from the Greek *ασκησ*, *uter*, bag or bladder.

The *Ascites* is the ordinary water-dropsy. See *DROPSY*.

ASCLEPIAD, *ASCLEPIADEUS*, a Greek or Latin verb of four feet, containing a spondee, a choriambus, and two dactyls; or, which amounts to the same, a spondee, two choriambus's, and a pyrrhicus.

Such is the verse, *Mæcenat atavis edite regibus*. Or, *Sublimi seriam sidera vertice*.

ASCODRUTÆ, in antiquity, a sect of heretics, in the second century, who rejected all use of symbols and sacraments, on this principle, that incorporeal things cannot be communicated by things corporeal, nor divine mysteries by any thing visible.

ASCOLIA, in antiquity, a feast which the peasants of Attica celebrated in honour of Bacchus.

They sacrificed a he-goat to him (as being the destroyer of vines) and of the victim's skin made a foot-ball, which they blew

blew up, and anointed with some unctuous matter: or, as Potter thinks, they made a bottle of it, which they filled with oil and wine. The young people playing at this, and keeping themselves always on one foot, whilst the other was suspended in air, by their frequent falls, gave occasion of diversion to the spectators.—Hence this feast took its name; *arsæ*, signifying a bag or budget.

ASELLII PANCREAS. See the article PANCREAS.

ASELLUS, in natural history. MILLEPEDES.

ASHLAR, a term used among builders: by which they mean common or free stones, as they come out of the quarry, of different lengths and thicknesses.

ASHLERING, among builders, signifies quartering, or tack to, in garrets, about 2½, or 3 foot high, perpendicular to the floor, up to the under side of the rafters.

ASH, in building. See the article TIMBER.

ASH-WEDNESDAY, the first day of Lent; supposed to have been so called from a custom in the church, of sprinkling ashes that day on the heads of penitents then admitted to penance.

ASHES, *Cineres*, the terrene or earthy part of wood, and other combustible bodies, remaining after they are burnt or consumed with fire.

Ashes are properly the earth, and fixed salts of the fuel, which the fire cannot raise; all the other principles being gone off in the smok.

The chymists frequently call the *ashes* of a body its *calx*.—*Ashes*, if well burnt, are usually pure white, by reason the oil to which they owe their blackness when in a coal, is supposed quite evaporated. The *ashes* of kali, fern, or the like, are a principal matter in the composition of glass.

The *ashes* of all vegetables are found to contain iron, inasmuch that M. Geoffroy makes it a chymical problem, which he proposes to the public, to find *ashes* without any particles of iron therein.—Whether the metal existed in the plants themselves, or is produced in them by the operation of calcination, is a point very ingeniously controverted between Mess. Geoffroy and Lemery the younger, in the memoirs of the royal academy. See the substance of the dispute under the article METAL.

Ashes are of considerable use in making lixiviums, or lyes, for the purposes of medicine, for bleaching, and for fugar-works, &c.

* White *ashes* were forbid to be exported, 2 *Ed.* 3 *Ed.* 6. c. 26. on account of their necessary use in the making of soap, and salt-petre; as well as for the whitening of linen, and the dying and tawering of woollen cloth.

In the bills of entry we find divers sorts of *ashes* imported from abroad: as pot-*ashes*, pearl-*ashes*, from Germany; wood or soap-*ashes*, and weed-*ashes*. See POTASHES, &c.

The ancients preserved the *ashes* of their dead ancestors with great care and piety, in urns made for the purpose. See FUNERAL, URN, BURNING, &c.

Ashes of all kinds, in virtue of their salt, make an excellent manure for cold and wet grounds.—Hence that of Virgil,

—*Ne pudeat,*

Effetos cinerem immundum jactare per agros.

POT-ASHES. See the article POT-ASHES.

In the Philosph. Transact. N^o. 21, we have an account of a shower of *ashes* in the Archipelago, which held several hours, and extended to places distant above an hundred leagues. See SHOWER, and RAIN.

ASIATIC Style. See the article STYLE.

ASIDE, in the drama.—An *ASIDE*, *seorsim*, is something which an actor speaks a-part, or, as it were, to himself, for the instruction of the audience, by discovering some sentiment which otherwise did not appear, and which is to be concealed from the rest of the actors then present.

The severer critics condemn all *asides*; and with some reason; as they are a manifest breach of probability.—Accordingly, they are never to be used but at a pinch, which a good author will scarce suffer himself to be brought to.

ASKING in the Church, 5 6 *Ed.* 6. c. 12. See BANNIS.

ASPALATH, ASPALATHUM, in pharmacy, the wood of a foreign tree, heavy, oleaginous, somewhat sharp and bitter to the taste, and of a strong smell and purple colour.

The *aspalath* is otherwise called *lignum Rhodium*, or *rose-wood*; and by some *Cypressi-wood*; the former on account of its sweet smell, or growth in the island of Rhodes; the latter from its being also found in the island of Cyprus. Though some will have *aspalathum* a different wood from the *lignum Rhodium*.

Aspalath was anciently in much repute, as an astringent, strengthner, and dryer, but is now much disused in internal practice.

In virtue, taste, smell, and weight, it resembles the *lignum albes*; and in phytic they are frequently substituted the one for the other.

There are four kinds of *aspalath*.—The first is of the colour of box; hard, solid, heavy, and of a smell like roses, whence

its appellation *rosewood*.—The second, is red, like yew, and of a very agreeable smell.—The third, hard, twisted, and knotty; it has a rank smell, like that of a goat, and a disagreeable taste.—The fourth has an ash-coloured bark, and is a wood of a purple dye.

Aspalathum affords an oil of an admirable scent; reputed one of the best of perfumes; it is chiefly used in scenting pomatums and liniments.

ASPECT, ASPECTUS, in gardening, is used for what we otherwise call *exposure*.

ASPECT, in astronomy, is used for the situation of the stars, or planets, in respect of each other; or a certain configuration, and mutual relation between the planets, arising from their situations in the zodiac, whereby their powers are supposed to be mutually either increased or diminished, as they happen to agree or disagree, in their active or passive qualities.

Though such configurations may be varied, and combined a thousand ways, yet only a few of them are considered.—Hence, Wolfius more accurately defines *aspect* the meeting of luminous rays emitted from two planets, to the earth, either situate in the same right line, or including an angle which is one or more quota parts of four right angles.

The doctrine of *aspects* was introduced by the astrologers, as the foundation of their predictions.—Hence Kepler defines *aspect* an angle formed by the rays of two planets meeting on the earth, able to excite some natural power or influence.

The ancients reckoned five *aspects*, viz. conjunction, denoted by the character \odot , opposition by \ominus , trine by Δ , quadrature by \square , and sextile \ast .

Conjunction and opposition are the two extremes of the *aspects*; the first being the beginning, and the second the highest or ultimate term. See CONJUNCTION, and OPPOSITION.

Trigon, or trine, is the third part of a circle, or the angle measured by AB. (*Tab. Astron. fig. 3.*)

Tetragon, or quadrature, is the fourth part of a circle, or the angle measured by the quadrant AD: sextile, which is the sixth part of a circle, or angle, is measured by the sextant AG. See TRIGON, &c.

The *aspects* are divided with regard to their supposed influences into benign, malign, and indifferent.

The quadrature *aspect* and opposition are reputed malign, or *malific*; trine and sextile, benign, or *friendly*; and conjunction, an *indifferent aspect*.

To the five ancient *aspects*, the modern writers have added several more; as *decile*, containing the tenth part of a circle; *tridecile*, three tenths; and *biquintile*, four tenths, or two fifths.—Kepler adds others, as he tells us, from meteorological observations; as the *semi-sextile*, containing the twelfth part of a circle; and *quincunx*, containing five twelfths.—Lastly, to the astrological physicians we owe *septile*; containing one eighth; and *tridecile*, containing three eighths. Some have also added *quintile*, containing a fifth part of the circle; and *biquintile*, or two fifths.

The angle intercepted between two planets in the *aspect* of conjunction is 0° ; in the semi-sextile *aspect*, 30° ; in decile, 36° ; in octile, 45° ; in sextile, 60° ; in quintile, 72° ; in quartile, 90° ; in tridecile, 108° ; in trine, 120° ; in tri-octile, 135° ; in biquintile, 144° ; in quincunx, 150° ; in opposition, 180° .

These angles, or intervals, are reckoned on the secondary circles; or according to the longitudes of the planets; so that the *aspects* are the same, whether a planet be in the ecliptic, or out of it.

The *aspects* are usually divided into *partile* and *platic*.

Partile ASPECTS are when the planets are just so many degrees distant, as is above expressed.—These alone are the *proper aspects*.

Platic ASPECTS are when the planets do not regard each other from these very degrees; but the one exceeds as much as the other comes short.—So that the one does not cast its rays immediately on the body of the other, but only on its orb or sphere of light.

Double ASPECT is used in painting, where a single figure is so contrived, as to represent two or more different objects, either by changing the position of the eye, or by means of angular glasses.—Instances hereof, see under the articles MIRROR, CATOPTRIC, CISTULA, and ANAMORPHOSIS.

ASPER, in grammar.—*Spiritus ASPER*, a character, or accent in form of a \ast ; placed over certain letters, in the Greek tongue, to shew they are to be strongly aspirated, and that the breath is here to supply the place of an *h*.

ASPER, or **ASPRE,** also signifies a little Turkish silver coin, wherein most of the grand signior's revenues are paid.

The *asper* is worth something more than an English half-penny.—The only impression it bears, is that of the prince's name under whom it was struck.—The pay of the Janizaries is from two to twelve *aspers per diem*.

ASPERA *Arteria*, in anatomy, the *wind-pipe*; otherwise called the *trachea*.

The *aspera arteria* is a canal situate in the middle and fore-part of the neck, before the *oesophagus*: its upper end is called the *larynx*; from whence it descends to the fourth vertebra of the back, where it divides and enters the lungs.—See *Tab. Anat. Angeiol. fig. 2. & lit. c. Splanch. fig. 12. lit. tt. & f.*

It is formed of annular cartilages ranged at small and equal distances from one another, and growing smaller and smaller, as they approach the lungs; those of the bronchia being so close to one another, that, in expiration, the second enters within the first, and the third within the second, and the following always enters the preceding.

Between the larynx and the lungs, these cartilages make not complete rings; being flat on one side, and not finishing the whole circle, but representing the figure of the ancient Greek sigma; whence they are also denominated *sigmoidea*.—Their hind part, which is contiguous to the *oesophagus*, is membranous, that they may better contract and dilate, and give way to the food as it passes down the gullet.

The cartilages of the bronchia are completely annular, yet their capillary branches have no cartilages, but instead of them small circular ligaments, which are at pretty large distances from one another.—The use of the cartilages is to keep the passage for the air open; but in the capillary bronchia, they would hinder the subsiding of the vessels.

These cartilages are tied together by two membranes, external and internal: the external is composed of circular fibres, and covers the whole trachea externally; the internal is of an exquisite sense, and covers the cartilages internally: it is composed of three distinct membranes; the first woven of two orders of fibres; those of the first order being longitudinal, for the shortening the trachea; these make the cartilages approach and enter one another: the other order is of circular fibres, for contracting the cartilages.

When these two orders of fibres act, they assist, together with the external membrane, in expiration, in coughing, and in altering the tone of the voice.

The second membrane is altogether glandulous; and the excretory vessels of its glands, opening into the cavity of the trachea, separate a liquor for moistening the same, and defending it from the acrimony of the air.—The larynx is a net of veins, nerves, and arteries; the veins are branches of the vena cava, the nerves of the recurrent; and the arteries, are sprigs of the carotides.

Transverse sections of the *aspera arteria* have been commonly reputed mortal. Yet in the modern practice we find many instances to the contrary*. In some dangerous cases of quinzies, &c. they are even obliged to cut open this part. This operation is called *branchotomy*, or *laryngotomy*.

* In the *Philosoph. Transact.* is a letter by Mr. John Keen, recommending the more frequent use of bronchotomy, or opening the wind-pipe upon pressing occasions; which he urges from a remarkable case of a person who had the trachea, or wind-pipe, cut quite through beneath the *ponum Adami*, cured by stitching the wound, and using proper medicines.

ASPERIFOLIOLIOUS, in botany, one of the divisions or classes of plants; so denominated, because usually rough-leaved. The characters of the *asperifolius* kind are, that the leaves stand alternately, or without any certain order on the stalks: the flowers are monopetalous, but they have the margin cut into five divisions, sometimes deep, sometimes shallow; and the upper spike or top of the plant, is often curv'd back, something like a scorpion's tail.

In the place of each flower, there usually succeed four seeds: Mr. Ray supposes the cerinthe the only plant of this genus, that hath less than four seeds at the base of each flower: this, indeed, hath but two.

To the class of *herbæ asperifoliae* belong the *pulmonaria maculosa*, *cynoglossa*, *borago*, *buglossa*, *anchusa*, *echium*, *linum umbilicatum*, *heliotropium majus*, *aparine major*, *consolida major*, *lithospermum*, *echium scorpioides*, and *cerinthe*.

ASPERITY, ASPERITAS, implies the inequality or roughness of the surface of any body; whereby some parts of it do so stick out beyond the rest, as to hinder the hand, &c. from passing over it easily and freely.

Asperity, or roughness stands opposed to smoothness, evenness, politure, &c.—From the *asperity* of the surfaces of contiguous bodies, arises friction.

According to the relations of Vermaufen, the blind man so famous for distinguishing colours by the touch, it should appear that every colour has its particular degree and kind of *asperity*. He makes black the roughest, as it is the darkest of colours; but the others are not smoother in proportion as they are lighter; i. e. the roughest do not always reflect the least light: for, according to him, yellow is two de-

grees rougher than blue, and as much smoother than green. Boyle of colours.

ASPERSION*, the act of sprinkling with water, or some other fluid.

* The word is formed of the Latin *aspergere*, to sprinkle; of *ad*, to, and *spargo*, I scatter.

Some contend for baptism by *asperision*, others by immersion.

ASPHALITES*, in anatomy, the fifth vertebra of the loins.

* It is thus called because conceived as the support of the whole spine of the loins; from the privative *a* and *σπινδα*, I supplant.

ASPHALTOS, or ASPHALTUM, a solid, brittle, black, inflammable, bituminous substance, resembling pitch, brought from the east, and particularly from Judea; whence it is also called *Jews-pitch*.

The *asphaltos* of the Greeks is the *bitumen* of the Latins. Modern naturalists, who make a class of bitumens, generally place *asphaltos* at the head of it; as being the most matured and concocted of the whole tribe; but consisting of the same simple principles as the rest.

It is chiefly found swimming on the surface of the *lacus asphaltites*, or dead sea, where anciently stood the cities of Sodom and Gomorrah.—It is cast up from time to time, in the nature of a liquid pitch, from the earth which lies under this sea; and being thrown upon the water, it there swims like other fat bodies, and condenses by little and little, through the heat of the sun, and the salt that is in it: it burns with great vehemence; in which it resembles *naphtha*, but is firmer as to consistence.

The Arabs use it to pitch their ships withal, as we do common pitch.—Besides this use, there was a deal of it employed in the imbalming of the ancients.

It is supposed to fortify and resist putrefaction; and to resolve, attenuate, cleanse, and cicatrize wounds: but it is little used among us either externally or internally.

It is usual to sophisticate the *asphaltos*, by mixing common pitch along with it; the result whereof makes the factitious *pisifasphaltum*, which the coarseness of the black colour, and the fetid smell easily discover. There is, however, besides this, a native *pisifasphaltum*.

ASPHALTUM also denotes a kind of bituminous stone, found near the ancient Babylon, and lately in the province of Neuchâtel; which, mixed with other matters, makes an excellent cement, incorruptible by air, and impenetrable by water; this was supposed to be the mortar so much celebrated among the ancients, wherewith the walls of Babylon were laid.

It yields an oil which defends ships from water, worms, &c. much better than the ordinary composition; and which is also of good service for the cleansing and healing of ulcers, &c. See SUPPLEMENT, article ASPHALTUM.

ASPIC—Oil of ASPIC. See the article OIL.

ASPIRATE, ASPIRATIO, in grammar, a character used to denote an aspiration.

The *aspirate*, by the Greeks called *spiritus asper*, and marked over their vowels, seems as if of a very different nature from the letters; but is nevertheless a true letter, as well as the rest, and a real consonant.—By letters we do not mean the characters of the alphabet, which are changeable according to the languages and the people, and among the same people, according to time and custom; and even according to the fancy of particular persons.—Thus, some, for instance, write the *aspirates*, or letters *aspirated*; which, by others are omitted; though both the one and the other pronounce alike; as in *huomo*, *huomini*, and Italian word frequently written *uomo*, *uomini*.

But, by letters, we mean articulate sounds, formed by the organs of speech, viz. the throat, mouth, tongue, palate, teeth, &c.

These sounds are of two kinds, the one *simple*, and the other *compound*, or modified.—*Simple* are those pronounced by a single motion of the organ; such are the vowels.

Compound sounds are those same simple sounds modified by a motion of the organ superadded to the motion necessary to pronounce the simple sound; of which kind are the consonants.

Now an *aspirate* is an effect or consequence of a motion made by some of the organs of speech; and therefore it must either be a vowel or a consonant.—The former it cannot be, as not being a simple sound, or a sound that may be pronounced by it self. It must therefore be a modificative, or consonant; and in effect it has all the properties of one.

For, *h*, it results from a motion of the organ, which, of it self, produces no sound. Thus the *spiritus* of the Greeks, our *b aspirate*, as well as that of the French, and other people, has no more sound of it self, than *h*, *c*, *d*, &c. and the same thing may be observed of the *aleph*, *bbath*, and *cap*, of the eastern languages.

2dly, On the contrary, our *h*, the *spiritus* of the Greeks, and the other *aspirates* just mentioned, are pronounced with all the vowels, in the same manner as consonants are.—They modify

modify those vowels, and are effects of a motion of the organ superadded to the motion necessary to form the vowel. Thus, to pronounce *ba*, two motions of the organ are required as well as for *ba*, or *ca*, &c. One for *a* which itself is a sound; the other for *b*, which yields no sound, no more than *z*; but adds something to *a* which modifies it, and makes that *ba* is not mere *a*, nor *ba*, nor *ca*, &c. And this must hold still more fausibly in the stronger aspirates, as those of the oriental tongues פ, פ', פ'', פ''', פ''''', &c. In all which, there are evidently two motions, the one to express the vowel, and the other to modify it: now this being the nature and essence of a consonant, it follows, that let them be denoted in what manner they will, whether as our *b*, as the orientals do, *i. e.* by proper characters in the course of the words themselves; or, as the Greeks do some of theirs, by a sign of aspiration placed over the vowel; it matters not. The aspirate is no less a consonant in ἀίρω, than in χαίρω; in ἰώ, than in χῶ; in ἰώ, than in χῶ; and so of others.

The third and last reason is, that the eastern languages, which do not express the vowels, do yet express the aspirates.

Add, that the aspirate is frequently changed into a consonant, and expressed by a consonant. Thus, of ἰξ is made *sex*; of ἰζα, *septem*; of ἰσπερ, *vesperis*, &c. of the Hebrew פ', *aves*, and thence *vinum*, &c. Nay, even in the same language, Hesiod, speaking of Hercules's buckler, uses Ἡρα for Ἡρα; making no difference between a *o* and an aspirate. See CONSONANT.

Hence it evidently follows, that aspirates are real consonants; and that it must be an error to rank S, P, T, Y, of the eastern languages, among the vowels; and to exclude the *h* in ours, out of the number of letters. See H.

ASPIRATION, the act of aspirating, *i. e.* of pronouncing any syllable, or word, strongly; with a good deal of breath, and vehemence.

This we do, for instance, in those words which have the letter *h* before them; as harangue, hook, holland, hero, &c. whereas the like syllables are sounded much softer and easier without the *h*; as in the ear, eat, &c. See H.

ASPRE. See the article ASPER.

ASSA-DULCIS, a name sometimes given to benzoin. See BENZOIN.

ASSA-FOETIDA, or ASA-FOETIDA, a gum or resin, brought from the East-Indies, of a brownish colour, a sharp taste, and a very strong offensive smell; whence it is also called *stercus diaboli*, or devil's dung.

It is the product of an umbelliferous plant, and flows either naturally or by incision from its root, in very considerable plenty.—They who after the ancients suppose it drawn from the *laser*, or *laserpitium*, would be hard put to it to get clear of those many disputes which have so often divided the botanists on the subject of the true *laser*, and the *succus cyrenicus*, so infinitely prized among them. Indeed there seems but little resemblance between the gum described by M. Fuciere, out of Pliny, *lib. xix. c. 3.* and our *assa-foetida*: if they be the same, it is certain we are not acquainted with half its virtues.

The modern *assa-foetida*, which is a very offensive drug in its smell, is a gum said to distil, during the summer's heat, from a plant frequent in Media, Persia, Assyria, and Arabia.—It is at first white, bordering on yellow, then on red, and lastly on violet; and melts under the fingers like wax. It is of known efficacy in some uterine disorders; but the rankness of its smell occasions it to be seldom used; yet in the East-Indies it makes an ingredient in their ragouts.

ASSACH, or **ASSATH**, a kind of purgation, anciently used in Wales, by the oaths of 300 men.

ASSAILANT, one that assaults, or sets upon another. See ASSAULT, ATTACK, &c.

ASSARABACCA. See ASARABACCA.

ASSART, **ASSARTUM**, in law, an offence committed in the forest, by pulling up, by the roots, woods which serve as thickets and covert for the deer, and making them plain as arable land.

This is the greatest trespass that can be committed in the forest, being more than a waste. For whereas waste of the forest is but the felling and cutting down the coverts, which may grow again; *assart* is a total extirpation thereof. See WASTE.—What we call *assartum*, is elsewhere termed *dispositio*.

ASSART was also used for a parcel of land assarted. See ESSART.

ASSART-Rents were those formerly paid to the crown for the forest lands assarted. See RENT.

ASSASIN*, or **ASSASSIN**, a person who kills another with the advantage either of an inequality in the weapons, or by means of the situation of the place, or by attacking him at unawares.

* The word *assassin* is said, by some, to have been brought from the Levant, where it took its rise from a certain prince of the family of the *Assacides*, popularly called *Assassin*, living in a castle between Antioch and Damascus.

and bringing up a number of young men, ready to pay a blind obedience to his commands; whom he employed in murdering the princes with whom he was at enmity.—The Jew Benjamin, in his itinerary, places these *Assasins*, near mount Libanus; and calls them in Hebrew from the Arabic *أشعريين*, *el affin*; which shews that the name did not come from *assacide*, but from the Arabic *أشعري*, *afsi*, *inhiator*, a person who lies in ambush.—The *Assasins*, or *Assesinians*, *Assesinii*, above-mentioned, possessed eight or twelve cities about Tyre: they chose themselves a king, whom they called the *old man of the mountain*. In 1213, they assassinated Louis of Bavaria. They were Mahometans, but paid some tribute to the knights-templars.—The favourers of the *Assasins* were condemned by the council of Lyons, and under Innocent IV. in 1231.—The Tartars overcame them, and killed their senior of the mountain in 1257; upon which the faction became extinct.

There was a certain law of nations, an opinion received in all the republics of Greece and Italy, whereby he that assassinated an emperor of the supreme power was declared a virtuous man. At Rome especially, after the expulsion of the kings, the law was formal and solemn, and instances of it admitted. The commonwealth armed the hand of any citizen, and created him magistrate for that moment. *Consid. sur les Loix. de la Grand. des Rom. c. 11. p. 121.*

ASSATION, the preparing or dressing of medicaments, or foods, in their own juices, by an external heat without addition of any foreign moisture.

*Assation**, in respect of culinary matters, is more frequently called *roasting*; and, in pharmacy, *astion*, or *torrefaction*.

* The word is formed of the Latin *assare*, to roast.

ASSAULT, in the art of war, an attack made upon a camp, fortress, or post, in order to carry or become master thereof.

An *assault* is properly a general furious attack, wherein the assailants do not screen themselves by any works.—We say, to give an *assault*, to be commanded to the *assault*, to stand an *assault*, to repulse an *assault*, to carry by *assault*, &c.

While an *assault* lasts, and both parties are mixed, the fire of the batteries ceases; and there is no use of caution on either side; for they are afraid of destroying their own men thereby.

A governour was formerly obliged to sustain three *assaults* before he gave up the place.—It is very difficult saving a town from pillage that is carried by *assault*.—The *enfants perdus* always march first to the *assault*.

Few places of late years stand *assaults*: M. de Feuquiere finds but three in his time. The first was Neuhâtel, in 1683, commanded by the Turkish Basha: it was taken, as most others must be, because the column of infantry that marched to the breach consisted of more ranks, than that of the infantry which defended it.—The second was Buda, the basha of which was killed in the attack. He had some flanking works remaining, whose fires had not been entirely ruin'd by the artillery of the besiegers.—The third was the castle of Namur, defended by M. de Boufflers; which was not carried, by reason the column of infantry which attacked the breach, marched from too far off unhelped. Add, that it is almost impossible to carry a place by *assault* or storm, when the breach may be defended by the fires of works not yet destroyed. In reality, it should be defended by no other fires, but those which are opposed to it in front, or from the breach itself. *Peug. Mem. c. 99.*

Such obstinacy in defending places to the last extremity is no longer found, except among the Turks; among whom it is a point of religion not to surrender to the Christians, by capitulation, any place where they have once had a mosque.—Though of late they have sometimes departed from this maxim. *Id. ibid.*

ASSAULT, **ASSULTUS**, or **Insultus**, in law, an offer, or attempt to hurt the person of another.

Or, it is a violent injury offered to a man's person; of a larger extent than battery, for that it may be committed by only offering to give a blow; or even, according to some, by a threatening speech, by presenting a pistol, or the like.—Though some, it is to be observed, deny that words can amount to an assault.

To rebuke a collector with foul words; so that he depart for fear, without doing his office, has been adjudged an *assault*; and to strike a man, though he be not hurt, or sometimes even not hit, with the blow, is reputed the same. For, in trespass for *assault* and battery, a man may be found guilty of the *assault*, and excused of the battery. 25 *Edw. 3. c. 4.*

The *assaulting* a person with offensive weapons, with a design to rob (though no robbery ensue) is punished with transportation for 7 years. 7 *G. 2. c. 21.*

ASSAY, **ESSAY**, or **SAY**, in metallurgy, the proof or trial of the goodness, purity, value, &c. of metals, and metalline substances.

In ancient statutes this is called *touch*; and those who had the care of it, *keepers of the touch*.—Under Henry 6. divers

cities were appointed to have *touch* for wrought silver-plate. 2 H. 6. c. 14.—By this, one might imagine they had no better method of *assaying* than the simple one, by the touchstone; but the case is far otherwise. In the time of king Henry II. the bishop of Salisbury, then treasurer, considering that though the money paid into the king's exchequer for his crown rents did answer *numero & pondere*, it might nevertheless be mixed with copper or brass: wherefore a constitution was made, called, the *trial by combustion*; which differs little or nothing from the present method of *assaying* silver. See a description of it in the Black-book in the exchequer, written by *Gervase of Tilbury*, c. 21.—This trial is also there called *essatum*, and the officer who made it is named *fufar*. Vid *Lexicon. Ess. Amend. Silo. Cain*, p. 5. & 155.

ASSAYING, *ars decimastica*, in its extent, comprehends particular manners of examining every ore, or mixed metal, according to its nature, with the best adapted fluxes; so as to discover, not only what metals, and what proportions of metal are contained in ores, but likewise how much sulphur, vitriol, alum, arsenic, smalt, &c. may be obtained from every ore respectively.

Assaying is more particularly used by moniers and goldsmiths, for the making a proof, or trial by the cuppel, or test, of the fineness or purity of the gold and silver to be used in the coining of money, and manufacture of plate, &c. or that have been already used therein.

There are two kinds of *assaying*; the one before metals are melted, in order to bring them to their proper fineness; the other after they are struck, to see that the species be standard.

For the first *assay*, the *assayers* use to take fourteen or fifteen grains of gold, and half a drachm of silver; if it be for money: and eighteen grains of the one, and a drachm of the other, if for other occasions.

As to the second *assay*, 'tis made of one of the pieces of money already coined, which they cut in four parts.

Method of ASSAYING Gold.—The *assayer* having weighed the gold he intends to make the trial in, very exactly, with scales that will turn with the hundredth part of a grain, and noted down the weight, he adds twice as much fine silver thereto; though this should be in proportion to the fineness the gold seems to be of, the safest gold requiring the least silver. The gold and silver thus weighed and mixed, are wrapped up in a piece of paper, to prevent their losing any thing of their weight, which would disturb the accuracy of the *assay*.

While the *assayer* is weighing his matters, a reverberatory fire is lighted in a furnace, furnished with a muffle, and a cuppel, or test, set therein to heat. This done, a little bullet of lead is put in the cuppel, of a weight proportionable to the quantity and quality of the gold to be *assayed*. When the lead is well melted, and appears very clean and bright; they put in the mixture of gold and silver, and let it fuse till it appear of an opal colour, and have fixed itself in a little lump to the bottom of the cuppel.

This done, the cuppel is left to cool in the furnace itself; after which the lump is separated very exactly from the place where it stuck to the vessel; and beaten or hammered on the anvil; heating it again and again, on the coals, to promote the fretching.

When sufficiently hammered, they roll it up in form of a cornet, or coffin, and thus put it in a glass matras, capable of containing four spoonfuls of water; and having added to it a quantity of *aqua fortis*, well corrected, that is, mixed with near one third of the quantity of river water; they boil it over a wood fire, till such time as the *aqua fortis* yields no more red fumes.

This first water being poured off, and the cornet left alone at the bottom of the matras, they fill the matras again, but with pure *aqua fortis*; which, after boiling, is poured off in its turn, at such time as the fumes are become white.—This done, they fill up the matras with river water, to wash the cornet.

When washed, they put it dry in a crucible, with a cover over it, and heat it till it become of a cherry-colour.

This done, the *assay* is finished; and there remains nothing but to weigh it against the same weight of fine gold, as was used at first, before the *assay*: for by comparing the first weight of the gold, ere it was put in the fire, and the *aqua fortis*, with what it retained after it had thus undergone the test; they judge, from the greater or less loss it has sustained, of the quantity of alloy mixed with it.

Method of ASSAYING Silver.—The process is much the same, as in gold; only less difficult, and shorter. The silver is weighed, as before; and the same furnace, and muffle, the same fire, the same cuppel used. Add, that lead is likewise put in the cuppel, proportioned to the quantity and quality of the silver to be *assayed*.

The lead being well melted, and clear, the silver is put in; and after it is brought to an opal colour, and fixed in a lump at the bottom of the cuppel, which happens in about half

an hour; they let it cool, and cleanse it: and lastly, weigh it again, as in gold. And from its diminution, they estimate the quantity of alloy.

ASSAYING of Lead.—The *assay* of gold and silver being performed by means of lead; 'tis of the utmost importance the lead be free of any mixture of either of the two metals: otherwise the *assay* will be false; by reason the gold and silver mixed with the lead will not evaporate like other kinds of alloy, but unite with the metal under *assay*.

To prevent this disorder, and assure the operation, there is no way but first to *assay* the lead itself.

This *assay* is performed in the same furnace, and with the same cuppels, as those of gold and silver: but the process is incomparably more simple. All here required, when the cuppel is heated, being to put in the piece of lead to be *assayed*. If this lead evaporate entirely, it is fit for the purpose. On the contrary, if there remain any little grain of silver, &c. at the bottom, it must be set aside. See SUPPLEMENT article DOCIMASTIC ART.

ASSAYING of Tin. See the article TIN.

ASSAY-MASTER, an officer, under certain corporations, intrusted with the care of making true *touch*, or *assay*, of the gold and silver brought to him; and giving a just report of the goodness or badness thereof.

Such is the *assay-master* of the mint in the Tower, called also *assayer of the king*.

The *assay-master* of the goldsmith's company is a sort of assistant-warden, called also a *touch-warden*, appointed to survey, *assay*, and mark all the silver-work, &c. committed to him.—There are also *assay-masters* appointed by statute, at York, Exeter, Bristol, Chester, Norwich, and Newcastle, for assaying wrought plate.—The *assay-master* is to retain 8 grains of every pound Troy of silver brought to him; 4 whereof are to be put in the *pix*, or box of deal, to be re-assayed the next year; and the other 4 to be allowed him for his waste and spillings. 12 & 13 W. III. c. 4. 1 An. c. 9. See PIX.

Note. The number of penny-weights set down in the *assay-master's* report is to be accounted as *per pound*, or so much in every pound of 12 ounces Troy.—For every twenty penny-weight, or ounce Troy, the silver is found by the *assay* to be worse than standard, or sterling, six-pence is to be deducted: for that every ounce will cost so much to reduce it to standard goodness, or to change it for sterling. *Touchst. of gold and silver-ware*, p. 41.

In gold, for every carat it is set down to be worse than standard, you must account, that in the ounce Troy it is worse by so many times 3s. 8d.—And for every grain it is set down worse, you must account it worse by so many times 11d. in the ounce Troy.—And for every half grain 5d. 4. for so much it will cost to make it of standard goodness, &c. *Id. ibid.*

ASSAY of weights and measures signifies the trial or examination of common weights and measures, by the clerk of the market. See CLERK of the market.

ASSEMBLAGE, the joining or uniting of several things together; or, the things themselves so joined, or united.

The *assemblage* of two bones for motion, is called *articulation*. See ARTICULATION.

Carpenters and joiners have various kinds and forms of *assemblage*; as, with mortises and tenons, with dove-tails, &c. See MORTISE, DOVE-TAIL, &c.

The Europeans admire the carpentry of some Indians, where the *assemblage* is made without either nails or pins. *Herrera*. See CARPENTRY.

ASSEMBLAGE is also used in a more general sense, for a collection of several things, so disposed together, as that the whole has an agreeable effect.—It is with discourse as with bodies, which owe their chief excellency to the just *assemblage* and proportion of their members.

ASSEMBLY*, a meeting of several persons in the same place, and with the same common design.

* The word is formed of the Latin *adsummare*; compounded of *ad*, to, and *sumul*, together.

Assemblies of the clergy are called convocations, synods, councils; though that annual one of the kirk of Scotland retains the name *general assembly*, &c.—The *assemblies* of judges, &c. are called *courts*, &c.—The *assemblies* of the Roman people were called *comitia*.—The *assembly* of a preacher, &c. is his audience.—The academies have their *assemblies*, or days of *assembly*.—The *assemblies* of dissenters, &c. are frequently, by way of reproach, called *conventicles*.

Under the Gothic governments, the supreme legislative power was lodged in an *assembly* of the states of the kingdom, held annually for the like purposes as our parliament.

Some feeble remains of this usage still subsist in the annual *assemblies* of the states of Languedoc, Bretagne, and a few other provinces of France; but these are no more than shadows of the ancient *assemblies*. It is only in Great-Britain,

Sweden, and Poland, that such *assemblies* retain their ancient powers and privileges.

ASSEMBLIES of the *campus Martii*, or *Moi*, of the field of *Mars*, or *May*. See *FIELD of Mars*, &c.

REBELLIOUS ASSEMBLY. } See } REBELLIOUS.

UNLAWFUL ASSEMBLY. } See } UNLAWFUL.

ASSEMBLY is particularly used in the *beau-monde*, for a stated and general meeting of the polite persons of both sexes; for the sake of conversation, gallantry, news, and play.

Quarter or Place of ASSEMBLY, in a camp, &c. See *QUARTER of assembly*.

ASSEMBLY is also used in the military art, for the second beat of the drum, being that before the march.

On hearing this, the soldiers strike their tents, roll them up, and then stand to their arms.—The third beating is called the *march*, as the first is called the *general*.

ASSENSU Regis. } See the articles } REGIO.

Dover ex ASSENSU Patris. } See the articles } DOWER.

ASSENT, ASSENSUS, an agreement or acquiescence of the mind to something proposed, or affirmed.—Thus, to *assent* to any proposition is to allow it true, or to perceive its truth.

The schoolmen observe, that to every proposition, how compound or complex soever it be, there only goes one *assent* of the mind.—Thus, in the conditional proposition, if the sun shines it is day; there is only one *assent* of the mind, which regards the connexion of the effect with the condition. So in the disjunctive proposition, Peter either studies, or does not study; the mind does not give a twofold *assent* to the two parts thereof, it being enough that Peter do either the one or the other, for the proposition is to be true.

Assent is distinguished, like faith, into *implicite*, or *blind*; and *explicite*, or *seeing*, &c.—Others distinguish it into *actual* and *habitual*.

Actual ASSENT is a judgment whereby the mind perceives a thing to be true.—

Habitual ASSENT consists in certain habits of believing or acquiescing, induced in the mind by repeated acts.

To this belongs faith, which is an *assent* arising from the authority of the person who speaks.—Such also is opinion, which is defined an *assent* of the mind *cum formidine operis*, &c.

For the measures and degrees of ASSENT, see *PROBABILITY*, *EVIDENCE*, *DEMONSTRATION*, &c.

Father Malebranche lays it down as an axiom, or principle of method, never to allow any thing for truth, from which we can forbear our *assent* without some secret reproach of our own reason.

Royal ASSENT. See the article *ROYAL*.

ASSERTION, ASSERTIO, in the language of the schools, a proposition which a person advances; and which he avows to be true, and is ready to maintain in public.

ASSESSOR*, ASSESSOUR, an inferior or subordinate officer of justice, chiefly appointed to assist the ordinary judge with his opinion and advice.

* The word is Latin, formed of *ad*, to, and *sido*, I sit.

In this sense, the masters in chancery are *assessors* of the lord chancellor.

There are two kinds of *assessors* in the imperial chamber, ordinary and extraordinary.—The ordinary are now in number forty one, whereof five are elected by the emperor, *viz.* three counts or barons, and two juriconsults, or civil lawyers. The electors appoint ten, the six circles eighteen, &c. They act in quality of counsellors of the chamber, and have salaries accordingly.

ASSESSOR is also used for a person who *assesses*, or lays *assessments* of taxes, and other public dues.

In this sense, *assessors*, among us, are inhabitants of a town, or village, elected by the community, to *assess*, or settle the taxes, and other impositions of the year, to fix the proportion which each person is to bear, according to his estate, and to see the collection made.—These are also called in our law *assisors*.—By the stat. 16 & 17 Car. 2. two inhabitants in every parish were made *assessors* for the royal aid.

ASSEVERATION, an earnest affirmation, or avouching.

ASSIDEANS, or rather HASIDEANS, in antiquity, a sect among the Jews; thus called from the Hebrew, חסידים *hasidim*, merciful, righteous.

The *Assideans* are recorded as holding works of supererogation necessary.—They were the fathers and predecessors of the Pharisees, and from them likewise arose the Esseni. See *PHARISEE*, and *ESSENI*.

The Jesuits Serrarius and Drusus, have wrote against each other upon the subject of the *Assideans*, on occasion of a passage in Joseph Ben Gorion; the first maintaining, that by the name *Assideans* he means Esseni, and the latter Pharisees.

ASSIENTO, or ASSIENTA, in matters of commerce, a contract or convention between the king of Spain and other powers, for furnishing the Spanish dominions in America, with negro slaves.

The term is originally Spanish, and signifies a bargain; accordingly the first *assiento* was a treaty or contract made with the French Guinea company, whereby they were put in possession of this privilege, in consideration of a certain duty which they were to pay to the king of Spain's farms, for every negro thus furnished.—

This contract was signed in the year 1702, it was to last ten years, with a further liberty allowed the *assientoists* of two years more, in case they had not furnished the whole number stipulated before.—The two principal articles regarded, first, the number of negroes to be provided, which was 3800 while the war should last, and 4800 in case of peace. Secondly, the duty to be paid the king of Spain, during the term, or *assientos*; which was fixed at 33 escudos, pieces of eight, *per head*, or *pieza de India*.

By the treaty of Utrecht, Philip V. being acknowledged king of Spain by the allies; it was one of the articles of the peace between England and France, that the *assiento* contract should be transferred to the English.—Accordingly a new instrument was signed in May 1713, to last 30 years; and the furnishing of negroes to the Spanish America was committed to the South-Sea company, just then erected.

In virtue hereof, they were yearly to furnish 4800 negroes; for which they were to pay at the same rate as the French, with this condition, that during the first 25 years, only half the duty shall be paid for such as they shall import beyond the stated number.

The last *assiento* gives them a further privilege not enjoyed by the French; which is, that the English *assientoists* shall be allowed, every year, to send to the Spanish America a ship of 500 tons, loaden with the same commodities as the Spaniards usually carry thither; with a licence to sell the same, concurrently with them, at the fairs of Porto Bello, Carthagena, and Vera Cruz.—This additional article is supposed as advantageous to the company, as the whole contract besides; being granted contrary to the usual Spanish policy, which has ever solicitously preserved the commerce of their America to themselves.

Some new articles have been since added to the ancient *assiento*; as, that the English shall send their register-ship yearly, even though the Spanish flota and galleons do not go; and that for the first ten years, the said ship may be of 650 ton.

The manner of valuing the negroes, in order to settle the king of Spain's duty, is the same as delivered under the article *NEGRO*.

ASSIGN, in common law, a person to whom a thing is *assigned*, or made over.

The word *assign* is said to have been introduced in favour of bastards; who, because they cannot pass by the name of *heirs*, are comprised under that of *assigns*.

ASSIGNEE, in law, a person to whom a thing is appointed or *assigned*, to be occupied, paid, or done.

An *assignee* differs from a *deputy* in this, that the *assignee* possesses or enjoys the things in his own right; and a *deputy* in the right of another.

Assignee may be so either by deed or by law.

ASSIGNEE by deed is, when a lessee of a term sells and assigns the same to another: that other is his *assignee* by deed.—

ASSIGNEE by law is he whom the law makes, without any appointment of the person.—

Thus, an executor is *assignee* by law to the testator, who dies possessed of a lease made to him and his *assigns*.

ASSIGNING is used for the act of appointing a deputy; or the making over a right to another.

In this sense we say, such lands or estates were *assigned* or made over to such persons for such uses, &c.—In the stat. 20 Edw. I. we read of justices *assigned* to take *assises*, &c.

ASSIGNING also signifies pointing out or setting forth.—Thus we say, to *assign* the real cause of such an event, &c.

To *assign error* is to shew in what part of a process at law an error is committed.

To *assign false judgment*, *verdict*, &c. is to declare how and where judgment, verdict, or the like, is unjust.

To *assign waste* is to shew especially wherein the waste is committed.

ASSIGNMENT, the act of *assigning*, or transferring the interest or property a man has in any thing; or of appointing and setting over a right to another.

The *assignment of a dower* is the setting out of a woman's marriage-portion by the heir.

Novel ASSIGNMENT. See the article *NOVEL*.

ASSIMILATION*, the act of *assimilating*; an act whereby a thing is rendered similar, or like to another.

* The word is compounded of *ad*, to, and *similis*, like.

ASSIMILATION, ASSIMILATIO, in physics, is properly a motion whereby bodies convert other duly disposed bodies into a nature like, or homogenous to their own.

Some philosophers call it, *the motion of multiplication*, meaning, that bodies are hereby multiplied not in number, but in bulk; but this might be more properly expressed by the motion of *augmentation, or accretion*.

Instances of this *assimilation* we see in flame, which converts the oily or other particles of fuel into its own fiery and luminous nature. The like also appears in air, smoke, and spirits of all kinds.

The like we see in vegetables, where the watery juices imbibed from the earth, being further prepared and digested in the vessels of the plant, become of a vegetable nature, and augment the wood, leaves, fruit, &c. thereof.

So also, in animal bodies, we see the food *assimilated*, or changed into an animal substance, by digestion, chylification, and the other operations necessary to nutrition.

ASSISA, or ASSISIA; see the articles **ASSISE**, and **TAL-LAGE**.

ASSISA cadere, to fall from the *assise*, in law, is to be nonsuited.

ASSISA cadit in Furatam is where the thing in controversy is so doubtful, that it must necessarily be tried by a jury. See **JURY**.

ASSISA capi in modum assise, is when the defendant pleads directly to the assise, without taking any exception to the count, declaration, or writ.

ASSISA continuanda is a writ directed to the justices, to take an assise for the continuance of a cause, where certain records alleged cannot in time be procured by the party. See **WRIT**.

ASSISA nocimenti is an assise of nuisance.

ASSISA panis & cervisie denotes the power or privilege of assigning, or adjusting the weight and measure of bread and beer.

ASSISÆ judicium, in law, signifies a judgment of the court, given either against the plaintiff or defendant, for default.

ASSISA preroganda is a writ directed to the justices of assise, for the stay of proceedings, by reason of the king's business, wherein the party is employed.

Tenantibus in ASSISA non onerandis.

ASSISE, or ASSIZE*, *assisa*, in law, a fitting of judges, or justices; for the hearing and determining of causes.

* The word is French, *assise*, of *assis*, seated; formed of the Latin *assides*, I sit by; which is compounded of *ad*, to, and *sedes*, I sit.

Clerk of ASSISE. See the article **CLERK**.

ASSISE, or ASSISES, was anciently used for certain extraordinary sittings of superior judges, in the inferior courts depending on their jurisdiction; to enquire whether the subaltern judges and officers did their duty; to receive the complaints preferred against them; and take cognizance of appeals from them. These are also called *mercatorial assises*.

ASSISE was also a court or assembly, composed of several great persons of the realm; held occasionally in the king's palace, for the final decision of all affairs of importance. See **COURT**.

This is more usually called, among our writers, *placita, mala publica, or curia generales*. Yet there is some difference between *assises*, and *placita*.—The vicounts, or sheriffs, who originally were only lieutenants of the comites, or counts, and rendered justice in their place, held two kinds of courts, the one ordinary, held every day, and called *placitum*; the other extraordinary, called *assise*, or *placitum generale*; at which the count himself assised for the dispatch of the more weighty affairs.

Hence the term *assise* came to be extended to all grand days of judgment, at which the trials and pleadings were to be solemn and extraordinary.

The modern constitution of *assises* is pretty different from that hitherto spoke of.—Our *assise* may be defined a court, place, or time where and when writs and processes, either civil or criminal, or both, are considered, dispatched, decided, &c. by judges and jury.

In this sense, we have two kinds of *assises*; *general* and *special*.

General ASSISES, or ASSIZES, are those held by the judges twice a year, in their several circuits.

The nature of these *assises* is explained by my lord Bacon, who observes, that all the counties of the kingdom are divided into six circuits; through each of which two learned men, assigned by the king's commission, ride twice a year, called *justices* or *judges of assise*, who have several commissions, by which they sit, &c.

1^o, *A commission of oyer and terminer*, directed to them; and many others of the best account in their respective circuits. In this commission, the judges of *assise* are of the quorum; so that without them there can be no proceeding. This commission gives them power to deal with treasons, murders, felonies, and other misdemeanors.

The second is of *goal-delivery*, which is only to the judges themselves, and the clerk of the *assise* associate.—By this commission they have to do with every prisoner in goal, for what offence he ever.

The third is directed to themselves, and the clerk of the *assise*, to take writs of possession, called also *assises*; and to do right and justice thereupon.

The fourth is to take *nisi prius*, directed to the justices, and the clerks of *assises*; whence they are also called *justices of nisi prius*.

The fifth is a *commission of peace*, in every county of their circuit; and all the justices of the peace, having no lawful impediment, are bound to be present at the *assises*, to attend the judges.

The sheriff of every shire is also to attend in person, or by a sufficient deputy allowed by the judges, who may fine him if he fail.

This excellent constitution of judges, circuits, and *assises*, was begun in the time of Henry II. though somewhat different from what it is now.

Special ASSISE is a particular commission granted to certain persons, to take cognizance of some one or two causes, as a disseisin, or the like.—This was very frequently practised among our ancestors. Bracton, lib. 3. c. 12.

ASSISE is also used for a writ directed to the sheriff, for the recovery of possession of things immoveable, whereof a man's self, or ancestors, have been disseised.

Littleton, and others, suppose these writs of *assise* to have given the denomination to the *assises*, or courts so called; and they assign several reasons of the name of the writ; as,

First, Because such writs settle the possession, and right, in him that obtains by them. *Secondly*, Because originally they were executed at a certain time and place appointed; for, by the Norman law, the time and place must be known forty days before the judges sit; and by our law there must be fifteen days preparation, except they be tried in the standing courts at Westminster.—But, it is more natural to suppose

the writs denominated from the courts; and that they were called *assises*, because anciently tried at special courts of *assises*, set and appointed for that purpose.—Though, of latter days, these are dispatched at the general *assises*, along with the commission of Oyer and Terminer, &c.

This writ is as well of things corporeal, as incorporeal rights, being of four sorts, *viz.*

ASSISE of novel disseisin, *Assisa nova disseisina*, which lies where a tenant in fee-simple, fee-tail, or for life, is lately disseised of his lands and tenements, rent-service, rent-feeck, or rent-charge, common of pasture, common way, &c.

To this may be added, the bill of fresh force, directed to the officers or magistrates of cities or towns-corporate; being a kind of *assise* for recovery of possession in such places, within forty days after the force, as the ordinary *assise* is in the county.

ASSISE of mort d'ancestor, *Assisa mortis antecessoris*, lies where my father, mother, brother, uncle, &c. dies seized of lands, tenements, rents, &c. held in fee-simple; and, after their death, a stranger abates. It is good as well against the abator, as any other in possession.

ASSISE of darrain presentment, *Assisa ultima presentationis*, lies where I or my ancestor have presented a clerk to a church; and after the church becomes vacant by the death, or otherwise, a stranger presents his clerk to the same church, in my disturbance.

These three *assises* were instituted by Henry II. in the place of duels*; which till then, had obtained on these occasions. See **DUEL**.

* *Magna assisa est regale beneficium, clementia principis de concilio procerum populi indulium; a quo vitæ hominum & status integritati tam salubriter consulitur, ut in jure quod quis in libera soli tenemento possidet, retinendo, duello casum homines declinare possunt, &c.* Glanvil. lib. 2. cap. 7. See **COMBAT**, &c.

ASSISE of Utrum lies for a parson against a layman, or for a layman against a parson, for a land or tenement, doubtful whether it be in lay-fee, or free-alm. See **TITHE**.

ASSISE is also used, according to Littleton, for a jury.—This, that author supposes to be by a metonymia effecti, the jury being so called, because summoned by virtue of the writ of *assise*.

Yet it must be observed, that the jury, summoned upon a writ of right, is likewise called the *assise*; but this may be said to be *καταχρηστικως*, or abusively so termed.—*Assise*, in this signification, is divided into *magna* & *parva*. See **JURY**.

ASSISE is further used, according to Littleton, for an ordinance, or statute regulating the weight, size, or dimensions of certain commodities.—Thus the ancient statute of bread and ale, *Anno 51 Hen. 3.* is termed the *assise of bread and ale, assisa panis & cerevisie.*

ASSISE is further used for the scantling, or quantity it self, prescribed by the statute.—When wheat is of such or such price, bread shall be of such *assise.* See **BREAD.**

We have divers statutes for fixing the *assise* of fish, cloths*, wood, billets, faggots, and the like. *Vid.* 34 & 35. H. 8. c. 3. 9 A. c. 15. 10 A. c. 6. 19 Car. 2. c. 3. 4 Jac. 1. c. 2. 1 Geo. 1. stat. 2. c. 18.

* Fixing any *assise* of cloth, or prescribing what length, breadth, weight, &c. it shall have, Sir Josiah Child thinks, does more hurt than good. As the fashions and humours of mankind are variable, to supply all markets at all times, we must have of all sorts, cheap and light, as well as heavier and better.—Stretching with tenters is essential to our drapery, and the precise degree or quantity of it cannot without injury be prescribed by any law; but must be left to the vender's or exporter's discretion. *Child, Disc. of Trade, p. 148.*

ASSISE of the forest is a statute or condition containing orders to be observed in the king's forest.—It is called an *assise*, because it sets down and appoints a certain measure, rate, or order in the things it concerns.

ASSISE, again, is used for the whole process in court, founded on a writ of *assise*; and sometimes for a part of it, *viz.* the issue, or verdict of the jury.

Thus we read, that ' *assises* of novel disseisin shall not be taken but in their shires; and after this manner, &c.' *Mag. Chart. cap. 12.*—So in *Merton, cap. 4. Hen. III.* we meet with, ' certified by *assise*, quitted by *assise*.' &c.

Continuance of ASSISE. }
 Justices of ASSISE. } See the article { CONTINUANCE.
 Limitation of ASSISE. } JUSTICE.
 Rents of ASSISE. } LIMITATION.
 RENT.

ASSISER, or **ASSIZER** of weights and measures, is an officer who has the care and oversight of those matters. See **CLERK of the market.**

ASSISIS.—*Non ponendo in assisi.* See **NON-PONENDO.**

ASSISOR, the same with *assessor.* See **ASSESSOR.**

In Scotland, *assisors* are the same with our *jurors.* See **JUROR.**

ASSISTANCE. See the article **AID.**

ASSISTANT is used for a person or officer appointed to attend another principal officer, for the more easy and regular discharge of his function.—Such a bishop or priest had seven or eight *assistants.*

ASSISTANT, in Roman Catholic countries, is particularly applied to a kind of counsellors, or controllers, added to the generals or superiors of monasteries, &c. to take care of the affairs of the community.

The general of the Jesuits has five *assistants*, of consummate experience, chosen by him out of all the provinces of the order, and denominated from the kingdoms or countries to which they belong, *i. e.* Italy, Spain, Germany, France, and Portugal.

In a like sense, most of our trading companies have their courts of *assistants.*

ASSISTANTS are also those condemned to *assist* in the execution of a criminal. See **ABSOLUTION.**

ASSIZE, or **ASSISE.** See the article **ASSISE.**

ASSOCIATE*, an adjunct, partner, or member. See **ADJUNCT.**

* The word is compounded of the Latin *ad*, to, and *socius*, fellow, companion.—The *associates* of Dr. Bray for conversion of the Negroes, &c.

ASSOCIATION, **ASSOCIATIO**, the act of associating or forming a society, or company.

Association is properly a contract or treaty of partnership, whereby two or more persons unite together, either for their mutual assistance, or for the joint carrying on of an affair; or even for a more commodious manner of life.—The closest of all *associations* is that made by the band of matrimony.

ASSOCIATION of Ideas is where two or more ideas constantly and immediately follow or succeed one another in the mind, so that one shall almost infallibly produce the other; whether there be any natural relation between them, or not.

Where there is a real affinity or connection in ideas, it is the excellency of the mind, to be able to collect, compare, and range them in order, in its enquiries; but where there is none, nor any cause to be assigned for their accompanying each other, but what is owing to mere accident or habit; this unnatural *association* becomes a great imperfection, and is, generally speaking, a main cause of error, or wrong deductions in reasoning.

Thus, the idea of goblins and sprights has really no more affinity with darkness than with light; and yet let a foolish maid inculcate these ideas often on the mind of a child, and raise them there together, it is possible he shall never be able

to separate them again so long as he lives, but darkness shall ever bring with it those frightful ideas.—Let custom, from the very childhood, have joined the idea of figure and shape to the idea of God, and what absurdities will that mind be liable to, about the Deity?

Such wrong combinations of ideas, Mr. Locke shews, are a great cause of the irreconcilable opposition between the different sects of philosophy and religion: for we cannot imagine, that all who hold tenets different from, and sometimes even contradictory to one another, should wilfully and knowingly impose upon themselves, and refuse truth offered by plain reason: but some loose and independent ideas are by education, custom, and the constant din of their party, so coupled in their minds, that they always appear there together: these they can no more separate in their thoughts, than if they were but one idea, and they operate as if they were so. This gives sense to jargon, demonstration to absurdities, consistency to nonsense, and is the foundation of the greatest, and almost of all the errors in the world.

ASSOCIATION, in law, is a patent sent by the king, either of his own motion, or at the suit of a party plaintiff, to the justices of *assise*; to have other persons *associated* to them, in order to take the *assise.* See **JUSTICE**, and **ASSISE.**

Upon this patent of *association*, the king sends his writ to the justices of the *assise*, by it commanding them to admit them that are so sent.

Commission of Association. See **COMMISSION.**

ASSOLE, in our ancient law-books, signifies to absolve, deliver, or set free from an excommunication. See **ABSOLUTION.**

ASSONANCE, in rhetoric and poetry, a term used where the words of a phrase, or a verse, have the same sound or termination, and yet make no proper rhyme.

These are usually vicious in English; though the Romans sometimes used them with elegance: as, *Militem comparavit, exercitum ordinavit, aciem lustravit.*

The Latins call it *similiter desinens*: and the Greeks *ἰσορροπία*.

ASSONANT Rhymes is a term particularly applied to a kind of verses common among the Spaniards, where a resemblance of sound serves instead of a natural rhyme.

Thus, *ligera, cubierta, tierra, mesa*, may answer each other in a kind of *assonant* rhyme, in regard they have each an *e* in the penultimate syllable, and an *a* in the last.

ASSUMPSIT, in law, a naked contract; or a voluntary promise, by word of mouth, by which a man *assumes* and takes upon him to perform, and pay any thing to another. See **CONTRACT.**

This term comprehends any verbal promise; and is variously expressed by the civilians, according to the nature of the promise: sometimes by *patium*; sometimes by *promissio, pollicitatio, or constitutum.*

Where a man tells goods to another, the law makes the *assumpsit*; and promises that he shall pay for them.

ASSUMPTION*, **ASSUMPTIO**, a feast celebrated in the Romish church, in honour of the miraculous ascent of the Holy Virgin, as they describe it, body and soul, into heaven.

* The word is compounded of the Latin *ad*, to, and *sumo*, I take.

This feast is held with great solemnity both in the eastern and western churches.—Yet is not the *assumption* of our lady any point of faith. The ancient martyrologies all speak of it with a great deal of reserve, as a thing not yet fully ascertained; though a divine who should now deny it among them, would be obliged to retract.

The Sorbonne, in the year 1696, in the condemnation of Mary of Agreda, protested, among other things, that they believed that the Holy Virgin was *assumed*, or taken into heaven, body and soul.

ASSUMPTION was also, among our ancestors, used for the day of the death of any saint: *Quia ejus anima in caelum assumitur.* See **ANNIVERSARY.**

ASSUMPTION, in logic, is the minor, or second proposition, in a categorical syllogism.

ASSUMPTION is sometimes also used for a consequence drawn from the propositions whereof an argument is composed. See **CONSEQUENCE.**

Thus we say, the premises are true, but the *assumption* is captious.

ASSUMPTIVE Arms, in heraldry, are such as a man has a right to assume of himself, in virtue of some gallant action.

As, if a man who is no gentleman of blood, nor has coat armour, takes a gentleman, lord, or prince, prisoner in any lawful war; he becomes entitled to bear the shield of such prisoner, and enjoy it to him and his heirs.—The foundation hereof is that principle in military law, that the dominion of things taken in lawful war passes to the conqueror.

ASSURANCE, in logic. See CERTAINTY, EVIDENCE, and DEMONSTRATION.

ASSURANCE, or INSURANCE, in commerce. See INSURANCE.

Policy of ASSURANCE is a kind of contract whereby one or more persons oblige themselves to make good any damages which a ship, a house, or the like, may undergo, by sea, fire, or the like dangers.—The nature and laws hereof, see under the article of *POLICY of assurance*.

We have several offices of *assurance* from fire.—As the Royal Exchange *assurance*; the Sun-fire-office; the Hand-in-hand fire-office; the London *assurance*; the Phoenix-office, &c. some for houses, others for goods, and some for both.

We have also *assurances for life*, in virtue whereof, when the person assured dies, a sum of money becomes payable to the person in whose behalf the *policy of assurance* was granted.

Collateral ASSURANCE. See the article COLLATERAL.

ASSUROR, a merchant, or other person, who assures, or makes out a policy of insurance for a ship, house, life, or the like.

Assurors are not answerable for what damages arise through the negligence, or other fault of the master or seamen; or even those which arise from any vice or defect in the thing assured.

ASTATI*, Ασται, a sect of heretics in the ninth century, the followers of one Sergius, who renew'd the errors of the Manichees.

* The word is derived from the Greek privative *a*, and *σταται*, *sto*, to stand firm, and signifies any thing unstable and inconsistent.

They prevailed much under the emperor Nicephorus; but his successor, Michael Curopalates, curbed them with very severe laws.

ASTERISK*, a character in form of a small star*, set over any word, or sentence, to make it the more conspicuous, or to refer to the margin, or elsewhere, for a quotation, explanation, or the like.

* The word is derived from a diminutive of the Greek *αστρον*, a star.

ASTERISM*, ASTERISMUS, in astronomy, the same with constellation.

* The word comes from the Greek *αστρον*, *stella*, star. See STAR.

ASTHMA*, Ασθμα, in medicine, a disease of the lungs, accompanied with a shortness and difficulty of respiration.

* The word is Greek, formed of the verb *ασω*, *spiro*, I breathe.

An *asthma* is a difficulty of breathing, arising from a disorder of the lungs; and usually attended with violent motions of the diaphragm, abdominal and intercostal muscles, to the very scapula and the pinnæ of the nostrils; as also with a rattling in the throat.

If respiration be only thick and quick, without the other symptoms, it is called a *dyspnoea*.—And if it be so intense as to occasion a violent motion of the muscles of the thorax, so that the patient cannot be tolerably easy, except in an erect posture; it is called an *orthopnoea*.

The *asthma* is usually divided into *moist* and *dry*, or *manifest* and *occult*, or *pneumonic* and *convulsive*: the first is attended with an expectoration of purulent matter; the latter is without.

The true or *pneumonic asthma* is occasioned by an abundance of ferocities, or of gross, viscous, or purulent humours, collected in the cavities of the lungs, which stop up or straighten the passages of the air, and compress the bronchia.

Asthma's may also be owing to emphysemata, phthisis's, polyposus, crudities in the stomach, cachexies, &c.

That kind called the convulsive *asthma* is supposed to be occasioned by an irregular motion of the animal spirits; and happens when the spirits do not flow fast enough, or in sufficient quantity, into the muscles of the breast, either by reason of an obstruction, or of some other obstacle: the necessary consequence whereof is a violent and painful respiration.—The *asthma*, again, is either continual, or periodical, and intermitting; which last returns chiefly when a sober regimen is not observed.

The *asthma* is found to be the most violent when the patient is in bed, and in a prone posture; the contents of the lower belly, in that case, bearing against the diaphragm, so as to lessen the capacity of the breast, and to leave the lungs less room to move.

The cure of the true or pneumonic *asthma* is by bleeding; after which emetics may be used; and, if the paroxysm returns, epispastics, with glysters instead of purges.—Insufflations of fine equin, or the juice thereof, being detensive and attenuating, are reputed excellent. Linctus's also give some relief, millepedes, spirit of gum armoniac, with fine armoniac, coffee, tincture of sulphur, &c. are also greatly commended in *asthmatic* cases.

For the convulsive kind, the cure is attempted by antiepileptics, antihysterics, antispasmodics, opiates, &c.—The *asthma*

is called by Seneca, *meditatio mortis*. See SUPPLEMENT, article ASTHMA.

ASTRAGAL, Αστραγαλός, in anatomy, a bone of the heel, having a convex head, articulated with the tibia, by ginglymus. See Tab. Anat. (Osteol.) fig. 7. a. a. fig. 3. n. 25. 25.

The *astragalus*, called also *talus*, and popularly *os baliste*, is the first bone of the tarsus, and the highest of all those that belong to the foot.

Some also apply the name *astragalus* to the vertebrae of the neck.—Homer, in his *Odyssey*, uses the term in this sense.

ASTRAGAL, in architecture, is a little round member, in form of a ring, or bracelet; serving as an ornament at the tops, and bottoms of columns.—See Tab. Architect. fig. 40. lit. f. & fig. 2.—26. lit. y. S. fig. 28. & 32. lit. f. fig. 24. lit. b. g.

The *astragal* is sometimes also used to separate the fasciae of the architrave; in which case it is carved chaplet-wise, with beads and berries.

It is also used both above and below the listel, adjoining immediately to the square, or dye of the pedestal.

ASTRAGAL, in gunnery, is a kind of ring or moulding on a piece of ordnance, at about half a foot's distance from the mouth; serving as an ornament to the piece, as the former does to a column.

ASTRAGAL Tyles. See the article TYLE.

ASTRAL*, something belonging to the stars, or depending on the stars.

* The word comes from the Latin *astrum*, of the Greek *αστρον*, star.

ASTRAL, or siderial year. See SIDERIAL, and YEAR.

ASTRICTION *Toga*. See the article TOGA.

ASTRINGENS *Crucus Martis*. See the article CRUCUS.

ASTRINGENTS, ADSTRINGENTIA, in medicine, binding remedies; or such as have the power of contracting the parts, and diminishing the pores thereof.

Astringents chiefly act either by the asperity of their particles, whereby they corrugate the membranes, and make them draw up closer; or by thickening the fluids, whereby they cannot run off so fast as before.

Hence, *astringents* are of the class of strengtheners, or corroborants; the nature and operation whereof, see under the article STRENGTHENER.

Astringents naturally stand opposed to *laxatives*. They only differ from what are called *styptics*, in degree of efficacy.

Among simples, mint, red roses, nettles, fennel, berberies, quinces, pomegranates, flices, cinnamon, blood-stone, allum, chalk, boles, coral, &c. are the principal *astringents*.

ASTROITES, Λαβις ASTROITES, or ASTERIA, in natural history, a kind of figured stone, found in divers places*, and bearing the resemblance of a star.

* Particularly at Shugburg in Warwickshire, near Belvoir-castle in Lincolnshire, and in several parts of the north of England.

The form thereof is very uniform and regular; consisting of several thin pentagonal joints set one over another, so as to form a kind of five-angled column.—The usual figures, as given by Dr. Lister, are represented in Tab. Nat. Hist. fig. 14.

But the name is also given to stones which have fossil corals in them. The *Asteria*, as now found, are all fragments, consisting of from one to twenty-five joints.—The matter or substance thereof, when broken, is sparry, of a dark shining pelture, very soft, and easily corroded by an acid menstruum.

—They creep, like the cornu ammonis, in vinegar; but a stronger spirit, as that of nitre, agitates them with considerable violence.

The protuberant parts represented under the top joint of the first figure are not found in all; but only in those which are deep-jointed.—They are always five in number. Dr. Lister calls them *wyers*; and compares them to the antennæ of locusts.

It is controverted among naturalists, to what species of bodies the *astroites*, trochites, entrochi, &c. are to be referred? Some will have them native stones, others rock-plants, and others petrifications of plants. They are properly, however, parts of a marine animal of the starfish kind, petrified. See SUPPLEMENT, article ASTERIA.

ASTROLABE, ASTROLABIUM, was originally used for a system or assemblage of the several circles of the sphere, in their proper order and situation with respect to each other.

The ancient *astrolabes* appear to have been much the same with our armillary spheres.

The first and most celebrated of this kind was that of Hipparchus, which he made at Alexandria, the capital of Egypt, and lodged in a secure place, where it served for divers astronomical operations.—Ptolemy made the same use of it; but as the instrument had several inconveniences, he bethought himself to change its figure, though perfectly natural and agreeable to the doctrine of the sphere; and to reduce

duce the whole *astrolabe* upon a plane surface, to which he gave the denomination of *planisphere*. See *PLANISPHERE*.—Hence,

ASTROLABE is used among the moderns for a planisphere; or a stereographic projection of the circles of the sphere upon the plane of some great circle thereof.

The usual planes of projection are that of the equinoctial, the eye being supposed in the pole of the world; that of the meridian, the eye being supposed in the point of intersection of the equinoctial and horizon; and that of the horizon.

Stoffler, Gemma Frisius, and Clavius, have treated at large of the *astrolabe*.—For a further account of the nature and kinds hereof, see the article *PLANISPHERE*.

ASTROLABE*, or *Sea Astrolabe*, more particularly denotes an instrument chiefly used for taking the altitude of the pole, the sun, or stars, at sea.

* The word is formed from the Greek *αστρον*, star, and *λαβειν*, capio, I take.—The Arabs call it in their tongue, *alsharlab*; a word formed by corruption from the common Greek name: though some of them have endeavoured to give it an Arabic original. But the learned are generally satisfied that the Arabs borrowed both the name, and the use of the instrument from the Greeks. Nafireddin Thousi has a treatise in the Persian language, entitled, *Bait Babshifl Astrolab*, wherein he teaches the structure and the application of the *astrolabe*.

The common *astrolabe* represented *Tab. Navigation*, fig. 22. consists of a large brass ring, about fifteen inches in diameter, whose limb, or a convenient part thereof, is divided into degrees and minutes; fitted with a moveable index, or label, which turns upon the centre and carries two sights.—At the zenith is a ring A, to hang it by in time of observation.

To use the *astrolabe*, turn it so to the sun, as that the rays may pass freely through both the sights F and G; in which case the edge of the label cuts the altitude in the divided limb.

The *astrolabe*, though now grown into disuse, is at least equal to any of the other instruments used for taking the altitude at sea; especially between the tropics, when the sun comes near the zenith.—There are a great many other uses of the *astrolabe*; whereof Clavius, Henion, &c. have wrote entire volumes.

ASTROLOGICAL fate. See the article *FATE*.
ASTROLOGY*, *ASTROLOGIA*, the art of foretelling future events, from the aspects, positions, and influences of the heavenly bodies.

* The word is compounded of the Greek *αστρον*, star, and *λογος*, discourse; whence, in the literal sense of the name, *astrology* should signify no more than the doctrine or science of the stars; which we read was its original acceptation, and made the ancient *astrology*; though, in course of time, an alteration has arose; that which the ancients called *astrology* being afterwards termed *astronomy*. See *ASTRONOMY*.

Astrology may be divided into two branches, *natural* and *judiciary*.

To the former belong the predicting of natural effects; as, the changes of weather, winds, storms, hurricanes, thunder, floods, earthquakes, &c.

To this part our countryman Good chiefly keeps, in his two volumes of *astrology*; wherein he pretends, that inundations may be foretold, and an infinity of phenomena explained from the contemplation of the stars.—Accordingly, he endeavours to account for the diversity of seasons, from the different situations and habitudes of the planets, from their retrograde motions; the number of fixed stars in the constellations, &c.

This art properly belongs to physiology, or natural philosophy, and is only to be deduced a posteriori from phenomena and observations.

Its foundation and merits the reader may gather from what we have said under the articles *AIR*, *ATMOSPHERE*, and *WEATHER*.

For this *astrology*, Mr. Boyle has a just apology in his *History of the Air*.—Generation and corruption being the extremes of motion, and rarefaction and condensation the mean; he shews, that the effluvia of the heavenly bodies, as we find them immediately contribute to the latter, must also have a mediate influence on the former; and consequently, all physical bodies must necessarily be affected thereby.

It is evident, that the properties of moisture, heat, cold, &c. employed by nature to produce the two great effects of rarefaction and condensation, almost wholly depend on the course, motion, position, &c. of the heavenly bodies.—And it is also clear, that every planet must have its own proper light, distinct from that of any other; light not being a bare visible

quality, but endued with this specific power. The sun, we know, not only shines on all the planets, but by his genial warmth calls forth, excites, and raises the motions, properties, &c. peculiar to them; and his rays must flare or receive somewhat of the tincture thereof; and thus tinged be again reflected into the other parts of the world, and particularly the adjacent bodies of the planetary system. Whence, according to the angle the planets make with that grand luminary, and the degree wherein they are enlightened, either by his direct or his oblique rays; together with their distance and situation in respect of our earth; the powers, effects, or tinctures, proper to each, must be transmitted hitherto, and have a greater or less effect on sublunary things. See *Mead de imperio solis & lune, &c.*

Judiciary, or Judicial ASTROLOGY, which is what we commonly call *astrology*, is that which pretends to foretell moral events; i. e. such as have a dependance on the free will and agency of man; as if that were directed by the stars.

The professors hereof maintain, “That the heavens are one great volume or book, wherein God has wrote the history of the world; and in which every man may read his own fortune, and the transactions of his time.—The art, say they, had its rise from the same hands as astronomy itself: while the ancient Assyrians, whose serene unclouded sky favoured their celestial observations, were intent on tracing the paths and periods of the heavenly bodies, they discovered a constant, settled relation, or analogy, between them and things below; and hence were led to conclude, these to be the *Parces*, the destinies, so much talked of, which preside at our births, and dispose of our future fate.

The laws therefore of this relation being ascertained by a series of observations, and the share each planet has therein; by knowing the precise time of any person’s nativity, they were enabled, from their knowledge in astronomy, to erect a theme or horoscope of the situation of the planets, at that point of time: and hence, by considering their degrees of power and influence, and how each was either strengthened or tempered by some other; to compute what must be the result thereof.”

Thus the *astrologers*.—But the chief province now remaining to the modern professors, is the making of calendars or almanacs.

Judicial *astrology*, is commonly said to have been invented in Chaldaea, and thence transmitted to the Egyptians, Greeks, and Romans.—Though some will have it of Egyptian origin, and ascribe the invention to Cham. But it is to the Arabs that we owe it. At Rome the people were so infatuated with it, that the *astrologers*, or, as they were then called, the *mathematicians*, maintained their ground in spite of all the edicts of the emperors to expel them out of the city. See *GENETHLIACI*.

Add, that the Bramins, who introduced and practised this art among the Indians, have hereby made themselves the arbiters of good and evil hours, which gives them a vast authority: they are consulted as oracles; and they have taken care never to sell their answers but at good rates.

The same superstition has prevailed in more modern ages and nations. The French historians remark, that, in the time of queen Catherine de Medicis, *astrology* was in so much vogue, that the most inconsiderable thing was not to be done without consulting the stars. And in the reigns of king Henry III. and IV. of France, the predictions of *astrologers* were the common theme of the court conversation.

This predominant humour in that court was well rallied by Barclay, in his *Argenis*, lib. II. on occasion of an *astrologer*, who had undertook to instruct king Henry in the event of a war then threatened by the faction of the Guises.

“You maintain, says Barclay, that the circumstances of life and death depend on the place and influence of the celestial bodies, at the time when the child first comes to light; and yet you own that the heavens revolve with such vast rapidity, that the situation of the stars is considerably changed in the least moment of time.—What certainty then, can there be in your art; unless you suppose the midwives constantly careful to observe the clock; that the minute of time may be conveyed to the infant as we do his patrimony? How often does the mother’s danger prevent this care? and how many are there who are not touched with this superstition? But suppose them watchful to your wish: if the child be long in delivery; if, as is often the case, a hand or the head come first, and be not immediately followed by the rest of the body; which state of the stars is to determine for him? that, when the head made its appearance; or when the whole body was disengaged? I say nothing of the common errors of clocks, and other time-keepers, sufficient to elude all your cares!

Again, why are we to regard only the stars at his nativity, and not those rather which shone when the fetus was animated

“ animated in the womb? and why must those others be excluded which precluded while the body remained tender, and susceptible of the weakest impression, during gestation?
 “ But setting this aside; and supposing, withal, the face of the heavens accurately known: whence arises this dominion of the stars over our bodies and minds, that they must be the arbiters of our happiness, our manner of life, and death? Were all those who went to battle, and died together, born under the same position of the heavens? and when a ship is to be cast away, do the stars to suffer shipwreck?
 “ Or rather, do not persons born under every planet go into the combat, or aboard the vessel; and thus, notwithstanding the disparity of their birth, perish alike? Again, all who were born under the same configuration of the stars do not live or die in the same manner. Are all who were born at the same time with the king, monarchs? or are they all even alive at this day? View M. Villeroy, here; may view yourself: were all that came into the world with him as wise and virtuous as he; or all born under your own stars, astrologers like you? If a man meet a robber, you will say he was doomed to perish by a robber's hand; but did the same stars which when the traveller was born subjected him to the robber's sword, did they likewise give the robber, who perhaps was born long before, a power and inclination to kill him? for you will allow it as much owing to the stars that the one kills, as that the other is killed. And when a man is overwhelmed by the fall of a house, did the walls become faulty because the stars had doomed him to die thereby; or rather, was not his death owing to this, that the walls were faulty?
 “ The fame may be said with regard to honours and employments: because the stars that shone at a man's nativity promised him preferment, could those have an influence over other persons not born under them, by whose suffrages he was to rise? or how do the stars at one man's birth annul or set aside the contrary influences of other stars, which shone at the birth of another?
 “ The truth is, supposing the reality of all the planetary powers; as the sun, which visits an infinity of bodies with the same rays, has not the same effect on all, but some things are hardened thereby, as clay; others, softened, as wax; some seeds cherished, others destroyed; and the tender herbs scorched up, others secured by their coarser juice: so, where so many children are born together, like a field tilled for many different ways, according to the various health, habitude, and temperament of the parents, the same celestial influx must operate differently. If the genius be suitable and towards, it must predominate therein: if contrary, it will only correct it. So that, to foretell the life and manners of a child, you are not only to look into the heavens, but into the parents, into the fortune which attended the pregnant mother, and a thousand other circumstances utterly inaccessible.
 “ Further, does the power that portends the new-born infant a life, for instance, of forty years; or perhaps a violent death at thirty; does that power, I say, endure and reside still in the heavens, waiting the destined time, when, descending upon earth, it may produce such an effect? or is it infused into the infant himself; so that being cherished, and gradually growing up together with him, it bursts forth at the appointed time, and fulfils what the stars had given it in charge? persist in the heavens it cannot; in that depending immediately on a certain configuration of the stars; when that is changed, the effect connected with it must cease, and a new, perhaps a contrary one, take place. What repository then have you for the former power to remain in, till the time come for its delivery?
 “ If you say it inheres or resides in the infant, not to operate on him till he be grown to manhood; the answer is more preposterous than the former: for this, in the instance of a shipwreck, you must suppose the cause why the winds rise, and the ship is leaky, or the pilot, through ignorance of the place, runs on a shoal or a rock. So the farmer is the cause of the war, that impoverishes him; or of the favourable season which brings him a plenteous harvest.
 “ You boast much of the event of a few predictions, which, considering the multitude of those your art has produced, plainly confess its impertinency.—A million of deceptions are industriously hidden and forgot in favour of some eight or ten things which have succeeded. Out of so many conjectures it must be preternatural if some did not hit; and it is certain, that, considering you only as guessers, there is no room to boast you have been successful therein. Do you know what fate awaits France in this war; and yet are not apprehensive what shall befall yourself? Did not you foresee the opposition I was this day to make you? If you can say whether the king shall vanquish his enemies; find out first, whether he will believe you.”

ASTRONOMICAL, something that relates to *astronomy*.

ASTRONOMICAL *Calendar*.
 ASTRONOMICAL *Characters*.
 ASTRONOMICAL *Calumn*.
 ASTRONOMICAL *Horizon*.
 ASTRONOMICAL *Hours*.
 ASTRONOMICAL *Month*.
 ASTRONOMICAL *Observations*. See

CALENDAR.
 CHARACTERS.
 COLUMN.
 HORIZON.
 HOURS.
 MONTH.
 COELESTIAL *Observations*.

The *astronomical* observations of the ancients, among which those of Hipparchus make a principal figure, are carefully preserved by Ptolemy in his *almagest*.

In the year 880, Albategni, a Sarazen, applied himself to the making of observations: in 1457, Regiomontanus undertook the province at Norimberg; and his disciples J. Wernerus, and Ber. Waltherus, continued the same from 1475 to 1504. Their observations were published together in 1544.—In 1509, Copernicus, and after him the landgrave of Hesse, with his assistants Rothmannus and Byrgius, observed; and after them Tycho, at Uranibourg, from 1582 to 1601.—All the observations hitherto rehearsed, together with Tycho's apparatus of instruments, are contained in the *Historia Cœlestis*, published in 1672, by order of the emperor Ferdinand.—Soon after, Hevelius, with a still more magnificent and better contrived apparatus of instruments, described in his *Machina Cœlestis*, began a course of observations. It is objected to him that he only used plain sights, and could never be brought to take the advantage of telescopic ones; which occasioned Dr. Hook to write animadversions on Hevelius's instruments, printed in 1674; wherein he too rashly despitues them on account of their inaccuracy: but Dr. Halley, who at the instance of the Royal Society went over to Dantzick in the year 1679, to inspect his instruments, approved of their justness, as well as of the observations made with them. See SIGHTS.

Jer. Horrox, and Will. Crabtree, two of our own countrymen, are famous for their observations from the years 1635 to 1645.—They were followed by Flamsteed, Cassini the father and son, Halley, de la Hire, Roemer, and Kirchius.—See further under the articles OBSERVATORY, CATALOGUE, &c.

ASTRONOMICAL *Place*, of a star or planet, is its longitude, or place in the ecliptic, reckoned from the beginning of Aries, in consequentia, or according to the natural order of the signs.

ASTRONOMICAL *Quadrant*. See the article QUADRANT.

ASTRONOMICAL *Ring-dial*. See RING-DIAL.
 ASTRONOMICALS, a name used by some writers for sexagesimal fractions; on account of their use in *astronomical* calculations.

ASTRONOMICAL *Tables*. See the article TABLE.

ASTRONOMICAL *Telescope*. See the article TELESCOPE.

ASTRONOMICAL *Time*. See the article TIME.

ASTRONOMICAL *Year*. See the article YEAR.

ASTRONOMICUS *Radius*. See the article RADIUS.

ASTRONOMY*, ASTRONOMIA, the doctrine of the heavens, and the phenomena thereof.

* The word is compounded of the Greek *αστρος*, star, and *νομος*, law, rule.

Astronomy is properly a mixed mathematical science, whereby we become acquainted with the celestial bodies, their magnitudes, motions, distances, periods, eclipses, &c.

Some understand the word *astronomy* in a more extensive sense; including under it the theory of the universe, and the primary laws of nature: in which sense it rather seems a branch of physics than of mathematics.

The heavens may be considered two ways; either as they appear to the naked sense, or as they are discovered by the understanding: and hence *astronomy* is divided into two branches, *spherical* and *theoretical*.

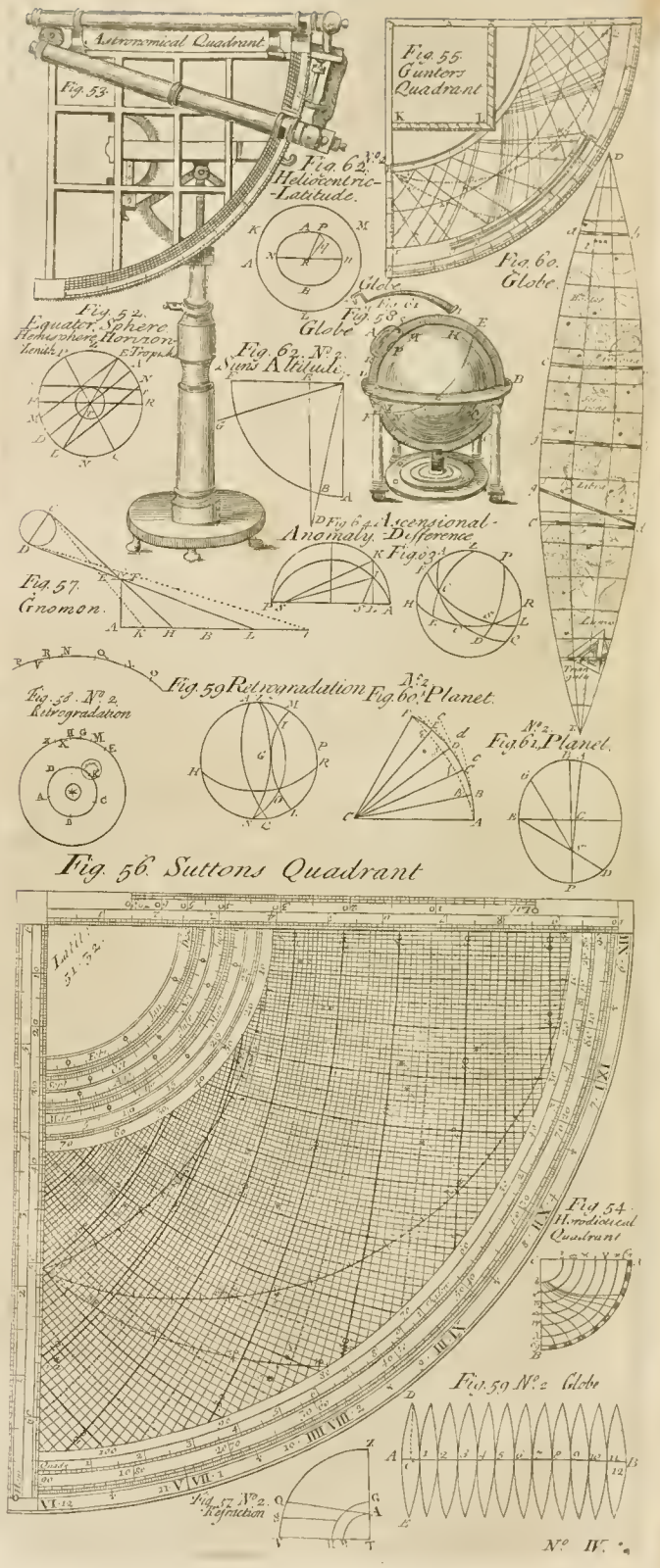
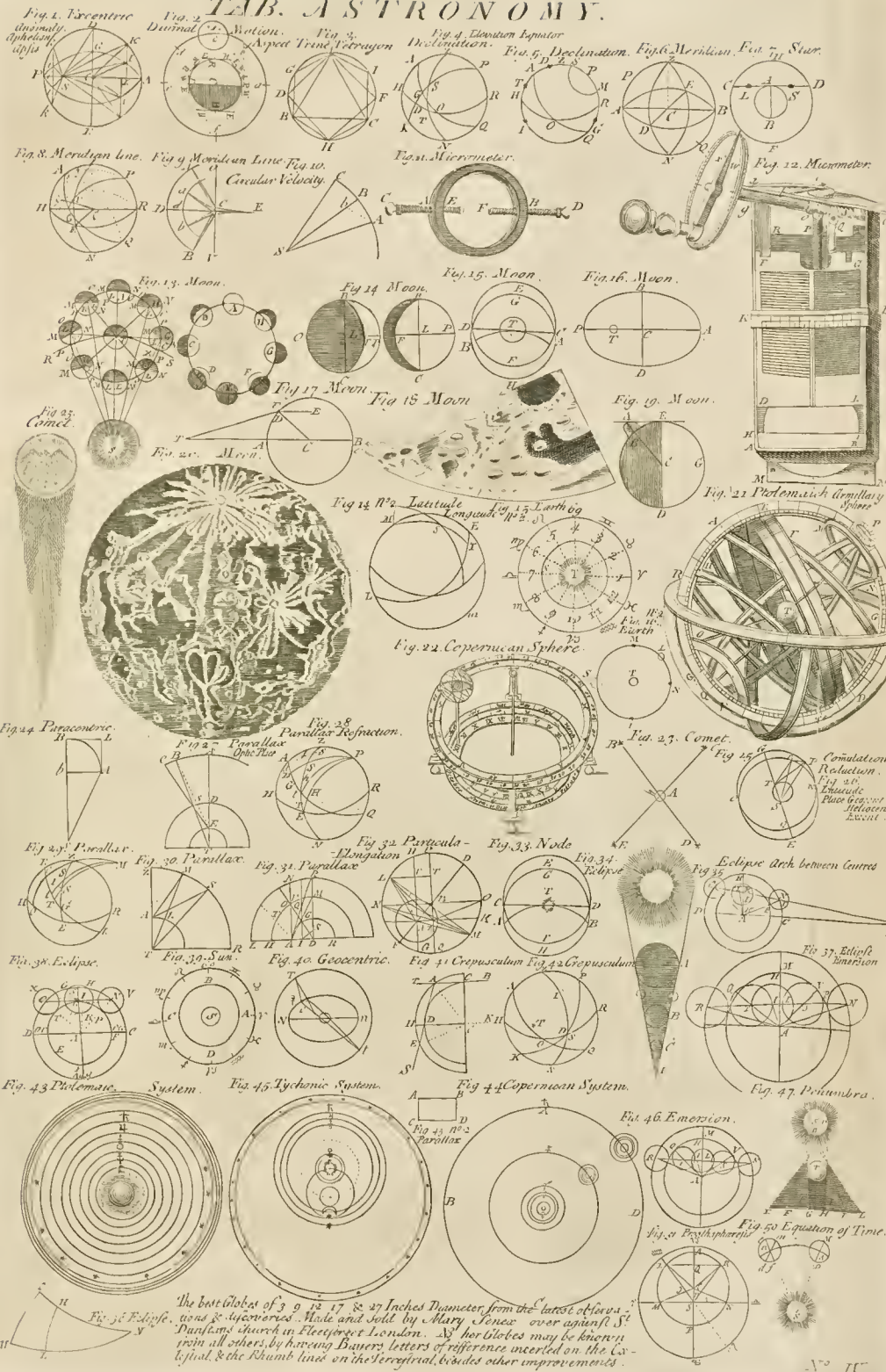
Spherical ASTRONOMY. } See the article { SPHERICAL.
Theoretical ASTRONOMY. } THEORETICAL.

The invention of *astronomy* has been variously assigned; and several persons, several nations, and several ages have laid claim to it.—From the accounts given us by the ancient historians, it appears that kings were the first inventors and cultivators of it; thus, Belus, king of Assyria; Atlas, king of Mauritania; and Uranus, king of the country situate on the shore of the Atlantic ocean; are severally recorded, as the persons to whom the world owes this noble science.

This, at least, is pretty evident, that it was known to those nations long before it came into Greece: agreeably to which, Plato tells us, it was a Barbarian who first observed the heavenly motions; to which he was led by the clearness of the weather in the summer season; as in Egypt and Syria, where the stars are constantly seen, there being no rain or clouds to interrupt the prospect. And the want of this clearness of atmosphere the same author lays down as the reason why the Greeks came so late to the knowledge of *astronomy*.

The

TAB. ASTRONOMY.



The best Globes of 30 17 & 27 Inches Diameter from the latest observations & discoveries. Made and sold by *Mary Jones* over against *S^t. Dunstons Church in Fleetstreet London.* As for Globes may be known from all others, by having *Bayers* letters of reference inserted on the Equator, & the Rhumb lines on the Terrestrial, besides other improvements.

2

The generality of writers fix the origin of *astronomy* and *astrology* in Chaldaea; and accordingly among the ancients we find the word *Chaldaean* frequently used for *astronomers*.—Some chuse however to attribute the invention to the ancient Hebrews; and some, even to the first men; building on the authority of Josephus, and what he mentions about Seth's pillars.—The Mussulmans, with some Jews as well as Christians, ascribe it to Enoch, and other of the Orientals to Cain.—But these opinions appear scarcely probable to others, in regard they find no terms of *astronomy* in the language of those first people, that is, in the Hebrew language; which, on the contrary, are very frequent in the Chaldaean; though it must be owned we have something of this kind in Job, and the books of Solomon.

We do not know whether it is worth noting, that Rudbeck, in his *Atlantica*, maintains *astronomy* to have been invented by the Swedes: his reasons are, the great diversity in the length of the days in that country, which must naturally lead the people to conclude the earth round, and that they lived near one of its extremes: a conclusion which the Chaldaean, and other inhabitants of the middle parts of the globe, had no such easy way of coming at. The Swedes, adds our author, prompted hereby to enquire further into the great opposition of seasons, soon discovered that the sun bounds his progress by a certain space in the heavens, &c.—But we have no historical facts to support this reasoning, which at best only proves that the thing might be so.

By Porphyry's account, *astronomy* must have been of a very ancient standing in the east; for he tells us, that when Babylon was taken by Alexander, there were brought thence celestial observations for the space of 1903 years, which therefore must have commenced within 115 years of the flood, or within fifteen years of the building of Babel.—Epigenes, according to Pliny, affirmed that the Babylonians had observations of 720 years, engraven on bricks.—Achilles Tattius ascribes the invention of *astronomy* to the Egyptians; and adds, that their knowledge therein was engraven on columns, and by that means transmitted to posterity.

From the Egyptians, *astronomy* is commonly supposed to have passed to the Greeks: Laertius tells us, that Thales, first, about the ninetieth olympiad, and after him Eudoxus and Pythagoras, travelled into Egypt, to be instructed therein; and that this last, in particular, living in a close community with the Egyptian priests for seven years, and being initiated into their religion, was here let into the true system of the universe; which he afterwards taught in Greece and Italy.—He was the first, among the Europeans, who taught that the earth and planets turn round the sun, which stands immovable in the centre; and that diurnal motion of the sun and fixed stars is not real, but apparent, arising from the earth's motion round its own axis, &c.

Yet Vitruvius represents the introduction of *astronomy* into Greece somewhat differently; maintaining, that Berofus, a Babylonian, brought it thither immediately from Babylon itself; and opened an *astronomical* school in the island of Cos. Plin. lib. 7. c. 37. adds, that, in consideration of his wonderful predictions, the Athenians erected him a statue in the gymnasium, with a gilded tongue.—If this Berofus be the same with the author of the Chaldaean histories, he must have been before Alexander.

After Pythagoras, *astronomy* sunk greatly into neglect; most of the celestial observations brought from Babylon were lost, and it was but a very small number that Ptolemy, in his time, was able to retrieve.—However, some few of his followers continued to cultivate *astronomy*; among whom were Philolaus and Aristarchus Samius.

At length, those patrons of learning, the Ptolemys, kings of Egypt, founding an academy of *astronomy* at Alexandria, there arose several eminent *astronomers* from the same; particularly Hipparchus, who, according to Pliny, undertook what would have been a great work even for a God to achieve, viz. to number the stars, and leave the heavens as an inheritance to posterity: he foretold the eclipses both of the sun and moon for 600 years, and on his observations is founded that noble work of Ptolemy, intitled *μυθολογία αστρονομίας*. The Sarazens, on their conquest of Egypt, got a tincture of *astronomy*, which they carried with them out of Africa into Spain; and by this means *astronomy* after a long exile, was at length introduced afresh into Europe.

From this time, *astronomy* began to improve very considerably; being cultivated by the greatest genius's, and patronized by the greatest princes.—Alphonfus, king of Castile, enriched it with those tables which still bear his name. See TABLE. Copernicus re-established the ancient Pythagorean system; and Tycho Brahe published a catalogue of 770 fixed stars, from his own observations.

Kepler, from Tycho's labours, soon after discovered the true theory of the world: and the physical laws by which the heavenly bodies move.

Galileo first introduced telescopes into *astronomy*, and by their means discovered the satellites of Jupiter; the various

phases of Saturn, the mountains of the moon, the spots in the sun, and its revolution about its axis. See TELESCOPE, and SATELLITE.

Add, that Hevelius, from his own curious observations, furnished a catalogue of fixed stars, much more complete than Tycho's.—Huygens and Cassini discovered the satellites of Saturn and his ring.—And Gaffendus, Horrox, Bullialdus, Ward, Ricciolus, Gascoign, &c. each contributed very considerably to the improvement of *astronomy*.

The immortal Newton first demonstrated, from physical considerations, the great law that regulates all the heavenly motions, sets bounds to the planets orbits, and determines their greatest excursions from the sun, and their nearest approaches to it.—It was he first taught the world whence arose that constant and regular proportion observed by both primary and secondary planets in their circulation round their central bodies; and their distances compared with their periods.—He has also given us a new theory of the moon, which accurately answers all her inequalities, and accounts for them from the laws of gravity and mechanism. See NEWTONIAN. See also ATTRACTION.

Dr. Halley obliged the world with the *astronomy* of comets, and with a catalogue of the stars in the southern hemisphere; and was a very great benefactor to *astronomy*, by his observations: to which it may be added, that he put in the press a new set of astronomical tables, more accurate than any before published.

Mr. Flamsteed upwards of forty years watched the motions of the stars; and has given us a great number of curious observations of the sun, moon, and planets; besides a noble catalogue of 3000 fixed stars; which is more than double the number in that of Hevelius.—Nothing now seemed wanting to *astronomy*, but an universal and complete theory of the celestial phenomena, explained according to their true motions and physical causes, which has been performed by Dr. Gregory.

ASTRONOMY is sometimes divided, with respect to its different states, into *new* and *old*.

Ancient astronomy is such as the art stood under Ptolemy, and his followers; with all the apparatus of solid orbs, epicycles, excentrics, deferents, trepidations, &c.

The *ancient astronomy* is delivered by Claud. Ptolemy, who died A. D. 147, in his *μυθολογία αστρονομίας*; translated in 827, into Arabic; and by G. Trapezantius into Latin. An epitome of it, for the use of learners, was made by Purbachius and his scholar Regiomontanus, in 1550; containing the whole doctrine of the heavenly motions, their magnitudes, eclipses, &c.—On the model hereof, Albategni the Arab compiled another work, on the knowledge of the stars, published in Latin in 1537.

New astronomy is such as the art has been since Copernicus; by whom those fictitious machines were thrown out; and the constitution of the heavens reduced to more simple, natural, and certain principles.

The *modern astronomy* is delivered by Copernicus in his six books of *Celestial Revolutions*, published about the year 1566; wherein, by retrieving Pythagoras's and Philolaus's dogma of the motion of the earth, he laid the foundation of a juster system.—Kepler's *Commentaries of the motions of Mars*, published in 1609; wherein, in lieu of the circular orbits admitted by all former astronomers, he proposed the elliptic theory; which, in his epitome of the Copernican *astronomy*, published in 1635, he applied to all the planets.—

1st. Bullialdus's *Astronomia Philolaica*, published in 1645, wherein he endeavoured to amend Kepler's theory, and render the calculus more exact and geometrical: some errors committed by Bullialdus were pointed out by Dr. Seth Ward, in his *Inquiry into the Philolaic astronomy, Inquisitio in astronomia Philolaica fundamenta*, published in 1653; and corrected by himself in his *Foundations of the Philolaic astronomy more clearly explained*, in 1657.—Ward's *Astronomia geometrica*, published in 1656; wherein a geometrical method is proposed of computing the planets motions; though not consistent with the true laws of their motions established by Kepler. The same was proposed the year following by the count de Pagan. The truth is, Kepler himself does not seem to have been ignorant thereof; but he rather chofe to set it aside, as finding it contrary to nature.—Vin. Wing's *Astronomia Britannica*, published in 1669; wherein, going on Bullialdus's principles, he gives just examples of all the precepts in practical *astronomy*, well accommodated to the capacity of learners.—Newton's *Astronomia Britannica*, published in 1657; and Street's *Astronomia Carolina*, in 1661; both upon Ward's hypothesis.

In Ricciolus's *Almagestum novum*, published in 1651, we have the several hypotheses of all the astronomers, ancient as well as modern.—And in Dr. Gregory's *Elementa astronomiae physicae & geometricae*, in 1702, the whole modern astronomy, as founded on the discoveries of Copernicus, Kepler, and Sir Isaac Newton.—The marrow of the old *astronomy* is given by Tacquet, and of the new *astronomy* by Whiston in his *Prælectiones*

lectiones astronomicae, in 1707.—For novices in the art, Mercator's *Institutiones astronomicae*, published in 1676; which contains the whole doctrine, both according to the ancients and moderns; and Dr. Keill's *Introductio ad veram astronomiam*, in 1718, which only takes in the modern, are the best calculated.

ASTYNOMI. See AGORANOMOUS.

ASYLUM*, *ἄστυλον*, a sanctuary or place of refuge, where a criminal who shelters himself is deemed inviolable, and not to be touched by any officer of justice.

* The word is Greek *ἄστυλον*, compounded of the privative particle *α*, and *στυλας*, I take out, or I hurt; because no person could be taken out of an *asylum* without sacrilege. See SACRILEGE.

The first *asylum* was established at Athens, by the descendants of Hercules, to shelter themselves from the fury of his enemies.

The temples, altars, statues, and tombs of heroes, were, anciently the ordinary retreat of those who found themselves aggrieved by the rigour of the laws, or oppressed by the violence of tyrants: but, of all others, temples were held the most sacred and inviolable refuge. It was supposed that the gods took upon them to punish the criminal who thus threw himself upon them; and that it would be a great impiety in man to take vengeance out of the hands of the immortals.

The Israelites had their cities of refuge, which were of god's own appointment; where the guilty, who had not committed any deliberate crime, found safety and protection.—As to the heathens, they allowed refuge and impunity, even to the vilest and most flagrant offenders, some out of superstition, and others for the sake of peopling their cities; and it was by this means, and with such inhabitants, that Thebes, Athens, and Rome, were first stocked.—We even read of *asylums* at Lyons and Vienne among the ancient Gauls; and there are some cities in Germany which still preserve the ancient right of *asylum*.

Hence, on the medals of several ancient cities, particularly in Syria, we meet the inscription, *ΑΣΥΛΟΙ*, to which is added, *ΙΕΡΑΙ*. For instance, *ΤΙΤΟΥ ΙΕΡΑΣ ΚΑΙ ΑΣΥΛΟΥ ΕΙΔΙΚΟΥΣ ΙΕΡΑΣ ΚΑΙ ΑΣΥΛΟΥ*.—This quality of *asylum* was given to them, according to M. Spanheim, in regard to their temples, and of the gods revered by them.

The same qualities have also been given to deities: thus Diana of Ephesus is called *ἄστυλος*.—Add that the camp formed by Romulus and Remus was called *asylum*, and afterwards became a city, in which was a temple erected to the god *Ashylæus*, *Θεὸς ἀστυλίου*.

The emperors Honorius and Theodosius granting the like immunities to churches, the bishops and monks laid hold of a certain tract or territory, without which they fixed the bounds of the secular jurisdiction: and so well did they manage their privileges, that convents, in a little time, became next a-kin to fortresses; where the most glaring villains were in safety, and braved the power of the magistrate.

These privileges, at length, were extended not only to the churches and church-yards, but also to the bishops houses, whence the criminal could not be removed without a legal assurance of life, and an entire remission of the crime.—The reason of the extension was, that they might not be obliged to live altogether in the churches, &c. where several of the occasions of life could not be decently performed.

But, at length, these *asylas*, or sanctuaries, were also stripped of most of their immunities, in regard they served to make guilt and libertinage more daring and bold-faced. In England, particularly, they were entirely abolished. See the article SANCTUARY.

ASYMMETRY*, *Ἀσυνμετρία*, a want of proportion, or correspondence between the parts of a thing. See SYMMETRY.

* The word is derived from the privative particle *α*, *συν*, with, and *μετρον*, measure, q. d. without measure.

In mathematics, the term is particularly used for what we more usually call *incommensurability*; which is when between two quantities there is no common measure: as between the side, and diagonal of a square.—In numbers, surd roots, as $\sqrt{2}$, &c. are incommensurable to rational numbers.

ASYMPTOTE*, in geometry, a line which continually approaches nearer and nearer to another, yet will never meet therewith, tho' indefinitely prolonged. See LINE.

* The word is compounded of the privative particle *α*, *συν*, with, and *πίπτω*, I fall; q. d. incoincident, or which never meet.—Some Latin Authors call these lines *intactæ*.

Bertinus rehearses divers sorts of *asymptotes*; some straight, others curve; some concave, others convex, &c. and further, proposes an instrument to describe them withal.—Though, in strictness, the term *asymptotes* seems appropriated to right lines.

ASYMPTOTES, then, are properly right lines, which approach nearer and nearer to some curve, of which they are said to be

the *asymptotes*; but which, though they and their curve were indefinitely continued, would never meet.

Asymptotes may be conceived as tangents to their curves at an infinite distance.

Two curves are also said to be *asymptotical*, when they thus continually approach, without a possibility of meeting.—Thus two parabolas, whose axes are in the same right line, are *asymptotical* to one another.

Of curves of the second kind, that is, the conic sections, only the hyperbola has *asymptotes*, which are two in number, long ago demonstrated by Apollonius Pergæus.

All curves of the third kind have at least one *asymptote*, but they may have three; and all curves of the fourth kind may have four *asymptotes*.

The conchoid, cissoid, and logarithmic curve, though not reputed geometrical curves, have each also one *asymptote*.

The nature of *asymptotes* will be easily conceived in the instance of the *asymptote* of a conchoid.—Suppose M M A M, &c. (*Tab. Analysis*, fig. 1.) be a part of a conchoid, C its pole, and the right line BD, so drawn that the parts Q M, E A, O M, &c. of right lines drawn from the pole C, are equal to each other: then will the line BD be an *asymptote* of the curve: because the perpendicular M I, &c. is shorter than M O, and M R than M Q, &c. so that the two lines continually approach; yet the points M, &c. and R, &c. can never coincide, in regard there is still a portion of a line to keep them asunder; which portion of a line is infinitely divisible, and consequently must be diminished infinitely ere it become nothing.

ASYMPTOTES of the hyperbola are thus described.—Suppose a right line DE (*Tab. Conics*, fig. 20.) drawn through the vertex A of the hyperbola, parallel to the ordinates M m, and equal to the conjugate axes, viz. the part DA, and that AE to the semi-axis: then, two right lines drawn from the centre C of the hyperbola, through the points D and E, viz. the right lines CF and CG, are *asymptotes* of the curve.

If the hyperbola G M R, (*fig. 12. n. 2.*) be of any kind whose nature with regard to the curve and its *asymptote*, is expressed, by this general equation $x^m y^n = a^m + n$; and the right line PM be drawn any where parallel to the *asymptotes* CS, and the parallelogram PCOM, be completed: this parallelogram is to the hyperbolic space PMG B, contained under the determinate line PM, the curve of the hyperbola G M indefinitely continued towards G, and the part PB of the *asymptote* indefinitely continued the same way, as $m - n$ is to n : and so if m be greater than n , the said space is squareable; but when $m = n$, as it will be in the common hyperbola, the ratio of the foregoing parallelogram to that space is as o to 1 ; that is, the space is infinitely greater than the parallelogram, and so cannot be had: and when m is less than n , the parallelogram will be to the space, as a negative number to a positive one, and the said space is squareable, and the solid generated by the revolving of the indeterminate space GMOL about the *asymptote* CE, is double of the cylinder generated by the motion of the parallelogram PCOM about the axis CO.

ASYMPTOTE of a logarithmic curve.—If MS (*fig. 33.*) be the logarithmic curve, PR an *asymptote*, P T the subtangent, and MP an ordinate; then will the indeterminate space RPMS = PM \times PT; and the solid, generated by the rotation of this curve about the *asymptote* \sqrt{P} , will be $\frac{1}{2}$ of a cylinder whose altitude is equal to the length of the subtangent, and the semidiameter of the base equal to the ordinate Q V.

ASYMPTOTIC Spaces. See HYPERBOLA.

ASYNDETON*, *ἄσυνδeton*, a figure in grammar, implying a defect, or want of conjunctions in a sentence.

* The word is derived from the privative *α*, and *συνδω*, colligē, I bind together.

As, in the instance, *veni, vidi, vici*, I came, I saw, I conquered; where the copulative *et*, and, is omitted: or in that of Cicero concerning Cætiline, *abiit, excessit, evasit, erupit*: or in that verse of Virgil,

Ferte citi flammæ, date vela, impellite remos.

Asyndeton stands opposed to *polyyndeton*, where the copulatives are multiplied.

ATARAXY*, *Ἀταραξία*, a term much used by the Sceptics, and Stoics, to denote that calmness, and tranquillity of mind, and that firmness of judgment which sets us free from any agitations or emotions arising from self-opinion, and the knowledge we imagine ourselves possessed of.

* The word is purely Greek, compounded of *αταρ*, but; and *ταξίς*, order.

In this *ataraxy*, they supposed the sovereign good, or highest bliss in this life to consist.

ATAXY*, *Ἀταξία*, a want of order or regularity.

* The word is compounded of the privative *α*, and *ταξίς*, order.

Ataxia is chiefly used in medicine, where the order of the critical days, or other phenomena of a disease, is inverted.

The

The physicians have frequent recourse to an *ataxy*, or irregularity of the spirits, when at a loss to account for any disorder in the body. The spirits, Dr. Drake observes, being always at hand, are forced to bear the blame of a thousand things they are innocent of.

ATCHEVEMENT *, in heraldry, the coat of arms of any person or family, duly marshalled with its external ornaments or supporters, helmet, wreath, crest and motto.

* The word is formed of the French, *achevement*, finishing, consummation, perfection.

Such are those usually hung out on the fronts of houses after the death of some considerable person; now corruptly called *hatchments*.

ATELLANÆ, in antiquity, a kind of comic and satyric pieces, presented on the Roman theatre; somewhat less ludicrous than the farces on the English stage, and yet less grave and serious than the Greek and Latin comedies and tragedies.

The *atellanae*, or *fabula atellana* of the Romans, answered to the *satyræ* among the Greeks.

They were thus called from *Atella*, a city of Tuscany, where they were first represented; and from whence, on account of their mirth and humour, they were introduced into Rome.

But they became at length so licentious, and impudent, that the senate was obliged to suppress them.

ATHAMADULET *, or **ATHEMADAULET**, the prime or chief minister in the Persian empire.

* The word, according to Kempfer, is properly written in the Persian *athamadault*: according to Tavernier, *athemadault*: according to Sanon, *cinadault*.—Authors suppose it originally Arabic, and compounded of *itmad* and *daulet*, that is, the trust of majesty; or according to Tavernier, the support of riches; according to Kempfer, the prop and refuge of the court.

The *athamadulet* is much the same with the grand visier in Turkey: excepting that he has not the command of the army, which the visier has.

The *athamadulet* is great chancellor of the kingdom, president of the council, superintendent of the finances; and has the charge of all foreign affairs.—He is in effect vice-roy, or administrator of the kingdom: he issues the king's mandates, or orders, in this stile, *Bende derga ali il alia etmadault*, that is, I who am the support of the power, the creature of this port, the highest of all ports, &c.

ATHANASIAN Creed. See **CREED**, and **TRINITY**.

ATHANATI *, an order of soldiers among the ancient Persians.

* The word is originally Greek, and signifies *immortal*; being compounded of the privative *a*, and *θανος*, death.

The *Athanati* were a body of cavalry, consisting of ten thousand men, always compleat, because, when any one of them died, another was immediately put into his place.—It was for this reason that they were called *athanati* by the Greeks, by the Latins *immortales*.

ATHANOR *, in chymistry, a large immoveable furnace, built of brick and earth, and covered with a tower at the top; proper to maintain a temperate and equal degree of heat for a considerable time.

* The word *athanor* is borrowed from the Arabs, who call an oven, *tannour*, from the Hebrew תנור, *tannour*, an oven, or furnace; whence, with the additional particle *al*, אל תנור, *al-tannour*, &c.—Others chuse to derive the name from the Greek ἀθάνατος, *immortal*, because of its durable fire.

The heat of the *athanor* is intended or remitted by opening or shutting a register. It is made to communicate its heat by tubes or apertures at the side of the hearth or fire-place, to several adjacent vessels; by which means different operations are carried on at the same time.

The *athanor* is also called *figer Henricus*, *slow Harry*; because chiefly used in the slower operations; and because, when once filled with coals, it keeps burning a long time; whence the Greeks call it *αειπυρος*, *q. d.* giving no trouble, as it does not need to be continually attended.—It is also called the *philosophical furnace*, or *furnace of arcana*; sometimes *sternus chymicus*, or *spagyricus*, and popularly the *tower furnace*, *furnus turritus*.

ATHEIST *, **ΑΘΕΙΣ** a person who denies the Deity; who does not believe the existence of a God, nor a providence; and who has no religion true nor false.

* The word is derived from the privative *a*, and *θεος*, God.

In general, a man is said to be an *atheist* who owns no being superior to nature, that is, to men and the other sensible beings in the world.

In this sense, Spinoza may be said to be an *atheist*; and it is an impropriety to rank him, as the learned commonly do, among *deists*; since he allows of no other God beside nature, or the universe, of which mankind makes a part; and there is no *atheist* but allows of the existence of the world, and of his own existence in particular.

Plato distinguishes three kinds of *atheists*.—Some, who deny absolutely that there are any gods; others who al-

low the existence of gods, but maintain that they do not concern themselves with human affairs, and so deny a providence; and others who believe there are gods, but think they are easily appeased with a little prayer, or the like; and that they remit the greatest crimes for the smallest supplication.

Some distinguish *speculative atheists*, or those who are so from principle, and theory—from *practical atheists*, whose wicked lives lead them to believe, or rather to wish, that there were no God.

Cicero represents it as a probable opinion, that they who apply themselves to the study of philosophy believe there are no gods.—This must doubtless be meant of the academic philosophy, to which Cicero himself was attached; and which doubted of every thing: on the contrary, the Newtonian philosophers are continually recurring to a deity, whom they always find at the end of their chain of natural causes*. Some foreigners have even charged them with making too much use of the notion of a God in philosophy, contrary to the rule of Horace: *Nec deus interfit, nisi dignus vindice nodus*.

* Among us, the philosophers have been the principal advocates for the existence of a deity.—Witness the writings of Boyle, Ray, Cheyne, Nieuentitt, &c. To which may be added divers others, who, though of the clergy, (as was also Ray) yet have distinguished themselves by their philosophical pieces in behalf of the existence of a God. *e. gr.* Derham, Bentley, Whiston, Sam. and John Clark, Fenelon, &c.—So true is that saying of Lord Bacon, that though a smattering of philosophy may lead a man into atheism, a deep draught will certainly bring him back again to the belief of a God and Providence!

ATHELING *, among our Saxon ancestors, was a title of honour properly belonging to the heir apparent or presumptive to the crown.

* The word is formed from the Saxon *Ætheling*, of *Æthel*, noble.—It is sometimes also written *Aðeling*, *Edling*, *Ethling*, and *Etheling*.

King Edward the confessor being without issue, and intending to make Edgar, to whom he was great uncle by the mother's side, his heir; first gave him the honourable appellation of *Atheling*.

Antiquaries observe, that it was frequent among the Saxons to annex the word *ling* or *ing* to a christian name, to denote the son, or younger; as Edmundling for the son of Edmund, Edgaring for the son of Edgar: on which footing some have thought *Atheling* might primarily import the son of a nobleman or prince.—But; in reality, *Atheling*, when applied to the heir to the crown, seems rather to denote a person endowed with noble qualities, than the son of a nobleman, and corresponds to the *nobilis Cæsar* among the Romans.

ATHENÆA, **Ἀθηναια**, a feast of the ancient Greeks, held in honour of Minerva, who was called **Ἀθηνᾶ**. See **FEAST**.

These were afterwards called *Panathenæa*: See **PANATHENÆA**.

ATHENÆUM *, in antiquity, a public place wherein the professors of the liberal arts held their assemblies, the rhetoricians declaimed, and the poets rehearsed their verses.

* The word is Greek, and is derived from *Atheni*, a learned city, where many of these assemblies were held; or from the Greek name of Pallas, **Ἀθηνᾶ**, goddess of science; intimating that *Athenæum* was a place consecrated to Pallas, or set apart for the exercises over which the presides.

The *athenæa* were built in form of amphitheatres; and were all encompassed with seats, which Sidonius calls *cunei*.

The three most celebrated *athenæa* were those at Athens, at Rome, and at Lyons; the second of which, according to Aurelius Victor, was built by the emperor Adrian.

ATHEROMA, **Ἀθήρωμα**, in medicine, a kind of tumour, of a pappy confidence, without pain, or discolouring the skin. The *atheroma* is contained in a cystis, or membranous bag; and does not give way when touched with the finger, nor retain any dent after pressure.

The *atheroma* is thus called from the Greek **ἀθήρωμα**, a kind of pap or pulp, which the matter of this tumour resembles.—It is near a-kin to the Meliceris and Steatoma; and is cured like them by section.

ATHLETÆ *, in antiquity, persons of strength and agility, disciplined to perform in the public games.

* The word is originally Greek, **ἀθλητής**, formed from **ἀθλος**, *certamen*, combat; whence also **ἀθλος**, the prize or reward adjudged the victor.

Under *athletæ* were comprehended wrestlers, boxers, runners, leapers, throwers of the disk, and those practised in other exercises exhibited in the Olympic, Pythian, and other solemn sports; for the conquerors wherein, there were established prizes.

From the five usual exercises, the *athletæ* were also denominated **πενταθλοι**, and by the Latins *quingentones*; at least such as professed them all.

ATHLETIC Crown. See the article **CROWN**.

ATIA. See the article **ODIO et Atia**.

ATLANTIC Ocean. See the article **OCEAN**.

ATLANTIS, in antiquity, an island spoke of by Plato, and many other writers, under some extraordinary circumstances; and rendered famous by a controversy among the moderns, concerning its place and existence.

* The *Atlantis* took its name from *Atlas*, Neptune's eldest son, who, they tell us, succeeded his father in the government thereof.

The most distinct account of this celebrated country, is given us in Plato's *Timæus*, and *Critias*; which amounts, in a few words, to what follows. "The *Atlantis* was a large island in the western ocean, situate before, or opposite to, the straits of *Gades*. Out of this island there was an easy passage into some others, which lay near a large continent exceeding all Europe and Asia. Neptune settled in this island, which he distributed among his ten sons; to the youngest fell the extremity of the island called *Gadir*, which in the language of the country signifies *fertile*, or *abundant in sheep*. The descendants of Neptune reigned here from father to son, for a great number of generations, in the order of primogeniture, during the space of 9000 years. They also possessed several other islands; and passing into Europe and Africa, subdued all Libya as far as Egypt, and all Europe to Asia Minor. At length the island sunk under water; and, for a long time afterwards, the sea thereabouts was full of flats and shelves."

The learned *Rudbeck*, professor in the university of Upsal, in an express treatise intitled, *Atlantica fœve Manheim*, maintains, very strenuously, that Plato's *Atlantis* is Sweden and Norway; and attributes to his country, whatever the ancients have said of their *Atlantis* or *Atlantic* island.—But after the little abridgment we have given of Plato's account, the reader will be surprized to find Sweden taken for the *Atlantis*; and accordingly, though *Rudbeck's* work be full of uncommon erudition, the author passes for a visionary in this point. Others will have America to be the *Atlantis*; and hence infer, that the new world was not unknown to the ancients: but what Plato says, does by no means quadrate thereto.—America should rather seem to be the vast continent beyond the *Atlantis*, and the other islands mentioned by Plato,

Kircher, in his *Mundus subterraneus*, and *Becman*, in his *History of islands*, chap. 5. advance a much more probable opinion than that of *Rudbeck*.—The *Atlantis*, according to them, was a large island which extended from the Canaries to the Azores; and these islands are the remains thereof not swallowed up by the sea.

ATLAS, in architecture, is a name given to those figures, or half-figures of men, sometimes used instead of columns, or pilasters; to support any member of architecture, as a balcony, or the like.

These are otherwise called *Telamones*. See *TELAMON*.

ATLAS, in anatomy, the name of the first vertebra of the neck, which supports the head.—See *Tab. Anat. (Osteol.) fig. 6.*

It is so called in allusion to the celebrated mountain *Atlas*, in Africa, which is so high, that it seems to bear the heavens; and to the fable, in which, *Atlas*, the king of this country, is said to bear the heavens on his shoulders.

The *Atlas* has no spiny apophyses; because the motions of the head do not turn on this vertebra, but on the second. As it is obliged to turn about as often as the head moves round, had there been any spiny apophyses, it would have incommoded the motion of the muscles in the extension of the head.—It is also of a finer and firmer texture than the other vertebra; and differs further from them in that those receive at one end, and are received at the other, whereas this receives at both extremes; for two eminences of the occiput are inserted within its two upper cavities, which makes its articulation with the head: and, at the same time, two other eminences of the second vertebra are received within its two lower cavities, by means of which they are articulated together.

ATLAS is also a title given to books of universal geography, containing maps of the known parts of the world; as if they were viewed from the top of that celebrated mountain, which the ancients esteemed the highest in the world; or rather on account of their holding the whole world like *Atlas*.

We have also *Atlas's* of particular parts, *sea-Atlas's*, &c.—The first work under this denomination was the *Great Atlas* of *Blæw*.

ATMOSPHERE, ATMOSPHERA, an appendage of our earth; consisting of a thin, fluid, elastic substance, called *air*, which surrounds the terraqueous globe to a considerable height, gravitates towards its centre, and on its surface is carried along with it, and partakes of all its motions both annual and diurnal.

By *atmosphere* is usually understood the whole mass, or assemblage of ambient air: though, among some of the more accurate writers, the *atmosphere* is restrained to that part of the air next the earth, which receives vapours and exhalations; and is terminated by the refraction of the sun's light.

The further or higher spaces, though perhaps not wholly destitute of air, are supposed to be possessed by a finer sub-

stance called *æther*; and are hence denominated the *æthereal region*, or space.

A late eminent author considers the *atmosphere* as a large chymical vessel, wherein the matter of all the kinds of sub-lunary bodies is copiously floating; and thus expedit to the continual action of that immense furnace the sun; whence innumerable operations, sublimations, separations, compositions, digestions, fermentations, putrefactions, &c. For the nature, constitution, properties, uses, diversities, &c. of the *atmosphere*, see the article *AIR*.

We have a large apparatus of instruments, contrived for indicating and measuring the state and alterations of the *atmosphere*; as, barometers, thermometers, hygrometers, manometers, anemometers, &c. see each under its proper article, BAROMETER, THERMOMETER, HYGROMETER, &c.

The *atmosphere* insinuates itself into all the vacuities of bodies; and thus becomes the great spring of most of the mutations here below; as generation, corruption, dissolution, &c. See *GENERATION*, *CORRUPTION*, *DISSOLUTION*, &c. It is one of the great discoveries of the modern philosophers, that the several motions attributed by the ancients to a *æther vacui*, are really owing to the pressure of the *atmosphere*. To the same is also in a great measure owing the cohesion of bodies.

Weight of the ATMOSPHERE.—Organical bodies are peculiarly affected by this pressure: to this, plants owe their vegetation, and animals their respiration, circulation, nutrition, &c.

To this also we owe several considerable alterations in the animal economy, with regard to health, life, disease, &c.

And hence, a calculus of the precise quantity of this pressure becomes a point worthy of attention.—Our bodies, then, are equally pressed on by the incumbent *atmosphere*; and

the weight they sustain is equal to a cylinder of air, whose base is equal to the superficies of our bodies.—Now, a cylinder of air of the height of the *atmosphere* is known to be equal to a cylinder of water of the same base, and thirty-five foot high; or a cylinder of mercury, twenty-nine inches high; as appears from the *Toricellian* experiment; as also from the height to which water ascends in pumps, siphons, &c.

Hence it follows, that every foot square of the superficies of our bodies, is pressed upon by a weight of air equal to thirty-five cubical feet of water; and a cubical foot of water, being found by experiment to weigh seventy-six pound Troy weight, therefore the compass of a foot square upon the superficies of our bodies sustains a quantity of air equal to 2260 pound: for $76 \times 35 = 2660$; and so many foot square as the superficies of our body contains, so many times 2660 pound does that body bear.

Hence, if the superficies of a man's body, contain fifteen square feet, which is pretty near the truth, he will sustain a weight equal to 39900 pound, for $2660 \times 15 = 39900$, which is above thirteen tun for the ordinary load.

The difference of the weight of the air which our bodies sustain at one time more than at another, is also very great.

—The whole weight of air which presses upon our bodies, when the mercury is highest in the barometer, is equal to 39900 pounds. Whence, the difference between the greatest and the least pressure of air upon our bodies, may be proved to be equal to 3982 pounds.

The difference of the air's weight, at different times, is readily measured by the different height to which the mercury is raised in the barometer; and the greatest variation of the height of the mercury being three inches, a column of air of any assignable base equal to the weight of a cylinder of mercury of the same base, and of the altitude of three inches, will be taken off from the pressure upon a body of an equal base, at such times as the mercury is three inches lower in the barometer; so that every inch square of the surface of our bodies, is pressed upon at one time more than another, by a weight of air equal to the weight of three cubical inches of mercury.—Now a cubical foot of water being seventy-six pound; a cubical foot of mercury is 1064 pound = 102144 drams: and as 102144 drams is to a cubical foot, or, which is all one, 1728 cubical inches, so is $59 \frac{7}{8}$ drams, to one cubical inch. So that a cubical inch of mercury being very near = 59 drams; and there being 144 square inches in a foot square, therefore a mass of mercury of a foot square, = 144 square inches, and if three inches high, must contain 432 cubical inches of mercury, which $\times 59$ (the number of drams in a cubical inch of mercury) makes 25488 drams.—And this weight does a foot square of the surface of our bodies, sustain at one time more than at another.

Suppose again, the superficies of an human body = 15 foot square; then would the body sustain at one time more than at another, a weight = $15 \times 25488 = 382230$ drams (= 47790 ounces) = 3890 $\frac{1}{2}$ pound Troy.

Hence, it is so far from being a wonder that we sometimes suffer in our health by a change of weather, that it is the greatest wonder we do not always suffer.—For when we consider that our bodies are sometimes pressed upon by near a tun and a half weight more than at another, and that this variation is often

often very sudden; it is surprising that every such change does not entirely break the frame of our bodies to pieces. In effect, the vessels of our bodies being so much frightened by an increased pressure, would stagnate the blood up to the very heart, and the circulation would quite cease, if nature had not wisely contrived, that when the resistance to the circulating blood is greatest, the impetus by which the heart contracts, should be so too.—For, upon an increase of the weight of the air, the lungs will be more forcibly expanded, and thereby the blood will be more intimately broken and divided, so that it becomes fitter for the more fluid secretions, such as that of the nervous fluid; by which the heart will be more strongly contracted. And the blood's motion towards the surface of the body being obstructed, it will pass in greater quantity to the brain, where the pressure of the air is taken off by the cranium; upon which fibre also, more spirits will be separated, and the heart on that account too be more enabled to carry on the circulation, through all passable canals, whilst some others, towards the surface, are obstructed. The most considerable alteration made in the blood, upon the air's greater or lesser pressure on the surface of our bodies, is its rendering the blood more or less compact, and making it crowd into a less, or expand into a greater space, in the vessels which it enters.—For the air contained in the blood always keeps itself in equilibrium with the external air that presses upon our bodies; and this it does by a constant nitus to unbend it self, which is always proportionable to the compressing weight by which it was bent: so that if the compression or weight of the circumbient air be ever so little abated, the air contained within the blood unfolds its springs, and forces the blood to take up a larger space than it did before.

The reason we are not sensible of this pressure is well explained by Borellus, *de mort. nat. a grav. fac. prop. 29, &c.*—After shewing that sand perfectly rammed in a hard vessel is not capable by any means of being penetrated or parted, not even by a wedge; and likewise that water contained in a bladder compressed equally on all sides, cannot yield or give way in any part; he proceeds, “in like manner, within the skin of an animal are contained a diversity of parts, some hard, as bones; others soft, as muscles, nerves, membranes, &c. others fluid, as blood, fat, &c. Now it is not possible the bones should be broke or displaced in the body, unless the weight lay heavier on one part than on another, as we sometimes see in porters. If the pressure be subdivided, so that it lie equally all around, upwards, downwards, and sideways, and no part of the skin be exempt therefrom, it is evidently impossible any fracture or luxation should follow. The same may be observed of the muscles and nerves; which, though soft, yet being composed of solid fibres, do mutually sustain each other, and resist the common weight. The same holds of blood, and the other humours; and as water does not admit any manifest condensation, so the animal humours contained in their vessels may suffer an attrition from an impulse made in one or more particular places, but can never be forced out of their vessels by a universal compression.—It follows, that as none of the parts undergo either separation, luxation, contusion, or any other change of situation; it is impossible any sense of pain should ensue, which can only be the effect of a solution of continuity.” This is confirmed by what we see in Divers, &c.

The same is farther confirmed by Mr. Boyle; who including a young frog in a vessel half full of water, and intruding so much air as that the water may sustain eight times the weight it otherwise would; yet the animalcule, notwithstanding the great tenderness of its skin, did not seem to be at all affected thereby.

For the effects of the removal of the pressure of the atmosphere, see AIR-pump.—For the cause of the variations in the weight and pressure of the atmosphere, see BAROMETER.

Height of the ATMOSPHERE.—The height of the atmosphere is a point about which the modern naturalists have been very solicitous.—Had not the air an elastic power, but were it every where of the same density, from the surface of the earth to the extreme limit of the atmosphere, like water, which is equally dense at all depths; it being above observed that the weight of the column of air, reaching to the top of the atmosphere, is equal to the weight of the mercury contained in the barometer; and the proportion of weight likewise being known between equal bulks of air and mercury; it were easy to find the height of such column, and consequently that of the atmosphere itself.—For a column of air one inch high, being to an equal column of mercury, as 1 to 10800; it is evident, that 10800 such columns of air, that is, a column 900 foot high, is equal in weight to one inch of mercury: and consequently, the 30 inches of mercury sustained in the barometer require a column of air 27000 foot high, on which footing the height of the atmosphere would only be 27000 foot, or little more than five English miles high.

But the air, by its elastic property, being liable to expand and contract; and it being found by repeated experiments in

England, France, and Italy, that the spaces it takes up, when compressed by different weights, are reciprocally proportional to those weights themselves; or, that the air takes up the less space, the more it is pressed: it follows, that the air in the upper regions of the atmosphere, where the weight is so much less, must be much rarer than nearer the surface of the earth; and consequently, that the height of the atmosphere must be much greater than is above assigned.

If we suppose the height of the whole atmosphere divided into innumerable equal parts; the density of the air in each of the said parts being as its quantity, and the weight of the atmosphere being also as the quantity of the whole incumbent air; it is evident, the weight of the incumbent air is every where as the quantity of air contained in the subjacent part, which makes a difference between every two contiguous parts of incumbent air.—Now, we have a theorem in geometry, that where the differences of magnitudes are geometrically proportionable to the magnitudes themselves, those magnitudes are in continual arithmetical proportion: wherefore if, according to the supposition, the altitude of the air, by the continual addition of the new parts into which it is divided, do increase in a continual arithmetical proportion; its density will be diminished, or, which amounts to the same, its gravity increased, in continual geometrical proportion.

From such a series it is easy, by making two or three barometrical observations of the rarity of the air at two or three different heights, to find its rarity at any other height, or the height corresponding to any rarity; and consequently the altitude of the whole atmosphere, supposing the utmost degree of rarity known, beyond which the air cannot go. See the articles BAROMETER, SERIES, PROGRESSION, &c. See also Greg. *astron. phys. geom. leg. 5. prop. 3.* and Hally in Philosoph. Transact. N^o 181.

It must not be here omitted, that some observations made by Cassini, and his associates, seem to render this method precarious.—In continuing the meridian line of the observatory at Paris, they measured the altitudes of several mountains with great accuracy; noting the height of the barometer at the top of each; and found, that the rarefactions of the air, as you ascend from the level of the earth, are much greater than they ought to be, according to this proportion.

Suspecting, therefore, the justness of the experiments, the royal academy made divers others, under great dilatations of air, far exceeding the rarities found on the tops of the mountains; the result whereof was, that they all exactly answered the proportion of the incumbent weights. Whence it should follow, that the higher air about the tops of mountains is of a different nature, and observes a different law from that near the earth.

The reason hereof may be owing to the great quantity of gross vapours and exhalations here, more than there; which vapours being less elastic and not capable of so much rarefaction as the pure air above: the rarefactions of the pure air increase in a greater ratio than the weights diminish.—M. Fontenelle, however, from some experiments made by M. de la Hire, accounts for the phenomenon in a different manner; alleging, that the elastic power of air is increased by the admixture of humidity therewith; and consequently, that the air near the tops of mountains, being moister than that below, becomes thereby more elastic, and rarefies in a greater ratio than naturally and in a drier state it would.—But Dr. Jurin shews, that the experiments produced to support this system are by no means conclusive. *Append. ad Varenii geograph.*

Be this as it will, the rarities of the air at different heights proving not to bear any constant proportion to the weights wherewith they are pressed; experiments made with barometers at the feet and tops of mountains, cannot give the height of the atmosphere: since our observations are all made near the earth; whereas the greater part of the atmosphere is far beyond; and the farther from us, the farther does it seem to recede from the nature and laws of ours.—M. de la Hire, therefore, after Kepler, has recourse to the more ancient, simple, and secure way of ascertaining the height of the atmosphere; viz. from the consideration of the crepusculum.

It is allowed by astronomers, that when the sun is 18° below the horizon we begin to cease to see the twilight: now the ray whereby we see it can be no other than a horizontal line, or a tangent to the earth in the place where the observer is. But this ray cannot come directly from the sun, which is under the horizon; and must therefore be a ray reflected to us by the last inner and concave surface of the atmosphere. We are to suppose that the sun, when 18° below the horizon, emits a ray which is a tangent to the earth, and strikes upon this last surface of the atmosphere, and is thence reflected to our eye, being still a tangent, and horizontal.—If there were no atmosphere, there would be no crepusculum; and consequently, if the atmosphere were not so high as it is, the crepusculum would begin and end when the sun is at a less distance from the horizon than 18°, and contrarily.—Hence we gather, that the largeness of the arch, by which the sun is depressed when the crepusculum begins or ends, determines the height of the atmosphere. We are to note however, that

32 must be subtracted from the arch of 18°, for the refraction which raises the sun so much higher than he would be; and 16° more for the height of the upper limb of the sun, which is supposed to send the ray, above his centre, which is supposed to be 18° low. The remaining arch, therefore, which determinates the height of the *atmosphère*, is only 17° 12'. Two rays, one direct, and the other reflected, but both tangents to the earth, must necessarily meet in the *atmosphère* at the point of reflection, and comprehend an arch between them of 17° 12', whereof they are tangents.—Hence it follows from the nature of the circle, that a line drawn from the centre of the earth, and cutting the arch in two, will go to the point of concurrence of those two rays; and as it is easy finding the excess of this line above the semidiameter of the earth, which is known, it is easy to find the height of the *atmosphère*, which is only that excess.—On this principle M. de la Hire discovers the height of the *atmosphère* to be 37223 fathoms, or near 17 French leagues. The same method was also made use of by Kepler, who only rejected it, because it gave the height of the *atmosphère* 20 times greater than he otherwise allowed it.

It must be added, that in this calculus the direct and reflected rays are supposed to be right lines; whereas in fact they are curves, formed by the perpetual refraction the rays undergo in passing through a series of different densities of air.—Computing then upon them, as two similar curves; or rather as a single curve, one extreme whereof is a tangent to the earth; its vertex, equally distant from both the extremes, determines the height of the *atmosphère*; which therefore, will be found somewhat lower than in the former case; the point of concurrence of two right lines, which are here only tangents to the curve, the one at one end, and the other at the other, being higher than the vertex of the curve. On this footing, M. de la Hire finds the *atmosphère* 35362 fathoms, or 16 leagues. *Hist. de l'Acad. Roy. des Scienc. an. 1713. p. 71.* See the articles REFRACTION, CREPUSCULUM, &c.

Lunar ATMOSPHERE.—That the moon is surrounded, like the earth, with a changeable *atmosphère*, see evinced under the article MOON.

The reality of the *atmosphères* of the other planets, see also under the article PLANET.

For the *atmosphères* of comets, and the sun, see COMET and SUN.—See also MACULÆ.

ATMOSPHERE of the Sun. See SUN, and ZODIACAL Light.

ATMOSPHERE of solid or consistent bodies is a kind of sphere formed by the effluvia, or minute corpuscles, emitted from them.

Mr. Boyle endeavours to shew that all bodies, even the hardest and most coherent, as gems, &c. have their *atmosphères*. See GEM.

ATOM*, *ἄτομος*, in philosophy, a part, or particle of matter, so indivisible.

* The word is Greek, *ἄτομος*; formed of the privative *α*, and *τομος*, I cut, I divide.

Atoms are properly the *minima naturæ*, the last or ultimate particles into which bodies are divisible; and are conceived as the first rudiments, or component parts of all physical magnitude; or the pre-existent and incorruptible matter whereof bodies were formed.

The notion of *atoms* arises hence, that matter is not divisible in infinitum.

And hence the Peripatetics are led to deny the reality of *atoms*, together with that of mathematical points: an *atom*, say they, either has parts, or it has none: if it have none, it is a mere mathematical point: if it have, then do these parts also consist of others, and so on to infinity.

But this is to recede from the genuine character of *atoms*, which are not esteemed indivisible, because of their want of bigness, or parts; (for all physical magnitude must have three dimensions, length, breadth, and thickness; and all extension is divisible) but they are indivisible on account of their solidity, hardness, and impenetrability, which preclude all division, and leave no vacancy for the admission of any foreign force to separate or disunite them.

As *atoms* are the first matter, it is necessary they should be indivisible, in order to their being incorruptible.—Sir Isaac Newton adds, that it is also required they be immutable, in order to the world's continuing in the same state, and bodies being of the same nature now as formerly.

Hence the ancients were also led to maintain *atoms* eternal; for that what is immutable must be eternal.

They also added gravity, and, in consequence thereof, motion, to their *atoms*: and further, observing that *atoms* thus falling perpendicularly could not join or unite together; they super-added a fortuitous or side motion, and furnished them with certain hooked parts, in order to enable them to catch and hang the better together.—And from a casual or fortuitous jumble of these famous *atoms*, they supposed the whole universe to be formed.

ATOMICAL Philosophy denotes the doctrine of atoms; or a method of accounting for the origin and formation of

all things, from the supposition of atoms, endued with gravity and motion.

The *atomical* philosophy was first broached and taught by Mæchus, a Sidonian, some time before the Trojan war.—Leucippus and Democritus probably learnt it from him.—But it was most cultivated and improved by Epicurus; whence it became also denominated the *Epicurean* philosophy. See EPICUREAN.

It has been since retrieved by Gassendus, and others; and is now espoused and adhered to by a great part of the philosophical world, under the denomination of the *corpusecular philosophy*. See CORPUSCULAR Philosophy.

ATONEMENT. See EXPIATION, LUSTRATION, PROPITIATION, and SACRIFICE.

ATONY*, *ἄτονα*, in medicine, &c. a want of tone or tension; or a relaxation of the solids of a human body; occasioning a loss of strength, faintings, &c. See TENSION, SOLID, FIBRE, RELAXATION, &c.

* The word is compounded of the privative *α*, and *τονος*, tone, of *τονος*, tends, I stretch.

ATRABILARIE Capsule. See CAPSULÆ.

ATRABILIS, in the ancient medicine, black or adust bile.

Atrabilis was one of the great humours of the ancient physicians; whence arose the *atrabilary*, one of their temperaments; answering to what we call *melancholy*. See HUMOUR, and TEMPERAMENT.

ATROPHY*, *ἄτροφία*, a disease wherein the body, or some of its parts, do not receive the necessary nutriment, but dwindle or waste incessantly.

* The word is compounded of the privative particle *α*, and *τροφία*, I feed, nourish: *q. d.* privation of nourishment.

Under *atrophy* may be reduced what we commonly call *consumptions*, *phthises*, &c. An *atrophy* is natural in old age, and this is called *atrophia senilis*.

ATTACHING*, or ATTACHMENT, in law, the taking or conveying a person or thing either by commandment or writ.

* The word is formed of the French *attacher*, to fasten, tie; and that from the corrupt Latin *attachiare*, of *attexere*, to weave to; or rather, as others think, from the Celtic *tach*, a nail; and *tacha*, to nail.

Lambard makes this difference between an *arrest* and an *attachment*; that an *arrest* proceeds out of an inferior court by precept only, and an *attachment* out of a higher court, either by precept or writ; and that a precept to arrest hath either formal words, *duci facias*, &c. and a writ of *attachment* these, *precipimus tibi quod attaches talem, & habeas eum coram nobis*.

By this it appears, that he who arrests carries the party arrested to another higher person, to be disposed of forthwith; whereas he that attaches keeps the party attached, and presents him in court at the day assigned in the *attachment*.

There is this further difference, that an *arrest* lies only upon the body of a man; and an *attachment* sometimes on his goods too: for a man may be attached by an hundred shcep.

ATTACHMENT by writ differs from *distress* in this, that an *attachment* does not reach lands, as a *distress* does; and that a *distress* does not touch the body, which an *attachment* does.—Yet the two are frequently confounded together.

In the most common use, an *attachment* is an apprehension of a man by his body, to bring him to answer the action of the plaintiff.—A *distress*, with a writ, is the taking of a man; a *distress*, without a writ, is the taking of a man's goods for some real cause, as rent, service, &c.

ATTACHMENT out of the Chancery is had of course, upon an affidavit made that the defendant was served with a subpoena, and appears not; or it issueth upon not performing some order or decree.

After the return of this *attachment* by the sheriff, *quod non est inventus in balliva sua*; another *attachment*, with proclamation, issues: and if he appear not thereupon, a commission of rebellion.

ATTACHMENT of the Forest is one of the three courts held in the forest.

The lowest court is called the court of *attachment*, or woodmote-court, the mean swanc-mote, the highest, the justice in eyre's feat.

The court of *attachments* seems so called, because the verderors of the forest have therein no other authority, but to receive the *attachments* of offenders against vert and venison taken by the foresters, and to inroll them, that they may be presented or punished at the next justice-feat.

This *attachment* is by three means; by goods and chattels; by body, pledges, and mainprize; or by body only.—This court is held every forty days throughout the year: whence it is also denominated *forty days court*.

ATTACHMENT of Privilege is, by virtue of a man's privilege, to call another to that court where he himself belongs, and in respect whereof he is privileged to answer some action.

Foreign ATTACHMENT is an *attachment* of goods or money found

found within a liberty or city, to satisfy some creditor within such city or liberty.

By the custom of some places, particularly of London, a man may *attach* money or goods in the hands of a stranger: as, if A. owes B. 10*l.* and C. owes A. 10*l.* B. may attach the 10*l.* in the hands of C. to satisfy himself.

ATTACHAMENTA *Bonarum*, in our ancient law-books, denotes a distress taken upon the goods or chattels of any person, sued for a personal estate, or debt, by the legal attachiators or bailiffs, as a security to answer the action.

ATTACHAMENTA de spinis & bosco signifies an ancient privilege granted to the other officers of forests, to take to their own use, thorns, brush, and windfalls, within their own precincts or liberties.

ATTACK, an attempt upon any person or thing; or the act of beginning a combat, or dispute.

ATTACK, in the military art, is an attempt or engagement to force a post, a body of troops, or the like.

We say to begin, to make, to sustain an *attack*, &c. Several authors have wrote of the art of attacking and defending. See **DEFENCE**.

ATTACK of a siege is an effort made by the besiegers with trenches, mines, galleries, &c. to make themselves masters of a fortress, in attacking one of its sides. See **STEEGE**, and **FORTIFICATION**.

'Tis a rule, always to attack on the weakest side; unless there be superior reasons for the contrary—as was the case at the siege of Lille: where the part where prince Eugene made his *attack* was the strongest in the whole place. *Savin, Nouv. Feal. Milit. p. 338, seq.*

In sieges, there are sometimes one, sometimes two, or at most three *attacks*.—The *attacks*, where they are several, ought to have a communication.

False ATTACK is that which is not so vigorously prosecuted; serving only to make a diversion among the besieged, and to oblige them to divide their forces, that the true *attack* may be carried on with greater success.

To **ATTACK in flank** is to *attack* both sides of the bastion.

Line of ATTACK. See the article **LINE**.

ATTAINER, in law, is when a man has committed felony, treason, or other crime, and judgment is passed upon him for the same.

The children of a person attainted of treason cannot be heirs to him, or any other ancestor; and, if he were noble before, his posterity are hereby degraded and made base: nor can this corruption of blood be saved but by an act of parliament, unless the judgment be reversed by a writ of error.

Our ancient laws make this difference between *attainder* and *conviction*, that a man was said to be convicted presently upon the verdict; but not attainted till it appeared he was no clerk, or being a clerk, and demanded by his ordinary, could not purge himself.—Add, that *attainder* is more extensive than conviction; conviction being only by the jury, whereas *attainder* may also be by outlawry, confession of the party, or the like.

A man is attainted two ways; by appearance, or by process.

Attainder by appearance is either by confession, by battel, or by verdict.—Confession, whereof *attainder* grows, is twofold; one at the bar before the judges, when the prisoner, upon his indictment read, owns himself guilty, never putting himself on his jury. The other is before the coroner, in sanctuary; where he, upon his confession, was in former times constrained to abjure the realm; which is also called *attainder by abjuration*.

Attainder by battel is when the party appeal'd by another, choosing rather to try the truth by combat than by jury, is vanquished.

Attainder by process, otherwise called *attainder by default*, or *attainder by outlawry*, is where a party flies, or does not appear after being five times publicly called in the county-court; and at last, upon his default, is pronounced or returned outlawed.

Attainder by verdict is when the prisoner at the bar, answering not guilty to the indictment, hath an inquest of life and death passed on him, and is by the verdict of the jury pronounced guilty.

Bill of ATTAINER is a bill brought into parliament, for attainting, condemning, and executing a person for high-treason.

ATTAINT, ATTRACTA, in law, a writ which lies after judgment, against a jury that hath given a false verdict, contrary to the evidence, in any court of record; be the action real or personal, if the debt or damages exceed 40*s.*

If the verdict be found false, the judgment anciently was, that the jurors meadows should be ploughed up, their houses broken down, their woods grubbed up, and their lands and tenements forfeited to the king.

If it passed against him that brought the *attaint*, he shall be imprisoned, and grievously ransomed at the king's will.

ATTAINT, among farriers, signifies a knot or swelling in a horse's leg; proceeding either from a blow which strikes either horse's foot, or from an over-reach in frost, weather, when a horse, being rough-shod, or having shoes with long calkers, strikes his hinder feet against his fore-leg. The farriers distinguish *upper attaints*, given by the toe of the hind-foot upon the finew of the fore-leg.—And *neither attaints*, or over-reaches on the pastern-joint, which are little bladders like wind-galls, coming either by a wrench, a strain, an over-reach, or the like. The usual place is in the heel or frush.

ATTAINTED, ATTAINTUS, or ATTRACTUS, in law, is used for a person found guilty of some crime or offence, particularly of felony or treason, by due course of law.

Yet a man is said to be *attainted* of perjury, *attainted* of dissimulation; and so it is used in French: as, *estre atteint, & vaincu en aucun cas*, is to be cast in any cause.

ATTELLANÆ. See **ATELLANÆ**.

ATTENDANT, or ATTENDENT, in a general sense. See **ASSISTANT, RETINUE, and SATELLITES**.

ATTENDANT, ATTENDENS, in law, signifies one that owes duty or service to another, or depends in some manner upon him.

Thus if there be lord mesne, and tenant; and the tenant hold of the mesne by a penny; and the mesne hold over by two pence: if the mesne release to the tenant all his right in the land, and the tenant die, his wife shall be endowed of the land, and shall be *attendant* to the heir, of the third part of the penny, not of the third part of the two pence; she being to be endowed of the best possession of her husband.

Where the wife is endowed by the guardian, she shall be *attendant* to the guardian, and to the heir at his full age.

ATTENTION, ATTENTIO, a due application of the ear, or the mind, to any thing said, or done, in order to acquire a knowledge thereof.

* The word is compounded of *ad*, to; and *tenso*, of *tendo*, I stretch.

Attention of mind is not properly an act of the understanding, but rather of the will, by which it calls the understanding from the consideration of other objects, and directs it to the thing in hand.

Attention, in respect of hearing, is the stretching or straining the membrana tympani, so as to make it more susceptible of sounds, and better prepared to catch even a feeble agitation of the air. Or it is the adjusting the tension of that membrane to the degree of loudness or lowness of the sound we are attentive to.

ATTENUANTS, or ATTENUATING medicines, are such as subtilize and break the humours into finer parts; and thus dispose them for motion, circulation, excretion, &c.

Attenuants stand opposed to *incrassants*, or thickeners, medicines which condense, inspissate. &c.

ATTENUATION*, **ATTENUATIO**, the act of attenuating; that is, of making any fluid thinner, and less consistent than it was before.

* The word is compounded of the Latin *ad*, and *tenso*, thin, slender, weak.

Attenuation is defined more generally by Chauvin, the dividing or separating of the minute parts of any body, which before, by their mutual nexus or implication, formed a more continuous mass.—Accordingly, among alchemists, we sometimes find the word used for pulverization, or the act of reducing a body into an impalpable powder, by grinding, pounding, or the like.

ATTESTATION*, the giving testimony, or evidence of the truth of any thing; especially in writing.

* The word is compounded of the Latin *ad*, to; and *testis*, witness.

Miracles need be well attested, to gain credit.

ATTIC, ATTICUS, something relating to Attica, or the city of Athens.—In matters of philology we use, *attic salt*, *sals atticæ*, meaning a delicate, poignant kind of wit and humour, peculiar to the Athenian writers.—*Attic* witnesses, *atticus testis*, was a witness incapable of corruption: for an *attic* mule was an excellent one, &c.

ATTIC is also used in architecture for a kind of building, wherein there is no roof or covering to be seen; thus called because usual at Athens.

ATTIC, or ATTIC-Order, is also a kind of little order, after the manner of a pedestal, raised upon another larger order; by way of crowning, or to finish the building.—See *Tab. Architect. fig. 35*.

An *attic* is sometimes also used for the conveniency of having a wardrobe, or the like; and instead of regular columns, has only pilasters of a particular form; and sometimes no pilasters at all.

There are also *attics* used for high altars.—The order takes its name from Athens, where it was first practised.

ATTIC of a roof is a little itery or pedicel, either of stone or wood

wood covered with lead, serving as a kind of parapet to a terrace, platform, or the like.

ATTIC Base is a peculiar kind of base, used by the ancient architects, in the Ionic order; and by Palladio, and others of the moderns, in the Doric.

The *attic* is the most beautiful of all the bases. See **BASE**.

ATTIC continued is that which encompasses the whole circumference of a building, without any interruption; following all the jets, the returns of the pavilions, &c.

ATTIC interspersed is that situate between two tall stories, sometimes adorned with columns, or pilasters.

ATTIRE, in botany, is used by some to denote the third part or division of the flower of a plant; the other two being the empalement and the foliation.

The *attire* is of two kinds; seminiform, and florid.—The seminiform *attire* consists of two parts; chives, or stamina; and summits, or apices; one upon each filament. See **STAMINA**, and **APICES**.

The florid *attire* is usually called the *thrums*, as in the flowers of marigold, tansy, &c.—Those thrums are called *suits*, which consist of two, but most times of three pieces.—And the outer part of the suit is the *foret*, whose body is divided at the top, like a cowslip flower, into five parts or distinct leaves.

ATTIRE, in hunting, denotes the head or horns of a deer. See **HEAD**.

The *attire* of a stag, if perfect, consists of bur, pearls, beam, gutters, antler, fur-antler, royal, fur-royal, and croches.—Of a buck, of the bur, beam, brow-antler, advancer, palm, and spellers.

ATTITUDE*, in painting and sculpture, the posture, or gesture, of a figure, or statue; or the disposition of its parts, by which we discover the action it is engaged in, and the very sentiment supposed to be in the mind of the person represented.

* The word comes from the Italian *attitudine*, which signifies the same; and that from the Latin *aptitudo*, fitness.

The representing of this action and sentiment in a strong and lively manner makes what they call a *good expression*.

ATTOLLENS*, in anatomy, is a name common to several muscles, whose office or action is to raise the parts they belong to.

* The word is compounded of the Latin *ad*, to; and *tollere*, I lift.

The *attollents*, or *attillant* muscles, are otherwise called *levator* and *elevator*.

ATTORNEY*, **ATTURNATUS**, or **ATTORNATUS**, in law, a person appointed by another to do something in his stead; particularly to solicit and carry on a lawsuit.

* The word is compounded of the Latin *ad*, to; and the French *tourner*, to turn; *q. d.* to turn a business over to another.—The ancient Latin name according to Bracton, is *responsalis*.

Attorneys in common law are much the same with procurators, proctors, or syndics, in the civil law.

Attorneys are properly those who sue out writs, or process, or commence, carry on, and defend actions in other proceedings, in the names of other persons, in any of the courts of common law.—They are distinguished from *solicitors* who do the like business in courts of equity; as the chancery, equity court in the exchequer, chamber court of the duchy, or the like.

None are to be admitted to act either as the one or the other, without having served a clerkship of five years, taken the oath provided in that case, and been enrolled.—Judges of the said courts of law are to examine into the capacity of the *attorneys*, and those of the courts of equity, into the capacity of the *solicitors*. 2 G. 2. c. 23.

Anciently, those of authority in courts had it in their power whether or no to suffer men to appear or sue by another than themselves; as appears from Fitz. *de Nat. Brev.* in the writ, *De dūmū pōtēstātē de attornātō faciendū*; where it appears, that men were driven to procure the king's writs, or letters patent, to appoint *attorneys* for them: but it is since provided by parliament, that it shall be lawful to appoint an *attorney* without any circuit; as appears by several statutes, 20 Hen. 3. cap. 10—6 Edw. 1. cap. 8. &c.

There is a great diversity of writs in the table of the register, wherein the king commands the judges to admit of *attorneys*; whereby there arose so many unskillful *attorneys*, and so many mischiefs thereby, that for restraining them it was enacted, 4 Hen. 4. cap. 18. that the judges should examine them, and displace the unskillful; and again 33 Hen. 6. cap. 7. that there should be but a certain number of *attorneys* in Norfolk and Suffolk.

Attorney is either *general* or *special*.

ATTORNEY General is he who is appointed to manage the affairs, or suits of a community; or rather he who is appointed to conduct all the suits in general, whether of a community, or a particular person.

Such is the *attorney general* of the king, who is the same as the *procurator cæsaris* in the Roman empire. See **PROCURATOR**.

To him come warrants for making out patents, pardons, &c.

He is at the head of managing all law-affairs of the crown, either in criminal prosecutions or otherwise; especially in matters of treason, sedition, &c. In all courts he pleads within the bar; but when a privy counsellor, he cannot plead in any court, but on the king's affairs, without obtaining a privy seal for so doing.

ATTORNEY Special is he who is employed in one or more causes particularly specified.

Attorneys are also distinguished with respect to the courts, into *attorneys at large*, and *attorneys special*, belonging to this or that court only.

ATTORNEY of the dutchy court of Lancaster, *Attornatus curie ducatus Lancastriæ*, is the second officer in that court, being there, for his skill in law, placed as assessor to the chancellor of the court.

Letter of ATTORNEY. } See the articles { **LETTER.**
Warrant of ATTORNEY. } **WARRANT.**

ATTOURNMENT, or **ATTORNMENT**, in law, a transferring of duty and service to another lord; or an acknowledgement which a tenant makes of homage and service to a new lord.

Thus, when one is tenant for life, and he in reversion grants his right to another, it is necessary the tenant for life agree thereto, which is called *attournment*; and without which nothing passes by the grant.—If the grant be by fine, in court of record, the tenant shall be compelled to *attourn*. Stat. 27 Hen. 8.

The words used in *attournment* are these; *I agree me to the grant made to you; or more commonly, I attourn to you by force of the same grant; or, I become your tenant; or deliver to the grantee a penny by way of attournment.* Littl. lib. 3.

Attournment is either by word, or by act; voluntary, or compulsory; by the writ *Per que servitia*, or by distress.—It may be made to the lord himself, or to his steward in court.

There is also *attournment* in deed, and *attournment* in law.

Attournment in law is an act, which though it be not an express *attournment*, yet in intendment of law is of equal force. Coke on Littl.

ATTRACTION*, **ATTRACTIO**, or **TRACTIO**, in mechanics, the act of a moving power, whereby a moveable is drawn, or brought nearer to the mover.

* The word is compound of *ad*, to, and *trahere*, I draw.

As action and re-action are always equal, and contrary; it follows, that, in all *attraction*, the mover is drawn towards the moveable, as much as the moveable towards the mover.

ATTRACTION, or **ATTRACTIVE force**, in the ancient physics, denotes a natural power supposed to be inherent in certain bodies, whereby they act on other distant bodies, and draw them towards themselves.

This, the Peripatetics call the *motion of attraction*; and on many occasions, *fusion*; and produce various instances where they suppose it to obtain.—Thus the air, in respiration, is taken in, according to them, by *attraction of fusion*; so is the smoke through a pipe of tobacco; and the milk out of the mother's breasts: thus also it is that the blood and humours rise in a cupping-glass, water in a pump, and smoke in chimneys; so vapours and exhalations are attracted by the sun; iron by the magnet, straws by amber, and electrical bodies, &c.

But the later philosophers generally explode the notion of *attraction*; asserting, that a body cannot act where it is not; and that all motion is performed by mere impulsion.—Accordingly, most of the effects which the ancients attributed to this unknown power of *attraction*, the moderns have discovered to be owing to more sensible and obvious causes; particularly the pressure of the air.

To this are owing the phenomena of inspiration, smocking, sucking, cupping-glasses, pumps, vapours, exhalations, &c.

For the phenomena of magnetical and electrical *attraction*, see **MAGNETISM**, and **ELECTRICITY**.

The power opposite to *attraction* is called *repulsion*; which is also argued to have some place in natural things. See **REPULSION**.

ATTRACTION, or **ATTRACTIVE power**, is more particularly used in the Newtonian philosophy, for a power or principle, whereby all bodies, and the particles of all bodies, mutually tend towards each other.—Or, more justly, *attraction* is the effect of such power, whereby every particle of matter tends towards every other particle.

Attraction, its laws, phenomena, &c. make the great hinge of Sir Isaac Newton's philosophy. See **NEWTONIAN Philosophy**.

It must be observed, that though the great author makes use of the word *attraction*, in common with the school philosophers; yet he very studiously distinguishes between the ideas.—The ancient *attraction* was supposed a kind of quality, inherent

herent in certain bodies themselves; and arising from their particular or specific forms.

The Newtonian *attraction* is a more indefinite principle; denoting, not any particular kind or manner of action, nor the physical cause of such action; but only a tendency in the general, a *conatus accedendi*; to whatever cause, physical or metaphysical, such effect be owing; whether to a power inherent in the bodies themselves, or to the impulse of an external agent.

Accordingly, that author, in his *Philosoph. Nat. Prin. Math.* notes, "that he uses the words *attraction*, *impulse*, and *propension* to the centre, indifferently; and cautions the reader not to imagine that by *attraction* he expresses the modus of the action, or the efficient cause thereof; as if there were any proper powers in the centres, which in reality are only mathematical points; or, as if centres could attract." *Lib. 1. p. 5.*—So he "considers centripetal powers as *attractions*; though, physically speaking, it were perhaps more just to call them impulses." *Ib. p. 147.* He adds, "that what he calls *attraction* may possibly be effected by impulse, though not a common or corporeal impulse; or after some other manner unknown to us." *Optic. p. 322.*

Attraction, if considered as a quality arising from the specific forms of bodies, ought, together with sympathy, antipathy, and the whole tribe of occult qualities to be exploded. But when we have set these aside, there will remain innumerable phenomena of nature, and particularly the gravity or weight of bodies, or their tendency to a centre, which argue a principle of action seemingly distinct from impulse; where, at least, there is no sensible impulsion concerned. Nay, what is more, this action, in some respects, differs from all impulsion we know of; impulse being always found to act in proportion to the surfaces of bodies; whereas gravity acts according to their solid content, and consequently must arise from some cause that penetrates or pervades the whole substance thereof.—This unknown principle, (unknown we mean in respect of its cause, for its phenomena and effects are most obvious) with all the species and modifications thereof, we call *attraction*; which is a general name, under which all mutual tendencies, where no physical impulse appears, and which cannot, therefore, be accounted for from any known laws of nature, may be ranged.

And hence arise divers particular kinds of *attractions*; as, gravity, magnetism, electricity, &c. which are so many different principles, acting by different laws; and only agreeing in this, that we do not see any physical causes thereof: but that, as to our senses, they may really arise from some power or efficacy in such bodies, whereby they are enabled to act, even upon distant bodies; though our reason absolutely disallows of any such action.

Attraction may be divided, with respect to the law it observes, into two kinds.—1^o. That which extends to a sensible distance.—Such are the *attraction* of gravity, found in all bodies; and the *attraction* of magnetism, and electricity, found in particular bodies.—The several laws and phenomena of each, see under their respective articles, GRAVITY, MAGNETISM, and ELECTRICITY.

The *attraction* of gravity, called also among mathematicians the *centripetal force*, is one of the greatest and most universal principles in all nature.—We see and feel it operate on bodies near the earth, and find, by observation, that the same power, (*i. e.* a power which acts in the same manner, and by the same rules; *viz.* always proportionably to the quantities of matter, and as the squares of the distances reciprocally) does also obtain in the moon, and the other planets primary and secondary, as well as in the comets: and even that this is the very power whereby they are all retained in their orbits, &c. And hence, as gravity is found in all the bodies which come under our observation, it is easily inferred, by one of the settled rules of philosophizing, that it obtains in all others; and as it is found to be as the quantity of matter in each body, it must be in every particle thereof; and hence, every particle in nature is proved to attract every other particle, &c. See the demonstration hereof laid down at large, with the application of the principle to the celestial motions, under the articles, NEWTONIAN *Philosophy*, SUN, MOON, PLANET, COMET, SATELLITE, CENTRIPETAL, CENTRIFUGAL, &c.

From this *attraction* arises all the motion, and consequently all the mutation, in the great world.—By this, heavy bodies descend, and light ones ascend; by this projectiles are directed, vapours and exhalations rise, and rains, &c. fall. By this rivers glide, the air presses, the ocean swells, &c.

In effect, the motions arising from this principle make the subject of that extensive branch of mathematics, called *mechanics*, or *statics*; with the parts or appendages thereof, *hydrostatics*, *pneumatics*, &c. See MECHANICS, STATICS, HYDROSTATICS, PNEUMATICS. See also MATHEMATICS, PHILOSOPHY, &c.

2^o. That which does not extend to sensible distances.—Such

is found to obtain in the minute particles whereof bodies are composed, which attract each other at, or extremely near, the point of contact, with a force much superior to that of gravity; but which at any distance therefrom decreases much faster than the power of gravity.—This power, a late ingenious author chuses to call the *attraction of cohesion*; as being that whereby the atoms or insensible particles of bodies are united into sensible masses.

This latter kind of *attraction* owns Sir Isaac Newton for its discoverer; as the former does, for its improver.—The laws of motion, percussion, &c. in sensible bodies under various circumstances, as falling, projected, &c. as ascertained by the later philosophers, do not reach to those more remote, intestine motions of the component particles of the same bodies, whereon the changes of the texture, colour, properties, &c. of bodies depend: so that our philosophy, if it were only founded on the principle of gravitation, and carried so far as that would lead us, would necessarily be very deficient.

But, beside the common laws of sensible masses, the minute parts they are composed of are found subject to some others, which have been but lately taken notice of, and are even yet very imperfectly known. Sir Isaac Newton, to whose happy penetration we own the hint, contents himself to establish, that there are such motions in the minima naturæ, and that they flow from certain powers or forces, not reducible to any of those in the great world.—In virtue of these powers, he shews, "That the small particles act on one another even at a distance; and that many of the phenomena of nature are the result thereof. Sensible bodies, we have already observed, act on one another divers ways; and as we thus perceive the tenour and course of nature, it appears highly probable, that there may be other powers of the like kind; nature being very uniform and consistent with herself.—Those just mentioned reach to sensible distances, and so have been observed by vulgar eyes; but there may be others, which reach to such small distances as have hitherto escaped observation; and it is probable electricity may reach to such distances, even without being excited by friction."

The great author just mentioned proceeds to confirm the reality of these suspicions from a great number of phenomena and experiments, which plainly argue such powers and actions between the particles, *e. gr.* of salts and water, oil of vitriol and water, aqua fortis and iron, spirit of vitriol and salt petre.—He also shews, that these powers, &c. are unequally strong between different bodies; stronger, *e. gr.* between the particles of salt of tartar, and those of aqua fortis, than those of silver; between aqua fortis and lapis calaminaris, than iron; between iron than copper, copper than silver, or mercury. So spirit of vitriol acts on water, but more on iron or copper, &c.

The other experiments which countenance the existence of such principle of *attraction* in the particles of matter are innumerable; many of them the reader will find enumerated under the articles MATTER, ACID, SALT, MENSTRUUM, &c.

These actions, in virtue whereof the particles of the bodies abovementioned tend towards each other, the author calls by a general, indefinite name, *attraction*, which is equally applicable to all actions, whereby distant bodies tend towards one another, whether by impulse, or by any other more latent power: and from hence he accounts for an infinity of phenomena, inderquate inexplicable, to which the principle of gravity is inadequate.—Such are cohesion, dissolution, coagulation, crystallization, the ascent of fluids in capillary tubes, animal secretion, fluidity, fixity, fermentation, &c. See the respective articles, COHESION, DISSOLUTION, CRYSTALLIZATION, ASCENT, SECRETION, SPHERICITY, FIXITY, and FERMENTATION.

"Thus, (adds our immortal author) will nature be found very conformable to herself, and very simple; performing all the great motions of the heavenly bodies, by the *attraction* of gravity, which intercedes those bodies, and almost all the small ones of their parts, by some other attractive power diffused through the particles thereof.—Without such principles, there never would have been any motion in the world; and without the continuance thereof, motion would soon perish, there being otherwise a great decrease or diminution thereof, which is only supplied by these active principles." *Optics*, p. 373.

We need not say how unjust it is in the generality of foreign philosophers, to declare against a principle which furnishes so beautiful a view; for no other reason, but because they cannot conceive how a body should act on another at a distance.—It is certain, philosophy allows of no action but what is by immediate contact and impulsion: (for how can a body exert any active power there, where it does not exist?) to suppose this of any thing, even the Supreme Being himself, would perhaps imply a contradiction,) yet we see effects without seeing any such impulse; and where there are effects,

we can easily infer there are causes, whether we see them or no. But a man may consider such effects, without entering into the consideration of the causes; as, indeed, it seems the business of a philosopher to do: for to exclude a number of phenomena which we do see, will be to leave a great chasm in the history of nature; and to argue about actions which we do not see, will be to build castles in the air.—It follows, therefore, that the phenomena of attraction are matter of physical consideration, and as such entitled to a share in a system of physics; but that the cause thereof will only become so, when they become sensible; *i. e.* when they appear to be the effect of some other higher causes (for a cause is no otherwise seen than as it self is an effect, so that the first cause must from the nature of things be invisible,) we are therefore at liberty to suppose the causes of attractions what we please, without any injury to the effects.—The illustrious author himself seems a little irresolute as to the cause; inclining, sometimes, to attribute gravity to the action of an immaterial cause, *Optics*, p. 343, &c. And sometimes to that of a material one. *Ib.* p. 325.

In his philosophy, the research into causes is the last thing; and never comes in turn till the laws and phenomena of the effect be settled; it being to these phenomena that the cause is to be accommodated.—The cause even of any, the grossest, and most sensible action, is not adequately known: how impulse or percussion it self works its effect, *i. e.* how motion is communicated by body to body, confounds the deepest philosophers; yet is impulse received not only into philosophy, but into mathematics; and accordingly the laws and phenomena of its effects make the greatest part of common mechanics.

The other species of attraction, therefore, when their phenomena are sufficiently ascertained, have the same title to be promoted from physical to mathematical consideration; and this, without any previous enquiry into their causes, which our conceptions may not be proportionate to: let their causes be occult, as all causes ever will be; so as their effects, which alone immediately concern us, be but apparent. See CAUSE. Our noble countryman, then, far from adulterating philosophy with any thing foreign, or metaphysical; as many have reproached him with doing; has the glory of opening a new source of sublimer mechanics, which, duly cultivated, might be of infinitely more extent than all the mechanics yet known: it is hence alone we must expect to learn the manner of the changes, productions, generations, corruptions, &c. of natural things; with all that scene of wonders opened to us by the operations of chymistry.

Some of our own countrymen have prosecuted the discovery with laudable zeal: Dr. Keil, particularly, has endeavoured to deduce some of the laws of this new action, and applied them to solve divers of the more general phenomena of bodies, as cohesion, fluidity, elasticity, fossils, fermentation, coagulation, &c. And Dr. Friend, seconding him, has made a further application of the same principles, to account at once for almost all the phenomena that chymistry presents.—So that the new mechanics should seem already raised to a compleat science; and nothing can now turn up, but we have an immediate solution of it, from the attractive force.

But this seems a little too precipitate; a principle so fertile, should have been further explored; its particular laws, limits, &c. more industriously detected and laid down, ere we had gone to the application.—Attraction, in the gross, is so complex a thing, that it may solve a thousand different phenomena alike: the notion is but one degree more simple and precise than action it self; and till more of its properties are ascertained, it were better to apply it less, and study it more.—It may be added, that some of Sir Isaac Newton's followers have been charged with falling into that error, which he industriously avoided: *viz.* of considering attraction as a cause or active property in bodies, not merely as a phenomenon, or effect.

As a specimen of the extent of the principle, and the manner of applying it, we shall here subjoin the principal laws and conditions thereof; as deduced by Sir Isaac Newton, Dr. Keil, Dr. Friend, &c.

Theor. I. Besides that attractive power whereby the planets and comets are retained in their orbits; there is another, by which the several particles whereof bodies consist, attract, and are mutually attracted by, each other; which power decreases in more than a duplicate ratio of the increase of the distance.

This theorem, we have already observed, is demonstrable from a great number of easy and obvious ones; as, the spherical figure assumed by the drops of fluids, which can only arise from such principle: the uniting and incorporating of two spherules of quicksilver into one, upon the first touch, or extremely near approach of their surfaces: the rising of water up the sides of a glass bubble immersed therein, higher than the level of the other water, or of mercury up a sphere of iron, or the like.

As to the just law of this attraction, it is not yet determined; only this we know in the general, that the force, in receding from the point of contact is diminished in a greater propor-

tion than that of the duplicate ratio of the distances, which is the law of gravity. For that, if the diminution were only in such duplicate ratio, the attraction at any small assignable distance would be nearly the same as at the point of contact: whereas experience teaches, that this attraction almost vanishes, and ceases to have any effect, at the smallest assignable distance.—But whether to fix on a triplicate, quadruplicate, or some other proportion to the increasing distance, is not ascertained by experiment.

II. The quantity of attraction, in all bodies, is exactly proportional to the quantity of matter in the attracting body; as being in reality the result or sum of the united forces of the attractions of all those single particles of which it is composed; or, in other words, attraction in all bodies is, *ceteris paribus*, as their solidities.

Hence, 1°. At equal distances the attractions of homogeneal spheres will be as their magnitudes.—And, 2°. At any distance whatever, the attraction is as the sphere divided by the square of the distance.

This law, it must be noted, only holds in respect of atoms, or the smallest constituent particles, sometimes called particles of the last composition; and not of corpuscles or compositions made up of these; for they may be so put together, as that the most solid corpuscles may form the lightest particles, *i. e.* the unfitness of their surfaces for intimate contact may occasion such great interstices, as will make their bulks large in proportion to their matter.

III. If a body consist of particles, every one whereof has an attractive power decreasing in a triplicate, or more than a triplicate ratio of their distances; the force wherewith a particle is attracted by that body in the point of contact, or at an infinitely little distance from the contact, will be infinitely greater than if that particle were placed at a given distance from the body.

IV. Upon the same supposition, if the attractive force at any assignable distance, have a finite ratio to its gravity, this force in the point of contact, or at an infinitely small distance, will be infinitely greater than its power of gravity.

V. But if in the point of contact the attractive force of bodies have a finite ratio to their gravity; this force in any assignable distance is infinitely less than the power of gravity, and therefore it becomes nothing.

VI. The attractive force of every particle of matter, in the point of contact, almost infinitely exceeds the power of gravity, but is not infinitely greater than that power; and therefore, in a given distance, the attractive force will vanish to nothing.

This attractive power, therefore, thus superadded to matter, only extends to spaces extremely minute, and vanishes at greater distances; whence, the motion of the heavenly bodies, which are at a prodigious distance from each other, cannot at all be disturbed by it, but will continually go on as if there were no such power in bodies.

Where this attracting power ceases, there, according to Sir Isaac Newton, does a repelling power commence; or rather, the attracting does thenceforward become a repelling power.

VII. Supposing a corpuscle to touch any body, the force whereby that corpuscle is impelled, that is, the force with which it coheres to that body, will be proportionable to the quantity of contact: for the parts, farther removed from the point of contact, contribute nothing towards its cohesion.

Hence, according to the difference in the contact of particles, there will be different degrees of cohesion: but the powers of cohesion are greatest when the touching surfaces are planes; in which case, *ceteris paribus*, the force by which one corpuscle adheres to others will be as the parts of the touching surfaces.

Hence it appears why two perfectly polished marbles, joined together by their plain surfaces, cannot be forced asunder, but by a weight which much exceeds that of the incumbent air.

Hence also may be drawn a solution of that famous problem concerning the cohesion of the parts of matter.

VIII. The power of attraction in the small particles increases, as the bulk and weight of the particles diminishes. For, the force only acting at or near the point of contact, the momentum must be as the quantity of contact, that is, as the density of the particles, and the largeness of their surfaces: but the surfaces of bodies increase or decrease as the squares, and the solidities as the cubes of the diameters. Consequently the smallest particles having the largest surfaces in proportion to their solidities, are capable of more contact, &c. Those corpuscles are most easily separated from one another, whose contacts are the fewest and the least, as in spheres infinitely small.

Hence we have the cause of fluidity.

IX. The force whereby any corpuscle is drawn to another nearly adjacent body suffers no change in its quantity, let the matter of the attracting body be increased or diminished; supposing the same density to remain in the body, and the distance of the corpuscle to continue the same.

For since the *attractive* powers of particles are diffused only through the smallest spaces; it is manifest that the remoter parts at C, D and E (*Tab. Nat. Hist. fig. 22.*) contribute nothing towards *attracting* the corpufcle A; and therefore the corpufcle will be attracted with the fame force towards B, whether thofe parts remain or be taken away; or, laftly, whether others be added to them.

Hence, particles will have different *attractive* forces, according to their different ftructure and compofition; thus a particle perforated will not attract fo ftrongly as if entire. So, again, the different figures into which a particle is formed, will occafion a diverfity of power: thus a fphere will attract more than a cone, cylinder, &c.

X. Suppofe a body of fuch a texture as that the particles of the laft compofition, by an external force, fuch as a weight compreffing them, or an impulf given by another body, may be a little removed from their original contact, but fo as not to acquire new ones; the particles by their *attractive* force tending to one another, will foon return to their original contacts.—But when the fame contacts and pofitions of the particles which compofe any body, return; the fame figure of the body will alfo be refored: and therefore bodies which have loft their original figures, may recover them by *attraction*.

Hence appears the caufe of elasticity.—For, where the contiguous particles of a body have by any external violence been forced from their former points of contact, to extremely fmall diftances; as foon as that force is taken off, the feparated particles muft return to their former contact: by which means the body will refume its figure, &c.

XI. But if the texture of a body be fuch that the particles by an impreffed force being removed from their contacts, come immediately into others of the fame degree, that body cannot refore it felf to its original figure.

Hence, we underftand what texture that is wherein the fuf-tenes of bodies confifts.

XII. The bulk of a body heavier than water may be fo far diminifhed, that it fhall remain fufpended in water, without defcending by its own gravity.

Hence it appears why faline, metallic, and other fuch-like particles, when reduced to fmall dimenfions, are fufpended in their menftruums.

XIII. Greater bodies approach one another with a lefs velocity than fmall.—For the force with which two bodies A and B (*Tab. Nat. Hist. fig. 23. No. 2.*) approach, refides only in the neareft particles; the more remote having nothing to do therein. No greater force, therefore, will be applied to move the bodies A and B, than to move the particles c and d; but the velocities of bodies moved by the fame force are in a reciprocal ratio of the bodies: wherefore the velocity with which the body A tends towards B is to the velocity with which the particle c detached from the body would tend towards the fame B, as the particle c is to the body A; confequently the velocity of the body A is much lefs than would be the velocity of the particle c detached from the body.

Hence it is that the motion of large bodies is naturally fo flow and languid that an ambient fluid and other circumjacent bodies generally retard them; whilft the leffer go on more briskly, and produce a greater number of effects: fo much greater is the *attractive* energy in fmall bodies than in the larger.—Hence again appears the reafon of that chymical axiom; *Salts do not act till they are diffolvd.*

XIV. If a corpufcle placed in a fluid be equally attracted every way by the circumambient particles, no motion of the corpufcle will enfue.—But if it be attracted by fome particles more than others, it will tend to that part where the attraction is the greateft; and the motion produced will correspond to the inequality of the attraction, viz. the greater the inequality, the greater the motion, and *vice verfa*.

XV. Corpufcles floating in a fluid, and attracting each other more than the particles of the fluid that lie between them, will force away the particles of the fluid, and ruft to one another with a force equal to that by which their mutual attraction exceeds that of the particles of the fluid.

XVI. If a body be immerged in a fluid whose parts more ftrongly attract the particles of the body than they do one another; and if there be a number of pores or interfices in the body pervious to the particles of the fluid; the fluid will immediately diffufe itfelf through thofe pores. And if the connexion of the parts of the body be not fo ftrong, but that it may be overcome by the force of the particles rufting within it; there will be a diffolution of the body.

Hence, for a menftrum to be able to diffolve any given body, there are three things required.—1^o. That the parts of the body attract the particles of the menftrum more ftrongly than they attract each other. 2^o. That the body have pores or interfices open and pervious to the particles of the menftrum. 3^o. That the cohesion of the particles which confitute the body, be not ftrong enough to refift the irruption of the particles of the menftrum. See MENSTRUM.

XVII. Salts are bodies endued with a great attractive force, though among them be interfperfed many interfices, which lie open to the particles of water; thefe are therefore ftrongly attracted by thofe faline particles, fo that they forcibly

ruft into them, feparate their contacts, and diffolve the con- texture of the falts. See SALT.

XVIII. If the corpufcles be more attracted by the particles of the fluid than by each other; they will recede from each other, and be diffused through the whole fluid.

Thus, if a little falt be diffolved in a deal of water, the particles of the falt, though fpecifically heavier than water, will evenly diffufe themfelves through the whole water; fo as to make it as faline at top as bottom.—Does not this imply that the parts of the falt have a centrifugal, or repulfive force, by which they fly from one another; or rather, that they attract the water more ftrongly than they do one another? for as all things afcend in water which are lefs attracted than water by the gravity of the earth, fo all the particles of falt floating in water, which are lefs attracted by any particle of falt than water is, muft recede from the particle, and give way to the more attracted water. *Nerv. Opt. p. 363.*

XIX. Corpufcles, or little bodies fwimming in a fluid, and tending towards each other; if they be fupposed elastic, will fly back again after their congrues, till fricking on other corpufcles, they be again reflected towards the frift; whence will arife innumerable other conflicts with other corpufcles, and a continued feris of percuffions and reboundings.—But, by the attractive power, the velocity of fuch corpufcles will be continually increafed; fo that the infteine motion of the parts will at length become evident to fenfe. See INTES- TINE Motion.

Add, that in proportion, as the corpufcles attract each other with a greater or lefs force, and as their elasticity is in a greater or lefs degree, their motions will be different, and become fenfible at various times, and in various degrees.

XX. If corpufcles that attract each other happen mutually to touch, there will not arife any motion, becaufe they cannot come nearer. If they be placed at a very little diftance from each other, a motion will arife; but if further removed, the force wherewith they attract each other will not exceed that wherewith they attract the particles of the intermediate fluid, and therefore no motion will be produced.

On thefe principles depend all the phenomena of fermentation and ebullition.

Hence appears the reafon why oil of vitriol, when a little water is poured on it, works and grows hot: for, the faline corpufcles are a little difjointed from their mutual contact, by the infufed water; whence, as they attract each other more ftrongly than they do the particles of water, and as they are not equally attracted on every fide, there muft of neceffity arife a motion.

Hence alfo appears the reafon of that uncommon ebullition occafioned by adding fteel-filings to the aforefaid mixture. For the particles of fteel are extremely elastic; whence there muft arife a very ftrong reflection.

Hence alfo we fee the reafon why fome menftruums act more ftrongly, and diffolve bodies fooner, when diluted with water.

XXI. If corpufcles mutually attracting each other have no elastic power, they will not be reflected back from each other, but will form congeries, or little mafles; whence a coagulum will arife. See COAGULATION.

If the gravity of the particles thus amafsed exceed the gravity of the fluid, a precipitation will fucceed.—Precipitation may alfo arife from an increafe or diminution of the gravity of the menftrum wherein the corpufcles are immerged.

XXII. If corpufcles fwimming in a fluid, and mutually attracting each other, have fuch a figure, as that in fome given parts they have a greater attractive power than in others, and their contact greater in thofe parts than in others; thofe corpufcles will unite into bodies with given figures; and thence will arife cryftallization.

Particles immerged in a fluid moved with a fwift or a flow progrefive motion will attract each other in the fame manner as if the fluid were at reft; but if all the parts of the fluid do not move equally, the attractions will be difturbed. Hence it is that many falts will not cryftallize till the water wherein they are diffolved is cold.

XXIV. If between two particles of a fluid there happen to be a corpufcle whose two oppofite fides have a ftrong attractive power, that intermediate corpufcle will agglutinate or faften the particles of the fluid to itfelf.—And feveral fuch corpufcles diffused through the fluid will fix all its particles into a firm body; and the fluid will be froze or reduced into ice.

XXV. If a body emit a great quantity of effluvia, whose attractive powers are very ftrong; as thofe effluvia approach any other very light body, their attractive powers will overcome the gravity of that body, and the effluvia will draw it towards themfelves: and as the effluvia are clofer and more copious at little diftances from the emitting body, than at greater; the light body will be continually drawn towards the denfer effluvia, till fuch time as it comes to adhere to the emitting body itfelf.

And hence moft of the phenomena of electricity may be accounted for.

Centre of **ATTRACTION**. See the article **CENTRE**.

ATTRACTIVE, **ATTRACTIVUS**, **ATTRATRIX**, something that has the power or faculty to attract. See **ATTRACTION**.

ATTRACTIVE Power, or *Force, Vis attractiva*. See **POWER**, and **ATTRACTION**.

The *attractive virtue* in loadstone is communicable, by touching to iron or steel. See **TOUCHING**.

ATTRACTIVES, or **ATTRACTIVE Remedies**, denote medicines which are to be externally applied, and which by their activity and warmth penetrate the pores, and mix with and rarely any obstructed matter, so as to render it fit for discharge, upon laying open the part by a caustic or incision.

Attrahents are the same with what we otherwise call *drawers, ripeners, maturants, and digestives*.

The principal simples belonging to this class are, the several kinds of fats or adipos, the dungs of pigeons and cows, bran, yeast, herring, melilot, tobacco, oil, pitch, resin, frankincense, &c. See each under its proper article.

In many instances, as the matter rarefies and grows more fluid by means of such medicines, the reſtuent blood is apt to wash it back into the common maſs; which ſometimes does a deal of miſchief; or by making it take up more room upon its rarefaction, it occasions it to diſtend more the parts in which it is contained: upon which a ſenſe of pain is excited, and thereby a greater concurrence of fluid, and conſequently an increaſe of the tumour.—So that medicines under this denomination require the moſt careful management.

ATTRIBUTE, **ATTRIBUTUM**, in a general ſenſe, that which agrees to ſome perſon, or thing; or a quality, which determines ſomething to be after a certain manner.

Thus, underſtanding is an *attribute* of mind; figure, an *attribute* of body, &c.—Spinoza makes the ſoul and the body to be of the ſame ſubſtance; with this only difference, that the ſoul is to be conceived under the *attribute* of thought, and the body under that of extension.

Of the ſeveral *attributes* belonging to any ſubſtance, that which preſents itſelf firſt, and which the mind conceives as the foundation of all the reſt, is called its *eſſential attribute*.

Thus, extension is by ſome, and ſolidity by others, made the eſſential *attribute* of body or matter.

The other *attributes* are called *accidental* ones: e. gr. roundneſs in wood, or learning in a man.—Mr. Locke endeavours to prove, that thinking, which the Cartesians make the eſſential *attribute* of the mind, is only an accidental one.

ATTRIBUTE, in logic, is an epithet given to any ſubject; or it is any predicate thereof; or whatever may be affirmed or denied of any thing.

Every propoſition conſiſts of a ſubject, an *attribute*, and a copula, or conjunctive particle. See **PROPOSITION**.

Attributes are uſually divided into *poſitive*, which give a thing ſomewhat; as when we ſay of a man that he is *animate*: and *negative*; as when we ſay of a ſtone that it is *inanimate*.

Others, again, divide them into *common*, which agree to ſeveral different things; as *animal*, which agrees both to man and brute: and *proper*, as *thought*, &c. which agrees only to ſpirit, *rationality* to man, &c.

ATTRIBUTES, in theology, denote the ſeveral qualities, and perfections which we conceive in God; and which conſtitute his proper eſſence; as juſtice, goodneſs, wiſdom, &c. See **GOD**.

The heathen mythologiſts divided the deity into as many diſtinct beings as he has *attributes*: thus the power of God was called *Jupiter*; the wrath and vengeance of God, *Juno*; the abſolute will of God, *Fate*, or *Deſtiny*, to which even his very power is ſubject.

ATTRIBUTES, in painting and ſculpture, are ſymbols added to figures and ſtatues, to denote their particular office and character.

Thus the club is an *attribute* of Hercules; the palm is an *attribute* of victory; the peacock of Juno; the eagle of Jupiter, &c.

ATTRITION*, **ATTRITIO**, *trituro*, or *frictio*, expreſſes ſuch a motion of bodies againſt one another, as ſtrikes off ſome ſuperficial particles; whereby they gradually become leſs and leſs.

* The word is formed of *atterere*, to rub, wear; compounded of *ad*, to; and *tero*, I wear.

The grinding and poliſhing of bodies is performed by *attrition*.

The effects of *attrition* in exciting heat, light, electricity, &c. ſee under the articles **HEAT**, **LIGHT**, **FIRE**, and **ELECTRICITY**.

A feather, by being only drawn through the fingers, has been found by Mr. S. Grey to acquire a degree of electricity, and would be attracted by the finger when held near it; a human hair, after having paſſed three or four times between the finger and thumb, would fly to his finger at the diſtance of half an inch; and the hair of a dog's

ear, and the threads of ſilk would do the like. The like was found in pieces of ribband of ſeveral colours, half a yard long; the hand, held at the lower-end of any of which, would attract them at the diſtance of five or fix inches. But if they had imbibed the moiſture of the air, the electricity would be much weakened thereby; in which caſe, the fire never failed to give them a ſtrong one. In effect, the ſame author found woollen, paper, leather, wood-shavings, parchment, and gold-beater's ſkin, to be electrical; and that they not only came to the hand, or any other ſolid body, but attracted ſmall bodies to them, ſometimes at the diſtance of eight or ten inches: ſome of theſe, alſo, appeared luminous upon friction. See *Philoſoph. Tranſact.* N^o 366.

ATTRITION is alſo frequently uſed for the friction or rubbing of ſuch ſimple bodies one againſt another, as will not wear out, but will occaſion ſome particular determinations of the fluids they contain.

Thus, the various ſenſations of hunger, pain, or pleaſure, are ſaid to be occaſioned by the *attritions* of the organs form'd for ſuch impreſſions.

ATTRITION, among divines, denotes a ſorrow or regret for having offended God; ariſing from a ſenſe of the odiousneſs of ſin, and the apprehenſions of puniſhment; i. e. of the loſs of heaven, and the pains of hell.

Attrition is eſteemed the loweſt degree of repentance, being a ſtep ſhort of contrition, which ſuppoſes the love of God an ingredient or motive of our ſorrow and repentance. See **CONTRITION**.

ATTURNATO *faciendo vel recipiendo*, a writ which a man owing ſuit to a county, hundred, or other court, deſiring to make an attorney appear for him there, whom he doubts the ſheriff or ſteward will not otherwiſe admit; purchaſeth, to command him to receive ſuch attorney, and admit his appearance by him.

Admittenda Clamea in itinere per ATTURNATUM. See **CLAMEA**.

AVANT, a French prepoſition, ſignifying *before*, or any priority either in reſpect of time, or place; ſometimes uſed, in compoſition, in our language, but more uſually contracted, and wrote *vant*, or *vant*, or even *van*. See **VAN**.

AVANT Poſſe, &c. } See **VAN Poſſe**.

AVANT Guard, &c. } See **VAN Guard**, &c.

AVARIA*, in the Turkiſh and Perſian dominions, a ſum of money exacted from the Chriſtians or Europeans, to be quit of ſome falſe accusation framed on purpoſe. *Rauwolff. Trav.* p. 182.

AVAST*, a term frequently uſed on board a ſhip, ſignifying to ſtop, hold, or ſtay.

* The word is formed of the Italian *vasta*, or *baſta*, it is enough, it ſuffices.

AVANCHERS, among hunters, the ſecond branches of a hart's horn. See **HEAD**.

AUBAINE*, in the French cuſtoms, a right veſted in the king, of being heir to a foreigner, who dies within his dominions.

* The word is formed of *aubain*, a foreigner; which Menage derives further from the Latin, *alibi natus*; Cujus, from *ad-vena*; which is the name foreigners bear in the capitularies of Charlemain; du Cange from *Albanus*, a Scot, or Iriliſman; by reaſon theſe were anciently much given to travelling and living abroad.

The king of France, by the right of *aubaine*, claims the inheritance of all foreigners in his dominions; excluſive of all other lords, and even of any teſtament the decaſed could make. An embaiſador, though not naturalized, is not ſubject to the right of *aubaine*. The Swiſs, Savoyards, Scots, and Portugueſe, are alſo exempted from the *aubaine*, as being reputed natives and regnicoles.

AUCTIO, **AUCTION**, this was originally a kind of ſale among the ancient Romans, performed by the public cryer *ſub hafta*, that is, under a ſpear ſtuck up on that occaſion, and by ſome magiſtrate, who made good the ſale by delivery of the goods.

This was termed *auctio*, q. d. increaſe; becauſe, according to Sigonius, the goods were ſold to him, *qui plurimum rem augetur*, who would bid moſt for them.

AUCTION by *inch of candle*. See the article **CANDLE**.

AUDIENCE*, in a general ſenſe. See **HEARING**.

* The word is formed from the corrupt Latin, *audientia*, of *audire*, to hear.

AUDIENCE is alſo uſed for the ceremonies praſticed in courts, at the admiſſion of embaiſadors, and public miniſters, to a hearing.

Such an embaiſador ſent to demand *audience*; took his *audience* of leave to depart, &c.

In England, *audience* is given to embaiſadors in the preſence-chamber; to envoys and reſidents, in a gallery, cloſet, or any place where the king chances to be.

At their admiſſion, the way, in all courts, is to make three bows; after which they cover and ſit down, the king firſt covering

covering and sitting down, and giving them the sign to put on their hats.—When the king cares not to have them be covered and sit, he continues uncovered himself, and standing all the while: which is taken as a slight and affront.—After the first audience, it does not look well to be too haughty in demanding another.

At Constantinople, ministers usually have audience of the prime vizir: in his absence, the caimacan admits them to audience.

AUDIENCE is also the name of a court of justice, established by the Spaniards in the West-Indies; answering in effect to the parliaments of France.

They judge without appeal, and have each a certain district, which ordinarily takes in several provinces, called also *audiencias*, from the names of the tribunal to which they belong.

Hence Sanfon divides Spain into as many of these *audiencias* as there are of those tribunals.—New Spain comprehends three *audiencias*; those of Gaudalajara, Mexico, and Guatimala.

AUDIENCE is also the name of one of the ecclesiastical courts in England, which is held where-ever the archbishop calls a cause to his own hearing.

The court of audience is chiefly concerned in differences arising upon elections, consecrations, infitutions, marriages, &c.

Chamber of AUDIENCES. See the article CHAMBER.

AUDIENDO & terminando, a writ, or rather commission, directed to certain persons, when an insurrection or great misdemeanour is committed in any place, for the appealing and punishment thereof.

AUDIENTES, or AUDITORES, in church-history, an order of catechumens; consisting of those who were newly instructed in the mysteries of the Christian religion, and not yet admitted to baptism.

AUDIT, a regular hearing and examining of an account, by officers appointed for that purpose. See AUDITOR.

AUDITA querela, a writ which lies against him, who, having taken a statute-merchant, or recognizance in the nature of a statute-staple, or a judgment, or a recognizance of another; and craving, or having obtained, execution of the same from the mayor and bailiffs, before whom it was entered; at the complaint of the party who entered the same, upon suggestion of some just cause why execution should not be granted; as a release, or other exception.

This writ is granted by the lord chancellor, upon view of the exception suggested, to the judges of either bench, willing them to grant summons to the sheriff of the county where the creditor is, for his appearance at a certain day before them.

AUDITOR, a hearer, or one who listens or attends to any thing.

AUDITOR is also used for several officers, appointed to audit, to hear accounts, pleadings, &c.

Anciently the word *auditor* was also used for judge, and even for an inquisitor, appointed by judges to examine and find out the truth of some matter in contest. *Notaries* are also frequently called *auditors*.

AUDITOR, in our law, is an officer of the king, or some other great person, who yearly, by examining the accounts of under-officers accountable, makes up a general book, with the difference between the receipts and charge, and their allowances or allocations.

AUDITORS of the Revenue, or of the Exchequer, are officers who take the accounts of those who collect the revenues, taxes, &c. raised by parliament; as also of the sheriffs, escheators, collectors, tenants, and customers, and set them down, and perfect them.

AUDITORS of the Press, or Impress, are officers in the exchequer, who take and make up the great accounts of Ireland, Berwick, the mint, customs, wardrobe, first-fruits, naval and military expences, and of all moneys impressed to any man for the king's service.

AUDITOR of the Receipts is an officer of the exchequer, who files the tellers bills, and makes an entry of them, and gives the lord treasurer a certificate of the money received the week before; who presents the estimate or balance to the king.

He makes debentures to every teller, before they receive any money, and takes their accounts. He keeps the black book of receipts, and the treasurer's key of the treasury, (where the ancient leagues of the realm, and many records of the king's bench and common pleas are deposited) and fees every teller's money lock'd up in the new treasury.

There are also *auditors* of the first-fruits; of the principality of Wales; of the duchy of Cornwall, &c. See FIRST-FRUIT, &c.

AUDITOR of the Rota, the apostolic chamber, the chatelet, &c. See ROTA, CHAMBER, &c.

AUDITORS, Conventual, Collegiate, &c. were officers formerly appointed among the religious, to examine and pass the accounts of the house.

AUDITORY, in an adjective sense, something belonging to the sense of hearing. See HEARING.

AUDITORY, AUDIENCE, is also a collective name, denoting an assembly of persons, hearing or attending to a person who speaks in public.

AUDITORY is also used for the seat or bench where a magistrate, or judge, hears causes.

At Rome, the several magistrates had *auditories* or seats of justice according to their dignity.—Those of the superior officers were called *tribunals*; those of the inferior, *subsellia*.

The *pedani* had their benches or *auditories* in the portico of the imperial palace.—Those of the Hebrews, at the gates of cities.—The judges appointed by the ancient lords distributed justice under an elm, which was usually planted before the manor-house, and served them for an *auditory*.

AUDITORY, AUDITORIUM, in the ancient churches, was that part of the church where the *audientes* stood to hear, and be instructed.

The *auditorium* was that part now called *navis ecclesiae*. See NAVE.

In the primitive times, the church was so strict in keeping the people together in that place, that the person who went from thence in sermon-time was ordered by the council of Carthage to be excommunicated.

MEATUS AUDITORIUS, or AUDITORY passage in anatomy, called also *aurium abeare*, on account of the cerumen collected in it. See MEATUS Auditorius.

AUDITORY Nerves, in anatomy, a pair of nerves arising from the medulla oblongata, and distributed, the one to the ear, the other to the tongue, eye, &c.—See Tab. Anat. (osteol.) fig. 5. lit. pp.

The soft and spongy branch of the *auditory nerve* being diffused through the labyrinth and tympanum of the ear, is the immediate organ of the sense of hearing.

The *auditory nerves* make the seventh conjugation, according to the way of reckoning of the moderns; and the fifth according to the ancients.

Anatomists observe a singular mark of the wisdom and contrivance of the creator in the *auditory nerves* being thus dispatched to different parts; an admirable and useful consent being hereby established between them.—Hence it is that most animals upon hearing any uncouth sound, are found to erect their ears, and prepare them to catch it; to open their eyes, to stand upon the watch; and to be ready with the mouth to call out, or testify their danger: accordingly most animals when surprized or terrified, shriek or cry out, &c.

Dr. Willis (*anat. cereb. c. 17.*) observes a further use of this nervous communication between the ear and the mouth; which is, that the voice may correspond with the hearing, and be a kind of echo thereof; that what is heard with one of the two nerves may be readily expressed with the voice, by the help of the other.

AVELLANE, or Cross AVELLANE, in heraldry, a form of cross which resembles four filberts in their buks or cafes, joined together at the great end. See CROSS.

Hence its name; a filbert in Latin being *nux avellana*—Syl. Morgan says, it is this cross which ensigns the mound of authority, or the sovereign's globe.

AVE-MARIA, or AVE-MARY, the angel Gabriel's salutation of the virgin, at his bringing her the tidings of the incarnation; thus called, as beginning with those words, *Ave Maria*, q. d. Hail Mary.

The *ave-mary* is a prayer or formula of devotion very usual in the Romish church.—Their chaplets and rosaries are divided into so many *ave-marys*, and so many pater-nosters: And hence the beads themselves, which indicate them, are also called *ave's*, or *ave-mary's*.

AVENAGE*, in law, a certain quantity of oats, paid to a landlord, in lieu of some other duties; or, as a rent, from the tenant.

* The word is French, formed of the Latin, *avena*, oats.

AVENOR, an officer under the master of the horse; who, by order or warrant from him, swears in all the officers belonging to the royal stables. See MASTER of the Horse.

The *avenor* also makes up the accounts of the stables, and issues debentures for paying the officers and servants.

In a stat. Car. II. we find the *avenor* mentioned as an officer who provides oats for the stables.—In the Rot. Parl. Edw. III. we also read of *avenor* of the queen, of the prince, &c.

AVENTURÆ, in our ancient writers, signify tournaments, or military exercises on horseback. See TURNAMENT.

AVENTURE, or rather ADVENTURE, in our law-books, a mischance, causing the death of a man, without felony; as, when he is suddenly drowned, or burnt by an accident or mischance, falling into the water or fire. See MISADVENTURE, and CHANCE MEDLY.

AVENUE*, in fortification, an opening or inlet into a fort, bastion, or the like place, or the passes and ways to and from it. See FORT, and BASTION.

* The word is formed of the French *avvenir*, or *advenir*, to come to, to arrive at.

AVENUE, in gardening, is a walk, planted on each side with trees, and leading to some place.

All *avenues*, Mortimer says, should lead to the front of an house, garden-gate, highway-gate, or wood, and terminate in a prospect.—In an *avenue* to be as wide as the whole breadth of the front; and if wider, it is so much better.

AVERAGE*, **AVERAGIUM**, in law, that duty or service which the tenant is to pay the king, or other lord, by his beasts and carriages.

* The word is derived from the base Latin *averia*, cattle; or the French, *averz*, work.

AVERAGE, or **AVERIDGE**, is also used in navigation and commerce, for the damage which a vessel, or the goods and loading thereof, sustains, from the time of its departure to its return; as also, for the charge or contributions raised on the proprietors, towards defraying such damages.

A late author, who has wrote a treatise express upon *average*, distinguishes two kinds thereof; *simple* or private, and *gross* or common.

To the first, the particular things which suffer, alone contribute; to the second, all both the ship and the merchandizes contribute in common.

Of the first kind are all extraordinary and unforeseen expenses and accidents, befalling either the ship, or the goods, or both: the loss in which cases is to be wholly defrayed by the thing or things which occasioned it.—Such as the loss of cables, anchors, masts, and sails, by reason of storms, &c. As also damages accruing to goods through their own defects, by wasting, rotting, wetting, storms, pirates, &c. The sailors wages while the ship is extraordinarily detained by embargo's, provided she be hired for the whole voyage, and not *per* month. All these are *simple* or private *averages*, and not to be charged to the common account.

For *gross* or common *average* to have place, the author just mentioned, shews, 1^o. That something must have been cast into the sea, and this out of absolute necessity. 2^o. That the commander have had the consent of the owners for so doing. 3^o. That it have only been done for the safety of the whole ship, and that the ship have been saved in consequence thereof.

—In such case, all those for whose interest the thing was cast into the sea, are to contribute to indemnify the person whose property it was: and every thing is to be taxed hereto, so much as jewels, gold, &c. notwithstanding they do not any way burthen the ship; and even the vessel itself, but not passengers, nor provisions. *Rainold. Christ. a Derfchaen in Nov. Lit. Mar. Bal. 1700.*

To the occasions of common *average* may be added, compositions with pirates for the ransom of the ship; as also cables, masts, anchors, &c. lost or abandoned for the common good; the food and physic of the sailors wounded in defence of the ship; and the pay and provisions of the crew when the ship is arrested or put under embargo by order of a prince, provided it were hired for the month, and not for the whole voyage.

AVERAGE is more particularly used for the quota or proportion which each merchant or proprietor in the ship or loading is adjudged, upon a reasonable estimation, to contribute to a common *average*.

Such sum shall be divided among the several claimers, by way of *average*, in proportion to their respective interests and demands. 10 *A. c. 17.*

AVERAGE is also a small duty which those merchants who send goods in another man's ship pay to the masters thereof, for his care of them, over and above the freight.

Hence, in bills of lading it is expressed—Paying so much freight for the said goods, with primage and *average* accustomed.

AVER-CORN, in ancient writings, such corn as by custom is brought by the tenant's carts or carriages, to the lord's granary, or barn.

AVERDUPOIS Pound. } See the article } **POUND.**

AVERDUPOIS Weight. }

AVERIA, in our law-books, properly signify oxen or horses used for the plough; but, in a general sense, any cattle.

When mention is made of one beast, they say, *quidam equus*, vel *quidam bos*: when of two, or more, they do not say *equi* or *boves*, but *averia*.

Replegiare de AVERIIS. See the article **REPLEGIARE.**

AVÈRMENT, in law, usually signifies an offer of the defendant to make good or justify an exemption, pleaded in abatement or bar of the plaintiff's action.

The word also sometimes signifies the act, as well as the offer, of justifying the exception.

Averment is two-fold, *general* and *particular*.

General AVÈRMENT is the conclusion of every plea to the writ, or in bar of replications or other pleadings; (for counts, or avowries in nature of counts, need not to be *averred*;) containing matter affirmative; and ought to be with these words, *hoc paratus est verificare*.

Particular AVÈRMENT is, when the life of a tenant for life, or

tenant in tail, is *averred*, &c.—An *averment* contains as well the matter as the form thereof.

AVERNI*, among the ancient naturalists, certain lakes, grotto's, and other places, which infect the air with poisonous steams or vapours; called also *melphites*.

* The word is Latin, formed of the Greek privative *a*, and *αερης*, bird; as intimating that birds could not fly over them, but dropped down dead. *Avernus*, q. d. *avernus, locus sine avibus*.

Averni are said to be frequent in Hungary, on account of the abundance of mines therein.

The grotta del Cani, in Italy, is a famous one. See **GROTTA**, and **EXHALATION**.

But the most celebrated *avernus* was, a lake near Baia, in Campania, by the modern Italians called *Lago di Treppe-gala*.—The fumes it emitted are represented by the ancients as being of so malignant a nature, that birds could not fly over it, but sunk down dead; which some later writers have chose to attribute to this, that the sulphurous effluvia hereof not being of consistence to sustain the birds, they dropped by their own weight. This circumstance, joined with the great depth of the lake, occasioned the ancients to take it for the gate or entrance of hell; and accordingly Virgil makes Æneas defend this way to the Inferi*.—Vibius Sequester says, there is no bottom to be found of it; *Immensæ altitudinis cujus ina pars apprehendi non potest. See HELL.*

* Next to the Baia, says Strabo, lies the Lucrine bay; and within it the lake *Avernus*. It was here the ancients believed that Homer had described Ulysses as conversing with the dead, and consulting Tiresias's ghost: for here they said was the oracle sacred to the shades, which Ulysses came and consulted concerning his return. The *Avernus* is a deep dark-some lake, with a narrow entry from the outer bay: it is surrounded with steep banks that hang threatening over it, and is only accessible by the narrow passage through which you fall in. These banks were anciently quite overgrown with a wild wood, impenetrable by a human foot. Its gloomy shade impressed an awful superstition upon the minds of the beholders; whence it was reputed the seat of the Cimmerians, who dwelt in perpetual night.

Whoever failed thither, first did sacrifice; and endeavoured to propitiate the infernal powers, with the assistance of some priests who attended upon the place, and directed the mystic performance. Within, a fountain of pure water broke out just over the sea; but no creature ever tasted of it, believing it to be a vein of the river Styx: somewhere near this fountain was the oracle; and the hot waters, frequent in these parts, made them think they were branches of the burning Phlegethon. *Enquiry into the Life, &c. of Homer, sect. 11.*

AVERPENY, q. d. *Average peny*, money contributed towards the king's averages; or money given to be freed thereof. See **AVERAGE**.

AVERRUNCATION, in agriculture, the act of cutting or lopping off the superfluous branches of trees. See **PRUNING**.

AVERRUNCI*, in antiquity, an order of deities among the Romans, whose peculiar office was to avert dangers and evils.

* The Greeks called this species of gods, *αὐερχικοί*, or *αποσπορευτικοί*; and their feast *αὐερχομῆσι*: sometimes, *αὐερχεσθῆσι*.

The Egyptians had also their *dii averrunci*, or *apocropei*, who were pictured in a menacing posture, and sometimes with whips in their hands.—Isis was a divinity of this kind; as is shewn by Kircher. See *Oedip. Egypt. T. III. p. 487.*

AVERSION*, abhorrence, dislike. See **ANTI-PATHY**.

* The word is compounded of *a*, from; and *aversio*, to turn.

AVERY, a place where oats, or provender are kept for the king's horses. See **AVERIA**.

AUGES, in astronomy, two points in a planet's orbit, otherwise called *apsides*. See **APSES**.

One of the *auges* is particularly denominated the *apogee*, the other *perigee*.

AUGMENT, **AUGMENTUM**, in the Greek grammar, an accident of certain tenses; being either the prefixing of a syllable, or an increase of the quantity of the initial vowels.

There are two kinds of *augment*.—*Temporale*, or of a letter, when a short vowel is changed into a long one; or a diphthong into another longer one: thus called by reason the effect of its pronunciation is now lengthened.

Augmentum syllabicum, or of a syllable, is when a letter, viz. *s*, is added at the beginning of the word; so that the number of syllables is increased.

AUGMENTS, in mathematics. See **FLUXIONS**, and **MOMENTS**.

AUGMENTATION, *Αὐξάνσις*, in a general sense, the act of *augmenting*; that is, of adding or joining something to another, to render it larger, or more considerable.

The governors of the bounty of queen Anne, for the *augmentation of the maintenance of the poor clergy*, by virtue of the several acts of parliament, made for that purpose, are empowered to augment all livings not exceeding 50*l.* per annum: and the number of livings following have been certified to be capable of *augmentation*.

- 1071 Livings not exceeding 10 l. per annum, which may be augmented (with the bounty alone) six times each, pursuant to the present rules of the governors, which will make 6426 augmentations. } 6426
- 1467 Livings above 10 l. and not exceeding 20 l. per annum, may be augmented four times each, which will make 5868 augmentations. } 5868
- 1126 Livings above 20 l. and not exceeding 30 l. per annum, may be augmented three times each, which will make 3378 augmentations. } 3378
- 1049 Livings above 30 l. and not exceeding 40 l. per annum, may be augmented twice each, which will make 2098 augmentations. } 2098
- 884 Livings above 40 l. and not exceeding 50 l. per annum, may be each once augmented, which will make 884 augmentations. } 884

5597 Total number of augmentations, which must be made (by the bounty alone) before the livings already certifi'd will exceed 50 l. per annum. } 18654

Computing the clear amount of the bounty to make 55 augmentations yearly, it will be 339 years, from the year 1714, (which was the first year in which any livings were augmented) before all the small livings already certified can exceed 50 l. per annum: and if it be computed, that one half of such augmentations may be made in conjunction with other benefactors (which is very improbable) it will require 226 years before all the livings already certified will exceed 50 l. per annum.

AUGMENTATION is also used for the *augment*, i. e. for the additament, or the thing added. Such a minister petitioned the king for an augmentation of salary, wages, &c.

Court of AUGMENTATION of the king's revenue is the name of a court erected under Henry VIII. in 1536, to the end the king might be justly dealt with, touching the profit of such religious houses, and their lands, as were given him by act of parliament the same year.—This court was dissolved under queen Mary, by the parliament held the first year of her reign; but the office of augmentation remains to this day, in which are many valuable records.

The court took its name hence, that the revenues of the crown were thought to be much augmented by the suppression of the said houses; many of which the king reserved to the crown.

AUGMENTATIONS, in heraldry, are additional charges to a coat-armour frequently given as particular marks of honour, and generally borne either on an escutcheon, or a canton.—Such are the arms of Ulster, borne by all the baronets of England.

AUGRE, or AWGRE, a carpenter's and joiner's instrument, serving to bore large, round holes.

The *augre* consists of a wooden handle, and an iron blade, terminated at bottom with a steel bit. *Vid. Mex. Mech. Exerc. p. 94.*

AUGSBURG Confession. See AUGUSTAN.

AUGUR *, in antiquity, a minister of religion among the Romans, appointed to take *auguries* or presages concerning futurity from birds, beasts, and the appearances of the heavens.

* The word is by some derived from *avis*, bird, and *garrulus*, chattering; on which footing, the original office of the *augurs* is supposed to have been to observe, and take indications from, the noise, calling, singing, chirping, and chattering of birds. Agreeably to which, *augur* is commonly distinguished from *auspex*, as the latter was supposed employed in observing the flight of birds. See AUSPEX.—Pezron derives it from the Celtic *au*, liver, and *gur*, man; so that according to him an *augur* was properly a person who inspected the entrails, and divined by means of the liver. On which principle, *augur* would have been the same with *auspex*.

The *augurs* made a college or community, which at first consisted of three persons, (one for each tribe:) then of four, (when Servius Tullius increased the tribes to that number:) then of nine (four of them patricians, and five plebeians:) lastly, Sylla made the number fifteen—Cato was of the college of *augurs*.

They bore an *augural staff*, or wand, called *lituus*, as the ensign of their office and authority. No affair of moment could be resolved on, without first consulting them; and their advice, be it what it would, was, by a decree of the senate, appointed to be exactly and religiously observed.

Some will have *augurs* to have differed from *auspices*, and *augury* from *auspicy*, in that the former was in strictness confined to the chirping of birds, and the latter to their flying, feeding, &c.—But this is a distinction often dispensed withal.

AUGURY, AUGURIUM, the discipline of the *augurs*, or the practice of consulting the gods, and learning their will, by divers kinds of omens. The observation of *auguries* is very ancient, as having been prohibited by Moses in Leviticus.—The cup put in Benja-

min's sack, in Egypt, was that used by Joseph to take *auguries* by.

AUGURY, in its more general signification, comprizes all the different kinds of divination; which Varro distinguishes into four species of *augury*, according to the four elements.—Pyromancy, or *augury* by the fire; aeromancy, or *augury* by the air; hydromancy, or *augury* by the water; and geomancy, or *augury* by the earth.

The particular branches are, *aleatoromancy*, *anthropomancy*, *belomancy*, *catoptromancy*, *capnomancy*, *gastro-mancy*, *geomancy*, *arsuspina*, *libanomancy*, *lecanomancy*, *necrumancy*, &c. See each described under its proper article.

AUGUST, AUGUSTUS, in a general sense, something majestic, venerable, or sacred.

The title *augustus* was first given by the Roman senate to Octavius, after his being confirmed by them in the sovereign power.—It was conceived as expressing something divine, or elevated above the pitch of mankind, being derived from the verb, *augere*, I grow, encrease, *tantum supra humanam sortem auctus*.

The successors of Octavius assumed the same quality; so that thence-forward emperor and *augustus* were the same thing: they became synonymous terms. See EMPEROR.

The presumptive heir of the empire, or he who was destined to succeed to the dignity, was first created *caesar*; which was a step necessary to arrive at that of *augustus*; or emperor.—Yet F. Pagi maintains the reverse; viz. that it was necessary to be *augustus*, previously to the being *caesar*. See CESAR.

M. Flechier observes, that the emperor Valentinian proclaimed his brother Valens, *augustus*; without first declaring him *caesar*: which had never been practised before.—It is added, that Marcus Aurelius, upon his succeeding to Antoninus, immediately created L. Verus, both *caesar* and *augustus*. This was the first time the Romans had known two *augusti* at once; for which reason the year when it was done, viz. 161, was marked in the Fasti with the consulate of the two *augusti*. It was a surprising spectacle to the people of Rome to see themselves governed by two sovereigns, after so much blood spilt for the choice of a single master.

The empresses also took the quality of *augusta*; and even some ladies of the imperial family, who had never been wives of emperors, but mothers or daughters.

On medals and coins, some of the ancient kings of France are also found with the appellation *augusti*; particularly Childbert, Clothaire, and Clovis: add, that the wife of this last, Chrotechida, is also called by Heric, in his book of the miracles of St. Germain, indifferently, either *augusta*, or *queen*.

The *Histeria Augusta* is the history of the Roman emperors from the time of Adrian to Carinus, that is from the year of our lord 157 to 284: composed by six Latin writers, Æl. Spartianus, Julius Capitolinus, Æl. Lampridius, Vulcatius Gallicanus, Trebellius Pollio, and Flavius Vopiseus. *Vid. Fabric. Bibl. Lat. c. 6.*

AUGUSTALES, or *Sadales AUGUSTALES*, or *Flamines AUGUSTALES*, were the priests of Augustus, appointed after the dedication of that emperor by Tiberius, to perform the service of the new god.

AUGUSTALIA, in antiquity, a feast instituted in honour of the emperor Augustus.

This festival was first established in the year of Rome 835, being the fourth after he had ended all his wars, and settled the affairs of Sicily, Greece, Asia, Syria, and the Parthians.—The day whereon he made his entry into Rome, being the 4th of the ides of October, was appointed to be kept a feast; and was called *Augustalis*.

AUGUSTALIA was also a name given to the games celebrated in honour of the same prince, on the 4th of the ides of October.

AUGUSTALIS, or *Profectus AUGUSTALIS*, a Roman magistrate, who was appointed to govern Egypt with a power much like that of a proconsul in other provinces.

AUGUSTAN, relating to Augustus, or Augustus.

AUGUSTAN *Æra*. See ÆTIAN.

AUGUSTAN Confession denotes a celebrated confession of faith, drawn up by Luther, and other ancient reformers, and presented in 1530 to the emperor Charles V. at the diet of Augusta or Augsbourg, in the name of the evangelic body.

AUGUSTINS, or AUGUSTINIANS, an order of religious; thus called from St. Augustin, whose rule they observe.

The *Augustini*, popularly also called *Austin friars*, were originally hermits, whom pope Alexander IV. first congregated into one body, under their general Lanfranc, in 1256.

The *Augustini* are clothed in black, and make one of the four orders of mendicants.

From these arose a reform, under the denomination of *bare-foot Augustini*, or *Minorites*, or *friars minor*.

There are also canons regular of St. Augustin, who are clothed in white, excepting their cope, which is black.

At Paris they are known under the denomination of, *religious of Genevieve*; that abby being the chief of the order. See **GENEVIEVE**.

There are also *Augustines*, or nuns and canonesse, who observe the rules of St. Augustin.

THE **AUGUSTIN**, **AUGUSTINUS**, of Janfenius, is a celebrated treatise of that author, bishop of Ypres, entitled, *Cornelii Janfenii Episcopi Ipresis, Augustinus*, in three volumes, folio, printed at Louvain in 1640; the first tome whereof contains a discourse against Pelagianism; and the second divers treatises of reason; the use of authority in theological matters; the state of innocence; fall of nature by sin; grace, &c. — From these several treatises were collected the five famous propositions, enumerated under the article **JANSENISM**.

AUGUY - PAN-NEUF, or **AGUILLANNEUF**. See **MISLETO**.

AVIARY *, a house or apartment kept for the keeping, feeding, and propagating of birds.

* The word is formed of the Latin *avis*, bird.
AVIGNON-Berry, called also *French Berry*, is the fruit of a shrub by some authors called *lycium*; growing plentifully near *Avignon*, and in other parts of France.

The berry is somewhat less than a pea; its colour is green, approaching towards a yellow; and it is of an astringent and bitter taste. — It is much used by the dyers, who stain a yellow colour with it; and by the painters, who, also make a fine golden yellow of it.

AVISO, an advice, piece of intelligence, or advertisement, to notify some event, or matter worthy of knowledge.

* The word is Italian, *avviso*, and is chiefly used in matters of commerce.

AUL. See the article **AWL**.

AULA, in our ancient law-books, signifies a court baron. — *Aula ibidem tertia quarta die Augusti*. &c.

Aula ecclesie is sometimes used for what we now call *navis ecclesie*. See **NAVE**.

AULIC, **AULICA**, an act which a young divine maintains in some foreign universities, upon the admission of a new doctor of divinity.

It is so called from the Latin, *aula*, a hall; it being in the hall of the university that this act is usually held. The person who presides at the disputation is the fame that is to take the doctor's cap.

AULIC, **AULICUS**, is also an appellation given to certain officers of the emperor, who compose a superior court or council, which has an universal jurisdiction, and without appeal, over all the subjects of the empire, in all processes entered therein.

We say, *aulic council*, the *aulic court* or chamber, *aulic counsellor*, &c.

The *aulic council* is established by the emperor, who nominates the officers; but the elector of Mentz has a right of visiting it. — It is composed of a president, who is a catholic; a vice-chancellor, presented by the elector of Mentz, and of eighteen assessors, or counsellors, nine whereof are Protestants, and nine Romanists.

They are divided into two benches, one whereof is taken up by nobles, and the other by lawyers. — They hold their assembly in the presence of the emperor; and for that reason are called *sistitium imperatoris*, the emperor's justice; and *aulic council*, because theirs follows the emperor's court, *aula*, and has its residence in the place where he is. — This court clashes a little with the imperial chamber of Spire; in that they are preventive of each other; it not being allowed to remove any cause from the one to the other.

Nor can the emperor himself hinder or suspend the decisions of either court; much less call any cause before himself which has once been before them; without the consent of the states of the empire. Yet, in some cases the same council forbears making any peremptory conclusion without the emperor's participation; and only decrees thus, *Fiat votum ad Caesarem*; that is, make a report hereof to the emperor in his privy-council.

AULNEGER, or **ALNAGER**. See **ALNAGER**.

AULO, *Aulo*, a Grecian long measure. See **MEASURE**.

AUMONE, or **ALMS**. See the article **ALMS**.

Tenure in AUMONE is where lands are given to a religious house or church, that some service may be paid for the good of the donor's soul.

AUMONIER, or **ALMONER**. See **ALMONER**.

AUNCEL-Weight, *quasi Hand/al-Weight*, an ancient kind of balance, consisting of scales hanging on hooks fastened at each end of a beam or staff, which a man lifts up on his hand or fore-finger, and so discovers the equality or difference between the weight and the thing weighed.

There being great deceits practised in these weights, they were prohibited by several statutes; and the even balance alone commanded.

The word is still used in some parts of England, to signify meat fold by poiling in the hand, without putting it into the scales.

AUNCESTOR — *Affixe of Mort d'AUNCESTOR*. See **ASSISE**.

AUNCESTREL Homage. See the article **HOMAGE**.

AUNCIENT Domain. See **ANCIENT Domain**.

AVOCATORIA, a mandate of the emperor of Germany, directed to some prince or subject of the empire, to stop his unlawful proceedings in any cause brought by way of appeal before him.

AVOIDANCE, in law, has two significations: the one when a benefice becomes void of an incumbent; the other, when we say in pleadings in chancery, confessed or avoided, traversed or denied, &c. See **VOIDANCE**.

AVOIRDUPOIS, or **AVERDUPOIS Weight**, a kind of weight used in England; the pound whereof contains sixteen ounces. See **WEIGHT**.

The proportion of a pound *avordupois* to a pound *troy*, is as 17 to 14.

All the larger and coarser commodities are weighed by *avordupois* weight; as groceries, cheese, wool, lead, hops, &c.

Bakers who live not in corporation towns, are to make their bread by *avordupois* weight; those in corporations by *troy* weight. — The apothecaries buy their drugs by *avordupois*, but sell their medicines by *troy*.

AVOWEE, **ADVOCATUS**: See **ADVOWEE**, and **ADVOCATE**.

The *avowee* is he to whom the right of advowson of any church belongs, so that he may present thereto in his own name; he is thus called by way of distinction from those who sometimes present in another man's name, as a guardian who presents in the name of his ward; as also from those who only have the lands whereto an advowson belongs for term of life or years, by intrusion, or disclaim.

AVOWRY, in law, is where one takes a distress for rent, or other thing; and the other sues replevin. In which case the taker shall justify, in his plea, for what cause he took it; and if he took it in his own right, he is to shew it, and so *avow* the taking; which is called his *avowry*. If he took it in the right of another, when he has shewed the cause, he is to make confession of the taking, as being a bailiff or servant to him in whose right he did it.

AU-PISALLE, a French phrase, sometimes used among English writers, signifying, at the worst.

AURA *, among phylologists, an airy exhalation or vapour. See **VAPOUR** and **EXHALATION**.

* The word is Latin, derived from the Greek *aura*, gentle wind.

AURATUS Equus. See **EQUUS**.

AUREA Alexandrina, in pharmacy, a kind of opiate, or antedote, which was in great fame among the ancient writers, composed of a great number of ingredients.

It is called *aurea*, from the gold (*aurum*) which enters its composition; and *alexandrina*, as having been first invented by a physician named Alexander. — It is reputed a good preservative against the colic and apoplexy.

AURELIA, a term used by natural historians for the first apparent change of the *eruca*, or maggot of any species of insects.

Aurelia is the same with what other writers call *chrysalis*, some *nympha*. See **SUPPLEMENT**, article **CHRYSALEIS**.

AUREOLA, the crown of glory, given by painters and statuary to saints, martyrs, and confessors; as a mark of the victory which they have obtained.

F. Sirmond says, the custom hereof was borrowed from the heathens, who used to encompass the heads of their deities with such rays.

The word *aureola*, in its original, signified a jewel which was proposed as the prize of a dispute; and was given as the reward of victory.

Among the Romish school-divines, *aureola* is supposed to be a special reward bestowed on martyrs, for the victory they have obtained over the powers of the world; or virgins over the temptations of the flesh; and doctors over the artifices and seductions of the devil.

AUREUS *, the roman gold coin, equivalent to 25 denarii or 100 sesterces. *Suet. in Oth. c. 4. Tacit. Hist. l. 1. Beverin. de Ponder. p. 33. seq.*

* In modern and middle-age writers, it is also called *solidus*, or *solidus aureus*. Vid. *Scalig. de Re Num. p. 52. Beverin. p. 252. seq.*

The *aureus*, according to Arbuthnot, generally weighed double the *denarius*: on which footing, it must have been worth, according to the first proportion of coinage mentioned by Pliny, 1 l. 4 s. 3 d. $\frac{1}{2}$ sterl. — According to the proportion that now obtains among us, 1 l. 0 s. 9 d. *Plin. l. 33. c. 3. — Arbuth. Tab. 25.* — Aynworth, however, makes the *auri* (*denarii*) of the higher empire weigh only five penny-weight; and under the lower empire, little more than half so much.

AURICHALCUM, among modern writers, denotes a factitious metal, popularly called *brass*. See **BRASS**.

The *aurichalcum* is a mixture of copper and calamine-stone melted together by a very vehement fire, in furnaces made on purpose. See **COPPER** and **CALAMINARIS**.

AURICLE,

AURICLE*, AURICULA, in anatomy, the external ear; or that part of the ear which is prominent from the head.

* The word is a diminutive of *auris*, ear; *q. d.* little ear.

For the structure and variety of the *auricle*, with the several parts thereof, their names, &c. See *E.A.R.*

AURICLE is also applied to two appendages of the heart; being two muscular caps, covering the two ventricles thereof; thus called from the resemblance they bear to the external ear.

They move regularly like the heart; only in an inverted order; their systole corresponding to the diastole of the heart, and vice versa. See *Tab. Anat. (Splanchn.) fig. 12. tit. d.* See also further of their structure and office under the article **HEART.**

AURICULA *Juda*, or *Jew's ear*, a kind of fungus or mushroom, somewhat resembling in figure, a human ear. It grows on old elder-trees, which is the tree whereon, it is pretended by some, Judas hanged himself; which has, as they think, given occasion to the name.

This fungus steeped in water, and applied to the eyes, is said to free them of inflammations: but its chief use is garglewise in decoctions, against inflammations of the throat, or swelling of the tonsils.

AURICULÆ *Alvarium.* } See the article { **ALVEARIUM.**

AURICULAM *Retrahens.* } RETRAHENS.

AURICULAR, something that relates to the ears. See **E.A.R., AURICULARIS.**

Thus we say, an *auricular witness*, *auritus testis*, a witness by hearsay. So,

AURICULAR *Confession* is that made in the ear, privately. See **CONFESSION.**

AURICULAR *Medicines* are such as are suited to the cure of the distempers of the ear.

AURICULARIS *Abductor.* See the article **ABDUCTOR.** The finger next the little finger is also called *auricularis*, by the Greeks *xyrus*, because used in picking the ear.

AURIGA, in astronomy, the *waggoner*; a constellation of stars in the northern hemisphere; whose stars, in Ptolemy's catalogue are 14; in Tycho's 23; in Hevelius's 40; in the Britannic catalogue 68; the longitudes, latitudes, magnitudes, &c. whereof are as follow:

<i>Names and situations of the stars.</i>	<i>Signs.</i>	<i>Longitudo.</i>	<i>Latitude.</i>	<i>Magnit.</i>
	o " "	o " "	North.	" " "
Preced. over the north. foot	♐ 11	22 20	14 52 35	6
Mid. and south. over the foot	♐ 11	49 45	14 1 48	6
In the heel of the north. foot	♐ 12	19 33	10 24 53	4 3
East of three over the foot	♐ 13	18 44	15 04 00	5
	♐ 13	41 48	16 32 24	6
5.				
In the preced. cubit	♐ 13	44 35	16 48 05	6
Against the hand, preced. Hædus	♐ 14	31 09	20 54 23	4
	♐ 14	18 57	18 10 10	4
Subseq. Hædus	♐ 16	20 03	28 33 29	6
	♐ 15	06 52	18 15 15	4
10.				
South of three in the loins	♐ 16	15 17	15 23 18	5
	♐ 17	32 33	23 15 07	6
Bright one of the fore-shoulder, Capella	♐ 17	31 41	22 51 47	1
	♐ 16	11 20	9 34 13	6
Middle one in the loins	♐ 17	28 54	16 58 39	5
15.				
Nebulosæ against the hips } South.	♐ 16	49 17	10 13 20	6
	♐ 16	53 03	10 35 44	7
Northern ones in the same } Middle.	♐ 17	07 13	10 48 09	7
	♐ 17	15 18	10 46 03	7
North of three in the loins } Preced.	♐ 18	10 58	18 34 24	6
Subseq. in the hip } Subseq.	♐ 18	26 49	14 07 31	5
	♐ 17	36 57	5 43 03	7
Bright one in the fourth. foot	♐ 18	13 56	5 21 34	2
In the fore-thigh	♐ 18	53 40	11 10 50	5
In the fore-knee	♐ 19	50 21	8 50 44	5
25.				
Inform. <i>al. Tauri</i> 16th	♐ 21	02 46	7 05 27	6
In the neck.	♐ 21	06 07	2 29 23	4 5
	♐ 23	09 56	26 22 40	6
Preced. in the hind-arm	♐ 23	26 40	16 04 34	7
30.	♐ 23	30 15	15 43 40	6
North in the head	♐ 24	50 04	32 13 30	5 6
In the hind-thigh	♐ 23	50 36	13 50 33	6
Subseq. in the hind-arm	♐ 23	37 35	15 41 06	5
South of two in the head	♐ 25	36 22	30 49 00	4
Brighter one in the hind-shoulder	♐ 25	35 32	21 28 20	2
35.				
A lesser one contiguous to that	♐ 25	40 12	22 27 52	6
	♐ 25	25 25	24 25 20	6
In the wrist of the hinder-hand	♐ 25	36 42	13 44 19	3 4
	♐ 26	19 09	19 31 48	6 7
	♐ 26	40 07	19 11 14	6 7

<i>Names and situations of the stars.</i>	<i>Signs.</i>	<i>Longitudo.</i>	<i>Latitude.</i>	<i>Magnit.</i>
	o " "	o " "	North.	" " "
Inform. following the eastern arm	♐ 27	00 04	15 00 59	6
	♐ 27	48 43	25 15 32	6
	♐ 28	59 02	22 59 32	6
Inform. under the hind-knee.	♐ 29	06 51	22 59 34	6
45.	♐ 29	02 42	6 04 47	4 5
	♐ 29	27 23	30 03 05	6
	♐ 0	12 40	25 54 20	5
	♐ 1	17 52	23 20 54	6
Al. of Gemini 22d.	♐ 1	52 18	5 47 05	6
50.	♐ 3	27 46	4 46 30	5 6
	♐ 3	20 25	19 16 34	5 6
	♐ 3	26 45	16 10 35	5 6
	♐ 3	27 27	16 40 44	5 6
Al. of Gemini 25th	♐ 4	06 16	5 47 05	6
of Gemini 27th	♐ 4	24 39	5 04 50	6
55.	♐ 3	55 02	21 21 22	5
	♐ 4	22 35	25 40 10	6
	♐ 4	40 47	20 27 01	5
	♐ 5	38 35	18 40 08	4 5
	♐ 6	21 50	15 52 47	6
60.				
Inform. behind Auriga towards Gemini, and the hinder feet of Ursa major	♐ 6	26 15	15 28 07	6
	♐ 6	35 28	15 21 23	7
	♐ 6	37 03	22 09 30	4 5
	♐ 7	40 23	15 11 33	6 7
	♐ 10	03 39	16 43 40	4 5
65.				
	♐ 11	06 34	18 26 35	5
	♐ 12	30 02	14 28 11	3
	♐ 12	20 53	18 24 21	5

AURIPIGMENTUM, called also *Orpiment.* See **ORPI- MENTUM.**

AURIS, an ear. See the article *E.A.R.*

Abscissio Aurium, cutting off the ears, was a punishment inflicted by the Saxon laws on those who robbed churches; and afterwards on every thief; and at length on divers other criminals.

AURIS *Elevator.* } See the article { **ELEVATOR.**

AURIS *Externus.* } **EXTERNUS.**

AURIS *Obliquus.* } **OBLIQUUS.**

AURIS *Tinnitus.* } **TINNITUS.**

AURISCALPIUM*, an instrument wherewith to pick and cleanse the ear from wax; and serving also for some other operations relating to disorders of that part.

* The word is compounded of the Latin *auris*, ear; and *scalpo*, I scratch, or pick.

AURORA*, the morning twilight; or that faint light which begins to appear in a morning, when the sun is within eighteen degrees of the horizon.

* Nicod. derives the word from *aurisco*, of *aurum*, quia ab oriente solet aer aurefcit.

The poets have personified, and even made it a goddess; representing her with a chariot, rosy fingers, &c.

AURORA *Borealis*, or AURORA *Septentrionalis*, the northern dawn, or light, is an extraordinary meteor, or luminous appearance, shewing itself in the night-time, in the northern part of the heavens. See **METEOR.**

It is usually of a reddish colour, inclining to yellow, and sends out frequent conflagrations of pale light, which seem to rise from the horizon in a pyramidal undulating form, and shoot, with great velocity, up to the zenith.

The *aurora borealis* appears almost always in form of an arch; chiefly in the spring and autumn; after a dry year.—The arch is partly bright, partly dark; but generally transparent. Sometimes it produces an iris.—M. Godin judges, that most of the extraordinary meteors and appearances in the skies, related as prodigies by historians, &c. gr. battles, and the like, may be probably enough reduced to the class of *aurora borealis*. Vid. *Hist. Acad. R. Scienc. an. 1726. p. 405.*

This kind of meteor never appears near the equator, and was so rare in England, that none are recorded in our annals since that remarkable one, Novemb. 14, 1574. till the surprising *aurora borealis*, March 6, 1716. which appeared for three nights successively, but by far more strongly on the first.—Indeed, in the years 1707 and 1708, five small ones were observed in little more than eighteen months.

Hence it should seem that the air or earth, or both, are not at all times disposed to produce this phenomenon; for though it is possible it may happen in the day-time, in bright moonshine, or in cloudy weather, and so pass unobserved; yet that it should appear so frequent at some times, and so seldom at others, cannot well this way be accounted for.—That in March 1716, was visible to the west of Ireland, and the confines of Russia, and to the east of Poland; extending at least near 30° of longitude, and 50° in latitude, that is, over almost

all the north of Europe; and in all places at the same time, it exhibited the like wondrous appearances.

A sufficient number of observations have not yet been made by the curious, to enable them to assign the cause of this phenomenon, with any certainty.—Dr. Halley, however, imagines the watry vapours, or effluvia, rarified exceedingly by subterraneous fire, and tinged with sulphurous steams; which naturalists suppose to be the cause of earthquakes; may also be the cause of this appearance: or, that it is produced by a kind of subtle matter, freely pervading the pores of the earth, and which, entering into it nearer the southern pole, passes out again with some force into the æther at the same distance from the northern; the obliquity of its direction being proportioned to its distance from the pole. This subtle matter, by becoming some way or other more dense, or having its velocity increased, may be capable of producing a small degree of light, after the manner of effluvia from electric bodies, which, by a strong and quick friction, emit light in the dark: to which sort of light this seems to have a great affinity. *Phil. Transact.* N° 347.

M. de Macran in an express treatise on the *aurora borealis*, published in 1731, assigns its cause to be the zodiacal light, which, according to him, is no other than the sun's atmosphere, which happening on some occasions to meet the upper parts of our air, on this side the limits where universal gravity begins to act more forcibly towards the earth than towards the sun, falls into our atmosphere, to a greater or less depth, as its specific gravity is greater or less, compared to the air it passes through. *Vid. Tract. Phys. et Hist. del. Auroræ Borealis. Suite des Mem. del Acad. R. des Scienc. ann. 1731. p. 3. seq.*—See also ZODIACAL LIGHT.

AURUM, in natural history, denotes gold. See GOLD.

The word is chiefly used among us as applied to certain chymical preparations, whereof gold is the basis or principal ingredient.—Such are the *aurum potable*, *aurum fulminans*, &c. **AURUM Fulminans**, is a preparation of gold; thus called, because when cast in the fire, it produces a violent noise, like thunder. It consists of gold dissolved in aqua regia, and precipitated by oil of tartar per deliquium, or volatile spirit of sal armoniac. The powder being wash'd in warm water, and dried to the consistence of a paste, is afterwards formed into little grains of the bigness of hemp-seed. It is inflammable, not only by fire, but also by a gentle warmth; and gives a report much louder than that of gunpowder.

Its effect is commonly said to be principally downwards; in opposition to gunpowder, which is chiefly upwards; but this rather seems a vulgar error.

A scruple of this powder acts more forcibly than half a pound of gunpowder: a single grain laid on the point of a knife, and lighted at the candle, goes off with a greater noise than a musket.—It is said to consume even to the very last atom.

AURUM musivum, or *musivum*, a preparation in pharmacy, thus called from its golden colour and appearance. It is made of mercury, tin, sal armoniac, and flowers of sulphur, by grinding, mixing, and then setting them three hours in a sand heat.—The dirty sublimate being taken off, the *aurum musivum* is found at the bottom of the matras.

It is recommended in most chronic and nervous cases; and particularly convulsions of children.—Its dose is from ʒ gr. to a scruple.

AURUM potable, potable gold, is a composition made of gold, by reducing it, without any corrosive, into a kind of gluten, or substance like honey, of the colour of blood; which being steeped in spirit of wine, gives it a ruby colour, and makes what is called *tincture of gold*.

An ounce of this tincture, mixed with sixteen ounces of another liquor, is called *aurum potable*, and is said to be a sovereign remedy against several distempers.

A modern physician has asserted, that gold is a resin drawn from the earth; and that the grand secret of rendering gold potable, does not consist in dissolving this resin by means of corrosives, but by a water, wherein it melts like ice or snow in hot water; and this water he says, must be nothing but a liquor extracted from gold, agreeable to an axiom that he lays down, which is, that matters of different natures have no ingress into one another; but that every menstruum or dissolvent ought to be taken from bodies of the same kind with those it is to act upon.

The same author observes, that blood and urine furnish a sal armoniac, which, mingled with aqua-fortis, acts upon gold: whence he conjectures, that there may be a conformity of nature between gold and blood; and that by consequence gold, well opened and subtilized, might produce a resin, and a fire that would augment the blood: but this is a wild sort of arguing.

AURUM Regium. See the article QUEEN Gold.

AUSCULTARE, in ancient customs.—In regard the reading of prayers with a graceful tone or accent, make some impression on the hearers; and was anciently a person appointed, in monasteries, to hear the monks read and sing, who instructed them how to perform, before they were ad-

mitted to read or chant publicly in the church, or before the people.—This was called *auscultare*, q. d. to hear or listen.

* *Quicunque leturus vel canturus est aliquid in monasterio; si necesse habeat ab eo, viz. cantore, priusquam incipiat debet auscultare.* Lanfranc in Decret. pro Ord. Bened.

AUSPEX*, a name originally given to those who were afterwards denominated *augurs*. See AUGUR.

* In which sense the word is supposed to be formed from *avis*, bird; and *inspicere*, to inspect; *auspices*, q. d. *avis pices*.

Some will therefore denote those who foretold future events from the flight of birds.

AUSPICUM, **AUSPICY**, the same with *augury*. See AUGURY.

Servius indeed distinguishes between *auspicy* and *augury*; making *auspicy* comprehend the consideration of all things; *augury* only of certain things: he adds, that the former was allowed a man any where abroad, whereas the latter might only be performed in his native place. *Auspiciari civis etiam peregræ licet: augurium agere nisi in patriis sedibus non licet.* And it is certain, that consuls, generals, and others, who took omens out of Rome, were properly said *auspiciari*: nevertheless, custom appears to have over-ruled this distinction.

AUSTERE*, implies a rough astringent taste; such as that of vitriol, allum, &c.

* The word comes from the Greek, *avrotes*, which signifies the same.

Austere things differ from *acerb*, or *sour* ones; in that they constrict the mouth and tongue somewhat less, and are devoid of acidity.

AUSTERITY, **AUSTERENESS** of taste, that which denominates aapid body, *austere*. See AUSTERE.

AUSTERITY, among moral writers, sometimes denotes rigour in the inflicting of punishments.

We say, *austerity of manners*; the *austerities* of the monastic life. The austerity of the Roman censors kept the people in their duty. The greatest *austerity* of the Catholians is perpetual solitude.

AUSTRAL*, **AUSTRALIS**, the same with *southern*. See SOUTH.

* The word is derived from *aufter*, south wind. See WIND.

Thus, *austral signs* are the six last signs of the zodiac; so called, because they are on the south-side of the equinoctial.

AUSTRALIS Pifcis is a constellation of the southern hemisphere; not visible in our latitude.

AUTHENTIC, *Authenticos*, something of received authority.

It also signifies something solemn, and celebrated; clothed in all its formalities; and attested by proper persons to whom credit has been regularly given.

In this sense we say, the truths of christianity are founded on *authentic* testimonies, &c.—*Authentic* papers, instruments, &c.

—The nobility and persons of rank were particularly called *authentic* persons, as being supposed more deserving of credit than others.

AUTHENTICATING* the punishing an adulteress, by public whipping, and shutting her up in a convent for two years; after which, if the husband be not willing to take her back, she is thaven, veiled, and shut up for life.

* It is thus called, as being the punishment prescribed in the Authentics.

If the husband die within the two years, she seems to have a right to petition the court for her liberty: at least, another man willing to marry her may petition, and probably obtain it.

AUTHENTICS, **AUTHENTICÆ**, in the civil law, is a name given to the novels of Justinian. See NOVEL.

The reason of the denomination is not well known.—Alciat will have it to have been first given them by Accursius. The novels were originally composed in Greek, and afterwards translated into Latin by the patrician Julian, who also reduced them into fewer words and less compass. And in the time of Bulgarus, there was a second version made, more exact and literal, tho' not quite so elegant as the former.

This translation, says the author just cited, being preferred by Accursius, he called it *authentica*, by way of preference over that of Julian, as being more conformable to the original.

AUTHOR*, **AUCTOR**, properly denotes one who created or produced any thing; and is applied by way of eminence to the first cause, viz. God.

* The word is Latin, formed of the Greek *avros*, *ipse*; or rather from the Latin participle *avtus*, of *avges*, I increase.

We say the *author of nature*; *author of the universe*, &c.

The term *author* is sometimes also used in the same sense with *institutor*, or *inventor*.—Polydore Virgil has wrote eight books of the *authors* or inventors of things, &c. See INVENTION.—Pythagoras is held the *author* of the dogma of metempsychosis.

AUTHOR, in matters of literature, denotes a person who has wrote or composed some book, or writing.

We say the sacred *authors*; anonymous *authors*, ancient and modern *authors*; the Latin *authors* pillaged the Greeks, &c.—An original *author* is he who first treated of any point or subject; who did not follow any other person, imitate any model

either in the matter or the manner of what he has wrote, See ORIGINAL.

AUTHORITATE Parliamenti. See CUSTODES.

AUTHORITY, AUCTORITAS, in a general sense denotes a right or power to command, and make one self obeyed.

In this sense we say the supreme or sovereign authority; absolute or despotick authority; the royal authority; the episcopal authority; the authority of the church; of a father, &c. The authority of scripture, of a creed, confession, or the like.

AUTHORITY is also used for the testimony of an author, or writing.

The word is also particularly understood of an apophthegm, or sentence of some great or eminent person, quoted in a discourse, either by way of proof, or embellishment.

Authority also includes rules, laws, canons, decrees, decisions, &c. alleged in confirmation of a matter in dispute.

Passages quoted from Aristotle were of great authority in the schools: texts of scripture are of decisive authority.

Authorities make a species of arguments called by rhetoricians, *inautical*, or *extrinsic arguments*.

For the use and effect of authorities, see PREJUDICE, EVIDENCE, REASON, PROBABILITY, FAITH, REVELATION, &c.

AUTO do se. See ACT OF FAITH.

AUTOCEPHALUS*, a person who is his own ruler or master, and who has no other over him.

* The word is compounded of the Greek *αὐτός, ipse*; and *κεφαλή, caput, head*.

This denomination was given by the Greeks to certain archbishops, who were exempted from the jurisdiction of patriarchs.—Such was the archbishop of Cyprus, by a general decree of the council of Ephesus, which freed him from the jurisdiction of the patriarch of Antioch.

There were several other bishops in the east, who were *autocephali*; and, in the west, those of Ravenna pretended to the same right.—The sixth council, canon 39. says, that the *autocephali* have the same authority with patriarchs; but this is not to be understood in the full latitude of the words: but only as intimating, that the *autocephali* have the same authority over their bishops, that patriarchs had over their archbishops: in which sense only they are equal to patriarchs.

AUTOGRAPHUM*, *Αὐτογράφοι*, the very hand-writing of any person: or the original of a treatise, or discourse.—The word is used in opposition to a copy.

* The word is formed of the two Greek words *αὐτός, and γραφή, scribo*.

AUTOMATON*, or **AUTOMATUM**, a self-moving engine; or a machine which has the principle of motion within it self.

* The word is Greek, *αὐτόματος*, compounded of *αὐτός, ipse*, and *μαρμαι, I am excited, or ready*; whence *αὐτόματος, spontaneous*.

Such were Archytas's flying dove, mentioned by Aulus Gellius, *Noct. At. l. 10. c. 12.* and Regiomontanus's wooden eagle, which, as historians relate, flew forth of the city, met the emperor, saluted him, and returned: as also his iron fly, which, at a feast, flew out of his hands, and taking a round, returned thither again. Hakew. *Appl. c. 10. § 1.*

Among *automata* are also reckoned all mechanical engines which go by springs, weights, &c. included within them: such are clocks, watches, &c. Vid. *Bapt. Port. Alag. Nat. c. 19. Scalig. Subtil. 326.*

AUTOPSY*, *αὐτοψία*, ocular inspection; or the seeing a thing with one's own eyes.

* The word is compounded of *αὐτός, one's self*, and *ὄψις, sight*.

AUTUMN*, **AUTUMNUS**, the third season of the year; being that wherein the harvest, and the fruits of the summer are gathered.

* Some derive the word from *augere, I encrease, quod annus fragibus augetur*.

Autumn begins on the day when the sun's meridian distance from the zenith, being on the decrease, is a mean between the greatest and the least; which in these countries is supposed to happen when the sun enters Libra. Its end coincides with the beginning of winter.

Divers nations have computed the years by *autumns*; the English Saxons, by winters.—Tacitus tells us, the ancient Germans were acquainted with all the other seasons of the year, but had no notion of *autumn*. Lidyat observes of the beginning of the several seasons of the year, that *Det Clemens hyemem, dat Parvus ver cathedratus, Effluat Urbanus, autumnat Baribhomaus*.

Autumn has always been reputed an unhealthy season. Tertullian calls it *tentator valetudinum*: and the satyrift speaks of it in the same light.—*Autumnus Libitinae quaestus accersit*.

AUTUMN, in alchymy, the time or season when the operation of the philosopher's stone is brought to maturity and perfection.

AUTUMNAL, something peculiar to *autumn*.

AUTUMNAL Point is one of the equinoctial points; being that from which the sun begins to descend towards the south pole.

AUTUMNAL Equinox is the time when the sun enters the autumnal point. See EQUINOX.

AUTUMNAL flowers. See the article FLOWER.

AUTUMNAL signs are those through which the sun passes during the season of *autumn*.

The autumnal signs are Libra, Scorpio; and Sagittary. See LIBRA, SCORPIO, and SAGITARIUS.

AUXESIS, in rhetoric, a figure whereby any thing is magnified too much. See AMPLIFICATION.

AUXILIARY, AUXILIARIS, any thing that is helping or assisting to another. See AUXILIUM.

We say, *auxiliary books*; a prince is to trust more to his own soldiers, than to *auxiliary troops*, &c.

AUXILIARY Verbi, in grammar, are such as help to form or conjugate others; that is, are prefixed to them to form or denote the moods or tenses thereof.

Such, in English, are *have, am, or be*; in French, *estre, and avoir*; in Italian, *ho, and sono*, &c.—The *auxiliary am* supplies the want of passives in our language. See PASSIVE.

All the modern languages we know of make use of *auxiliary verbs*.—The reason is, that the verbs thereof do not change their terminations or endings, as those of the Latin and Greek, to denote the different tenses or times of being, doing, or suffering; nor the different moods or manners of their signifying; so that to supply this defect, recourse is had to different *auxiliary verbs*.

Besides the perfect *auxiliary verbs*, we have several defective ones; as *do, will, shall, may, can, and have*; which by changing their own terminations save the necessity of changing those of the verbs they are added to.—Thus, instead of *ego uris, tu uris, ille uris, &c.* we say, *I do burn, thou dost burn, he doth burn, &c.*

AUXILIUM, in law. See the article AD.

AUXILIUM Curia signifies an order of court, for the summoning of one party at the suit of another.

AUXILIUM ad filium militem faciendum, vel filiam maritandam, was a writ directed to the sheriff of every county, where the king or other lord had any tenants, to levy of them reasonable aid, towards the knighting his eldest son, or the marriage of his eldest daughter.

AWARD, in law, the judgment of some person who is neither assigned by law, nor appointed by the judge; for sending a matter in controversy; but is chosen by the parties themselves that are at variance.

AWL, or AUL, a shoemaker's impliment, wherewith holes are bored in leather, to facilitate the stitching or sewing the same.—The blade of the *awl* is usually a little flat, and crooked; and the point ground to an acute angle.

AWME, or AUME, a Dutch measure of capacity for liquids; containing 8 steckans, or 20 verges or vertels; answering to what in England is called a tierce, or $\frac{1}{2}$ of a ton of France, or $\frac{1}{4}$ of an English ton. *Arbuth. Tab. 33.* See also MEASURE, &c.

AWN, in botany, *arista*, the beard growing out of the husk of corn or grass. See ARISTA.

AWNING, on board a ship, is when a sail, a tarpaulin, or the like, is hung over any part of the ship, above the decks, to keep off the sun, rain, or wind.

In the long boat they make an *awning*, by bringing the sail over the yard and stay; and booming it out with the boat-hook.

AX, a carpenter's instrument, serving to hew wood.—The *ax* differs from the joiner's hatchet, in that it is made bigger, deeper, and heavier, as serving to hew large stuff; and its edge tapering into the middle of its blade.—It is furnished with a long handle or helve, as being to be used with both hands. *Max. Mech. Exerc. p. 119.*

AXILLA*, or **ALA**, in anatomy, the cavity under the upper part of the arm; commonly called the *arm-pit*.

* The word is a diminutive of *axis*; *q. d.* little axis. See AXIS.

Abscesses in the *axilla* are usually dangerous, on account of the many blood-vessels, lymphatics, nerves, &c. thereabout, which form several large plexus's.—By the ancient laws, criminals were to be hanged by the *axilla*, if they were under the age of puberty.

AXILLA, in botany, is the space comprehended between the stems of plants and their leaves.

Hence we say, those flowers grow in the *axilla* of the leaves, *i. e.* at the base of the leaves, or just within the angle of their pedicles.

AXILLARY, AXILLARIS, in anatomy, something that belongs to the *axilla*, or lies near them. See AXILLA.

AXILLARY Artery, is a ramification of the trunk of the subclavian artery; which, passing under the arm-pits, changes its name, and is called *axillary*.

AUXILIARY Vein is one of the subclavian veins; which, passing under the arm-pits, divides itself into several branches, superior, inferior, external, internal, &c. which are spread over the arm.—See *Tab. Anat. (Angiol.) fig. 6. lit. m.*

The second *vertebra* of the back is sometimes also called the *axillary vertebra*; in regard it is nearest to the arm-pits.

AXILLARY GLANDS. See **HIRCUS**.

AXINOMANCY*, **AXINOMANTIA**, an ancient species of divination, or a method of foretelling future events by means of an ax or hatchet.

* The word is formed from the Greek *αξίς*, *securis*, and *μαντις*, *divinatio*.

This art was in considerable repute among the ancients; and was performed, according to some, by laying an agat-stone on a red-hot hatchet.

AXIOM, **AXIOMA**, a self-evident truth; or a proposition whose truth every person perceives at first sight.

Thus, that the whole is greater than a part; that a thing cannot give what itself has not; that a thing cannot be and not be at the same time; that from nothing, nothing can arise, &c. are *axioms*.

By *axioms*, called also *maxims*, are understood all common notions of the mind, whose evidence is so clear and forcible, that a man cannot deny them without renouncing common sense and natural reason.

The rule of *axioms* is this, that whatever proposition expresses the immediate clear comparison of two ideas without the help of a third, is an *axiom*.—On the other hand, a truth which does not arise from an immediate comparison of two ideas, is no *axiom*.

Wolffius assigns the essence of an *axiom* thus: whatever proposition arises immediately from the consideration of a single definition, is an *axiom*.—Thus it necessarily following from the genesis of a circle, that all right lines drawn from the centre to the circumference thereof, are equal; inasmuch as they all represent the same line in different situations: this is an *axiom*.

Hence, the truth of *axioms* being perceived by the mere intuition of a definition; they need no demonstration: since they are necessarily as true, as the definition is just.

Several authors abuse this property of *axioms*, and obtrude for *axioms* the premises of syllogisms, which they are not able to prove.—Euclid himself lies liable to exception on this account, having assumed the equality of figures which mutually agree, or are congruous to each other, as an *axiom*.

Axioms, in effect, strictly speaking, are no other than identical propositions.—Thus, to say that all right angles are equal to each other is as much as to say, all right angles are right angles: each equality being implied in the very definition, or the very name.

My lord Bacon proposes a new science, to consist of general *axioms*, under the denomination of *philosophia prima*.

For the reason of the evidence of *axioms*: it may be observed, that knowledge being only the perception of the agreement or disagreement of ideas; where that agreement or disagreement is perceived immediately by itself, without the intervention or help of any other ideas, there our knowledge is self-evident: which being so, not only those usually allowed for *axioms* or *maxims*, but an infinite number of other propositions, partake equally with them in this self-evidence. Thus, that a circle is a circle, or that blue is not red, are as self-evident propositions, as those general ones, what is, is; and it is impossible for the same thing to be, and not to be. Nor can the consideration of these propositions add any thing to the evidence or certainty of our knowledge of them. As to the agreement or disagreement of co-existence, the mind has an immediate perception of this but in very few. And therefore in this sort we have very little intuitive knowledge; though in some few propositions we have. Two bodies cannot be in the same place, is a self-evident proposition: the idea of fitting a place equal to the contents of its superficies, being annexed to our idea of body.

As to the relations of modes, mathematicians have framed many *axioms* concerning that one relation of equality: as, that equals being taken from equals, the remainders will be equal, &c. which however received for *axioms*, yet have not a clearer self-evidence than these, that one and one are equal to two; that if from the five fingers of one hand you take two, and from the five fingers of the other hand two, the remaining numbers will be equal. As to real existence, since that has no connexion with any other of our ideas, but that of ourselves, and of a first being; we have not so much as a demonstrative, much less a self-evident, knowledge concerning the real existence of other beings. See **EXISTENCE**.

For the influence of *axioms* or general maxims on the other parts of our knowledge: the rules established in the schools, that all reasonings are *ex præcognitis* & *præconcessis*, seem to lay the foundation of all other knowledge in these maxims, and to suppose them to be præcognita; which implies two things, viz. that these *axioms* are those truths first known to the mind; and, that on them the other parts of our knowledge depend.—But, first, that these *axioms* are not the truths first known to the mind, is evident from experience: for

who knows not that a child perceives that a stranger is not its mother, long before he knows it impossible for the same thing to be, and not to be? and how many truths are there about numbers, which the mind is perfectly acquainted with, and fully convinced of, before it ever thought on those general maxims?

Hence it follows, that these magnified *axioms* are not the principles and foundations of all our other knowledge; for if there be a great many other truths as self-evident as they, and a great many that we know before them, it is impossible that they should be the principles from which we deduce all other truths.—Thus, that one and two are equal to three, is as evident, and easier known, than that the whole is equal to all its parts.—Nor, after the knowledge of this *axiom*, do we know that one and two are equal to three, better or more certainly, than we did before. For if there be any odds in these ideas the ideas of whole and parts are more obscure, or at least more difficult to be settled in the mind, than those of one, two, and three.

Either, therefore, all knowledge does not depend on præcognita, or general maxims, called *principles*; or else such as these (that one and one are two, that two and two are four, &c.) and a great part of numeration, are *axioms*. To these, if we add all the self-evident propositions that may be made about all our distinct ideas, principles will be almost infinite; and a great many innate principles, many men never come to know all their lives.

General maxims, or *axioms*, then, may be of use in disputes, to stop the mouths of wranglers; but they are of little in the discovery of unknown truths. Several general maxims are no more than bare verbal propositions, and teach us nothing but the respect and import of names one to another; as, the whole is equal to all its parts: what real truth doth this teach us more, than what the signification of the word *tatum*, or *whole*, does of itself import? If rightly considered, we may say, that where our ideas are clear and distinct, there is little or no use at all of maxims, to prove the agreement or disagreement of any of them. He that needs any proof to make him certain, and give his assent to this proposition, that two are equal to two, or that white is not black; will also have need of a proof to make him admit, that what is, is; or, that it is impossible for the same thing to be and not to be. But as maxims are of little use, where we have clear and distinct ideas; so they are of dangerous use, where our ideas are confused, and where we use words, that are not annexed to clear and distinct ideas.

Lacks.

AXIOM is also an established principle in some art or science.

Thus, it is an *axiom* in physics, that nature discovers herself most in the smallest subjects; also that nature does nothing in vain; that effects are proportional to their causes, &c. So it is an *axiom* in geometry, that things equal to the same third are also equal to one another; that if to equal things you add equals, the sums will be equal, &c. It is an *axiom* in optics, that the angle of incidence is equal to the angle of reflection, &c. It is an *axiom* in medicine, &c. that there is no sincere action in the human body, &c.

In this sense the general laws of motion are called *axioms*; as, that all motion is rectilinear, that action and re-action are equal, &c.

These particular *axioms*, it may be observed, do not immediately arise from any first notions or ideas, but are deduced from certain hypotheses: this is particularly observable in physical matters, wherein, as several experiments contribute to make one hypothesis, so several hypotheses contribute to one *axiom*.

AXIS properly signifies a line, or a long piece of iron or wood passing through the centre of a sphere, which is moveable upon the same.

In this sense we say, the *axis* of a sphere, or globe; the *axis*, or *axle-tree* of a wheel*, &c.

* There are now a sort of improved iron axle-trees made for coaches and chaises, which will go in all roads, wider or narrower. Some screw to the end, after the French manner.

AXIS of the world, in astronomy.—The *axis* of the world is an imaginary right line, which is conceived to pass through the centre of the earth, and terminating at each end in the surface of the mundane sphere.

About this line as an *axis*, the sphere, in the Ptolemaic system, is supposed daily to revolve.

This *axis* is represented by the line PQ, *Tab. Astron. fig. 52*.—The two extreme points hereof, in the surface of the sphere, viz. P and Q, are called its *poles*.

AXIS of the earth, is a right line, upon which the earth performs its diurnal rotation, from west to east.

Such is the line PQ, *Tab. Geog. fig. 7*.—The two extreme points hereof are also called *poles*.

The *axis* of the earth is a part of the *axis* of the world.—It always remains parallel to itself, and at right angles with the equator.

equator. See PARALLELISM, INCLINATION, and ANGLE.

Axis of a planet is a line drawn through the centre thereof, about which the planet revolves.

The sun, moon, and all the planets, except Mercury and Saturn, are known, by observation, to move about their several axes; and the like motion is easily inferred of those two.

Axis of the horizon, the equator, ecliptic, zodiac, &c. are right lines drawn through the centres of those circles perpendicularly to the planes thereof. See CIRCLE. See also HORIZON, and ECLIPTIC.

Axis, in mechanics.—The axis of a ballance is the line upon which it moves or turns.

Axis of oscillation is a right line parallel to the horizon, passing through the centre, about which a pendulum vibrates. See PENDULUM.

Axis, in geometry.—Axis of rotation, or circumvolution, is an imaginary right line, about which any plane figure is conceived to revolve, in order to generate a solid.

Thus a sphere is conceived to be formed by the rotation of a femicircle about its diameter or axis, and a right cone by that of a right-angled triangle about its perpendicular leg, which is here its axis.

Axis of a circle or sphere is a line passing through the centre of the circle or sphere, and terminating at each end, in the circumference thereof.

The axis of a circle, &c. is otherwise called the diameter thereof.—Such is the line AE. *Tab. Geom. fig. 27.* See DIAMETER.

Axis is yet more generally used for a right line proceeding from the vertex of a figure to the base thereof.

Axis of a Cylinder is properly that quiescent right line about which the parallelogram turns, by whose revolution the cylinder is formed.

Though, both in right and oblique cylinders, the right line joining the centres of the opposite bases is also called the axis of the cylinder.

Axes of a Cone is the right line or side upon which the right-angled triangle forming the cone makes its motion.

Hence it follows, that only a right cone can properly have an axis; in regard an oblique one cannot be generated by any motion of a plane figure about a right line at rest.

But in regard the axis of a right cone is a right line drawn from the centre of its base to the vertex; in analogy hereto the writers of conics do likewise call the like line drawn from the centre of the base of an oblique cone to the vertex, the axis thereof.

Axis of a Vessel is that quiescent right line passing through the middle thereof, perpendicularly to its base, and equally distant from its sides.

Axis of a Conic Section is a right line passing through the middle of the figure, and cutting all the ordinates at right angles, and into two equal parts.

Thus if AP, *Tab. Conics, fig. 31.* be drawn perpendicularly to FF, so as to divide the section into two equal parts; it is called the axis of the section.

Transverse Axis, called also the *first or principal Axis* of an Ellipsis, is the axis AP, last defined: being thus called in contradistinction to the conjugate or secondary axis.

The transverse axis in the ellipsis is the longest; and in the hyperbola it cuts the curve in the points A and P. *fig. 32.*

Conjugate Axis, or second Axis of the Ellipsis, is the line FF, *fig. 31.* drawn through the centre of the figure C, parallel to the ordinate MN, and perpendicularly to the transverse axis AP; being terminated at each extreme by the curve. See ELLIPSIS, and CONJUGATE.

The conjugate is the shorter of the two axes of an ellipsis; and is not only found in the ellipsis, but in the hyperbola.

Conjugate, or second Axis of an Hyperbola, is the right line FF, *fig. 32.* drawn through the centre parallel to the ordinates MN, MN, perpendicularly to the transverse axis AP.

The length of this axis, though more than infinite, may be found by this proportion, $\sqrt{AM \times PM} : AP :: zMN : FF$. The axis of a parabola is of an indeterminate length, that is, is infinite.—The axis of the ellipsis is determinate.—The parabola has only one axis; the ellipsis and hyperbola have two.

Axis in Optics.—Optic axis, or visual axis, is a ray passing through the centre of the eye; or it is that ray which, proceeding through the middle of the luminous cone, falls perpendicularly on the crystalline humour, and consequently passes through the centre of the eye.

Common or mean Axis is a right line drawn from the point of concourse of the two optic nerves, through the middle of the right line, which joins the extremity of the same optic nerves.

Axis of a Lens, or Glass, is a right line passing along the axis of that solid whereof the lens is a segment. See LENS, and GLASS.

Thus a spherical convex lens being a segment of some sphere, the axis of the lens is the same with the axis of the sphere; or it is a right line passing through the centre thereof.

Or, the axis of a glass is a right line joining the middle points of the two opposite surfaces of the glass.

Axis of Incidence, in dioptrics, is a right line drawn through the point of incidence, perpendicularly to the refracting surface. See INCIDENCE.—Such is the line DB, *Tab. Optics, fig. 56.*

Axis of Refraction, is a right line continued from the point of incidence or refraction, perpendicularly to the refracting surface, along the further medium. Such is the line BE.

Or it is that made by the incident ray, perpendicularly prolonged on the side of the second medium.

Axis of a Magnet, or magnetical Axis, is a line passing through the middle of a magnet, length-wise; in such manner, as that however the magnet be divided, provided the division be made according to a plane wherein such line is found, the load-stone will be made into two load-stones.

The extremes of such lines are called the poles of the stone.

Axis, in anatomy, is the second vertebra of the neck; reckoning from the skull.—See *Tab. Anat. (Osteol.) fig. 9.*

It is thus called by reason the first vertebra, with the head, move thereon, as on an axis. See CARDO.

Spiral Axis, in architecture, is the axis of a twisted column, drawn spirally, in order to trace the circumvolutions without. See Twisted Column.

Axis of the Ionic Capital is a line passing perpendicularly through the middle of the eye of the volute.

The axis is otherwise called cathetus. See CATHETUS.

Axis in peritrochio is one of the five mechanical powers, or simple machines; contrived chiefly for the raising of weights to a considerable height.

It consists of a circle, represented AB, *(Tab. Mechanics, fig. 44.)* concentric with the base of a cylinder, and moveable together with it, about its axis EF.—This cylinder is called the axis; and the circle, the peritrochium; and the radii, or spokes, which are sometimes fitted immediately into the cylinder, without any circle, the *scytalæ*. See PERITROCHUM.—Round the axis winds a rope, whereby the weight, &c. is to be raised.

The axis in peritrochio takes place in the motion of every machine, where a circle may be conceived described about a fixed axis, concentric to the plane of a cylinder about which it is placed; as in crane-wheels, in mill-wheels, capstans, &c.

Doctrine of the Axis in peritrochio.—1. If the power, applied to an axis in peritrochio, in the direction AL, *fig. 7.* perpendicular to the periphery of the wheel, or to the scytala or spoke, be to a weight G, as the radius of the axis CE is to the radius of the wheel CA, or the length of the spoke; the power will just sustain the weight, i.e. the weight and the power will be in æquilibrium.

2. If a power applied in F, pull down the wheel, according to the line of direction FD, which is oblique to the radius of the wheel, though parallel to the perpendicular direction; it will have the same proportion to a power which acts according to the perpendicular direction AL, which the whole line has to the sine of the angle of direction DFC. Hence, since the distance of the power in A, is the radius CA; the angle of direction DFC being given, the distance DC is easily found.

3. Powers applied to the wheel in several points, F and K, according to the directions, FD and KI, parallel to the perpendicular one AL, are to each other as the distances from the centre of motion CD and CI, reciprocally.

Hence, as the distance from the centre of motion increases, the power decreases; & *vice versa*.—Hence also, since the radius AC is the greatest distance, and agrees to the power acting according to the line of direction; the perpendicular power will be the smallest of all those able to sustain the weight G, according to the several lines of direction.

4. If a power acting according to the perpendicular AL, raise the weight G; the space passed through by the power will be to the space passed through by the weight, as the weight to the power.

For, in each revolution of the wheel, the power passes through its whole periphery; and in the same time the weight is raised a space equal to the periphery of the axis; the space of the power, therefore, is to the space of the weight, as the periphery of the wheel to that of the axis; but the power is to the weight, as the radius of the axis to that of the wheel. Therefore, &c.

5. A power, and a weight being given, to construct an axis in peritrochio, whereby it shall be sustained and raised.

Let the radius of the axis be big enough to support the weight without breaking. Then, as the power is to the weight, so make the radius of the wheel, or the length of the spoke, to the radius of the axis.

Hence, if the power be but a small part of the weight, the radius of the wheel must be vastly great.—e. gr. suppose the weight 3000, and the power 50, the radius of the wheel will be to that of the axis as 60 to 1.

This inconvenience is provided against by increasing the number of wheels and axes; and making one turn round another, by means of teeth or pinions.

AXLE-Tree. See the article AXIS.

AXUNGIA*, a kind of fat, the hardest and dryest of any in the bodies of animals.

* The word is supposed to be formed, *ab axe rotarum que unguntur*, from its being used as the greafe of wheels.

The Latins distinguish fat into *pinguedo*, and *adeps* or *sebum*; which last, when old, is particularly called *axungia*: but many of our modern writers confound them.

Physicians make use of the *axungia* of the goose, the dog, the viper, and some others, especially that of man, which is held by some to be of extraordinary service in the drawing and ripening of tumours, &c.

AXUNGIA of *Glass*, called also the *gall*, and *salt of glass*, is a scum taken from the top of the matter of glass before it be thoroughly vitrified.

AYEL, in law, a writ which lies where the grandfather being seized in his demesne the day he died, a stranger enters the same day, and disposes the heir.

AYRY, or **AERY** of hawks, a nest or company of hawks; so called from the old French word *aire*, which signifies the same. See **HAWK**.

AYSIA MENTA, or **AYZIA MENTA**. See **EASEMENTS**.
AZAMOGLANS. See the article **AGEMOGLANS**.

AZIMUTH*, in astronomy.—The *azimuth* of the sun, or a star, is an arch of the horizon, comprehended between the meridian of the place, and any given vertical.

* The word is pure Arabic, which signifies the same thing.

The *azimuth* is the complement of the eastern and western amplitude to a quadrant.

The *azimuth* is found trigonometrically, by this proportion; As radius is to the tangent of the latitude, so is the tangent of the sun's altitude to the cosine of the *azimuth* from the south, at the time of the equinox.—To find the *azimuth* by the globe, see **GLOBE**.

Magnetical AZIMUTH is an arch of the horizon contained between the sun's *azimuth* circle, and the magnetical meridian; or it is the apparent distance of the sun from the north or south point of the compass.

It is found, by observing the sun with an *azimuth* compass, when he is about 10 or 15 degrees high, either in the forenoon or afternoon.

AZIMUTH Compass is an instrument used at sea for finding the sun's magnetical *azimuth*. See **Magnetical AZIMUTH**.

The description and use of the *azimuth* compass, see under the article **Azimuth COMPASS**.

AZIMUTH Dial is a dial whose style or gnomon is at right angles to the plane of the horizon.

AZIMUTHS, called also *vertical circles*, are great circles intersecting each other in the zenith and nadir, and cutting the horizon at right angles, in all the points thereof.

The horizon being divided into 360°; for this reason they usually conceive 360 *azimuths*.—These *azimuths* are represented by the rhumbs on common sea-charts.

On the globe these circles are represented by the quadrant of altitude when serewed in the zenith.

On these *azimuths* is reckoned the height of the stars and the sun; when he is not in the meridian; that is, the *azimuths* shew what distance these are at from the horizon.

AZONI, *Ἀζονίαι*, in mythology, a term anciently applied to such of the gods as were not the private divinities of any particular country or people, but were acknowledged as gods in every country, and worshipped by every nation. See **GOD**.

* The word is derived from the Greek privative α , and $\zeta\omega\eta$, *zone*, country.

These *azoni* were a degree above the visible and sensible gods, which were called *zonai*; who inhabited some particular part of the world, and never stirred out of the district or zone that was assigned them.

AZOTH, among the ancient chymists, signified the first matter of metals; or the mercury of a metal, more particularly that which they call the mercury of the philosophers, which they pretend to draw from all sorts of metallic bodies*.

* Paracelsus's *azoth*, which he boasted of as an universal remedy, is pretended to have been a preparation of gold, silver, and

mercury: a quantity of this he is said to have always carried with him in the pummel of his sword.

AZURE, the blue colour of the skies. See **BLUE COLOUR**, and **SKY**.

AZURE, in heraldry, signifies the blue colour in the coats of arms of all persons under the degree of a baron.

In the escutcheons of noblemen, blue is called *sapphire*; and in those of sovereign princes, *Jupiter*.—In engraving, it is represented by strokes or hatches drawn horizontally, as represented in *Tab. Heraldry*, fig. 3.

The French prefer this colour to all others, by reason the field of the arms of their kings is *azure*.

AZURE is also used for a mineral colour, better known by the name of *ultramarine*: this is prepared from the lapis lazuli. See **LAZULI**, and **ULTRAMARINE**.

In propriety, however, *azure* should rather denote a bright blue colour, made from the lapis armenius; by our painters more usually called *Lambert's-blue*.

AZYGOS, *Ἀζυγος*, in anatomy, a vein arising out of the cava, otherwise called *vena sine pari*, because single. See *Tab. Anat.* (Splanch.) fig. 12. lit. hh. and also see **VEIN**.

The *vena azygos* is the third branch of the ascending trunk of the cava.—It descends through the right side of the cavity of the thorax, and at its arrival at the eighth or ninth vertebra begins to keep the middle, and sends forth on each side intercostal branches to the interstices of the eight lower ribs; and there is divided into two branches, the larger of which is inserted sometimes into the cava, but oftener into the emulgent; the other enters the cava, commonly a little below the emulgent, but is seldom joined to the emulgent itself.

AZYMITES, they who communicate in bread not leavened, or fermented. See **AZYMUS**.

This appellation is given by Cerialius, to those of the Latin church, upon his excommunicating them in the eleventh century.

The Armenians and Maronites do also make use of *azymus*, or unleavened bread, in their office; on which account some Greeks call them *azymites*.

AZYMUS*, *Ἀζυμος*, something not fermented, or that is made without leaven.

* The word is Greek, composed of the privative α , and $\zeta\eta\mu\alpha$, ferment.

The term *azymus* is much used in the disputes betwixt those of the Greek and Romish Church; the latter of whom contend, that the bread in the mass ought to be *azymus*, unleavened, in imitation of the paschal bread of the Jews, and of our Saviour, who instituted the sacrament on the day of the passover; and the former strenuously maintaining the contrary, from tradition, and the constant usage of the church.

This dispute was not the occasion of the rupture between the Greek and Latin churches; Photius having broke with the Popes 200 years before.—The patriarch Cerialius, in the eleventh century, excommunicated the Latins for adhering to the use of *azymus* bread or consecrating in *azymus*.

St. Thomas, in 4 *Sent. dist. 11. q. 2. art. 2. quæstion. 3.* relates, that during the first ages of the church, none but unleavened bread was used in the eucharist, till such time as the Ebionites arose, who held, that all the observances prescribed by Moses were still in force: upon which, both the eastern and western churches took to the use of leavened bread; and, after the extinction of that heresy, the western church returned to the *azymus*; the eastern pertinaciously adhering to the former usage.

This account is controverted by Fa. Sirmond, in a dissertation express; wherein he shews, that the Latins had constantly communicated in leavened bread, till the tenth century. And cardinal Bona, *Rerum Liturgic. c. 24. p. 185.* owns a deal of distrust of what St. Thomas alleges.—In the council of Florence it was decreed, that the point lay at the discretion of the church; and that either leavened or unleavened bread might be used; the western church has preferred the latter.

B.

B THE second letter of our, and of most other alphabets *.

B is the first consonant, and first mute, and in its pronunciation is supposed to resemble the bleating of a sheep; upon which account Pierius tells us, in his hieroglyphics, that the Egyptians represented the sound of this letter by the figure of that animal.

* This observation fails in the ancient Irish alphabet; where *B* is the first, and *A* the seventeenth: and in the Abyssinian, where *A* is the thirteenth. *V. Nichols, bist. prof. p. 12. O. Flahert, ogy. 3. 30. Ludolph. gram. Etib. p. 2.*

B, is also one of those letters which the Eastern grammarians call *labial*, because the principal organs employed in its pronunciation are the lips. It has a near affinity with the other labials *P* and *V*, and is often used for *P* both by the Armenians, and other Orientals; as in *Betrus* for *Petrus*, *absens* for *absens*, &c. and by the Romans for *V*, as in *amavit* for *amavit*, *berna* for *verna*, &c. whence arose that jest of Aurelian on the emperor Bonofius, *Nou ut vivat natus est, sed ut bibat*. See *V*.

B requires an entire closure and pressure of the lips to pronounce it, and therefore can scarce ever end the sound of a word: but when you endeavour to pronounce it there, you are obliged to add an *E* to open the lips again; as in *Job*, which is sounded *Jobe*.

This letter also, if it pass through the nose, becomes an *M*; as appears in those who have the nostrils stopp'd by a cold or otherwise, when they endeavour to pronounce the letter *M*; for instance, *many men*, is by such a one sounded, *bany ben*. See *M*.

With the ancients, *B* stood for 300, as appears by this verse;
Et B trecentum per se retinere videtur.

When a line was drawn above it, *B̄*, it stood for 3000: and with a kind of accent below it, for 200; but among the Greeks as well as Hebrews, this letter signified only 2.

BF, in the preface to the decrees or senatus-consulta, of the old Romans, signified *bonum factum*. It is often found on medals to mark the epocha or year.

Plutarch observes, that the Macedonians changed *Φ* into *B*, and pronounced *Bilip*, *Berance*, &c. for *Philip*, *Pheronice*, &c. and that those of Delphos used *B*, instead of *Π*; as *Babus* for *παδρις*, *βυβου* for *πυβου*, &c. See *P*.

The Latins said *suppono*, *oppono*, for *subpono*, *obpono*, and pronounced *opimuit*, though they wrote *obimuit*, as Quintilian has observed.—They also used *B* for *F* or *PH*; thus, in an ancient inscription mentioned by Gruter, *OBRENDARIO* is used for *OFRENDARIO*. See *F*, &c.

BABYLONISH Hours. See the article *HOURS*:

BACCHANALIA, a religious feast in honour of Bacchus, celebrated with much solemnity among the ancients, particularly the Athenians, who even computed their years thereby, till the commencement of the Olympiads.

The *bacchanalia* are sometimes also called *orgia*, from the Greek *οργη*, fury, transport; by reason of the madness and enthusiasm wherewith the people appeared to be possessed at the time of their celebration.

They were held in autumn, and took their rise from Egypt; whence, according to Diodorus, they were brought into Greece by Melampus.

The form and disposition of the solemnity depended, at Athens, on the archon, and was at first exceedingly simple, but by degrees they became incumbered with a number of ridiculous ceremonies, and attended with a world of dissoluteness and debauchery; in somuch that the Romans, who grew ashamed of them, suppressed them by a senatus-consultum throughout all Italy.

The women had a great share in the solemnity, which is said to have been instituted on their account: for a great number of them attending Bacchus to the conquest of the Indies, and carrying in their hands the thyrsus, *i. e.* a little lance covered with ivy and vine-leaves, singing his victories and triumphs wherever they went, the ceremony was kept up after Bacchus's deification under the title of *bacchanalia*, and the women were installed priestesses thereof under that of *bacchæ* or *bacchantes*.

These priestesses at the time of the feast run through the streets and over the mountains covered with tygers skins, their hair dishevelled, their thyrsus in one hand, and torches in the

other, howling and shrieking;] *Εροι σαβει, σοι Βακχι, ορ το λακχι, ορ το Βακχι.*

Men and women met promiscuously at the feast, all perfectly naked, except only for the vine-leaves and clusters of grapes which bound their heads and hips; here they danced and jumped tumultuously, and with strange gesticulations sung hymns to Bacchus, till weary and giddy they tumbled down distracted.

BACCHIUS, in the Latin poetry, a kind of foot, consisting of three syllables; whereof the first is short, and the two latter long: as *εγείσται*.

The *bacchius* is the reverse of a dactyl, and takes its name from that of Bacchus, because frequently used in the hymns composed in his honour. It was also called among the ancients, *anotrius*, *tripodius*, *salians*, and by the Greeks *παταμβος*. *Dion. iii. p. 475.*

BACCIFEROUS Plants are such as bear berries, *i. e.* fruit covered with a thin membrane, wherein is contained a pulp, which grows soft and moist when ripe, and incloses the seed within its substance.

The *bacciferous* trees Mr. Ray divides into four kinds, 1. Such as bear a calculeate or naked berry; the flower and calix both falling off together, and leaving the berry bare; as the *salisfras* tree, &c.

2. Such as have a naked monopryneous fruit, that is, containing in it only one seed; as the *arbutus*, the *terebinthus*, *lentiscus*, &c.

3. Such as have a naked but a polypyrneous fruit, that is, containing two or more kernels or seeds within it; as the *jasminum*, *ligustrum*, &c.

4. Such as have their fruit composed of many acini, or round soft balls set close together like a bunch of grapes; as the *uva marina*, the *rubus vulgaris*, *rubus idæus*, and the *rubus minor fructu coeruleo*.

BACHELOR, or **BACHELOR**, **BACCALARIUS**, in middle-age writers, was a denomination given to those who had attained to knighthood, but were not rich enough, or had not a sufficient number of vassals to have their banner carried before them in battle; or if they were of the order of bannerets, were not yet of age to display their own banner; but obliged to march to war under the banner of another.

Camden and others define *bachelor*, a person of a middle degree between a knight and an esquire; of less age and standing than the former, but superior to the latter.

Others will have *bachelor* to have been a common name for all degrees between a mere gentleman and a baron.—Thus we find the lord admiral, when he was neither an earl, nor baron, denominated a *bachelor*.—"Ant it is to weet, that when the admiral rideth to assemble a shippes of war, or other, for the busines and affairs of the realm, if he be a *bachelor*, he shall take for his day wages four shillings ster^{ling}; if he be an earl or baron, he shall take wages after his estate and degree."

BACHELOR was more peculiarly a title given to a young cavalier who made his first campaign, and received the military girdle accordingly.

BACHELOR was also a denomination given to him who had overcome another in a tournament, the first time he ever engaged.

Knights BACHELORS were anciently so called, *quasi baro cavaliers*, as being the lowest order of knights, and inferior bannerets, &c.

At present these are called *equites aurati*, from the gilt spurs that are put on them at the time of their creation.—The dignity was at first confined to the military men, but afterwards was conferred on men of the long robe.

The ceremony is exceedingly simple; the candidate kneeling down, the king touches him lightly with a naked sword, and says, *Seis chevalier, au nom de dieu*; and afterwards, *Avance chevalier*.

BACHELOR is also used, in a college sense, to denote a person possessed of the *baccalaurate*, which is the first degree in the liberal arts, or sciences.

The degree of *bachelor* was first introduced in the thirteenth century, by Pope Gregory IX. but it remains still unknown in Italy. At Oxford, ere a person be intitled to the degree of *bachelor of arts*, he must have studied there four years; three years

more to become *master of arts*; and seven more to commence *bachelor of divinity*.

At Cambridge, to commence *bachelor of arts*, he must have been admitted near four years; and above three years more before he commence *master*; and seven more still to become *bachelor of divinity*. He may commence *bachelor of law* after having studied it six years.

At Paris, to pass *bachelor in theology*, a person must have studied five years in philosophy and theology, and held an act of examination in the Sorbonne.—*Bachelors in the canon law* are admitted after three years study in the same, and sustaining an act according to the forms.

A *bachelor of physic* must have studied two years in medicine, have been four years master of arts in the university, and have passed an examination; after which he is invested with the sur, in order to be licensed.

In the university of Paris, before the foundation of divinity-professorships, those who had studied divinity six years were admitted to go through their course, whence they were called *baccalarii cursores*; and as there were two courses, the first employed in explaining the bible, during three successive years; the second, in explaining the master of the sentences for one year: those who were in their bible course, were called *baccalarii biblici*; and those arrived at the sentences, *baccalarii sententiarum*. And lastly, those who had gone through both, were denominated *baccalarii formati*, or formed *bachelors*.

At present, *formed bachelor* denotes a person who has taken the degree regularly, after the due course of study, and exercises, required by the statutes; by way of opposition to a *current bachelor*, who is admitted in the way of grace, or by diploma.

We also find mention of *bachelors* of the church, *baccalarii ecclesiarum*.—The bishop with his canons and *baccalarii*, cum concilio & consensu omnium canonicorum suorum & baccaliorum. There is scarce any word whose origin is more controverted among the critics than that of *bachelor*, *baccalarius*, or *baccalarius*: the two different acceptations of the word, literary and military, above recited, have each of them their advocates, who assert each to be the primitive sense, and derive the word accordingly. The former is espoused by Martinus, who derives it from the Latin *baccalarius*, quasi *bacca laurea donatus*; in allusion to the custom that anciently obtained, of crowning the poets with laurel, *baccis lauri*, as Petrarck was at Rome in 1341; and Alciatus and Vives are of the same opinion. Rhennaus rather advises to derive it from *bacculus* or *bacillus*, a staff; because at their commencement, says he, a staff was put into their hands, as a symbol of their authority, of their studies being finished, and of the liberty they were restored to. Thus it was that the ancient gladiators had a staff given them, as a discharge, which Horace calls, *rude donatus*; but Spelman rejects this opinion, in regard there is no proof, that the ceremony of putting a staff in the hand was ever used in the creating of *bachelors*.

Among those who hold the military *bachelors* the primitive ones, are Cujas, who derives the word from *buccellarius*, a kind of cavalry anciently in great esteem. Du Cange deduces it from *baccalaria*, a kind of fees, or farms, consisting of several pieces of ground, each whereof contained 12 acres, or as much as two oxen would plough; the possessors of which *baccalaria* were called *bachelors*.

Lastly, Caseneuve, and Altaferra, derive *bachelor* from *baculus*, or *bacillus*, a staff, in regard the young cavaliers exercised themselves in fighting with staves.

BACILLI, or **BACULI**, in medicine, such compositions as are made up of a cylindrical figure, like a stick; thus called from the Latin *baculus*, a staff. See **LOZENGE**.

BACK. See the article **DORSUM**.

BACK-Bone. See the article **SPINE**.

BACKED-Colum. See the article **COLUMN**.

BACK-Nails. See the article **NAIL**.

BACKS of a Hip. See the article **HIP**.

BACK-STAFF, in navigation, an instrument, by the French called the *English quadrant*; it was invented by Capt. Davis: and is of good use in taking the sun's altitude at sea.—It consists of three vanes, A, B, and C, and of two arches, (*Tab. Navigation*, fig. 6.) The vane at A called the *horizon-vane*; that at B the *shade-vane*; and that at C the *fight-vane*. The lesser arch B is of 60 degrees, and that of C (or FG) of 30 degrees.

To use the **BACK-STAFF**; the shadow-vane B is set upon the 60 arch, to an even degree of some altitude, less by 10 or 15 degrees than you judge the complement of the sun's altitude will be: the horizon-vane is put on at A, and the fight-vane on the 30 arch FG: the observer's back being then turned to the sun (whence the name of *back-staff* or *back-quadrant*) he lifts up the instrument, and looks through the fight-vane, raising or falling the quadrant, till the shadow of the upper edge of the shade-vane fall on the upper edge of the slit in the horizon-vane; and then if you can see the horizon through the said slit, the observation is well made: but if the sea appear instead of the horizon, move the fight-vane lower towards F: if the sky appear, move it upward towards G, and so try if it comes right: then observe how many degrees and minutes are cut by that edge of the fight-vane which answers to the fight-hole, and to them add the degrees cut by the

upper edge of the shade-vane: the sum is the sun's distance from the zenith, or the complement of his altitude. To find the sun's meridian, or greatest altitude on any day, continue the observation as long as the altitude is found to increase, which you will perceive by the appearance of the sea, instead of the horizon, removing the fight-vane lower: but when you perceive the sky appear instead of the horizon, the altitude is diminished; therefore desist from farther observation at that time, and add the degrees upon the 60 arch to the degrees and minutes upon the 30 arch, and the sum is the zenith distance, or co-altitude of the sun's upper limb.

And because it is the zenith distance, or co-altitude of the upper limb of the sun, not the centre that is given by the quadrant, in observing by the upper end of the shade-vane, add 16 minutes, the sun's semidiameter, to that which is produced by your observation, and the sum is the true zenith distance of the sun's centre. If you observe by the lower part of the shadow of the shade-vane; then the lower limb of the sun gives the shadow; and therefore you must subtract 16 minutes from what the instrument gives; but considering the height of the observer above the surface of the sea, which is commonly between 16 and 20 foot, you may take 5 or 6 minutes from the 16 minutes, and make the allowance but of 10 minutes, or 12 minutes, to be added instead of 16 minutes.

Mr. Flamsteed contrived a glass lens, or double convex, to be placed in the middle of the shade-vane, which makes a small bright spot on the slit of the horizon-vane, instead of the shade: which is a great improvement, if the glass be truly made; for by this means the instrument may be used in hazy weather, and a much more accurate observation made in clear weather than could be by the shadow.

BACK-STAYS of a ship are ropes belonging to the main-mast and fore-mast, and the masts belonging to them; serving to keep them from pitching forwards or over-board.—See *Tab. Ship*, fig. 1. n. 105, 63, 25.

BACULE, in fortification, a kind of portcullis or gate, made like a pit-fall with a counter-poise, and supported by two great stakes.—It is usually made before the corps-de-guard, advancing near the gate.

BACULI. See the article **BACILLI**.

BACULOMETRY, the art of measuring accessible and inaccessible lines, by the help of baculi, staves or rods.

BACULUS Divinatorius, or *virgula divina*, a branch of hazle-tree, of a forked figure, used for the discovery of mines, springs, &c. See **VIRGULA Divina**.

BADGER*, a licensed huckster, or person privileged to buy corn or other provisions, and to carry them from one place to another to make profit of, without being reputed an ingroffler.

* In the statutes, he is also called a *kidder*, or *lader of corn*, 5 & 6 Ed. 6. c. 14. 5 El. c. 12.—We also read of *badgers* or *retailers of salt*. 9 W. 3. c. 6.

BADGER-Hunting. See the article **HUNTING**.

BAG, in commerce, a term used to signify different quantities of certain commodities.

A *bag* of almonds, for instance, is about 3 hundred weight; of aniseeds, from 3 to 4 hundred; of pepper, from 1 $\frac{1}{2}$ to 3 hundred; of goats-hair, from 2 to 4 hundred; of cotton-yarn, from 2 $\frac{1}{2}$ to 4 $\frac{1}{2}$, &c.

Oil BAG } See the articles } **OIL**.

Petty BAG. } See the articles } **PETTY**, and **CLERK**.

Sand-BAGS. } See the articles } **SAND**.

BAGGING of Hops. } See the articles } **HOPS**.

BAGNIO, an Italian term signifying a bath; it is used by us for a house with conveniences for bathing, sweating, and otherwise cleaning the body: and often for worse purposes.

Bagnio is also become a general name in Turkey for the prisons where there slaves are inclosed; it being usual in those prisons to have baths.

BAGNOLENTSES, or **BAGNOLIANS**, a sect of heretics in the eighth century; who in reality were Manichees, though they somewhat disguised their errors.—They rejected the Old Testament, and part of the New; held the world to be eternal; and affirmed, that God did not create the soul when he infused it into the body.

* They derive their name from *Bageols*, a city in Languedoc, where they were chiefly found.

BAGPIPE, a musical instrument of the wind-kind, chiefly used in country places, especially in the North.—It consists of two principal parts; the first a leathern bag, which blows up like a foot-ball, by means of a port-vent, or little tube fitted to it, and stopped by a valve.

The other part consists of three pipes, or flutes; the first called the *great pipe*, or *drone*, and the second the *little one*; which pass the wind out only at the bottom: the third has a reed, and is played on by compressing the bag under the arm, when full, and opening or stopping the holes, which are eight, with the fingers. The little pipe is ordinarily a foot long, that played on 13 inches, and the port-vent six. The *bagpipe* takes in the compass of three octaves.

BAGUETTE, in architecture, a little round moulding, less than an astragal; sometimes carved and enriched with foliages, pearls, ribbands laurals, &c.—See *Tab. Archit.* fig. 2. and 11.

According to M. le Clerc, when the *baguette* is enriched with ornaments it changes its name, and is called chaplet. See **CHAPLET**.

BAIL, in law, the setting at liberty one arrested, or imprisoned upon an action either civil or criminal, under *fureties* taken for his appearance at a day and place assigned.

It is called *bail*, because hereby the party confined is *baillif*, delivered into the hands of those who bind themselves for his forthcoming: or from *bail*, used in the sense of a guardian, into whose hands the party is put for security sake.

Manwood distinguishes between *bail* and *mainprise* thus: he that is mainprised, is said to be at large, and to go about at his liberty, without ward, till the time of appearance; whereas he who is let to *bail* to two or more men, is always accounted by law, to be in their ward and custody for the time; and they may, if they please, actually keep him in prison.

Bail is either *common*, or *special*.

Common BAIL is that given in actions of small prejudice, or slight proof; in which cases any nominal *fureties* are taken; as John Doe, and Richard Roe: this being no other than a form of appearance.

Special BAIL is given in cases of greater moment, where it is required that the *fureties* be *subdy-men* at the least, and according to the value of the matter in question.

It was enacted a few years ago, in compassion to the poor, that no persons should be held to special bail in any action brought for less than ten pounds.—This is observed as to writs issued out of the courts of Westminster-hall.—But the marshals court continues to arrest and hold to bail in actions for sums exceeding forty shillings.—What better are the poor of this metropolis for this provision, which has indeed taken them out of bad hands, but left them to be grafted to death by work! — If there be any exception in the act in favour of that court, it was doubtless more owing to the degree of favour in which the superior officers of such court stood with certain great persons in parliament, than to any real reason there could be for it. *Season. Observ. on Declin. of Trade*, p. 76.

Clerk of the BAILS is an officer belonging to the court of king's-bench. He files the bail-pieces taken in that court, and attends for that purpose.

BAILLE, or **BALE**, in the sea-language.—The seamen call lading or casting the water by hand out of a boat or ship's hold with buckets, cans, or the like, *bailing*.

When the water is thus *bailed* out, they say, *the boat is freed*. They also call those hoops that bear up the tilt of the boat, its *bailes*.

BAILEMENT, a term in law, signifying the delivery of things, whether writings or goods, to another; sometimes to be delivered back to the bailor, that is, to him who delivered them; sometimes to the use of him to whom they are delivered; and sometimes to a third person.

BAILIFF *, in a general sense, denotes an officer appointed for the administration of justice within a certain district, called *bailiwick*.

* The word is also written *baile*, *baily*, *bayly*, *baylie*, and *baillif*, in Latin *ballivus*. — It is formed from the French *baillif*, of *bail*, an old word, denoting a guardian, or governor of a youth, originally derived from the Latin *bajulus*, which signified the same. See **BAJULUS**.

Paquier maintains, that *bailiffs* were originally a kind of commissioners, or judges delegate, sent into the provinces to examine whether or no justice were well distributed by the counts, who were then the ordinary judges. Loyseau, with more probability, refers the origin of *bailiffs* to the usurpation and idleness of the great lords, who having got the administration of justice into their own hands, and being weary of the burthen, turned it over to their deputies, whom they called *bailiffs*.

These *bailiffs* had at first the superintendance of arms, of justice, and of the finances; but abusing their power, they were by degrees stripped of it, and the greatest part of their authority transferred to their lieutenants, who were to be men of the long robe. It is true, in France they have still some prerogatives, as being reputed the heads of their respective districts: in their name justice is administered, contracts and other deeds passed, and to them is committed the command of the militia.

From thence it was that the English *bailiffs* originally took both their name, and their office: for as the French have eight parliaments, which are supreme courts, whence no appeal lies, within the precincts of the several parliaments, or provinces, and in which justice is administered by *bailiffs*, at least by their lieutenants; so in England are several counties where-in justice was administered by a vicount or sheriff, who appears likewise to have been called *bailiff*, and his district or county *bailiwick*. Further, the counties were again subdivided into hundreds; within which it is manifest justice was anciently rendered by officers called *bailiffs*. But those hundred-courts are now swallowed up by the county-courts, certain franchises alone excepted (see **COUNTY**, and **HUNDRED**) and the *bailiffs* name and office is grown into such contempt, at least these *bailiffs* of hundreds, that they are

now no more than bare messengers, and mandatories within their liberties, to serve writs, and such mean offices.

Bailiffs are of two kinds, viz. *bailiffs errant* or *itinerant*, and *bailiffs of franchises*.

BAILIFFS errant are those whom the sheriff appoints to go up and down the county to serve writs and warrants, summon county-courts, sessions, assizes, &c.

BAILIFFS of franchises are those who are appointed by every lord within his liberty, to do such offices therein, as the *bailiff errant* does at large in the county.

There are also *bailiffs of the forest*, and *bailiffs of manors*, who direct the husbandry, fell trees, gather rents, pay quit-rents, &c.

The word *bailiff* still retains some of its ancient significance; being applied also to the chief magistrates of several corporate towns, as Ludlow, Leominster, &c.—And again, the government of some of the king's castles is committed to persons called *bailiffs*; as, the *bailiff of Dover castle*.

Water-BAILIFF. See the article **WATER**.

BAILLIWICK, **BAILYWICK**, or **BAYLWICK**, the territory of a bailiff; or the place within which his jurisdiction is terminated. See **BAILIFF**.

BAIRAM *, a name given to the great annual feast of the Mahometans.

* The word is also written, by some authors, more conformably to the oriental orthography, *beiram*. It is originally Turkish, and signifies literally, a feast day, or holiday.

The Mahometans have two *baïrams*, the *great*, and the *little*, which Scaliger, Erpenius, Rycart, Hyde, Chardin, Bobovius, and other European writers, commonly interchange, giving the appellation *great*, to that which the Turks call *little*; and *vice versa*.

The *little baïram* holds for three days, during which no work is done; but presents pass from one to another, with many other manifestations of joy. If the day after Ramazan should prove so cloudy, as to prevent the sight of the new moon, the *baïram* is put off to the next day, when it begins, though the moon be still obscured. When they celebrate this feast, after numerous ceremonies, or rather strange mimickries, in their mosque, they end it with a solemn prayer against the infidels, to root out Christian princes, or to arm them one against another, that they may have an opportunity to extend the borders of their law.

BAIT. See **FISHING**.

BAJULUS, an ancient officer in the court of the Greek emperors; whereof there were several degrees: as the grand *bajulus*, who was preceptor of the emperor, and the simple *bajulli*, who were sub-preceptors.

Hence the Italians use the word *bajulus* of a kingdom, in the same sense with *protector* of a kingdom among the English.

BAKING, the art of preparing bread, or of reducing meals of any kind, whether simple or compound, into bread.

The forms of baking among us are very various, but may be reduced to two; the one for unleavened, the other for leavened bread.—For the first, the chief is *manchet-baking*, the process whereof is as follows.

The meal ground and bolted is put into a trough, and being opened in the middle, to a bushel is poured in about three pints of warm ale, with barn and salt to season it. This is kneaded together with the hands through the brake; or for want thereof with the feet through a cloth: after having lain an hour to swell, it is molded into manchet; which scotched in the middle, and pricked a-top to give room to rise, are baked in the oven by a gentle fire.

For the second, sometimes called *cheat-bread-baking*, it is thus: The meal being in the trough, some leaven (saved from a former batch, filled with salt, laid up to four, and at length dissolved in warm water) is strained through a cloth into a hole made in the middle of the heap, and worked with some of the flour to a moderate consistence: this is covered up with meal, where it lies all night, and in the morning the whole heap is stirred up and mixt together with a little warm water, barn and salt, by which it is seasoned, stiffened, and brought to an even leaven; it is then kneaded or trodden, and molded and baked as before.

The learned are in great doubt about the time when *baking* first became a particular profession, and *bakers* were introduced. It is generally agreed, they had their rise in the east, and passed from Greece to Italy after the war with Pyrrhus, about the year of Rome 583. Till which time every housewife was her own *baker*: for the word *pisitor*, which we find in Roman authors before that time, signified a person who ground or pounded the grain in a mill or mortar to prepare it for *baking*, as Varro observes. According to Athenæus, the Cappadocians were the most applauded *bakers*, after them the Lydians, then the Phœnicians.

To the foreign *bakers* brought into Rome, were added a number of freed-men, who were incorporated into a body, or, as they called it, a *college*; from which neither they nor their children were allowed to withdraw. See **COLLEGE**.—They held their effects in common, and could not dispose of any part of them. Each bake-house had a patronus, who had the superintendency thereof; and these patroni elected one out

of their number each year, who had the superintendance over all the rest, and the care of the college. Out of the body of the *bakers* were every now and then one admitted among the *fenators*.

To preserve honour and honesty in the college of *bakers*, they were expressly prohibited all alliance with comedians and gladiators; each had his shop or bake-house, and they were distributed into fourteen regions of the city. They were excused from guardianships and other offices, which might divert them from their employment. See COLLEGE.

By our own statutes, *bakers* are declared not to be handicrafts.—No man for using the mysteries or sciences of *baking*, brewing, furgery, or writing, shall be interpreted a handicraft. 22 H. 8. c. 13.

BAKING of Porcelain. See the article PORCELAIN.

BALANCE. See the article BALANCE.

BALANI, in natural history, certain multivalve shells usually growing to the shells of the larger sort of sea-shell-fish: they are commonly called in English, center-shells. See SUPPLEMENT, article BALANUS.

BALANUS, or GLANS, is sometimes used by anatomists for the nut of the yard. See GLANS.

Sometimes also the clitoris is so called. See CLITORIS.

BALANUS is also sometimes used for a suppository. See SUPPOSITORY.

BALAUSTINES, BALAUSTIA, in pharmacy, the flowers of the wild pomegranate, or *malus punica sylvestris*, which are very rough to the tongue and palate, and very astringent; and on that account are frequently used in diarrhoeas, and other fluxes, hernias, &c.

BALCONY *, or BALCONIA, in architecture, a jutting, or projecture in the front of a house or other building, supported by pillars, or consoles, and encompassed with a ballustrade.

* The word comes from the Italian *balcone*, and that from the Latin, *palcus*; or the German *park*, a beam. Covarruvias derives it from *balcon*, *jacere*; asserting, that *balconies* were originally little turrets over the gates of citadels, whence darts, &c. were thrown on the enemy.

BALDACHIN *, or BALDAQUIN, a piece of architecture in form of a canopy, supported with columns, and serving as a crown or covering to an altar.

* The word comes from the Italian *baldacchino*, which signifies the same.

BALDNESS. See the article CALVITIES.

BALE, in commerce, denotes a pack or certain quantity of merchandize: as a bale of spicery, of books, of thread &c.—A bale of cotton-yarn is from three to four hundred weight; of raw silk, it is from one to four hundred; of lockram or dowls, either three, three and a half, or four pieces, &c.

BALISTA. See the article BALLISTA.

BALKERS, or BALKORS. See the article CONDERS.

BALKS, in agriculture, are ridges or banks between two furrows or pieces of arable land: the word is sometimes also used for the poles or rafters over out-houses or barns; and among bricklayers for great beams, such as are used in making scaffolds.

BALL and *jacket*, a machine contrived to give an instrument full play, and motion every way.

It consists of a ball or sphere of brass, fitted within a concave semi-globe, so as to be moveable every way, both horizontally, vertically, and obliquely. It is carried by an endless screw, and is principally used for the managing of surveying instruments; to which it is a very necessary appendage.

The ancient balls and jackets had two concaves, or channels, the one for the horizontal, the other for the vertical direction.

BALLANCE, or BALANCE, *libra*, one of the six simple powers in mechanics, used principally for determining the equality, or difference of weights in heavy bodies, and consequently their masses or quantities of matter.

The *ballance* is of two kinds, *viz.* the ancient and modern.

The ancient or Roman, called also *statera Romana*, or *steel-yard*, consists of a lever or beam, moveable on a centre, and suspended near one of its extremes: on one side the centre are applied the bodies to be weighed, and their weight is measured by the division marked on the beam; on the other side is the place where a weight moveable along it keeps the *ballance* in equilibrium.

The modern *ballance*, now ordinarily in use, consists of a lever or beam suspended, exactly by the middle; to the extremes whereof are hung scales, or basons.

In each case, the beam is called the *jugum*, and the two moieties thereof on each side the *axis*, the *brachia*, or *arms*: and the handle whereby it is held, *trutina*; the line on which the beam turns, or which divides its brachia, is called the *axis*, and, when considered with regard to the length of the brachia, is esteemed but a point, and called the centre of the *ballance*; and the places where the weights are applied, the *points of suspension or application*.—That slender part perpendicular to the *jugum*, whereby either the equilibrium, or preponderancy of bodies is indicated, is called the *tongue of the ballance*.

In the Roman *ballance*, therefore, the weight used for a counterballance is the same, but the points of application are various; in the common *ballance*, the counterpoise is various, and the point of application the same.

The principle on which each is founded is the same, and may be conceived from what follows.

Dôctrine of the BALLANCE.—The beam AB (*Tab. Mechanics, fig. 9.*) the principal part of the *ballance*, is a lever of the first kind, which (instead of resting on a fulcrum at C, its centre of motion) is suspended by somewhat fastened to C, its centre of motion. So that the mechanism of the *ballance* depends on the same theorem as that of the lever.

Hence, as the known weight is to the unknown, so is the distance of the unknown weight from the centre of motion, to the distance of the known weight, where the two weights will counterpoise each other; consequently, the known weights shew the quantity of the unknown.

Or thus; the action of a weight to move a *ballance* is by so much greater, as the point prested by the weight is more distant from the centre of the *ballance*; and that action follows the proportion of the distance of the said point from that centre.

When the *ballance* moves about its centre, the point B describes the arch Bb (*Fig. 10.*) whilst the point A describes the arch Aa, which is the biggest of the two: therefore in the motion of the *ballance*, the action of the same weight is different, according to the point to which it is applied: hence it follows, that the proportion of the space gone through by the point at A is as Aa, and at B as Bb; but thro' these arches are to one another as CB, CA.

Varieties in the application of the BALLANCE.—If the brachia of a *ballance* be divided into equal parts, one ounce applied to the ninth division from the centre will equiponderate with three ounces at the third; and two ounces at the sixth division act as strongly as three at the fourth, &c.

Hence it follows, that the action of a power to move a *ballance* is in a ratio compounded of the power itself, and its distance from the centre: for that distance is as the space gone through in the motion of the *ballance*.

It may be here observed, that the weight equally prestes the point of suspension at whatever height it hangs from it, and in the same manner as if it was fixed at that very point; for the weight at all heights equally stretches the cord by which it hangs.

A *ballance* is said to be in *æquilibrium*, when the actions of the weights upon the brachia to move the *ballance*, are equal, so as mutually to destroy each other. When a *ballance* is in *æquilibrium*, the weights on each side are said to equiponderate: unequal weights may also equiponderate; but then the distances from the centre must be reciprocally as the weights. In which case, if each weight be multiplied by its distance, the products will be equal; which is the foundation of the steel-yard.

Thus in a *ballance* whose brachia are very unequal; a scale hanging at the shortest, and the longest divided into equal parts: if such a weight be applied to it, as at the first division shall equiponderate with one ounce in the scale; and the body to be weighed be put into the scale, and the above-mentioned weight be moved along the longest brachium, till the *æquilibrium* be found; the number of divisions between the body and the centre shews the number of ounces that the body weighs, and the sub-divisions the parts of an ounce. On the same principle also is founded the *deceitful ballance*, which cheats by the inequality of the brachia: for instance; take two scales of unequal weights, in the proportion of 9 to 10, and hang one of them at the tenth division of the *ballance* above-described, and another at the ninth division, so that there may be an *æquilibrium*; if then you take any weights, which are to one another as 9 to 10, and put the first in the first scale, and the second in the other scale, they will equiponderate.

Several weights hanging at several distances on one side may equiponderate with a single weight on the other side: to do this it is required, that the product of that weight, by its distance from the centre, be equal to the sum of the products of all the other weights, each being multiplied by its distance from the centre.

To demonstrate which, hang three weights, of an ounce each, at the second, third, and fifth divisions from the centre, and they will equiponderate with the weight of one single ounce applied to the tenth division of the other brachium; and the weight of one ounce at the sixth division, and another of three ounces at the fourth division, will equiponderate with a weight of two ounces on the other side at the ninth division.

Several weights unequal in number, on either side, may equiponderate: in this case, if each of them be multiplied by its distance from the centre, the sums of the product on either side will be equal; and if those sums be equal, there will be an *æquilibrium*.

To prove which, hang on a weight of two ounces at the fifth division, and two others, each of one ounce, at the second and seventh; and on the other side hang two weights, each also of one ounce, at the ninth and tenth divisions: and these two will equiponderate with those three.

To the justness of a *ballance* it is required, that the points of suspension be exactly in the same line as the centre of the *ballance*;

ballance;

balance; that they be precisely equi-distant from that point on either side; that the brachia be as long as conveniently they may; that there be as little friction as possible in the motion of the beam and scales; and lastly, that the centre of gravity of the beam be placed a little below the centre of motion.

BALANCE of the air is used to denote the weight of that fluid, whereby, according to its known property, it presses where it is least resisted, till it be equally adjusted in all parts.

Hydrostatical BALANCE, is a machine for determining the specific gravities of bodies. See **HYDROSTATICAL**.

BALANCE of Trade denotes an equality between the value of commodities bought of foreigners, and the value of the native productions transported into other nations.

It is necessary that this *balance* be kept in trading nations; and if it cannot be made in commodities, it must in specie. Hereby it is, that we know whether a nation gains, or loses by foreign trade, or any branch thereof; and consequently, whether that nation grows richer or poorer.

There are divers *methods of arriving at this knowledge*.

1^o, That most received is, by taking a strict survey of what proportion the value of the commodities exported bears to those imported. If the exports exceed the imports, it is concluded that nation is in a *winning way*, it being supposed that the overplus is imported in bullion, and so increases the treasure of the nation.—But this method is very uncertain: by reason of the difficulty of obtaining a true account either of the exports or imports. (1.) Custom-house books are no rule in this case; by reason of the running of goods, especially many fine commodities of small bulk but great value: as point, lace, ribbands, silks, jewels, fine linens, &c. also wines, brandies, teas, and the like. (2.) To which add various accidents which affect the value of the stock either sent out or brought in; as losses at sea, markets, bankrupts, seizures, &c. (3.) Then, as to particular trades, there are divers countries to which the manufactures we send out are inconsiderable, yet the goods we import are necessary to the carrying on our trade in general; as the trade to Norway, &c. for timber and naval stores. Also the East-India company, whose imports much exceed their exports, yet is their trade highly advantageous to the nation: as we fell much of these imports to foreigners, and wear others, *e. gr.* callico's and silks, in lieu of linens and silks from other countries, which would cost us dearer.

2^o, The second method is, by observing the course of exchange, which if generally above the intrinsic value or par of the coins of foreign countries; we not only lose by such exchanges, but the same is a proof that we lose by the general course of our trade.—But this method is imperfect; since we trade to many countries with which there is no settled course of exchange.

3^o, The third method (which is Sir Jof. Child's) is made from the increase or the diminution of our trade, and shipping in general: for if these diminish, whatever profit particular men may make, the nation loses: and vice versa. He lays it down as an infallible rule, that in all parts of the world wherever trade is great, and continues so, and grows daily greater, and the shipping increases for a succession of ages; that trade must be nationally profitable. Even in the case of a merchant, who, by driving a great trade, ruins himself; though he lose, what a multitude are gainers by him? as the king, and customhouse officers; besides shipwrights, butchers, brewers, bakers, ropemakers, porters, carmen, manufacturers, mariners, &c.

4^o, A fourth way is, by observing the increase and diminution of our coin and bullion.—But this is the least obvious and palpable of any; for the money seems to vulgar eyes most plentiful when there is least occasion for it; and more scarce as the occasions for employing it are more numerous and advantageous: by which means we seem to have most money when we have least trade. Thus, *e. gr.* when the East-India company have a great sale to make, money is generally found to be scarce in London; because the occasion engages people to employ quantities which they had provided for that purpose. So a high rate of interest will make money seem scarce, because every man, as soon as he can make up a small sum, sends it to the goldsmith to be employed. *Child Disc. on Trade. c. 9.*

BALANCE of a clock or watch is that part of either, which by its motion regulates and determines the beats.—The circular part of it is called the *rim*, and its spindle the *verge*: there belong to it also two *pallets* or *nuts*, which play in the fangs of the crown-wheel: in pocket watches, that strong stud in which the lower pivot of the verge plays, and in the middle of which one pivot of the crown-wheel runs, is called the *potence*: the wrought piece which covers the *balance*, and in which the upper pivot of the *balance* plays, is the *cock*: the final spring in the new pocket-watches is called the *regulator*.

BALLAST *, in navigation, any heavy matter used to sink a vessel to its proper depth in water, or to give it a just weight and counterpoise, and enable it to bear sail without overturning.

* The word comes from the Flemish *ballast*, formed of *ba*, and *last* or *left*. The French call it simply *left*. In the Mediterranean, *guarteloge*. In Latin writers of the lower age it is denominated *lastagium*.

The ordinary *ballast* is sand or stones, stowed in the bottom, or hold, next the false keel of a vessel: sometimes, lead, corn, or other heavy goods serve for *ballast*.—The *ballast* is sometimes one half, sometimes a third, and sometimes a fourth part of the burden of the vessel. Flat vessels require the most ballast.—Ships are said to be *in ballast*, when they have no other loading.

Masters of vessels are obliged to declare the quantity of *ballast* they bear, and to unload it at certain places. They are prohibited unloading their *ballast* in havens, roads, &c. the neglect of which has ruined many excellent ports.

Trench the BALLAST. See the article **TRENCH**.

BALLASTAGE. See the article **LASTAGE**.

BALLIAGE, a small duty paid to the City of London, by aliens, and even denizens, for certain commodities exported by them.

BALLISTA *, a military engine in use among the ancients, somewhat like our cross-bow, though much bigger and more forcible; it was used in the besieging of cities, to throw in stones, or sometimes darts and javelins.

* The word is also frequently written, less consistently with its etymon, *ballista*, sometimes *ballistra*. It is formed from the Greek *βαννισ*, *jacere*, being chiefly used in casting of darts, and arrows, in which it differed from the *catapulta*, which was used only for casting stones; in other respects they were alike, and were each bent in the same manner. See the article **CATAPULTA**.

Marcellinus describes the *ballista* thus; a round iron cylinder is fastened between two planks, from which reaches a hollow square beam placed cross-wise, fastened with cords, to which are added screws; at one end of this stands the engineer, who puts a wooden shaft with a big head, into the cavity of the beam; this done, two men bend the engine, by drawing some wheels: when the top of the head is drawn to the utmost end of the cords, the shaft is driven out of the *ballista*, &c.

BALLOON, or **BALLON**, denotes a large round short-necked matras, or vessel used in chymistry, to receive what is distilled or drawn off by means of fire.

BALLOON is also used in architecture, for a round ball, or globe placed a-top of a pillar, or the like, by way of acroter, or crowning.

BALLOTTING, a method of voting at elections, &c. by means of little balls which are usually of different colours, by the French called *ballotes*; which are put into a box privately.

BALLS, or **BALLETS**, in heraldry, make a frequent bearing in coats of arms, though never so called; but having according to their several colours several names, as *besants* when the colour is or; *plates* when argent; *burts* when azure; *torteaux* when gules; *ponies* when vert; *pellets* or *agresses* when sable; *golpes* when purple; *orenges* when tanne; and *guzes* when sanguine.

BALLS of silk. See the article **SILK**.

BALL-SOAP. See the article **SOAP**.

BALLUSTRADE, in architecture, an assemblage of one or more rows of ballusters, high enough to rest the elbow on, fixed upon a terrace, or the top of a building, by way of security; sometimes also to make a separation between one part and another, as those around altars, fountains, &c.

BALM, or **BALSAM**. See the article **BALSAM**.

BALM of Sulphur. See the article **SULPHUR**.

BALMING. See the article **EMBALMING**.

BALNEUM, is a word much used by chymists, generally signifying a vessel filled with some matter, as sand, water, or the like, in which another is placed that requires a more gentle heat than the naked fire.

BALNEUM Maria is by some so called, as being supposed to have been first invented by the blessed virgin; but by others, with more propriety, it is called *balneum maris*, or sea-bath, in regard the vessel here floats as it were in a sea. Here the cucurbit is placed in hot water, which warms the matter contained, and disposes it for rising, or exhalation. A sand-heat is sometimes also called *balneum fecum*, or *arenosum*.

BALNEUM vaporarium. See the article **VAPORARIUM**.

BALOTADE, a leap in which a managed horse offers to strike out with his hind legs, but does it not, only making an offer, and shewing the shoes of his hind feet.

BALSAM, **BALSAMUM**, properly denotes an oily, resinous, and odorous substance, oozing from incisions in certain plants; of whose virtue in the cure of wounds, and divers other disorders.

This amounts to the same with what we otherwise call *balm*, sometimes by way of distinction, a *native balsam*.

We say the *balsam of Mecca*, *balsam of Peru*, of *Tolu*, of *Capaiba*, of liquid amber, and a multitude of others.

BALSAM, or *balm of Gilead*, is in the greatest esteem, though there are some who hold that of Peru equal to it in virtue. It is drawn by incision from a tree of the same name, growing in Egypt and Judea, but chiefly in Arabia Felix, and which

which is held so precious, that it makes part of the special revenue of the grand signior, without whose permission none are allowed to be planted or cultivated.—The incision through which this admirable juice flows is made in the dog-days: Theophrastus says, it must be made with iron nails; Pliny says, with glass; becaus', says he, iron makes the plant die: Tacitus tells us, that when the branches of this tree are full of sap, their veins tend to apprehend the iron, and stop when an incision is made with that metal, but that they flow freely when opened with a stone, or a piece of broken glass, or of an earthen vessel: lastly, Marmol says, the veins must necessarily be opened with ivory or glass.—The juice is white at first, afterwards it becomes green, by degrees of a gold colour, and, when old, of the colour of honey. It is at first muddy, but by degrees grows clear, and of the consistence of turpentine.—Its smell is agreeable, and very brisk: its taste bitter, sharp, and affringent; it easily dissolves in the mouth, and leaves no stain on woollen cloth.

It is suggested, that the juice brought to us for *balsam* is not properly the gum, or tears of the tree, flowing by incision, for that it yields but little that way; but that it is prepared from the wood and green branches of the tree distilled: and yet even this is frequently adulterated with Cyprus turpentine, and other resins and oils; also with honey, wax, &c.—Besides which, there is likewise a liquor extracted from the seed of the plant, which is frequently passed off for the true *balsam*, though its smell is much weaker, and its taste much bitterer. The *balsam* tree is about the height of a pomegranate tree; its leaves are like those of rue, always green; its flowers white, and in form of stars, whence spring out little pointed pods, inclosing a fruit like an almond, called *carpo-balsamum*, as the wood is called *xylu-balsamum*, and the juice *epo-balsamum*.

The fruit or *carpo-balsamum* enters the composition of Venice treacle, having little other use in medicine: it must be chosen of an aromatic taste and agreeable smell. The *xylu-balsamum*, which, like the other products of the *balsam*-tree, is brought from Cairo, is used in the troches of Hedychrous. It is brought in little faggots, the bark is red, the wood white, resinous, and aromatic. See *Xylobalsamum*.

There is likewise a *balsam* of Mecca, which is a dry, white gum, resembling white copperas, especially when old. It is brought from Mecca by the return of the Caravans of pilgrims and Mahometan merchants, who travel there out of devotion to the birth-place of their prophet. It has all the virtues of the *balm* of Gilead, or Judea; and is probably the same, only hardened, and its colour altered.

BALSAM of Peru is of three kinds; or rather, it is one and the same *balsam*, having three several names, viz. *balsam* of incision, which is a white glutinous resin, oozing at an incision in the tree, and afterwards thickened and hardened. This is excellent for green wounds, and much resembles the *opo-balsamum*, excepting in smell, which distinguishes it.—*Dry balsam*, which is distilled from the tips of branches cut off, to which are fastened little vessels to receive the liquor, which at first is like milk, but reddens by being exposed to the sun. Its chief use is in the composition of the lac virginale, which is made much better with this, than with styrax or benzoin.—Lastly, the *balsam* of *lesion*, which is blackish, and is drawn from the bark, roots, and leaves of the tree minced and boiled together. This is used in wounds like the white *balsam*; and, on account of its excellent smell, by the perfumers.

BALSAM of Copaiba, or Copivi, comes from Brasil, in earthen bottles. There are two sorts, the one bright and thin; the other thick; the first white, of a resinous smell; the other a little more on the yellow; both are admirable for wounds: the Jews use this *balsam* after circumcision to stop the blood.

BALSAM of Tolu is at first a liquid resin, which as it grows old becomes of the colour and consistence of Flanders glue. It comes by incision from some trees growing in New Spain; where the inhabitants receive it in little vessels of black wax: in taste and smell it resembles *balm* of Gilead; as it grows old it takes the consistence of a dry *balsam*.

BALSAM of liquid amber is a clear reddish resin, produced by a tree in New Spain, called by the natives *osfol*; in some degree resembling ambergrease in smell, whence its name. The new *balsam* is liquid; in which state it is called *oil* of liquid amber, and when old, *balsam* of liquid amber; it comes from both the Spains, in barrels, but the genuine is very rare among us.

It is found sovereign for wounds and ulcers, especially for fistulas in ano: it resembles *balsam* of Tolu in smell and colour, and is procured in the manner of oil of bays, from a red fruit in the island of St. Domingo.

BALSAM is also applied to certain scititious substances, made by chymists and apothecaries, chiefly of balsamic and healing ingredients, in imitation of the native *balsams*.

These are called by way of distinction, *fictitious*, or *artificial balsams*.

We have two different compositions of *balsams*, in imitation of the true, or Egyptian *balsam*; one by Matthiolus, the

other by Euricus Cordus. Pomet has also given a method of imitating many of the native *balsams*.

BALSAM of sulphur is a solution of the flowers of sulphur in some oil, it is made by boiling the two together over a soft fire the space of an hour, or till the sulphur be totally incorporated with the oil into a red *balsam*.

It is recommended both for external and internal uses, as being warm and mollifying in case of wounds, sanious ulcers, fistulas, &c. and curative even of ulcers of the lungs. Helmont, its inventor, extols it for all diseases of the breast: yet Boerhaave rejects all internal use of it, as too hot, and acrimonious. Bartholin also observes, that it sometimes causes a cardialgy.

BALSAM of Saturn is a salt, or sugar of lead, dissolved in oil or spirit of turpentine, juniper, or the like, digested, till the matter have acquired a red tincture. This is found to resist the putrefaction of humours, and is good to cleanse and cicatrize ulcers.

BALSAM, or **BALM**, among alchymists, sometimes denotes the spirit of common salt extracted in a particular manner. The preparation is thus: they dissolve the salt, and place its dissolution, well clarified, in horse-dung to putrify, for the space of two or three months, and then distil it strongly with a sand-heat; upon which there arises a precious unctuality, wherein things the most corruptible being steeped, are said to remain entire, eternally.

It is said, that it was by this means some of the ancients preserved dead bodies entire without reducing them to mummy; and particularly that of the woman mentioned by Volaterranus to be found in a mausoleum near Albano, in the time of pope Alexander VI. which was by his order thrown secretly into the Tiber, to prevent idolatry; she being found as fresh as when alive, though she had been dead 1300 years.

BALSAMIC, a term in physic, signifying that property in a medicine, whereby it is rendered soft, gently attenuating, and somewhat agglutinating.

BAN, and **BANS**. See the articles **BANN**, and **BANNS**.

ARRIERE BANN. See the article **ARRIERE**.

BANC, **BANCUS**, or **BANK**, in law, denotes a seat, or bench of judgment.

Jus BANC, or the privilege of having a bench, was anciently only allowed to the king's judges *qui summam administrant justitiam*. Inferior courts, as courts baron, hundred courts, &c. were not allowed that prerogative; and even at this day the hundred court at Freibridge, in Norfolk, is held under an oak at Gey-wood; and that of Woolfry, in Herefordshire, under an oak, near Ashton in that county, called Hundred-oak.

King's BANC, or **BENCH**, is a sovereign tribunal where the king himself formerly presided, the judges being placed in a lower bench at his feet.—The jurisdiction of this court is very extensive, and reaches throughout all England, the law supposing the king himself to be present.

Common BANC, or **common-pleas**, the second court of justice in England, where common and ordinary causes are pleaded between subject and subject.—Here most civil causes are tried, whether real or personal, according to the rigour of the law. Here are usually four judges, the chief whereof is called the *lord chief justice of the common-pleas*. Formerly there were seven judges, then six, then five, &c.

BAND, in a general sense, some small, narrow ligament, wherewith a thing is tied, or fastened.

We say, a *stay-band*, a *brow-band*, a *bat-band*, &c.

BAND, in architecture, denotes any flat, low member, or moulding.

This amounts to the same with what is otherwise called *face*, from the Latin *fascia*, which Vitruvius uses for the same thing; and sometimes *fillet*, *plinth*, &c.

BAND, in surgery, denotes a fillet, swath, or piece of linen cloth, wherewith either to cover or surround certain parts that stand in need of assistance.

Bands are the same with what are otherwise called *rollers*.

A *band*, or *roller*, when applied, becomes a *bandage*. See

BANDAGE, and **ROLLER**.

BAND also gives the denomination to a military order in Spain, instituted by Alphonius XI. king of Castile, anno 1332.

It takes its name from the *banda*, band, or red ribbon which comes a-cross over the right shoulder and under the left arm of the knight.

This order is for none but the younger sons of nobles; the eldest sons of grandes are excluded; and, before admittance, it is requisite to have served at least ten years, either in the army, or at court. They are bound to take up arms for the catholic faith against the infidels.

The king himself is grand master of the order.

BAND of soldiers, so many as fight under the same flag, or ensign.

Thus Romulus called those who fought under the same manipule, (a handful of hay being then used for a flag) *manipulus militum*. Trained-

Trained-BANDS. See the article TRAIN-BANDS.

BANDAGE, in surgery, the application of a band, swath, roller, or fillet to a part of the body; or the act of rolling, or tying a swath or band, round a part affected, and the parts adjacent, with compresses, plasters, and the like.

Of bandages there are two sorts; whereof one sort are remedies of themselves.—The other being intended only to keep the medicaments on the part, are called more particularly *Contentive Bandages*.

Incarnative BANDAGE. See the article INCARNATIVE.

BANDALEER*, or **BANDELEER**, a large leathern belt, thrown over the right shoulder, and hanging down under the left arm; wore by the ancient musqueteers, both for the fastening of their fire-arms, and for the carriage of their musket-charges; which being put up in little wooden cases, coated with leather, were hung, to the number of twelve, to each *bandaleer*.

* The word is originally French, *bandouiller*, formed apparently from *bandealer*, a kind of banditti particularly infesting the Pyreneans; who were formerly distinguished by this piece of furniture; and were themselves so denominated, *quasi ban de voliers*, a knot of robbers.

The French soldiery still retain the *bandaleer*; their horse, their musqueteers, and common guards, wearing it indifferently; excepting for some difference in its garniture.

BANDELET, or **BANDET**, in architecture, any little band or flat moulding, as that which crowns the Doric architrave.—See *Tab. Archit. fig. 1. & 28. lit. a.*

It is also called *tania*, which Vitruvius uses for the same thing: sometimes, *fillet*, *diadema*, &c.

BANDEROLL, a little flag in form of a guidon, extended more in length than breadth, us'd to be hung out on the masts of vessels, &c.

BANDET. See the article BANDELET.

BANIANS, a religious sect in the country of the Moguls, who believe a metempsychosis; and will therefore eat no living creature, nor even kill noxious animals, but endeavour to release them if they see them in the hands of others.

The *Banians* are said to be so fearful of having communication with other nations, that they break their cups if one of a different religion have drank out of them, or even touched them; and empty the water out of a pond where he has washed himself. It is added, that if they happen to touch one another, they must wash and purify themselves before they eat, or enter their own houses. They carry, hanging at their necks, a stone called *tamberan*, as big as an egg, and perforated in the middle, through which run three strings: this stone, they say, represents their great God, and upon that account they have great respect shewn them by all the Indians.

BANISHMENT, *Exile*, among us, is of two kinds: the one voluntary, and upon oath; the other by compulsion, for some offence or crime.

The former, properly called *abjuration*, is now ceased; the latter is chiefly enjoined by judgment of parliament. Yet outlawing and transportation may also be considered as species of exile.

BANK*, in commerce, is a denomination given to certain societies, or communities, who take on them the charge of the money of private persons, to improve it, or to keep it secure.

* The word *bank* in this sense, comes from the Italian *banca*, formed of the Spanish *banco*, a bench whereon the ancient money-changers sat in the public markets; or, as others think, a table whereon they told their money: for the Spanish *banco* signifies a table, as well as a bench; as among the Greeks the word *τραπέζα* signified a bench, as well as a table; whence the word *τραπέζιτης* for a benches. Guichard chuses to derive *bank* from the Latin *abacus*, a table, or cupboard.

There are several of these *banks* established in the several principal trading cities in Europe; as in Venice, London, Amsterdam, Hamburg, Paris, &c. But of all others that of Venice is the most considerable, as being the most ancient, and that whereon the others are modelled.

The *banco*, or *bank* of Venice, commonly called *banco del giro*, is properly a board of public credit and interest; or a general and perpetual purse for all merchants and traders; established by a solemn edict of the commonwealth, which enacts, That all payments of wholesale merchandise, and letters of exchange, shall be in *banca*, or *bank* notes; and that all debtors and creditors shall be obliged, the one to carry their money to the *bank*, the other to receive their payments in *banco*; so that payments are performed by a simple transfer from the one to the other: he who was before creditor on the *bank* books, becoming debtor as soon as he has resigned his right to another, who is entered down as creditor in his place; so that the parties only change name, without any effective payment being made. Indeed there are sometimes actual payments made, especially in matters of retail, and when foreigners are disposed to have ready money to carry off in specie; or when particular traders chuse to have a stock by them to negotiate in bills of exchange, &c. The necessity of these effective payments, has given occasion to the

opening a fund of ready money; which is found so far from diminishing the stock, that this liberty of withdrawing money at pleasure rather augments it. By means of this *bank*, the republic, without encroaching on the freedom of commerce, or without paying any interest, is mistress of 5000000 ducats, to which the capital of the *bank* is limited, to be in readiness on any pressing occasion; the republic being security for the capital.

Agents of BANK. } See the articles } **AGENT**.
BANK bills. } **BILL**.

BANK, or **BENCH**, in law. See **BANC**.

Days in BANK. See the article **DAY**.

Post-BANK. See **BANQUETTE**, and **FOOTBANK**.

BANKER, a person who *banks*, that is, negotiates and trafficks in money; or receives, and remits money from place to place, by means of bills or letters of exchange.

In Italy the employment of a *banker*, especially in republics, does not derogate from nobility; and hence it is, that most of the cadets, or younger sons of persons of condition, undertake it for the support of their family.

The Romans had two kinds of *bankers*, though their office was much more extensive than that of the *bankers* among us; theirs being public officers, in whom were united the functions of a broker, agent, *banker*, and notary; managing the exchange, taking in money, assisting in buying and selling, and drawing the writings necessary on all these occasions.

BANKRUPT*, a dealer who, having gotten other men's goods or money in his hands, absconds to defraud his creditors.

* The word is formed of the ancient Latin *banca*, a bench, or table; and *ruptus*, broken.

Bank, we have elsewhere observed, originally signified a *bench*, which the first bankers had in the public places, in markets, fairs, &c. on which they told their money, wrote bills of exchange, &c. Hence when a banker failed they broke his bank, to advertise the public, that the person to whom the bank belonged, was no longer in a condition to continue his business. As this practice was very frequent in Italy, it is said the term *bankrupt* is derived from the Italian *banco rotto*, broken bench.

Cowel rather chuses to deduce the word from the French *banque*, table, and *route*, vestigium, trace, by a metaphor from the sign left in the ground of a table once fastened to it, and now gone. On this principle he traces the origin of *bankrupts*, from the ancient Roman *mensarii*, or *argentarii*, who had their *tabernæ* or *mensæ* in certain public places; and who, when they fled or made off with the money that had been trusted to them, left only the sign or shadow of their former station behind them.

BANKRUPTCY, the failure, absconding, and relinquishment of traffick in a merchant, a banker, or any other trader.

The French make this difference between a *bankruptcy* and a *failure*; that the first is supposed voluntary and fraudulent, and the latter constrained and necessary, by means of accidents, &c.

A failing, breaking, or stopping of payment, diminishes the merchant's credit, but does not note him with infamy, as *bankruptcy* does.

When a merchant, &c. fails to appear at the exchange, &c. without apparent reason, it is called a *failing of presence*; the *bankruptcy* becomes open from the day he absconds, or the seal is affixed to his effects.

Commission of BANKRUPTCY. See **COMMISSION**.

BANN*, or **BAN**; **BANNUM**, or **BANNUM**, in the feudal law, a solemn proclamation, or publication of any thing.

* The origin of the word is uncertain; some deduce it from the British *ban*, clamour, noise; others from the Saxon *pan*, a thing spread; whence *ban*, and *band*, used for a flag.

Bracon mentions *bannus regis*, for a proclamation of silence anciently made by the court, before the encounter of the champions in a combat.

BANNS of marriage, are certain solemn notices of matrimonial contracts, made in the parish church, before the marriage; that if there be any exceptions to either party as to prior engagements, &c. there may bean opportunity of making them.

The publication of *banns*, (popularly called *asking in the church*) was intended as an expedient, to prevent clandestine marriages; but a licence or dispensation is now so easily procured, that their use is defeated.—By the laws of the church, *banns* are to be published thrice, on three distant days, in the places where the parties live; on pain of nullity of marriage: and excommunications are threatened against those, who knowing impediments conceal them.

BANNERETS*, an ancient order of knights, or feudal lords, who possessing several large fecs, led their vassals to battle, under their own flag, or banner, when summoned thereto, by the King.

* The word seems formed from *banner*, a square flag, or from *band*, which anciently also denoted a flag.—*Bannerets* are also called in ancient writers, *militæ vexilliferi*, and *vexillarii*, *bannerarii*, *bannarii*, *banderisti*, *banneristi*, &c.

Anciently there were two kinds of knights, *great and little*; the first whereof were called *bannerets*, the second *bachelors*; the first composed the upper; the second, the middle nobility. See **BACHELOR**.

The *banneret* was a dignitary allowed to march under his own flag, whereas the *bachelarius eques* followed that of another. To be qualified for a *banneret*, one must be a gentleman of family, and must have a power to raise a certain number of armed men; with estate enough to subsist at least twenty-eight, or thirty men. This must have been very considerable in those days, in regard each man, besides his servant, had two horsemen to wait on him, armed, the one with a cross-bow, the other with a bow and hatchet.

As he was not allowed to be a baron who had not above thirteen knights-fees, so he was not admitted to be a *banneret*, if he had less than ten.

Banneret, according to Spelman, was a middle order between a baron, and a simple knight; called sometimes also *vexillarius minor*, to distinguish him from the greater, that is, from the baron, to whom alone properly belonged the *ius vexilli*, or privilege of the square flag.

Hence the *banneret* was also called *bannerettus*, *quasi baro minor*, a word frequently used by English writers in the same sense, as *baneret* was by the French; though neither of them occur before the time of Edward II.

Some will have *bannerets* to have originally been persons who had some portion of a barony assigned them; and enjoyed it under the title of *baro proximus*, and that with the same prerogatives as the baron himself.

Some again find the origin of *bannerets* in France; others in Brittany; others in England. These last attribute the institution of *bannerets* to Conan, lieutenant of Maximus, who commanded the Roman legions in England under the empire of Gratian, in 383. This general, say they, revolting, divided England into forty cantons, and in these cantons distributed forty knights, to whom he gave a power of assembling on occasion, under their several banners, as many of the effective men as were found in their respective districts; whence they are called *bannerets*.

However this be, it appears from Froissart, &c. that anciently such of the military men as were rich enough to raise and subsist a company of armed men, and had a right to do so, were called *bannerets*. Not, however, that these qualifications rendered them knights, but only *bannerets*; the appellation of knight being only added thereto, because they were simple knights before.

Bannerets were second to none, but knights of the garter; they were reputed the next degree below the nobility; and were allowed to bear arms with supporters, which none else may under the degree of a baron. In France, it is said, the dignity was hereditary; but in England it died with the person that gained it. The order dwindled on the institution of *baronets* by king James I. and at length became extinct. The last person created *banneret* was Sir John Smith, made so after Edghill-fight, for rescuing the standard of king Charles I.

The form of the *banneret's* creation was this: on a day of battle, the candidate presented his flag to the king or general, who cutting off the train, or skirt thereof, and making it a square, returned it again, the proper banner of *bannerets*; who are hence sometimes called *knights of the square flag*.

BANNIMUS, the form of expulsion of any member from the university of Oxford, by affixing the sentence up in some public place, as a denunciation or promulgation of it.

BANQUETTE, in fortification, is a little foot-bank, or an elevation of earth forming a path which runs along the inside of a parapet; by which the musqueteers get up, to discover the counterescarp, or to fire on the enemies in the moat, or in the covert-way.

The *banquette* is generally a foot and half high, and almost three foot broad: having two or three steps to mount it by. —Where the parapet is very high, they make a double *banquette* one over the other.

BAPTISM*, in theology, the ceremony of *washing*; or a sacrament whereby a person is initiated into the Christian church, and original sin is washed away in infants, and actual sins in adults who receive it.

* The word is formed from the Greek βαπτίζω, of βαπτίζω, I dip or plunge.

The Jews practised this ceremony, after circumcision, on their proselytes, long before the coming of Jesus Christ. —For the matter of *baptism*, any natural water is held sufficient, but nothing else is allowed: for this reason pope Stephen II. excommunicated a priest for *baptizing* a child with wine. —In the primitive times this ceremony was performed by immersion, as it is to this day in the oriental churches, according to the original signification of the word. The practice of the western churches is, to sprinkle the water on the head or face of the person to be baptized, except in the church of Milan, in whose ritual it is ordered, that the head of the infant be plunged three times into the water. —A trine immersion was first used, and continued for a long time: this was to signify either the three days that our Saviour lay in the grave, or the three persons in the trinity. But it was afterwards laid aside; because the Arians used it: it was then thought proper to plunge but once, lest the heretics should think that the catholics, like them, divided the trinity. —Some are of opinion, that sprinkling in *baptism* was begun in cold coun-

tries: It was introduced into England about the beginning of the ninth century. At the council of Celchyth, in 816, it was ordered, that the priest should not only sprinkle the holy water upon the head of the infant, but likewise plunge it in the basin. —There are abundance of ceremonies delivered by ecclesiastical writers, as used in *baptism*, which are now disused; though there are not wanting those who contend for their re-admission; as the giving milk and honey to the baptized, in the east; wine and milk in the west, &c. —It appears, that in the primitive times none were baptized but adults. —Formerly there were great disputes, whether the baptism of heretics was valid. The general opinion run for the affirmative, provided it was conferred in the name of the trinity, and therefore they allowed even that given by laymen, or even by women in case of necessity. The council of Roan in 1072, ordered, that the priest should baptize fasting.

Theological authors distinguish three kinds of *baptism*. 1^o. *Water baptism*, which is that above-mentioned. 2^o. *Baptism of fire*, which is the perfect love of God, joined with an earnest desire to be baptized; called also the *baptism of the holy ghost*: on occasion this may supply the place of *water-baptism*. 3^o. *Baptism of blood*; which is the martyrdom of a catechumen. *Baptism*, in the primitive times, was only administered at Easter and Whitson-tide, except in cases of necessity. The catechumens were not forward in coming to *baptism*: St. Ambrose was not baptized before he was elected bishop of Milan; and some of the fathers not till the time of their death. Some deferred it out of a tender conscience; and others out of too much attachment to the world; it being the prevailing opinion of the primitive times, that *baptism*, whenever conferred, washed away all antecedent sins and fins. Divers of the fathers rallied this superstitious delicacy to such a degree, that they introduced a different extreme; the ridiculous zeal of some people carrying them to baptize even the dead, by proxy.

BAPTISM, or *Christening*, in the sea-language, is a ceremony in long voyages aboard merchant-ships; practised both on persons and vessels which pass the tropic, or line, for the first time.

The *christening* of vessels is simple, and consists only in the washing them throughout with sea-water: that of passengers is more mysterious; but neither the one nor the other is done without making the crew drunk; the seamen, on christening the ship, pretending to a right of cutting off the beak-head, unless redeemed by the master or captain.

The *christening* of a seaman, or passenger, is as follows: the oldest of the crew who has passed the line, or tropic, comes, whimsically dress'd, his face blacked, a grotesque cap on his head, and a waggoner or other sea-book in his hand, followed by the rest of the seamen masqued like himself, each having some kitchen utensil in his hand, with drums beating: he places himself gravely on a seat prepared on the deck, at the foot of the main-mast. At the tribunal of this mock-magistrate, each passenger, not yet initiated, swears, he will take care the same ceremony be observed, whenever he is in the same circumstance: by giving a little money, by way of gratification, he is discharged with a little sprinkling of water; otherwise, as is usually the case with the common seamen, he is heartily drenched with streams of water poured on him: the ship-boys are inclosed in a cage, and ducked at discretion; and besides, in memory of the ceremony, they are obliged to whip each other, which they never spare.

BAPTISMAL FONT. See FONT and BAPTISTERY.

BAPTIST. See ANABAPTIST, CATABAPTIST, and HEMEROBAPTIST.

Hermits of St. John BAPTIST. See HERMIT.

BAPTISTERY, in ecclesiastical writers, a place or edifice where water is preserved for persons to be baptized in.

Anciently, in the churches which baptized by immersion, the *baptistry* was a kind of pond where the catechumens were plunged; though in many places the next river served for a *baptistry*.

In after times, the *baptistry* was a little building adjoining to the church, purposely appointed for the administration of this ceremony.

There were several fonts and altars in each *baptistry*, because then they baptized a number at once, all of whom received the eucharist immediately after.

At first, these *baptistries* were only in the great cities, where bishops resided, who alone had the right of baptizing; but they afterwards allowed parishes to have fonts, for the more commodious administration of baptism. This right was confined to parishes alone; and if any monasteries were found with baptismal fonts, it was because they had baptismal churches in another place: though the bishops sometimes granted them to monks, upon condition that they would have a secular priest along with them to take care of the people; but they afterwards found means to throw off the priest, and make themselves masters of the church, and attach it, with its baptismal fonts, to their own monastery.

BAR, in a court of justice, denotes an inclosure made with a strong partition of timber, three or four foot high, where the council are placed to plead causes.

This the French call *barre d'audience*, and in some places *auditaire*. It answers to what, among the Romans, was denominated *causidica*.

B A R

It is called *bar*, because inclosed with a barrier, called also in Latin writers *cancelli* and *caulae*, by a metaphor taken from sheep-folds.

The denomination **BAR** is also given to the benches where the lawyers or advocates are seated.—The appellation arose hence, that anciently there was a *bar*, or barrier, to separate the counsellors and pleaders, from the attorneys and others. Hence our lawyers who are called to the *bar*, or licensed to plead, in other countries called licentiati, are termed *barri-sters*.

BAR, or **BARRE**, **BARRA**, in common law, denotes a peremptory exception, against a demand or plaint.

The author of the terms of the law defines *bar*, a plea brought by the defendant in an action, whereby the action of the plaintiff is destroyed for ever.—But the modern writers extend the use of the word farther, dividing *bars* into *perpetual* and *temporary*.

Perpetual BAR is that which overthrows the action for ever.

Temporary BAR, or *bar pro tempore*, is that which is allowed good for the present, but may fail or be set aside hereafter.

BARS, in the manage, denote the ridges or upper part of the gums, between the tushes and grinders of a horse; the under and outward sides retaining the name *gum*.

The *bars* should be sharp-ridged and lean; for since all the subjection a horse suffers proceeds from those parts, if they have not those qualities, they will be very little or not at all sensible; so that the horse can never have a good mouth; for if the *bars* be flat, round, and insensible, the bit will not have its effect; and consequently, such a horse can be no more governed by his bridle, than if one took hold of his tail.

BARS, in music, denote strokes drawn perpendicularly across the lines of a piece of music, including between each two, a certain quantity or measure of time, which is various as the time is triple or common.

In common time, between each two *bars* is included the measure of four crotchets, in triple time three crotchets. Their principal use is to regulate the beating, or measure of the musical time in a concert.

BAR, **BARR**, or **BARRE**, in heraldry, denotes an ordinary nearly resembling the *sefs*; from which it only differs by its narrowness, and by this, that the *bar* may be placed in any part of the field, whereas the *sefs* is confined to a single place. See **FESS**.

BAR-SHOT. See the article **SHOT**.

BARACK *, or **BARRACK**, **BARAQUE**, a hut, or little lodge for soldiers in a camp.

* The word comes from the Spanish *barracas*, little cabins which fishermen make on the sea-shore.

Those for the horse were formerly called *baracks*, and those for the foot *butts*; but *barack* is now used indifferently for both. *Baracks* are generally made by fixing four forked poles in the ground; and laying four others across them; afterwards they build up the walls with fods, wattles, or what the place affords: and the top is planked, thatched, or covered with turf, as they have convenience.

When the army is in winter quarters, the soldiers usually build *baracks*; in the summer they are content with their tents.

BARALIPTON, a term in logic, denoting the first indirect mode of the first figure of syllogisms.

A syllogism in *baralipson* is, when the two first propositions thereof are general, and the third particular; the middle term being the subject of the first, and the attribute of the second.—For example,

BA Every evil ought to be feared:

RA Every violent passion is an evil:

LIP. Therefore something that ought to be feared is a violent passion.

BARALLOTTI, **BARALOTTI**, the name of a sect of heretics at Bologna in Italy, who had all things in common, even their wives and children.—They gave very readily into all manner of debauchery, and were also termed *compliers*.

BARANGI, officers among the Greeks of the lower empire, whose business it was to keep the keys of the city-gates where the emperor resided.

Codinus says, *barangi* were those who stood guard at the door of the emperor's bed-chamber and dining-room.

BARBACAN, or **BARBICAN**, properly denotes an outer defence, or fortification to a city, or castle; used especially as a fence to the gates, or walls.

In which sense, *barbacan* amounts to the same with what is otherwise called, *antemurale*, *promurale*, *murus exterior*, or *outer wall*.

BARBACAN is also used for a fort at the entrance of a bridge, or in the outlet of a city, having a double wall with towers. Such is that at one end of the wooden bridge at Rouen, which is still called by some *Barbacana*.

BARBACAN is also used for an aperture in the walls of a city, through which to fire with muskets on the enemy. See **EMBRASURE**.

BARBACAN, in architecture, denotes a long narrow canal, or opening, left in the walls for water to come in and go out, when edifices are raised in places liable to be overflowed; or to drain off the water from a terrace, or the like.

B A R

BARBARA, in logic, the first mode of the first figure of syllogisms.

A syllogism in *barbara* is that whereof all the propositions are universal and affirmative; the middle term being the subject in the first proposition, and attribute in the second.—For example;

BA *Whoever suffers a man to starve, whom he ought to sustain, is a murderer:*

BA *Whoever is rich, and refuses to give alms, suffers those to starve whom he ought to sustain:*

RA. *Therefore, whoever is rich, and refuses to give alms, is a murderer.*

BARBARIAN *, a name given by the ancient Greeks to all those who were not of their own country, or who did not speak the Greek language.—In which sense the word signified with them no more than *foreigner*, and did not carry that odium with it, as it does now.

* Strabo derives the word βαρβαρος from βαρβαρίζω, *barbarize*, by reason foreigners coming to Athens used to stammer, or speak coarsely: others derive it from βαρβαρ, a word that foreigners frequently stumbled on, which yet had no meaning; others from the Arabic *bar*, a defect; Vossius from the Chaldee adverb נָרָא, *extra, foris*.

BARBARISM *, in grammar, denotes an offence against the purity of style or language.

A *barbarism* differs, according to Isidore, from a barbarous term, as the former, for instance, is Latin, though corrupt or misused; whereas the latter, which this writer calls *barbarologia*, is a word merely foreign, intruded into Latin speech.

BARBE, or **BARB**, in commerce, a kind of horse brought from Barbary, much esteemed for its beauty, vigour and swiftness.

Barbs are usually of a slender make, and their legs far apart. It is a maxim, That *barbs* grow ripe, but never old; because they retain their vigour to the last, which makes them prized for stallions: their mettle, according to the duke of Newcastle, never ceases but with their lives.

It is said, they were anciently wild, and run at large in the deserts of Arabia; and that it was in the time of the Cheq Ishmael, that they first began to tame them. It is said there are *barbs* in Africa that will outrun officers, such are ordinarily sold, according to Dapper, for 1000 ducats, or 100 camels. They are fed very sparingly, Dapper says with camel's milk. It is added, that in Barbary they preserve the genealogy of their *barbs*, with as much care as the Europeans do those of their noble families; and that to sell them, they always produce their titles of nobility.

The race of horses is much degenerated in Numidia; the Arabs having been discouraged from keeping it up, by the Turkish officers, who were sure to be masters of them. At present the Tingitanians, and Egyptians, have the reputation of preserving the best breed, both for size and beauty.

The smallest of these last are usually sixteen hands high, and all of them shap'd, according to their phrase, like the antelope.

The *good conditions* of a Barbary horse (besides the supposed quality of never lying down, and of standing still when the rider drops his bridle) are to have a long walk, and to stop short, if required, in a full career.

BARBE, in the military art.—To *fire en BARBE*, is to fire the cannon over the parapet, instead of through the embrasures; in which case the parapet must not be more than three foot and a half high.

BARBE, or **BARDE**, is also an old term for the armour of the horses of the ancient knights, and soldiers, who were accoutred at all points.

Della Crusca says, the *barde* is an armour of iron or leather, wherewith the neck, breast, and shoulders of the horse are covered.

BARBER. See **CHIRURGERY**.

BARBICAN. See the article **BARBACAN**.

BARBING is sometimes used in ancient statutes for sheering.

Cloth is not to be exported till it be *barbed*, rowed and shorn.

3 *Il. 7. c. 11.*

BARBOTINE, a seed, otherwise called *semen santonicum*, and *semen contra vermes*, in English *wormseed*. See **WORMSEED**.

BARDE. See the article **BARBE**.

BARDESANISTS, a sect of ancient heretics, thus denominated from their leader, Bardesanes, a Syrian of Edeffa, in Mesopotamia.

Bardesanes, born in the middle of the second century, became eminent after his conversion to Christianity, for his piety and learning; but especially for his zeal against heretics, against whom, we are informed by St. Jerome and Eusebius, he wrote a multitude of books: yet had he the misfortune to fall himself, into the errors of Valentinus, to which he added some others of his own. He taught, that the actions of men depend altogether on fate, and that God himself is subject to necessity. His followers went further, and denied the resurrection of the body, and the incarnati n and death of our Saviour; holding, that these were only apparent or phantastical.

Strunzius has given the history of the *Bardesanists*.

BARDS;

BARDS, BARDI, ancient poets among the Gauls and Britons, who described and sung in verse the brave actions of the great men of their nation; with design to inculcate and recommend virtue, and even sometimes to put an end to the difference between armies at the point of engagement.

* Bochart derives the word from *parat*, to sing. Camden agrees with Felius, that *bardus* originally signifies a singer: and adds, that the word is pure British. Others derive the word from Bardus, a druid, the son of Dryis, and the fifth king of the Celts.

The *bards* differed from the *druids*, in that the latter were priests and teachers of the nation, but the former only poets and writers.

Larrey, Bodin, and Pasquier, indeed will have the *bards* to have been priests, as well as philosophers: and Cluverius, orators too: but without much foundation in antiquity. — Strabo divides the sects of philosophers among the Gauls and Britons into three, *viz.* the druids, *bards*, and evates. The *bards*, adds he, are the singers and poets; the evates, the priests and natural philosophers; and the druids, to natural philosophy add also the moral. Hornius however reduces them to two sects, *viz.* *bards*, and druids; others to one, and make druid a general name comprehending all the others. Cluverius will have it, that there were *bards* also among the ancient Germans; because Tacitus makes mention of their songs and poems which contained their history.

BARE-footed-Trinitarians. } See the articles { TRINITARIAN.
BARE-footed-Carmelites. } CARMELITE.
BARE-pump. } PUMP.

BAR-FEE, a fee of 20 pence, which every person acquitted of felony pays the gaoler.

BARGE, a kind of state, or pleasure-boat, used chiefly in the navigation of rivers which lead to great cities.

Barges are of various kinds, and acquire various names, according to the variety of their uses and structures: as,

- A company's barge,* *A Severn-boat,*
- A rove-barge,* *A Ware-barge,*
- A royal-barge,* *A light barge,*
- A sand-barge,* *A West-country-barge.*

BARK*, the exterior part of trees, serving them for a skin or covering.

* In writers of the last age, this is sometimes also called *baf*. *Vid.* 15 *Cur.* 2. c. 2.

The *bark* of trees in general is of a spongy texture; and, by many little fibres which pass through the capillary tubes whereof the wood consists, it communicates with the pith; so that the proper nutriment of the tree, being imbibed by the roots, and carried up through the fine arterial vessels of the tree by the warmth of the soil, &c. to the top of the plant, is usually supposed to be there condensed by the cold air, and in that form returns by its own gravity down the vessels, which do the office of veins, lying between the wood and inner *bark*; leaving, as it passes by, such parts of its juice as the texture of the *bark* will receive, and requires for its support. See **WOOD**.

That soft whitish rind or substance between the inner *bark* and the wood, which Mr. Bradley thinks to do the office of veins, some account a third *bark*, only differing from the others in that its fibres are closer; 'tis this contains the liquid sap, gums, &c. found in plants in the spring and summer months. It hardens by little and little, by means of the sap it transmits, and is converted imperceptibly into the woody part of the tree. There are few trees but what have it; yet it is still found in less quantity, as the tree is more exposed to the sun: that of the oak is ordinarily about an inch thick. It is here that the corruption of trees generally begins, whence those who fell and cut out trees ought always to take care to leave as little of it on, as possible.

There are a great many kinds of *barks* in use in the several arts: some in medicine, as the *quinquina*, or *jesuit's bark*, *macrer*, *chocarilla*, &c. others in dying, as the *bark* of the alder; others in spicery, as *cinnamon*, *castia lignea*, &c. the *bark* of oak in tanning; others on other occasions, as *cork*; that of the linden-tree for cordage for wells; that of a kind of birch is used by the Indians for canoes, capable of holding twenty-four persons.

The ancients wrote their books on *barks*, especially those of the ash and tilia or lime-tree; not on the exterior or outer *bark*, but on the inner and finer, called *phlyra*; which is of so durable a texture, that there are manuscripts on it still extant a thousand years old.

In the East-Indies they manufacture the *bark* of a certain tree into a kind of stuff or cloth. It is spun and dressed much after the manner of hemp. The long filaments separated from it, upon beating and steeping it in water, compose a thread, of a middle kind between silk and common thread; neither so soft nor bright as silk, nor so hard or flat as hemp.

Some of these stuffs are pure *bark*, and are called pinasses, biam-bonnes, &c. In others they mix silk with the *bark*, and call them Gingham and Nilas: the Foutalungees too are part silk, part *bark*, and are only distinguished by being striped.

BARK-Mill. } See the articles { MILL.
Grafting in BARK. } ENGRAFTING.

BARK*, in navigation, denotes a little vessel for the sea, usually with pointed or triangular sails, in number two, or three at the most.

* The word is derived by some from the Latin *barca*; Four-nier from *Barce*, a city in Africa; and Toletanus from *Ber-celona*; others, among whom is Salmasius, from the Greek, *καπη*, a round building; Scaliger from *βαπες*, burthen. Some authors use the word *bark* for any vessel that has no masts.—Of *barks* there are various kinds: as,

- A binlander,* *A fluit,*
- A fait,* *A paul,*
- A jettee,* *A snauke.*

BARK-BINDING, a distemper incident to trees, cured by flitting the *bark*, or cutting it along the grain, *viz.* in apple-trees by cutting frait down.

BARK-GALLING is when trees are galled by thorns, or by being bound to stakes, &c. It is cured by clay laid on the galled place, and bound on with hay.

BARKING of trees is the peeling off or stripping the bark from the wood.

The month of May is the season for *barking* of trees, because then the sap loosens the bark from the wood; which it is very hard to effect in any other time, unless the fairs be very wet; heat and dryness being always opposite thereto.

Malignantly *barking* of apple-trees or other fruit-trees is made felony, by 37 *H.* 8. c. 6.

BARLEY-Sugar. See the article **SUGAR**.

BARM, otherwise called *yass*, the head or workings out of ale or beer. See **LEAVEN**.

BARNABITES, an order of religious, thus called from the church of St. Barnabas at Milan, where they were first established; and not, as some have imagined, because St. Barnabas was their patron: in reality St. Paul is the patron of the *Barnabites*.

The *Barnabites* are regular priests of the congregation of St. Paul. Their habit is black, and the same with that they wore when first established, in 1533, by the express bulls of Pope Clement VII. Their office is to instruct, catechize, and serve in missions.

BARNACLE*, in natural history, a bird of the goose kind, frequent in the western isles of Scotland; concerning whose origin and species many fables have been advanced.

* The word is also written *bernacl*, agreeably to its supposed etymon, from the Saxon *berna*, a child.

Several authors have represented the *bernacl* as the produce of a marine animal, or shell-fish: but the later naturalists on better grounds refer it to the natural manner of generation of the feathered kind; making it a real goose, produced like others *ab ovo*. See a description and draught of it in Sir Rob. Sibbald's *Nat Hist. Scot.*

The *bernacl* is the same with what is otherwise called the *Soland goose*, in Latin *anser Scoticus*; some will have it the same with the French *macreuse*, or *macrou*; and others with the *diabie de mer*, but erroneously: Dr. Robinson assigns the difference: making the *bernacl* to be of the goose, the *macreuse* of the duck, and the *diabie de mer* of the moorhen kind.—The same author shews, that the *macreuse* is no other than the *foater*, or *anas niger minor*, described by Mr. Ray and Willughby; contrary to the opinion of M. Cattier, who took it for the greater *coot* of Bellonius; and also of others, who mistook it for the puffin of the Scyllies and isle of Man; and of others with whom it passed for a kind of *calymbus* or *ducher*. See *Ray Syn. Meth. Avium*, p. 141.

BARNACLES, also denote an instrument which farriers apply to horses' noses when they will not stand quietly to be shod, blooded, dressed, or the like.

BAROCO, in logic, denotes the fourth mode of the second figure of syllogisms.

A syllogism in *baroco* has the first proposition universal and affirmative, but the second and third particular and negative; and the middle term the attribute in the two first.

For example,

- BA** Every virtue is attended with discretion:
- RO** Some kinds of zeal are not attended with discretion:
- CO** Therefore some kinds of zeal are not virtues.
- BAR** Nullus homo non est bipes:
- OC** Non omne animal est bipes:
- O** Non omne animal est homo.

BAROMETER*, a machine for measuring the weight of the atmosphere, and the variations therein, in order chiefly to determine the changes of weather.

* The word is compounded of *βαρως*, weight; and *μετρον*, measure.

The *barometer* is frequently confounded with the *baroscope*, though somewhat improperly; the latter, in strictness, being a machine that barely shews an alteration in the weight of the atmosphere: but it is one thing to know that the air is heavier at one time than at another, and another to measure how much that difference is; which is the business of the *barometer*.

The *barometer* is founded on the Torricellian experiment, as it is called from its inventor Torricelli: which is no more than a glass tube filled with mercury, hermetically sealed at one end; the other open, and immersed in a basin of stagnant

nant mercury. Now, as the weight of the atmosphere diminishes, the mercury in the tube will here descend; on the contrary, as it increases, the mercury will again ascend: the column of mercury suspended in the tube being always equal to the weight of the incumbent atmosphere; as is shewn under the word TORRICELLIAN.

Common BAROMETER.—The construction thereof is thus: a glass tube AB, (*Tab. Pneumatica, fig. 1.*) hermetically sealed in A, having its diameter about $\frac{1}{2}$ of an inch, and its length, at least, thirty-one inches, is filled with mercury so justly, as not to have any hair over it, nor any bubbles adhering to the sides of the tube; which is best done by means of a glass funnel, with a capillary tube. The orifice of the tube, filled after this manner, so as to overflow, is then closely pressed by the finger, so as to exclude any air between it and the mercury; and thus immersed in a wooden vessel, of a convenient diameter, so, however, as not to touch the bottom: at the distance of twenty-eight inches from the surface of the mercury, are fixed two plates, CE and DF, divided into three inches, and these again subdivided into any number of smaller parts.—Lastly, the tube is inclosed in a wooden frame, to prevent its being broke; and the basin, though open to the air, is cured from dirt: and the *barometar* is complet.

Many attempts have been made to render the changes in the *barometar* more sensible, and so to measure the atmosphere more accurately; which has given rise to a great number of *barometars* of different structures.—Hence the *wheel barometar*, *diagonal barometar*, *horizontal barometar*, *pendant barometar*, &c.

Des Cartes, and after him Huygens, used a tube AB, (*fig. 2.*) having a cylindric vessel CD; one half of which vessel, together with the upper part of the tube, were filled with water; the other half of the vessel, and the lower part of the tube, with mercury.—But here, though the column suspended was larger, and consequently the variation greater, yet the air, imprisoned in the water, getting loose by degrees, filled the void space in the top, and so ruined the machine.

Huygens then bethought himself of placing the mercury a-top, and the water at bottom, in the manner following: A DG, (*fig. 3.*) is a bent tube hermetically sealed in A, and open in G; the cylindric vessels BC and FE are equal, and about twenty-nine inches a-part; the diameter of the tube is about a line, that of each vessel fifteen lines, and the depth of the vessels is about ten; the tube is filled with mercury (the common *barometar* standing about twenty-nine inches) which will be suspended between the middle of the vessel FE, and that of the vessel BC; the remaining space to A, being void both of mercury and air: lastly, common water, tinged with a sixth part of aqua regis, to prevent its freezing, is poured into the tube FG, till it rises a foot above the mercury in D F.

When, then, the mercury rising above the level of that contained in FE, through the tube AD, becomes a balance to the weight of the atmosphere; as the atmosphere increases, the column of mercury will increase, consequently the water will descend; as the atmosphere again grows lighter, the column of mercury will descend, and the water ascend. This *barometar* therefore, which is the same with that of Dr. Hook, will discover much minuter alterations in the air than the common one: for, instead of two inches, the fluid will here vary two foot; and by enlarging the diameters of the cylinders, that variation may be still increased: but it has this inconvenience, that the water will evaporate, and so render the alterations precarious; though the evaporation be, in some measure, prevented by a drop of oil of sweet almonds swimming a top.—On account of this defect, others have had recourse to a

Horizontal, or rectangular BAROMETER, ABCD, (*fig. 4.*) the tube whereof is bent, in form of a square BCD; a-top of its perpendicular leg it is joined to a vessel or cistern AB; and its variation accounted on the horizontal leg CD.

Now here the interval, or space of variation, may be made of any extent at pleasure, and so the minuttest change in the air become sensible. For the diameter of the tube CD being given, it is easy to find the diameter of the vessel AB so as that the scale of descent in the tube DC shall have any given proportion to the scale of ascent in the vessel AB; this rule being, that the diameter of the vessel is to that of the tube in a triplicate reciprocal ratio of their scales.

The diameters then of CD and AB being given, together with the scale or ascent of the mercury in the vessel, the scale of mercury in the tube is found thus: as the square of the diameter of the tube is to the square of the diameter of the vessel, so, reciprocally, is the scale of mercury in the vessel, to the scale of mercury in the tube.

This and the preceding contrivance of Huygens are founded on a theorem in hydrostatics, *viz.* that fluids having the same base, gravitate according to their perpendicular altitude, not according to the quantity of their matter; whence the same weight of the atmosphere supports the quicksilver that fills the tube AD and the cistern B, as would support the mercury in the tube alone.

This last, however, with its virtues, has great defects; for, by reason of the attraction between the parts of the glass and of

the mercury, (which Dr. Jurin has shewn to be considerable) with the length of the scale, (consequently the quantity of motion) and the attrition against its sides, especially in sudden rises and descents, the mercury breaks, some parts of it are left behind, and the equality of its rise and fall ruined.—Some therefore prefer the

Diagonal BAROMETER, where the space of variation is considerably larger than in the common one, and yet the rise and fall more regular than in the others.—Its foundation is this; that in a Torricellian tube BD, (*fig. 5.*) inclined at any angle to the horizon, the cylinder of mercury equivalent to the weight of the atmosphere is, to a cylinder of mercury equivalent to the same placed in a vertical tube, as the length of the tube BC to the perpendicular height DC.

Hence, if the height DC be subtriplic, subquadruple, &c. of the length of the tube, the changes in the diagonal *barometar* will be double, or triple, &c. of the changes in the common *barometar*. This *barometar* will scarce allow its tube to be inclined to the horizon at a less angle than 45°, without undergoing the inconvenience of the horizontal one.

Wheel-BAROMETER. This was a contrivance of Dr. Hook, to make the alterations in the air more sensible; the foundation of this is the common vertical *barometar*, with the addition of a couple of weights A and B, (*fig. 5.*) hanging in a pulley, the one of them playing at liberty in the air, the other resting on the surface of the mercury in the tube, and rising and falling with it.

This is the motion of the mercury communicated, by means of the pulley, to an index which turns round a graduated circle; and thus the three inches of vertical ascent are here improved to five, or six, or more, at pleasure.

But the friction of the parts, in the pulley, and index, is so considerable, that unless the machine be made with a great deal of accuracy, it does not answer.

Pendant BAROMETER is a machine rather pretty and curious, than useful. It consists of a conical tube, placed vertically, its upper and smaller extreme hermetically sealed; it has no vessel or cistern, its conical figure supplying that defect: for when filled, like the rest, there will be as much mercury sustained as is equivalent to the weight of the atmosphere; and as that varies, the same mercury takes up a different part of the tube, and so becomes of a different weight.

Thus, when the weight of the atmosphere is increased, the mercury is driven up into a narrower part of the tube, by which means its column is lengthened, and, for the reason just given, its weight increased. Again, the atmosphere decreasing, the mercury sinks into a wider part of the tube, by which means its column is again shortened, and its pressure accordingly weakened. Thus, the same mercury is still a balance to the atmosphere under all its variations.

The inconvenience in this *barometar* is, that, to prevent the mercury and air from changing places, the bore of the tube must be very small; which smallness of the bore renders the friction so sensible, as to impede its playing.

Marine BAROMETER is likewise a contrivance of Dr. Hook, to be used at sea, where the motion of the waves renders the others impracticable. It is nothing more than a double thermometer, or a couple of tubes half filled with spirit of wine; the one hermetically sealed at both ends, with a quantity of common air inclosed; the other sealed at one end, and open at the other.

Now, the air, we know, is able to act on the spirit of wine, and raise it, two ways; the one by its gravity, as in the Torricellian tube; the other by its heat, as in the thermometer. If then the two tubes be graduated, so as to agree with each other at the time when the air is inclosed, it will easily follow, that, where-ever the two agree afterwards, the pressure of the atmosphere is the same, as that at the time when the air was inclosed. If in the thermometer open to the air the liquor stand higher, considering wital how much the other is risen or fallen from the other cause of heat or cold, the air is heavier; on the contrary, when it is lower, compared with the other, the air is lighter than at the time when the instrument was graduated.

Here the spaces answering to an inch of mercury will be more or less, according to the quantity of the air inclosed, and the smallness of the tubes; and they may be increased, almost, in any proportion.

But it must be remembered, that the density and rarity of the air, on which this machine is founded, do not only depend on the weight of the atmosphere, but also on the action of heat and cold.—This, therefore, can never be a just *barometar*; but may properly enough be called a *manoscope*, or instrument to shew the density of the air. See MANOSCOPE. Nevertheless, the instrument is said to be of good use in giving notice of all bad weather at sea, as also of venereal winds, and of the neighbourhood of ice. *Phil. Transf. N^o. 429. p. 133.*

Statical BAROMETER, or BAROSCOPE, used by Mr. Boyle, Otto de Gueric, &c. is fallacious, and liable to be acted on by a double cause: it consists of a large glass bubble, balanced by a brass weight, in a nice pair of scales: for these two bodies being of equal gravity, but unequal bulk, if the medium in which they equiponderate be changed, there will follow a

change of their weight; so that if the air grows heavier, the greater body, being lighter in specie, will loose more of its weight than the lesser and more compact; but if the medium grow lighter, then the bigger body will outweigh the less.

The most accurate *barometer* yet invented seems to be that of Mr. Cavendish; the structure whereof he describes as follows: suppose ABCD, (fig. 6.) a bucket of water, wherein is the *barometer x r e z y o s m*, consisting of a body *x r s m*, and a tube *e z y o*. The body and tube are both concave cylinders, communicating with each other, made of tin, or rather glass. The bottom of the tube, *z y*, has a lead weight to sink it, so as the top of the body may just swim even with the surface of the water, by the addition of some grain weights a-top. The water, when the instrument is forced with its mouth downwards, gets up into the tube to the height *g o*. There is added on the top a small concave cylinder, which we call the *pipe*, to distinguish it from the other at bottom, which we call the *tube*: this pipe is to sustain the instrument from sinking to the bottom. *m d* is a wire, *m s* and *d e* two threads oblique to the surface of the water, performing the office of diagonals. Now, while the instrument sinks more or less, by the alteration of the gravity of the air; there, where the surface of the water cuts the thread, is formed a small bubble, which ascends up the thread, as the mercury of the common *barometer* ascends, and *vice versa*.

This instrument, as appears from a calculation which the author gives, shews the alterations in the air more accurately than the common *barometer*, by no less than 1200 times. He observes, that the bubble is seldom known to stand still a minute; that a small blast of wind, that cannot be heard in a chamber, will make it sink sensibly; and that a cloud always makes it descend, &c.

Portable BAROMETER. See the article PORTABLE.

Phænomena of the BAROMETER.—The phenomena of the *barometer* are various; the causes assigned for them, by several authors, are widely different; nor is its use in predicting the weather yet perfectly ascertained.

On the top of Snowdon-hill, 1240 yards high, Dr. Halley found the mercury to be lower by three inches eight tenths, than at the foot thereof; whence it appears, that at every 30 yards the mercury sinks $\frac{1}{10}$ of an inch. Mr. Derham, from some experiments he made at the top and bottom of the monument, allows 32 yards perpendicular ascent, to a fall of the mercury of $\frac{1}{10}$ of an inch: whence we have not only a foundation for determining the height of the atmosphere, which, on this foundation (were it equally dense every where) would not be found more than 5 miles and $\frac{1}{10}$; but also a very accurate method of measuring the height of mountains. Thus, if on the surface of the earth the mercury be at 30 inches, at 1000 foot high, it will be at 28,91 inches; at 2000 foot, 27,86; at 3000, 26,85; at 4000, 25,87; at 5000, 24,93; at 1 mile, 24,07; at 2 miles, 20,29; at 5 miles, 11,28; at 10 miles, 4,24; at 15 miles, 1,60; at 20 miles, 0,95; at 30 miles, 0,08; at 40 miles, 0,012; though it must be observed, this is on a supposition that the atmosphere is equally dense every where.

The greatest height the mercury has been known to stand at in the *barometer*, at London, is 30 inches $\frac{3}{4}$, its least 28 inches; its greatest height at the observatory of Paris, has been found 28 inches $\frac{3}{4}$, and its least 26 $\frac{3}{4}$ of the Paris foot, which exceeds the London foot by $\frac{1}{14}$; and with these observations agree others, made at Hall, in Saxony, by Wolfius. At Algiers it rises to 30 inches $\frac{3}{4}$, or $\frac{1}{2}$, with a northerly wind, though attended with the greatest rains and tempests. *Shaw Trav. p. 218.*

It is true, there is an experiment wherein the height of the mercury is found surprizingly to exceed these numbers; mercury perfectly purged being suspended in a tube, in the Torricellian way, at the height of 75 feet; though by the least shake it falls down to the ordinary height. See an account of this phenomenon under the word TORRICELLIAN.

The phenomena of the *barometer*, Mr. Boyle observes, are so very precarious, that it is exceedingly difficult to form any general, certain rules about the rise or fall thereof. Even that which seems to hold most universally, *viz.* that, when high winds blow, the mercury is the lower, sometimes fails.

Dr. Halley gives us the following observations: that in calm weather, when the air is inclined to rain, the mercury is commonly low; in serene good settled weather, high.

That on great winds, though unaccompanied with rain, the mercury is the lowest of all, with regard to the point of the compass the wind blows on. That, *cæteris paribus*, the greatest heights of the mercury are on easterly and north-easterly winds. That after great storms of wind, when the mercury has been low, it rises again very fast.

That in calm frosty weather it stands high. That the more northerly places find greater alterations than the more southern*: and that within the tropics, and near them, there is little or no variation of the height of the mercury at all.

* For instance,—at Naples it hardly ever exceeds an inch; whereas,—at Upminster it is 2,5 inches,—at Petersburg 3,31. *Phil. Transf. n. 434. p. 407.*

Dr. Beal observes that, *cæteris paribus*, the mercury is higher in colder weather than in warm, and usually in the morning and evening higher than at mid-day.

That, in settled and fair weather, the mercury is higher than either a little before or after, or in the rain; and that it generally descends lower after rain than it was before it. If it chance to rise higher after rain, it is generally followed by a settled serenity.

That there are frequently great changes in the air, without any perceptible alteration in the *barometer*.

For the use of BAROMETERS, an ingenious author observes, that by their means we may regain the knowledge which still resides in brutes, and which we forfeited by not continuing in the open air, as they generally do; and by our intemperance, corrupting the crasis of our organs of sense.

As to the predictions from *barometers*, Dr. Halley has found, that the rising of the mercury forebodes fair weather after foul, and an easterly or north-easterly wind.

That the falling thereof portends southerly or westerly winds, with rain, or stormy winds, or both.

That, during the time of a storm, the mercury beginning to rise is a pretty sure sign that it begins to abate.

Mr. Patrick observes, that in hot weather, the falling of the mercury prefaces thunder; that when foul weather happens soon after the fall of mercury, it seldom holds long; and, the same is observed, if fair weather succeed presently after its rise.

Lastly, Mr. Derham, from a long series of *barometrical observations* made by Dr. Scheucher, at Zurich, compared with others made at the same times by himself at Upminster, observes, that throughout the whole year the mercury was lower at the former place than at the latter, by sometimes one, and sometimes two inches; though the difference at a medium he computes to be about half an inch; and thence concludes the situation of Zurich to be near $\frac{1}{2}$ of an English mile higher than that of Upminster. He found, however, a considerable harmony between the two; the one usually rising and falling, and that much or little, as the other did; though this harmony is not so exact, as has been observed in *barometers* nearer home, as at London, Paris, in Lancashire, &c.

Cause of the phenomena of the BAROMETER.—These are the chief phenomena of the *barometer*; to account for which, the hypotheses that have been framed are almost infinite.

Indeed, as the weight of the atmosphere is generally allowed to be the foundation of the *barometer*, so it is generally granted, that the alterations in the weight of the air, are the occasions of those in the *barometer*; and yet even this does not obtain universally. Dr. Lister, for instance, accounts for the changes of the *barometer* from the alterations of heat and cold.

This, he says, he has often observed, that in storms, &c. when the mercury is at the lowest, it breaks and emits small particles, which he calls a kind of *fretting*; and argues, that in all times of its descent, it is more or less on the fret.

In this disorder, he thinks, its parts are contracted and brought closer together, and for that reason descend: besides, in the *fretting* they let go little particles of air, before inclosed in them; and these rising into the top of the tube, the mercury must sink, both from the column's being shortened by their escape, and by their lying upon it. Mercury, therefore, he adds, rises either in very hot or very cold weather, between the tropics, &c. as being then in its natural state; and again, in the intermediate degrees of heat and cold it falls, as being contracted, and as it were convulsed and drawn together.—But this account, however ingenious, yet comes far short of accounting for the phenomena; nay, in some respects, it contradicts them.

The changes in the weight of the atmosphere, therefore, must be laid down as the cause of those in the *barometer*; but then, for the cause of that cause, or whence those alterations arise in the atmosphere, will be no easy matter to determine; there being, perhaps, no one principle in nature that will account for such a variety of appearances, and those too so irregular. It is probable, the winds, as driven this or that way, have a great share in them; some share too vapours, and exhalations rising from the earth, may have; some, the changes in the air of the neighbouring regions; and some, the flux and reflux occasioned in the air by the moon.

Dr. Halley thinks the winds and exhalations sufficient; and on their footing gives us a very probable rationale of the *barometer*: the substance of what may be said on that head is as follows.

1st, Then, the winds must necessarily alter the weight of the air in any particular country; and that, either by bringing together and accumulating a greater quantity of air, and so loading the atmosphere of any place; which will be the case, as often as two winds blow at the same time, from opposite points towards the same point: or, by sweeping away a part of the air, and removing some of the load, and thus giving room for the atmosphere to expand itself; which will be the case, when two winds blow at the same time, and from the same point, opposite ways: or, lastly, by cutting off the perpendicular pressure of the atmosphere; which happens, as often as any single wind blows briskly any way; it being found by experiment,

rimant, that a strong blast of wind, even made by art, will render the atmosphere lighter, and accordingly, the mercury, in a tube under which it passes, as well as in another at a distance from it, will subside considerably. See *Phil. Trans.* N^o 292.

2dly, The cold nitrous particles, and even air itself condensed in the northern parts, and driven elsewhere, must load the atmosphere, and increase its pressure.

3dly, Heavy, dry exhalations from the earth, must increase the weight of the atmosphere, and heighten its elastic force, as we find the specific gravity of menstruums increased by dissolved salts and metals.

4thly, The air being rendered heavier, from these and the like causes, is thereby the more able to support the vapours; which being likewise intimately mixed with it, and swimming every where equally throughout it, make the weather serene and fair: again, the air being made lighter, from the contrary causes, it becomes unable to support the vapours wherewith it is replete; these therefore precipitating are gathered into clouds, and those in their progress coalesce into drops of rain.

These things observed, it appears pretty evident, that the same causes which increase the weight of the air, and make it more able to support the mercury in the *barometer*, do likewise occasion a serene sky, and a dry season; and the same causes which render the air lighter, and less able to support the mercury, do likewise generate clouds and rain.

Hence, 1st, When the air is lightest, and the mercury in the *barometer* is lowest, the clouds are very low, and move swiftly; and when after rain the clouds break, and a calm sky again shines forth, being purged of the vapours, it appears exceedingly bright and transparent, and affords an easy prospect of remote objects.

2dly, When the air is heavier, and the mercury stands higher in the tube, the weather is calm, though somewhat less clear, by reason the vapours are dispersed every where equally; if any clouds now appear, they are very high, and move slowly. And when the air is heaviest of all, the earth is frequently found enveloped in pretty thick clouds, which appear to be formed out of the grosser exhalations, and which the air is then able to sustain, though a lighter atmosphere could not.

3dly, Hence it is, that with us the mercury stands highest in the coldest seasons, and when the wind blows from the north or north-east corner: for in that case there are two winds blowing towards us at the same time, and from opposite corners; there being a constant west wind found in the Atlantic ocean, at the latitude corresponding to ours. To which we may add, that in a north-wind, the cold condensed air of the northern parts is brought hither.

4thly, Hence, in the northern regions, the variation of the mercury is more sensible than in the southern ones; the winds being found both more strong, more frequent, more various, and more opposite to each other in the former than the latter.

Lastly, Hence it is, that, between the tropics, the variation of the mercury is scarce sensible; the winds there being extremely gentle, and usually blowing the same way.

Now, this account, however well adapted to many of the particular cases of the *barometer*, seems to come short of some of the principal and most obvious ones; and is, besides, liable to several objections.

For, 1st, If the wind were the sole agent in effecting these alterations, we should have no alterations without a sensible wind, nor any wind without some alteration of the mercury; both which are contrary to experience.

2dly, If two winds be supposed blowing from the same place, *viz.* London, opposite ways, *viz.* N. E. and S. W. there will be two others, blowing from opposite points, *viz.* N. W. and S. E. to the same place; which two last will balance the first, and bring as much air towards the point, as the others swept from it. Or thus, in proportion as the air is carried off N. E. and S. W. the adjacent air will crowd in from the other points, and form a couple of new currents in the direction N. W. and S. E. to fill up the vacancy, and restore the equilibrium. This is a necessary consequence from the laws of fluids.

3dly, If the wind were the sole agent, the alterations in the height of the mercury would only be relative or topical; there would be still the same quantity supported at several places taken collectively: thus what a tube at London lost, another at Paris, or at Pisa, or at Zurich, &c. would at the same time gain. But, we find the very contrary true in fact; for, from all the observations hitherto made, the *barometers* in several parts of the globe rise and fall together; so that it must be some alteration in the absolute weight of the atmosphere, that accounts for the rise and fall of the mercury.

Lastly, Setting aside all objections, these popular phenomena, the mercury's fall before, and rise after rain, seem to be inexplicable on the foot of this hypothesis: for, suppose two contrary winds sweeping the air from over London: we know that few, if any, of the winds reach above a mile high; all therefore they can do will be, to cut off a certain part of the

column of air over London: if the consequence of this be the fall of the mercury, yet there is no apparent reason for the rains following it. The vapours indeed, may be let lower, but it will only be till they come into an air of the same specific gravity with themselves; and there they will stick as before.

M. Leibnitz endeavours to supply the defects of this hypothesis with a new one of his own. He asserts, that a body immersed in a fluid only weighs with that fluid while it is sustained thereby; so that when it ceases to be sustained, *i. e.* when let fall, its weight ceases to make a part of that of the fluid; which by this means becomes lighter. Thus, adds he, the watery vapours, while sustained in the air, increase its weight; but when let fall, they cease to weigh along with it. Thus the weight of the air is diminished; and thus the mercury falls, and rain ensues.

But M. Leibnitz's principle, notwithstanding the experiment he brings to confirm it, is false, as has been evidently made appear by a counter-experiment of Dr. Desaguliers. For, a body, whether specifically equal, or lighter, or heavier than a fluid, while it is immersed in it, whether it be at rest or in motion, adds to the fluid a weight equivalent to that of an equal bulk of the fluid; as follows from that law in hydrostatics. That fluids gravitate according to their perpendicular altitudes.—However, were Mr. Leibnitz's principle true, yet it is defective; and that in the same respect with Dr. Halley's: nor would it account for the phenomena more than the other. For, supposing the vapours, by being condensed, to be put in a motion downwards, and so ceasing to gravitate with the atmosphere; they will therefore fall, till they reach a part of the atmosphere of the same specific gravity with themselves; and there they will hang as before. If the mercury fall, it will only be during the time of that descent; for these once fixed, the former gravity is retrieved; or, were it not retrieved, yet no rain would ensue the fall of the mercury.

If it might be allowed us to add any thing after such great men, it should be as follows.—Suppose any number of watery vesicles floating in any part of the atmosphere, over any determinate portion of the globe; for instance, over AB, fig. 21. If the upper vesicles be condensed by the cold of the superior regions, their specific gravity will be increased, and they will descend; the horizontal class 1, *v. gr.* to 2, 2 to 3, &c. where meeting with other vesicles not yet precipitated, they will coalesce, or run into larger vesicles, by the known laws of attraction. Or, if we rather chuse to have the wind act; let it drive either horizontally, or obliquely: in the former case, the vesicles, class 8, will be given against 9; those against 10, &c. or the oblique class A 7, driven against 5, 8 against 4, &c. By which means likewise will the particles coalesce, and form new and larger vesicles, as before; so that their number, which before was, suppose a million, will now be reduced, *v. gr.* to a hundred thousand.

But by the same coalition whereby their number is diminished, their specific gravity, if we may so call it, is increased, *i. e.* they come to have more matter in the same space, or under an equal surface; as may be easily proved from principles of geometry: for in augmenting the mass of any homogeneous body, the increase of surface does not keep pace with that of the solidity; but that of the former, is as the square of the diameter; and that of the latter, as the cube of the same.

But since the same quantity of matter is now in a less space, or under less dimensions, it will lose less of its weight by the resistance of the medium. This is evident; for a body immersed in a fluid, loses nothing of its weight but by the friction of its parts against those of the fluid; but the friction is evidently as the surface; therefore, where the surface is lessened, the resistance must be so too. Consequently, the vesicles, whose gravity before the coalition was equal to the resistance of the medium, now that resistance is diminished, will descend; and that with a velocity, in the ratio of the increase of the mass to the increase of the surface.

In their descent, as they arrive at denser parts of the atmosphere, *v. gr.* at 4, 5, &c. their mass and surface again will be increased by new coalitions; and thus, by constant fresh accessions, more than equal to the constant resistances, they will be enabled to pursue their journey through all the stages of the air, till they reach the earth; their masses exceedingly magnified; and in the form of rain.

Now that the vapours are got down, let us consider how the *barometer* must have been affected during their passage. Before any of the vesicles began to subside, either from the action of the cold, or of the wind, they all floated in the portion of the atmosphere ABCD, and all gravitated towards the centre E. Here now, each respectively residing in a part of the medium of the same specific gravity with itself, will lose as much of its weight, as is equal to that of a part of the medium of the same bulk with itself, *i. e.* each will lose all its weight. But then, whatever weight each loses, it communicates to the medium, which now presses on the surface of the earth AB, with its own weight, and that of the vesicles conjointly. Suppose then this united pressure keeps up the mercury in the *barometer* at thirty inches: By the coalition of the vesicles from the causes aforesaid, their surfaces, and consequently their friction is lessened: therefore they will communicate

less of their weight to the air, *i. e.* less than the whole; and consequently they will descend with the excess, *i. e.* with a velocity equal to the remainder, as before observed. Now, as the vesicles can act no otherwise on the surface of the earth A B, but by the mediation of the interjacent air; in proportion as their action on the medium is less, their action on the earth will be less. It is also evident, that the surface of the earth A B, must be now less pressed than before: and that in proportion, as the vesicles reserve more of their weight uncommunicated to the medium, to promote their own descent, *i. e.* in proportion to the velocity of the falling vesicles; which is, again, in proportion to their bulks. Thus, as the vesicles descend, the bulks continually increasing, the friction, and therefore the pressure on the earth, and lastly, the height of the mercury will continually decrease, during the whole time of the fall.—Hence we see, both why the vesicles, when once beginning to fall, persevere; why the mercury begins to fall at the same time; and why it continues and ceases to fall together with them: which were the great desiderata in the philosophy of the *barometer*.

I see but one objection that lies against this theory; and it is this, that the vesicles being put in motion, and striking against the particles of the medium and one another with some momentum, will meet with a considerable resistance from the *vis inertiae* thereof; by which means their descent will be retarded, and the pressure of the atmosphere retrieved; and the impetus of the moving vesicles being supposed to compensate for their loss of surface. Thus a heavy body sustained in a fluid by a hair, and moved up and down therein, presses more on the bottom, than when held at rest; which additional pressure will be the greater, as the velocity of the falling vesicles is greater; a greater impulse being required to break through the *vis inertiae* of the contiguous particles, in a less time than in a larger.

But, we have both reason and experiment against this objection: for, besides that the velocity of the vesicles, in these circumstances, must necessarily be very small, and their impulse inconsiderable; besides, that the *vis inertiae* of the air must be exceedingly weak, by reason of its extreme subtilty; and that it must be a very improper vehicle to convey an impulse to a distance, by reason of its elasticity: we find, that even in water, (a gross un-elastic medium) and a piece of lead, (a ponderous body, which falls with a great momentum) that even here the body, in its descent through the fluid, gravitates considerably less than when sustained at rest therein: in which the several experiments of Reaumur, Ramazzini, and Desaguliers, all agree.

BAROMETRICAL Phosphorus. See PHOSPHORUS.
BARON *, a dignitary who holds a barony.

* *Baron* is a term whose origin and primary import is much contested; some will have it originally denote a man, *any*; some a hero, or valiant man; some a *libertinus* or freeman; some a great or rich man; some a *vassal* or liegeman.—*Ménage* derives it from the Latin *baro*, which we find used in the pure age of that language for a stout, or valiant man: whence, according to this author, it was, that those placed next the king in battles were called *barones*, as being the bravest men in the army: and as princes frequently rewarded the bravery and fidelity of those about them with fees, the word came to be used for any noble person who holds a fee immediately of the king.—*Sidore*, and after him *Cambden*, take the word in its original sense to signify, a mercenary soldier. *Messieurs* of the Port Royal derive it from *Baro*, weight, or authority. *Cicero* uses the word *baro* for a stupid, brutal man; and the old Germans make mention of, *buffeting a baron*, *i. e.* a villain; as the Italians still use the word *barone*, to signify a beggar.—*M. de Marca* derives *baron* from the German *bar*, man, or freeman: others derive it from the old Gaulish, Celtic, and Hebrew languages: but the most probable opinion is, that it comes from the Spanish *varo*, a stout, noble person; whence wives come to call their husbands, and princes their tenants, *barons*. In the Satic laws, as well as the laws of the Lombards, the word *baron* signifies a man in the general; and the old Glossary of *Philomenus* translates *baron* by *avis*, man.

BARON is more particularly used among us for a lord, or peer of the lowest class; or a degree of nobility next below that of a viscount, and above that of a knight, or a baronet.

Barons are lords of parliament, and peers of the realm, and enjoy all the privileges thereof.—They are not girt with a sword at their creation, nor had they any coronets till the reign of King Charles II. who gave them a circle of gold with six pearls set close to the rim.

In ancient records, the word *barons* included all the nobility of England, because regularly all noblemen were *barons*, tho' they had also a higher dignity.—And therefore the charter of king Edward I. which is an exposition of what relates to *barons* in Magna Charta, concludes, *testibus archiepiscopo, episcopis, baronibus, &c.* And the great council of the nobility, when they consisted of, besides earls and *barons*, dukes, marquises, &c. were comprehended under the name of *la conseil de baronage*.

BARONS by ancient tenure were those who held certain territories of the king, who still reserved, the tenure in chief to himself. We also read of *barons by temporal tenure*; who are such

as hold honours, castles, manors, as heads of their *barony*, that is, by grand feignancy; by which tenure they were anciently summoned to parliament. But at present a *baron* by tenure is no lord of parliament, till he be called thither by writ. The *barons* by tenure, after the conquest, were divided into *majores*, and *minores*, and were summoned accordingly to parliament; the *majores*, or greater *barons*, by immediate writ from the king; the *minores*, or lesser *barons*, by general writ from the high sheriff, at the king's command.

The ancients distinguished the greater *barons* from the less, by attributing high, and even sovereign jurisdiction to the former, and only inferior jurisdiction over smaller matters to the latter.

BARONS of the exchequer are judges, four in number, to whom the administration of justice is committed in causes between the king and his subjects, touching matters belonging to the exchequer, and the king's revenue.

They are called *barons*, because *barons* of the realm were used to be employed in that office.

Their office is also to look to the accounts of the king; to which end they have auditors under them; as well as to decide causes relating to the revenue, brought by any means into the exchequer. So that of late they have been constantly persons learned in the law; whereas formerly they were *majores & discretiores in regno, sive de clero essent, sive de curia*.

BARONS of the cinque-ports, are members of the house of commons elected by the five ports, two for each port.

Those who have been mayors of Corfe-castle in Dorsetshire, are also denominated *barons*.—As were formerly, likewise, the chief citizens of London.

BARON is also used for the husband, in relation to the wife; which two in law are called *baron and feme*. See HUSBAND and WIFE.

BARON and feme, in heraldry, is when the coats of arms of a man and his wife are borne per pale in the same escutcheon; the man's being always on the dexter side, and the woman's on the sinister.—But here the wife is supposed not an heiress; for then her coat must be borne by the husband on an in-escutcheon, or escutcheon of pretence.

COURT-BARON. } See the articles } COURT.
Prender of BARON. } **PRENDER.**

BARONET, among modern writers, denotes a dignity, or degree of honour next beneath a baron, and above a knight; having precedency of all knights, excepting those of the garter.

The dignity of *baronet* is given by patent, and is the lowest degree of honour that is hereditary. The order was founded by king James I. in 1611, when 200 baronets were created at once; to which number, by the patent, they were always to be restrained. Though, it is said, there are now four times that number.

They had several considerable privileges given them, with an habendum to them and their heirs male. They were allowed to charge their coat with the arms of Ulster, which are, in a field argent a hand gules; and that upon condition of their defending the province of Ulster, in Ireland, against the rebels, who then harassed it extremely; to which end, they were each to raise and keep up thirty soldiers, at their own expence, for three years together; or to pay into the exchequer a sum sufficient to do it; which at 8*d.* per day per head, was 1095*l.* now always remitted them.

Baronets take place according to the dates of their patents; by the terms of which, no honour is to be erected between *barons* and *baronets*.

The title *Sir* is granted them by a peculiar clause in their patents, though they be not dubbed knights.—But both a *baronet*, and his eldest son being of full age, may claim knighthood.

BARONIE Caput. See the article CAPUT.

BARONY, BARONIA, or BARONAGIUM, the lordship, or fee of a baron, either temporal or spiritual. See BARON.

In which sense *barony* amounts to the same with what is otherwise called *honour*.

A *barony* may be considered as a lordship held by some service in chief of the king *, coinciding with what is otherwise called *grand feignancy*.

* *Baronias*, in their first creation, moved from the king himself, the chief lord of the whole realm: and could be holden immediately of no other lord: for example; The king enfeoffed a man of a great feignancy in land; to hold to the person enfeoffed and his heirs, of the king and his heirs, by baronial service, to wit, by the service of twenty, forty, sixty knights, or of such other number of knights, either more or fewer, as the king by his enfeoffment limited or appointed.—In the ages next after the conquest, when a great lord was enfeoffed by the king of a large feignourie, such feignourie was called a *barony*; but more commonly, an *honour*; as, the *honour* of Gloucester, the *honour* of Walsford, the *honour* of Lancaster, the *honour* of Richmond, and the like. There were in England certain *honours* which were often called by Norman or other foreign names, that is to say, sometimes by the English, and sometimes by the foreign name. This happened when the same person was lord of an *honour* in Normandy, or some other foreign country, and also of an *honour* in England. For example: William de Forz, De Force, or De Foribus, was lord of the *honour* of Albenarie in Normandy,

Normandy. He was also lord of two honours in England, to wit, the honour of Holderness, and the honour of Skipton in Craven. These honours in England were sometimes called by the Norman name, the honour of Albemarle, or the honour of the earl of Albemarle. In like manner, the earl of Britannie was lord of the honour of Britannie in France, and also of the honour of Richmond in England. The honour of Richmond was sometimes called by the foreign name, the honour of Britannie, or the honour of the earl of Britannie. This serveth to explain the terms, honour of Albemarle in England, honor Albemarle, or Comitatus Albemarle in Anglia; honor Britannie, or Comitatus Britannie in Anglia, the honour of Britannie, or of the earl of Britannie in England. Not that Albemarle or Britannie were in England; but that the same person respectively was lord of each of the said honours abroad, and each of the said honours in England. See *Madox, Hist. of Land hon. and baronies.*

The baronies belonging to bishops are, by some, called *regalia*, as being held solely on the king's liberality. These do not consist in one barony alone, but in many; for, *tot erant baronie, quot majora preidia.*

A barony, according to Bracton, is a right indivisible: wherefore, if an inheritance be to be divided among coparceners, though some capital messuages may be divided, yet, if the capital messuage be the head of a county, or barony, it may not be parcelled; and the reason is, lest by this division, many of the rights of counties and baronies, by degrees, come to nothing, to the prejudice of the realm; which is said to be compelled of counties and baronies.

BAROSCOPE *, a machine contrived to shew the alterations in the weight of the atmosphere. See *BAROMETER.*
* The word is derived from *βαροσ, onus, and σκοπειν, video.*

BARR. See the article *BAR.*

BARRATOR *, in law, a common mover, or maintainer of suits, quarrels, or parties, either in courts or elsewhere.

* The word is also written, *barator, barrator, and barretour.* Lambert derives it from the Latin *baratro, or bulatro, a vile knave or unskilful.* Skene from the Italian *barrataria, corruption, or bribery in a judge.* Menage from the French *burrator, of the old word burry, a trick.*

BARRATRY, in a marine sense, is the master of a ship's cheating the owners or insurers, whether it be done by running away with the ship, sinking her, deserting her, or embezzeling the cargo.

BARRE. See the article *BAR.*

Ports de BARRE. See the article *PORT.*

BARREL, an oblong vessel, of a spheroidal, or rather a cylindrical figure, used for the holding divers sorts of goods, both liquid and dry.

The English barrel, wine measure, contains the eighth part of a tun, the fourth part of a pipe, and the moiety of a hoghead, that is, thirty-one gallons and a half; of beer it contains thirty-six gallons; and of ale thirty-two gallons.

The barrel of beer, vinegar, or liquor preparing for vinegar, is to contain 34 gallons, according to the standard of the ale quart. 10 *E. 11 W. III. c. 21.*

The barrel or barrille of Florence is a liquid measure containing twenty saiques, staks, or one third of a star or staio.—The barrel, barique of Paris, contains two hundred and ten pints, or twenty-six septiers and an half; four bariques make three muids, or one tun.—The barrel is half a pipe.

BARREL is also used for a certain quantity, or weight, of several merchandizes; which is various as the commodities vary.

The barrel of herrings is to contain 32 gallons, wine measure; being about 28 gallons old standard: usually amounting to about 1000 full herrings. 13 *Eliz. c. 11.*

The barrel of salmon is to contain 42 gallons. 5 *G. c. 18.*—

And the barrel of eels, the same. 22 *Ed. 4. c. 2.*

The barrel of soap, is to contain 250 pounds. 10 *A. c. 19.*

BARREL, in anatomy, denotes a pretty large cavity situated behind the drum of the ear, lined with a membrane, in which there are several veins and arteries. It is said to be full of a purulent matter in children; and in its cavity there are four small bones; viz. the malleolus, the incus, the stapes, and the os orbiculare. See *EAR.*

BARRENNESS. See the article *STERILITY.*

BARRICADE, or BARRICADO, a military term for a fence, or retrenchment, hastily made with vessels or baskets of earth, carts, trees, palisades, or the like, to preserve an army from the enemy's shot, or assault. See *DEFENCE.*

The most usual matter of barricades is pales or stakes, which are crossed with battoons, and shod with iron at the feet: usually set up in passages, or breaches, to keep back as well the horse as foot.

BARRIER, a kind of fence made at a passage, retrenchment, gate, &c. to stop up the entry thereof. See *DEFENCE.*

It is usually made of great stakes, about four or five foot high, placed at the distance of eight or ten foot from one another, with overthwart rafters; serving to stop either horse or foot that would rush in.—In the middle is a moveable bar of wood, which opens and shuts at pleasure.

BARRIERS, has been likewise used to signify a martial exercise of men, armed and fighting together with short swords, with-

in certain rails or bars, whereby they were inclosed from the spectators.

BARRISTER *, a person qualified and impowered to plead and defend the causes of clients, in the courts of justice.

* The word is formed from *bar, barra, a name given the place where they stand to plead.*

Barristers, in the English law, amount to the same with *licentiats*, and *advocates*; in other countries and courts, where the civil, &c. laws obtain.

Anciently they were denominated among us, *apprentices of the law, apprenticii juris*; now usually, *counsellors at law.*

To pass *barristers* they were formerly obliged to study eight years, now only seven, and sometimes fewer. The exercise required was 12 grand moots performed in the inns of chancery in time of the grand readings, and 24 petty moots at the inns of chancery in term-time, before the readers of the respective inns of chancery.

Utter barristers, according to some, are pleaders without the bar; they are thus called to distinguish them from benchers, or those who have been readers, who are admitted to plead within the bar; hence called *inner barristers*. 5 *El. c. 1.*

BARRULET, in heraldry, is the half of the closet, or the quarter of the bar.

BARRY, in heraldry.—When an escutcheon is divided barways into an even number of partitions, and consists of two or more tinctures interchangeably disposed, it is expressed in blazon by the word *barry*, and the number of pieces is to be specified.—e. gr. *Barry of six* many pieces.

If the divisions be odd, the field must be first named, and the number of bars expressed.

BARRY-BENDY is when an escutcheon is divided evenly both bar and bend-ways, by lines drawn transverse and diagonal, interchangeably varying the tinctures of which it consists.—Thus, he bears *barry-bendy, or and fable.*—See *Tab. Herald. fig. 4.*

BARRY-PILY, is when a coat is divided as represented in *Tab. Herald. fig. 5*; which is blazoned, *barry-pily* of eight pieces.

Counter-BARRY. See the article *COUNTER.*

BARTERING *, the act of trucking or exchanging one commodity for another of like value. See *EXCHANGE.*

* The word comes from the Spanish *baratar*, to deceive or circumvent in bargaining; perhaps because those who deal this way usually endeavour to over-reach one another.

This is also called *bartry*, 13 *Eliz. c. 7.*

BARTHOLOMEW'S Hospital. See *HOSPITAL.*

BARTON, in Devonshire, and the West of England, is used for the demesne-lands of a manor.—Also for the manor-house.—And in some places, for out-houses, fold-yards, &c.

BAS-Relief. See the article *BASSO-Relievo.*

BASALTES *, *Βασαλιτις*, a kind of stone, described by the ancient naturalists, as of the hardest and colour of iron.

* Pliny, and others after him, write the word *basaltes*; Sal-

matius corrects it, *basalites, Βασαλιτις λιθου.*

The largest block of this stone that ever was seen, Pliny says, was placed by Vespasian in the temple of Peace: in it were represented the figure of Nilus, with 16 children playing about her, denoting so many cubits of its rise: He adds, that the statue of Memnon, in the temple of Serapis, at Thebes, which resounded at the rising of the sun, was also made of this stone. How this miraculous kind of resonance was caused seems indicated by Juvenal, *Sat. 15. v. 5.*

—*Dimidia magicæ resonant ubi Memnonæ chordæ*—

Most of the antique Egyptian figures remaining are also apparently of the same stone.

Some of the ancients call it *lapis Lydius*, from Lydia, the place where it was found in most abundance; and among the moderns it is denominated the *touch-stone*, as being used for the trial of gold and silver.

It is hard, heavy, close, black, and resists the file; and had its name from *basal*, iron; or *Βασαλιτις, diligenter examina.*—Delechampius says, there are stones of the same kind near Gaillon in Normandy; others are brought from Ethiopia and Germany.—The giants causeway in Ireland is composed of the *basaltes*. See *SUPPLEMENT, article BASALTES.*

BASE, BASIS, in architecture, denotes the lower part of a column or pedestal.

The *base* is sometimes also called *spira*, from *spiræ*, the folds of a serpent laid at rest, which make a figure not unlike it.—See *Tab. Archit. fig. 24. lit. 2. fig. 26, 28, 30, 32.*

BASE of a Column is that part between the shaft and the pedestal, if there be any pedestal; or, if there be none, between the shaft and the plinth, or zocle.

The *base* is supposed to be the foot of the column; or, as some will have it, it is that to a column which a shoe is to a man.—The members or ornaments whereof it is composed are supposed by some to have been originally intended to represent the iron circles wherewith the feet of trees and posts which supported the ancient houses were girt, in order to strengthen them.

The *base* is different in the different orders.—The Tuscan *BASE* is the most simple of all others; consisting only of a single torse besides the plinth.—See *Tab. Archit. fig. 24. lit. 1.*

Doric BASE has an astragal more than the Tuscan; though that was introduced by the moderns. See fig. 28.

Ionic BASE has a large tore over two slender scotias, separated by two astragals; though in the most ancient monuments of this order there are no *bases* at all; which the architects are at a loss to account for. See fig. 32.

Corinthian BASE has two tores, two scotias, and a fillet.—See fig. 26.

Composite BASE has an astragal less than the Corinthian. See fig. 30.

Attic, or *Attic* BASE, so called, because first used by the Athenians, has two tores and a scotia.

BASE, in fortification, denotes the external side of the polygon; or, that imaginary line which is drawn from the flanked angle of a bastion to that which is opposite thereto.

Line of the Base. See the article LINE.

BASE of a *figure*, in geometry, denotes the lowest parts of its perimeter.

In which sense, the *base* stands opposed to the *vertex*, which denotes the highest part.

BASE of a *triangle*: any side thereof is occasionally so called; though properly it is the lowest side, or that which lies parallel to the horizon.

Thus, the line AB is the *base* of the triangle ABC, *Tab. Geom. fig. 68*. Not, but on other occasions, the lines AC, or BC in the triangle, may be made the *base*.

In a rectangled triangle, the *base* is properly that side opposite to the right angle, i. e. the hypotenuse.

BASE of a *solid figure* is its lowest side, or that whereon it stands.

Thus the plane DFE, is the *base* of the cylinder ABDE.—*Tab. Geom. fig. 56*.

BASE of a *conic section* is a right line in the hyperbola and parabola, formed by the common intersection of the secant plane, and the *base* of the cone.

Alter BASE. See the article ALTERN.

Distin BASE, in optics. See DISTINCT.

BASE of the *heart*, in anatomy, denotes the broader or upper part of that viscus, to the sides of which the two auricles are affixed.—See *Tab. Anat. (Splanchn.) fig. 12. litt. aa, and cc*.

This is sometimes also called the vertex or head, *κεφαλή*; in opposition to which, is the lesser or narrower part, called *apex*, or *muera*, the point or tip of the heart.

Some also give the denomination *base*, to the root of the os hyoides.

BASE, in music. See the article *BASE*.

BASE, in a law sense.—*Base estate* is that estate which base tenants have in their lands.

BASE *Fee* denotes a tenure in fee at the will of the lord. By which it stands distinguished from *focage* or free tenure. See *FE*.

BASE *Court* is any court not of record.—Such, e. gr. is the court-baron. See *COURT*.

BASE *Tenure*, *Bassa Tenura*, denotes holding by villenage, or other customary service; as distinguished from the higher tenures in capite, or by military service.

BASE *Point* in heraldry. See *POINT* and *ESCUTCHEON*.

BASE *Ring of a cannon* is the great ring next behind the touch-hole.

BASHAW, PASCHA, or PACHA, a Turkish governour of a province, city, or other district.

We say, the *bashaw* of Babylon, the *bashaw* of Anatolia, the *bashaw* of Bender, &c.

RASHAWS include Beglerbegs, and sometimes Sangiacbegs: though a distinction is sometimes made, and the name *bashaw* is appropriated to the middle sort, or such as have two ensigns or horse-tails carried before them.—Those who have the honour of three tails, are called *Beglerbegs*; and those who have only one, *Sangiacbegs*.

The appellation *Pascha* is also given by way of courtesy at Constantinople, to the lords about the Grand Signor's court, the officers in the army, and almost every person of any figure.

Captain BASHAW is the title of the Turkish high admiral.

BASIA *Ultima*. See the article *ULTIMA*.

BASIL, among joiners, denotes the angle to which the edge of an iron tool is ground.

To work on soft wood they usually make their *basil* 12 degrees, for hard wood 18; it being observed, that the more acute or thin the *basil* is, the better and smoother it cuts; and the more obtuse, the stronger and fitter it is for service.

Order of St. BASIL is the most ancient of all the religious orders; it takes its name from St. Basil, bishop of Casarea, in Cappadocia, about the middle of the fourth century; who is supposed to have been the author of the rule observed by this order, though some dispute it.—The order of St. *Basil* was anciently very famous in the east.

BASILARE *O*. See the article SPHENOIDES.

BASILIC *, or BASILICA, in the ancient architecture, denotes a kind of public hall or court of judicature,

where the princes or magistrates sat to administer justice.

* The word is originally Greek, *Βασιλική*, q. d. royal house, or palace.

In after-times the denomination *basilica* was also given to other buildings of public use, as town-houses, exchanges, burles, and the like.

BASILIC, BASILICA, is also used in ecclesiastical writers, for a church.

In which sense, this name frequently occurs in St. Ambrose, St. Austin, St. Jerom, Sidonius Apollinaris, and other writers of the fourth and fifth centuries.

M. Perrault says, that *basilics* differed from *temples*, in that the columns of temples were without-side, and those of *basilics* within.

BASILICA, or BASILICUS, in anatomy, the name of a vein, arising from the axillary branch, and running the whole length of the arm. See *Tab. Anat. (Angiol.) fig. 6. litt. o*.

The *basilica* is one of the veins used in bleeding in the arm.

BASILICS, BASILICA, a collection of the Roman laws, translated into Greek by order of the emperors Basil and Leo, and which were of force in the Eastern empire till its dissolution.

The *basilics* comprehend the institutes, digests, code, and novels, and some edicts of Justinian, and other emperors. The collection consisted of 60 books, for which reason it was called *ἑξήκονταβιβλίων*. It is supposed to be chiefly the work of the emperor Leo the philosopher, who denominated it from his father Basilus Macedo, who first began it.—Of the 60 books there are now remaining only 41; the other 19 are, in some measure, supplied by Fabrotus, from the *synopsis basilicon*, &c.

BASILICI, *Βασιλικοί*, in the Greek empire, was a denomination given to the prince's mandararies, or those who carried his orders and commands.

BASILICON, or BASILICUM, in pharmacy, is the denomination of an official unguent or plaster; called also *terro-pharmacum*, as being composed of four simples, viz. rosin, wax, pitch, and oil olives.

BASILICUS, or BASILICA, in astronomy, is the name of a fixed star of the first magnitude, in the constellation Leo; called also *regulus*, and *cor leonis*.

BASILIDIANS, ancient heretics, the followers of Basilides, an Egyptian, who lived near the beginning of the second century.

He was educated in the Gnostic school, over which Simon Magus presided; with whom he agreed, that Christ was only a man in appearance, that his body was a phantom, and, that he gave his form to Simon the Cyrenian, who was crucified in his stead.

We learn from Eusebius, that this heresiarch wrote 24 books upon the gospels, and that he forged several prophets; to two of which he gave the names Barcaba, and Barcopel. We have still the fragment of a Basilidian gospel.

His disciples supposed there were particular virtues in names, and taught, with Pythagoras and Plato, that names were not formed by chance, but naturally signified something.—Basilides, to imitate Pythagoras, made his disciples keep silence for five years.

BASIOGLOSSUM *, or rather BASIGLOSSUM, in anatomy, a pair of muscles, which arise fleshy from the basis of the os hyoides, and are inserted into the root of the tongue; serving to draw the tongue towards the bottom of the mouth.

* The word comes from the Greek, *βασίς*, foundation; and *γλῶσσα*, a tongue.

BASIS, or BASE. See the article *BASE*.

BASON, *pelvis*, in anatomy, a round cavity in form of a tunnel, situate between the anterior ventricles of the brain, descending from its base, and ending in a point at the glandula pituitaria.

It is formed of the pia mater, and receives the pituita which comes from the brain, and passes through the pituitary gland, and from thence into the veins.

That capacity also is called *pelvis*, or *bason*, which is formed by the ossa ilia and sacrum, and contains the bladder of urine, the matrix, and the intestines.

BASONS of a *Balance*, two pieces of brass, or other matter, fastened to the extremities of the frings; the one to hold the weight, the other the thing to be weighed.

BASON, or *Dish*, among glass-grinders.—These artificers use various kinds of *basons*, of copper, iron, &c. and of various forms, some deeper, others shallower, according to the focus of the glasses that are to be ground. In these *basons* it is, that convex glasses are formed, as concave ones are formed on spheres or bowls.

Glasses are worked in *basons* two ways.—In the first, the *bason* is fitted to the arbor, or tree of a lathe, and the glass (fixed with cement to a handle of wood) presented and held fast in the

the right hand within the *basin*, while the proper motion is given by the foot to the *basin*.—In the other, the *basin* is fixed to a stand or block, and the glass with its wooden handle moved.

The moveable *basins* are very small, seldom exceeding five or six inches in diameter; the others are larger, sometimes above ten foot diameter.

After the glass has been ground in the *basin*, it is brought smoother with greafe and emery; and polished first with tripoli, and finished with paper cemented to the bottom of the *basin*.

BASON, among hatters, is a large, round shell, or case, ordinarily of iron, placed over a furnace; wherein the matter of the hat is moulded into form.

The hatters have also *basons* for the brims of hats, usually of lead, having an aperture in the middle, of a diameter sufficient for the largest block to go through. See **HAT**.

BASON is also used on various occasions for a small reservoir of water: as the *basin* of a jet d'eau, or fountain; the *basin* of a port, of a bath, &c. which last Vitruvius calls *labrum*. See **FOUNTAIN**.

BASON is likewise used for a dock. See **DOCK**.

BASS*, in music, that part of a concert which is the most heard, which consists of the gravest, deepest and longest sounds; or which is played on the largest pipes or strings of a common instrument, or on instruments larger than ordinary, for the purpose.

* It is called *bass*, from the Italian *basso*, of the Latin *bassus*, as being the foundation of the harmony.

Musicians hold the *bass* the principal part of a concert, and the foundation of the composition: though some will have the *treble* the chief part; which others only make a circumstance, or ornament.

Counter-BASS, is a second bass, where there are several in the same concert.

Thorough-BASS, is that which proceeds, without interruption, from the beginning of a musical composition to the end.—By which it stands contradistinguished from the *singing bass*, and the *basses of violins*, which make pauses from time to time.

The *thorough bass* is the harmony made by *bass* viols, theorbo's, or the like, continuing to play, both while the voices sing, and the other instruments perform their part; and also filling the intervals when any of those stop.

M. Broffard observes, the *thorough bass* to be a part of the modern music; first invented in 1600, by an Italian, called Ludovico Viadana.

It is commonly distinguished from the other *basses* by figures over the notes; which figures are proper only for the organ, harpsicord, spinet, and theorbo lute.—But it is to be observed a *thorough bass* is not always figured, though it ought to be so.

BASSON, or **BASSOON**, a musical instrument of the wind kind, blown with a reed, and furnished with eleven holes; serving for the *bass* in concerts of hautboys, &c.

To make it more portable, it divides into two parts, whence it also bears the denomination *fagot*. Its diameter at bottom is nine inches, and its holes are stopped, like those of large flutes.—A good *bassoon* is said to be worth four or five hundred pistoles.

BASSO rilievo, or **BAS relief**, a piece of sculpture, the figures whereof do not project far, or stand out from the ground with their full proportion.

M. Felibien distinguishes three kinds of *reliefs*; in the first, the front figures appear almost with their full *reliefs*, called *alto rilievo*; in the second, they do but stand out one half, called *mezza rilievo*; and in the third, much less, which is the proper *basso rilievo*, as in coins, vases, &c. See **RELIEVO**.

BASSO & alto, in law. See the article **ALTO**.

BASS-VIOL, a musical instrument of the same form with that of the violin, except that it is much larger.—It is struck like that, with a bow; and has strings, and eight stops, divided by half stops, or semi-tones.

The sound it yields is much more grave, sweet, and agreeable than that of the violin, and of a much nobler effect in a concert. See **VIOLIN**.

BASTARD, a natural child, or one born out of lawful wedlock.

A *bastard* differs from one born in adultery, or incest, in that the parents of the former are free, or allowed to marry, which those of the latter are not.

The *bastards*, or natural sons of a king in France, are princes when owned; those of a prince, or nobleman, are gentlemen; but those of a gentleman are only plebeians, and pay taxes accordingly.

By the French laws, *bastards* cannot inherit before they are legitimated; nor have heirs, except their own children begot in wedlock: for want of these, their inheritance devolves on the king.

By the Roman law, the mother inherited from her *bastard* child, and *vice versa*: but there was a great difference between *bastards*, *natii*, and those they called *spurius*. The law did not own the latter, nor allow them sustenance, because they were born in common and uncertain prostitution. *Is non habet patrem, cui pater est populus*. The former sort, born

in concubinage, which resembles marriage, inherited from their mothers, and had a right to demand sustenance of their natural fathers. They were looked upon as domestic creditors, that ought to be treated the more favourably, for being the innocent product of their parents crimes. Solon would have it, that the parents should be deprived of their paternal authority over their *bastards*, because, as they were only parents for pleasure, that ought to be their only reward.

Anciently, in Rome, natural children were quite excluded from inheriting after their fathers *ab intestato*: but they might be appointed heirs in general. The emperor Arcadius and Honorius made a restriction, that when there were legitimate children, the *bastards* should only come in for a twelfth, to be shared with their mother. Justinian afterwards ordered, that they might come in for half; and succeed *ab intestato* for a sixth, when there were legitimates.

Bastards might be legitimated by subsequent marriage, or by the emperor's letters. Only the king in France, and the king and parliament in England, can give *bastards* a right of legitimacy, and a power to inherit. The emperor Anastasius allowed fathers to legitimate their *bastards* by adoption alone: but this was abolished by Justin and Justinian, left by this indulgence they should authorize concubinage. The pope has sometimes legitimated *bastards*. Nay, the holy see has on some occasions dispensed not only with illegitimacy, but with the offspring of adultery, as to spiritual considerations, in allowing of their promotion to episcopacy.

Bastards not legitimated may dispose of their goods by donation when alive, or by will afterwards. Those legitimated by subsequent marriage are in the same state, and enjoy the same right with those born in wedlock: but, those who are legitimated by the king's letters, are not esteemed legitimate, or capable of inheriting, but with regard to such of their parents as have consented to their legitimation. Pope Clement VII. by his bull, forbade a priest to resign his benefice to his *bastard*.

A *bastard's* arms should be crossed with a bar, fillet, or traverse from the left to the right. They were not formerly allowed to carry the arms of their father, and therefore they invented arms for themselves; and this is still done by the natural sons of a king.

Bastards cannot be admitted to simple benefices, or the lowest orders, or to more than a simple benefice, without orders from the pope: nor are they allowed to bear office without the prince's letters.

A *bastard*, by the law of England, cannot inherit land as heir to his father; nor can any person inherit land as heir to him, but one that is heir of his body. If a child be begotten by him who doth marry the woman after the child's birth, yet it is in judgment of the law a *bastard*, though the church holds it legitimate.—If one marry a woman and die before night, and never bed her, and she have a child after, it is yet accounted his child, and legitimate.—If a man or woman marry again, and have issue by the second wife or husband, whilst the first is living, such issue is a *bastard*. If a woman elope with a stranger, and have a child by him, her husband being within the four seas, this is legitimate, and shall inherit the husband's lands.—He that gets a *bastard* in the hundred of Middleton, in Kent, forfeits all his goods and chattels to the king.

BASTARD diseases, &c. See **SPURIOUS**.

BASTARD dittany, &c. See **DITTANY**.

BASTERNA*, a kind of vehicle, or chariot, used by the ancient Roman ladies.

* Papias thinks, that *basterna* was first wrote for *osterna*; Rolweid says, it should be *vite sterna*, which he couleades from Sidoro, who says, *bysteria, vite sterna*. But the word seems better derived from the Greek *βασταρα, ποτι, Ι* carry.

Salmasius observes, that the *basterna* succeeded the *lectica*, or litter; from whence it differed very little, except that the litter was borne on the shoulders of slaves, and the *basterna* borne or drawn by beasts. Caustabon says, it was borne by mules. F. Daniel, Mabillon, &c. assert it was drawn by oxen, to go the more gently: and Gregory de Tours gives an instance of its being drawn by wild bulls. The inside they called the *cavea*, or cage: it had soft cushions or beds, besides glasses on each side, like our chariots.

The mode of *basterna's* passed from Italy into Gaul, and thence into other countries; and to this we owe our chariots; which, though we call them *currus*, yet have they no conformity to the ancient *currus*, but are in effect *basterna's* improved.

The *basterna* appears also to have been used in war, for carrying of baggage.

BASTILE denotes a small antique castle, fortified with turrets. Such is the *bastile* of Paris, which seems the only castle that has retained the name: it was begun to be built in 1369, by order of Charles V. and finished in 1383, under the reign of his successor.—Its chief use is for the custody of state-prisoners.

BASTION, in the modern fortification, a huge massive of earth usually faced with fods, sometimes with brick, rarely with stone, standing out from a rampart, whereof it is a principal part.

This answers to what in the ancient fortification is called a *bulwark*.

A *bastion* consists of two faces and two flanks.—The faces are the lines BC and CS, (*Tab. fortificat. fig. 1.*) including the angle of the *bastion*. See FACE.—The flanks are the lines BA, SD.

The union of the two faces makes the outmost or salient angle, called also the *angle of the bastion*, BCS.

The two faces to the two flanks make the side angles, called the *shoulders* or *epaules of the bastion*.

And the union of the two other ends of the flanks to the two curtains, the angles of the flanks of the *bastion*.—See *Tab. Fortific. fig. 21. lit. oo. &c. ppp.*

The foundation of the *bastion*, i. e. of a work consisting of flanks and faces, is that great rule in fortification, viz. that every part of a work must be seen and defended, from some other part: mere angles therefore are not sufficient, but flanks and faces are indispensably requisite.—If the *bastions* EFG and HIK, *fig. 26.* consisted of faces alone, the angles G and H could not be defended from the lines FG or IH. But if the *bastion* consist of flanks and faces, as ABCSD, all the points may be defended from the flanks; there being none, *v. gr.* in the face BC, but what may be defended from the opposite flank EL, nor any in the curtain AE, but may be defended from the adjacent flanks BA and EL; nor any in one flank BA, but may be defended from the other EL.

For the proportions of the faces, they are not to be less than twenty-four Rhinland perches, nor more than thirty.

The flanks of *bastions* are better as they are longer, provided they stand at the same angle under the line of defence: hence the flank must stand at right angles to the line of defence. Indeed, in the ancient fortification, the flank is made perpendicular to the curtain, so as to have the angle out of the enemies eye; but this is now provided for, by withdrawing the lower part of the flank two or three perches, towards the capital line: which part, thus withdrawn, is better, if made concave, than retilinear; and, if double, with a ditch between, than if single.

The business of disposing the flanks of *bastions* makes the principal part of the art of fortification; it is that on which the defence principally depends, and which has introduced the various forms and manners of fortifying.

If the angle of the *bastion* be less than sixty degrees, it will be too small to give room for guns; and besides, so acute as to be easily beaten down by the enemies guns: to which may be added, that it will either render the line of defence too long, or the flanks too short: it must therefore be more than sixty degrees; but whether or no it should be a right angle, some intermediate angle between sixty and ninety, or even whether or no it should exceed a right angle, is still disputed. Hence it follows, that a triangle can never be fortified, in regard either some or all of the angles will be either sixty degrees, or less than sixty.

Bastions are of divers kinds, *Solid, void, flat, cut, &c.*

Solid BASTIONS are those that are filled up entirely, and have the earth equal to the height of the rampart, without any void space towards the centre.

Void or hollow BASTIONS are those surrounded with a rampart, and parapet only ranging round their flanks and faces, so as to leave a void space towards the centre; where the ground is so low, that if the rampart be taken, no retrenchment can be made in the centre, but what will lie under the fire of the besieged.

Flat BASTION is a *bastion* built on a right line in the middle of a curtain, when it is too long to be defended by the *bastion* at its extremes.

Cut BASTION is that, whose point is cut off, and in lieu thereof has a re-entering angle, or an angle inwards with two points outwards; this is sometimes also called, *bastion with a tenaille*; and is used either, when, without such a contrivance, the angle would be too acute, or when water or some other impediment hinders the carrying on the *bastion* to its full extent.

Compofed BASTION is, when the two sides of the interior polygon are very unequal, which makes the gorges also unequal.

Regular BASTION, is that which hath its due proportion of faces, flanks, and gorges; the faces being of an equal length, the flanks the same, and the two angles of the shoulder equal.

Irregular BASTION is, where this proportion and equality is not observed.

Deformed BASTION is, where the irregularity of the lines and angles make the *bastion* out of shape, as when it wants one of its demi-gorges; one side of the interior polygon being too short.

Demi-BASTION is that which hath but one face and one flank; called also an *epanlement*.

To fortify the angle of a place that is too acute, they cut off the point, and make two *demi-bastions*, which form a tenaille, or a re-entering angle.—Their chief use is before a hornwork or crownwork.

Double BASTION is that, which on the plain of the great bastion has another bastion built higher, somewhat after the manner of a cavalier; leaving twelve or eighteen feet between the parapet of the lower and the foot of the higher.

Capital of a BASTION.

Gorge of a BASTION.

Distance of the BASTION.

BASTION company of France.

BASTON*, in law, is used for one of the warden of the

feet's men, who attends the king's courts with a red staff,

for taking such to ward as are committed by the court; and likewise attends on such prisoners as are suffered to go at large

by licence.

* The word is French, where it literally signifies a *staff*, and technically a *gorge* or *mace*.

BASTON, or BATOON, in architecture, denotes a mould in the base of a column, otherwise called a *torc*.—See *Tab. Archit. fig. 3. and 24. lit. t.*

BASTON, or BATOON, in heraldry, a kind of bend which has only one third of the usual breadth.

The *baston* does not go from side to side of the escutcheon, as the bend or scarf does, but is broken off short, in form of a truncheon: its use is as a mark of bairdary.

BASTON also signifies the earl marshal's staff.

BATCHELOR. See the article BACHELOR.

BAT-FOWLING, a method of catching birds in the night, by lighting some straw or torches near the place where they are at roost: for, upon beating them up, they fly to the flames, where, being amazed, they are easily caught in nets, or beat down with bushes fixed to the ends of poles, &c.

BATH, BALNEUM, a convenient receptacle of water for persons to wash, or plunge in, either for health or pleasure.

Baths are either natural or artificial. Natural, again, are either hot or cold.

Hot BATHS, called by the ancients *thermae*, owe their origin partly to the admixture of sulphureous particles, while the water is passing through its subterraneous canals, or rather while it creeps through beds and mines of sulphur, &c. and partly to the fumes and vapours exhaling through the pores of the earth where sulphur is, either pure or impure, as in coals, amber, &c.—Though in most hot baths there are likewise mixed particles of iron, allom, nitre, and other mineral bodies, which give them an acid astringent taste.

The chief hot baths in our country are that near Wells, in Somersetshire; and those others at Buxton and Matlock in Derbyshire; which latter, however, are rather warm or tepid than hot.

In the city of Bath there are four hot baths: one triangular, called the *cross bath*, from a cross that formerly stood in the middle of it; the heat of which is more gentle than that of the others, because it has fewer springs.—The second is the *hot bath*, which heretofore was much hotter than the rest, when it was not so large as it now is.—The other two are the *king's* and *queen's baths*, divided only by a wall; the last having no spring, but receiving the water from the king's bath, which is about sixty feet square, and has in the middle of it many hot springs, which render its healing quality more effectual.—Each of these is furnished with a pump to throw out water upon the diseased, where that is required.

The waters abound with a mineral sulphur: they are hot, of a blueish colour, and strong scent, and send forth thin vapours.—They do not pass through the body like most other mineral waters; though if salt be added, they purge presently. On settlement they afford a black mud, which is used by way of cataplasm in aches; of more service to some than the waters themselves: the like they deposit on distillation, and no other.

Dr. Astruc found the colour of the salt drawn from the king's and hot bath, to be yellow; and that from the *cross bath*, white; whence he concludes, that the *cross bath* has more allom and nitre than the *hotter*, which abounds more with sulphur; and yet the *cross bath* is found to loosen shrunken sinews, by which it should seem to abound less with allom: it is harsher to the taste than the others, and soaks the hands more.—The *cross bath* preys on silver, and all of them on iron, but none on brass.

Hot BATHING, it is observed, increases the weight of the body for the present, but causes a plentiful perspiration afterwards; though not so great as set down by Dr. Keill, who makes it amount to 1 1/2 pound in an hour's time.—By Mr. Martyn's experiment at Buxton, it was only 5 ounces in one hour, and from 8 to 12 ounces in an hour and half. *Phil. Trans. N^o. 407. p. 27.*

The use of these baths is found beneficial in diseases of the head, as palfies, &c. in cuticular diseases, as leprosy, &c. obstructions and constipations of the bowels, the scurvy and stone, and in most diseases of women and children.—The baths have performed many cures, and are commonly used as a last remedy in obstinate chronic diseases; where they succeed well, if they agree with the constitution of the patient: but whether they will agree or not, cannot be known without trial.

Cold BATHS were long banished out of medicine, though the ancients had them in the greatest esteem: but the improvements accruing to physic from geometry and mechanics, have brought them into use again; and the present age can boast abundance of noble cures performed by them, and such as were

were long attempted in vain by the most powerful medicines. The cold bath is found one of the most universal and innocent remedies yet discovered. It is serviceable in most chronic distempers, and is reckoned so safe, that physicians sometimes prescribe it in a beginning phthisis, or consumption, when the lungs are but slightly affected. The effect of cold bathing is attributed not only to its chillness and constringing power, but in some measure to the weight of the water. For, supposing a person immersed two feet, and the area of his skin to be fifteen feet, he sustains a weight of water, added to that of the air, = 2280 l. For 23 the number of cubical feet of water pressing upon a foot square of the skin X 76, the number of pounds in a cubical foot of water, is = 152; which X 15, the supposed number of square feet on the surface of the body, is = 2280 l. Troy.—Besides, the water in bathing enters the body, and mixes with the blood, and dilutes this as well as the other juices.

The rise and progress of cold bathing, and the cures effected thereby, are described at large in Sir J. Floyer's, and Dr. Baynard's *Hydrotaera*, or *History of cold bathing*.

Artificial BATHS are various, according to the various occasions; some aqueous, others vaporous, others dry, &c.

Aqueous BATHS are those prepared from common plants, and other substances of emollient, resolvent and nerve kinds.

Aqueous baths sometimes consist of milk and emollient herbs, with rose-water, &c. when the design is to humectate; at other times of bran and water, when the design is only to cleanse: sometimes again, they are made of a decoction of roots and plants, with an addition of spirit of wine, when a person bathes for a great pain or tumour, &c.

In **Vapour BATHS**, the fume or steam of some decoction is received upon the body to promote a perspiration.—These are also by some called *balnea Laconica*.

Vapour baths are, when the patient is not plunged into what is prepared for the bath, but only receives its steam upon those parts of his body which require it: as in some distempers of the fundament, and womb, where the patient sits and receives the fumes of some proper fomentation, &c.

To these may be added the *bagno*, where people are made to sweat by the heat of a room, and pouring on of hot water; after which they generally go into a hot bath. See BAGNIO.

Dry BATHS are those made of ashes, salt, sand, shreds of leather, and the like.

The same name is sometimes also given to another kind of bath, made of kindled coals, or burning spirit of wine; the patient being placed in a convenient close chair for the reception of the fume, which rises and provokes sweat in a plentiful manner: care is here taken to keep the head out, and to secure respiration.

This bath has been found very effectual in removing old, oblitinate pains in the limbs, and venereal complaints; and will often compleat a cure left unperformed by salivation.

BATHS, BALNEA, in architecture, denote large pompous buildings among the ancients, erected for the sake of bathing. *Baths* made a part of the ancient gymnasia. Though they were frequented more for the sake of pleasure than health.

The most magnificent *baths* were those of Titus, Paulus Æmilius, and Dioclesian, of which there are some ruins still remaining. It is said, that at Rome there were 856 public *baths*. Fabricius adds, that the excessive luxury of the Romans, appeared in nothing more visible, than in their *baths*. Seneca complains, that the *baths* of plebeians were filled from silver pumps; and that the freed-men trod on gems. Macrobius tells us of one Sergius Oratus, a voluptuary, who had pendant *baths*, hanging in the air.

Knights of the BATH, a military order in England, instituted by Richard II. who ordained that there should be no more than four; however, his successor Henry IV. increased them to forty-six. Their motto was *Tres in uno*, signifying the three theological virtues.

It was the custom to bathe before they received the golden spurs; but this was only observed at first, being afterwards gradually dropt; however, it was this occasioned the denomination of *knights of the bath*.

The order of *knights of the bath* is scarce ever conferred, but at the coronation of kings, or the inauguration of a prince of Wales, or duke of York. They wear a red ribbon betwixt.

Camden and others say, Henry IV. was the institutor in 1399; and upon this occasion: that prince, being in the bath, was told by some knight, that two widows came to demand justice of him; when his majesty leaping out of the bath, cried, He ought to prefer doing justice to his subjects to the pleasure of the bath; and thereupon created *knights of the bath*.

Some authors, however, will have the order of the *bath* to have been on foot long before Henry IV. even as early as the Saxon times: at least, it is certain, the *bath* had been used long before, in the creation of knights, in France; though there was no order of knights under this name.

The order of the *Bath*, after remaining many years extinct, VOL. I.

was revived under king George I. by a solemn creation of a great number of knights.

BATH metal. See the article METAL.

BATHMUS, or **BATHMIS**, βαθυμ, or βαθυμι, an appellation given to such cavities of bones as receive the prominences of other bones into them.

BATON, or **BATOON**. See the article BASTON.

BATRACHITES*, among ancient naturalists, a kind of gem, found in Egypt, denominated from its resemblance in colour to a frog.

* The word is formed from the word βατραχιδον, rana, a frog.

BATRACHOMYOMACHIA*, *battle of the frogs and the mice*; the title of a fine burlesque poem, usually ascribed to Homer.

* The word comes from the Greeks βατραχιδον, frog, μυς, mouse, and μαχη, pugna.

The subject of the war is the death of Pŷcharpax, a mouse, son of Toxartes, who being mounted on the back of Pŷthignates, a frog, on a voyage to her palace, to which she had invited him, was seized with fear when he saw himself in the middle of the pond, so that he tumbled off and was drowned. Pŷthignates being suspected to have thook him off with design, the mice demanded satisfaction, and unanimously declared war against the frogs.

Stephens, Nunnsius, and other modern authors, take the poem not to be Homer's; but several of the ancients seem of another opinion; and Statius, who wrote under Domitian, makes no doubt of it.

BATTLE* *ground* denotes land lying between England and Scotland, heretofore in question to which it belonged, when they were two distinct kingdoms.

* The word imports as much as *lignis*, or *disputable ground*: from *batis*, to beat or fight.

BATTALION*, in the military art, a little body of infantry ranged in form of battle, and ready to engage.

* The word comes from *battel*, an engagement of two armies, &c. and that from *battualia*, the place where two men fight; or from *battalia*, the exercise of people who learn to fight.

A battalion usually contains from 5 to 800 men, of which one third were formerly pikes in the middle, and the other two thirds musquets posted on the wings: but the number of men it consists of is not determined.

Battalions are usually drawn up with six men in file, or one before another.—Some regiments consist but of one *battalion*, which is too few, others more numerous are divided into four or five, which are too many.

Angle of a BATTALION. } See the article { ANGLE.
Fraizing a BATTALION. } FRAIZING.
Square BATTALION. } SQUARE.

BATTEN, a name which the workmen give to a scantling of wooden stuff, from two to four inches broad, and about an inch thick; the length being pretty considerable, but undetermined.

The term is chiefly used in speaking of doors, &c. which are not framed of whole deal, &c. with files, rails, and panels, like waincot, but are made to appear, as if they were, by means of these pieces, or *battens*, bradded on the plain board round the edges, and sometimes cross them, and up and down.

Hence *batten*-doors, or windows, are such as seem to be waincot ones, but are not. These are said to be either *single* or *double*, as the *battens* are fitted on to one side, or to both.

BATTERING, the attacking a place, work, or the like, with heavy artillery. See BATTERY.

To **BATTER** in breach, *battre en breche*, is to play furiously on a work, as the angle of a half-moon, in order to demolish and make a gap therein. See BREACH.

In this, they observe, never to fire a single piece against the top of the wall; but all towards the bottom: 3, 4, 5, or 6 foot from the ground: they also fire par camarade, all together, till they perceive the earth fall from behind the lining of the rampart. *Savin, Nouv. Ecol. Milit. p. 248.*

BATTERING-pieces, or pieces of battery. See CANNON.

BATTERY*, in the military art, denotes an eminence cast up, whercon to plant artillery, that it may play to better advantage.—See *Tab. Fortif. fig. 21. n. 33. and fig. 23.*

* The word is French, formed of *battre*, to beat, strike.

In all *batteries*, the open space left to put the muzzles of the great guns out at, are called *embrasures*; and the distances between the *embrasures*, *merlons**.—The guns are generally about twelve foot distant one from another; that the parapet may be strong, and the gunners may have room to work.

* There are also *batteries of mortars*, the same with those of cannon, except that they have no merlons.

The *battery* of a camp is usually surrounded with a trench and palisades at the bottom, as also with a parapet on the top, having as many holes as there are pieces of artillery, and two redoubts on the wings, or certain pieces of arms, capable of covering the troops, which are appointed for their defence.

Sunk or buried BATTERY is that whose platform is sunk or let down into the ground, with trenches cut in the earth against the muzzles of the guns, to serve for embrasures.

This fort, which the French call *batterie en terre*, and *rui-nante*, is generally used upon the first making approaches, to beat down the parapet of the place.

Cross-BATTERIES are two batteries at a considerable distance from each other, which play a-thwart one another at the same time, and upon the same point, forming right angles; where, what one bullet strikes, the other beats down.

BATTERY *d'enfilade* is one which sweeps the whole length of a strait line, a street, &c.

BATTERY *en echarpe*, is that which plays obliquely.

BATTERY *de revers*, or *murdering battery*, is one that plays on the back of any place; and being placed on an eminence, fers into it.

BATTERY *joint*, or *par camarade*, or *cameretta*, is when several guns play at the same time upon one place.

BATTERY *en rouage* is that used to dismount the enemy's cannon.

BATTERY, in law, denotes an act that tends to the breach of the peace of the realm, by striking, beating, or offering other violence to another person.

Battery is frequently confounded with *assault*, though in law they are different offences; for that in the trespass for *assault* and *battery*, one may be found guilty of the assault, yet acquitted of the *battery*: there may therefore be *assault* without *battery*; but *battery* always implies an *assault*.

BATTEURS *d'esfrade*, *souts*, or horsemen sent out before, and on the wings of an army, two or three miles, to make discoveries; of which they are to give an account to the general.

BATTLE, an action which passes between two armies ranged in order of *battle*, and who engage in a country sufficiently open for them to encounter in front; and, at the same time, or at least for the greater part of the line to engage, while the remainder remains in fight, by reason of some difficulty, which hinders it from entering so readily into action, with a front equal to that which may be opposed to it by the enemy.

Other great actions, though generally of a longer duration, and even frequently attended with greater slaughter, are only called *fight*s, by the French *combats*. *Freq. Mem. c. 80.*

A *battle* lost almost always draws with it the loss of the artillery of the army, and frequently also that of the baggage: consequently, as the army beaten cannot again look the enemy in the face till it have repaired those losses, it is forced to leave the enemy a long time master of the country, and at liberty to execute all its schemes.—Whereas a great fight lost is rarely attended with a loss of all the artillery, and scarce ever of the baggage, because the two armies not meeting in front, they can only have suffered in the part that has been engaged. *Freq. loc. cit.*

An ingenious modern author remarks, that it is not, usually, the real loss sustained in a *battle* (that is, of some thousands of men) that proves so fatal to a state; but it is the imaginary loss, and discouragement, which deprives it of the use of those very powers which fortune had left it. *Consid. sur les Causes de la Grand. des Rom. c. 4. p. 39.*

The history of *battles* is only the history of the faults and overights of generals: luckily enough, the mistakes of the two opposite commanders generally balance one another: one of them makes a fault, and the other overlooks, or does not take advantage of it. M. de Feuquieres's *Remarks sur la Guerre* is little else but a recital of mistakes on both sides: he scarce speaks of one modern general, except Turenne, Luxembourg, and the prince of Condé, whose conduct was not full of them: Crequi, and Catinat, were guilty of great ones; which, however, they compensated by their judicious conduct on other occasions. *Freq. ubi supra.*

For *Naval BATTLES*, or *sea-fights*.—It is observable, that the ancient and usual way of fighting in our fleets was board and board, yard-arm and yard-arm, through and through; and not at a distance in a line or half-moon, as is now done: which practice our old sailors say they were strangers to.—For this reason our guns are shorter, and of larger bore than those of the French, which are adapted to the method of fighting in line of battle; as being longer, and carrying farther. So that we engage with them in this way at a disadvantage.—It has been often found that their balls will fly over our ships, before ours can reach them by a mile. *Dennis Eff. on Navy, sect. 2.*

BATTLE is also used figuratively for a representation of a battle in sculpture, painting, or the like.—The battles of Alexander in the gallery of the Louvre, painted by le Brun, are held by the French the noblest pieces of painting that have been executed on this side the Alps. *List. Journ. to Paris.*

Line of BATTLE. } LINE.
Order of BATTLE. } ORDER.
Square BATTLE. } SQUARE.
Trial by BATTLE. } DUEL, CHAMPION, &c.
Attainder by BATTLE. } ATTAINDER.

BATTLEMENTS, in the military art, indentures, or notches on the top of a wall, parapet, or other building, in

form of embrasures, for the sake of looking through them, &c. much affected in the old fortification.

BATTOLOGY, in grammar, a multiplying of words without occasion, or a needless repetition of the same words, or things over and above.

BATTOON, BATOON, or BASTON. See BASTON.

BATTUS, an order of penitents at Avignon, and in Provence, whose piety carries them to exercise severe discipline upon themselves, both in public and private.

BAU. See NUMERICAL CHARACTER.

BAVINS, in war, brush-faggots, made with the brush at length. See FASCINES.

BAY, in geography, denotes a little gulph; or an arm of the sea, stretching up into the land; being larger in the middle within, than at its entrance, which is called the *mouth of the bay*.

BAY, likewise signifies a pen, or pond-head, made up a great height, to keep in store of water for driving the wheels of a forge or furnace of an iron mill, by the stream that comes thence through a passage, or flood-gate, called the *pen-stock*.

Among huntsmen, deer are said to *bay*, or *be at bay*, when, after being hard run, they turn head against the hounds.

BAY, or BAYES, is also a fort of woollen *stuff*, made chiefly in Colchester; where there is a hall, called the Dutch Bay-hall, or Raw-hall.

None shall weave in Colchester any *bay* known by the names of *four-and-fifties*, *sixties*, *sixty-eights*, *eighties*, or *hundred bays*, but within two days after weaving they shall carry it to the Dutch Bay-hall, to be viewed and searched; that it may appear whether it be well and substantially wrought, before it be carried to be scoured and thicked: and, no fuller or thicker is to receive such bay before it have been stamped or marked at said hall. *12 Car. 2. c. 22.*

BAY-salt. See the article SALT.

BAY-yarn, is a denomination sometimes used promiscuously with *woollen-yarn*. *10 & 11 W. 3. c. 10. 5 G. 2. c. 21.* See YARN, &c.

BAYONET, a short broad dagger, made lancet-fashion, and having, instead of an hilt, an hollow iron handle to fix it to the end of a musket, so as not to hinder its firing or charging.

Bayonets are of great service to the dragoons and fuzileers, after they have spent their powder and ball.

This instrument is also used in hunting the boar or bear; for which purpose it is made larger than for the military use.

BAYS, in com merce, a kind of coarse, open woollen stuff, having a long nap; sometimes frized on one side, and sometimes not frized, according to the uses it is intended for.

This stuff is without wale, being wrought on a loom with two treddles, like flannel.—The manufacture of *bays* is very considerable in England, particularly about Colchester; and in Flanders, about Lille and Tournay, &c.

Formerly the French, as well as Italians, were furnished with *bays* from England; but of late the French workmen have undertaken to counterfeit them, and set up manufactures of their own: and that with success; especially at Nismes, Montpellier, &c.

The export of *bays* is very considerable to Spain, Portugal, and Italy. Their chief use is for linings, especially in the army: the looking-glass-makers also use them behind their glasses, to preserve the tin or quicksilver; and the case-makers to line their cases.

BDELLIUM *, BAEALION, an aromatic gum, brought from the Levant, of some use, both as a medicine and a perfume.

* The word is supposed to have been formed of the Hebrew בדרלל, *bedellach*, which the English translators render by the appellation *bdellium*. It is also written *bedellium*, *bedelle*, *petellium*, *petalium*, *megalium*, and *telinum*.

There is much uncertainty concerning *bdellium*: we find mention of the name both among the ancient naturalists, and in scripture; but it is doubtful whether any of these be the same with the modern kind. As for the scripture *bdellium*, we know very little of it. Moses describes *manna* as of the colour of *bdellium*; and Josephus explains the passage, by saying it is the gum of a tree resembling the olive-tree; and that the manna wherewith the Jews were fed in the desert resembled this drug.—But Scaliger and others set aside this explanation, and own, they do not know what the *bdellium* mentioned in scripture is.

BEACON, a signal for the better securing the kingdom from foreign invasions. See SIGNAL.

On certain eminent places of the country are placed long poles erect, whereon are fastened pitch-barrels to be fired by night, and smoke made by day, to give notice, in a few hours, to the whole kingdom of an approaching invasion.—These are commonly called *beacons*; whence also comes *beaconage*.

BEACONS are also marks and signs for the sea; erected on the coasts by the masters, &c. of Trinity-houses, who are empowered thereto by act of parliament, 8 EL. c. 13.—Whitaker *beacon* having been blown down in the storm, a buoy

was laid, till a *beacon* could be conveniently replaced. *Advert. Trin. Houf.*

BEACONAGE *, money paid towards the maintenance of a *beacon*.

* The word is derived from the Saxon *beacnian*, to nod, or shew by a sign: hence also the word *beckon*.

BEAD, in architecture, denotes a round moulding, carved in short embossments, like beads in necklaces. Sometimes also an astragal is carved *bead-fashion*.

There are also a sort of *beads plain*, frequently set on the edge of each fascia of an architrave; sometimes also on the lining-board of a door-case; and on the upper end of skirting-boards.

BEADS, in a religious sense. See **CHAPLET**.

BEAD-ROLL, among the Romish priests, a list or catalogue of such persons, for the rest of whose souls they are obliged to rehearse a certain number of prayers, &c. which are told by means of their *beads*.

BEADLE, or **BEDIL**, **BEDELLUS**, signifies a messenger or apparitor of a court, who cites men to appear and answer. **BEADLE** is also used for an officer in universities, whose place it is to walk before the masters at all public processions, &c. with a mace.

Some say they are called *bedelli*, from a corruption of *pedelli*, as serving and running on foot. Others from *pedo*, *scilicet baculo*, *quia virga utebantur*; forming *pedellus* from *pedum*, a kind of wand, which is their symbol; and from *pedellus*, *bedellus*. Others derive the word from the Hebrew *בדל* *bedal*, *ordinare*, to range, or dispose.

Spelman, Vossius, and Sommer, derive *bedellus* from the Saxon *bidel*, a public crier; in which sense bishops, in some ancient Saxon manuscripts, are called *bedelles* of *Gud*, *Dei bedellus*.—The translator of the Saxon New Testament, renders *exactor* by *tydale*; and, the word is used in the same sense in the laws of Scotland.

BEAK, in architecture, a little fillet left on the edge of a cornice, which forms a canal, and makes a kind of pendant chin; answering to what Vitruvius calls the *mentum*.

BEAK, or **BEAK-head**, of a ship, is that part without the ship, before the fore-castle, which is fastened to the stem, and is supported by the main knee: this is usually carved and painted, and, besides its use, makes the becoming part, or grace of a ship.

BEAM, in architecture, the largest piece of wood in a building; being laid across the walls, and serving to support the principal rafters of the roof.

No house has less than two of these *beams*, *viz.* one at each head; into these the girders of the garret floor are also framed; and, if the building be of timber, the teazel-tenons of the posts.

The proportions of *beams* near London are fixed by statute, as follows: a *beam* 15 foot long, must be seven inches on one side its square, and five on the other: if it be 16 foot long, one side must be eight inches, the other six: if 17 foot long, one side must be ten inches, the other six: in the country they usually make them stronger. Sir H. Wotton advises these to be of the strongest and most durable timber.

Herrera tells us, that in Fer. Cortez's palace, in Mexico, there were 7000 *beams* of cedar: but, he must certainly use the word *beam* in a greater latitude than we do. In effect, the French, under *pourtre*, *beam*, take in not only the pieces which support the rafters, but also those which sustain the joists for the cieling.

Some of their best authors have considered the force or strength of *beams*, and brought their resistance to a precise calculation; particularly M. Varignon, and M. Parent; the system of the latter is as follows.

When, in a *beam* breaking parallel to its base, which is supposed to be a parallelogram, two plans of fibres, which were before contiguous, are separated, there is nothing to be considered in those fibres, but their number, bigness, tension before they broke, and the lever by which they act; all these together making the strength or resistance of the *beam* to be broke.

Suppose then another *beam* of the same wood, where the base is likewise a parallelogram, and of any bigness, with regard to the other, at pleasure; the height or thickness of each of these, when laid horizontal, being divided into an indefinite number of equal parts, and their breadth into the same number, in each of their bases will be found an equal number of little quadrangular cells, proportional to the bases whereof they are parts.—These then will represent little bases, or which is the same thing, the thicknesses of the fibres to be separated for the fracture of each *beam*: and, since the number of cells is equal in each, the ratio of the bases of both *beams* will be that of the resistance of their fibres, both with regard to number and thickness.

Now, the two *beams* being supposed of the same wood, the fibres most remote from the points of support, which are those which break the first, must be equally stretched when they break. Thus the fibres, *v. gr.* of the 10th division, are equally stretched in each case, when the first breaks; and in whatever proportion, the tension be supposed,

it will still be the same in both cases; so that the doctrine is entirely free, and unembarrassed with any physical system.

Lastly, it is evident, the levers whereby the fibres of the two *beams* act, are represented by the height or depth of their bases; and, of consequence, the whole resistance of each *beam* is the product of its base by its height; or, which is the same thing, it is the square of the height multiplied by the breadth: which holds, not only in case of parallelogramatic, but also of elliptic bases.

Hence, if the bases of two *beams* be equal, though both their heights and breadths be unequal, their resistance will be as their heights alone; and, by consequence, one and the same *beam* laid on the smallest side of its base, will resist more than when laid flat, in proportion as the first situation gives it a greater height than the second: and thus an elliptic base will resist more, when laid on its greatest axis, than when on its smallest.

Since, in *beams* equally long, it is the bases that determine the proportion of their weights or solidities; and since their bases being equal, their heights may be different, two *beams* of the same weight may have resistances differing to infinity: thus, if in the one, the height of the base be conceived infinitely great, and the breadth infinitely small, while in the other the dimensions of the base are infinite; the resistance of the first will be infinitely greater than that of the second, though their solidity and weight be the same. If therefore all required in architecture were to have *beams* capable of supporting vast loads, and at the same time be of the least weights possible, it is plain they must be cut thin as laths, and laid edge-wise.

If the bases of two *beams* be supposed unequal, but the sum of the sides of the two bases equal, *v. gr.* if they be either 12 and 12, or 11 and 13, or 10 and 14, &c. so that they always make 24; and further, if they be supposed to be laid edge-wise; pursuing the series, it will appear, that in the *beam* of 12 and 12 the resistance will be 1728, and the solidity or weight 144; and that in the last, or 1 and 23, the resistance will be 529, and the weight 23: the first therefore, which is square, will have less than half the strength of the last, with regard to its weight.

Hence M. Parent remarks, that the common practice of cutting the *beams* out of trees as square as possible, is ill husbandry: he hence takes occasion to determine geometrically, what dimensions the base of a *beam*, to be cut out of any tree proposed, shall have, in order to its being of the greatest possible strength; or, which is the same thing, a circular base being given, he determines the rectangle of the greatest resistance that can be inscribed; and finds, that the sides must be nearly as 7 to 5, which agrees with observation.

Hiberto the length of the *beams* has been supposed equal; if it be unequal, the bases will resist to much the less, as the *beams* are longer.

To this it may be added, that a *beam* sustained at each end, breaking by a weight suspended from its middle, does not only break at the middle, but also at each extreme; or, if it does not actually break there, at least immediately before the moment of the fracture, which is that of the equilibrium between the resistance and the weight, its fibres are as much stretched at the extremes, as in the middle.—So that, of the weight sustained by the middle, there is but one third part which acts at the middle, to make the fracture; the other two only acting to induce a fracture in the two extremes.

A *beam* may either be supposed loaded only with its own weight, or with other foreign weights applied at any distance, or else only with those foreign weights. Since, according to M. Parent, the weight of a *beam* is not ordinarily above $\frac{1}{3}$ part of the load given it to sustain, it is evident, that in considering several weights they must all be reduced by the common rules to one common centre of gravity.

M. Parent has calculated tables of the weights that will be sustained by the middle, in *beams* of various bases and lengths, fitted at each end into walls, on a supposition that a piece of oak of an inch square and a foot long, retained horizontally by the two extremes, will sustain 315 lb. in its middle before it breaks, which it is found by experience it will. See *Mem. Acad. R. Scienc. an. 1708*.

BEAM, among hunters, denotes the main stem of a deer's head, or that part which bears the antlers, royals, and tops; the little streaks wherein are called circles.

BEAMS of a ship are the large, main, cross timbers, which hold the sides of a ship from falling together, and which also support the decks and orlops. See **SHIP**.

The *main beam* is that next the main mast; and from it they are reckoned by *first*, *second*, and *third beam*. The great *beam* of all is called the *midship beam*. See *Tab. Ship. fig. 2. n. 36, 45, 61, 28, 91, 87*.

Camber-BEAM. See the article **CAMBER-BEAM**.

BEAM-Compasses, an instrument made in wood or brass, with sliding sockets, or cursors, serving to carry several shifting points, in order to draw and divide circles with very long radii.

They are of use in large projections for drawing the furniture on wall-dials, &c. See **COMPASSES**.

BEAM-Filling, in building, the filling up the vacant space between the rafter and roof, with stones, or bricks, laid between the rafters on the rafter, and plastered on with loam; this is frequent where the garrets are not pargeted, plastered.

BEAR, in astronomy, a name given to two constellations called the *greater* and the *lesser bear*; or *ursa major* and *minor*. See **URSA**.
The pole-star is said to be in the tail of the *lesser bear*; this star is never above two degrees distant from the north-pole of the world.

BEARD, the hair growing on the chin, and adjacent parts of the face; chiefly of adults and males. See **HAIR**.
Various are the ceremonies and customs the *beard* has been liable to: Kingdon assures us, that a considerable branch of the religion of the Tartars consists in the management of their *beards*; and that they waged a long and bloody war with the Persians, and declared them infidels, though, in other respects, of the same faith with themselves, merely because they would not cut their whiskers after the mode or rite of the Tartars.
Athenæus, from Chrypsippus, observes, that the Greeks always wore their *beards*: till the time of Alexander; and that the first who cut it at Athens ever after bore the addition of *καρπός*, shaven, in medals. Plutarch adds, that Alexander commanded the Macedonians to be shaven, left the length of their *beards* should give a handle to their enemies: however this be, we find Philip, his father, as well as Amyntas and Archelaus, his predecessors, represented on medals without *beards*.
Pliny observes, that the Romans did not begin to shave till the year of Rome 454, when P. Titinius brought over a stock of barbers from Sicily: He adds, that Scipio Africanus was the first who introduced the mode of shaving every day.
Among that people, it became the custom to have visits made in form at the cutting of the *beard* for the first time: the first fourteen Roman emperors shaved, till the time of the emperor Adrian, who retained the mode of wearing the *beard*. Plutarch tells us, he did it to hide the fears in his face.
Formerly there was a great deal of ceremony used in blessing the *beard*; and there are still extant the prayers used in the solemnity of consecrating it to God, when an ecclesiastic was shaven.
Persons of quality had their children shaved the first time by others of the same, or greater quality, who, by this means, became god-father, or adoptive father of the children.
Anciently, indeed, a person became god-father of the child by barely touching his *beard*: thus historians relate, that one of the articles of the treaty between Alaric and Clovis was, that Alaric should touch the *beard* of Clovis to become his god-father. See **GOD-FATHER**.
As to ecclesiastics, the discipline has been very different on the article of *beards*: sometimes they have been enjoined to wear them, from a notion of too much effeminacy in shaving, and that a long *beard* was more suitable to the ecclesiastical gravity; and sometimes again they were forbid it, as imagining pride to lurk beneath a venerable *beard*.
The Greek and Romish churches have been long together by the ears about their *beards*: since the time of their separation, the Romanists seem to have given more into the practice of shaving, by way of opposition to the Greeks; and have even made some express constitutions *de radendis barbis*.
The Greeks, on the contrary, espouse very zealously the cause of long *beards*, and are extremely scandalized at the beardless images of saints in the Roman churches.
By the statutes of some monasteries, it appears, that the lay-monks were to let their *beards* grow, and the priests among them to shave; and that the *beards* of all that were received into the monasteries were blessed with a great deal of ceremony.
To let the *beard* grow is a token of mourning in some countries, and to shave it is so in others. Le Comte observes, that the Chinese affect long *beards* extravagantly; but nature has balked them, and only given them very little ones, which, however, they cultivate with infinite care: the Europeans are strangely envied by them on this account, and esteemed the greatest men in the world.
The Russians wore their *beards* till within these few years, when the Czar Peter enjoined them all to shave; but, notwithstanding his injunction, he was obliged to keep on foot a number of officers to cut off by violence the *beards* of such as would not otherwise part with them.
Chrysofom observes, that the kings of Persia had their *beards* wove or matted together with gold thread; and some of the first kings of France had, in the same manner, their *beards* knotted and buttoned with gold.

BEARD of a Comet denotes the rays which the comet emits towards that part of the heavens to which its proper motion seems to direct it.
In which the *beard* of the comet is distinguished from the tail,

which is understood of the rays emitted towards that part from which its motion seems to carry it. See **TAIL**.
It is called *beard*, from some fancied resemblance it bears to the *beard* of a man.

BEARDING of Wool. See the article **WOOL**.

BEARER, in architecture, a post, or brick-wall, trimmed up between the two ends of a piece of timber, to shorten its bearing, or to prevent its bearing with the whole weight at the ends only.

BEARER of a bill of exchange denotes the person in whose hands it is, and in favour of whom the last order or endorsement was made.

When a bill is said to be *payable to bearer*, it is understood to be payable to him, who first offers himself after it becomes due. To be paid a bill of this kind, there needs neither order or transfer; yet it is good to know to whom it is paid. See **BILL OF EXCHANGE**.

BEARERS, in heraldry. See **SUPPORTERS**.

Cross-BEARER. See the article **CROSS**.

BEARING, in geography and navigation, the situation of one place from another, with regard to the points of the compass; or the angle, which a line drawn through the two places makes with the meridians of each.

The *bearings* of places on the ground are usually determined from the magnetic needle: in the managing of these lies the principal part of surveying; since the *bearing* and distance of a second point from a first being found, the place of that second is determined; or the *bearings* of a third point from two others, whose distance from each other is known, being found, the place of the third is determined: instrumentally we mean; for to calculate trigonometrically there must be more data.

Mr. Collins gives the solution of a problem in the *Philos. Transact.* where the distances of three objects on the same plain being given, and the *bearings* from a fourth place in the same plain observed, the distances from the place of observation to the respective objects are required.

BEARING, in the sea-language.—When a ship sails towards the shore, she is said to *bear in with the land*.—When a ship that was to windward comes under another ship's stern, and so gives her the wind, she is said to *bear under her lee*.—If a ship sails into an harbour with the wind large, or before the wind, she is said to *bear in with the harbour*, &c.

In conding they say, *bear up the helm*, that is, let the ship go more large before the wind—*bear up round*, that is, let the ship go between her two sheets, directly before the wind.

They also say, a ship *bears*, when having too slender a quarter she will sink too deep into the water with an over-light freight, and therefore can carry but a small quantity of goods.

BEARING of a piece of timber, in carpentry, denotes the space either between the two fix extremes thereof, when it has no other support; which is called *bearing at length*: or between one extreme, and a post, brick-wall, or the like, trimmed up between the ends to shorten its *bearing*.

Joists are not to *bear* above 10 foot length; nor single rafters more than 9 foot. 19 *Car.* 2. c. 3.

BEARING is also a term in heraldry.—Thus, he that has a coat of arms, is said to *bear in* it the several charges or ordinaries which are in his escutcheon: as, if there are three lions rampant in it, he is said to *bear three lions rampant*. See **CHARGE**, &c.

High-BEARING Cack. See the article **HIGH**.

BEASTS of Chase, in our statute books, are five; the buck, doe, fox, martin, and roe. See **CHASE**.

BEASTS of the forest are, the hart, hind, hare, boar, and wolf.

BEASTS and fowls of the warren are, the hare, coney, pheasant, and partridge. See **GAME**.

Rother-BEASTS. See the article **ROTHER**.

BEATÆ. See **MASS of the Beata**.

BEATIFIC Vision. See the article **VISION**.

BEATIFICATION, in the Romish church, the act whereby the pope declares a person happy, after death.

Beatification differs from *canonization*; in the former, the pope does not act as a judge in determining the state of the *beatified*, but only grants a privilege to certain persons to honour him by a particular religious worship, without incurring the penalty of superstitious worshippers: but, in *canonization*, the pope speaks as a judge, and determines *ex cathedra*, upon the state of the *canonized*.

Beatification was introduced, when it was thought proper to delay the canonization of saints, for the greater assurance of the truth, and manifestation of the rigorous steps taken in the procedure.

BEATING, *pulsation*, in medicine, is applied to the reciprocal agitation or palpitation of the heart and pulse. See **PULSATION**.

Some physicians distinguish 81 different kinds of simple *beatings*, and 15 compound ones. They compute 60 beats in the space of a minute, in a temperate man. But, in fact, we generally find a greater number.

BEATING of gold and silver. See **GOLD-BEATING**, &c.

BEATS, in a watch or clock, are the strokes made by the fangs or pallets of the spindle of the balance; or of the pads in a royal pendulum.

To find the *beats* of the balance in any watch, or in one turn of any wheel.—Having found the number of turns, which the crown-wheel makes in one turn of the wheel you seek for, (by the direction given under the word *TURN*) those turns of the crown-wheel, multiplied by its notches, give half the number of *beats* in that one turn of the wheel: for the balance or swing has two strokes to every tooth of the crown-wheel: in as much as each of the two pallets has its blow against each tooth of the crown-wheel: whence it is, that a pendulum which beats seconds, has in its crown-wheel only 30 teeth.

To explain this, suppose the numbers of a sixteen hour watch wherein the pinion of report is 4, the dial-wheel 32, the great wheel 55, the pinion of the second wheel 5, &c. The number of the notches in the crown-wheel 17, being multiplied into 6336 (the product arising from the continual multiplication of the quotients 8, 11, 9, 8) gives 107712, for half the number of *beats* in one turn of the dial-wheel; for 8 times 17 is 136, which is half the number of *beats* in one turn of the contrate-wheel 40, and 9 times 136 is 1224, the half *beats* in one turn of the second-wheel; and 11 times 1224 is 13464, the half *beats* in one turn of the great wheel 55; and 8 times 13464 makes 107712. If you multiply this by the two pallets, *i. e.* double it, it gives 215424, which is the number of *beats* in one turn of the dial wheel, or 12 hours.

To know how many *beats* this watch has in an hour, divide the *beats* in 12 hours into 12 parts, and it gives 17952, which is called the *train* of the watch, or the *beats* in an hour.—If this be divided into 60 parts, it gives 299 and a little more, for the *beats* in a minute; and so you may proceed to seconds or thirds.

By the *beats* and turns of the fufy, the hours that any watch will go, may be found thus.—As the *beats* of the balance in one hour, are to the *beats* in one turn of the fufy; so is the number of the turns of the fufy 1, to the continuance of the watch's going.—Thus, 20196 : 26928 :: 12 : 16.

To find the *beats* of the balance in one turn of the fufy, say, As the number of turns of the fufy, to the continuance of the watch's going in hours; so are the *beats* in one hour, to the *beats* of one turn of the fufy; *i. e.* 12 : 16 :: 20196 : 26928. To find the *beats* of the balance in an hour, say, As the hours of the watch's going, to the number of turns of the fufy; so are the *beats* in one turn of the fufy, to the *beats* of an hour.—Thus, 16 : 12 :: 26928 : 20196.

BEAVER, the fur or skin of the *castor* or *beaver*; this is much used in the making of hats, and sometimes also in that of stockings, and even cloaths.

BEAVER is chiefly imported by the Hudfon's-bay company, from the northern-parts of America; where the animal abounds.—There are chiefly two sorts: the *coat beaver*, which has been worn sometimes by the savages as a garment, and of course has imbibed much of the sweat of their bodies—and *parchment beaver*.

BEAUFET, **BUFFET**, or **BUFFT**, was anciently a little apartment separated from the rest of a room by slender wooden columns, for the disposing china and glass ware, &c. called also a *cabinet*.

It is now, properly, a large table in a dining room, called also a *side-board*, for the plate, glasses, bottles, batons, &c. to be placed, as well for the service of the table, as for magnificence.

The *buffet*, among the Italians called *credenza*, is inclosed within a ballustrade, elbow high.

BEA U-MASS. See the article *MASS*.

BEAU-PLEADER, or **BEW-PLEADER**, a writ on the statute of Marlbridge, whereby it is provided, that no fine shall be taken of any man in any court for *fair-pleading*, *i. e.* for not pleading aptly, and to the purpose.

BEAUTY is a term whereby we express a certain relation of some object, either to an agreeable sensation, or to an idea of approbation.

When, therefore, I say, a thing is *beautiful*, I either mean that I perceive something that I approve, or that something gives me pleasure: whence it appears, that the idea annexed to the word *beauty* is double; which renders the word equivocal, and this is the source of most of the disputes on the subject of *beauty*.

We must therefore distinguish between *ideas* and *sensations*. Ideas take up the mind, sensations interest the heart. Though we see nothing in an object to interest us, we may yet discover something in its idea to merit our approbation. Such an object therefore pleases, and does not please, *i. e.* it pleases the understanding, and not the sense. On the contrary, there are some objects, whose ideas do not offer any thing laudable, which yet excite agreeable sensations. There is therefore *beauty* of two sorts.

It is exceeding hard to fix any general characteristic of *beauty*: for, as the ideas and sensations of different persons differ according to the habitudes of the body and the turn of the mind; so do the relations of objects to those ideas and sensations vary, whence what we call *beauty* results. Hence arise those different opinions of a *beautiful* thought, a *beautiful* woman, a *beautiful* painting, &c.

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Mr. Perrault distinguishes two kinds of *beauties* in architecture, which chime in pretty aptly with the two species of *beauty* above: the one, he calls *positive* and *convincing*, such as the richness of the materials, grandeur of the structure, neatness of the workmanship, symmetry, &c.

The others he calls *arbitrary*, which depend on the will, and which would admit of having their proportions changed without deformity. These only please by the connexion, or association of their ideas with others of a different kind which please of themselves; they owe their *beauty* to that prepossession of the mind, whereby a thing, whose value we do not know, insinuates an esteem for others which we do not.

Thus, he observes, there are many things in architecture, which reason and good sense would judge deformed, and which, however, custom has not only made tolerable, but even *beautiful*, by their being always joined with other *beauties* that are positive. Thus, being at first pleased with viewing them in company, and merely on account of their company, at length we become pleased with them alone; and thus we frequently fall in love with deformities, and grow fond of faults.

Hence, the use of foils may seem founded on an ill philosophy. If a *beauty* takes off from a deformity, the deformity in its turn takes off from the *beauty*: it is the foil, therefore, is the gainer, the diamond loses. As the diamond pleases, we are pleased, in some measure, with every thing about it, particularly the foil; and as the foil displeases, we are in some measure disgusted with every thing about it, therefore with the diamond: the mind cannot be well pleased and displeas'd at the same time: by viewing the diamond and foil together, a man might in a long course of time find the one almost as *beautiful* as the other. The disparity would be always diminishing, till they came near a level: and by removing them apart, they would by degrees return to their original state, *i. e.* the diamond would recover, and the foil lose its lustre. See *DEFORMITY*.

BEAUTY of Christ's Person has been the subject of strong disputes in all ages of the church.—Isaiah describes the Messiah, as *without form and comeliness*, or any beauty to render him desirable. And the most ancient writers, as Justin Martyr, Clem. Alex. Origen, St. Cyril, Tertullian, &c. not only understand the prophet thus, but confess that the prophecy was literally fulfilled in the person of our Saviour.

Tertullian says, that Christ was *ne aspectu quidem honestus*: de car. Christ. And Celsus brings this consideration as an argument against his divine office and mission.—But all this was afterwards denied by St. Jerom, and Chryostom; who interpret the words of Isaiah, of the poverty and humility of the Messiah: and take the words of the Psalmist, *speciosus præ filiis hominum*; as meant of his personal form.—

At length they began to magnify the external *beauty* of his body; and confined themselves to one kind of picture, with a zealous pretence of a likeness, which 800 years ago was known by none; every country having a several one. Whence that query of the Iconoclasts, which of those images or veronica was a true one? And well might they be unlike each other, since every nation painted our Saviour in the nearest resemblance to the make, air, &c. of the people of the country.

BECHICS*, **BETCHICA**, **ВѢХИКА**, medicines proper for relieving coughs.

* The word is formed of the Greek, *βηξ, βηξω*, a cough.

Bechics amount to much the same with what we otherwise call *pneumonics*, *thoracics*, *expectorants*, and *pectorals*. See the articles *EXPECTORANT*, and *PECTORAL*.

BECHIC Pills. See the article *PILLULA*.

BED, a place prepared to stretch and compose the body on, for rest and sleep; made chiefly of feathers inclosed in a ticken case.

We say a feather *bed*, a down *bed*; a standing *bed*, a settee *bed*, a tent *bed*, a truckle *bed*, &c.

BED of State. See *PARADE*.

No *beds* are to be sold except filled with one sort of stuffing only; *e. gr.* feather *beds* with only dry pulled feathers; and down *beds* with clean down alone. No scalded feathers are to be mixed with the former; nor fen-down with the latter, on the pain of forfeiture; the mixture of such things being conceived as contagious for man's body to lie on. *Stat. II. Hen. 7. c. 19.*

Also *bed-quilts*, *matresses*, and cushions stuffed with horse-hair, fen-down, goats-hair, and meats-hair, which are dressed in lime; and which the heat of man's body will cause to exhale and yield a noxious smell, whereby many of the king's subjects have been destroyed—are prohibited by the same statute.

The ancient Romans had various kinds of *beds* for repose; as their *lectus cubicularis*, or *chamber-bed*, whereon they slept—their *table-bed*, or *lectus discubitorius*, whereon they eat (for they always eat lying) there being usually three persons to one *bed*, whereof the middle place was accounted the most honourable, as well as the *middle-bed*.—They had also their *lectus lucubratorius*, whereon they studied; and a *lectus funebrius*, or *emortalus*, whereon the dead were carried to the pile. See *FUNERAL*.

BED of a great gun is that thick plank which lies immediately under the piece; being, as it were, the body of the carriage.

BED, in gardening, a piece of made-ground, raised above the level of the adjoining ground, usually square or oblong, and enriched with dung or other amendments; intended for the raising of herbs, flowers, seeds, roots, or the like.

Hot-BED. See the article *HOT-BED*.

BED, in masonry, denotes a course or range of stones. See *COURSE*.

Joint of the BED is the mortar between two stones placed over each other.

BEDS, in speaking of minerals and fossils, signify certain strata, or layers of matter disposed over each other. See *STRATA*.

BED-CHAMBER.—*Lords or Gentlemen of the BED-CHAMBER* are persons of the first rank, ten in number; whose office is, each in his turn, to attend a week in the king's bed-chamber, lying by the king on a pallet-bed all night, and to wait on the king when he eats in private. The title of these is called *groom of the stole*. See the article *STOLE*.

BED-MOULDING, or *BEDDING-moulding*, in architecture, is a term used by the workmen for those members in a cornice, which are placed below the corona or crown.

Abed-moulding usually consists of these four members, an O—G, a list, a large boutine, and another list under the coronet.

BEECH-OIL, an oil drawn from the fruit, or mast, of the beech-tree.

The *beech-mast* is a kind of triangular seed, in form of a nut, or rather acorn, containing a whitish, oleaginous pith, of a very agreeable taste; whereof is made an oil much valued for sallets, &c.

It is very common in Picardy, and other places, where the mast abounds. They draw it cold by expression, after the mast has been shelled, and ground or pounded.

An attempt was made, a few years ago, to introduce the manufacture of *beech-oil* in England, and a patent granted to the proprietor; but without success; the country people, it seems, turning their mast to better account in feeding the hogs with it, than in selling it to the patentee, and his co-proprietors, for oil.

BEDOUENS. See *SCENITES*.

BEEN, or *BEHEN*, in pharmacy, denotes a medicinal root, celebrated, especially among the Arabs, for its aromatic, cardiac, and alexiterial virtues.

There are two kinds of *beens*, viz. the *whites*, *been album*, which is insipid, making little impression on the tongue, besides that of a little bitterness which it leaves behind it, and supposed by some modern botanists to be the same with our *lychnis terrestris*, by others called the papaver spumeum.

Red been, *been rubrum*, is fibrous, brown without and reddish within; supposed to be the root of a species of limonium, or sea-lavender.

They are both brought from the Levant, and have much the same virtues, being substituted for each other; they must be chosen dry, and of an aromatic astringent taste.

BEER*, a popular drink, prepared from malt and hops.

* The word is Saxon, formed from the German *bier*, of the Latin *bibere*, sometimes written by apocope *biber*.

Mathiolus takes the *zythum* and *curmi* of the ancients to be the same with the *beer* and *ale* of our days; and thinks the only difference between *zythum* and *curmi*, to have lain in some circumstances of the preparation, which rendered the one stronger than the other.

Tacitus, in speaking of the ancient Germans, as also Dioscorides, Galen, &c. condemn *beer*, as prejudicial to the head, nerves, and membranous parts, as occasioning a more lasting and more uneasy drunkenness than wine, and as promoting a suppression of urine, and sometimes a leprosy.

Mess. Perrault, Rainfant, and others, defend the modern *beer*; urging, that the hops used with us, and which the ancients were strangers to, having a faculty of purifying the blood, and removing obstructions, serve as a corrective, and free our drink from the inconveniences laid at the door of that of the ancients.

For the manner of preparing *beer*, see *BREWING*.

For its qualities, see *MALT-LIQUOR*.

Eager BEER is used by calicoe-printers, chymists, lapidaries, scarlet-dyers, vinegar-merchants, white-lead-men, &c.

BEER-Measure. See the article *MEASURE*.

BEER-Vinegar. See *VINEGAR*.

BEE-S-WAX. See the article *WAX*.

BEGGAR. See *VAGABOND* and *ROGUE*.

BEGGING Orders. See *MENDICANT*.

BEGHARDI, *BEGUARDI*, or *BEGGHARDI*, the name of an heretical sect in Germany, which sprung up towards the end of the 13th century.—Their head was one Dulcinus. Their principal tenets were, That man, in this life, might be impeccable; and, that he might arrive to a degree of perfection not to be exceeded; that this state is as happy as heaven; which, when once obtained, men are no longer obliged to ob-

serve the fashs of the church, nor obey their superiors; that every intellectual creature is self-happy; that it stands in need of nothing but the light of glory to raise it to the vision and enjoyment of God; that none, but the imperfect, apply themselves to practise virtuous actions; that Christ Jesus ought not to be adored in the elevation of the host, nor the mysteries of his incarnation be regarded: they condemned good works, and are said to have spread abroad divers impure doctrines. These fanatics, who wore the habit of monks, without paying regard to any rule, or observing celibacy, were condemned under pope Clement V. at the council of Vienne in 1311.

BEGINNING of an eclipse. } See *ECLIPSE*.

BEGINNING of the action. } See *ACTION*.

BEGLER BEG*, a Turkish title for the chief governor of a province, who has under him several beys or tangacs, that is, sub-governors.

* The word is also written *beglerbey*, *beglerbey*, *begbuler begli*, and *beglerbeg*.—It is compounded of *begler*, lords; the plural of *beg*, lord, with the word *beg* subjoined; importing as much as *lord of lords*.

BEGUARDI. See the article *BEGHARDI*.

BEGUINS, devout societies of young women, established in several parts of Flanders, Picardy, and Lorraine; who maintain themselves by the work of their own hands; leading a middle kind of life, between the secular and religious; but make no vows.

These societies began at Nivelles, in Flanders, A. D. 1226, and soon spread into France. Their habit was particular, but modest; they lived in common, and had men of great piety for their governors. Some of them giving into the errors of the Beghardi, and of Margaret Porreta, pope Clement V. abolished their institution; upon which they ceased in France; but John XXII. successor to Clement V. explained that decree, and declared only those societies of the *Beguins* extinct, which had fallen into heresy.

BHEN. See the article *BEEN*.

BELAY, on board a ship, signifies the same as *fasten*.—Thus, they say, *belay* the sheet, or tack, that is, fasten it to the kennel, &c.

BELIEF, in its general and natural sense, denotes a persuasion, or a strong assent of the mind to the truth of any proposition.

In which sense *belief* has no relation to any particular kind of means or arguments, but may be produced by any means whatever.—Thus we are said to *believe* our senses, to *believe* our reason, to *believe* a witness, &c. And hence, in rhetoric, all sorts of proofs, from whatsoever topics deduced, are called *beliefs*, because apt to beget *belief*, or persuasion touching the matter in hand.

BELIEF, in its more restrained and technical sense, invented by the schoolmen, denotes that kind of assent which is grounded only on the authority, or testimony of some person, or persons, asserting or attesting the truth of any matter proposed.

In this sense, *belief* stands opposed to knowledge and science: We do not say, we *believe* that snow is white, or that the whole is equal to its parts; but we see and know them to be so.—That the three angles of a triangle are equal to two right angles, or that all motion is naturally rectilinear, are not said to be things *credible*, but *scientific*; and the comprehension of such truths is not *belief*, but *science*.

But, when a thing propounded to us is neither apparent to our sense, nor evident to our understanding; neither certainly to be collected from any clear and necessary connexion with the cause from which it proceeds, nor with the effects which it naturally produces; nor is taken up upon any real arguments, or relation thereof to other acknowledged truths; and yet, notwithstanding appears as true, not by a manifestation, but by an attestation of the truth, and moves us to assent, not of itself, but in virtue of a testimony given to it;—This is said to be properly *credible*; and an assent to this, is the proper notion of *belief* or *faith*. See *FAITH*.

Bishop Pearson, with the generality of divines, holds the *belief* declared in the creed to be of this latter kind.—Dr. Barrow, on the contrary, contends for its being of the first or general and vulgar kind; implying, that we profess our being persuaded in our minds of the truth of the propositions annexed; not, upon one only kind of reason, viz. authority; but upon all the kinds of reason proper for begetting persuasion in the several points ensuing.—In effect, the word *medium* is evidently used in scripture in this sense: as when Thomas is said “to have believed because “he had seen,” where *belief* is grounded in sense.—Add, that our Saviour himself requires men not to rely merely on his bare testimony concerning himself, but to consider rationally the quality of his works, and on that to ground their faith: which kind of persuasion is grounded on principles of reason.—So St. James says, “the devils believe that there is a “God.” But how? They know it by experience; not by any relation or testimony.—Add, that the *belief* of the first and main article, that there is a God, cannot be grounded only on authority: for human authority alone cannot prove such a point; and divine authority presupposes it.—To say no more: the faith of the first christians does not seem to have been

been founded merely on authority; but relied partly on principles of reason, and partly on the attestations of sense: as they beheld the sincerity and innocency of our Saviour's conversation; the wisdom and majesty of his discourses; the goodness and holiness of his doctrine; the greatness of his power discovered in his miraculous works; these considerations had their weight as well as his own testimony. Nay, he seems to give up and disclaim all persuasion from his own testimony, as insufficient and foppish. It was by the following syllogism, the people became *believers*: He that is so qualified (so speaks, acts, lives, so admirable in himself, so agreeable to ancient prophecies) his pretences cannot reasonably be deemed false, but we must of justice assent to his words: But, we see and experience that Jesus, &c. Ergo—With us the case is somewhat different. The minor proposition, which was evident from sense to the people of those times, is to be inferred from authority and reason by us, viz. from the credible histories of it still extant, confirmed by so constant a tradition, and maintained by such wonderful circumstances of providence, as perhaps never concurred to any matter of fact before.

BELCHING. See the article RUCTATION.

BELLS, a popular machine, ranked by musicians among the number of musical instruments of percussion. See **MUSIC.**
The parts of a *bell* are the body or barrel, the *clapper* within-side, and the ear or *canon*, whereby it is hung to a large beam of wood.—Its usual matter is a kind of compound metal made of twenty pounds of pewter to an hundred of copper, called *bell-metal*. The thickness of its edges is usually $\frac{1}{4}$ of the diameter, and its height twelve times its thickness.—The *bell-founders* have a diapason, or *bell-scale*, wherewith they measure the size, thickness, weight, and tone of their *bells*.—For the method of casting *bells*, see **FOUNDRY.**

The uses of *bells* are summed up in the Latin distich:

*Laudo Deum verum, plebem voces, congreo clerum,
Defunctos ploro, postem fugo, festa decuro.*

The first *bells* are said to have been made at Nola, in Campania, wherof St. Paulinus was bishop; at least, it is assured, he was the first who brought them into use in the church. And hence, it is added, they had their Latin names, *nole* and *campane*: but others say, they take these names, not from their being invented in Campania, but because it was here the manner of hanging and ballancing them, now in use, was first practised; at least, that they were hung on the model of a sort of ballance invented or used in Campania. For in Latin writers we find *campana statera*, for a steelyard, and in the Greek *καμπαναίος*, for ponderary, or weigh.
Polydore Virgil ascribes the invention of church *bells* to pope Sabinian, St. Gregory's successor; but by mistake: for St. Jerome, cotemporary with Paulinus, makes mention of one. In effect, pope Sabinian did not invent *bells*; but he was the first who appointed the canonical hours to be distinguished by them.

We even find mention made of *bells* in Ovid, Tibullus, Martial, Statius, Manilius, and the Greek authors, under the appellations of *τιτιμάβουλα*, and *φώνου βρασι*. Suetonius, Dion, Strabo, Polybius, Josephus, and others, mention them under the names of *πετασος*, *τιτινάβουλον*, *αραμαντιουμ*, *κροταλιν*, *σηγναι*, &c. But these appear to have been no more than bangles, and little like the huge *bells* in use among us. Hieronymus Magius, who has a treatise express on *bells*, (wrote, when in chains, in Turkey, and which is accounted very remarkable, purely from his memory, without the assistance of any books) makes large *bells* a modern invention. Indeed, we do not hear of any before the sixth century: in 610, we are told, Lupus, bishop of Orleans, being at Sens, then besieged by the army of Clotharius, frighted away the besiegers by ringing the *bells* of St. Stephen's.—The first large *bells* in England are mentioned by Bede towards the latter end of that century. They seem to have been pretty common in the year 816. The Greeks are usually said to have been unacquainted with them till the ninth century, when their construction was first taught them by a Venetian.

Indeed, it is not true, that the use of *bells* was entirely unknown in the ancient Eastern churches, and that they called the people to church, as at present, with wooden mallets. Leo Allatius, in his dissertation on the Greek temples, proves the contrary from several ancient writers. It is his opinion, that *bells* first began to be used among them, after the taking of Constantinople by the Turks; who, it seems, prohibited them, lest their sound should disturb the repose of souls, which, according to them, wander in the air. He adds, that they still retain the use of *bells* in places remote from the intercourse of the Turks; particularly, very ancient ones in mount Athos.

F. Simon thinks the Turks rather prohibited the Christians the use of *bells*, out of political, than religious reasons; inasmuch, as the ringing of *bells* might serve as a signal for the execution of revolts, &c.

The city of Bourdeaux was deprived of its *bells* for rebellion; and, when it was offered to have them restored, the people refused it, after having tasted the ease and conveniency of being freed from the constant din and jangling of *bells*.

Matthew Paris observes, that anciently the use of *bells* was prohibited in time of mourning; though, at present, they make one of the principal ceremonies of mourning. Mabillon adds, that it was an ancient custom to ring the *bells* for persons about to expire, to advertise the people to pray for them; whence our *passing-bells*.

Lobineau observes, that the custom of ringing *bells*, at the approach of thunder, is of some antiquity; but, that the design was not so much to shake the air, and so dissipate the thunder, as to call the people to church, to pray that the parish might be preserved from that terrible meteor.

The custom of christening, or blessing *bells*, is very ancient. Some say it was introduced by pope John XIII. in 972; but, it is evidently of an older standing; there being an express prohibition of the practice in a capitular of Charlemain in 789. Alcuin says, it was established long before the eighth century; so that what has been said of John XIII. is only to be understood of an order of that pope, for restoring the practice which had been disused. See Hospinian *de Origine Templorum*, p. 113. where there is a particular account of all the ridiculous ceremonies practised about *bells*.

Nankin, a city of China, was anciently famous for the largeness of its *bells*; but their enormous weight having brought down the tower, in which they were hung, the whole building fell to ruin, and the *bells* have ever since lain on the ground.—One of these *bells* is near twelve English foot high, the diameter seven and an half, and its circumference twenty-three; its figure almost cylindrical, except for a swelling in the middle; and the thickness of the metal about the edges, seven inches.—From the dimensions of this *bell*, its weight is computed at 50,000 pounds, which is more than double the weight of that of Erfort, said by father Kircher to be the greatest *bell* in the world.—These *bells* were cast by the first emperor of the preceding dynasty, about 300 years ago. They have each their name, the hanger *tabou*, the eater *chey* the sleeper *chau*, the will *fi*.—Father le Comte adds, that there are seven other *bells* in Pekin, cast in the reign of Youlo, each of which weighs 120,000 pounds. But the founds even of their biggest *bells*, are very poor; being struck with a wooden in lieu of an iron clapper.

The Egyptians have none but wooden *bells*, except one brought by the Franks into the monastery of St. Anthony.

The found of a *bell* arises from a vibratory motion of the parts thereof, much like that of a musical chord. The stroke of the clapper, it is evident, must change the figure of the *bell*, and of round make it oval: but the metal having a great degree of elasticity, that part which the stroke drove furthest from the centre will fly back again, and this even somewhat nearer to the centre than before: so that the two points which before were the extremes of the longer diameter, now become those of the shorter. Thus, the circumference of the *bell* undergoes alternate changes of figure, and by means thereof gives that tremulous motion to the air wherein found consists. See **SOUND.**

M. Perrault maintains, that the found of the same *bell*, or chord, is a compound of the founds of the several parts thereof; so that where the parts are homogeneous, and the dimensions of the figure uniform, there is such a perfect mixture of all these founds, as constitutes one uniform, smooth, even found; and the contrary circumstances produce harshness: This he proves from the *bells* differing in tune according to the part you strike; and yet strike it any where, there is a motion of all the parts. He therefore considers *bells* as composed of an infinite number of rings; which, according to their different dimensions, have different tones, as chords of different lengths have: and, when struck, the vibrations of the parts immediately struck determine the tone; being supported by a sufficient number of consonant tones in the other parts.

Mr. Haukbee, and others, have found by experiment, that the found of a *bell* struck under water is a fourth deeper than in the air: though Merfenne says, it is of the same pitch in both elements.

Bells are observed to be heard further, placed on plains, than on hills; and still further, in valleys, than on plains: the reason of which will not be difficult to assign, if it be considered, that the higher the sonorous body is, the rarer is its medium; consequently, the less impulse it receives, and the less proper vehicle it is to convey it to a distance.

BELL metal.

Foundry of *Bells* } See the articles METAL.
Diving *BELL* } FOUNDRY.

BELLOWS,

a machine used to give a brisk agitation to the air, by enlarging and contracting its capacity, and thus expiring and inspiring the air by turns.

Bellows are of various kinds, as domestic *bellows*, enamellers *bellows*, smiths *bellows*, &c.

There are some *bellows* triangular, which only move on one side: others, called lantern-*bellows*, from their resembling a paper lantern: these move every way, and yet still continue parallel.

Mr. Triewald, engineer to his Swedish majesty, has contrived a kind of *water-bellows*.—This is not the first time that water

has been applied to blow the fire. The same is done at Ti-voll, and in other parts of Italy, where the contrivances for this purpose are called *siffi d'acqua*.—*Vide Phil. Transf.* No. 448. p. 234.

The action and effect of *bellows* of every kind, whether leathern or wooden, wrought by water or by men, depends on this, that the air which enters them, and which they contain when raised, is again compressed into a narrower space when they are closed. And, as the air, like all other fluids, runs to that place where it meets the least resistance, the air must of consequence fly out of the pipe or aperture with a velocity proportional to the force whereby the air is compressed, and must of consequence blow stronger or weaker, as the velocity with which the top and bottom of the *bellows* meet is greater or lesser. The blast also will last in proportion to the quantity of air that was drawn into the *bellows* through the valve or wind-clap.

The *Hessian bellows* are a contrivance for driving air into a mine for the respiration of the miners. This M. Papin improved, changing its cylindrical form into a spiral one; and, with this, working it only with his foot, he could make a wind to raise two pound weight.

The *bellows* of an organ are six foot long and four broad; each having an aperture of four inches, that the valve may play easily. There should likewise be a valve at the nose of the *bellows*, that one may not take the air from the other. To blow an organ of sixteen feet, there are required four pair of these *bellows*.

BELOMANCY *, **BELOMANTIA**, a kind of divination by means of arrows, practised in the east, but chiefly among the Arabians.

* The word is of Greek origin; compounded of βολη, arrow; and μαντια, divination.

Belomancy has been performed in different manners: one was to mark a parcel of arrows, and put eleven, or more of them, into a bag; these were afterwards drawn out, and according as they were marked, or not, they judged of future events.

Another way was to have three arrows, upon one of which was wrote, *God orders it me*; upon another, *God forbids it me*; and upon the third, nothing at all. These were put into a quiver, out of which they drew one of the three at random; if it happened to be that with the first inscription, the thing they consulted about was to be done; if it chanced to be that with the second inscription, it was let alone; and, if it proved that without inscription, they drew over again.

Belomancy is an ancient practice, and probably that which Ezekiel mentions, *ch. xxi. 21*. At least St. Jerome understands it so, and observes that the practice was frequent among the Assyrians and Babylonians. Something like it is also mentioned in *Hofea, ch. iv.* only that *flaves* are there mentioned instead of *arrows*, which is rather *rhabdomancy* than *belomancy*.—Grotius, as well as Jerome, confounds the two together, and shews that they prevailed much among the Magi, Chaldeans, and Scythians; whence they passed to the Sclavonians, and thence to the Germans, whom Tacitus observes to make of *belomancy*.

BELTS, *Fascia*, in astronomy, two zones or girdles surrounding Jupiter's body, more lucid than the rest, and terminated by parallel lines; being sometimes broader and sometimes narrower, nor constantly taking up the same places in his disk.

BEN, BEEN, or BEHEN. See **BEEN**.

BENCH. See the articles **BANC**, **BANK**, &c.

King's BENCH. } See the articles { **KING.**
Free BENCH. } { **FREE-BENCH.**
Widow BENCH. } { **WIDOW.**

BENCHERS, in an inn of court, the seniors of the house, who have the government and direction thereof; and out of whom is yearly chosen a treasurer, &c. See **INN**.

BEND, in heraldry, an ordinary, or bearing, formed by two lines, drawn diagonally, or a-thwart, from the upper part of the shield on the right, to the lower part on the left; being supposed to represent a shoulder-belt, or scarf worn over the shoulder.—See *Tab. Herald. fig. 7*.

The *bend* is one of the ten honorable ordinaries, containing a third part of the field when charged, and a fifth when plain.—It is sometimes indented, engrailed, &c.

Heralds speak of a *bend dexter*, and a *bend sinister*.

A *bend* is subdivided into a *benlet*, or *bandelet*, which is the sixth part of the shield; a *garter*, which is the moiety of a *bend*; a *cost*, which is the fourth part of a *bend*; and a *ribband*, which is the moiety of a *cost*.

BEND dexter is that properly and absolutely called a *bend*, as above defined.—The word *dexter* is usually annexed to prevent mistakes, and distinguish it from the

BEND sinister, which is the same with what is otherwise called after the French heralds, a *bar*, *barre*. See the article **BAR**.

The *bend-sinister* is subdivided into the *scarf*, or *scarpe*, and the *battoon*; which latter is the fourth part of the *bend*, and the most usual mark of illegitimacy; but, then it never extends it self quite a-thwart the shield, but is cut off a little at each end.

When two frait lines drawn within the *bend* run nearly

parallel to the outward edges of it, this is called *voiding*; and, he that bears it, is said to bear a *bend voided*.

Party per BEND dexter. } See the article { **PARTY.**
Point in BEND. } { **POINT.**

BENDING, in the sea language.—They say, *bend the cable*, when it is to be made fast to the ring of the anchor.—To *bend two cables*, signifies to tie them together with a knot, which, though less sure than splicing, is sooner done.

To *unbend the cable*, is to loosen it from the ring of the anchor; which is done when a ship designs to be long at sea.

To *bend a main sail*, is to make it fast to the yard in its proper place.

BENDS, in a ship, are the same with *wailes*, or *wales*, which are the outermost timbers of a ship, on which men set their feet in climbing up.

They are reckoned from the water, the *first*, *second*, and *third bend*: they help much to strengthen the ship, and have the beams, knees, and foot-hooks bolted into them.

BENDY, **BANDE'**, in blazonry, denotes an escutcheon's being divided bend-wise into an even number of partitions.—If they be odd, the field must first be named and then the number of bends.

Barry-BENDY. } See the articles { **BARRY.**
Counter-BENDY. } { **COUNTER.**
Paly-BENDY. } { **PALY.**

BENE. See the article **DE BENE esse**.

BENEDICTINS, or **BENEDICTIN order**, is an order of monks, who profess to follow the rule of St. Benedict.

The *Benedictins* are those properly called *monachi*, monks; the other orders are better denominatd *friars*, or *religious*.

In the canon law, the *Benedictins* are called *black monks*, being distinguished from the other orders by the colour of their habit; and not by the name of their patriarch, St. Benedict.—Among us they were formerly also denominatd *black friars*. The *Benedictins* wear a loose black gown, with large wide sleeves, and a capuche on their heads, ending in a point behind.

The list of saints of the *Benedictin* order is very ample; but they are accused by Baronius and many other writers, of putting many in the list who were never of the order. See **RELIGIOUS**.

BENEDICTUS CARDUUS. See the article **CARDUUS**.

BENEDITTO SACCO. See the article **SACCO**.

BENEFICE, **BENEFICIUM**, in an ecclesiastical sense, a church endowed with a revenue for the performance of divine service; or the revenue itself, assigned to an ecclesiastical person for life, in return for his performing the service of the church.

All church-preferments, except bishoprics, are called *benefices*; and all *benefices* are, by the canonists, sometimes called *dignities*; but we now ordinarily distinguish between *benefice* and *dignity*, applying the word *dignity* to bishoprics, deanries, arch-deaconries and prebends; and *benefice* to parsonages, vicarages, and donatives.

The term *benefice* comes to us from the old Romans, who using to distribute part of the lands they had conquered on the frontiers of the empire, to their soldiers; those who enjoyed such rewards were called *beneficiarii*, and the lands themselves *beneficia*, as being held on the pure beneficence and liberality of the sovereign. These *benefices* at first were given for life only, but afterwards they became hereditary and patrimonial.

From the Romans, both the name and the thing passed into France and England, with this difference, as Mr. Blount observes, that *benefices* were not given as mere gratuities for past services, but as warrants for future ones, and were accordingly held by the tenure of serving, on occasion, in the wars, &c. So that what was before a *benefice*, became now converted into a *fee*. See **FREE**, and **SERVICE**.

Hence, doublets, came the term *benefice* to be applied to church-livings; for, besides that the ecclesiastics held for life, like the soldiers, the riches of the church arose from the beneficence of princes.

As to the origin of ecclesiastical *benefices*, it is hard to determine when the revenues of the church were first divided: it is certain, till the fourth century, all the revenues were in the hands of the bishops, who distributed them by their economy; they consisted principally in alms and voluntary contributions.—As the church came to have lands, parts thereof were assigned for the subsistence of the clerks, and called *benefices*; of which we find some footing in the fifth and sixth century: but then there does not appear to have been any certain partition, nor any precise quota allotted to each particular; but the allotments were absolutely discretionary till about the twelfth century.

At first, each was contented with a single *benefice*; but, pluralities were, by degrees, introduced, on pretence of equity: for, a single *benefice* being sometimes scarce thought a competency, the priest was allowed two: as his quality, or occasions, increased, so the number of *benefices* that were to support him were increased too. Hence some, affecting to equal princes in quality, pretend to revenues answerable thereto.

Vinc. Ferrier observes, that, in his time, there were five cases by which *benefices* were acquired: by the *nominative*, as in royal nominations; by the *genitive*, as where the children of great men, &c. are provided of *benefices* by their birth; by the *dative*, as when speaking of a *benefice*, it is said, *dato*, & *debitur tibi*; by the *accusative*, as where by virtue of an accusation, either true or false, an incumbent is dispossessed, and another admitted; by the *ablative*, as when *benefices* are taken away by force from the poor and helpless: but the *vocative* case, which is the most just and legitimate, is out of use.—The *nominative* is for the king; the *genitive* for the great; the *dative* for the rich; the *accusative* for the cunning; and the *ablative* for the ambitious; but the *vocative* is reserved for the Holy Ghost alone.

The canonists distinguish three manners of vacating a *benefice*, viz. *de jure*, *de facto*, and by the *sententia* of a judge.—A *benefice* is vacated *de jure*, when the person enjoying it is guilty of certain crimes expressed in those laws, as heresy, simony, &c.—A *benefice* is vacated *de facto*, as well as *de jure*, by the natural death, or the resignation of the incumbent: which resignation may be either express; or tacit, as when he engages in a state, &c. inconsistent with it; as among the Romanists by marrying, entering a religious order, or the like. A *benefice* becomes vacant by the *sententia* of a judge, by way of punishment for certain crimes, as concubinage, perjury, forcery, &c.

Benefices are divided by the canonists into *simple*, and *sacredotal*: in the first, there is no obligation but to read prayers, sing, &c.—Such are canonries, chaplainships, chanties, &c. The second are charged with a cure of souls, or the direction and guidance of consciences.—Such are vicarages, rectories, &c.

The Romanists, again, distinguish *benefices* into *regular* and *secular*.

Regular or *titular* *BENEFICES* are those held by a religious, or a regular, who has made profession of some religious order.—Such are abbies, priories, conventual, &c.

Or rather, *regular* *benefice* is that which cannot be conferred on any but a religious; either by its foundation, by the institution of some superior, or by prescription. For prescription, forty years possession by a religious, makes the *benefice* regular.

Secular *BENEFICES* are those which are only to be given to seculars.—Of which kind are almost all cures.

All *benefices* are reputed secular, till the contrary is made appear.—They are called *secular* *benefices*, because held by secular priests, i. e. by such as live in the world, and are not engaged in any monastic order.

Some *benefices*, regular in themselves, have been secularized by the pope's bull.

A *BENEFICE* in *commendam* is that, the direction and management whereof, upon a vacancy, is given or recommended to an ecclesiastic for a certain time, till it may be conveniently provided for. See *REGULAR* and *SECULAR*.

Possession of a *BENEFICE*. See *POSSESSION*.

BENEFICIO. See *DEPRIVATIO* a *beneficio*.

Supersesio a *BENEFICIO*. } See *SUSPENSIO*.

Primo *BENEFICIO* *ecclesiastico* *habenda*. } See *PRIMO*.

BENEVOLENCE is used, both in our statutes and chronicles, for a voluntary gratuity given by the subjects to their sovereign, to which each person contributes in proportion to his estate.

In this sense, *benevolence* amounts to much the same with what in other nations is called *subsidium charitativum*, given sometimes by tenants to their lords, by the clergy to their bishops, &c.—In France it is called *free gift*, excepting that this latter is restrained to the act of the clergy.

BENZOIN, a medicinal kind of resin, imported from the kingdoms of Cochinchina, Lao, and several other parts of the East Indies.

Benzoin is the same with what is popularly called *benjamin*, or *benjain*, sometimes also *asa dulcis*.

It is procured by a wound or incision made in a tree, whose leaves resemble those of the lemon-tree. It is of a yellowish colour, of an agreeable scent, and melts easily.

There are three sorts of *benzoin*: the first is called *amygdaloides*, because of its being interspersed with several white spots, which resemble broken almonds: this comes from Siam, and is esteemed the best.—The second is black and very odoriferous; it drops from young trees, and comes from Sumatra, it is called *benzoinum de Bonina*.—The third sort is also black, but less odoriferous; this is found in the islands of Java and Sumatra.

Benzoin is used in physic, as a pectoral, and anti-asthmatic; and thrown on live coals, it serves to perfume houses, &c.

BERENGARIANS, a religious sect, who adhered to the opinions of Berengarius, archdeacon of Anjou, who opposed the doctrine of transubstantiation and the real presence, a considerable time before Luther.

He is further charged by the Romanists with desecrating marriage, and maintaining the common use of all sorts of women, and asserting infant-baptism of no effect.

His followers were divided on the head of the eucharist: Though they all agreed that the bread and wine were not ef-

fectually changed, yet some allowed that the body and blood of Christ were contained in them, though concealed under an impanation, which was the opinion of Berengarius himself: others denied any change at all, and received the whole into figure; others again allowed a change in part; and others an entire change, with this restriction, that to those who presented themselves unworthily it was changed back again.

BERENICE's hair, *coma* *BERENICIS*. See *COMA*.

BERGAMOT gives the denomination to a kind of essence, drawn from a fruit, produced by ingrafting the lemon-tree on the *bergamot* pear-stock. It is properly the oily fluid of the peels of these lemons expressed by the fingers.

There is likewise a kind of stuff of the same name, which is only clean tobacco, with a little of the essence rubbed into it.

*BERGHMOT**, or *BERGHMOTE*, vulgarly *BARMOTE*, a court held on a hill for deciding pleas and controversies among the Derbyshire miners.

* The word is formed from the Saxon *berg*, *mons*; and *mote*, *conventus*, assembly or meeting.

BERLIN, a sort of vehicle, of the chariot-kind, much used of late; taking its name from the city of Berlin in Germany: though some attribute the invention of it to the Italians, and derive the word from *berlina*, a name given by them to a sort of sledge, whereon persons are exposed to public shame.

The *berlin* is a very convenient machine to travel in, being lighter, and less apt to be overturned, than a chariot.—The body of it is hung high on flaxits by leathern braces; there being a kind of stirrup or footstool for the convenience of getting into it: instead of side-windows, some have screens to let down in bad weather, and draw up in good.

BERME, in fortification, a small space of ground, four or five foot wide, left without the rampart, between its foot and the side of the moat; to receive the earth that rolls down from the rampart, and prevent its falling into and filling up the moat.

This is also called *lisere*, *relais*, *retraite*, *pas de fouris*, *foreland*, &c.

Sometimes, for more security, the *berme* is palisaded.

BERNARDINS, or *BERNARDITES*, the name of a religious order extended over great part of Europe; being an improvement on the order of St. Benedict, first made by Robert, abbot de Moleme; and further reformed by St. Bernard, abbot de Clervaux, whence they take their name.

Their usual habit is a white gown, with a black scapulary; but when they officiate, they put on a large white cowl with great sleeves, and a hood of the same colour.

The *Bernardins* differ very little from the Cistercians. They had their origin towards the beginning of the twelfth century.

BERRY, *batca*, a grain, fruit, or seed, produced by several herbs, trees, and shrubs, thence called *bacciferous*, for the conservation, and re-production of their kind. See *BACCIFERUS*.

Berries are of various sizes, forms, properties, and uses, according to the plants whereon they grow.—Some are used in medicine, as juniper-berries, buckthorn-berries, &c.—Others in dying, as French or yellow berries, &c.

Avignon BERRY. } See the articles *AVIGNON*.

Alc BERRY. } See the articles *ALC*.

BERYL, or *BERYLL*, *ΕμERALΔΟΣ*, in the ancient physiology, denotes a transparent stone, or gem, brought from India, of a light, or pale green colour; in some, that some have represented it as of two colours, the one green, the other pale.

The *beryl* of the ancients is the same with what in latter times has been denominated *aqua marina*, by reason of its glaucous, or sea-green colour.

The *beryl* differs from the *chrysoberyl*, which is somewhat paler, and partakes more of the yellow; and from the *chrysoprasus*, which partakes more of the green.

Some authors take the *beryl* to be the diamond of the ancients.

The *beryl* is sometimes found in pieces large enough to form fine vases. It is said there are many of these in Cambaya, Martaban, Pegu, and Ceylon.

The properties of the *beryl* were very wonderful in the opinion of the ancient naturalists; they tell us, it kept people from falling into ambuscades of enemies, excited courage in the fearful, and cured diseases of the eyes and stomach.—It does none of these things now; because people are not simple enough to believe it has the virtue to do them. See *SUPPLEMENT*, article *BERYLL*.

BES, or *BESSIS*, an ancient Roman weight, containing two thirds of the *as*; that is, eight *unciae*. See the article *AS*.

BESANT, *BEZANT*, *BISANT*, or *BYZANT*, a sort of coin struck at Byzantium, in the time of the Christian emperors.

The *besant* was pure gold, or twenty-four carats fine: but its value is not well agreed on.

Hence also the gold offered by the king at the altar, on festivals, is still called *besant*, or *bisfant*.

BESSIS. See the article *BES*.

BESTAIL, or **BESTIAL**, in ancient statutes is used for cattle. 5 Ed. 3. c. 2.

BESTIARI, among the ancient Romans, those who were hired to combat with beasts, or those who were exposed to them, by sentence of law.

We usually distinguish two kinds of *bestiarii*: the first were those condemned to the beasts; either as being enemies taken prisoners, or as being slaves, and guilty of some enormous crime.—These were all exposed naked, and without defence to the beasts; nor did it aught avail to conquer and kill the beast, fresh ones being continually let loose on them, till they were dead.—But, it seldom happened that two were required for the same man; on the contrary, one beast frequently dispatched several men. Cicero mentions a lion, which alone dispatched two hundred *bestiarii*.—Those who succeeded the first were called *epidori*, and the last *σχηματα*; among the Romans, *meridiani*.

The Christians were *bestiarii* of this kind, even some of them who were Roman citizens; though it was the legal right of such to be exempt from it.

The second kind of *bestiarii*, Seneca observes, consisted of young men, who, to become expert in managing their arms, fought sometimes against beasts, and sometimes against one another; and of bravo's, who, to shew their courage and dexterity, exposed themselves to this dangerous combat. Augustus encouraged this practice in young men of the first rank; Nero exposed himself to it; and it was for the killing beasts in the amphitheatre, that Commodus acquired the title of the *Roman Hercules*.

Vignerou to these adds two kinds of *bestiarii* more: the first were those who made a trade of it, and fought for money; the second was where several *bestiarii* armed, were let loose at once against a number of beasts.

BEVEL, in masonry, and among joiners, a kind of square, one leg whereof is frequently frant, and the other crooked, according to the sweep of an arch or vault; being withal moveable, on a point, or centre, so that it may be set to any angle.

The make and use of the *bevel* are pretty much the same as those of the common square and mitre, except that these latter are fixed; the first at an angle of ninety degrees, and the second at forty-five; whereas the *bevel*, being moveable, may, in some measure, supply the office of both, and yet, which it is chiefly intended for, supply the deficiencies of both, serving to set off, or transfer, angles either greater or less than ninety or forty-five degrees.

BEVEL-angel is used among the workmen, to denote any other angle beside those of ninety or forty-five degrees. See **ANGLE**.

BEVILE, in heraldry, denotes a thing broken, or opening like a carpenter's rule.—Thus he beareth argent a chief *bevile* vert, by the name of *Beveris*.—V. *Tab. Herald. fig. 8*.

BEY, or **Beg**, denotes a governor of a country or town in the Turkish empire.

The Turks write the word *begh*, or *bek*, but they pronounce it *bey*: properly it signifies *lord*, but is particularly applied to a *lord of a banner*, whom in the same language they call *sanggiakbeg*, or *bey*; *sanggiak*, which among them signifies *banner*, or *standard*, being the badge of him who commands in a considerable place of some province, having under him a considerable number of Spah's, or horse.

Each province in Turkey is divided into seven of these *sanggiaks*, or banners, each of which qualifies a *bey*; and these are all commanded by the governor of the province, whom they also call *beghiler-beghi*, or *beyler-bey*, i. e. lord of the lords or *beys* of the province.

These *beys* are in a great measure the same that *bannerets* formerly were in England.

BEY, of Tunis, denotes a *prince*, or *king* thereof; answering to what at Algiers is called the *Dey*.

In the kingdom of Algiers, each province is governed by a *bey*, or vice-roy; who is appointed and removed at pleasure by the dey; but has a despotic power within his jurisdiction; and, at the seasons of collecting the tribute from the Arabs, is assisted by a body of troops from Algiers. *Shaw Trav. p. 6*.

BEZANT. See the article **BESANT**.

BEZOAR*, or **BEZOARD**, primarily denotes an antidote, or counter-poison.

* The word is formed from the Persian *pa-zabar*, which denotes the same; *pa*, signifying, against; and *zabar*, poison.

In this sense the name is applied to divers chymical compositions of that intention; as the mineral, solar, and jovial *bezoards*.

Some have also given the appellation *animal bezoard*, to a powder made of the heart and liver of vipers, pulverized together.

BEZOAR, or **BEZOARD**, in a more proper sense, denotes a medicinal stone, brought from the East or West-indies, composed of several coats laid one over another, generated in the stomach of an animal of the goat kind, and esteemed a powerful antidote and cardiac.—Or, it may be defined, a stony substance, taken out of the stomach of some animal, composed of several coats or lamina, like an onion, and endued with a power of resisting poison.

This is sometimes also called the *true bezoar*; and is of two kinds, *oriental* and *occidental*.

Oriental BEZOAR is in the most esteem, and is brought from several parts of the East-Indies, chiefly Golconda and Cananor: it is there found mingled with the dung of an animal of the goat-kind called *paizan*; in the belly whereof this stone is found.—The buds of a certain shrub which the animal uses to browse, are usually found in the middle of it, and are supposed to be the basis on which it is formed.

The *bezoar* ordinarily grows to the bigness of an acorn, sometimes of that of a pigeon's egg: it is composed of several shining skins, or coats, like an onion, sometimes of a blood-colour, sometimes a greenish yellow, a brownish red, and honey-colour.—The number of *bezoars* produced by each animal is various, some yielding one, two, &c. to six, and others none at all.

The larger the stone, the more valuable it is held; its price increasing like that of the diamond.—A stone of one ounce is sold in the Indies for 100 franks, and one of four ounces for 2000 livres.

Oriental bezoar must be chose glossy, of a finell like that of ambergreece, smooth to the touch, and in large pieces; its figure is indifferent, its colour usually olive.

Bezoar is easily sophisticated, and the deceit is as easily discovered. The methods of proving it are, 1st, to steep it three or fours hours in lukewarm water; if the water be not tinged, nor the *bezoar* lose of its weight, it is pure. 2^{dly}, To try it with a sharp, red-hot iron; if it enters the stone, and the heat makes it fry and shiver, it is facitious. 3^{dly}, To rub it over a paper smeared with chalk, or quick-lime; if it leave a yellow teint on the former, or a green one on the latter, it is good.

Bezoar is given in vertigo's, epilepsies, palpitations of the heart, jaundice, colic, and so many other diseases, that were its real virtues answerable to its reputed ones, it were doubtless a *panacea*. Indeed, its rarity, and the peculiar manner of its formation, have contributed as much to its reputation, as any intrinsic worth. At present it begins to be prized less, and a great many able physicians discard it, as of no use or efficacy at all.

Occidental BEZOAR is heavier, more brittle, of a dirtier green colour, as also less glossy, and generally held much inferior in virtue to the oriental kind.—It is found in the belly of several animals, especially in Peru; as the guanaco's, jacho's, vicunna's, and taragua's; the *bezoar* of which last is the most esteemed, this animal being much like the goat that produces the oriental.—But, that of the first is more common, viz. the guanaco's, a creature about the size of a horse, by some described, as of a species between a camel and a wild goat.

In some, this stone is of the bigness of a nut, in others of a puller's egg: in some it is oval, in others flat, in others round; it is usually of an ash-colour, sometimes dusky; and formed of scales, like the oriental, but much thicker: it is smooth and even without-fise, but when broken, looks as if it had been fibrillated, by reason of the little shining needles whereof it appears to be composed.

German BEZOAR, which some call *cow's egg*, is said to be found in the stomach of some cows, but more frequently in that of the chamois, a sort of rupicapra, or wild goat.

These *bezoars* are supposed to be nothing else but the hair of those animals, which being occasionally licked off by the tongue, is swallowed down, and being impregnated with the saliva, &c. is condensed into balls.

Some of them weigh 18 ounces, but they are not much esteemed, though they are used in some medicines, and by the painters in miniature, to make a yellow colour.

Besides these three kinds of *bezoar* which the shops afford, there are three other kinds much rarer, viz. the

Hog or Boar BEZOAR, called by the Dutch, *pedro de porco*, and by the Portuguese, who first brought it into Europe, *pedro de saparis*, found in the gall-bladder of a boar in the East-Indies.

In figure and size it resembles a fibert, though more irregular; its colour not fixed, but most commonly white with a teint of blue; it is smooth and shining; and is valued at ten times its weight in gold.

The Indians attribute infinite virtues to this *bezoar*: they call it *massica de jobo*, and prefer it to the *goat-bezoar*; not so much on account of its being supposed the best preservative in the world against poisons, as on account of its being sovereign in the cure of the mardoxi, a disease they are very liable to, and which is not less dangerous than the plague in Europe.

Other properties which they ascribe to it are, that it is admirable against malignant fevers, small-pox, and most diseases of women not with child; experience shewing, that it promotes abortion in those who are, if they use it indirectly.

To use it, they infuse it in water, or wine, till it has communicated a little bitterness to it. To facilitate the infusion, and at the same time preserve so precious a stone, they usually set it in a gold case pierced with holes.

Porcupine and Monkey BEZOARS only differ from those of the hog, in that they are found in the gall-bladders of those animals; unless we say with Tavernier, that these two, which he

calls *Malacca-stones*, are not taken from the gall-bladders, but from the heads of the monkey and porcupine; and that they are held in such esteem by the natives of Malacca, that they never part with them, unless as presents to ambassadors, or the greatest princes of the east.

Some add, that they are likewise found in Siam.—Indeed, the form, colour, and properties of these three *bezours* are so near a kin, that it is more than probable, they are all the same stone under three different names.

BEZOARDICUM Minerale, or *Mineral BEZOAR*, is a preparation of antimony corrected with spirit of nitre, and softened by repeated lotions, which carry off the purgative virtue, and substitute a diaphoretic one; by which it promotes sweat, like the stone of that name.

BEZOARDICUM Joviale, or *BEZOAR of Jupiter*, is a regulus made by melting three ounces of regulus of antimony and two of black-tin, which, powdered and mixed with six ounces of corrosive sublimate, and distilled off in a kind of butter, and that dissolved in spirit of nitre, and the solution distilled three times; the *bezour* remaining at bottom is to be powdered, washed, and mingled with spirit of wine, till it grow insipid.

BEZOARDICUM Lunale, or *of silver*, is made by mixing rectified butter of antimony with fine silver, dissolved in spirit of nitre, upon which, a powder falls to the bottom, which is the *bezour*.

BEZOARDICUM Martiale, is a dissolution of crocus martis by reverberation in butter of antimony, with spirit of nitre poured on it: commended by some against hysterical, hypochondriacal, and icterical disorders.

BIATHANATI, **BIATHANATOI***, the same with suicides, or those who kill themselves.

* Dr. Dome, dean of St. Paal's, has a work under the title of *Biathanatos*: wherein he undertakes to prove this position, or paradox.—That suicide is not so naturally sin, as that it may never be otherwise. *Lond.* 4to.

BIBERE ad pinnas. See the article PINNAS.

BIBITORY Adufle. See ADDUCTOR Oculi.

BIBLE, a book, by way of eminence so called, containing the scriptures, i. e. the writings of the old and new testament.

Bibles are distinguished, according to their language, into Hebrew, Greek, Latin, Chaldee, Syriac, Arabic, Coptic, &c. Some account of each whereof, and their several editions, &c. we shall here subjoin.

Hebrew Bibles are either manuscript, or printed.—The best *manuscript bibles* are those copied by the Jews of Spain. Those copied by the Jews of Germany are less exact, but more common. The two kinds are easily distinguished from each other; the former being in beautiful characters, like the *Hebrew bibles* of Bomberg, Stephens and Plantin; the latter in characters, like those of Munster and Grypius.—F. Simon observes, that the oldest *manuscript Hebrew bible* is not above 6 or 700 years old; nor does Rabbi Menham, who quotes a vast number of them, pretend any of them exceed 600 years.

The most ancient *printed Hebrew bibles* are those published by the Jews of Italy, especially of Pesaro and Brescia. Those of Portugal also printed some parts of the *bible* at Lisbon, before their expulsion.—This may be observed in the general, that the best *Hebrew bibles* are those printed under the inspection of the Jews; there being so many minutiae to be observed, that it is scarce possible for any other to succeed in it.

In the beginning of the sixth century Dan. Bomberg printed several *Hebrew bibles* in folio and quarto at Venice, most of which are esteemed both by the Jews and Christians: the first in 1517, which is the least exact, and generally goes by the name of Felix Pratensis, the person who revised it: the second in 1526, with the massora, and the commentaries of several rabbins, and a Hebrew preface by Rabbi J. Benchajim.—In 1548, the same Bomberg printed the *folio bible* of Rabbi Benchajim, which is the best and most perfect of them all: it is distinguished from the first of the same rabbi, by the comment of Rabbi D. Kimchi on the chronicles, which is not in the preceding. From this edition it was, that Buxtorf, the father, printed his *rabbinal Hebrew bible* at Basil, in 1618; but in this are several faults, especially in the commentaries of the rabbins, where that learned man altered some places that were against the Christians.—In the same year appeared at Venice a new edition of the *rabbinal bible* by Leo of Modena, a rabbin of that city, who pretended to have corrected a great number of faults in the former edition; but, besides that it is much inferior to the other *Hebrew bibles* of Venice, with regard to paper and print, it has passed through the hands of the inquisitors, who have altered many passages in the commentaries of the rabbins.

For *Hebrew bibles* in 4to, that of R. Stephens is esteemed for the beauty of the characters; but it is very incorrect. Plantin also printed several beautiful *Hebrew bibles* at Antwerp; the best is that of 1566, in 4to. Manasseh Ben Israél, a learned Portuguese Jew, published two editions of the *Hebrew bible* at Amsterdam, the one in 4to, the other in 8vo; the first has two columns, and for that reason is commodious for the reader. In 1634, R. J. C. Lombroso published a new edition in 4to at Venice, with small literal notes at the bot-

tom of each page, where he explains the Hebrew words by Spanish words. This *bible* is much esteemed by the Jews at Constantinople: in the text they have distinguished between words where the point camets is to be read with a camets-hatup, that is by o and not an a.

Of all the editions of the *Hebrew bible* in 8vo, the most beautiful and correct are the two of Jo. Athias, a Jew of Amsterdam. The first, of 1661, is the best paper; but that of 1667, is the most exact: that, however, published since at Amsterdam by Vander Hooght 1705, is preferable to any of them.

After Athias, three Hebraising Protestants engaged themselves in revising and publishing the *Hebrew bible*, viz. Clodius, Jablonki, and Opitius.—Clodius's edition was published at Frankfort, in 1677, in 4to. At the bottom of the page it has the various readings of the former editions; but the author does not appear sufficiently versed in the accenting, especially in the poetical books; besides, that not being published under his eye, many faults have crept in.—That of Jablonki in 1699, in 4to, at Berlin, is very beautiful as to letter and print: but, though the editor pretends he made use of the editions of Athias and Clodius, some critics find it scarce in any thing different from the 4to edition of Bomberg.—That of Opitius is also in 4to, at Keil, in 1709; the character is large and good, but the paper bad: It is done with a great deal of care; but the editor made use of no manuscripts but those of the German libraries; neglecting the French ones, which is an omission common to all three.—They have this advantage however, that besides the divisions used by the Jews, both general and particular, into parafkes and pesukim, they have also those of the Christians, or of the Latin *bibles*, into chapters and verses; the *keri ketib*, or various readings, Latin summaries, &c. which make them of considerable use, with respect to the Latin editions and the concordances.

The little *bible* of R. Stephens in 16to, is very much prized for the beauty of the character. Care, however, must be taken; there being another edition of Geneva, exceedingly like it, excepting, that the print is worse, and the text less correct.—To these may be added some other *Hebrew bibles* without points, in 8vo and 24to which are much coveted by the Jews; not that they are more exact, but more portable than the rest; and are used in their synagogues and schools: of these there are two beautiful editions, the one of Plantin, in 8vo, with two columns, and the other in 24to, reprinted by Raphaelengius at Leiden, in 1610. There is also an edition of them by Laurens at Amsterdam, in 1631, in a larger character: and another in 12mo, at Frankfort, in 1694, full of faults, with a preface of M. Leusden at the head of it.

Greek Bibles.—There are a great number of editions of the *bible* in Greek; but they may be all reduced to three or four principal ones, viz. that of Complutum, or Alcalá de Henares, that of Venice, that of Rome, and that of Oxford.—The first was published in 1515 by Cardinal Ximenes, and inserted in the *polyglot bible*, usually called the *Complutensian bible*: this edition is not just, the Greek of the Seventy being altered in many places according to the Hebrew text. It has, however, been reprinted in the *Polyglot bible* of Antwerp, in that of Paris, and in the 4to *bible* commonly called *bible of Vatable*.

The second *Greek bible* is that of Venice in 1518. Here the Greek text of the Septuagint is reprinted just as it stood in the manuscript, full of faults of the copists, but easily amended.

—This edition has been reprinted at Strasbourg, Basil, Frankfurt, and other places, with some alterations to bring it nearer the Hebrew. The most commodious is that of Frankfurt; there being added to this, little scholia, where are shewn the different interpretations of the old Greek translators: the author of this collection has not added his name; but it is commonly ascribed to Junius.

The third *Greek bible* is that of Rome in 1587, with Greek scholia collected from the manuscripts in the Roman libraries by Pet. Morin. This fine edition has been reprinted at Paris in 1628, by J. Morin, priest of the oratory, who has added the Latin translation, which in the Roman was printed separately, with scholia.—The Greek edition of Rome has been printed in the *Polyglot bible* of London; to which are added, at bottom, the various readings of the Alexandrian manuscript. This has been also reprinted in England in 4to and 12mo, with some alterations. It has been again published at Franeker in 1709, by Bos, who has added all the various readings he could find.

The fourth *Greek bible* is that done from the Alexandrian manuscript, begun at Oxford by Dr. Grabe in 1707. In this the Alexandrian manuscript is not printed such as it is, but such as it was thought it should be, i. e. it is altered wherever there appeared any fault of the copists, or any word inserted from any particular dialect: this, some think a piece of merit, but others a fault; urging, that the manuscript should have been given absolutely and entirely of itself, and all conjectures, as to the readings, have been thrown into the notes. See SEPTUAGINT.

Latin Bibles, how numerous soever, may be all reduced to three classes, viz. the *antient vulgate*, translated from the Greek

Greek Septuagint: the *modern vulgate*, the greatest part of which is done from the Hebrew text; and the *new Latin translations*, done also from the Hebrew text in the 16th century.—We have nothing remaining of the ancient vulgate used in the primitive times in the Western churches, but the Pſalms, Wisdom, and Ecclesiastes. Nobilius has endeavoured to retrieve it from the works of the ancient Latin fathers; but it was impossible to do it exactly, in regard most of the fathers did not keep close to it in their citations. See VULGATE.

As to the *modern vulgate*, there are a vast number of editions very different from each other. Cardinal Ximenes has inserted one in the *bible* of Complutum, corrected and altered in many places. R. Stephens, and the doctors of Louvain, have taken a world of pains in correcting the modern vulgate. The best edition of Stephens's *Latin bible* is that of 1540, reprinted in 1545; in which are added, on the margin, the various readings of several Latin manuscripts, which he had consulted. The doctors of Louvain revised the modern vulgate after R. Stephens; and added the various readings of several Latin manuscripts. The best of the Louvain editions are those, at the end of which are added the critical notes of Francis Lucas of Bruges.

All these reformations of the *Latin bible* were made before the time of Pope Sixtus V. and Clement VIII. Since which, people have not dared to make any alterations, excepting in comments, and separate notes. The correction of Clement VIII. in 1592, is now the standard throughout all the Roman churches: that Pontiff made two reformations; but it is the first of them that is followed. From this the *bibles* of Pluntin were done, and from those of Pluntin all the rest; so that the common *bibles* have none of the after-corrections of the same Clement VIII.—It is a heavy charge that lies on the editions of Pope Clement, *viz.* that they have some new texts added, and many old ones altered, to countenance and confirm what they call the Catholic doctrine: witness that celebrated passage of St. John, *tres sunt, &c.*

There are a great number of *Latin bibles* of the third class, comprehending the versions from the originals of the sacred books made within these 200 years.—The first is that of Santes Pagninus, a Dominican, printed at Lions in 410, in 1528, much esteemed by the Jews. This the author improved in a second edition. In 1542, there was a beautiful edition of the same at Lions in folio, with scholia, published under the name of Michael Villanovanus, *i. e.* Michael Servetus, author of the scholia. Those of Zurich have likewise published an edition of Pagninus's *bible* in 4to. And R. Stephens reprinted it in folio, with the vulgate, in 1557, pretending to give it more correct than in the former editions. There is also another edition of 1586, in four columns, under the name of Vatable: And we find it again in the Hamburgh edition of the *bible* in four languages.

In the number of *Latin bibles* is also usually ranked the version of the same Pagninus corrected, or rather rendered literal, by Arias Montanus; which correction being approved of by the doctors of Louvain, &c. was inserted in the polyglot *bible* of Philip II. and since in that of London. There have been various editions of this in folio, 4to and 8vo; to which have been added the Hebrew text of the old testament, and the Greek of the new. The best of them all is the first, which is in folio, 1571.

Since the reformation, there have been several Latin versions of the *bible* from the originals, by Protestants. The most esteemed are those of Munster, Leo Juda, Castalio, and Tremellius: the three last whereof have been reprinted various times.—Castalio's fine Latin pleases most people; but there are some who think it too much affected: the best edition thereof is that in 1573. Leo Juda's version, altered a little by the divines of Salamanca, was added to the ancient Latin edition, as published by R. Stephens with notes, under the name of Vatable. That of Janius and Tremellius is preferred, especially by the Calvinists, and has undergone a great number of editions.

One may add a fourth class of *Latin bibles*, comprehending the Vulgate edition corrected from the originals. The *bible* of Hieronymus Clarus is of this number: that author not being contented with restoring the ancient Latin copy, has corrected the translator in a great number of places, which he thought ill rendered. Some Protestants have followed the same method; and, among others, Andrew and Luke Osiander, who have each published a new edition of the Vulgate, corrected from the originals.

Oriental Bibles.—At the head of the Oriental versions of the *bible* must be placed the Samaritan; as being the most ancient of all, and admitting no more for holy scripture but the Pentateuch, or five books of Moses.—This translation is made from the Samaritan Hebrew text, which is a little different from the Hebrew text of the Jews. This version has never been printed alone; nor any where but in the Polyglots of London and Paris.

Chaldee Bibles are only the glosses or expositions made by the Jews in the time when they spoke the Chaldee tongue. These they call by the name of *Targumim*, or *paraphrases*, as not being any strict versions of the scripture. They have

been inserted entire in the large Hebrew *bibles* of Venice and Basil; but are read more commodiously in the Polyglots, being there attended with a Latin translation.

Syriac Bibles.—In the year 1562, Widmanstadius printed the whole New Testament in Syriac at Vienna, in a beautiful character: After him there were several other editions; and it was inserted in the *bible* of Philip II. with a Latin translation. Gabriel Sionita also published a beautiful Syriac edition of the Pſalms at Paris in 1525, with a Latin interpretation. The whole *bible* is printed in Syriac in the Polyglots of London and Paris.

Arabic Bibles.—In the year 1516, Aug. Justinian, bishop of Nebio, printed at Genoa an Arabic version of the Pſalter, with the Hebrew text and Chaldee paraphrase, adding Latin interpretations. There are also Arabic versions of the whole scriptures in the Polyglots of London and Paris; and we have an edition of the Old-Testament entire, printed at Rome in 1671, by order of the congregation de *propaganda fide*; but it is of little esteem, as having been altered agreeably to the Vulgate edition. The *Arabic bibles* among us, are not the same with those used with the Christians in the East.—Some learned men take the Arabic version in the Old-Testament, printed in the Polyglots, to be that of Saadias; at least in the main. Their reason is, that Aben Ezra, a great antagonist of Saadias, quotes some passages of his version, which are the same with those in the Arabic version of the Polyglots; yet others are of opinion, that Saadias's version is not extant. In 1622, Erpenius printed an Arabic Pentateuch, called also the Pentateuch of Mauritania, as being made by the Jews of Barbary, and for their use. This version is very literal, and esteemed very exact. The four Evangelists have also been published in Arabic, with a Latin version, at Rome in 1591, folio. These have been since reprinted in the Polyglots of London and Paris, with some little alterations of Gabriel Sionita. Erpenius published an Arabic New-Testament, entire, as he found it in his manuscript copy, at Leyden, in 1616.

Coptic Bibles.—We have no part of the *bible* printed in Coptic, but there are several manuscript copies in some of the great libraries, especially in that of the French King.

Ethiopic Bibles.—The Ethiopians have also translated the *bible* into their language. There have been printed separately, the Pſalms, Canticles, some chapters of Genesis, Ruth, Joel, Jonah, Zephaniah, Malachi, and the New-Testament; all which have been since reprinted in the Polyglot of London.—For the *Ethiopic New-Testament*, which was first printed at Rome in 1548, it is a very inaccurate work, and is reprinted in the English Polyglot with all its faults.

Armenian Bibles.—There is a very ancient Armenian version of all the *bibles*, done from the Greek of the Seventy, by some of their doctors about the time of St. Chrysofom. This was first printed entire in 1664, by one of their bishops at Amsterdam in 4to; with the New-Testament in 8vo.

Persian Bibles.—Some of the fathers seem to say, that all the scripture was formerly translated into the language of the Persians; but we have nothing now remaining of the ancient version, which was, doubtless, done from the Septuagint. The Persian Pentateuch printed in the London Polyglot is, doubtless, the work of Rabbi Jacob, a Persian Jew. In the same Polyglot we have likewise the four Evangelists in Persian, with a Latin translation; but this appears very modern, incorrect, and of little use.

Gothic Bibles. It is generally said, that Uphilas, a Gothic bishop, who lived in the fourth century, made a version of the whole *bible*, excepting the book of Kings, for the use of his country-men. That book he omitted, by reason of the frequent mention of the wars therein; as fearing to inspire too much of the military genius into that people. We have nothing remaining of this version, but the Four Evangelists, printed in 4to at Dort in 1665, from a very ancient MS.

Muscovite Bibles. An entire *bible*, in the Slavonic tongue, was printed at Ostravia in Volhinia, in the year 1581; and this is what we commonly the *Muscovite bible*. It was printed at the expense of Con. Basil, duke of Ostravia, for the common service of all Christians who speak the Slavonic language, whereof the Muscovitish is a dialect.

BIBLES in the vulgar tongues are too numerous to be here rehearsed. See F. Simon's *Critical History*, Le Long's *Bibliotheca Sacra*, and the *Bibliotheca Sacra* of F. Calmet, annexed to his dictionary of the *bible*.

BICEPS, in anatomy, is a name common to several muscles, from their having two heads.—Such is the

BICEPS cubiti, or *humeri*, a muscle of the arm, one of whose heads arises from the upper edge of the cavity of the head of the capula, and is round and tendinous, and inclosed in the channel in the head of the humerus: the other arising from the processus coracoides, is broad and tendinous; and both unite about the middle and fore-part of the arm, and make one belly, which is inserted by a strong and round tendon into the tuberosity at the upper end of the radius.—See *Tab. Anat. (Myol.) fig. 1. n. 24. fig. 2. n. 20. fig. 6. n. 15.*

Some

Some of the fibres of the tendon form a large and thin aponeurosis, which covers all the muscles of the radius and fingers externally.—Care ought to be taken in blood-letting, not to cut a-crofs, but, according to the length of the fibres of this aponeurosis.—This muscle, with the brachiius internus, bends the arm.

Biceps Externus, called also *gemellus*. See **GEMELLUS**.

Biceps Tibiæ, or *Femoris*, a muscle of the leg with two heads; the one coming from the tuberosity of the ischium, and the other from the lower part of the femur: both which join together, and are inserted by one tendon into the superior and external part of the perone.—Its use is to help to bend the tibia, and is likewise employed in turning the leg, together with the foot and toes, outward, when we sit down.—See *Tab. Anat. (Myol.) fig. 6. n. 40.*

BIDENTALES, priests among the ancient Romans, instituted for the performance of the ceremonies of a *bidental*. The *bidentales* constituted a college or decury, who had the service and procuration, or interpretation of thunder and lightning.

The first and principal part of their office was the sacrificing a sheep of two years old, which in their language was called *bidenis*, as having only two teeth, one on each side; or rather from *bidentis*, anciently written for *biennis*, two years old.

BIGA*, a chariot for racing, drawn by two horses a-breast.

* The word ought rather to be written *bigæ*, in the plural; *q. d. bigæ*, two horses being joined by a *jugum*, or yoke.

Bigæ stand contradistinguished from *trigæ*, *quadrigæ*, &c. *Bigæ* are of very ancient standing: all the heroes in Homer, Hesiod, Virgil, &c. fought in them.

BIGAMY, a double marriage, or the possession of two wives at the same time.

Among the ancient Romans, those convicted of *bigamy* were branded with a note of ignominy; and, in France, they were anciently punished with death.

BIGAMY, in the canon law, is also where a person either marries two women successively; or only marries one woman who had been married before.—Each of which the canonists account impediments to be a clerk, or to hold a bishopric without a dispensation: a point of discipline founded on that of St. Paul, *Let a bishop be the husband of one wife*, 1 Tim. iii. 2. Apoft. Const. 17. 18.

Bigamy they make of two kinds—*real*, as where the party actually marries twice—and *interpretative*, where he marries a widow, or woman debauched before, which is esteemed a kind of second marriage.

Here, F. Doucine distinguishes, and observes, that Irenæus having been married twice, must in this sense have been guilty of *bigamy*, and therefore have been made bishop of Tyre contrary to the canons. He therefore thinks with St. Jerom, &c. that those only who married two wives after baptism, came under the incapacity of *bigamy*; but St. Ambrose, Augustin, &c. are express, that it is *bigamy*, whether the first wife were married before, or after baptism. *Hist. du Neflor.*

The Romanists make a third kind of *bigamy*, by interpretation; as, when a person in holy orders, or that has taken on him some monastic order, marries.—This the bishop can dispense withal, at least on some occasions.

There is also a kind of *spiritual bigamy*; as, when a person holds two incompatible benefices, *v. gr.* two bishoprics, two vicarages, two canonicies *sub eodem titulo*, &c.

BIGNESS. See the article **MAGNITUDE**.

BIGOT*, a person foolishly obstinate, or perversely wedded to an opinion.

* The word comes from the German *boy*, and *Gott*, or the English *by-God*.

Camden relates, that the Normans were first called *bigots*, on occasion of their duke Rollo, who receiving Giffa, daughter of king Charles, in marriage, and with her the investiture of the dukedom, refused to kiss the king's foot in token of subjection, unless he would hold it out for that purpose: and being urged to it by those present, answered hastily, *No by God*; whereupon the king turning about, called him *bigot*; which name passed from him to his people.

BILARIUS porus, **BILARY poræ**, or *hepatic duct*, a considerable appendage of the liver, formed from the concurrence of a multitude of small ramifications springing from the glands of the liver, which unite into several trunks equal in magnitude to the branches of the hepatic arteries; and accompany them branch for branch through the whole substance of the liver; being wrapped up in the same capsula with the porta. See *Tab. Anat. (Spanch.) fig. 5. lit. ff.* See also **PORUS**.

These branches are about the size of a wheat-straw, the biggest large enough to admit the little finger; and are distinguishable from the porta by their contents, being always full of bile. Besides, the capsula common to these and the porta, each has a thick white coat proper to itself, like the muscular coat of an artery.

On the concave side of the liver the several ramifications meet, and form one trunk, or channel, properly called the *biliary poræ*, about the bigness of a goose-quill, which descending about two inches, meets with the cystic duct, and together with it forms what we call the *ductus communis*; which

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descending in a right line, about four inches, discharges itself into the duodenum, by an oblique insertion, oftentimes at the same aperture with the pancreatic duct.

The *porus bilarius* communicates with the gall-bladder, by a duct first described by Dr. Clifton, and afterwards by Blasius and Perrault, who gave it the name of the *cyst-hepatic duct*. Verheyen, in oxen, found two, three, or four of these cyst-hepatic ducts; and the like has been observed in a dog and a man.

BILAWS, or **BILAWES**. See the article **BY-LAWS**.

BILDGE, or **BILGE** of a ship, denotes the bottom of her floor; or the breadth of that part which she rests on, when she is a-ground.

BILDGE-water is that, which, by reason of the flatness of the ships bottom, lies on her floor, and cannot go to the well of the pump.

The Dutch, whose ships are often of this form, use a sort of pumps called *bilge-pumps*; or, as we call them, *burp-pumps*, to carry off the *bilge-water*.

When a ship strikes on a rock, they also say, she is *bilged*, or *bulged*.

BILE*, **BILIS**, a yellow bitter juice, separated from the blood in the liver, collected in the *porus bilarius*, and gall-bladder, and thence discharged by the common duct into the duodenum.

* The word *bile* comes from the Latin *bilis*, which some fetch further from the Greek *βίαι*, violence; because bilious people are inclined to anger: others derive it from the Latin *bullire*, to boil.

Bile is of two kinds, *hepatic* and *cystic*.—The first, most properly called *bile*, is separated immediately from the glands of the liver into the *porus bilarius*.—The second, more properly called *gall*, is separated likewise from the glands of the liver into the gall-bladder, by roots or ducts proper to itself.

The *cystic bile* is thicker, of a deeper yellow, and bitterer; is not evacuated continually, but only when its receptacle is replete; in which case the contraction of the irritated fibres propels it into the duodenum.—The *hepatic bile* is greener, thinner, more mild and pellucid, and is continually oozing out; being expelled by the sole action of the neighbouring parts. The *cystic bile* resists acids, and, mixed with other fluids, gives them the like property: it abterges like soap, and renders oils capable of mixing with water; it resolves and attenuates resins, gums, and other tenacious bodies, rendering them homogenous to itself. It is neither acalious nor acid, but seems a concretion of oil, salt, and spirits diluted with water.—By a chymical analysis, Dr. Drake observes, it affords some sulphur, or oil, some volatile salt, a good deal of fixt salt, (in which particular it differs from all other animal liquors) and a moderate quantity of caput mortuum, or earth: the basis is phlegm.

The principal use and effect of the *bile* is, by mixing with the chyle and the fæces, to attenuate, resolve, abterge, and stimulate the fibre motrices of the intestines; as, also to mix together things very different, to bruise and blunt those that are sharp and saline, to divide those that are coagulated, to open the passages for the chyle, to excite appetite, to act the part of a ferment, and to assimilate crude things to things concocted.—These effects the *cystic bile* has in a greater, the *hepatic* in a lesser degree.

Dr. Quincy thinks the principal use of both sorts of *bile* is to sheath and blunt the acids of the chyle, entangling them with its sulphur, so as to prevent their being sufficiently diluted by the pancreatic juice to enter the lacteals: which seems confirmed by this, that notwithstanding the great quantity of acid salts in the aliment in the stomach, there are never any found in the chyle after it has passed the *duodenum*, and been impregnated with the *bile* continually oozing out of the *porus bilarius*. See **ACID** and **BLOOD**.

Borelli asserts, that part of the *bile* discharged into the intestines re-enters the meseraic veins, and mixing with the blood of the vena porta is again percolated through the liver; and Boerhaave seems of the same opinion: on which footing the *bile* has its circulation, as well as the blood.

Some will have the *cystic bile* brought to its receptacle three different ways, and that it is even composed of three different kinds of *bile*, whence its different properties.—Though Boerhaave takes those properties rather to result from its stagnating in the gall-bladder; and, with Malpighi, thinks the bitter part may probably become so in the glands between the coats of the gall-bladder, which are furnished from the cystic arteries; whence it proceeds bitter, and mixes with the rest in the bladder.

The *bile* is a juice of great importance, with regard to the good or ill habitude of the animal. Dr. Woodward has traced its effects throughout the body very minutely, and makes no scruple to ascribe most of the diseases thereof to some disorder of the *bile*. This he takes to be the chief spring in the animal machine, and from this accounts for most of the phenomena of a body, whether healthy or diseased: and yet the ancients generally took it to be no more than an excrement, for which they could not find any use.

Many of the moderns, from the small quantity of *bile* discerned, have been led into a mistake, that this secretion is

not the sole end of so considerable a viscus as the liver. Dr. Keil observes, that in a dog whose common duct was near as big as that of a man, he gathered at the rate of about two drams an hour; though in a human body, there is reason to think the quantity secreted to be greater.

The *bile* is a part found in all animals: even pigeons, &c. which have no gall-bladder, yet have *bile*; their liver being found very bitter. Mr. Tauvry observes, that the *bile* becomes one of the principal causes of thirst, by mixing with the salivary juice. See THIRST.

Sometimes the *bile* from yellow becomes greenish, like verdigrise, and frequently pale, like the yolks of eggs, and that without any other apparent cause than a little motion, a convulsion, or a violent passion of the mind. This occasions many and terrible diseases, as nausea's, an abhorrence of food, anxiety, sighing, cardialgia's, wind, diarrhœa's, dysenteries, acute diseases, fevers, and convulsions.

Sometimes it becomes black, and takes the name of *choler*: in this case it sometimes tastes like a very sharp vinegar; sometimes like putrified blood, gnawing, burning, dissolving, consuming, occasioning inflammations, gangrenes, mortifications, violent pains, and terrible fermentations.

Of *atrabilis*, or *black bile*, Boerhaave distinguishes three kinds: 1st, the mildest, arising from the matter of the blood, put in too great a motion, which hence takes the name of *adust*: the 2^d is an aggravation of the first arising from the same causes, only heightened: the 3^d is a corrupt, parched *bile*, which, if it arose from a greenish, or palish sort, is still worse.

Too great an evacuation of the *bile*, either upwards or downwards, robs the chylefaction of its main instrument; hence it prevents digestion, secretion, excretion of the feces, and produces an acid temperature, coldness, weakness, paleness, swoonings, &c.—If the *bile*, when prepared, be prevented its discharge into the intestines, it produces jaundice. See JAUNDICE.

Secretion of the *BILE*.—For the manner in which the *bile* is separated in the liver, there are various opinions.—Some maintain, that the pores of the secretory glandules of the liver have a certain configuration and magnitude, to which the particles of the *bile* floating in the blood being just answerable, both in bulk and figure, are admitted in, and all the rest excluded.—Others, with Sylvius and Lister, not allowing any difference in the configuration, as knowing that the pores of all the vessels are circular, and that particles of all kinds will be admitted, if small enough, have recourse to a ferment, which they suppose to reside in the liver, by means whereof the particles of the blood, in their passage through the secretory ducts, assume the form of *bile*. But, as this is little else than begging the question, others have recourse to another hypothesis; maintaining, that the fluids contained in the blood of the vena porta, while that enters the substance of the liver in its way to the extremities of the vena cava, indifferently apply to the apertures of the secretory tubes contiguous to the extreme branches of the porta, which are wide enough, and to the roots of the cava, which are not wide enough, to receive them; by which means being separated from the society and the intestine motion of the other and essential part of the blood, and being no longer agitated by the vital action of the blood-vessels, and becoming exposed to the actions of the *biliary* vessels, they constitute a new humour distinct from the blood, called *bile*, &c.—Dr. Keil chuses to account for the secretion of the *bile* from the strong attraction between the particles whereof it is composed. He observes, that the heart and liver being so near each other, were the cœliac artery to have carried all the blood to the liver, considering the velocity of the blood, so viscid a secretion as the *bile* could never have been affected. Nature therefore forms a vein for the purpose, *viz.* the porta, and by it sends the blood from the branches of the mesenteric and cœliac arteries to the liver; by which the blood is brought a great way about, passing through the intestines, stomach, spleen, and pancreas, ere it arrives at the liver; thus its velocity is exceedingly diminished, and the particles that are to form the *bile* have a sufficient time to attract one another, and unite before they come to their secreting vessels. But, as if this diminution of velocity were not sufficient for the purpose, nature has gone further; having made the cavities of all the arteries increase as they divide: thus the sum of the branches arising from the aorta, is to the aorta itself, as 102740 to 100000. And yet, as if that proportion were too little for the present purpose, nature has here taken a further step, and increased the branches springing from the mesenteric artery in a greater ratio. Thus, in a body which he examined, he found the sum of the branches more than double that of the trunk; and therefore the velocity of the blood in the former, must be less than half that of the latter. He further shews, from a just calculation, that the time the blood now takes in its passage from the aorta to the liver is at least twenty-six minutes: whereas, had an artery gone directly from the aorta to the liver, it would have passed in little more than half a second, *viz.* 2437 times in the space it now takes up in its passage. Whence, it appears, that the blood was not in a state fit to yield *bile*, had it gone directly from the aorta to the liver; and, that a longer time, and more languid motion, was necessary to have the *bilious* particles in a

readiness to be separated. He adds, that did the humours exist in the glands the same as they are found after secretion, nature would not on this occasion have been at so much expence to retard the blood's velocity: besides, that the *bile* has another advantage from the use of the porta; for, by running through so many parts ere it reach the liver, it leaves behind it most of its lymphæ; by which means the particles being brought nearer each other, are, by their mutual attraction, sooner united.

BILGEE. See the article **BILGEE**.

BILINGUIS, in law, a denomination given the jury which passes in any case betwixt an Englishman and an Alien; whereof one moiety is to be natives, and the other, foreigners, if required.

BILIOUS complexion. See **COMPLEXION, TEMPERAMENT, CHOLERIC, &c.**

BILIOUS colic. See the article **COLIC**.

BILLS, in husbandry, denotes an edge-tool, of the ax kind, fitted to a handle, and used to lop trees, &c.—When short, it is called an *hand-bill*; when long, an *edge-bill*.

BILL, in law, denotes a security for money under the hand and sometimes seal of the debtor, without any condition, or forfeiture, in case of non-performance.—In which it is distinguished from a bond or obligation.

BILL also denotes a declaration in writing, expressing a wrong, or grievance, which the complainant hath suffered by the party complained of; or else some offence committed by him against some law or statute of the realm.

This *bill* is commonly addressed to the lord chancellor; especially for unconscionable wrongs done sometimes to others having jurisdiction, according as the law they are grounded on, directs.—It contains the fact complained of, the damages sustained, and the petition of process against the defendant for redress.

BILL, in parliament, denotes a paper containing propositions offered to the houses, to be passed by them, and then to be presented to the king to pass into an act or law. See **PARLIAMENT**.

BILL of attainder. } See the article **ATTAINDER**.

BILL of appeal. } See the article **APPEAL**.

BILL of exchange, a short note, or writing, ordering the payment of a sum of money in one place, to some person assigned by the drawer, or remitter, in consideration of the like value paid to him in another place. See **EXCHANGE** and **REMITTANCE**.

The whole estate and effects of merchants often consist in *bills of exchange*.

A *bill of exchange* is an instrument so noble and excellent, that though it want those formalities required by the common law; as seal, delivery, and witnesses; and so cannot be deemed a speciality: yet is it superior to any bond or speciality by the respect that is paid it, and the punctuality and preciseness of the payment.

There is some dispute about the nature and sanction of a *bill of exchange*: some take it to be a contract of permutation, or exchange; but the more general opinion is, that it is a mere contract of buying and selling; that the money given by the person who draws the *bill* is the price of sale; and that paid at the appointed place, the thing bought and sold.

Bills of exchange were unknown in the ancient Roman commerce, as well as jurisprudence. According to the common opinion, they are the invention of the Jews; who, being banished France, for some enormous crimes charged on them, retired into Lombardy, about the twelfth century, and found means to withdraw their effects, which they had lodged in the hands of friends, by secret letters and *bills* conceived in short precise terms, like the modern *bills of exchange*; and this, by the assistance of merchants and travellers.—The faction of the Gibellins, being expelled Italy by the Guelphs, retired to Amsterdam, and used the same means, for the recovery of their effects in Italy, as the Jews had done; hence the Dutch merchants took the hint of negotiating *bills of exchange*; and soon spread the practice throughout all Europe.—The same Gibellins are said to be the inventors of the *exchange*, on account of damages and interests, when *bills of exchange*, which they called *salizza di cambia*, are not paid, but returned on protest. See **RE-EXCHANGE**.

That which constitutes the form and essence of a *bill of exchange* is the cession, or transferring of a sum of money made by the drawer, to him, on whose account it is drawn, to be received of his correspondent in another place; which cession, or transfer, is made, in the mercantile terms, for *value received*, i. e. for a like sum given by the person for whose sake the *bill* is drawn, to the drawer, in money, merchandize, or other effects.

There are therefore three things necessary to constitute a *bill of exchange*; 1st, That it be drawn in one city on another; 2^{dly}, That there be three persons concerned, the drawer, the presenter, or the person for whom it is drawn, and the acceptor, or he on whom it is drawn. See **ACCEPTOR**. 3^{dly}, That it make mention, that the value which the drawer has received, is either in *bills of exchange*, in money, merchandize, or other effects, which are to be expressed; otherwise it is no *bill of exchange*.

When

When a bill of exchange is expressed to be for value in myself, it is not supposed the drawer has received the sum; but the person for whom it is drawn, stands debtor to him for it.—When a bill of exchange bears, for which sum I promise to furnish bills of exchange to such a place, the person for whom the bill is drawn may compel him to give the bills, or to return the money.

Bills of exchange may be divided into inland and outland.—Outland or foreign bills are those made for money taken up in some other country, and to be paid in England: or vice versa.—Inland bills are those made for money taken up in one part of the kingdom, and to be repaid in another.—By the stat. 9. & 10 Gul. 3. these latter are made equally binding with the former.

To note a BILL. See the article NOTE.

To protest a BILL. See the article PROTEST.

Bank-BILLS are printed instruments, whereby private persons become entitled to a part in the bank-stock. See BANK.

BILL of parcels, an account of the particular sorts and prices of goods bought, given by the seller to the buyer.

BILL of lading, an instrument signed by the master of a ship, acknowledging the receipt of a merchant's goods, and obliging himself to deliver them, at the place to which they are consigned, in good condition.

Of such bills there are usually three: the first the merchant keeps; the second is sent to the factor to whom the goods are consigned; and the third is kept by the master of the ship.

BILL of sale is when a person wanting a sum of money, delivers goods as a security to the lender, to whom he gives this bill, empowering him to sell the said goods, in case the sum borrowed is not repaid, with interest, at the time appointed.

BILL of store, a kind of licence granted at the custom-house to merchants, to carry such stores and provisions as are necessary for their voyages, custom-free.

BILL of sufferance, a licence granted at the custom-house to a merchant, to suffer him to trade from one English port to another, without paying custom.

BILL of entry, an account of goods entered at the custom-house, both inward and outward; wherein is expressed, the merchant importing or exporting the quantity of goods, and the sorts, and from whence imported, or to what place exported.

BILLS of mortality. See the article MORTALITY.

BILLA VERA, the bill is true.—The grand jury endorsing a bill, whereby any crime punishable in that court is presented to them, with the words *bill a vera*, signify thereby, that the presenter has furnished his presentment with probable evidence, and worthy of further consideration; whereupon the party presented is said to stand indicted of the crime, and bound to make an answer thereto, either by confessing or traversing the indictment.

If the crime touch his life, it is yet referred to another inquest, called the *inquest of life and death*, by whom, if he be found guilty, he stands convicted of the crime, and is condemned by the judge.

BILLET, in heraldry, a bearing, in form of a long square.

See Tab. Herald. fig. 9.

Billets are said to be couched, or inverted, when their longest side is parallel to the top of the shield, and the shortest perpendicular.

They are supposed to represent pieces of cloth of gold or silver, longer than broad, placed at a distance by way of ornament, on clothes, and afterwards translated to their coat-armour;—though Gullim takes the *billet* to represent a letter sealed up.

A coat is said to be *billeted*, when it is charged with *billets*: Thus, he bears *argent-billette*, a cross engrailed gules by the name of *Heath*.—Bloom rays, the number of the *billets* must be expressed when they are not above ten.

BILLIARDS*, an ingenious kind of game played on an oblong table, covered with green cloth, and placed exactly level, with little ivory or wooden balls, which are driven by crooked sticks, made on purpose, into hazards, or holes, on the edge and corners, according to certain laws, or conditions of the game.

* The word comes from the French *billard*, of *bill*, the ball made use of; and that from the Latin *pila*, a ball.

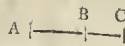
BILLON*, *BILLIO*, in coinage, a kind of base metal, either of gold or silver, in whose mixture copper predominates.

* The word is French, formed, according to Menage, from the Latin *bullus*, or *bulus*, bullion.—We do not find it is naturalized among us; but the necessity we are frequently under of using it in the course of this work, required its being explained.

According to M. Boutheroue, *billon of gold* is any gold beneath standard, or twenty-one carats; and *billon of silver*, all below ten penny-weights. But, according to others, and among the rest M. Boizard, gold and silver beneath the standard, as far as twelve carats, and six penny-weights, are properly base gold and silver, and all under those, *billon of gold* and *billon of silver*, in regard copper is the prevailing metal.

BIMEDIAL, in mathematics.—When two medial lines, as

AB and BC, commensurable only in power, and containing a rational rectangle, are compounded; the whole AC shall be irrational, and is called a *first bimedral line*.



Euel. 1. 10. prop. 38.

BINARY number, that composed of two units. See NUMBER. BINARY arithmetic, a method of computation, first proposed by M. Leibnitz; * wherein, in lieu of the ten figures in the common arithmetic, and the progression from 10 to 10, he has only two figures, and uses the simple progression from two to two.

* Jos. Pelican of Prague has more largely explained the principles and practice of the binary arithmetic, in a book entitled *Arithmetica profana qui tria numerare nescit*. 1712.

All his characters used in this arithmetic are 0 and 1: and the cypher, here, multiplies every thing by 2, as in the common arithmetic by 10.—Thus, 1 is one; 10, two; 11, three; 100, four; 101, five; 110, six; 111, seven; 1000, eight; 1001, nine; 1010, ten, &c. which is built on the same principles with the common arithmetic.

Hence immediately appears the reason of a celebrated property of the duplicate geometrical proportion in whole numbers, viz. that one number of each degree being had, we may thence compose all the other whole numbers above the double of the highest degree. It being here, v. gr. as if one should say, 111 is the sum of 4, 2, and 1, which property may serve essays to weigh all kinds of masses with a little weight; and may be used in coins, to give several values with small pieces.

100	4
10	2
1	1
111	7

This method of expressing numbers once established, all the operations will be easy: in multiplication particularly, there will be no need for a table, or getting any thing by heart.

The author however does not recommend this method for common use, because of the great number of figures required to express a number; adding, that if the common progression were from 12 to 12, or from 16 to 16, it would be still more expeditious; but its use is in discovering the properties of numbers, in constructing tables, &c.

What makes the binary arithmetic the more remarkable is, that it appears to have been the same with that used 4000 years ago among the Chinese, and left in enigmas by Foh, the founder of their empire, as well as of their sciences.

M. Lagni has proposed a new system of logarithms, on the foot of the binary arithmetic; which he finds shorter, more easy and natural, than the common ones.

BINARY measure, in music, is that which is beaten equally; or where the time of rising is equal to that of falling. See TIME and MEASURE.

BINDER's press. See the article PRESS.

BINDING books. See the article BOOK-BINDING.

BINOCULAR telescope, that to which both the eyes may be applied, and consequently the same object be observed at the same time by both.

It consists of two tubes, with two sets of glasses of the same power, and adjusted to the same axis; and has been pretended to represent objects much larger and clearer, than a single, or monocular glass.

BINOMIAL, or BINOMIAL, in algebra, a root consisting of two parts, or members, connected by the sign +, or —.

Thus $a+e$ and $5-3$ are *binomials*, consisting of the sums and difference of those quantities.

If a root have three parts, as $a+b+c$, it is called a *trinomial*; if more, a *multinomial*. See TRINOMIAL, ROOT, &c.

BIOGRAPHER*, an author who writes the history, or life of one or more persons.—Such were Plutarch, Corn. Nepos, &c.

* The word is formed from the Greek *βίος*, life, and *γράφω*, scribo, I describe.

BIQUADRATE, or BIQUADRATIC, is the next power above the cube, or the square of a cube root. See POWER, ROOT, QUADRATOQUADRATUM, &c.

BIQUINTILE, an aspect of the planets, when they are 144 degrees distant from each other. See ASPECT.

BIRD, a two-footed animal, covered with feathers, and furnished with wings, whereby it can sustain itself in the air, and fly from place to place.

Birds are usually divided into *terrestrial* and *aquatic*.

Terrestrial birds are subdivided into those which have *crooked beaks* and *talons*; and those whose beaks and claws are *straiter*.

Of birds with *crooked beaks* and *talons*, some are carnivorous and rapacious, called *birds of prey*; others are frugivorous, called by the general name of *parrots*.

Of *birds of prey*, some prey in the day-time, and are called *diurnal*; others in the night, and are called *nocturnal* birds.

Diurnal birds of prey are either of a greater or a lesser size.—The greater are either of a more bold and generous nature, as the eagle-kind; or of a more cowardly and sluggish, as the vulture.

The *lesser* diurnal birds of prey are either of a generous and docile, or of a cowardly, sluggish, and untractable nature. The *generous* and *docile* are the hawk-kind, which are wont to be reclaimed and manned for fowling. These by the falconers are distinguished into *long-winged*, as the falcon, lanner, sacre, gerfacon, kestrel, &c. whose wings reach almost as far as the end of their train; and *short-winged*, as the goshawk and sparrow-hawk, whose wings, when closed, fall much short of the end of their trains.

The *cowardly* and *sluggish* are neglected by our falconers, and so live at large.—Of these also there is a *greater* sort, as the buzzard-kind; to which may be added the ringtail and kite; and a *lesser*, as the butcher-kind, or shrike, about the bigness of a blackbird.

Of birds of prey with crooked beaks and talons, others are *nocturnal*, as the owl-kind, which prey by night: and these are either horned or eared, as the eagle-owl, horn-owl, &c. or without horns or ears, as the brown owl, white owl, grey owl, howlet, fern-owl or goat-lucker, &c.

Frugivorous land-birds, with crooked beaks and talons, are distinguished into three sorts, according to their bigness; the *greatest* size being called maccaws, and cockatoons; the *middle-sized*, and most common, parrots, and popinjays; and the *least* sort, parakeets: these all make use of their beak in climbing, and move the upper jaw.

Land-birds which have their bills and claws more strait, are distinguished into three sizes; the *greatest* kind are, such as by reason of the bulk of their bodies, and smallness of their wings cannot fly at all; such are the ostrich, the cassowary; and the dodo.

The *middle-sized* are divided into such as have either *large* and *long*, or *smaller* and *shorter* bills.

Of those with large, thick, strong, and long bills, some feed promiscuously on flesh, insects, and fruits, as the crow-kind, which are wholly black; and the pye-kind, which are partly-coloured, as the magpy, jay, &c. others feed on fish only, as the king's fisher; and others on insects only, as the woodpecker.

For those which have a smaller and shorter bill; their flesh is either white, as the poultry kind; or blackish, as the pigeon, and thrush kind.

The *least sized* kind of land birds, with strait bills and claws, are called *small-birds*.—These are of two kinds; *soft-beaked*, which have slender, strait, and pretty longish bills, most of them, and feed chiefly upon insects; and *hard-beaked*, which have thick and hard bills, and feed mostly on seeds.

Among birds which have strait beaks and claws, Mr. Willughby observes, that the cassowary (as well as the pelican) is without a tongue; swallowing not only bits of iron, as the ostriches, but also red-hot coals; yet, not digesting the iron, but voiding it whole, as the ostrich also does.

Aquatic Birds, or water-fowl, are distinguished into such as *walk* in the waters, and such as *swim* in them.

Aquatics which *walk* are all cloven-footed, and generally have long legs, and those naked, or bare of feathers, a good way above the knee, that they may the more conveniently wade in waters.—Of these authors reckon two kinds; a *greater* and a *lesser*.—To the *greater* belongs the crane, jabiru, &c.—The *lesser* are either *piscivorous*, as the heron, spoon-bill, stork, &c. or *mudfuckers*, and *insectivorous*.

Of *insectivorous* water-fowl, some have very long bills; others *middle-sized* ones, as the sea-pye and red-thank; others *short bills*, as the lapwing and plover.

Of those with *long bills*, some have them crooked, as the curlew and whimbrel; and others strait, as the woodcock and godwit.

Note, those are reckoned *short bills*, which exceed not an inch and half; *middle sized bills*, to two inches and an half; and *long bills* above two inches and a half.

Of aquatics, which *swim* in the water, some are *fissipedes*, cloven-footed, as the moor-hen and coot, &c. but most are whole-footed, or web-footed, *palmipedes*.

Of these, some few have very long legs, as the flamingo, the avocetta, and curru; but the generality are short-legged.

Of the *short-legged*, *whole-footed aquatics*, some have but three toes on each foot, as the penguin, razor-bill, &c. but generally they have four toes on each foot, and these either all connected together by intervening membranes, as in the pelican, soland-goose, &c. or more usually with the back-toe loose.

This last kind are either *narrow-billed*, or *broad-billed*.—Those with *narrow bills* have them either blunt or hooked at the tip, or sharp-pointed and straiter.

Of the former sort some are serrate, as in the diver-kind; and some not toothed, as in the puffin.

Of those with sharp-pointed and straiter bills, some have long wings, as the gull-kind; and some shorter, as those diving birds called *douckers*.

Those with *broad bills* may be divided into the goose-kind, which are larger; and the duck-kind, which are smaller; and these latter into sea-ducks, or river and plash-ducks.

Most water-fowls have a short tail; and none of this kind

have their feet disposed like parrots and wood-peckers, which have two toes forward, and two backward, whereas none of these have more than one back-toe, and some have none at all.

Birds of Passage. See MIGRATION, PASSAGE, &c.

BIRDLIME, a viscid substance, prepared various ways, and from various materials, for the catching of birds, mice, and other vermin.

The *birdlime* ordinarily used among us, is made from holly-bark, boiled ten or twelve hours: when the green coat being separated from the other, it is covered up a fortnight in a moist place, then pounded into a tough paste, so that no fibres of the wood be left, and washed in a running stream till no motes appear, put up to ferment four or five days, skimmed as often as any thing arises, and laid up for use.—To use it, a third part of nut-oil, or any thin grease, is incorporated with it over the fire.

The *birdlime* brought from Damascus is supposed to be made of sebessens, their kernels being frequently found in it; but this does not endure either frost or wet.—That brought from Spain is of an ill smell; that of the Italians is made of the berries of millete heated, mixed with oil, as before; to make it bear the water, they add turpentine.—It is said, the bark of our viburnum or way-faring shrub, makes *birdlime* as good as the best. *Vid. Hought. Collect. N^o. 426, 427.*

BIRTH, the natural exclusion of a perfect fetus from the womb by the vagina. See FŒTUS, DELIVERY, &c.

An *Immature BIRTH* is called an *abortion*. See ABORTION.

Præternatural births are those made by the way of the anus, navel, &c.

For the number of *births*, see MARRIAGE: under which the proportion of *births* to marriages, of *births* to burials, and of male-*births* to females are computed.

BIRTH, or *BIRTHING*, among seamen, denotes the due distance observed between ships lying at an anchor, or under fail.—A convenient place a-board for a mews to put their chests, &c. is also called a *birth*.—And a proper place to moor a ship in, is called by the same name.

After-BIRTH. See the article AFTER-BIRTH.

BISANT. See the article BESANT.

*BISHOP**, a prelate, or person consecrated for the spiritual government and direction of a diocese.

* The word comes from the Saxon *bishop*, and that from the Greek *ἐπίσκοπος*, an overseer, or inspector; which was a title the Athenians gave to those whom they sent into the provinces subject to them, to see whether every thing were kept in order; and the Romans gave the same title to those who were inspectors and visitors of the bread and provision. It appears from a letter of Cicero, that he himself had a bishopric, being *episcopus Oræ & Campaniæ*.

A *bishop* differs from an archbishop in this, that an archbishop with *bishops* consecrate a *bishop*, as a *bishop* with priests ordain a priest; that the archbishop visits a province, as the *bishop* a diocese; that the archbishop convokes a provincial synod, as the *bishop* a diocesan one; and that the archbishop has canonical authority over all the *bishops* of his province, as the *bishop* over the priests in his diocese.

It is a long time that *bishops* have been distinguished from mere priests or presbyters; but whether that distinction be of divine or human right, whether it was settled in the apostolical age, or introduced since, is much controverted! On the one side stands the New Testament, wherein it is certain the names *bishop* and priest are used indifferently: on the other side is tradition, the fathers, and the apostolical constitutions.

Indeed there appear no footsteps of any institution of *bishops*, distinct from priests, in the scriptures; neither do the opposers thereof pretend to shew any mark of any other form of church-government therein. So that it may seem probable, the apostles did not settle any thing of this kind at all; but either left the spiritual economy in the hands of the presbyters, or of those together with the people.

Accordingly, new occasions requiring new measures, in a little time, the functions of the priesthood were divided, and the priests distinguished into degrees; the political part of religion being assigned principally to *bishops*, and the evangelical to the priests, &c. Or rather, as some will have it, the functions of teaching and preaching were referred to the *bishops*, and that of ordination superadded; which was their principal distinction, and the mark of their sovereignty in their diocese.

The function of a *bishop*, in England, may be considered as twofold, *viz.* what belongs to his order, and what to his jurisdiction.—To the episcopal order belong the ceremonies of dedication, confirmation, and ordination: to the episcopal jurisdiction, by the statute-law, belongs the licensing of physicians, chirurgeons, and school-masters, the uniting small parishes, (though this last privilege is now peculiar to the *bishop* of Norwich) assisting the civil magistrate in the execution of statutes relating to ecclesiastical matters, and compelling the payment of tithes and subsidies due from the clergy.

By the common law, the *bishop* is to certify the judges, touching legitimate and illegitimate births and marriages; and by

that and the ecclesiastical law, he is to take care of the probate of wills, and granting administrations; to collate to benefices, grant institutions on the presentation of other patrons, command induction, order the collecting and preserving the profits of vacant benefices for the use of the successors, defend the liberties of the church, and visit his diocese once in three years. To the *bishop* also belong suspension, deprivation, deposition, degradation, and excommunication.

The *bishops* of England are all barons and peers. Barons in a two-fold manner, *viz.* feudal, in regard of lands and baronies annexed to their bishoprics; and by writ, as being summoned by writ to parliament.—They have the precedence of all other barons, and sit in the upper house, both as barons and as *bishops*.

Bishops have two special privileges next to regal: the first, that in their courts they sit and pass sentence, of themselves, and by their own authority: the *bishops* courts being not like other courts; but writs are sent out in their own name, *teste* the *bishop*, not in the king's name, as is done in the king's courts.—The second, That, like the king, they can depute their authority to another, as their surrogate, chancellor, commissary, &c.

They have also this advantage over lay-lords, that, in whatever Christian country they come, their episcopal degree and dignity is acknowledged; and they may, *quatenus bishops*, ordain, &c.

They have their vote in the trial and arraignment of a peer; but ere sentence of death, &c. they withdraw, and vote by proxy.—They have several immunities, as from arrests, outlawries, distress, &c. liberty to hunt in the king's forests, &c. to have certain tuns of wine duty-free, &c. Their persons may not be seized, as lay-peers may, upon contempt, but their temporalities alone. They may qualify as many chaplains as a duke, *viz.* six.

By law, the crime of episcopicide, which a clergyman commits by killing his *bishop*, is equivalent to parricide, *viz.* it is petty-treason.

The form of consecrating a *bishop* is different in different churches.—In the Greek church, the *bishop* elect being by the assistant *bishops* presented for consecration, and the instrument of election put in his hand; after several prayers, (the first called diaconicum) the *bishop* elect demanding consecration, makes profession of his faith: after which he receives a benediction. He is then interrogated as to the belief of the Trinity; to which he answers by a long profession of faith, and receives a second benediction. Lastly, he is asked what he thinks of the incarnation; to which he answers in a third profession of faith; which is followed by a third benediction: after which the consecrator gives him the pastoral staff: then he is led up to the altar; where, after certain prayers, and three crosses on his head, he receives the pallium, if he be an archbishop, or patriarch; he then receives the kiss of peace, of his consecrator and two assistants; and, sitting down, reads, prays, and gives the communion to his consecrator and others.

In the Romish church, the *bishop* elect being presented by the elder assistant to the consecrator, takes the oath: he is then examined as to his faith; and, after several prayers, the New Testament is drawn open over his head, and he receives the chrism or unction on his head. The pastoral staff, rings, and gospel, are then given him; and, after communion, the mitre is put on his head: each ceremony being accompanied with proper prayers, &c. the process ends with Te Deum.

In England, the king being certified of the death of a *bishop* by the dean and chapter, and his leave requested to elect another, the conge d'elire is sent to them, nominating the person he would have chosen. The election is to be within twenty days after the receipt of the conge d'elire; and the chapter, in case of refusing the person named by the king, incurs a premonition.—After election, and its being accepted of by the *bishop*, the king grants a mandate under the great seal for confirmation; which the archbishop consigns to his vicar-general; consisting mostly in a solemn citation of such as have any objections to the *bishop* elect, a declaration of their contumacy in not appearing, and an administration of the oaths of supremacy and canonical obedience. Sentence being read by the vicar-general, the confirmation concludes with a treat.—Then follows the consecration, by the archbishop and two assistant *bishops*; the ceremony of which is much the same as in the Romish church, save that, having put on the episcopal robes, the archbishop and *bishops* lay their hands on the new prelate's head, and consecrate him with a certain form of words.—After communion they go to a banquet.

The process of the translation of a *bishop* to another bishopric only differs in this, that there is no consecration.

In Denmark there are six superintendants, who take it very kindly to be called *bishops*, and *my lords*.—They have no temporalities; keep no ecclesiastical courts; have no cathedrals; or prebends, &c. but are only *primi inter pares*, having the rank above the inferior clergy of the province, and the inspection into their doctrine and manners.

The revenue of the superintendent *bishop* of Copenhagen is about 2000 rixdollars, yearly; and of the rest, 1500 rixdollars. They are allowed two or three parishes each. Their habit is common with that of the other ministers. *Account of Denmark*, p. 161.

In Sweden is an archbishop and ten *bishops*, with seven or eight superintendants under them.—The archbishopric of Upsal is worth but 400 l. per annum, and the rest in proportion.—They have also ecclesiastical courts, &c. *Rebins. Acc. of Swed.* c. 5.

REGIARY BISHOPS. See the article REGIONARY.

BISHOP'S-COURT, an ecclesiastical court held in the cathedral of each diocese; the judge whereof is the *bishop's* chancellor, anciently called *ecclesiasticus*, and *ecclesia causidicus*, q. d. the church-lawyer; who judges by the civil and canon law; and, if the diocese be large, has his commissaries in remote parts, who hold what they call *consistory courts*, for matters limited to them by their commission.

BISHOPRIC, the jurisdiction of a *bishop*: or the district within which it is comprized; called also *diocese*.

There are 24 *bishoprics*, and two archbishoprics, in England and Wales.—To the old ones, subsisting before the times of the reformation; Henry VIII. by letters patent added five more *bishoprics*; *viz.* those of Chester, Gloucester, Peterborough, Bristol, and Oxford. *Stat.* 34 & 35 H. 8. c. 17.

BISKET, or **BISQUET**, usually denotes a delicate kind of bread, prepared by the confectioners, of fine flour, eggs, sugar, and rose or orange-water; or of flour, eggs, and sugar, with anniseeds and citron peel; baked again and again in the oven in tin or paper moulds.

The word comes from the Latin *bis*, twice, and the French *cuit*, *cuitus*, q. d. twice baked.

We find divers sorts of such *biskets*; as, *seed-bisket*, *fruit-bisket*, *long-bisket*, *round-bisket*, *naples-bisket*, *spunge-bisket*, &c.

Sea-BISKET is a sort of bread much dried, by passing the oven twice, to make it keep for the service of the sea.—For long voyages they bake it four times, and prepare it six months before the embarkation. It will hold good a whole year.

BISMUTH, a mineral body, of the semi-metallic kind; by many supposed to be composed of the first matter of tin, while yet imperfect. It is found usually in tin-mines, sometimes also in silver-mines.

Its substance is hard, ponderous, and brittle, of a large grain, glossy, white, and shining.—It is also called *tin-glass*; because, when broke, it shews a vast number of little polished laminae like glass: it is also called *marcasite*, by way of excellence, because surpassing all other marcasites or semi-metals in whiteness and beauty.

Bismuth contains an arsenical salt, very dangerous to take inwardly. Its precipitate makes a very white magistry, which is mixed with waters and pomatums to make a fucus to beautify the complexion. There are also flowers prepared from it, which take away spots in the face. See the process in Quincy.

There is also an *artificial bismuth*, which is that ordinarily found in the shops, made by reducing tin into thin laminae, or plates, and cementing them by a mixture of white tartar, salt-petre, and arsenick, stratified in a crucible over a naked fire. The same is also by some made of a mineral called zink, using lead instead of tin, and a little calamine. See SUPPLEMENT, article BISMUTH.

BISQUET. See the article BISKET.

BISSECTION, in geometry, the division of any quantity into two equal parts, otherwise called *bipartition*. See DIVISION, &c.

BISSEXTILE, or *leap-year*, in chronology, a year consisting of 366 days, happening once each four years, by reason of the addition of a day in the month of February, to recover the six hours which the sun spends in his course each year, beyond the 365 days, ordinarily allowed for it. See YEAR.

The day thus added, is also called *bissextile*; Cæsar having appointed it to be the day before the 24th of February, which among the Romans was the sixth of the calends of March.

Thus the sixth of the calends of March was this year reckoned twice over; whence the intercalary day, and the year when it happens, were both called by the name *bissextile*.—By the statute *de anno bissextile*, 21 Hen. III. to prevent misunderstandings, the intercalary day, and that next before it, are to be accounted as one day.

The astronomers concerned in reforming the calendar, by order of pope Gregory III. observing, that the *bissextile* in four years added 40 minutes more than the sun spent in returning to the same point of the zodiac; and computing that these supernumerary minutes in 133 years would form a day; to prevent any changes being thus insensibly introduced in the seasons, it was appointed, that, in the course of 400 years, there should be three *bissextiles* retrenched: accordingly, in the year 1700, there was no *bissextile*, for that reason.

BISTER, or **BISTRE**, among painters and designers, a colour made of chimney-foot boiled, and afterwards diluted with water; serving to wash their deliquis. See WASHING.

Instead of this, some use the hatches of a pen, with a little Indian ink, others red chalk, others black lead, &c.

BISTOURY, a kind of surgeon's cutting instrument, of the knife-kind; much used in making incisions.—There are three kinds: the blade of the *first* turns backwards and forwards like a lancet for opening abscesses, and is sometimes used instead of it.—The *straight bistoury* does not turn, but stands straight in the handle like a common knife.—The *crooked bistoury* is shaped like a half-moon, the keen edge being on the inside. *Dionis op. Bibl. Anat. t. 1. p. 427.*

BIT, or **BITT**, an essential part of a bridle; its form and use well known; its parts and kinds various.

The kinds of *bitts* are, 1. The musfloll, snaffle, or watering *bit*. 2. The cannon-mouth, jointed in the middle; preferred by Solleyfel to all others. 3. The cannon with a fist mouth all of a piece, only kneed in the middle, to form a liberty or space for the tongue; fit for horses too sensible or ticklish, and liable to be continually bearing on the hand. 4. The cannon-mouth, with the liberty in form of a pigeon's neck; proper where a horse has too large a tongue. 5. The cannon with a port mouth and an upset, or mounting liberty, used where a horse has a good mouth but large tongue. 6. The scatch-mouth with an upset; ruder, but more secure than a cannon-mouth. 7. The cannon-mouth with a liberty, after M. Pignatelli's manner; proper for a horse with a large tongue and round bars. 8. The mafficadour, or flaving *bit*. 9. The cat's foot *bit*. 10. The bastonet *bit*, &c.

The several parts of a snaffle or curb-*bit* are—the mouth-piece, the cheeks and eyes, guard of the cheek, head of the cheeks, the port, the welts, the campanel or curb and hook, the bolles, the bolsters and rabbits, the water-chains, the side-bolts, bolts and rings, kirbles of the bit or curb, trench, top-roll, flap, and jeive.

BITE of a mad dog. See the article **HYDROPHOBIA**.

BITE of a viper. See the article **VIPER**.

BITE of a tarantula. See the article **TARANTULA**.

BITTER Almonds. } See the articles }
BITTER Waters. } **ALMOND.** }
BITTER Wine. } **WATER.** }
BITTER Wine. } **WINE.** }

BITTERNESS, a kind of flavour or sensation, opposite to sweetness, supposed by some to result from this, that all the particles of the bitter body are broken, blunted, and diminished; so as none of them remain long and rigid: which is confirmed from this, that foods burnt, and their particles much comminuted and broken by the fire, become bitter.

BITUMEN, in a general sense, a fatty, tenacious, mineral juice, very inflammable: or a fossil body which readily takes fire, yields an oil, and is not soluble in water.

Naturalists distinguish three kinds of *bitumens*, *hard*, *soft*, and *liquid* or *oil*; each of which they subdivide into several species.

Among the *hard bitumens* are ranked, yellow amber, amber-graese, jet, asphaltum, pissasphaltum, pit-coal, and sulphur.—The *soft* are, malcha, *bitumen* of Colao and of Surinam.—Lastly, the naphtha of Italy, and petroleum, are ranked among the *liquid bitumens*.

Of *bitumens* some again are fossil, others are found floating on the surface of certain lakes, and others spring from the earth like fountains; as at Pitchford in Shropshire, &c.—Some *bitumens* are so hard, that they are used in forges, instead of coals: others so glutinous that they serve instead of cement, or mortar in buildings; of which kind that was which the famous walls of Babylon were built with: and others so liquid, that they are burnt in lamps instead of oil.

The *bitumen* in most esteem is that of Judea. See **SUPPLEMENT**, article **BITUMEN**.

BIVALVE, or **BIVALVULAR**, a term used by the writers of natural history, for such shell-fish as have two shells, *a. gr.* cockles, muscles, oysters, &c. which are said to be of the *bivalvular* kind.

A certain *bivalvular* shell, being a large blood-red spondile in Buco's cabinet, is said by Dr. Lister to have been purchased by the duke of Orleans for 900 livres, which is upwards of 50 l. sterling. The same prince also offered a Parisian 1000 livres for 32 shells, and was refused.

BIVALVE is also applied to the siliqua, or seed-pods of such plants as open all their whole length to discharge their seeds—such are peas, beans, &c. which the botanists say, have *bivalvular* or *bivalvular* siliqua.

BIVENTER, in anatomy, a denomination given to the sixth muscle of the lower jaw; being the last of those serving to depress or open it: thus called, as having two bellies for its two extremities, and a tendon in the middle.—See *Tab. Anat. (Myl.) fig. 2. n. 2.*

The *biventer* or *digestivus* has its origin from a scissure between the occipital bone and the mastoid apophysis, whence passing its tendon through a hole in the stylo-hyoidetus and an annular ligament of the os hyoides, there arise some fibres which join its second belly: hence, growing fleshy, and returning upwards, it is inserted into the middle of the in-

ferior part of the lower jaw.—By this contrivance it is enabled to draw the jaw downwards.

BLACK, something opaque and porous, that imbibes all the light falling on it, reflects none, and therefore exhibits no colour.

There are various kinds of *blacks* which pass in commerce, *viz.* *dyers black*, *painters black*, *german black*, *ivory black*, *spanish black*, *lamp-black*, &c.

Dyers BLACK, is one of the five simple and mother colours used in dyeing; and is given differently, according to the different quality and value of the stuffs to be dyed. See **DYING**.

For broad-cloths, fine ratines, and druggets, &c. they use woad and indigo; the goodness of the colour consists in there not being above six pounds of indigo to a ball of woad, when the latter begins to cast its blue flower; and, in its not being heated for use above twice.—Thus blued, the stuff is boiled with alum, or tartar, then maddered; and, lastly, the *black* given with galls, coppers, and sumac.—To bind it, and prevent its smearing in use, the stuffs are to be well scoured in the fulling-mill, when white, and well washed afterwards.

For stuffs of less value, it is sufficient they be well blued with woad, and blacked with galls and coppers: but no stuff can be regularly dyed from white into *black*, without passing through the intermediate blue.

Yet there is a colour called *coal black*, or *jesuit's black*, prepared of the same ingredients as the former, but without being first dyed blue.—Here the drugs are dissolved in water that had boiled four hours, and stood to cool till the hand would bear it; then the stuff dipped in it, and again taken out six or eight times. Some even prefer this *black* to the other.—This method of dyeing *black* is said to have been invented by the Jesuits, and to be still practised in their houses, where they retain numbers of dyers.

By 23 *El. c. 9.* Nothing of the nature of cloth shall be maddered for a *black*, except it be first grounded with woad only, or with woad and anle [blue ind.] unless the madder be put in with sumac or galls; on pain of forfeiting the value of the thing dyed. Provided it shall be lawful to dye any manner of *gall-black*, and *sumac-black* [plain black] wherein no madder shall be used.

Earth-BLACK is a kind of coal found in the ground, which, well-pounded, is used by painters in fresco.

There is also a kind of **BLACK** made of silver and lead, used to fill up the strokes and cavities of things engraved.

German or Frankfurt BLACK is made of the lees of wine burnt, then washed in water, and ground in mills for that purpose, together with ivory or peach-stones burnt.

This *black* makes the principal ingredients in the rolling-press-printers ink. See **INK**.—It is ordinarily brought from Frankfurt, Mentz, or Strasbourg, either in lumps or powder. That made in France is less valued than that of Germany, by reason of the difference between the lees of wine used in the one and the other; though some prefer that made at Paris to that of Frankfurt.

Ivory-BLACK is made of ivory burnt or charred, ordinarily between two crucibles well luted; which, being thus rendered perfectly *black*, and in scales, is ground in water, and made into troches, or little cakes, used by the painters; as also by the jewellers to blacken the bottom or ground of the collets, wherein they set diamonds to give them their tint or foil.

Lamp-BLACK, or **Lan-BLACK**, the sooty fumes of rosin, prepared by melting and purifying the rosin in iron vessels; then setting fire to it under a chimney, or other place made for the purpose lined a-top with sheep-skins, or thick linen-cloth, to receive the vapour or smoke, which is the *black*: in which manner they prepare vast quantities of it at Paris.

In England it is ordinarily prepared from the resinous and fatty parts of woods, burnt under a kind of tent, which receives it; but the greatest part is brought from Sweden and Norway.

It is used on various occasions, particularly in the printers ink; for which it is mixed with oils of turpentine and linseed, all boiled together. See **INK**.

It must be observed, that this *black* takes fire very readily, and when on fire, is very difficultly extinguished: the best method of putting it out is with wet linen, hay, or straw; for water alone will not do it.

Spanish BLACK, so called, because first invented by the Spaniards, and most of it brought from them, is no other than burnt cork used in various works, particularly among painters.

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| BLACK book of the exchequer. | } See { | EXCHEQUER. |
| BLACK eagle. | | EAGLE. |
| BLACK hellebore. | | HELLEBORE. |
| BLACK lead. | | LEAD. |
| BLACK money. | | MONEY. |
| BLACK order. | | ORDER. |
| BLACK star. | | STAR. |

BLACKMAIL, a certain rate of money, corn, cattle, or other matter, paid by the inhabitants of towns in Westmorland, Cumberland, Northumberland, and Durham, to divers persons inhabiting on or near the borders, being men of name, and allied with others in those parts, known to be great robbers and spoil-takers: in order to be by them freed and protected from any pillage.—Prohibited by 43 *El. c. 13*.

BLACKNESS, the quality of a black body; or a colour arising from such a texture and situation of the superficial parts of the body, as does, as it were deaden, or rather absorb, the light falling on it, without reflecting any, or very little, of it to the eye.

In which sense, *blackness* stands directly opposed to *whiteness*; which consists in such a texture of parts, as indifferently reflects all the rays thrown upon it, of what colour soever they be.

Sir Isaac Newton, in his *Optics*, shews, that for the production of *black* colours, the corpuscles must be less than those which exhibit any other colours: because, where the sizes of the component particles are greater, there is too much light reflected to constitute this colour: but, if there be a little less than is requisite to reflect the white, and very faint blue of the first order, they will reflect so little light, as to appear intensely black; and yet may, perhaps, reflect it variously to and fro within them so long, till it happen to be stifled and lost; by which means they will appear *black* in all positions of the eye, without any transparency.

And from hence it appears, why fire, and putrefaction, by dividing the particles of substances, turn them black?—Why small quantities of *black* substances impart their colours very freely, and intensely, to other substances to which they are applied; the minute particles of these, by reason of their very great number, easily overspreading the gross particles of others.—Hence also appears, why glass, ground very elaborately with sand, on a copper plate, till it be well polished, makes the sand, together with what by rubbing is worn off from the glass and copper, become very black;—and why black substances do, sooner of all others, become hot in the sun's light, and burn, (which effect may proceed partly from the multitude of refractions in a little room, and partly from the easy commotion of such very small particles);—also, why blacks are usually a little inclined towards a bluish colour: for, that they are so, may be seen by illuminating white paper with light reflecting from black substances, where the paper will usually appear of a bluish white; and, the reason is, that black borders on the obscure blue of the first order of colours; and therefore, reflects more rays of that colour than of any other.

BLACK ROD, *Gentleman-usher* of the **Black Rod**, is the chief gentleman-usher to the king; called in the black book, *Lator virgæ nigrae, & bastiarius*, and elsewhere *virgi-bajulus*.

His duty is to bear the rod before the king at the feast of St. George at Windsor: he has also the keeping of the chapter-house door, when a chapter of the order of the garter is sitting; and, in time of parliament, attends the house of peers.—His badge is a *black rod*, with a lion in gold a-top. This rod has the authority of a mace.

BLACKS, *Negrees*; a nation of people, so called from the colour of their skin.—For the reason of their colour, and the commerce of them. See **NEGRO**.

BLACKS is also a name given to an affection of disorderly, and ill-designing persons, heading chiefly about Waltham in Essex, who destroyed deer, robbed fish-ponds, ruined timber, &c.—Many of them were armed, and disguised, with their faces blacked.

Hence, we say, the *black act*, the *Waltham blacks*, &c.—Such doings for the future are made felony, by 9 *Geo. c. 22*.

BLADDER, in anatomy, a thin expanded membranous body, found in several parts of an animal, serving as a receptacle of some juice, or of some liquid excrement; from whence it takes various denominations, as *urine-bladder, gall-bladder, &c.*

BLADDER *, by way of eminence, is a large vessel, which serves as a receptacle of the urine of animals, after its secretion from the blood in the kidneys.

* This is sometimes also called, by way of distinction, the *urinary bladder, vesica urinaria*.

The *bladder* is situated in the pelvis of the abdomen; in men, immediately on the rectum; in women, on the vagina uteri: Its figure in quadrupeds resembles a pear, with the basis upwards; but in human bodies the lower part is almost on a level with the upper; and, its orifice, or neck, placed sideways, while the fundus, or bottom, which, in a human bladder is very broad, rests either on the rectum, or the vagina uteri.—It is fastened to the navel by the urachus degenerated into a ligament, its sides to the umbilical arteries, and its neck to the intestinum rectum in women.

The *bladder* is composed of three coats; the first a covering of the peritoneum, the second consists of muscular fibres, which run irregularly several ways; and the third, which is full of wrinkles for facilitating its dilatation, is both glandulous and nervous.—Its glands separate a viscid and slimy matter, which defends the *bladder* from the acrimony of the salts in the urine.

Around its neck there goes a small muscle, called *sphincter vesicae*, which contracts the orifice of the *bladder*, to prevent the urine from dripping involuntarily, or till it thrust open the passage, by the contraction of the second coat of the *bladder*, which is therefore called *detrusor urinae*.

The *diseases* of the *bladder* are the stone, inflammations, ulcers, and palties; to which may be added, incontinence of urine, suppression of urine, &c. See **STONE, URINE, &c.**

Swimming, or Air-BLADDER. See the article **SWIMMING**.

BLADE. See the article **SHOULDER-BLADE**.

BLAIN, a distemper incident to beasts, consisting in a bladder growing on the roof of the tongue against the wind-pipe, which at length swelling, stops the breath.

It comes by great chafing, and heating of the stomach; whereby, as some judge, it fill grows, and increases by more heat.

BLANCHE carte. See the article **CARTE**.

BLANCHING, the art or manner of *bleaching*, or whitening. See **BLEACHING**, and **WHITENING**.

BLANCHING of *copper* for sale, in imitation of silver; or mixing blanched copper with silver; or exposing the same to sale; or any malleable composition or mixture of metals or minerals heavier than silver, and which looks, and touches, and wears like gold, but is manifestly worse than standard is made felony, 8 & 9 *W. 3. &c. 26*.

BLANCHING of *wax*. See the article **WAX**.

BLANCHING, in coinage, the operation of preparing the pieces before striking, to give them the requisite lustre and brightness.

The *blanching*, as now practised, is performed by heating or heating the pieces in a kind of pan or shovel, with a wood-fire, in manner of a reverberatory furnace, so as the flame passes over the shovel. The pieces being sufficiently heated, and cooled again, are put successively to boil in two copper pans, wherein are aqua fortis, common salt, and tartar of Montpellier; when they have been well-drained of this first water in a copper sieve, they throw sand and fresh water over them; and when dry, they are well rubbed.

The ancient method of *blanching* was, by putting the pieces, after heating, in a large vessel of common water, and some ounces of aqua fortis; but in different proportions for gold and silver.—The method is now disused, partly by reason of its expensiveness, and partly because it diminishes the weight of the metal.

BLANCHE firme. See article **WHITE-MONEY**.

BLANCHED money. See the article **MONEY**.

BLANKS in coinage. See **COINING**.

BLANK verse. See **VERSE**, and **RHYME**.

Point BLANK. See the article **POINT blank**.

BLANKET. See **HYKES**.

BLATTA * *Byzantia*, in physiology and pharmacy, a testaceous body, being the operculum, or lid of a turbinate shell, whose fish yields a purple dye.

* This is otherwise called *blatium byzantium, Blatium Byzantia*.

The *blatta* differs from the lid of the *buccinum*, or *purpura*, in figure; the first being oblong, the latter round: but in the shops they are ordinarily confounded, and sold for each other. The *blatta byzantia* is also confounded by apothecaries with the *unguis odoratus*, from which it ought to be distinguished as belonging to another kind of shell-fish.

Dr. Lister takes the *blatta byzantia* to have succeeded the *unguis odoratus*, and to have been brought into the shops in its place. In Dioscorides's time, the best was brought from the Red-Sea, viz. the palest and fattest; the blacker and less from Babylon, or the Persian gulph; but, it seems, latter times took up with those found about Constantinople; whence the present shop-*blatta* had its name.

The name *blatta* seems to have been given to this operculum from the colour; as being of a dark hair colour, as the common *blatta pislitaria*, or *bakehouse-beetle*, so frequent in London, is. See **SUPPLEMENT**, article **BLATTA BYZANTIA**.

BLAZE, in the manage. See the article **STAR**.

BLAZING *G-Star*. See the article **COMET**.

BLAZON *, or **BLAZONRY**, in heraldry, the art of deciphering the arms of noble houses; or of naming all the parts in their proper and particular terms.

* Various etymologies are given of the word *blazon*: the most probable is that which brings it from the German, *blaesfu*, to blow a horn; it being the custom of those who presented themselves at the lists in the ancient tournaments to blow a horn, to notify their coming. After this the heralds founded their trumpets, and then *blazoned* the arms of those who presented themselves; describing them aloud, and sometimes expatiating on the praises and high exploits of the persons who bore them.

There is this difference between *arms* and *blazon*; that the first are the device or figures bore on the coat, or shield; and *blazon*, the description thereof in words.

The rules of *blazon* are, 1^o. To name the metal or colour of the field first: as, *or, argent, or gules, &c.* 2^o. To name the manner of the division of the escutcheon by line, whether downright or bendwise, and also the difference of the

the line, whether it be indented, ingrained, &c. in the next place. 3°. Then to name the charge that is on the field. 4°. Having thus expressed the field, the division, and the charge, if there be more parts of the field occupied by the charge than one, you are to name the principal part of the field first. 5°. If there be more than one kind of charge in a field, that in the chief part is to be named first. 6°. To use no iteration or repetition of words in *blazoning* a coat, especially of any of these four words, *of*, *or*, *and*, *with*. 7°. The three forms of *blazon* are by metals and colours, by precious stones, and by the celestial planets: the first for private gentlemen; the second for persons ennobled with titles, as dukes, earls, &c. and the third for emperors, kings and princes. Though this variety of form is rejected by the French, from whom we had our heraldry, and by all other nations, who use none but metals and colours for all degrees. 8°. That metal upon metal, and colour upon colour is false heraldry: which admits of no exception, except in the arms of Jerusalem, which are, argent, a cross potent between four crozets, or.—Add, that when lions stand upright in a coat, they are called *rampant*; when walking forward, *passant*; when they look you in the face, *passant guardant*; in other postures they have other terms, as *saliant*, *regardant*, &c. Wolves and bears are termed after the manner of lions; griffons (instead of *rampant* and *saliant*) are termed *segreant*; lions, griffins, and eagles, are also said to be *langued* and *armed*; swans, *membered*; hawks, *jeffed* and *belled*; cocks, *armed*, *crested*, and *jevolved*.—that is, when the tongues, bills, and claws of such creatures are found of different colours from the body.—When an animal proceeds from the bottom of the ordinary, it is termed *issuant*; when over some ordinary, *jeffant*; and if it proceed from the middle of any ordinary, or common charge, *naissant*.

BLEACHING, or **BLANCHING**, the art of whitening linens, stuffs, silks, and other matters.

BLEACHING of silk.—While it is yet raw, it is put into a thin linen bag, and thrown into a vessel of boiling river water, wherein soap has been dissolved, then boiled two or three hours, and the bag being turned several times, taken out, beaten and washed in cold water, slightly wrung out, and thrown into a vessel of cold water, mixed with soap and a little indigo: the indigo gives it the bluish cast always observed in white silks. After taking it out of the second vessel, it is wrung out, and all the water and soap expressed, shook out to untwist and separate the threads, and hung up in the air, in a kind of stove made on purpose, wherein is burnt sulphur; the vapour whereof gives the last degree of whiteness to the silk.

BLEACHING or scouring of woollen stuff.—There are three manners of whitening woollens; the first with water and soap; the second with vapour of sulphur; the third with chalk, indigo, and vapour of sulphur.

For the first, the stuffs being taken from the fulling-mill, are put into soaped water pretty hot, and worked a-fresh by force of arms over a bench, which finishes the whitening the fulling-mill had begun; and lastly, washed out in clear water and dried: this is called the *natural way of bleaching*. In the second method, they begin with washing the stuff in river-water: it is then laid to dry on poles, and, when half dry, spread out in a kind of stove well-closed, wherein is burnt sulphur; the vapour whereof diffusing itself, sticks by little and little over all the stuff, and gives it a fine whiteness: this is commonly called *bleaching by the stove*.

In the third method, after the stuffs have been washed, they are thrown into cold water impregnated with chalk and indigo; after they have been well agitated here, they are washed a-fresh in clear water, half dried on poles, and spread in a stove to receive the vapour of the sulphur; which finishes the operation. This is not esteemed the best method of *bleaching*, though agreeable enough to the sight.

It may be here observed, that when a stuff has once received the steam of sulphur, it will scarce receive any beautiful dye, but black or blue.

BLEACHING of hollandis or fine linens.—After taking them from the loom, while yet raw, they are steeped a day in fair water, washed out and cleared of their filth, and thrown into a bucking-tub filled with a cold lixivium, or lie of wood-ashes and water. When taken out of the lie, they are washed in clear water, spread in a meadow, and watered from time to time, with water from little dikes, or canals, along the ground, by means of scoops, or hollow peels of wood, called by the Dutch, who pretend to be the inventors of them, *gieter*. After lying a certain time on the ground, they are passed through a new lie, poured on hot; and again washed in clear water, and laid a second time on the ground, and every thing repeated as before; then passed through a soft gentle lie, to dispose them to resume the softness which the other harsher lies have taken from them, washed in clear water, soaped with black soap, and that soap again washed out in clear water: they are then steeped in cow's milk, the cream first skimmed off, which finishes their whitening; and scowering gives them a softness, and makes them cast a little nap: when taken out of the milk, they are washed in clear water for the last time.—After all this process, they give the linen its

soft blue, by passing it through a water wherein a little starch, smalt, and Dutch lapis lazuli have been steeped.—Lastly, the proper stiffness and lustre is given with starch, pale smalt, and gums, the quantity and quality whereof may be adjusted according to occasion.

In fine weather, the whole process of *bleaching* is complicated in a month's time; in ill weather it takes up six weeks, or more.

BLEACHER. See the article **WHITSTER**.

BLEACHING of coarse linens. They are taken from the loom, and laid in wooden frames, full of cold water; where, by means of wooden hammers, worked by a water-mill, they are beat so, as insensibly to wash and purge them of their filth; then spread on the ground, where the dew, which they receive for eight days, takes off more of their impurity; then put into a kind of wooden tubs or pans, with a hot lie over them. Thus lixiviated, they are again purged in the mill, laid a-fresh on the ground, and after eight days more, passed through a second lie, and all things repeated, till such time as they have acquired their just degree of whiteness. Persons appointed by the trustees for improving the hempen and flaxen manufactures in Scotland, may enter into any bleach-yard, back-house, &c. and search all rooms, and the boilers therein, and view the lees, and refuse and dregs thereof—to see whether there have been any lime, pigeons-dung*, or soap-dregs used in the *bleaching* of linen cloth or yarn, contrary to the statute, 13 G. c. 26. §. 16.

* Lime, or pigeons-dung are not to be used in *bleaching* and whitening of linen, 10 A. c. 21.

For **BLEACHING of hair.** See the article **HAIR**.

For **BLEACHING of wax.** See the article **WAX**.

BLEDING, phlebotomy, an operation in chirurgery; being the opening of a vein with a lancet, for the evacuation of corrupt or redundant blood.

Some physicians extol *bleeding* as the surest, and most efficacious species of evacuations. Yet was it very rare among the ancients, however frequent among the moderns.—Offensius observes, that at Rome persons of quality are not allowed to be let blood, even in the most dangerous diseases, without leave from the pope.

The Hippopotamus is said to have first taught men the use of *bleeding*: for that animal being overcharged with blood, rubs herself against a pointed bulrush, and opens a vein; till finding its plenitude discharged, it welters in the mire to stanch the blood again. See **PHLEBOTOMY**.

BLEMISH, a term in hunting used when the hounds, or beagles, finding where the chase has been, make a proffer to enter, but return.

BLEMMYES*, or **BLEMYES**, **BAEMTEE**, among the ancient geographers, a fabulous sort of people, supposed without heads; having eyes and mouths in their breasts; said to have inhabited part of Æthiopia.

* Bochart derives the word *Blemmyes* from בלי, which implies a negation, and מין brain; in which sense the *Blemmyes* should have been people without brains.

BLENDING of mortar. See **MORTAR**.

BLIGHT, a disease incident to plants, and affecting them variously; the whole plant sometimes perishing of it, and sometimes only the leaves and blossoms, which will be scorched and shriveled up, the rest remaining green and flourishing.

This disorder seldom happens but upon the blowing of sharp easterly winds, which are most frequent with us about March; whence that month proves, of all others, the most fatal to plants.—From this circumstance some imagine the colds that then reign, being exasperated by the eastern winds, effect *blights*; but Mr. Bradley furnishes a more plausible account: for, on this principle, it were hard to say why one plant, or one part of a plant, should be blighted more than another. He observes then, that caterpillars and other insects generally attend those winds, and that they infect some one kind of tree more than another, and even some particular branch more than others; and thence infers, either that the eggs of those insects, or the insects themselves, are brought to us by the easterly winds; or that the temperature of the air, when the eastern winds blow, is necessary to hatch those creatures, supposing the eggs to have been already laid on the infected parts. Now each of these causes seems to have its effect: those *blights* attended with large worms, or caterpillars, seem hatched by the eastern winds; and those others, which only produce the small insects, that occasion the curling of the leaves of trees, may proceed from swarms of them, either ready hatched, or in the egg, brought with the wind.

The coldness of those winds he shews to be no objection against their being fitted to hatch insects; different insects requiring vastly different degrees of heat. To this he adds, that every insect has its proper plant, or tribe of plants, which it naturally requires for its nourishment, and will feed on no other; and in which, therefore, it lays its eggs: it is no wonder then, that one kind of tree should be infected, and all the rest escape. That wind, *v. gr.* which brings, or hatches the caterpillars on the apple-tree, will not infect the pear, plum, or cherry; because, were the shoals of insects natural to the apple to light on those other trees mentioned, they

they would either want their proper matrix to hatch in ; or, were they ready hatched, would perish for want of proper food. So that it is morally impossible, all kinds of plants should be blighted at the same time, unless the eggs of every kind of insect natural to each tree could be brought at one time with the wind ; or, that an easterly wind could contain in it, at once, as many different degrees of cold, or heat, as would be required to hatch and maintain each different class of insects. Nor is it any objection, that in *blights* there are not frequently any animals immediately perceptible. By the microscope, we discover animalcules a million of times less than the smallest which come under ordinary notice ; these, the gentlest air may be conceived capable of blowing from place to place ; so that it is no wonder if they be brought to us from the remotest regions, especially the north-east part of Great Tartary, &c. where the cold is intense enough to give them life ; and from whence there is not sea enough, by the warmth and fineness of whose vapours they might be suffocated. Those brought from the north-east parts of America, are probably destroyed by passing the vast Atlantic ocean, which may be the reason why the north-west wind is not so infectious.

To prevent *blights*, the more knowing among country-people, while the easterly winds blow, used to guard against them by burning heaps of weeds, chaff, and other combustibles, on the wind-side of their orchards, that the smoke may either poison the insects or their eggs, as they pass along. It may be added, that these fires are often made with good success, to destroy the caterpillars, even after they are hatched, and have begun to devour the trees.—Another method of preserving trees from *blights* is, by sprinkling tobacco-dust, or pepper-dust ; which, it is said, is present death to all insects, and animalcules.

Corn is liable to *blights* like other sorts of grain.

BLIGHT of Corn is called *Smut*. See the article *SMUT*.

BLIND Faith. See the article *FAITH*.

BLIND Gut. See *COCURUM*.

BLINDNESS, a privation of the sense of sight, arising from a total deprivation of the organs thereof, or an involuntary obstruction of their functions.

The causes of *blindness* are various ; proceeding from catarrhs, gutta serena's, &c.

We meet with divers instances of periodical *blindness* ; some persons only finding the defect of their sight toward night ; others only in the day.—

A *Nocturnal blindness* is called *Nyctalopia*.

A *Diurnal* one, *Hemeralopia*. See *NYCTALOPIA*.

The author of the embassy of D. Garcia de Silva Figueroa into Persia tells us, that in several parts of that kingdom are found vast numbers of blind people of all ages, sexes, and conditions ; by reason of a species of little flies which prick the eyes and lips, and enter the nostrils, carrying certain *blindness* with them when they light on the eyes.

Aldrovandus speaks of a sculptor, who became *blind* at twenty years of age, and yet ten years after made a perfect marble statue of Cosmo II. de Medicis ; and another of clay like Urban VIII. Bartholin tells us of a *blind* sculptor in Denmark, who distinguished perfectly well, by mere touch, not only all kinds of wood, but all the colours ; and F. Grimaldi gives an instance of the like kind ; beside the *blind* organist lately living in Paris, who is said to have done the same. F. Zahn rectes abundance of instances of the amazing sagacity of blind people in his *oculus artificialis*.

Usually among chymists vessels are said to be *blind*, which have no opening but at one side.

BLINDS, or **BLINDES**, in fortification, a sort of defences, usually made of ozers, or branches interwoven and laid across, between two rows of stakes about the height of a man, and four or five foot apart ; used particularly at the heads of trenches, when they are extended in front towards the glacis ; serving to shelter the workmen, and prevent their being overlooked by the enemy.

BLISTER. See *VESICATORY*, and *EPISPASTIC*.

BLOCKER is used for a piece of marble, as it comes out of the quarry, ere it is assumed any form from the workman's hand.

BLOCK, in falconry, denotes the perch whereon a bird of prey is kept. This is to be covered with cloth.

BLOCKADE *, a sort of siege of a place, intended to be taken by famine ; wherein all the passages, and avenues, are seized, and shut up, so as no supplies of provision can be brought in.

* It comes from the German *blockus*, or *blockhaus*, a bulwark, or house of wood ; or from the Gaulish *blocal*, barricade : though others derive it from the Latin *buculare*, to stop a passage.

A *blockade* is no regular siege ; inasmuch as there are no trenches or attacks. *Blockades* are formed by the cavalry. The word *blockade* is sometimes also used in speaking of the beginning of a siege, when forces are sent to seize the principal avenues where the besiegers intend to fix their quarters. See *SIEGE*.

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BLOCKS, on board ships, are pieces of wood, in which the shivers of pulleys are placed, and wherein the running-ropes go. Of these, some are single, some double ; and some have three, four, or five shivers in them. They are named and distinguished by the ropes they carry, and the uses they serve for.— See *Tab. Ship. fig. 2. n. 77*.

Block-Wood is a name sometimes given in our Laws to *Log-wood*. 23 *Eliz. c. 9*. See *LOG-WOOD*.

Wind-Tackle BLOCKS. See the article *WIND*.

BLOMARY, or **BLOOMARY**, the first forge in an iron-work, through which the metal passes after it is melted out of the ore. See *IRON*.

BLOOD, a warm, red liquor or humour, circulating, by means of arteries and veins, through every part of the body.

The *blood*, while in its vessels, appears to the naked eye uniform and homogeneous ; but, when let out and cold, it separates spontaneously into two different parts : the one red and fibrous, which coheres into a mass, and is called the *cruur* ; the other thin and transparent, which retains its fluidity when cold, and, being supposed specifically heavier than the other, sustains and bears it up, and is called the *serum*.—The proportion of the serum to the *cruur*, Dr. Drake makes at a medium, as one and a half to one ; but Mr. Boyle, more accurately, makes the serum $\frac{1}{3}$ of the whole *blood* ; and Dr. Jurin $\frac{1}{5}$ of the whole weight, or $\frac{1}{4}$ of the bulk.

By the microscope, the *blood* appears to consist of little red globules, swimming in an aqueous liquor, supposed to be the *cruur* and serum that appear distinct when let out. Mr. Leuwenhoeck computes these globules to be twenty-five thousand times smaller than the smallest grains of sand ; and Dr. Jurin makes them still less. Upon an accurate mensuration, he found the diameter of one, equal to $\frac{1}{1125}$ of an inch, or less than $\frac{1}{174}$ of an ordinary hair of the head.

Dr. Drake thinks, that though the rapid motion of the *blood* may make the *cruur* appear round, and perhaps, by a kind of whirling or rotation, really convolute its parts ; yet that their figure is not naturally globular, when let out, as appears from their cohesion, or hanging together in a lump ; which spherical bodies, touching in a very few points, are not apt to do : but, on the contrary, this phenomenon, he thinks, argues an implication of their fibres within one another : which is confirmed by what Dr. Adams observed with his microscope, *viz.* that immediately after emission of *blood*, it is so far from exhibiting any red globules, that it appears to consist of infinite branches, running in no other order, and variously coloured.

Principles of the BLOOD.—By a chymical analysis, the *blood* is found to consist chiefly of phlegm, as the basis or vehicle ; of volatile salts ; of oil, which, by some nice examiners has been found of two kinds ; and of caput mortuum or earth, which, though it may consist of divers substances, essentially different from each other, yet all we get out of it is a little fixed salt.—From the best experiments in this kind it appears, that in seven ounces of human *blood*, there are five ounces two drams of phlegm, three drams of a subtle spirituous oil, a small quantity of a thicker oil, two drams of salt, and about two of earth.

Dr. Jurin adds, that the serum, upon a chymical analysis, exhibits a great deal of phlegm, and of the other principles a small quantity ; and, on the contrary, the *cruur* yields less phlegm, but the other principles much more copiously than the serum. From which data he concludes, that the globules consist of some phlegm united with the oil and salts, and a small quantity of earth ; but, in what proportion, and how, and in what parts they are formed, &c. is not determined. Indeed, it must be considered, that the principles which the chymists thus produce separate, may possibly be much altered by the fire. Thus, it is past doubt, the oils drawn from the *blood* by fire are vastly different from the natural oil which circulates with the *blood*. To which may be added, that the caput mortuum remaining after distillation may, possibly, be a new production, which had no existence under any form resembling that in the *blood*.

The origin of the *BLOOD* is in the chyle, which passing the lacteals is delivered into the subclavian ; where, mixing with the *blood*, they proceed together to the right ventricle of the heart ; and there, being yet more intimately mixed, they circulate together through the whole body : till, after several circulations, and secretions at the several strainers of the body, they are assimilated, so as to make one uniform compound mass, which appears to be nothing else but chyle altered by the artifice of nature, and exalted into *blood* ; there being no appearance of any thing extraneous mixed with the liquor circulating in the *blood-vessels*, but chyle ; excepting what had been before separated from it, for some particular purposes, which being once served, it is returned to it again : unless, perhaps, it may receive some portion of air in the lungs.

That there is *Air mixed in the BLOOD*, and circulating with it, is past doubt ; but, whether any more than was at first contained in the food whereof the chyle is formed, is a question not yet decided. The principal arguments urged for it, are,

the necessity of respiration; which may be accounted for on another principle: and the florid colour the *blood* receives in the lungs, and first shews in the vena pulmonalis; which is countenanced by an experiment made with the red grumous part of the *blood* after coagulation on *blood*-letting; for, upon turning the under-surface, which was before black, upwards, and exposing it to the air, by its contact therewith it acquires a florid colour, like that of the *blood* in the vena pulmonalis. But this effect others account for from the extraordinary agitation and comminution of the *blood* in the lungs.

Indeed, Dr. Keil, Bohnius, Bernoulli, and some other mathematic physiologists, go farther. Mr. Boyle having examined the specific gravity of *blood*, and found that of the serum to be greater than that of *blood*, in the proportion of 1190 to 1040, *i. e.* nearly as 8 to 7, it followed, that the cruor, or *blood*-globules, were specifically lighter than the serum, and that in a considerable degree; which was further confirmed by the globules being sustained in the serum, both while circulating, and when let out.—Hence it was conjectured, that these globules were nothing else but thin vesicles filled with a subtile aerial substance: and this opinion was confirmed from its being observed, in viewing the circulation by a microscope, that a *blood*-globule, in passing through a very narrow vessel, would change its shape from a globular, to an oval form, and would again recover its former figure, as soon as it was got through its narrow passage; which appearance was naturally enough ascribed to the elasticity of the included air: and, from this conjecture, were accounted for a great number of the phenomena of the animal oeconomy, particularly Dr. Keil's theory of muscular motion.

But this principle Dr. Jurin has examined, and appears to have overthrown. He made several experiments, in some of which the cruor before suspended a-top of the serum, by its adhesion to the sides of the porringer being cut off, and put in another vessel of serum, immediately sunk. In others, where the cruor buoyed up in the serum, even without any adhesion to the sides of the glass, and merely by the bubbles of air adhering to its surface, upon including it in a receiver, and exhaling the air, the bubbles bursting, the cruor would sink: whence he concludes, the globular part of the *blood* to be heavier than the serum: and, from other experiments, he ascertains the proportion of the gravity of *blood* to that of serum, to be as 1054 to 1030; whence the quantity of the globules being before fixed at $\frac{1}{4}$ of the whole, the precise gravity of the globules beyond that of the serum is easily determined.—The *blood*-globules therefore are not vesicles filled with air, or any other fluid substance lighter than serum: which is further confirmed from this, that *blood*-globules are not found to dilate, or undergo any alteration, in an exhausted receiver, when viewed through a microscope; whereas, were they filled with any elastic fluid, they would either burst, or at least dilate into 70 or 80 times the space.

As to the Heat of the BLOOD, authors are exceedingly divided about the cause thereof: the ancients ascribe it to a vital flame, or innate heat lodged in the heart, and thence communicated to the *blood*. Dr. Willis imagines a kind of accession in the *blood*; and thinks its heat results from its being, as it were, set on fire, and persevering in that state. Dr. Henshaw solves it from an ebullition consequent on the mixture of two fluids, so dissimilar as the chyle and *blood*. Others have recourse to the chymical principles of alkali and acid; others to the mutual action of the principles, or component parts of the *blood*, by means whereof an intestine motion, and by that means an intestine heat, or incalcescence, is effected.

Dr. Drake, with more reason, attributes the heat of the *blood* to the spring of the air inclosed together with it in the vessels: for, air being inclosed in the *blood*-vessels, will endeavour to expand itself, and, consequently, if it have force enough, will drive outwards the parts of the body that inclose it; by which means it causes the *blood* to beat against the sides of the vessels; which, having muscular, contractile coats, do in their turns compress it again, and so cause a reciprocal æssus in the *blood*, greater than the mere circulatory motion could; whence the parts of the solids, or containing vessels, being put into a constant agitation, a heat is produced in both, which they mutually impart to each other. See ATTRITION, &c. Lastly, Dr. Boerhaave accounts for the heat of the *blood* from the action of the heart, and the re-action of the aorta: for, the *blood*, driven by the heart obliquely against the sides of the aorta, presses them, and spends almost its whole momentum against the curvity thereof, and is, by the figure and elasticity of this vessel pressed back again. Every moment of time, therefore, each particle of *blood* acquires a new motion, a new nifus, and rotation: hence follows a perpetual attrition, attenuation, rubbing off of angles, and a similitude and homogeneity of all the parts; and hence the mass derives its fluidity, heat, division into particles accommodated to all vessels, pressure into the lateral tubes, &c.

Nor is the cause of the Redness of the BLOOD less obscure: the chymists account for it from the exaltation of its sulphur; others from the mixture of saline and subacid juices with sulphurous ones; and others from the colour of the

heart. The French philosophers attribute this redness to the smallness of the size, and roundness of the figure of the particles that compose the cruor; notwithstanding that red, being the colour of all others least refrangible, and the globular figure of all others the most refrangible, that figure seems, of all others, least apt to produce this colour. Others fetch the colour of the *blood* from the impregnation of the air in the lungs; for, that air is disposed to produce such an effect, appears from the experiment above.

But others, more reserved, extend this effect of the air no further than to account for the difference of redness between the venal and arterial *blood*; supposing, that after its colour has been heightened, and rendered more florid by the mixture of the air in the lungs, it retains it pretty well in the arteries; but, that circulating in the body, and carried through the veins, the air transpires, by degrees, through the pores of the vessels, and leaves the liquor of a paler dye.

Boerhaave accounts for the colour of the *blood* from the same cause as for its heat, *viz.* from the action of the heart, and re-action of the sides of the aorta. Borelli, to ascertain the cause of the redness, took a parcel of the cruor, after it had separated itself as far as spontaneously it would from the serum, and washing it frequently in water, found it separable into a viscous, slippery substance, consisting of white or colourless fibres (which rose to the surface of the water, and there gathered into a skim, or coherent pellicle of a reticular texture) and a deep-red powder, which precipitated pretty plentifully to the bottom. Hence, it appears, that the red colour of the *blood* is imparted to it by red tinging particles, as in the common case of dyes. By examining the red precipitate apart, and finding which of the elements it consisted chiefly of, a man who would reason about the colour of the *blood* from principles of the chymists, might carry that matter nearer an issue.

However, this red colour, though generally found in all terrestrial animals, is not yet absolutely necessary and essential; there being whole species which have their circulating liquor, or *blood*, white and limpid: to which Dr. Drake adds an instance of a pure white *blood*, like milk, which he let out of the median vein of a man, and which, when cold, did not separate into a crassamentum, as the red usually does; nor yield a skim or cream, or turn four upon keeping, as milk does. Dr. Beal gives us another instance of the like kind; and Dr. Lower adds a third, of a person who bled so long at the nose, till at last the broth he drank flowed, little altered, that way, as *blood*.

Changes and disorders of the BLOOD.—From the principles, or constituent parts of the *blood* above recited, variously combined and distributed by the circulatory motion impressed by the heart, and by the oscillatory expansive motion of the interspersed air, and the re-action of the contractile vessels, flow all the properties and operations of the *blood*. From this mixture of elements, and their lax composition, it becomes susceptible of various alterations and impressions; the principal whereof are, *coagulation*, which usually attends it out of the body, sometimes in it, and scarce ever without an artificial procurement, but always mortal: and *dissolution*, which is just opposite to the former, and consists in such a comminution of the fibrous parts of the *blood*, as indispotes it for a separation of the cruor from the serum. This is frequently the consequence of malignant and peffilential fevers, &c. and is likewise occasioned by some kinds of poisons.

These two contrary affections of the *blood*, Dr. Drake ascribes to the opposite kinds of salts, acids, and volatile alkalies. For though, adds he, in a human body, no sincere acid is found, nor could it, indeed, be consistent with life; yet, it may, and does often enter the *blood*, so compounded as to bridle the volatile, alcalious salt of the *blood*, and so hinder the due attenuation and mixture of the several parts; as is the case in a diabetes, and perhaps in a chlorosis, where the *blood* is thick and torpid: on the other hand, where the alcalious salts are too redundant, the *blood* is rendered too thin and fluid, so that the difference of its constituent parts is lost.

Another affection frequent in the *blood* is, a too great abundance of oils, or oily particles, by means whereof the active parts of the *blood* are too much clogged, and those parts which should be secreted, for peculiar uses in the body, are detained; and perhaps the solids, through which it passes, too much lubricated, their tone vitiated, shrunken, relaxed, &c. whence that sluggishness and inactivity of very fat people.

The contrary affection to this is, the defect of oil in the *blood*; which being, as it were, its balsam, lines and preserves the parts from being fretted and corroded by the salts, whose siccula or edges are, as it were, sheathed in this soft balsamic matter, and their attrition against the solid parts prevented: this state of the *blood* is usually attended with a general atrophy, and a fretting and corrosion of some particular parts; whence ferous defluxions, apothumations, and ulcers, especially in the lungs, whose tender vesiculous substance is

more easily annoyed than any other, by the acrimony of the saline serum. See CATARRH, CORPULENCY, &c.

There are other affections of the *blood*, resulting from its inordinate temperature and mixture, with regard to the earthy parts; the consequences of which are, the stone, &c. and others that do not originally spring from any dyscrasy, or undue mixture of the elements, but from an alteration in its motion; such as an augmentation or diminution of its progressive motion, or the like changes in its intestine motion; whence supernatural fermentations are induced.—The occasions here may be various; sometimes fevers, and other disorders occasioned by surfeits, debauches, catching cold, violent exercise, &c. whence atonias; at other times some latent malignity of the air, whence epidemical diseases.

The *blood*, thus variously compounded and circumstantiated, visits even the minutest parts of the body, by means of its circulatory motion: the cause and course whereof see under CIRCULATION.—In this round, those particles of the *blood* which conform best to the figure and structure of the parts through which they pass, are apposed to them, either for their accretion, or for the reparation of such as the constant rapid force of the *blood* wears off.

About the matter of nutrition, or the source whence the nourishment is derived, great contests have arisen among physicians and anatomists; some contending for a nutritious juice conveyed through the lungs; some letting up the lymph, others the chyle, some the serum of the *blood*, some the cruor, as the universal fucus albilis, &c. However, all these, except they who bring the nutriment through the nerves, make the *blood* the vehicle, that conveys the alimentary parts through the body, whatever they be, and whencesoever derived: but, perhaps it was on the score of its heterogeneity, or composition of different elements, that they did not make itself the nutritious fluid, without refraining that faculty to some particular parts thereof. But Dr. Drake makes no scruple to say, that the *blood*, in its largest acceptation, as consisting of all the parts before described, is simple and homogeneous enough for the purposes of nutrition; and that every part thereof contributes something, either materially or instrumentally, to the augmentation, or reparation, of the parts through which it passes.

For the manner in which the *blood* is formed, and how the chyle is assimilated into *blood*, see SANGUIFICATION.

The quantity of BLOOD in a human body, has been variously estimated by various authors: Dr. Lower computes it in an ordinary man, at about twenty pounds; Dr. Moulin by observing the proportion of the weight of several animals to their *blood*, estimates it at about $\frac{1}{25}$ of the weight of the whole man, which may amount to eight or ten pounds: Dr. Keil, from a calculation built on the proportion of the coats to the diameters of the vessels, shews, that in a body weighing 160 pounds, 100 pounds thereof are *blood*; but then under *blood* he includes the juices of the lymphæducts, nerves, and other vessels which are secreted from it. Hence he also proposes a method of determining the velocity of the *blood*: for, as each ventricle of the heart is capable of receiving an ounce of *blood*; being full in their diastole, we may suppose they throw out about an ounce each systole. Now, the heart beats about 4000 times in an hour; therefore every hour 4000 ounces, or 250 pound of *blood*, passes through the heart. So that a quantity of *blood* equal to the whole mass, passes in two hours and a half: but, the sum of the sections of the branches of an artery being always greater than that of the trunk, the velocity of the *blood* will constantly decrease as the artery divides; and the ratio of its greatest to its least velocity in the arteries may be thus found to be as 5223 to 1. Again, the veins are to the arteries, as 441 to 324; wherefore, as the *blood* returns to the heart by the veins, its velocity will be still further diminished, and may be found to move more slowly in the veins than in the aorta, 7116 times. Again, the farther the *blood* goes off the heart, the more slowly it returns. The times of these are directly as the spaces, and reciprocally as the velocities; consequently, some parts may be some thousands of times longer in returning to the heart than others.—From the diameter of the aorta, and the quantity of *blood* driven out every pulse, the velocity of the *blood* in the aorta is easily determined, and found to be at the rate of 52 feet in a minute.

But Dr. Jurin shews, that in any two arteries transmitting equal quantities of *blood*, the momentum of the *blood* is greater in the artery more remote from the heart than in that nearer; and that its momentum is greater in all the capillary arteries together, than in the aorta; and, lastly, that the momentum of the *blood* is greater in any of the veins, than in the artery corresponding to it; and therefore greater in the vena cava, than the aorta.

Lastly, he shews, that the momentum of the *blood* in the vena cava is equal to that of the quantity of *blood* thrown out into the aorta at each systole, whose velocity is such as would pass the whole length of the arteries and veins in the interval of time between two pulses; and that the absolute momentum of the *blood* in the cava, without any regard to the resistance, is equal to the momentum of the weight of

thirty pounds passing over the space of an inch in a second.—But note, that the motion of the *blood* is here supposed equal, which in reality it is not.

For the *deposition of the blood*, and how the animal juices are secreted from it, see ANIMAL SECRETION.

As to the *transfusion of the blood* of one animal into the veins of another, first set on foot by Dr. Lower, see the method and effects thereof under TRANSFUSION.

In the Philosophical Transactions we have several very uncommon instances of spontaneous hemorrhages or effusions of *blood*; particularly of a child that bled at the nose, ears, and hind-part of the head, for three days; from that to the sixth, the sweat *blood* from the head; on the sixth, bled at the head, shoulders, and waist; and for three days more continued to bleed at the toes, bend of the arms, joints of the fingers of each hand, and at the fingers ends till the died: After her death were found, in the places whence the *blood* issued, little holes like the prickings of a needle.

For the *stanching of blood*, see STYPTIC.

Dragons BLOOD.

Salamanders BLOOD. } See the article { DRAGON.

Salamanders BLOOD. } SALAMANDER.

BLOOD of Christ is the denomination of a military order instituted at Mantua in 1608, by Vinc. Gonzaga IV. its device was, *Domine proboasti me*; or, *Nihil hoc triste rapto*.

Hermant speaks of this order, and observes it took its name from some drops of the *blood of Christ*, said to have been preserved in the cathedral church of Mantua.

The number of knights was restrained to twenty, besides the grand master; the office whereof was annexed to himself and his successors.

There is also a congregation of nuns at Paris called by the same name, reformed from the Bernardines.

BLOOD-HOUND. See the article HOUND.

BLOOD-LETTING. See BLEEDING, and PLEBOTOMY.

BLOOD-SHOTTEN, a distemper of the eyes, wherein the blood-vessels are greatly distended, so as to make the eyes appear red. See OPHTHALMIA.

BLOOD-STONE. See HEMATITES, and SANGUINE.

BLOODY Hand, one of the four kinds of trespasses in the king's forest, by which the offender being taken with his hands or other part bloody, is judged to have killed the deer, though he be not found either hunting or chasing.

BLOODY heel-cock. See HEELER.

BLOODY rains. See the article RAIN.

BLOODY flux. See FLUX, and DYSENTERY.

BLOODY urine, a disorder wherein the urine comes away mixed with blood, in greater or less quantity. See URINE.

The *blood* here voided, usually comes from the kidneys, though sometimes from the bladder or ureters.—It is sometimes occasioned by violent motion, or a fall on the back, causing a rupture of some of the blood-vessels of the urinary parts; sometimes it succeeds sudden suppressions of the hemorrhoids or menses. The stone, especially in the kidneys, will also occasion frequent paroxysms of this disease: and cantharides taken internally, or even applied externally without acids, will sometimes have the same effect.—Bloody urine is a terrible symptom in the small-pox and malignant fevers; though on some occasions it has proved critical, and carried off the distemper.

BLOOM. } See the article { HALF bloom.

BLOOMARY. } BLOMARY.

BLOWING of glass, one of the methods of forming the divers kinds of works in the glass manufacture.—It is performed by dipping the end of an iron pontego or blowing-pipe, in the melted glass, and blowing through it with the mouth, according to the circumstances of the glass to be blown.

BLUE, one of the primitive colours of the rays of light. Anciently, *blue* was the symbol of the sea; for which reason, in the Circenian games the combatants who represented the sea were clad in *blue*; and those who had distinguished themselves by any notable exploit at sea, were rewarded with a *blue* ensign.

The painters BLUE is made differently according to the different kinds of paintings. In limnings, fresco, and miniature, they use indifferently ultramarine, *blue* ashes, and smalt; these are the natural blues, excepting the last, which is partly natural, partly artificial: see each under its proper head.

In oil and miniature they use indigo, *blue* vice, *blue* verditer, lapis armenus, smalt, and limonite; also a counterfeit ultramarine.

Enamellers and painters on glass have blues peculiar to themselves; each preparing them after their own manner. See ENAMELLING, and painting on GLASS.

Dyers BLUE is one of their simple or mother-colours, used in the composition of others: it is given chiefly with woad, and indigo. Some dyers heighten their *blue*, by adding madder, brass, and other woods. The way of brightening blues is by passing the stuff, when dyed and well washed, through lukewarm water; or, which is much better, by working and filtering the dyed stuff with melted soap, and then scowering it well.

well—*Blues* are dyed immediately from the whites, without any other preparation than flowering. See **DYING**.

Turnsol BLUE is a blue used in painting on wood, made of the seed of that plant. It is prepared by boiling four ounces of turnsol in a pint and a half of water wherein lime has been slacked. See **TURN SOL**.

Flanders BLUE is a colour seldom used but in landships, as being apt to turn green. The French call it *cendre verte*, or green ashes.

Blue-coat hospital. } See the article { **HOSPITAL**.
Blue Vitriol. } { **VITRIOL**.

BLUEING of metals is done by heating of them till they assume a blue colour; particularly practised by gilders, &c. who blue their metals ere they apply the gold or silver leaf. See **GILDING**.

BLUENESS, that quality which denominates a body blue; or, such a size and texture of the parts that compose the surface of a body, as disposes them to reflect the blue or azure rays of light, and those only, to the eye.

For the *blueness* of the skies, Sir Isaac Newton observes, that all the vapours, when they begin to condense and coalesce into natural particles, become first of such a bigness as to reflect the azure rays, ere they can constitute clouds of any other colour. This, therefore, being the first colour they begin to reflect, must be that of the finest and most transparent skies, in which the vapours are not arrived to a grossness sufficient to reflect other colours.

M. de la Hire, after Leonardo da Vinci, observes, that any black body viewed through a thin white one, gives the sensation of blue; and this he assigns as the reason of the *blueness* of the sky, the immense depth whereof being wholly devoid of light, is viewed through the air illuminated and whitened by the sun. For the same reason he adds, it is, that foot mixed with white makes a blue; for white bodies being always a little transparent, and mixing themselves with a black behind, give the perception of blue. From the same principle he accounts for the *blueness* of the veins on the surface of the skin, though the blood they are filled with be a deep red; for red, he observes, unless viewed in a clear, strong light, appears a dark brown, bordering on black: being then in a kind of obscurity in the veins, it must have the effect of a black; and this, viewed through the membrane of the vein and the white skin, will produce the perception of *blueness*.

BLUSHING, a suffusion, or redness of the cheeks, excited by a sense of shame, on account of a consciousness of some failing, or imperfection.

Blushing is supposed to be produced from a kind of consent, or sympathy, between several parts of the body, occasioned by the same nerve being extended to them all. Thus the fifth pair of nerves being branched from the brain to the eye, ear, muscles of the lips, cheeks, palate, tongue, and nose; hence a thing seen, or heard, that is shameful, affects the cheeks with *blushes*, driving the blood into the minute vessels thereof; at the same time that it affects the eye, and ear. For the same reason it is, as Mr. Derham observes, that a favouring thing seen or smelt affects the glands and parts of the mouth: if a thing heard be pleasing, it affects the muscles of the face with laughter; if melancholy, it exerts it self on the glands of the eyes, and occasions weeping, &c. And to the same cause Dr. Willis ascribes the pleasure of kissing.

BOARD, a piece of timber sawed thin, for the purposes of building. See **TIMBER**.

We say a *deal-board*, an *oak-board*, &c.—Boards thicker than ordinary are called *planks*.—Boards formed ready for the coopers use are called *clap-boards*. We have also *mill-board*, and *scale-board* shaved very thin for cases, band-boxes, &c.—*Pass-board*. See **PAST-BOARD**.

Feather-edged BOARD.	} See the articles	FEATHER.
Graining-BOARD.		GRAINING.
Log-BOARD.		LOG.
Sound-BOARD.		SOUND.
Trail-BOARD.		TRAIL.
Waste-BOARDS.		WASTE.
Weather-BOARD.		WEATHER.

BOARDED floors. See the article **FLOOR**.

BOAT, a small, open, floating vessel, commonly wrought or moved only by rowing; intended chiefly for the navigation of rivers, lakes, and the like.

The *boat* acquires various names, according to its various structure, and the various uses it is appointed for, and the places where it is to be used.—The several *boats*, and their names are,

A jolly boat.	} Boats for ships	A ballon of Siam.
A long boat.		A horse boat.
A fluffe.		A periaga.
A pinnace.		A pleasure boat.
A water boat.		A ponton.
A yawl.		A canoe.
A gondola.		A cruce.
A greenland boat.		A carrycarry.
A bermudas boat.		A deal booker.

A flacca.	A tilt boat.
A ferry-boat.	A tod boat.
A prau.	A well boat.
A flying prau.	A wherry.
A punt.	

The *boats*, or wherries allowed to ply about London are either *skullers*, wrought by a single person with two oars; or oars, wrought by two persons, with each an oar.—All *boats* rowed with more than four oars above or below London bridge are forfeited. 8 Geo. c. 18.

De Chales proposes the construction of a *boat*, which, what burden soever it bear, shall not only move against the current, without either sails or oars, but also advance so much the faster, as the rapidity of the water is greater. Its make is the same with that of the others, excepting only a wheel added to its side, with a cord, which winds round a roller as fast as the wheel turns.

Something of the like kind has also been since done by M. Pitot. *Vid. Mem. Acad. R. Scienc. an. 1729. p. 359.* and p. 540.

A new attempt, and with greater success, is also said to have been lately made at Vienna.

M. de la Hire has given us an examination of the force necessary to move *boats*, both in stagnant and running water, either with ropes fastened to them, or with oars, or with any other machine: wherein he shews, that the larger the surface of the oars plunged in the water, and the smaller that of the *boat* presented to the water is; and again, the longer that part of the oar between the hand and the place where the oar rests on the *boat*, and the shorter that between this last point and the water; the freer will the *boat* move, and the greater effect will the oar have. See **OAR**.

Hence it is easy to calculate the force of any machine that shall be applied to rowing; *v. gr.* if we know the absolute force of all the men who row, it must be changed into a relative force, according to the proportion of the two parts of the oar; *i. e.* if the part out of the vessel be double the other, and all the men together can act with the force of 900 pounds, we compute first, that they will exert 300: which 300, multiplied by the surface the vessel presents to the water, gives a solid of water of a certain weight; which weight may be found, and of consequence the velocity impressed on the vessel by the oars. Or, the velocity of the oars may be found in the same manner, by multiplying the 300 pounds by the surface of all the parts of the oars plunged in the water. Nor would there be any difficulty in finding first the relative forces, then the absolute ones; the velocities either of the oars, or of the vessel being given, or the proportion of the two parts of the oar.

BOAT-SWAIN, an officer on board a ship, who has charge of her rigging, ropes, cables, anchors, sails, flags, colours and pendants; and is also to take care of the long-boat, and its furniture, and to steer her, either by himself or his mate.

He calls out the several gangs aboard, to the due execution of their watches, works, &c.—He is likewise a kind of provost-marshal, who sees and punishes all offenders sentenced by the captain, or a court-martial of the fleet. See **PROVOST**.

BOBBING. See **FISHING**.

BOCARD O, in logic, the fifth mode of the third figure of syllogisms, wherein the first proposition is particular and negative, the second universal and affirmative; and the third or conclusion particular and negative. Thus,

BOC Some animal is not man,

AR Every animal has a principle of sensation.

DO Therefore something has a principle of sensation that is not man.

BOCK-LAND formerly denoted that which we now call *free-hold land*, or *charter land*; and it was by that name distinguished from *folk-land* which was *copyhold land*. See **FREEHOLD**.

BODY*, in physics, a solid, extended, palpable substance; of it self merely passive, and indifferent either to motion or rest, but capable of any sort of motion, and of all figures and forms.

* The word alludes to the Saxon *bodige*, stature; and to the Belgic *bode*, a cover, *q. d.* the tabernacle of the soul.

Body is composed, according to the Peripatetics, of *matter*, *form*, and *privation*; according to the Epicureans and Corpufcularians, of an assemblage of hooked, heavy atoms; according to the Cartesian, of a certain quantity of *extension*; according to the Newtonians, of a system, or association of solid, massy, hard, impenetrable, moveable particles, ranged or disposed in this or that manner; whence result *bodies* of this or that form; distinguished by this or that name.

These elementary or component particles of *bodies* must be infinitely hard; vastly harder than the *bodies* compounded of them; nay, so hard as never to wear, or break in pieces. "This Sir Isaac Newton observes is necessary, in order to "the world's persisting in the same state, and *bodies* continuing of the same nature and texture in several ages."

Affections of BODY. See the article AFFECTION.

Modes of BODY. See the article MODE.

Elements of BODY. See the article ELEMENT.

The existence of BODIES is a thing incapable of being demonstrated: the order in which we arrive at the knowledge of their existence, seems to be this.—We first find we have sensations; we then observe we have not those sensations when we please; and thence conclude, we are not the absolute cause thereof, but that there is required some other cause for their production. Thus we begin to know, that we do not exist alone, but that there are several other things in the world together with us.—But this, Dr. Clark owns, comes far short of a demonstration of the existence of a corporeal world: he adds, that all the proof we have of it is this; that God would not create us such, as that all the judgments we make about things existing without us, must necessarily be false. If there be no external bodies, it follows, that it is God who represents the appearance of *bodies* to us; and that he does it in such a manner as to deceive us.—Some think this has the force of a demonstration: “It is evident God cannot deceive us; it is evident he does deceive and delude us every moment, if there be no *bodies*; it is evident therefore, there must be *bodies*.”—But the minor of this argument may be denied without any suspicion of scepticism.

“In effect, were it possible for *bodies*, i. e. solid, figured, &c. substances to exist without the mind, corresponding to those ideas we have of external objects, yet how were it possible for us to know it? Either we must know it by sense, or reason: as for our senses, by them we have only the knowledge of our sensations or ideas: they do not inform us that things exist without the mind, or unperceived, like those which are perceived. It remains, therefore, that if we have any knowledge at all of external things, it must be by reason inferring their existence from what is immediately perceived by sense. But how shall reason induce us to believe the existence of *bodies* without the mind, when the patrons of matter themselves deny that there is any necessary connection betwixt them and our ideas. In effect, it is granted on all hands, and what happens in dreams, phrenzies, deliriums, extasies, &c. puts it beyond dispute, that we might be affected with all the ideas we have now, though there were no *bodies* existing without, resembling them. Hence, it is evident, the supposition of external *bodies* is not necessary for the production of our ideas.”

Berkeley's Princ. of Human Knowledge, p. 59.—“Granting the materialists their external *bodies*, they by their own confession, are never the nearer knowing how our ideas are produced; since they own themselves unable to comprehend in what manner *body* can act upon spirit; or how it is possible it should imprint any idea on the mind. Hence, the production of ideas or sensations, in our minds, can be no reason why we should suppose *bodies*, or corporeal substances; since that is equally inexplicable with or without the supposition. In short, though there were external *bodies*, it is impossible we should ever come to know it; and if there were none, we should have the same cause to think there were, that we now have.” *Id. ibid.* p. 60, 61.

“Try whether you can conceive it possible for a sound, or figure, or motion, or colour, to exist without the mind, or unperceived.—If you can but conceive it possible for one extended, moveable substance, or, in general, for any one idea to exist otherwise than in a mind perceiving it; I shall readily give up the cause.” *Id. ibid.* p. 63.—“It is worth while to reflect a little on the motives which induced men to suppose the existence of material substance; that so, having observed the gradual ceasing and expiration of those motives, we may withdraw the assent grounded to them. First, therefore it was thought that colour, figure, motion, and the rest of the sensible qualities, did really exist without the mind; and for this reason, it seemed necessary to suppose some unthinking substratum, or substance, wherein they did exist, since they could not be conceived to subsist by themselves. Afterwards, in process of time, men being convinced that colours, sounds, and the rest of the sensible secondary qualities had no existence without the mind; they stripped this substratum of these qualities, leaving only the primary ones, figure, motion, &c. which they still conceived to exist without the mind, and consequently to stand in need of a material support. But having shewn above, that none, even of these, can possibly exist otherwise than in a spirit, or mind, which perceives them, it follows, that we have no longer any reason to suppose the being of matter.” *Id. ibid.* p. 118, 119.

For the Colours of BODIES: Sir Isaac Newton shews, that *bodies* appear of this or that colour, as they are disposed to reflect most copiously the rays of light originally endued with such colours. But the particular constitutions, whereby they reflect some rays more copiously than others, remain yet to be discovered. However some of the laws and circumstances thereof, he delivers in the following propositions.

1. Those surfaces of transparent *bodies* reflect the greatest quantity of light, which have the greatest refracting power;

i. e. which intercede mediums, that differ most in their refractive densities: and in the confines of equally refracting mediums, there is no reflection. 2. The least parts of almost all natural *bodies* are in some measure transparent; and the opacity of those *bodies* arises from the multitude of reflexions caused in their internal parts. 3. Between the parts of opaque and coloured *bodies* are many spaces, either empty, or replete with mediums of different densities; as water between the tinging corpuscles wherewith a liquor is impregnated, air between the aqueous globules that constitute clouds or mists: and even spaces void both of air and water, between the parts of hard *bodies*, are not wholly void of all substance. 4. The parts of the *bodies*, and their interstices, must be less than of some definite bigness, to render them opaque and coloured. 5. The transparent parts of *bodies*, according to their several sizes, reflect rays of one colour, and transmit those of another, for the same reason that thin plates or bubbles do reflect, or transmit those rays: and this appears to be the ground of all their colour. 6. The parts of *bodies*, on which their colours depend, are denser than the medium which pervades their interstices. 7. The bigness of the component parts of natural *bodies* may be conjectured from their colour; on this principle, that transparent corpuscles, of the same thickness and density with a plate, do exhibit the same colour. 8. The cause of reflexion is not the impinging of light on the solid or impervious parts of *bodies*, as commonly believed, 9. *Bodies* reflect and refract light, by one and the same power variously exercised, in various circumstances.

BODIES, are divided into *animate* and *inanimate*; i. e. into those informed by a soul, and those which are not; or those that have life, and those that have none.

Some consider *bodies*, either as *natural* and *sensible*; viz. as formed by physical causes, and clothed with physical qualities: (in which sense, *body* makes the object of physics, See **PHYSICS**.) Or, as *intellectual* or *quantitative*, in the general or abstract; and according to three dimensions: in which sense, *body* makes the subject of geometry.

Alkaline BODIES.	} See the article	ALKALINE.
Consistent BODIES.		CONSISTENT.
Elastic BODIES.		ELASTIC.
Fixt BODIES.		FIXT.
Heterogeneous BODIES.		HETEROGENEOUS.
Atmosphere of BODIES.		ATMOSPHERE.
Descent of BODIES.	DESCENT.	
Mercury of BODIES.	MERCURY.	

BODY, with regard to animals, is used in opposition to *soul*; viz. for that part of an animal, composed of bones, muscles, canals, juices, nerves, &c.

In which sense, *body* makes the subject of comparative anatomy.

The human BODY, considered with regard to the various voluntary motions it is capable of performing, is an assemblage of an infinite number of levers, drawn by cords; if considered with regard to the motions of the fluids it contains, it is another assemblage of an infinity of tubes and hydraulic machines. Lastly, if considered with regard to the generation of those same fluids, it is another infinite assemblage of chymical instruments and vessels; as, philters, alembics, recipients, serpentes, &c. and the whole is a compound which we can only admire, and whereof the greatest part escapes our admiration itself.—The principal chymical apparatus in the whole *body*, is that wonderful laboratory the brain: it is in this, that precious extract, called animal spirits, the only material mover of the whole fabric, is secreted from the blood.

In the machine of the *animal body*, the retainers to the doctrine of trituration maintain the brain to do the office of the beam of a press; the heart, of a piston; the lungs, of bellows; the mouth, of a millstone; and the teeth, of pestles; the stomach, of a press; the intestines, of a reservoir; the vessels, of sieves or strainers; and the air, of a pondus, or spring that sets the machine a going.

The soul, Rohault observes, is not the form of the human *body*, as the Peripatetics assert. So far is animal life from depending on the soul, because of its ceasing when the soul is separated; that, on the contrary, the continuance of the soul depends entirely on the state of the *body*: the former never quitting the latter, till its economy or order is interrupted.

The Cartesians maintain the soul and *body* to be too disproportionate, for thoughts or ideas of the soul to be caused by the motions of the *body*, and *vice versa*: thus, their reciprocal motions not being able to be the direct cause of the one and the other, are only deemed the occasion, or occasional cause. God on occasion of the motion of a *body*, impresses an idea or sensation on the soul; and again, on occasion of an idea of the soul, communicates a motion to the *body*: of consequence, God is the only agent in the whole intercourse between soul and *body*.

Physicians divide the *body* into solids, and fluids.—Also into venters, or cavities, the head, thorax, and lower venter.

The rest of the *body* they call members or extremities.

Faculties of the Body. See the article *FACULTY*.

BODY, corpus, is also applied by anatomists to several particular parts of the animal fabric.—As, the callous *body* of the brain, the cavernous or spongy *bodies* of the penis, &c. See *CORPUS CALLOSUM*, *CORPORA CAVERNOSEA*, &c.

Reticular Body. See the article *RETICULAR*.

Body in Geometry denotes the same with *solid*. See *SOLID*.

The Regular or Platonic Bodies are those which have all their sides, angles, and planes similar and equal.

Of these there are only five, *viz.* the tetrahedron, consisting of four angles; the octahedron, of eight; the icosaedron, of twenty; the dodecahedron, of twelve pentagons; and the cube of six squares.

Body in Law—A man is said to be bound or held in *body and goods*; that is, he is liable to remain in prison, in default of payment.

In France, by an ordinance of 1667, all restraints of the *body*, for civil debts, are null after four months, unless the sums exceed two hundred livres.

A woman, though in other respects she cannot engage her person but to her husband, may be *taken by the body*, when she carries on a separate trade.

Body, corps, in war, is an aggregate or assemblage of forces, horse and foot, united and marching under some chief.

An army, ranged in form of battle, is divided into three *bodies*; the van-guard, the rear-guard, and the main *body*; which last is ordinarily the general's post.

Body of Reserve. See the article *RESERVE*.

BOG, a moist, rotten spot of earth, which sinks, and gives way to the weight of the body, formed of grass and plants putrified by some spring; frequent, especially in Ireland.

* The word may be derived from the Italian *bucca*, a hole; or rather from the Belgic *boegen*, to bend, on account of its giving way when trod upon.

In this sense, *bog* amounts to much the same with what in other places are called *masses*, *marishes*, *fenis*, &c.

Ireland is become infamous for *bogs*: they distinguish between a *turf-bog*, called also *red-bog*, out of which turf or peat is dug; and a *quaking-bog*, which will sink under a man in the place where he stands to a considerable depth, and rise before and behind proportionably; underneath, is frequently clear water, into which a person often slips to the middle, upon breaking the surface.—*Quaking-bogs* frequently turn into *turf-bogs*.

Every *red bog* is encompassed with a deep marshy spongy ground, called the *bounds of the bog*.—Horns and skeletons of moufe-deer are sometimes found in *bogs* fourteen foot deep.

The inconveniences of *bogs* are, that a considerable part of the kingdom is rendered useless by them: they also keep people at a distance from each other, and thus hinder business from going forward. They occasion the roads to be crooked and circuitous to avoid them: they are a great destruction to cattle, the chief commodity of Ireland; which are encouraged by the grass growing on the edges of the *bogs* to venture in, where they are lost: they are also a shelter to robbers and thieves. The smell and vapour arising from them is accounted unwholesome, and the fogs putrid and stinking. Add, that they corrupt the water, both as to its colour and taste.

Bogs have also their uses: most of the people in Ireland have their firing from them; the wood being impolitically destroyed, and little pit-coal yet discovered. The Irish could hardly do without some *bogs*.—The natives had anciently another advantage from *bogs*; *viz.* that by means of them they were preserved from the conquest of the English: and it seems to be from the remembrance hereof that they still chuse to build near *bogs*.

For the origin and formation of *Bogs*, it is to be observed, that there are few places, in the northern world, but have formerly been as famous for them, as Ireland now is: every wild, ill-inhabited country has them: the *loca palustris*, or *paludes*, to which the ancient Gauls, Germans, and Britons, retired when beaten, appear to be no other, than what we now call *bogs*. The *lik* may even still be found in the barren parts of Italy, as Liguria.

The true cause of *bogs*, then, seems to be the want of industry; at least it is certain industry may remove, and much more prevent them. There are many *bogs* of late standing in Ireland, formed within our own memory, through the miseries of the times, and the desolations of civil war.—It is no wonder if a country famous for laziness should abound with them.

To shew how want of industry causes *bogs*, it must be remembered that Ireland abounds with springs; that these springs are dry, or nearly so, in the summer-time, and that the grass and weeds grow thick about the places where they burst out. In the winter the same springs swell again, and run and soften and loosen the earth about them; and the sword or scurf of the earth, which consists of the roots of

grass, being lifted up and made fuzzy by the water, becomes dried again the spring; and does not fall together, but withers in a tuft, and new grass springs through it; which, the next winter is again lifted up: thus the spring is more and more spongy; and the scurf grows thicker and thicker, till it first makes what we call a *quaking bog*: and as it grows higher and dryer, and the grass roots and other vegetables become more putrid, together with the mud and slime of the water, it acquires a blackness, and grows into what we call a *turf-bog*.

What confirms this account is, that *bogs* are generally found higher than the land about them, and the highest in the middle: the chief springs which cause them being commonly about the middle; from whence they dilate themselves by degrees, as one would blow a bladder; but not always equally, because they sometimes meet with greater obstacles on one side, than on the other.—Add, that if a deep trench be cut through a *bog*, you will find the original spring, and vast quantities of water will run from it, and the *bog* will subside; sometimes a dozen or 15, some even say, 30 foot.—Lastly, those hills which have no springs, have no *bogs*; and those which have springs, and want culture, are never without them. In brief, wherever *bogs* are, there are great springs: the turf generally discovers a vegetable substance; it is light, and impervious to water, while the ground under it is very pervious.

True, there are some *quaking bogs* caused otherwise; as, when a stream or spring runs through a flat; if the passage be not tended, it fills with weeds in summer, trees fall a-crois it, and dam it up; then in winter, the water stagnates farther and farther every year, till the whole flat be covered; next, there rises a coarse kind of grass peculiar to these *bogs*; it grows in tufts, and the roots consolidate together, and yearly grow higher, in so much as sometimes to reach the height of a man: this grass rots in winter, and falls on the tufts, and the seed with it, which springs up next year, and thus makes a new addition: sometimes the tops of flags and grass being interwoven on the surface of the water, and become by degrees thicker, till they lie like a cover on the water; other herbs take root in it, and by a plexus of those roots it becomes strong enough to bear the weight of a man.

Another cause of *bogs* is moss, which Ireland abounds extremely.—That which grows in *bogs* is remarkable; the light spongy turf above-mentioned being nothing but a congeries of the threads of this moss, which is sometimes in such quantities, and so tough, that the turf-spades cannot cut it: in the north of Ireland they call it *old wives tow*; not being much unlike flax. The turf-holes in time grow up with it again, and all the little gutters in *bogs* are generally filled with it. In reality, to this the *red* or *turf-bogs* seem to be chiefly owing.

For the draining of *Bogs*, to render them fit for pasture or arable, it is not impossible; the same having been performed in England, France, Germany, &c.—People commonly distinguish between *bogs* which have no fall to carry away the water from them, and those which have; the last are reputed drainable, the former not. But Mr. King assures, he never observed one *bog* without a fall sufficient to drain it, nor does he believe there is any. In reality, the great objection against draining is the charge; which, it is commonly reckoned, will amount to much more than would purchase an equal quantity of good ground: for an acre of this last in most parts of Ireland is not worth above 4 s. *per annum*, and 14 or 15 years purchase; so that three pound will buy an acre of good land; and it is very doubtful with moss, whether that sum will reduce a *bog*: this reasoning passes current, and is the great impediment of this work.

To this it is answered, that *quaking-bogs*, though land be never so cheap, never fail to be worth draining; one trench will drain many acres; and when dry, it is generally meadow, or the best grazing ground. Again, what is called the bounds of a *red bog*, never fail to be worth the draining; being done by one deep trench drawn round the *bog*; by this cattle are kept out of the *bog*, and the bounds turned into meadow.—Add, that even *red bogs* might be made fit for grazing at a much cheaper rate than has hitherto been done, by a proper conduct in the digging of trenches, particularly described by Mr. King.—See *Philos. Transact.* N^o. 170, p. 948. *seq.* & N^o. 330, p. 305. Item N^o. 314, p. 59. *Plot. Nat. Hist. Oxford.* c. 9. §. 81. *seq.* *Mortim. Husband.* T. 1. l. 1. c. 2. p. 21.

*BOGOMILI**, or *BOGARMI*Æ, a sect of heretics, sprung from the Manichees, or rather from the Massilians toward the close of the 11th century; whose chief, Basil, was burnt alive by order of the emperor Alexander Comnenus.

* Du Cange derives the name from two words in the Bulgarian language, *bog*, *deus*, and *milos*, *miserere*, have mercy.

The *Bogomili* denied the trinity; maintaining, that God had a human form, that the world was created by evil angels; and that it was the archangel Gabriel that became incarnate. They rejected the books of Moses, and only admitted seven books of scripture: they maintained the lord's prayer to be the only eucharist; that the baptism of the Catholics was only that of St. John, and theirs that of Jesus Christ; and that all those of their sect conceived the word, or logos, as

much as the virgin. Lastly, that there was no other reformation but repentance.

BOILING, or *Boiling*, *Ebullition*, in physics, the agitation of a fluid body, arising from the application of fire, &c.

The phenomenon of *boiling* may be thus accounted for: the minute particles of the fluid being detached from each other, and impelled in orbem, with a great velocity, (*i. e.* being converted into fire) pass the pores of the containing vessel, and mix with the liquid. By the resistance they here meet withal, their motion is destroyed; *i. e.* they communicate it wholly to the quiescent water; hence arises, at first, a small intestine motion in the water, and from the continued action of the first cause, the effect is increased, and the motion of the water continually accelerated: so that the water, by degrees, becomes sensibly agitated. But now the particles of the fire striking on those in the lowest surface of the water, will not only give them an impulse upwards, contrary to the laws of equilibrium, but will likewise render them specifically lighter than before, so as to determine them to ascend according to the laws of equilibrium: and this, either by inflating them into little vesicles, by the attraction of the particles of water around them; or by breaking and separating the little spherules of water, and so increasing the ratio of their surface to their solid content. There will therefore be a constant flux of water from the bottom of the vessel to the top; and consequently a reciprocal flux from the top to the bottom: *i. e.* the upper and under water will change places; and hence we have the reason of that phenomenon, of the water's being hot at top sooner than at bottom.

Again, an intense heat will diminish the specific gravity of water, so as not only to make it mount in water, but also in air; whence arise the phenomena of vapour and smoke: Though the air inclosed in the interstices of the water must be allowed a good share in this appearance: for that air being dilated, and its spring strengthened by the action of the fire, breaks its prison, and ascends through the water into the air; carrying with it some of the contiguous spherules of water, so many as shall hang in its villi, or can adhere immediately to it.

The particles of air in the several interstices of the fluid mass thus expanded, and moving upwards, will meet and coalesce in their passage; by which means great quantities of the water will be heaved up, and let fall again alternately; as the air rises up, and again passes from the water: for the air, after coalition, though it may bouy up a great heap of water, by its elasticity while in the water, yet cannot carry it up together with itself into the atmosphere; since, when once got free from the upper surface of the water in the vessel, it will unbend itself in the atmosphere, and so its spring and force will become just equal to that of the common unheated air. Add to this, that were the spring and motion of the air sufficient to carry up the water with it, yet it would not have that effect; but the water would run off at the extremities of the air; all, except so much as should be either entangled in its villi, or immediately adhere to its surface by attraction: and hence we see the reason of the principal phenomenon of *boiling*, *viz.* the fluctuating of the surface of the water.

Water, only lukewarm, boils very vehemently in the recipient of an air-pump, when the air is exhausted: the reason is obvious; for the pressure of the atmosphere being taken off from its surface, the air included in the interstices of the water, dilated by a feeble heat, has spring enough to heave up the water, and disengage itself.—When the water ceases *boiling*, it is again excited thereto by pouring cold water upon the recipient; and when it *boils* the most vehemently, it ceases by pouring on hot water: the reason whereof is scarce guessed at. See **VACUUM**.

BOILING Waters, in natural history. See **WATER**.

BOLE, in medicine, is applied to several kinds of earths that enter some of the Galenical compositions. See **SUPPLEMENT**, article **BOLE**.

BOLE Armeniac*, or the *Armenian BOLE*, is a soft, friable, fatty earth, usually of a pale red colour; tho' there are two other kinds, a yellow and a white. They are all easily pulverized, and adhere to the tongue. The common or red kind is esteemed a good drier, styptic, and vulnerary; and in those qualities is used in divers diseases both internally and externally.

* This, popularly, though corruptly, called in English, *bole Armeniac*, is called, by the naturalists, *Armenia terra*, sometimes *επιθεο Αρμενικη*, or *Armenian clay*.

This *bole* is easily falsified; and the druggists frequently sell some other earth in lieu thereof. Matthiolus says, it is found in gold, silver, and copper-mines.

BOLE of the Levant is a medicinal earth brought from the Levant; nearly of the same nature, and having the same uses with the *bole-armeniac*.

Pomet says, there is no such thing among us, as either true *bole-armeniac*, or *bole of the Levant*; and that all the *boles* now in use are brought either from the provinces of France,

or the neighbouring countries: but this does not seem sufficiently warranted; and the new tariffs, or duties on goods imported into France, which mention them both, make it credible that there are of each kind imported into that kingdom. Indeed, it appears, that it is the *Levant bole* which usually passes among us for the *Armeniac*. See **SUPPLEMENT**, article **BOLUS-ARMENIA**.

BOLLANDISTS, in literary history, a denomination given to certain Jesuits of Antwerp, who have been a considerable time employed in collecting the lives and acts of the saints.—Thus called from F. Bollandus, one of the first and chief of the association.

As we find frequent occasion to quote that learned body in this work, and are indebted to them for several excellent observations that occur herein, the reader will not be displeas'd to find some account of them.

In the beginning of the 17th century, F. Heribert Rosweide, a Jesuit of Antwerp, laid a design of collecting the lives of the saints, as wrote by the original authors, with notes, like those added to his lives of the fathers, to clear obscure passages, and distinguish the genuine from the spurious; but he died in 1629, ere the work was begun.—The year following, J. Bollandus, a Jesuit of the same house, took up the design; and whereas Rosweide only propos'd to collect the lives already compos'd, Bollandus undertook, where there was no life of a saint extant, to compose new ones from the authors who had mentioned him.—In 1635, he took in G. Henfchenius, as a partner with him; and in 1641, published the *acts of the saints of the month of January*, in two large volumes, folio. In 1650, F. Papebroch became an associate; and, Henfchenius dying, the fathers, Baert, Janning, Sollier, and Raye were called in, who continued the work: whereof, in eight years, there have appeared twenty-four volumes, for the first six months of the Roman calendar.

BOLONIAN. See **BONONIAN**.

BOLT, in building, an iron fastening, fixed to doors and windows.

Bolts are chiefly of three kinds, *plate*, *round*, and *spring-bolts*.

Bolt of a Lock. See the article **LOCK**.

BOLTS, or iron pins in a ship, are of several sorts, frequently distinguished according to the places where they are used; as, *chain-bolts*, *bolts for carriages*, &c. *ring-bolts*, serving for the bringing to of the planks, &c. *drive-bolts*, used to drive out others; *fit-bolts*, employed for forcing the planks and other works, and bringing them close to one another; *rag-bolts*, on each side full of jags or bars, to keep from flying out of their holes; *clench-bolts*, those which are clenched or fastened at the ends where they come through; *fore-lock-bolts*, made like locks with an eye at each end, wherinto a fore-lock of iron is driven to prevent starting out; *stend*, or *fender-bolts*, made with long and thick heads, struck into the uttermost bends or wales of a ship, to save her sides from bruises and hurts.

Thunder-BOLT. See the article **THUNDER-BOLT**.

BOLT-HEAD, the same as *matrafs*; a vessel used by the chymists. See **MATRASS**.

BOLTING*, a method of pleading, or arguing, in use in the Inns of courts; inferior to mooting. The case is argued first by three students, then by two barristers; a senior sitting judge.

* The word comes from the Saxon *bolt*, an house, because done privately within doors for instruction.

BOLUS, in medicine, an extemporaneous form of remedy, of a soft consistence, somewhat more so than that of an electuary, and of the quantity of one dose, or morfel to be swallowed down; contrived principally for the sake of such as have an aversion to potable medicines; as also for the better conveyance of certain preparations of mercury, antimony, &c. which by their weight would sink to the bottom of the glass, were they given in draughts.

There are *bolus's* of various kinds, made with electuaries, confectiions, conserves, pulps, powders, salts, oils, essences, extracts, syrups, &c. some of which ingredients must always have solidity or dryness enough, to give a consistence to those that are liquid.

BOMB*, a hollow iron ball, or shell, filled with gun-powder, and furnished with a vent for a fusee, or wooden tube filled with combustible matter; to be thrown out from a mortar.

* The word *bomb* comes from the Latin *bombus*, *crepitus*, or *strilus ani*, by reason of the noise it makes.

The method of preparing a *bomb* is as follows: a hollow iron globe AB, (*Tab. Fortification. fig. 8.*) is cast pretty thick, having a round aperture A, by which it may be filled and lighted; and circular ansæ CD, for the commodious putting it into the mortar.

To prove whether it be staunch, after heating it red-hot on the coals, it is exposed to the air, so as it may cool gently; for since fire dilates iron, if there be any hidden chinks or perforations, they will thus be opened and enlarged; and the rather, because of the spring of the included air continually acting from within. This done, the cavity of the globe is filled with hot water,

water, and the aperture well stopp'd; and the outer surface washed with cold water and soap; so that if there be the smallest leak, the air, rarified by the heat, will now perpire and form bubbles on the surface.

If no defect be thus found in the globe, its cavity is filled with whole gunpowder; a little space, or liberty is left, that when a fucee or wooden tube a ϵ , of the figure of a truncated cone, is driven through the aperture, and fastened with a cement made of quick-lime, ashes, brick-duft, and steel-filings, worked together in a glutinous water; or, if four parts of pitch, two of colophony, one of turpentine, and one of wax; the powder may not be bruised. This tube is filled with a combustible matter, made of two ounces of nitre, one of sulphur, and three of gun-powder-duft, well-rammed.

This fucee, fet on fire, burns slowly till it reach the gun-powder, which goes off at once, bursting the shell to pieces with incredible violence: whence the use of *bombs* in besieging towns.

Special care, however, must be taken, that the fucee be proportioned, as that the gun-powder do not take fire ere the shell arrives at the destined place; to prevent which, the fucee is frequently wound round with a wet clammy thread. See FUSEE.

Bombs being made of different magnitudes, it may be proposed to exhibit some of their dimensions; as in the following table.

Diam. of Bomb.	Thickness of Metal.	Diam. of Apert.	Quant. of Gunpow.	Weight of Bomb.
17, In. 10	2 In. 2, 10	,20	48 lb	490 lb.
11, 8	,18	,16	15	130
8	0, 10	,13	4	40

Others make the thickness of the *bomb* $\frac{1}{3}$, or $\frac{1}{4}$, or $\frac{1}{5}$, of the whole diameter; and the diameter of the aperture $\frac{1}{5}$ or $\frac{1}{7}$ of the same.

Bombs only differ from *granadas*, in that the latter are much less, and instead of mortars are thrown out of the hand.

M. Blondel, who has wrote on the art of throwing *bombs*, observes, that the first *bombs* were those thrown into the city of Watchtendouch in Guilderland, in 1588; though others pretend they were in use a century before, viz. at the siege of Naples by Charles VIII. in 1495.

BOMB-BATTERY. See the article BATTERY.

BOMB-CHEST is a kind of chest filled usually with bombs, sometimes only with gun-powder, placed under ground, to tear and blow it up in the air, with those who stand on it. *Bomb-chests* were formerly much used to drive enemies from a post they had seized, or were about to take possession of; they were fet on fire by means of a faucissee fastened at one end; but they are now much disused.

BOMBARD*, **BOMBARDA**, a piece of artillery anciently in use, exceedingly short and thick, and with a very large mouth, by some also called *basilic*, by the Dutch *donderbuis*.

* Some derive the word, by corruption, from *lombard*, as supposing this piece first used in Lombardy: Du Cange, after Vollius, derives it from *bombus*, and *ardis*; Menage, from the German *bombarden*, the plural of *bomber*, *basilica*. But we doubt whether the Germans know any such word. It is no unusual thing with Menage, and many other etymologists, to give derivations from words of their own making.

There were some of these pieces said to have carried balls of 300 pound weight; Froissart mentions one of 50 foot long. To load them, they made use of cranes, &c. The *bombarda* is supposed to have been in use before the invention of cannons.

BOMBARDIER, an engineer, or person whose business is to take care of the firing and throwing *bombs* out of mortars.—He first drives the fucee, then fixes the shell, points, loads, and fires.

BOMB-KETCH is a small vessel, strengthened with large beams, for the use of mortars at sea.

BOMBYCINUM velamentum. See VELAMENTUM.

BONA mobilia. See the article MOBILIA.

BONA notabilia, in law, where a person dying has goods, or good debts, in another diocese but within the same province, besides his goods in the diocese where he dies, amounting to the value of five pounds at least, he is said to have *bona notabilia*; in which case, the probate of his will, &c. belongs not to the bishop of the diocese where he dies, whose jurisdiction cannot extend beyond the bounds of his own diocese, but to the archbishop of the province.

BONA patria, a jury or assise of countrymen, or good neighbours. See JURY and ASSISE.

BONIS arrestandis ne dissipentur. See ARRESTANDIS.

Torris, BONIS, & catalis rehabendis post purgationem. See TERRIS.

Arresto facto super BONIS mercatorum. See ARRESTO.

BONORUM attachiamenta. See ATTACHIAMENTA.

Summum BONUM. See SUMMUM.

BOND. See the articles OBLIGATION, and COUNTER-BOND.

BONE, in anatomy, a white, hard, brittle, insensible part of the body, framed for the defence of the soft parts, and the support of the whole fabric. See BODY, PART, &c.

The *bones* are all covered with a peculiar membrane, called the *periosteum*, and are most of them hollow, and filled with an oily substance called *marrow*.

Dr. Havers, describing the texture of the *bones*, observes, that they consist of lamelle, or plates lying one upon another; and those, again, of fibres running lengthwise, some to the extremities of the *bones*, others not so far; but none of them terminating there in distinct ends, as they seem to do; but in lieu of that continued transverfly, and as it were arched: the fibres of one side meeting and uniting with those of the other; and this at each extremity. So that the fibres are a continuation of each other; though not in the same uniform order, but in very long ellipses; not all of a length, however, but in each plate, shorter and shorter than other.

These lamelle, or plates, are differently disposed in different *bones*; *v. gr.* in those that have a large cavity, they are contiguous on each side, and very closely united; in those again, whose cavities are small, or which are altogether spongy within, many of the internal laminae are placed at a distance from each other, having betwixt them little *bony* cells; and even in *bones* that have a larger cavity, some of these lesser cells are usually found at each extremity. In such *bones* as have their plates contiguous, there are pores through and between the plates, besides those made for the passage of the blood-vessels: the first penetrate the laminae transverfly, and look from the cavity to the external surface of the *bone*; the second run longitudinally between the plates; the first are found in every lamina; though the nearer the cavity, the greater the number of pores; but they do not lie directly over one another, so as to form any continued passage from the cavity to the surface. The second are seldom found but by good glasses: a medullary oil is diffused, by these, throughout the plates; and to those, the first kind seems only subordinate; serving to bring the oil into them.

The marrow in the cavity of the *bones* is invested with a membrane, wherein are included little bags, or lobules; and in these bags are vesiculae, or glandulous bladders, serving both for the secretion of the medullary oil from the blood, and for the reception and conservation of the same. They seem to have passages into each other, as have also the bags; whereby the oil has a freer course to the joints and substance of the *bone*. The use of the marrow is to dry the substance of the *bone*, and to prevent its being too dry and brittle; it also lubricates the articulation of the *bones*, and hinders their ends from being worn, or overheated with motion; and it softens the ligaments by which they are tied to each other: in which it is assisted by the mucilaginous glands, found in all the articulations of the *bones*.

The *bones* are generally bigger at their extremities than in the middle; that the articulations might be firm, and the *bones* not so easily dislocated: but to render the middle of the *bone* strong withal, so as to sustain its allotted weight, and resist accidents, the fibres are there more closely compacted together, and support one another: to which it may be added, that the *bone* being hollow, is not so easily broken, as if it had been solid and smaller: for of two *bones* of equal length, and of equal numbers of fibres, the strength of the one to the strength of the other will be as their diameters.

The *bones* are joined and connected together various ways, according to the various purposes they are to serve: some being intended for motion, others for rest, and the support of the incumbent parts only.—That jointure intended for motion, is called *arthrosis*, or articulation; that for rest, *symphysis*, or coalition.

Articulation is divided into two kinds, *diarthrosis*, and *synarthrosis*; and each of these again subdivided into several others. See ARTICULATION, DIARTHROSIS, &c.—*Symphysis* is divided into *sutura*, *harmenia*, and *gambphysis*.—Besides which there are five other kinds of connection, viz. *syffarocosis*, *synchondrosis*, *synsarcosis*, *syntenosis*, and *synymosis*. See SYMPHYISIS, SYSSARCOISIS, &c.

The number of the *bones* is various in various subjects; ordinarily it is about 242; some say 300; others 307; others 318; but the later writers fix it at 249 or 250; 61 of which are in the head, 67 in the trunk, 62 in the arms and hands, and 60 in the legs and feet: the variations are in the number of the sesamoida, the teeth, and the sternum.

The names of the several *bones* are given in the following table; their figures, and places are represented in *Tab. Anatomy P. I.* (Osteology) and particular descriptions of each are given under their proper heads.—

<i>Os frontis</i>	1	<i>Vertebra Cervicis</i>	7	<i>The Os Femoris</i>	2
<i>—Occipitis</i>	1	<i>—Dorsii</i>	12	<i>Rotula</i>	2
<i>Offa Parietalia</i>	2	<i>—Lumborum</i>	15	<i>Tibia</i>	2
<i>—Temporum</i>	2	<i>—Offa Sacri</i>	6	<i>Fibula</i>	2
<i>Officula Auditus</i>	8	<i>Os Coccygis</i>	3	<i>Offa Tarfi</i>	14
<i>Os Ethmoides</i>	1	<i>—Scapula</i>	2	<i>—Metatarfi</i>	10
<i>—Sphenoides</i>	1	<i>Clavicula</i>	2	<i>—Digitorum</i>	28
<i>—Male</i>	2	<i>Ciftæ</i>	24		
<i>—Maxillare</i>	2	<i>Sternum</i>	1		
<i>—Unguis</i>	2	<i>Offa Innaminata</i>	2		
<i>—Nafi</i>	2				
<i>—Palati</i>	2				
<i>Vomer</i>	1				
<i>Maxilla Inferior</i>	1	<i>The Humerus</i>	2		
<i>Dentes Incifivi</i>	8	<i>Ulna</i>	2		
<i>—Canini</i>	4	<i>Radius</i>	2		
<i>—Molares</i>	20	<i>Offa Carpi</i>	16		
<i>Os Hyoides</i>	1	<i>—Metacarpi</i>	8		
		<i>—Digitorum</i>	30		
	67				

when these are too narrow, or shallow to clothe the mast; or in order to make more way in calm weather.

BONONIAN Stone, a small, gray, soft, glossy, fibrous, ponderous, sulphurous stone, about the bigness of a large walnut; when broken, having a kind of crystal or sparry tale within; found in the neighbourhood of Bologna, or Bononia in Italy, and, when duly prepared, making a species of phosphorus.

This stone is found in divers parts of that country, particularly in a river at the foot of mount Palermo; where a chymist, one Vincenzo Casciaro, having gathered some pieces and carried them home, in hopes by the fire to draw silver out of them; instead of what he expected, found that admirable phenomenon they exhibit, which consists in this, that having been exposed to the light, they retain it, and shine, for the space of six or eight hours in the dark.

M. Homberg is said to be the person who first taught us the true manner of preparing and calcining the *Bononian Stone*, having made a journey to Italy on purpose to learn it. Though others alledge, that the true art of preparing and calcining the stone is lost; there having been but one, an ecclesiastic, who had the true secret, and who is since dead, without communicating it to any person. See *Philosoph. Transact.* N° 21.

M. Elpigni observes, that one Zagonius had a method of making statues and pictures of the *Bononian Stone*, which would shine variously in the dark; but he adds, the person died without discovering his secret. See *Philos. Transact.* N° 134.

The blood-vessels of the bones, Dr. Havers divides into nutritious and medullary; the one furnishing matter for the nutrition, the other for the lubrication of the bones. The chief of the nutritious enter the ends of the bone, viz. the arteries at one end, and the veins at the other. The medullary commonly enter the sides of the bone, and that obliquely; but both by the same foramen.

The medullary oil is dispensed from the cavity where it is deposited, throughout the whole substance of the bone; passing first through the transverse pores of the first internal laminae into the longitudinal ones; where it proceeds till it finds other transverse pores, when it alters its course again, and extends farther: thus it passes alternately through and between the plates, till it is diffused throughout. This is the method of its conveyance in bones whose plates are contiguous: where the plates are at a distance, as in bones that have no great cavity, the small caverns above mentioned contain medullary glands; whence the plates have the benefit of the marrow without the former method of conveyance.

Thus are all the bones stocked with pores, &c. excepting the teeth; which have this further distinction, that they have nerves inserted into them: whereas in all the other bones, the nerves go no further than the periosteum. See **TOOTH**.

Besides the large cavities in the inside, most bones have superficial cavities, or *sinus*'s, which may be distinguished into *sulci*, or furrows, the longer sort; and *foveæ*, pits, the shorter ones.

On the outside are also observed prominences, whereof there are two kinds; the one a continued part of the bones, jetting apparently above its plane surface, for the more commodious insertion of the muscles, &c. called *apophysis*, or *processus*; the other an additional bone, growing to another by mere contiguity, being generally more soft and porous than the other, and called an *epiphysis*, or *appendage*. If the protuberance be round, it is called the *caput*, under which is the *cervix*; if flat, *condylus*; if sharp, *corone*.

The general use of the bones is, to support and strengthen the body, like beams and pillars in a building; to defend some of the more essential parts, as the brain, &c. to give shape to the body, and to assist in motion.

The diseases of the bones are, aches, caries, exostoses, rickets, &c. to which add, fractures, fistules, luxations, &c. See **CARIES**, **RICKETS**, &c.

BONS-HOMMES, See **ALBIGENSES**.

BOOK*, a writing composed on some point of knowledge by a person intelligent therein, for the instruction or amusement of the reader.

* The word is formed from the Saxon *booc*, which comes from the Northern *tuoch*, of *luachau*, a beech or service-tree, on the bark of which our ancestors used to write.—*Vid.* Rudbeck *Atlant. P. 3. Philosoph. Transact.* N° 301. p. 2051.

Book may be defined more precisely, a composition of some man of wit or learning, designed to communicate somewhat he has invented, experienced or collected, to the public, and thence to posterity; being withal of a competent length to make a volume.—*Vid.* Saalbach *Sched. de Libr. Veter. §. 8.* Reimm. *Idæa Syst. Antiq. Liter.* p. 230. Trev. *D. Univ. T. 3. p. 1506. voc. Livre.* See also the article **VOLUME**.

In this sense, *book* is distinguished from *pamphlet*, or single paper, by its greater length; and from *tomæ* or *volume*, by its containing the whole writing.—*Idore* makes this distinction between *liber* and *codex*; that the former denotes a single book, the latter a collection of several; though, according to Scipio Maffei, *codex* signifies a book in the square form, *liber*, a book, in the roll-form.—*Vid.* *Isid. Orig. l. 6. c. 13.* Maffei *Isid. Diplom. l. 2. Bibl. Ital. T. 2. p. 244.* See also Saalbach *Lib. cit. §. 4. Reimm. ubi supra.*

According to the ancients, a *book* differed from an *epistle*, or *letter*, not only in bulk, but in that the latter was folded up, the former only rolled*: not but that there are divers books now extant under the names of *epistles*.—*Vid.* *Pittic. L. Ant. T. 2. p. 84. voc. Libri.*

We say an old book, a new book; a Latin, a Greek book: to read, to write, to publish a book; the preface, the title, the dedication, the index of a book. See **INDEX**, &c.—To *catalogue* a book is to see that it be perfect, and that none of the sheets be either wanting, or transposed.—Book-binders speak of *folding, sewing, beating, pressing, covering, gilding, and lettering of books.* See **BOOK-BINDING**.

A large collection of books for use is called a **library**. See **LIBRARY**.—An inventory of a library, in order for the reader's finding any book, is called a *catalogue*. See **CATALOGUE**.—Cicero calls M. Cato, *bellus librorum*, a glutton, or devourer of books; Gæza holds Plutarch, and Herm. Barbarus, Pliny, the best of all books;—Crenius, has a discourse on the best or capital books of each author; Tertullian's best is held to be his *book De Pallio*; St. Augustin's master-piece is that *De Civitate Dei*; that of Hippocrates, the *Coacæ prænotiones*; of Cicero, *de Officiis*; of Aristotle, *de Animalibus*; of Galen, *de Usu Partium*; of Virgil, the sixth *Æneid*; of Horace, the first and seventh *Epistles*; of Catullus, the *ama Berenices*; of Juvenal, the sixth *Satire*; of Plautus, the *Epistula*; of Theocritus, the 27th *Idyl*; Paracelsus's best book is his *Chirurgia*; that of Severinus, *de Alveo scissus*; of Budæus, *Commentarii Linguae Græcæ*; of Jos. Scaliger, *de Emendatione temporum*; of Erasmus, the *Adagia*; of Petavius, the *Rationarium temporum*; of Bellarmin, *de Scriptorib. Ecclesiasticis*; of Salmafius, the *Exercitationes Plinianæ*; of Vossius, *Institut. Oratoriæ*; of Heinsius, *Aristarebus Sacer*; of Caufabon, *Exercitationes in Baronium*.—*Vid.* *Cic. de Finib. l. 3. n. 1.* Gentzen. *Hist. Philos. p. 130.* Harduin. *Præf. ad Plin. Cren. de Libr. Script. Optim.* Act. *Erud. Lips. an. 1704. p. 526.* Barthol. *de Libr. Legend. diff. 3. p. 66.*

It would be of good use to know which is the best book on each subject; e. gr. the best logic, best dictionary and grammar, best physics, best commentary on the bible, or on the institutes, or Genesis, or the epistle to the Hebrews, or the best harmony of the Evangelists; best defence of the truth of Christianity,

HURLE BONE. }
NEPER'S BONES. } See the articles {
QUITTER BONE. } HURLE.
RING BONE. } NEPER.
WHALE BONE. } QUITTER.
 } KING.
 } WHALE.

BONE-SETTING. See the articles **REDUCTION**, **FRACTURE**, and **LUXATION**.

BONNET, in a general sense. See **CAP**, **HAT**, &c.

BONNET, in fortification, a kind of little ravelin, without a ditch, having a parapet three foot high; anciently placed before the points of the salient angles of the glacis; being palliaded round: of late also before the angles of bastions, and the points of ravelins, and faulchbrayes. See *Tab. Fortif. fig. 21. lit. m.*

The *bonnet* has two faces, from ten to fifteen, or more rods long: the parapet is made of earth, from thirty to thirty-six foot thick, and from nine to twelve foot high: it is environed with a double row of palliades, ten or twelve paces distant from each other; hath a parapet three foot high, and is like a little advanced corps du guard.

BONNET a prêtre, or priest's cap, is an outwork, having at the head three salient angles, and two inwards.

It differs from the *double tenaille* only in this, that its sides, instead of being parallel, grow narrower, or closer at the gorge, and open wider at the front; on which account it is also denominated *queue d'aronde*, or swallow's tail. See **QUEUE D'ARONDE**, and **TENAILLE**.

BONNETS, in the sea-language, small sails, set on the courses, on the mizzen, main-sail and fore-sail of a ship.

Christianity, and the like: by which a library might be composed of none but the best books of each kind.—For this purpose we have the sentiments of many authors of established reputation on the most considerable writers, in Sir Tho. Pope-Blount's *Censura celebratum auctorum*, which may be of use to direct one's choice. But, to be more express,

The history or *notitia* of Books makes the first part, according to some, the whole of the literary science.—The principal points in the *notitia* of a book, are, its author, date, printer, edition, versions, comments, epitomes, success, eulogies, censures, condemnation, suppression, adversaries, vindicators, continuators, and the like.

The history of a book is either of its contents, which is given by analysing it, as is done by journalists; or of its appendages and accidents, which is the more immediate province of those called literators, and bibliothecarians.

The contents of a book are the matters delivered in it; which make the province of the author.—Of these there is one principal matter, called the *subject*; in respect of which the rest are only incidents.

The appendages of a book are, the title, preface, epistle dedicatory, summaries, table of contents, index, and the like, which are the proper province of the editor, unless perhaps the title-page, which is frequently usurped by the book-seller.

In the composition of a book, there occur sentiments, which are also the materials of it; method, the order wherein these are disposed; and style, or expression, which is the language wherein they are clothed.

The giving histories, catalogues and bibliotheca's of books, is said to have been first introduced by the Germans: we may add, that it is they who have best succeeded in them; and to whom the chief works of this kind are owing.—J. Alb. Fabricius has given us the history of the Greek and Latin books: Wolfius that of the Hebrew books: Boecler, of the principal books in each science and faculty: Struvius, of the books of history, law, and philology; the abbot Fabricius, of the books in his own library: Lambecius, of those in the Vienna library: Le Long, of the books of scripture: Mattaire, of the books printed before the year 1550, &c.—*Vid. Reimm. Bibl. Aroam. in praef. §. 1. p. 3. b. Bol. Introd. ad Not. Script. Eccl. c. 4. §. 13. p. 124. seq.*

Burning of Books was a kind of punishment much in use among the Romans, by legal sentence: sometimes the care of the execution was committed to triumph appointed on purpose; sometimes to the praetors, and sometimes to the aediles; Labienus, whom from his satirical spirit some have called *Rabienus*, is said to have been the first, who underwent the severity of it. His enemies procured a senatusconsultum, whereby all his books, published during several years, were ordered to be collected and burnt: "The thing," says Seneca, then appeared new and strange, to take revenge on "learning!" *Res nova & insueti supplicium de studiis sumi*. Cassius Serrius, a friend of Labienus, hearing the sentence pronounced, cried aloud, "That they must burn him too, "since he had got all the books by heart." *Nunc me vivum uri oportet, quia illis dilici*. Labienus could not survive his books, but shutting himself up in the tomb of his ancestors, pined away, and was buried alive.—*Vid. Tacit. Agric. c. 2. n. 1. Valer. Max. l. 1. c. 1. n. 12. Tacit. Annal. l. 4. c. 35. n. 4. Senec. Controv. in praef. §. 5. Rhodig. Ant. Lect. c. 13. l. 2. Salmuth ad Paucel. P. 1. tit. 22. p. 68. Pitific. L. Ant. T. 2. p. 84.* Divers other ancient testimonies concerning the burning of books are given in Reimm. *Idea Syst. Antiq. Liter. p. 389. seqq.*

For the matter of Books.—They were first written on stones, witness the Decalogue given to Moses, (which is the oldest book we have any warranted account of;) then, on the parts of plants, e. gr. the leaves, chiefly of the palm-tree; the rinds and barks, especially of the tilia, or philyra, and the Egyptian papyrus*. By degrees, wax, then leather were introduced, especially the skins of goats and sheep, of which at length parchment was prepared: then lead came in use; also linen, silk, horn, and lately paper itself.—*Vid. Calm. Diff. 1. sur Genes. Comment. T. 1. ejusd. D. Bibl. T. 1. p. 316. Du Pin Bibl. Eccl. T. 10. p. 381. Barthol. de legend. libr. diff. 4. p. 70. seqq. Hist. Acad. R. Infer. T. 3. p. 103. Schwartz de Orn. libr. diff. 1. Reimm. Idea Syst. Antiq. Liter. p. 235. & 286. seq. Montfauc. Palaeogr. l. 2. c. 8. p. 180. seq. Guiland Papyr. Membr. 3. See also the article PAPER.*

* The parts of vegetables continued long the common matter of books; inasmuch that most of the names and terms belonging to books, in most languages, are taken thence: as the Greek *biblos*, the Latin *liber*, *codex*, *folium*, *tabula*, and the English *book* itself.—We may add, that vegetable barks appear still in some measure retained for books in certain of the Northern countries, as among the Calmue Tartars, where a library was lately discovered by the Russians, of an unusual form as well as matter; the books were exceedingly long, but, of no breadth; the leaves very thick, and made of barks of trees, smeared over with a double varnish; the ink or writing being white on a black ground.—*Vid. Hist. Acad. R. Infer. T. 3. p. 6.*

The first books were in form of blocks and tables, of which we find frequent mention in scripture, under the appellation

spiber, which the septuagint render *αβων*, q. d. *square tables*; of which form the book of the covenant, book of the law, book or bill of divorce, book of curses, &c. appear to have been*.—As flexible matters came to be wrote on, they found it more convenient to make their books in form of rolls, called by the Greeks *ξυσταμα*, by the Latins *volumina**, which appear to have been in use among the ancient Jews, as well as Grecians, Romans, Persians, and even Indians. And of such did the libraries chiefly consist, till some centuries after Christ.—The form which obtains among us is the square, composed of separate leaves; which was also known, though little used, among the ancients; having been invented by Attalus, king of Pergamus, the same who also invented parchment: but it has now been so long in possession, that the oldest manuscripts are found in it. Montfaucon assures us, that of all the ancient Greek MSS. he has seen, there are but two in the roll form; the rest being made up much after the manner of the modern books.—*Vid. Calm. lib. cit. Du Pin Bibl. Eccl. T. 10. p. 382. Barth. de Libris legend. diff. 4. p. 95. seqq. Montfauc. Palaeogr. Graec. l. 1. c. 4. p. 26. Reimm. Idea Syst. Antiq. Liter. p. 227. Item p. 242. Schwartz. de Orn. libr. diff. 2. See also the article BOOK-BINDING.*

* The rolls, or volumes, were composed of several sheets, fastened to each other, and rolled upon a stick, or umbilicus; the whole making a kind of column, or cylinder, which was to be managed by the umbilicus, as a handle; it being reputed a kind of crime to take hold of the roll itself. The outside of the volume was called *front*; the ends of the umbilicus *cornua*, horns; which were usually carved, and adorned likewise with bits of silver, ivory, or even gold and precious stones. The title *ἑξασταμα*, was stuck on the outside. The whole volume, when extended, might make a yard and half wide, and fifty long.—*Vid. Salmuth, ad Paucel. P. 1. tit. 42. p. 143. seq. Walk. Parerg. Acad. p. 72. Pitific. L. Ant. T. 2. p. 43. voc. libr. Barth. Antiq. l. 22. c. 18. Schwartz. de Orn. Libror. diff. 2. Reimm. Idea Syst. Ant. Liter. p. 242. seq. Item p. 251.* To which may be added divers other writers on the form and ornaments of the ancient books recited in Fabric. *Bibl. Antiq. c. 19. §. 7. p. 607.*

To the form of books belongs also the *Oeconomy of the inside*, or the order and arrangement of points and letters into lines and pages*, with margins and other appurtenances: this has undergone many varieties; at first, the letters were only divided into lines, then into separate words; which by degrees were noted with accents, and distributed by points and stops into periods, paragraphs, chapters, and other divisions. In some countries, as among the Orientals, the lines began from the right, and run to the leftwards; in others, as the Northern and Western nations, from the left to the rightward: others, as the Grecians, followed both directions alternately, going in the one and returning in the other, called *baustrophedon*.—In most countries the lines run from side to side of the page, in some, particularly the Chinese, from top to bottom. Again, the page in some is entire, and uniform; in others, divided into columns; in others distinguished into text and notes, either marginal, or at the bottom: usually it is furnished with signatures and catch-words; sometimes also with a register to discover whether the book be complete.—To these are occasionally added the apparatus of summaries, or *fidic* notes; the embellishments of red, gold, or figured initial letters, head-pieces, tail-pieces, effigies, schemes, maps, and the like.—The end of the book, now denoted by *fnis*, was anciently marked with a ω , called *coronis*; and the whole frequently washed with an oil drawn from cedar, or citron chips, strewn between the leaves to preserve it from rotting.—There also occur certain formula's at the beginnings and ends of books: as, among the Jews, the word *ויהי*, *esto fortis*, which we find at the end of the books of Exodus, Leviticus, Numbers, Ezekiel, &c. to exhort the reader to be courageous, and proceed on to the following book.—The conclusions were also often guarded with imprecations against such as should falsify them; of which we have an instance in the Apocalypse*.—The Mahometans for the like reason place the name of God, at the beginning of all their books, which cannot fail to procure them protection, on account of the infinite regard had among them to that name where-ever found.—For the like reason it is, that divers of the laws of the ancient emperors begin with the formula, *In nomine Dei**.—*Vid. Barth. de Libr. Legend. diff. 5. p. 106. seqq. Montfauc. Palaeogr. l. 1. c. 4. Reimm. Idea Syst. Antiq. Liter. p. 227. Schwartz. de Orn. Libror. diff. 1. Reimm. Idea Syst. Antiq. Liter. p. 240. seq. Schwartz. de Orn. Libror. diff. 2. Reimm. Idea Syst. Ant. Liter. p. 251. Schwartz. ubi supra diff. 3. Reimm. l. c. p. 260. seq. Fabric. Bibl. Graec. l. 1. c. 5. p. 74. Revul. c. 22. v. 19. Sale Prelim. Disc. to Koran, sect. 3. p. 59. Barthol. lib. cit. p. 117.*

* At the end of each book the Jews also added the number of verses contained in it, and at the end of the Pentateuch the number of sections; that it might be transmitted to posterity entire: the Masorettes and Mahometan doctors have gone farther; so as to number the several words and letters in each book, chapter, verse, &c. of the Old Testament, and the Alcoran. See MASSORA, ALCORAN, &c.

The kinds and denominations of Books are various: with regard to their use and authority, books may be divided into,—*human*, those composed by mere men;—*divine*, those sent from heaven, or dictated by God himself, containing his word and will; which latter are also called *sacred and inspired books*. The Mahometans reckon one hundred and four divine books, given by God to his prophets; viz. ten to Adam, fifty to Seth; thirty to Enoch; ten to Abraham; one to Moses, the Pentateuch (such as it was before the Jews and Christians corrupted it) another to Jesus, the Gospel; another to David, the Psalms; and another to Mahomet, the Alcoran. He that denies these, or any of them, or any part, verse, or even word of them, is deemed an infidel^a: and God preserve us from infidels!—They make it a criterion of a divine book, that God himself speak in it, not others concerning God, in the third person; as it does in our books of the old and new testament, which they therefore reject as compositions merely human^b.—*Vid.* Reland. *de Relig. Mahom.* l. 1. c. 4. p. 21. seq. ^b *Id. ibid.* l. 2. §. 26. p. 231.

Sibylline Books are those composed by certain pretended prophetesses, deposited in the capitol, under the care of dumviri.—*Vid.* Lomei. *de Biblioth. c.* 13. p. 377. See also **SIBYL**.

Canonical Books are those received and allowed by the church, as parts of holy scripture.—Such are the books of the old and new testament.

Apocryphal Books, those excluded out of the canon, yet received and read in churches.

Authentic Books, those which are decisive, and of authority: such, in the civil law, are the code, digest, &c. in our law, the statutes, &c.—*Vid.* Bac. *de Augm. Scient.* l. 8. c. 3. Works T. 1. p. 257.

Auxiliary Books, those less essential, yet of use as subservient to the others: as, in the study of the law, books of institutes, formulæ, maxims, reports, &c.

Elementary Books, those which deliver the first principles of sciences: such are those under the titles of *rudiments, methods, grammars, &c.* by which they stand contradistinguished from books of a superior order, which aim at making further advances in the sciences.—*Vid.* Mem. *de Trev. an.* 1734. p. 804.

Library Books, such as are not ordinarily read over, but turned to, and consulted occasionally: such are dictionaries, comments, corpus, thesaurus, &c.

Exoteric Books, those intended for the use of popular and ordinary readers.

Acroamatic Books, those containing more secret and sublime matters, calculated for adepts and proficient in the subject.—*Vid.* Reimm. *Idea Syst. Antiq. Liter.* p. 136.

Prohibited Books, those condemned and forbidden by the superiors of the church, as either containing matters of heresy, or things contrary to good morals.—*Vid.* Bingham. *Orig. Ecclesi.* l. 16. c. 11. §. 11. Pasch. *de Var. Mod. Mor. Trad.* c. 3. p. 208. & 250. Trev. *D. Univ. T.* 3. p. 1507. Pfaff. *Introd. Hist. Theol.* T. 2. p. 65. Heuman *Via ad Hist. Lit.* c. 4. §. 63. p. 163. See also the article **INDEX**.

Public Books, libri publici, the records of past times and transactions kept by public authority.—*Vid.* Calv. *L. Jur.* p. 534. *ve. Libri.* Trev. *D. Univ. T.* 1. p. 1500. See also **ACTS, &c.**

Church Books, or ecclesiastical Books, those used in the public offices of religion.—Such in the Latin church, are the sacramentary, antiphonary, lectionary, psalter, evangelary or evangelistary, ordo, missal, pontifical, ritual, processional, breviary, rosary, &c.—In the Greek church, the menologium, euchologium, tropologium, &c.—Also, the book of peace, liber pacis, which is a book given to be killed in the ceremony of the mass.—The music-book, containing the psalms, troparies, and other prayers of that kind, which are used to be sung, with the notes marked to each.—Book of liturgies, liber liturgiarum, containing not all the liturgies of the Greek church, but only the four now in use; viz. the liturgy of St. Basil, of St. Chrysostom, that of the prebenedicted, *προβενεδικτων*, and that of St. James, which is only used in the church of Jerusalem, and that but once a year.—*Vid.* Pfaff. *Introd. Hist. Theol.* l. 4. §. 8. T. 3. p. 287. ^b Trev. *D. Univ. T.* 3. p. 1507. ^c *Id. ibid.*

The English church-books, in use in the middle of the tenth century, as enumerated in Elfric's canons, were the bible, psalter, psalter-book, (i. e. epistles) gospel-book, mass-book, song-book, (elsewhere called antiphonary) hand-book, (or manual) kalender, passionall, (or martyrology) penitential, and the lesson-book.—*Vid.* John. *Ecclesi. Laws.* An. 957. §. 21. ^a

^a By 3 and 4 Ed. 6. c. 10. Popish books (under the names of antiphoners, couchers, gales, journals, legends, manuals, missals, ordinals, pies, porraffes, primers, processional) are abolished.—But it is doubted whether this statute be in force, because repealed by 1 Jac. 1. c. 2. for, though 1 M. is afterwards repealed by 1 Jac. 1. c. 25; yet, because this of E. 6. was once repealed, and not revived by special words; it may be questioned whether it be now in force.

The Jewish church-books, were the books of the law, the hagiographas, the prophets, &c.—See **PENTATEUCH, PROPHET, and HAGIOGRAPHAS**.—The first was also called the book of Moses; because composed by him; and the book of the covenant, because the terms thereof were contained in

it. In a more absolute sense, book of the law denotes Moses's original or autograph, found in a hole of the temple in king Joliah's time.

Books, again, with regard to their scope and subject, may be divided into—*historical*, those which relate facts, either of nature or mankind—*dogmatical*, those which lay down doctrines, or general truths—*miscellaneous*, those of a neutral kind, containing both facts and doctrines—*historico-dogmatical*, and those which only rehearse doctrines, or at most indicate the arguments by which they are proved, as Mallet's *geometry*;—*scientifico-dogmatical*, those which not only recite the doctrines, but demonstrate them, as Euclid's *Elements*.—*Vid.* Wolf. *Phil. Rat. sect.* 3. c. 1. §. 744, 750, 751, &c.

Pontifical Books, libri pontificales, *ιερατικα βιβλια*; among the Romans, were those appointed by Numa to be kept by the pontifex maximus; describing all the ceremonies, sacrifices, feasts, prayers, and other religious matters, with the manner and circumstances, wherewith each was to be celebrated: these were also called, *indigitamenta*, as containing the names of all the gods, and the occasions, and formula's of invoking each.—*Vid.* Liv. l. 1. p. 23. Lomei. *de Bibl. c.* 6. p. 107. Ptitic. *L. Ant. T.* 2. p. 85. *ve. Libri.*

Ritual Books, libri rituales, those which directed the order and manner of founding, building, and consecrating cities, temples, and altars; the ceremonies belonging to walls, gates, tribes, curiæ, camps, and the like.—*Vid.* Lomei. *lib. cit.* c. 6. p. 111. Ptitic. *ubi supra.*

Augural Books, libri augurales, called by Cicero^a, *reconditi*, were those wherein the science of foretelling futurity from the flight and chattering of birds were contained^b.—*Vid.* Cic. *Orat. pro domo sua ad pontif.* ^b Serv. *ad Æn.* l. 5. v. 738. Lomei. *lib. cit.* c. 6. p. 109.

Auruspicine Books, libri auruspici, those wherein the mysteries of divining from the entrails of victims were prescribed.—*Vid.* Lomei. *ubi supra* c. 6. p. 111.

Acherontic Books, libri Acherontici, those wherein the ceremonies and discipline of Acheron were contained; sometimes also called libri *Etrusci*, as being supposed to have been composed by Tages the Etrurian, though others pretend that he had received them from Jupiter himself^c: some suppose these to have been the same with the libri *fatales*; others, with the libri *cruspici*^d.—*Vid.* Serv. *ad Æneid.* l. 8. v. 398. Lomei. *de Bibl. c.* 6. p. 112. Ptitic. l. c. p. 84. ^e Lindendrug. *ad Ceyforin.* c. 14.

Fulgural Books, libri fulgurales, those written touching thunder and lightning, and the interpretation thereof.—As that composed by the Tuscan nymph Bigois, preserved in the temple of Apollo.—*Vid.* Serv. *ad Æn.* 6. v. 72. Lomei. *de Bibl. c.* 6. p. 111.

Fatal Books, libri fatales, those wherein the ages, or terms of the life of men were written, according to the Etrurian discipline. These were consulted by the Romans in all public calamities; and instructions taken from them, how to expiate the offended deities.—*Vid.* Censor. *de die Natal.* c. 14. Lomei. *lib. cit.* c. 6. p. 112. Ptitic. *ubi supra*, p. 85.

Black Books, those which treat of necromancy and witchcraft.

The same denomination is also given to some other books, on account of the colour of their backs, or the dimness of their contents; whence also *red book*, and *domesday book*.

Good Books, in the common usage, are those of devotion and piety; as colloquies, meditations, prayers, &c.—*Vid.* Shaftesb. *Charact.* T. 1. p. 165. *Item.* T. 3. p. 327.

A good book, in the bookellers language, is a saleable one; in the language of the curious, a scarce one; in that of men of sense, an useful and instructive one.

Among five principal things which Rabbi Akiba recommended to his son, one was, that if he studied the law, he should take care to do it in a good book, lest he should be obliged to learn all again.—*Vid.* Cren. *de Furib. Librar.* See also, further on, the head of judging and chusing of Books.

Spiritual Books, those which treat more expressly of the spiritual or christian life, and the exercises thereof, as contemplation, &c.—Such are those of St. John Climax, St. Francis de Sales, St. Theresa, Thomas a Kempis, Grana densis, Dr. Horneck, &c.

Profane Books, such as do not treat of matters of religion. See **PROFANE**.

Books, with regard to their authors, may be divided into—*Anonymous*, those without any author's name.—*Cryptonymous*, those whose authors names are concealed in some anagram, or the like.—*Pseudonymous*, those which bear false names of authors.—*Psephonymous*, those published after the author's death.—*Genuine*, those really written by the persons whom they pretend for their authors, and still remaining in the state wherein they were left by them.—*Spurious*, or *supposititious*, those pretending to be written by others than their real authors.—*Interpleated*, those which since their composition have been corrupted by spurious additions or insertions.—*Vid.* Pasch. *de Var. Mod. Averb. Trad.* c. 3. p. 287. ^b Heuman. *Via ad Hist. Liter.* c. 6. §. 40: p. 334.

BOOKS, with regard to their qualities, may be divided into—*Clear or perspicuous*, which, in the dogmatical kind, are those where the authors define all their terms accurately, and keep strictly to those definitions in the course of their works.—*Obscure*, those where words are used vaguely, and without defining.—*Prolix*, those which contain more things than were necessary to the author's design: as, in a book of surveying a man should give all Euclid.—*Useful*, those which deliver things necessary to be known, either in other sciences, or in the business of life.—*Complete*, those which contain all that is known concerning the subject.—*Relatively Complete*, those which contain all that was known on the subject, at a certain time; or, if a book were written with any particular design or view, it may be said to be complete, if it contain neither more nor less than is necessary for the accomplishing that end.—In the contrary cases, books are said to be incomplete.—*Vid.* Wolf. *Leg.* §. 815, p. 818, 820, 825, &c.

BOOKS, with regard to the matter they consist of, may be divided into—*Paper-books*, those written either on linen and cotton paper, or on the papyrus, of which last kind few are now remaining.—*Vid.* Montfauc. *Palæogr. Græc.* l. 1. c. 2. p. 14. seq. See also PAPER.

PARCHMENT-BOOKS, *libri in membrana*, those written on skins or pelts, chiefly of sheep. See PARCHMENT.

LINEN BOOKS, *libri lintei*, among the Romans were those wrote on blocks or tables covered with a linen cloth.—Such were the Sibylline books, and divers ancient laws, epistles of princes, leagues, annals, &c.—*Vid.* Plin. *Hist. Nat.* l. 13. c. 2. Dempst. *ad Resin.* l. 3. c. 24. Lomci. *de Bibl.* c. 6. p. 106.

LEATHER BOOKS, *libri in corio*, mentioned by Ulpian^a, are by Guilandinus taken for such as were written on barks, different from that usually wrote on; which was the tilla^b; by Scalliger, with more probability, for such as were written on certain skins, or certain parts of skins, different from those commonly used, which were the pelts or back parts of sheep.—*Vid.* Ulp. l. 52. ff. *de Leg.* 3. ^b Guiland. *Papyr. membr.* 3. n. 50. Salmuth. *ad Pancirol.* P. 2. tit. 13. p. 253. ^c Scallig. *ad Guiland.* p. 17. Pitific. *L. Ant.* T. 2. p. 84. voc. *Libri*.

BLACK BOOKS, *libri in schedis*, those written on wooden planks or tablets, smoothed for that purpose with an asia and plane.—Such were the ordinary books among the Romans.—*Vid.* Pitific. *loc. cit.*

WAXEN BOOKS, *libri in ceris*, mentioned by Pliny, have occasioned some dispute. Herm. Barbarus suspects the term to be a corruption, and inclines to read in *schedis* instead of it, on the authority of some ancient MSS. Others see no need of the emendation, since it is known the Romans sometimes covered their planks, or schedæ, with a thin skin of wax, to make them susceptible of erasements, and amendments, which the *libri in schedis* were not, and consequently were less fit for works that required elegance and accuracy than the waxen ones, which are also called *ceræ*, or *libri cerei*.—*Vid.* Pitific. *ubi supra*.

ELPHANTINE BOOKS, *libri elephantini*, according to Turnebus, were those written on thin slices or leaves of ivory^a; according to Scalliger, those made of the guts of elephants^b; according to others, those wherein the acts of the senate relating to the emperors were written^c; according to others, certain huge or bulky books, consisting of 35 volumes, containing all the names of the 35 tribes.—*Vid.* Salmuth. *ad Pancirol.* P. 2. tit. 13. p. 255. Guiland. *Papyr. membr.* 2. n. 48. ^b Scallig. *ad Guiland.* p. 16. ^c Calv. *L. Jur.* p. 534. voc. *Libri*. ^d Fabric. *Descript. Urb. c.* 6. Donat. *de Urb. Rom.* l. 2. c. 23. Pitific. *L. Ant. loc. cit.* p. 84. seq.

BOOKS, with regard to their manufacture and commerce, may be divided into—*Manuscript*, those written with the hand, whether originally by the authors, called *autographs*, or at second hand by *librarii* or *copists*. See MANUSCRIPT, LIBRARIUS, &c.—*Printed*, those wrought off from the press. See PRINTING.—*Books in quires* or *sheets*, those not bound or stitched.—*Books in folio*, those wherein a sheet is folded but once, or makes two leaves, or 4 pages: *Books in 4°*, where it makes four leaves; in 8°, where eight; in *duodecimo*, where twelve; in 16°, where sixteen; in 24°, where twenty-four.

BOOKS, with regard to circumstances and accidents, may be divided into—*Lost*, those which have perished by the injuries of time, or the malice or zeal of enemies.—Such as are divers even of the ancient books of scripture, written by Solomon, and others of the prophets.—*Vid.* Fabric. *Cod. Pseudepig. Vet. Test.* T. 2. p. 171. Joseph. *Hypenn.* l. 5. c. 120. ap. Fabric. *lib. cit.* p. 247.

PROMISED BOOKS, those which authors have given expectations of, which they have never accomplished.—Janf. ab Almeloveen has given a bibliotheca of books promised, but still latent, or not published.—*Vid.* Struv. *Introd. ad Notit. Rei. Liter.* c. 3. §. 21. p. 754.

FICTITIOUS BOOKS, those which never existed.—Such is the book *de tribus Impatoribus*, so much talked of by some, supposed to be by others: to whom may be added, divers feigned titles of books^a in Baillet^b and others. Loecher^c has published a great number of plans or projects of books, many of them good and useful enough; if there were but books written to them.

M. Dugono has a whole volume of *schemes or projects of books*^a, containing no less than 3000.—*Vid.* Falch. *de Var. Mod. Mor. Trad.* c. 3. p. 282. ^b Bail. *des Satyr. Personel.* ^c Loecher. *Arcan. Liter.* ^d *Projets Littéraires.* ^e *Jour. Liter.* T. 1. p. 470.

BOOKS in ANA, ANTI, &c. See the articles ANTI, ANA, &c. *The Scope or Design of BOOKS* is various; that of some, is to trace the origins of things discovered; of others, to fix and establish some truth, or raise some doctrine to a higher pitch of subtility; of others, to remove some scruple or prejudice which had before obtained, or fix more accurate and precise ideas of things; of others, to explain the names and words used in different nations, ages, and sects; of others, to improve our knowledge of facts, and events, and shew the order and ways of providence: lastly, others aim at divers, or all of these ends.—*Vid.* Loecher. *de Caus. Ling. Hebr. in præf.*

The Uses of BOOKS are numerous: they make one of the chief instruments, or means of acquiring knowledge: they are the repositories of laws, and the vehicles of learning of every kind: our religion itself is founded on books: without them, says Bartholin, God is silent, justice dormant, physic at a stand, philosophy lame, letters dumb, and all things involved in Cimmerian darkness.—*Vid.* Barth. *de Libr. Legend. Diff.* 1. p. 5. *Sine libris Deus jam flet, iustitia quiescit, torpet medicina, philosophia manca est, literæ mutæ, omnia tenebris involuta Cimmeris.*

The elogiums which have been bestowed on books are infinite: they are represented, “as the refuge of truth, which is banished out of conversation; as standing counsellors, and preachers, always at hand, and always disinterested; as having this advantage over oral instructors, that they are ready to repeat their lesson, as oft as we please.”—Books supply the want of masters, and even in some measure the want of genius and invention; and can raise the dullest persons, who have memory, above the level of the brightest, without.—An author, who wrote not inelegantly, though in a barbarous age, sums up all their praises.—*Vid.* Lucas *de Pema ap. Morhoff Polybist.* l. 1. c. 3. p. 27. *Libri est lumen cordis, speculum corporis, virtutum magistrus, vitiorum depulsor, coram prudentum, comes itineris, domesticus amicus, congerio cæcæ, collega & consiliarius præsentis, myrothecium eloquentiæ, hortus plenus fructibus, prætor floribus distinctum, memoriæ penus, vita recordationis; vocatus properat, iussus festinat, semper præsto est, nunquam non morigerus, rogatus confestim respondet: arcana revelat, obscura illustrat, ambigua certiorat, perplexa resolvit, contra adversæ fortunæ defensor, secundæ moderator, spes adauget, iacturam propulsat, &c.*

Perhaps their great glory is, the affection borne them by many of the greatest men of all ages: M. Cato^a, the elder Pliny^b, the emperor Julian, and others, are on record for an excessive devotion to books. The last has perpetuated his passion by some Greek epigrams in their praise. Richard Bury, bishop of Durham, and lord chancellor of England, has a treatise express on the love of books^c.—*Vid.* Plin. *Epist.* 7. l. 3. ^b Philobiblon, *sive de Amore Librorum.* Fabric. *Bibl. Lat. Med. Aevi.* T. 1. p. 842, seq. Morhoff *Polybist.* l. 1. c. 17. p. 190. Salmuth. *ad Pancirol.* l. 1. tit. 22. p. 67. Barth. *de lib. legend. diff.* 1. p. 13. seq.

^a M. Catonem vidi in bibliotheca sedentem multis circumfusum Stoicorum libris. Erat enim, ut scis, in eo inexhausta aviditas legendi, nec satior poterat: quippe qui, ne reprehensionem vulgi inane refermandam, in ipsa curia soleret legere, sepe dum sanatus cægeretur, nihil opera republicæ detrahebat.—*Vid.* Cic. *de Divin.* l. 3. n. 11.

The ill Effects objected to BOOKS are, that they employ too much of our time and attention; engage us in pursuits of no use to the common-wealth, and dispose us for the functions of civil life; that they render men lazy, and prevent their exerting their own talents, by furnishing them on every occasion with things of the growth of others; and that our natural lights become weakened and extinguished, by inuring ourselves to see only with foreign lights: besides, that ill men are hereby furnished with means of poisoning the people and propagating superstition, immorality, enthusiasm or irreligion, which will always spread faster, and be received more greedily than lessons of truth and virtue.—Many other things are added concerning the emptiness of books, and the errors, fables and follies they are fraught with; which, together with the multitude and perplexity of them, is such, that it may seem easier to discover truth in the nature and reason of things, than in the uncertainty and confusion of books.—Add, that books have turned the other instruments of knowledge out of doors, as experiments, observations, furnaces, and the like, without which the natural sciences can never be cultivated to purpose^a; and that in mathematics, books have so far superseded the exercise of invention, that the generality of mathematicians are now contented to learn the solution of problems from others; which is to relinquish the chief end of their science: since what is contained in mathematical books is properly the history only of mathematics, not the science, art or talent of solving questions; which is hardly to be had from books; but only from nature and meditation.—*Vid.* Bac. *de Augm. Scient.* l. 2. *Works,* T. 1. p. 61.

For the Art of Writing or Composing BOOKS, we have much fewer helps and instructions than for the art of speaking; though the former

former be the more difficult of the two; as a reader is not so easy to be imposed upon, but has better opportunities of detecting faults than a hearer.—A great cardinal, indeed, reduces an author's business to a few heads; were they but as easily practised as prescribed: "Let him consider who it is writes, what, how, why and to whom?" *Quis scribat, quid scribatur, quomodo, cur & ad quas.*—*Vid.* August. Valer. de caut. in eisdem libr.

To write a good book, an interesting subject must be chosen, which is to be long and closely meditated on; and of the sentiments which offer themselves, those which are already commonly known are to be rejected; few or no digressions from the main points are to be allowed; quotations rarely made, and then only to prove more important truth, or embellish the subject with some beautiful and uncommon observation; never bringing an ancient philosopher on the stage to say what the meanest laquay could have said as well; nor making a sermon, unless where the business is to preach.—*Vid.* *Nouv. Rep. Lett.* T. 39. p. 427.

The conditions required in a book are, according to Salden, "Solidity, perspicuity and brevity:" the first will be best attained, by keeping the piece long by us, often reviewing and correcting it by the advice of friends; the second, by disposing the sentiments in a due order, and delivering them under proper and usual expressions: the third, by throwing every thing aside that does not immediately concern the subject.

Were these rules observed, it would scarce be possible for any, except an angel from heaven, to write many books: *Vix totidem quot Thebarum portæ vel divitis ostia Nil.*—We should hear no more of those volatile authors, who throw off yearly six or eight books, for ten or twelve years running*; of those voluminous authors, who number their books by scores and hundreds †; nor of those childish authors, who publish books by that time they are able to speak ‡.

* Severin. Lintrapius, professor at Copenhagen, has given a catalogue of seventy-two books, which he composed within the compass of twelve years: containing six volumes in theology, eleven in ecclesiastical history, three in philosophy, fourteen on miscellaneous subjects, and thirty-eight on literary subjects.—*Vid.* Lintrup. *Reliq. Incend. Berg. ap. Nov. Lit. Lubec. an. 1704. p. 247.*

† Fa. Macedo, a Franciscan friar, wrote, according to his own testimony, 44 volumes, 53 panegyrics, 60 Latin speeches, 100 epigrams, 500 elegies, 110 odes, 212 epistles dedicatory, 500 familiar epistles, *poemata epica juxta bis mille sexcenta*: (it is to be supposed he means 2600 poems in heroic or hexameters) and in fine 150000 verses.—*Vid.* Noris *Miles Macedon. ep. Jour. des Scav.* T. 47. p. 179.

‡ The young duke de Maine's works were published at seven years old, under the title of, *Ouvrages divers d'un auteur de sept Ans*, Paris, 4to. 1685.—*Vid.* *Jour. des Scav.* T. 13. p. 7.—Dan. Heinius published his notes on Silius Italicus so young, that he entitied them his *Rattles, Crequydia Siliiana*. *Lugd. Bat.* 1600. 6to.—Caramuel is even said to have written a book on the sphere, before he was old enough to go to school; and what is pleasant, he took it chiefly from *Sacro Bosco's treatise de Sphaera*, before he had learnt a word of Latin.—*Vid.* *Bailliet Enfants celebres*, n. 81. p. 500.—We may add, that Placcius assures us, he began to make his collections, while under the tutorage of his nurse, and when he had nothing to collect out of, but his nurse's prayer-books.—*Place. de Art. Excerpt.* p. 190.

M. Comet D. de S. used to say, that to write books, a man must be either very foolish or very wise*: there are doubtless many of both sorts in the number of authors; yet the majority seems to consist of those, who are neither the one or the other. The custom is much altered since the times of the ancients, who carried their scrupulousness in what relates to the composition of books beyond all that has been above expressed: so august was the idea they formed of a book, that nothing would suffice less than its being a treasure: *thesaurus apertæ esse, non libere*; no labour, no assiduity and exactness was thought enough to fit a work for the public view: every sentiment and expression was to be maturely weighed, and turned on all its sides; and not suffered to pass, unless every word were a pearl, and every page beset with gems. So that they put the reader in possession in a single hour, of what had cost them perhaps ten years intense thought and application.—Such were those books, which were reputed *cedo digni*, to be anointed with cedar-juice, and thus rendered incorruptible, for the instruction of all future ages.—With us, the case is otherwise: the ambition of being an author possesses every body, even those who have nothing to say, or at most, only one thing, and that perhaps a trifle, and already said by a hundred others: to furnish out a book, we have recourse to various arts, and stratagems; a formal method is first chalked out, which like a drag-net gathers all before it, old and new, common and uncommon, good, bad, and indifferent, which we adopt with little choice; the chief attention being, with Albutius the rhetor, to say all on the subject we can, not merely all we ought.—*Vid.* Vign. *de Marv. ap. Trev. D. Univ. T. 3. p. 1509. vcc. LIVRE.* † Salmuth. *ad Pancirol. P. 1. tit. 42. p. 144.* Guiland. *de Poyry. membr. 24.* Keimm. *Idea Syll. Ant. Liter. p. 296.* † Barthol. de l' *Hauma de Liter. P. 2. p. 318.* † Barthol. lib. cit. *disj. s. Cum Albutio rhetore de omni causa scribere, non quæ debeant, sed quæ poterant.*

VOL. I.

A modern author, let his subject be what it will, generally takes occasion to retail his whole stock of knowledge then on hand: if he write, for instance, on the gout, as M. Aignan, he will give you the nature of all diseases, and their cures, and perhaps a system of physics into the bargain, and over and above many important doctrines of theology, and rules of morality*: if, on the building of Solomon's temple, as Caramuel, he will not confine himself to architecture, but treat of numerous matters relating to theology, mathematics, geography, history, grammar, &c. Inomuch, that if we may believe the author of a piece inserted in Caramuel's work, if God should permit all the sciences in all the universities in the world to be lost, they might be restored by means of this book alone.—*Vid.* Aignan *Trait. de la Goute*, Par. 1707. 12°. *Jour. des Scav. T. 39. p. 421. seq.* † *Architect. civil. restit. y obliqua confid. en el templ. de Jerus.* 3 vol. folio. Vegev. 1678. *Jour. des Scav. T. 10. p. 348. seq.* *Nouv. Rep. Lett. T. 1. p. 103.*

He sets out with a tedious preamble, perhaps foreign to the question; and thence proceeds on to a digression, this gives rise to a second; which carries him such a length, that his life slight of him: he oppresses us with proofs of things that needed none; makes objections no body would have thought of, and to answer them is sometimes forced to make a dissertation in form, to which he gives a particular title, and to lengthen it out, subjoins the plan of some future work, wherein he will treat the point more at large. Sometimes he argues in form, accumulates syllogism on syllogism, and induction on induction; being careful to note that they are so many geometrical demonstrations. At length you come to a string of consequences, which you never expected; and after twelve or fifteen corollaries, wherein contradictions are not spared, you are surprized for the conclusion to find a proposition which had never been mentioned, or at least had been utterly put out of your head, or perhaps one which has no relation to the subject.

The subject of the book, in all probability, is some trifle; perhaps the use of the particle, *and*, or the pronunciation of the Greek *eta*, or the praise of an ass, or a louse, or a shadow, or folly, or idleness, or the art of drinking, or loving, or dressing; or the use and abuse of spurs, or hoors, or gloves, or the like.—Suppose, for instance, it be the last, and let us see how a modern writer of note proceeds to make his book.—For method he takes that of the Lullists, and begins with the name and etymology of *glove*; which he gives not only in the language he writes in, but in all the languages he understands, or of which he has dictionaries in his study, oriental or occidental, living or dead; accompanying each with its respective etymon, and sometimes too with its compounds and derivatives, and referring for more thorough knowledge to the several dictionaries from whence he took them; always, most religiously quoting chapter and page. From the name he proceeds at length to the thing, and passes with great pains and exactness through all the common places of arguments, as the matter, form, use, abuse, adjuncts, conjuncts, disjuncts, &c. of gloves. On each of which he does not confine himself to give us what is new, singular, or some way uncommon, but thinks himself obliged to exhaust his subject, and give us all he can find. Thus gloves, he informs us, preserve the hands from cold; and proves, that if we go much in the sun without them, our hands will be tanned. He goes on next to show, how chaps on the hands will ensue in winter, if we leave our gloves at home; and how painful as well as unsightly a thing chapped hands are.—Yet must this be allowed an author of merit, and far from being singular in his method of writing. In reality, we all do the same thing, some in a greater degree, and some in a less, with good Mr. Nicolai.—*Vid.* Nicolai *Disquis. de Chirobecarum Usu & Abusu. Giess.* 1702. 12mo. *Nouv. Rep. Lett. Aut.* 1702. p. 158. *seq.*

The form or method is the spirit or archeus that directs all: one writer supposes his book to be a candle-stick, and every chapter a socket †; another reduces his work to the form of a pair of folding-doors, which open into two parts, to admit the reader into a dichotomy ‡. Mr. Walthers considers his book, *officina biblica*, as a shop, and divides or ranges the materials of it accordingly, on so many shelves, treating his reader throughout as a customer. Another turns his book into a tree, with its trunk, branches, flowers, and fruits; the twenty-four letters of the alphabet being the branches; the several words the flowers, and 120 sermons the fruit.—*Vid.* Wolf. *Bibl. Hebr. T. 3. p. 987.* † R. Schabati *Labra Dormitium. ap. Wolf. lib. cit. Item T. 1. in pref.* p. 12. ‡ Cassian. a. S. Elia, *Arbor omnium opinionum moralium, quæ ex truncis pullulant, tot ramis quæ sunt literæ alphabetæ, cujus flores sunt verba, fructus sunt 120 conciones, &c.* Venet. 1688. fol. *V. Giorn. de Parma, an. 1688. p. 60.*

For the origin of Books, we have nothing that is clear: the books of Moses are doubtless the oldest of all that are extant †; but there were books before those of Moses, who cites several ‡: Scipio Sgambati, and others †, even talk of books before the deluge, written by the patriarchs Adam, Seth, Enos, Cainan, Enoch †, Methusalem, Lamech, Noah and his wife, all by Ham, and Japhet and his wife, besides others by the da-

mons or angels; of all which some moderns have found enough to fill an antediluvian library: but they appear all, either the dreams of idle writers, or the impostures of fraudulent ones.—*Vid. Mem. Acad. R. Inscr. T. 6. p. 32. Id. ibid. T. 8. p. 18. Sgambati. Archiv. Vet. Test. Fabric. Cod. Pseudep. V. Test. passim. Heuman. Via ad Hist. Liter. c. 3. §. 3. p. 29.*

* A book of Enoch is even cited in the epistle of Jude v. 14. and 15: from which some endeavour to prove the reality of antediluvian writings; but the book cited by that apostle is generally allowed both by ancient and modern writers to be spurious.—*Vid. Saalbach. Sched. de Libr. Vet. §. 42. Reimm. Idea Syst. Ant. Liter. p. 233.*

Of profane books, the oldest extant are Homer's poems, which were even so in the time of Sextus Empiricus²; though we find mention in Greek writers of about seventy others prior to Homer, as Hermes, Orpheus, Daphne, Horus, Linus, Mufæus, Palamedes, Zoroaster, &c. but of the greater part of these, there is not the least fragment remaining; and of the others, the pieces which go under their names are generally held by the learned supposititious.—F. Hardouin goes farther; charging all the ancient books, both Greek and Latin, except Cicero, Pliny, Virgil's georgics, Horace's satires and epistles, Herodotus, and Homer, as spurious, and forged in the thirteenth century, by a club of persons under the direction of one Severus Arcontius³.—*Vid. Fabric. Bibl. Græc. l. 1. c. 1. §. 1. T. 1. p. 1. Id. ibid. §. 6. p. 4. Hardouin. de Numm. Herodiad. in Proluf. Ad. Erud. Lips. an. 1710. p. 70.* Among the Greeks, it is to be observed, the oldest books were in verse, which was prior to prose⁴: Herodotus's history is the oldest book extant of the profane kind⁵.—*Vid. Strabo Geogr. l. 1. Heuman. lib. cit. §. 20. p. 50. Id. ibid. §. 21. p. 52.*

The multitude of Books has been long complained of: they are grown too numerous, not only to procure and read, but to see, learn the names of, or even number. Solomon, three thousand years ago complained, that "of writing books there was no end." But modern writers cannot keep within terms of so much moderation: "You may sooner empty the sea, says one, than exhaust the immense ocean of books, or number the sands on the shore than the volumes extant. "They are not to be told, says another, though like an inhabitant of Mahomet's paradise, a man had seventy thousand heads, and to each head seventy thousand mouths, and to each mouth seventy thousand tongues, which each spoke seventy thousand languages."—Yet how is the number continually increasing! When we consider the multitude or hands employed in writing, of copists throughout the east in transcribing, and of presses in the west continually pouring in fresh quantities, it seems a kind of miracle the world should be able to contain them! England has more to fear on this score than other countries; since besides our own produce, we have for some years past, drained our neighbours. The Italians and French make great complaints that their best books are carried out of the country by foreigners: "It seems, say they, to be the fate of the provinces which composed the ancient Roman empire, to be plundered by the northern nations: anciently they conquered and took possession of the country; of late, they leave the inhabitants their lands, and only take their learning." *Commigrant ad nos quotidie (cries Sig. Faccioliati) callidi homines pecunia instructissimi et præclarum illam misarum superlectilem, optima volumina, nobis abripiunt. Artes etiam, ac disciplinas paulatim abducentur aliis, nisi studio et diligentia resistatis.*—*Vid. Barth. de Libr. legend. diff. l. 1. p. 7. Heuman. Via ad Hist. Liter. c. 6. §. 43. p. 338. seqq. Faccioliati. Orat. 1. Mem. de Trev. an. 1730. p. 1793.*

Elementary books seem the least to need to be multiplied; since a good grammar, or dictionary, or institutions of any kind, seems hardly to admit of a second in one age, or even in many ages. Yet it has been observed, that in France alone, within the compass of thirty years, there have appeared no less than fifty new elements of geometry, as many treatises of algebra, as many of arithmetic, and as many of surveying and measuring; it is added, that within the space of fifteen years, there have been above a hundred French and Latin grammars published in the same country; and of dictionaries, abridgments, methods, &c. in proportion: all which are but an eternal round of the same things, the same ideas, same discoveries, same truths, same falsehoods.—*Vide Mem. de Trev. an. 1734. p. 804.*

The best of it is, we are not obliged to read them all: Thanks to providence, the good bishop Caramuel's scheme miscarried, which was, to write about an hundred volumes in folio, and then prevail on the civil and spiritual powers to oblige all their subjects to read them. Ringelberg had laid the schemes of no less than a thousand several books, which he alone was to have composed, had he lived long enough⁶; and apparently would not have been less eager in obtruding them on the public. Had the same thought entered Hermes Trifmegistus, who, according to the account given by Jamblichus, wrote 36525 books, people would have had much more reason to complain of the multitude of books than they now have.

—*Vid. Baill. Enfants Celebr. sec. 12. Jugem. des Scav. T. 5. P. 1. p. 373.*

In reality, there are few of the immense number of books which deserve seriously to be studied: for the rest, part of them are only to be occasionally consulted, and the rest read for amusement. A mathematician, for instance, ought not to be entirely ignorant of what is contained in the mathematical books; but then a general knowledge is sufficient, which may easily be had by running over the chief authors; out of whom references may be made, directing to the places where they may be found, when wanted. For there are many things which are much better preserved in books than in the memory; as astronomical observations, tables, rules, theorems, proportions, and in fine, whatever does not spontaneously adhere to the memory, when once known. For the less we crowd that faculty, the reader and freer will the wit remain for inventing.—*Vid. Cartes Epist. ad Hoghel. ap. Hook Phil. Collect. N^o 5. p. 144. seq.*

Thus, a few books well-chosen, and thoroughly studied, may suffice: many have even held the bible alone sufficient for all the purposes of knowledge; others, the alcoran: Cardan requires but three books for any person, who does not make a profession of learning: one, to contain the lives and acts of the saints and other virtuous men; another to amuse the mind with pleasing verses; and a third to teach the rules of civil life.—Some have only proposed two books for our study, viz. that of scripture, which discovers the will of God; and that of the creation, which shews his power; the latter of which is the key of the former⁷.—But this, under pretence of retrenching superfluities, seems to be running into the opposite extreme. The business is, rather to make a due choice among the multitude, of a number of good ones.—It may be added, that as knowledge is naturally advantageous, and as every man ought to be in the way of information, even a superfluity of books is not without its use, since hereby they are brought to obtrude themselves on us, and engage us when we had least design.—This advantage, an ancient father observes, we owe to the multiplicity of books on the same subject, that one falls in the way of one man, and another best suits the level, or the apprehension of another.—"Every thing that is written, says he, does not come into the hands of all persons: perhaps some may meet with my books, who may hear nothing of others which have treated better of the same subject. It is of service therefore, that the same questions be handled by several persons and after different methods, though all on the same principles, that the explications of difficulties, and arguments for the truth, may come to the knowledge of every one, by one way or other."—Add, that the multitude is the only security against the total loss, or destruction of books: it is this has preserved them against the injuries of time, the rage of tyrants, the zeal of persecutors, and the ravages of barbarians; and handed them down, through long intervals of darkness, and ignorance, safe to our days⁸.—*Soloque non norunt hæc monumenta mori.*—*Vid. Bac. de Augment. Scient. l. 1. Works T. 1. p. 49. August. de Trin. l. 1. c. 3. Barth. lib. cit. Diff. 1. p. 8. seq.*

Choosing and judging of Books.—Authors are not well agreed on the conditions necessary to denominate a book, good. Some require only good sense in the writer, and an acquaintance with the subject; others with Salden demand solidity, perspicuity, and brevity: others think intelligence and exactness enough: the generality of critics seem to hold, that none of the perfections, which the human mind is capable of, ought to be wanting; but on this footing there is scarce any such thing as a good book; at least none which they themselves will all agree to be such⁹. The more reasonable allow a book to be very good, which has but few faults; *optimus ille, qui minimis arguetur*: at least where the good things in it exceed the bad and indifferent. Nor is a book to be called bad, where the indifferent is the prevailing part, and the good and bad are proportioned equally.—*Vid. Baillet. Jugem. des Scav. T. 1. P. 1. c. 6. p. 19. seq. Honor. Rejex. sur les Regl. de Crit. diff. 1.*

Since the fall of the Latin tongue, authors do not seem so much to aim at the glory of writing well, as of writing good things: so that a book is commonly allowed for good, if it be happily conducted to the end which the author aimed at; whatever other faults it may have: thus a book which is not written on account of style, may be good, though the style be naught¹⁰. Thus, an historian, who is well informed, faithful, and judicious; a philosopher, who reasons justly, and on found principles; a divine, who is orthodox, and departs not from scripture and antiquity; will be allowed good in their kinds, though they be faulty in the less material things.—*Vid. Baillet. lib. cit. c. 7. p. 24. seq.*

And thus most books, in one respect or other, will be found good and useful; so that the choice seems difficult; not so much what to take, as what to reject¹¹. The elder Pliny used to say, there was no book so bad, but some good might be had from it: *Nullum librum tam malum esse, qui non aliqua ex parte proficit.* But there are degrees of goodness; and, in many books, the good is so thin flown, that it is hardly

worth the gathering^a; or hid so deep, or so beset with thorns, that it will not quit the cost of digging. Virgil could gather gold out of Ennius's dunghill; but every body has not the zeal, or the skill and attention necessary to do the like.—^a *Vid. Hook. Collect. N^o 5. p. 127, & 135, seq.* ^b *Plin. Epist. 5. l. 3.* ^c *Reimman. Bibl. Aetioam. in Praef. §. 7. p. 8. seq.* ^d *Sacchin. de Rat. Libr. Legend. c. 3. p. 10. seq.*

It is better judged in those who recommend a small number of the best books; advising us to read much, but not many: *multum legendum esse, non multa*^a. But how is the choice to be made?—^a *Vide Plin. Epist. 9. l. 7.*

To judge of a book, those who have treated of the subject, direct us to observe the title, the author's or editor's name, the number of the edition, the place where, and year when it was printed (which in old books is frequently marked at the end) and the printer's name, especially if he be a celebrated one^a; proceed thence to the preface, and look for the author's design, and the occasion of his writing; consider also his country, (each nation having its peculiar genius^b) and the person by whose order he wrote, which may sometimes be learned from the dedication: if his life be annexed, run it over, and note his profession, what rank he was of, and any thing remarkable that attended his education, studies, conversation, or correspondences with learned men: not forgetting the eulogies which have been given the author, which often occur at the beginning, or even any critique or censure, especially if made by a man of judgment. If the preface do not give an account of the method of the work, run briefly over the order and disposition of it, and note what points the author has handled, observe whether the things and sentiments he produces be trite and vulgar, or solid and fetched from greater depths. Note, whether he go in the common road, or make any innovation, and introduce any new principle. Observe also his method, whether it be a dichotomy, or according to the four causes, or any other more peculiarly adapted to the subject.—^a *Vide Barth. Diss. 4. p. 93. seq.* ^b *Baill. c. 7. p. 228. seq.* ^c *Struv. Introd. ad Natit. Rei Liter. c. 5. §. 2. p. 338. seq.*

But it is a small number of Books we have opportunity of thus judging of, by perusing them; beside, that when we have read a book over, the judgment comes too late for many purposes: it seems necessary therefore to have other indications, whereby to prevent our being at the charge of procuring, or the pains of perusing a worthless book: divers rules of this kind are given by Baillet^a, Struvius^b, Stollus^c, and others; which though, in reality, no more than presumptions, and frequently liable to be falsified^d, are not without their use. The journalists de Trevoix objected to them all: "The shortest way, say they, to judge of a book is to read it, if you be qualified in the subject; otherwise to refer yourself to those who are so^e." Heuman is somewhat more explicit; making it a mark that a book is good, when it is esteemed by persons intelligent in the subject it treats of; and when those who commend it receive no advantage from the applause they bestow on it, nor are leagued with the author in any cabal, for espousing any particular principle, system, or party in religion or learning^f.—^a *Vide Baillet. Jugen. des Scav. T. 1. P. 2. p. 121. seq.* ^b *Struv. lib. cit. c. 5. §. 3. p. 390.* ^c *Stoll. Introd. Hist. Liter. P. 1. §. 11. p. 9.* ^d *Budd. de Criticis Boni Libri passim. Walc. Hist. Crit. Ling. Lat. c. 7. §. 6. p. 320.* ^e *Mem. de Trev. an. 1712. art. 17.* ^f *Heuman Confp. Republ. Liter. c. 6. §. 11. p. 280. seq.*

But more particularly, it is an indication that a book is good, 1^o. If the author be known to excel in that talent more immediately necessary for such a subject; or have already published any thing on the same that is esteemed. Thus we may conclude, that Julius Cæsar will teach us the art of war better than Peter Ramus; Cato, Palladius, and Columella, agriculture better than Aristotle; and Cicero oratory better than M. Varro^a; add, that it is not enough the author be skilled in the faculty, but that he be so in the particular branch of it he treats of; some, for instance, excel in the civil law, yet not in the public law: Salmastus proved himself an excellent critic in his *Exercit. Plinian.* but came much inferior to Milton in his *Defensio Regia*^b. 2^o. If the book be on a subject that requires great reading, it may be presumed good, if the author have a copious library, or can have access to one; or if he lived in a place where books were not wanting: though here is danger too of running into excess in quotations, especially, says Struvius, if the author be a lawyer^c. 3^o. A book which took up a long time in composing, cannot often fail of being good: Thus Villapanus's Commentary on Ezekiel was a work of forty years: Baronius's annals of thirty; Gousset's Hebrew commentaries of thirty; Paulus Æmilius employed the same time in his history; and Vaugelles in his translation of Q. Curtius; Lamy was thirty years in his treatise of the temple: Em. Tesauro forty years in his *Idea Argute distinctis*; and the Jesuit Carra forty years in his poem called *Columbus*.—It is true, they who are so long on the same subject, rarely bring it out uniform and methodical; besides, that they are apt to flag, and grow cold in so long a pursuit: men cannot attend to the same thing for so many years without being tired; which will be

apt to shew itself in the composition: and hence it has been observed that in those large books so long about, the beginnings glow, the middle-parts are lukewarm, the latter ends frigid, *apud vultorum voluminum auctores, principia fervent, medium tepet, ultima frigidat*^a. But then they must excel in the materials, which have been gathering for so long a tract of time: this is particularly observed of the Spanish writers; and is at least more commendable, than the levity and precipitancy of some of their neighbours. Not but the public are sometimes disappointed in their expectations, from writers who are so long in labour: as was the case in Chapelain's poem *la Pucelle*, in the finishing of which he spent thirty years: and concerning which we have that epigram of Monmor:

*Ille Capellani dudum expectata puella,
Post tanta in lucem tempora protulit anus.*

Some, it is certain, have carried their scrupulousness to an excess, as Paulus Manutius, who often spent three or four months in writing a single epistle; and Iocrotas, who was three olympiads in writing one panegyric^a. 4^o. Books on points of doctrine by eclectic writers, are to be presumed better than those writ by the retainers to particular sects. 5^o. The age of a writer may also give us some indication: books, which require labour, are usually better performed by younger persons, than those who are far advanced in years: thus, there is more life in Luther's first published pieces, than in those he wrote a little before his death: strength decays, business encreases, we trust too much to our judgment, and are not scrupulous enough in making inquiries^b. 6^o. Another indication may be taken from the author's state and condition: Thus history written by a person who was an eye-witness of what he relates, or is concerned in public affairs, or has access to the public records, or other monuments, from whence intelligence may be drawn; or who is not biased by party, or hired by any great man, will be supposed to be good. Thus Sallust and Cicero were well able to write the history of Catiline's conspiracy, as having some concerns in it; d'Avila, de Comines, Guicciardin^c, Clarendon, &c. were present in the civil wars they describe: Xenophon, having an employment in the Spartan state, has treated excellently of that commonwealth: and Amelot de la Houffaye, by living long at Venice, was enabled to explain the secrets of their policy: Camden wrote annals of the affairs of his own time; Thuanus had correspondences with the best writers in every country; and Puffendorf had access to the public archives. So, in practical divinity, more regard is due to those who have actually discharged the office of pastors than to others; and, in literary matters, we give credit to those who have the direction of libraries. 7^o. The time or age wherein the author lived may give some light; every age having, according to Barclay, its peculiar genius and excellency^d.—^a *Vid. Barth. de Lib. Legend. diss. 2. p. 45.* ^b *Struv. lib. cit. c. 5. §. 3. p. 390. Budd. diss. de crit. boni libri, §. 7. p. 7.* ^c *Heuman. Confp. Republ. Liter. p. 152.* ^d *Struv. lib. cit. §. 4. p. 393.* ^e *Milic. Lips. T. 3. p. 287.* ^f *Struv. lib. cit. §. 5. p. 396. seq. Baill. c. 10. p. 396.* ^g *Baill. c. 9. p. 378.* ^h *Barth. Diss. 2. p. 43. seq. Struv. §. 6.* ⁱ *Id. ibid. p. 45.* ^j *Struv. lib. cit. §. 15. p. 430. seq. & 404. seq. Baill. c. 1. p. 121. seq. Heuman. Via ad Hist. Liter. c. 7. §. 7. p. 856.*

Some judge by the bulk or size of books; following the grammarian Callimachus's rule, that every great book is of course an ill one, *μυγα βιβλιον, μωρη κωμοσ*; a single leaf of the Sibyl was doubtless preferable to the vast annals of Volufius: yet Pliny's observation will nevertheless hold true, that "a good book is so much the better by how much it is bigger."^a *Bonus liber melior est quisque quo major*^b. Martial gives us a remedy against the largeness of a book, where that is the only complaint: read but a little of it.

*Si nimis videar, seraque coronide longas
Esse liber, legito pauca, libellus ero.*

Yet is the smallness of a book a real preference in its favour: he must be a poor author who cannot furnish a pamphlet, or loose sheet, with things curious, and written with spirit: but to support the same through a volume in folio, requires other-guise funds. In reality, in large books it is allowed a man to be sometimes dull: a heavy preamble is expected, and a series of words of course, ere you come to the business; in the prosecution of which many nodding places are likewise allowed; but smaller pieces are indulged with none of these privileges: they must immediately fall into their subject, and treat every part of it in a lively manner: the matter must be thrown close together, and either be new in itself, or in the turn which is given it.—Were the best authors of volumes in form retailed to the public piece-meal, we should complain of many flat expressions, trivial observations, beaten topics, and common thoughts, which pass well enough off in the lump.—^a *Vid. Barth. lib. cit. diss. 3. p. 62. seq.* ^b *Plin. Epist. 20. l. 1.* ^c *Addit. in Spectat. N^o 124.*

See further concerning books, in the writers on literary history, libraries, studies, learning, arts and sciences; more especially in Salden^a, Bartholin^b, Hodannus^c, Sacchinus^d, Baillet^e, Buddes^f, Saalbach^g, Putherbus^h, Raynaudⁱ, Schufner^j, Lauffer^k, Schwartzius^l, Crœnius^m, and others, who have written treatises express concerning books.—^a *Cl. rit. Lib. berius, i. e. Gul. Saldenus, Bibliothecarius, seu de Libris scriben-*

dis & legendis Ultraj. 1681. 12°. & Amstel. 1688. 8°. Struv. *Intrad. ad Hist. Liter. c. 5. §. 21. p. 454.* ^o Th. Bartholini de *libris legendis*. 1678. 8°. & Francof. 1711. 12°. Struv. *loc. cit.* ^o Jo. Fred. Hodanum *Dissert. de libris legendis*. Hanov. 1705. 8°. Struv. *loc. cit.* ^o Fr. Sacchini de *Ratione librorum cum perfectis legendis*. Lipsi. 1711. 12°. ^o Baillet *Jugemens des sçavans sur les principaux ouvrages des auteurs*. T. 1. ^o Car. Frid. Buddeus, de *Criteriis boni libri*. Jen. 1714. ^o Chr. Saalbach. *Schediasma de libris veterum*. Gryphis. 1705. 4°. ^o Fabric. *Bibl. Ant. c. 19. §. 7. p. 607.* ^o Reimm. *Idea Syst. Antiq. Liter. p. 229. seqq.* ^o Gab. Putherbeus de *tollendis & expurgandis malis libris*. Pat. 1549. 8°. Struv. *lib. cit. c. 8. p. 694. seqq.* ^o Theoph. Raynaud *Erroremata de bonis ac malis libris*. Lugd. 1653. 4°. ^o Morhof. *Polybist. Liter. l. 1. c. 16. n. 28. p. 177.* ^o Schufner *Dissert. Acad. de multitudine Librorum*. Jenæ 1702. 4°. ^o Lauffer *Diss. advers. nimiam Librorum multitudinem*. *Vid. Jour. des Sav. T. 75. p. 572.* ^o Chr. Got. Schwartzius de *Ornamentis librorum apud veteres*. Lipsi. 1705. & 1707. ^o Reimm. *Idea Syst. Antiq. p. 335.* ^o Tho. Crenius de *Libris scriptorum optimis & utilissimis*. Lugd. Bat. 1704. 8°. an extract of which is given in *Ant. Erud. Lipsi. an. 1704. p. 526. seq.*

Censors of BOOKS. } See the article } CENSOR.
Privileges of BOOKS. } PRIVILEGE.
Common place BOOK. } See the article } COMMON PLACE.
Text BOOK. } TEXT.

Book is also used for a part or division of a volume, or large work.

In this sense we say the *book of Genesis*, the first *book of Kings*, the five *books of Moses*, &c.—The Digest is contained in fifty *books*, the Code in twelve *books*.

Books are usually sub-divided into chapters, sometimes into sections, or paragraphs: accurate writers quote chapter and *book*.

Book is also used for a list or catalogue of persons names.—Such among the ancients were the censorial *books*, *libri censorii*; being tables or registers containing the names of all those who were censured or taxed under Augustus. Tertullian assures us, that our Saviour's name was found in the censorial *books* of Augustus.—*Vid. Tertul. adv. Marcion. l. 4. c. 7. De censu Augusti quem testem fidelissimum dominicæ natiuitatis Romana archiva custodiunt. Vid. Lomei. de Biblioth. p. 104. Pitif. L. Ant. T. 2. p. 84.*

Books, in matter of commerce, denote the several registers wherein merchants and other dealers keep their accounts.

We say, such a person's *books* are in good order: merchants cannot possibly do without *books*; they are even obliged by the laws to keep *books*. But more, or fewer are required, according to the nature and extent of their dealings, or the precision and exactness they desire therein.—*Vid. Savar. D. Comm. T. 2. p. 569. voc. Livres.*

The ancients had also their *books of accounts*; witness the codex accepti and expensi, so often mentioned in Roman writers: and the patrimonial *books*, *libri patrimoniorum*, which were rentals, or terriers, containing an account of the lands, goods, and chattels, and other effects belonging to each person.—*Vid. Senec. de Benef. l. 7. c. 10. Meurf. de Lux. Rom. c. 1. Pitif. L. Ant. T. 2. p. 85.*

Merchants Books are divided into *essential* and *auxiliary*.—*Essential*, or *necessary*, are those without which regular accounts cannot be kept; in which number some include the *journal*, *waste-book*, and *ledger*; others only the two latter.

—*Vid. Malc. Treat. of Book-keep. c. 1. Sect. 2. p. 3.* *Subsidiary*, or *auxiliary*, are separate *books*, wherein particular accounts are kept more distinctly, for easing the ledger.—Such are the *cash-book*, *debt-book*, *book of expences*, &c.

Waste-Book, is the first, and most essential: in this, all kinds of matters are, as it were, mixed and jumbled together; to be afterwards separated and transferred into the others: so that this may be called the elements of all the rest.—It may be kept two ways; the first by entering things down simply as they happen, *v. gr. Bought of such a one, sold to such a one, paid such a one, lent so much*, &c. the second by entering at once, each article, debtor and creditor: this last is esteemed the best; in regard, forming a kind of little journal, it saves the keeping any other.—*Vid. Savar. loc. cit. p. 570.*

The *waste-book*, Mr. Malcolin observes, is an universal and compleat memorial of all the transactions and events of business, taken in the natural order of time; whereby all things of one date are placed together; serving as a preparation for the ledger-book, into which they are all to be transferred, upon distinct accounts, according to the order of subjects. The *waste-book* begins with the inventory of a merchant's effects, and debts; and contains a compleat record of every transaction of his affairs, with all the circumstances, in a plain narration of matter of fact; every transaction following another in the order of the dates.

This *book* is in reality a journal, or day-book; but that name being applied to another, the name *waste-book* is given to this by way of distinction: though what relation the word *waste* bears to the nature of this *book*, is not very obvious.—Some authors better call it the *memorial-book*, or *memorandum-book*, in regard its principal use is for taking memorandums.—*Vid. Malc. lib. cit. c. 1. Sect. 2. p. 4. seqq.*

Journal-Book, or *day-Book*, is that wherein the affairs of each day are entered orderly down, as they happen, from the *waste-book*.—Each article in this *book* is to consist of seven parts, *viz.* the date, debtor, creditor, sum, quantity and quality, how payable, and the price.

The journal, so far as it differs from the *waste-book*, is only a *book of aid* to the ledger.—There are two different methods of keeping it: in the first, which is that hitherto chiefly in use, the journal is a compleat transcript of the *waste-book*, in the same order of time, but in a different stile: for that the *waste-book* expresses every transaction in a simple narration of what is done; whereas the *journal* distinguishes the debtors and creditors, as a preparation for the ledger: thus, when any transaction is to be transferred from the *waste-book* into the *journal*, they examine it by the rules of the ledger, as if it were to be entered immediately there; and finding the debtors and creditors to which it belongs, these are distinctly marked by their denominations of *debtor* and *creditor*, in the stile of the journal; at least, the accounts that are debtors are expressly so named; and by their being directly connected debtor to some other accounts, these are sufficiently determined to be the creditors, though the word *creditor* be not written.

Model of an article in the Journal.

Wine Dr. to Cash	L. 160: —	15th July, 1723.			
Burgundy, at	—	Bought of Duval,	ready Money,	16 Pipes of	l. s. d.
		L. 10.			160 0 0

The other form of a journal, which Mr. Malcolin judges preferable in certain respects to the former, makes the journal a compleat transcript of the *waste-book*, without any alteration, leaving on the left side of every page a large margin, about a third part of the page; on which against every transaction, is to be written the names of the debtors and creditors of that transaction, with their titles of debtor and creditor, and sums of money; observing, that where there are sundry debtors or creditors to one creditor or debtor, they write their names next each other, and the name of the one corresponding debtor or creditor against the total of the other sums; by which means the balance and connection appears at sight. Then, when the transaction is transferred to the ledger, they write on this margin the numbers of the folios where the accounts stand in the ledger; for the purposes already mentioned in speaking of the former method.

This *book* may be called either the *waste-book*, or *journal*, being in reality both; not only as every *waste-book* is a *journal*, but as there is here also that which distinguishes both a *waste-book* and a *journal*.—*Malc. lib. cit. sect. 4. p. 20.* By an ordinance of the year 1673, all traders in France, whether by wholesale or retail, are obliged to keep a journal, containing all their affairs, debts active and passive, bills of exchange, &c. For want of keeping this, and surrendering it up on a failure, they are to be reputed fraudulent bankrupts, and subjected to the penalties thereof.—*Vid. Savar. D. Comm. T. 2. p. 570. seq.*

Ledger, or *Ledger-Books*, sometimes also called the *great-book*,

and the *post-book*, is a large volume, containing all the transactions of a man's affairs in such order, as that those belonging to every different subject lie together in one place; making so many distinct or several accounts.

The ledger is only the *waste-book* still further digested; being extracted either immediately from it, or from the journal. It is usually ruled in six columns. In it all the accounts dispersed in the journal are drawn out and stated in debtor and creditor. To form each account, two pages are required, opposite to each other; that on the left serving for debtor, the other for creditor: each article to consist of five parts, or members; the date, the person whom we credit, or are credited by; the subject, *i. e.* the thing credited or indebted for; the page where it is found, and the sum or amount of the article.—Two instances, the one of an article of credit, the other of debt; will illustrate the form and use of this *book*.

Model of an article in debtor.

May 14.	Anthony Roberts Dr.				
1701.	To Cash, paid by his order to Wilks	£o. 16.	1900.	0	0

Model of an article in creditor.

Cr.					
By Cash,	for his remittance on James	£o. 16.	1900.	0	0

The management of the ledger being of great importance in accounts, we will subjoin, from Mr. Malcolin, the following rules relating thereto. 1^o That

For every distinct subject, with which you have an account (i. e. for every person with whom you deal on mutual trust and credit, or who, by any means becomes your debtor, or you his) as well as for every thing you deal in; there must be a certain separate, space, or portion allowed; wherein are to be written all and only the transactions relating to that subject, whose name is to be inscribed, or written on the head thereof; making thereby distinct particular accounts.

2^o. Every account is to be distinguished into two parts, taking for each an equal portion (less or more, as you think fit) of right and left pages, of one folio or opening; the name of the subject being written on the head of the account, on both sides, which are distinguished by the words *debtor* on the left side, and *creditor* on the right, for the uses following: to which the columns explained below are subservient.

3^o. Every personal account to contain, on the debtor side, all the articles which that person owes you, and the payments you make of your debts to him; and on the creditor side all that you owe to him, and the payments he makes of his debts to you. Or, because this rule considers payments under the notion of mutual opposite debts upon the receiver, if this be once supposed, the rule may be briefly expressed thus: Every person is debtor for what he owes me, and creditor for what I owe him.

4^o. Every real account ought to contain, on the debtor side, the quantity and value of what was upon hand at the beginning of the account, and what was afterwards received, with all cost and charges: and, on the creditor side, the quantity and value of what is disposed of, or any way taken away, or gone out of it, with all the returns that subject makes me. Or, more briefly thus: it is debtor for all received, first cost and charges; and creditor for all gone out of it, with the returns.

5^o. Every transaction must be entered in the *ledger-book*, with a balance of debt and credit, i. e. so as that every article be placed on the debtor side of one account, and the creditor side of some other, making thereby equal debt and credit in the ledger; and where the personal and real accounts concerned in the transaction do not, in the articles belonging to them, make this balance (as they will in most cases) then some imaginary account must be used to supply the defect.

6^o. Those accounts, whose articles of debt and credit, in any transaction, balance one another, are, in the ledger, to be connected together in the file of every article, as mutual and correspondent debtors and creditors; by writing in each of the corresponding accounts the name of the other, after the particle *to* in the debtor's account, and *by* in the creditor's, which connects the two; the name of the account, in which the articles are written, with its quality of debtor and creditor, being understood as joined to, and so is read before, the word *to* or *by* in every article, (though it be written only once for all upon the head of the account.) Then, after the name of the corresponding creditor or debtor, follows a brief narration of the fact; the date and other numbers being placed in their proper columns.—Hence we find the use of the column that stands within the money-columns, which is this, to write in it the number of the folio where stands the corresponding account, with which the account in which you write is connected in every article.—*V. Malc. Treat. of Book-keep. c. 1. sect. 3. p. 7.—20.*

To facilitate the use of the ledger, there is an alphabet, to serve as an index or repository; consisting of 24 leaves, each cut on the edge, and marked with one of the 24 letters; wherein, the initial letters of the persons names with whom you have accounts, are inserted, with the folio of the ledger, where the account is stated.—*V. Savar. lib. cit. p. 571.*

The more exact *book-keepers* extend the index to the things or commodities a man has dealings in, as well as the persons he deals with. Generally, it is the letter of a man's surname, and the proper name of the thing that directs its place in the index: thus John Gordon is put under G; and claret wine under C, unless all sorts of wines be comprehended in one account, in which case it is put under W.—*V. Malc. ubi supra sect. 4. p. 27, seq.*

Debt-Book, or *Book of Payments*, a book wherein is entered the day whereon all sums fall due, whether to be paid, or received by bills of exchange, merchandizes, or otherwise: to the end, that by comparing receipts and payments, provision may be made in time for a fund for payment; by receiving bills, &c. due, or taking other precautions.

Two models will suffice for the use and form of this book: it is only to be observed, that like the ledger, it must be on two opposite pages; moneys to be received on the left hand, those to be paid on the right.

Model of the page of payment.

Jan. 1708	To pay.	l.	s.	d.
1	To Charles Horn, for a purchase of the 1 st of July.	700	0	0
	To R. Hart, a note under hand of the 5 th of August.	400	0	0
2	Remittance of Lucas, of 1 st of December, to Hall.	700	0	0
	Adv. own bill of 25 th of October, to bearer.—	100	0	0

Model of the page of receipt.

May 1708	To receive.	l.	s.	d.
1	Remittance of J. Vallor, of the 10 th of March, on Pitts.	600	0	0
	Of Cade, for wool sold the 6 th of July.—	150	0	0
2	Of Dykes by bond of 23 ^d of May last.—	2000	0	0
	Remittance of Price, of 23 ^d of October on Page.—	170	0	0

The *Cash Book* is the most important of all the auxiliary ones: it is so called, because it contains, in debtor and creditor, all the cash that comes in or goes out of the merchant's stock.—In this are entered all the sums received and paid daily; those received on the left hand, with the person's name, of whom received, for what, for whom, and in what species: those paid on the side of creditor; mentioning likewise, the species, the reason why, the person to whom, and for whom the payment is made.—For instance;

Model of an article in debt. Cash Dr.

June 29 th , 1708.	l.	s.	d.
Recd. of Paul Simon for 2 tonn of wax, sold the 6 th instant,			
A purse of — L. 1000 —:—			
Pieces of eight, L. 108 —:—	1108	0	0
L. 1108 —:—			

Model of an article in credit. Cr.

May 14 th , 1711.	l.	s.	d.
Paid. To Tim. Hall, for 2 tonn of wax, bought the 2 ^d instant,			
A purse of — L. 1000 —:—			
Pieces of eight, L. 300 —:—	1300	0	0
L. 1300 —:—			

Better to conceive the nature of this book, it is to be observed, that in business where cash happens to be an account which has numerous articles, it is convenient to keep a particular account thereof, in a book distinct from the ledger; and for this reason called the *cash-book*. This is formed in all respects, like the cash-account in the ledger, with a debtor and creditor side; in which all the cash received and given out is entered; either in a simple file, or in that of the ledger: but which way soever the narration is made, every article must be duly entered on the opposite side of the corresponding account in the ledger; with a reference to the ledger account of cash: for such an account there must also be, into which the sums of the debtor and creditor sides of the particular account must be transferred once a week or month, as is found convenient; thus, in the *cash-book*, the sums being written down against them, write transferred to the ledger, and mark the folio; and in the ledger account, enter the sum with the date of the transfer, debtor *to*, and creditor by sundry accounts, as *per* the *cash-book*. The cash account in the ledger is necessary for the balance of the whole; and the convenience of the separate account of all the particulars, is, that we have them all together, in one continued account: whereas, the rule of the ledger being not to allow more than one folio for one account, till that be filled up, the account might hereby lie in several different folios.—*V. Savar. l. c. p. 571, seq. Malc. c. 2. sect. 2. p. 54.*

Book of Invoices, a book to save the journal from the erasures inevitable in taking accounts or invoices of the several goods received, sent, or sold; where it is necessary to be very particular, and to render those invoices easier to find than they can be in the *waste-book*. The invoices here entered are to be those of goods bought, and set to account of some other; those of goods sold by commission; of goods sent away to be sold on our account; and those of goods sold in partnership, whereof we have the direction, or whereof others have the direction.—*V. Savar. p. 575.*

This book contains an account or invoice of all the goods which a person ships off, either for his own account, or for others in commission, according to the bills of lading; with the whole charges till on board; every invoice following after another, in order as they happen.

The invoice book is only a copy of what is written in the *waste-book*, in those cases.—After the date, the narration is to begin thus:—Shipped aboard the ship—A. B. master; bound for—the following goods; consigned to—for my account, or by order, and the account of.—Or, it may be begun thus,—Invoice of goods shipped aboard—&c.

The design of this book is for the more ready finding out these invoices, than can be done in the *waste-book*.—*V. Malc. ubi supra, c. 2. sect. 3. p. 62.*

Factor-Book is an account of what a person receives to sell in commission for others, and of the disposal thereof.—It is numbered and distinguished into folios, like the ledger; on the left hand side is written, in a plain narrative stile, an account of the goods received, with all charges: and on the opposite side,

side, an account of all the sales, and disposals of those goods.—So that this is only a copy of the employer's account of goods in the ledger, in the file of the waste-book. Where a person does little in commission, a separate book for this purpose is needless.—*V. Malc. loc. cit. p. 63. Savar. p. 575.*

Book of Accounts Current is kept in debtor and creditor, like the ledger; and serves for accounts sent to correspondents, to be regulated in concert with them, ere they are entered in the ledger. This is properly a duplicate of the accounts current, kept to have recourse to on occasion.

Book of Acceptances is destined for the registering all bills of exchange, notified by letters of advice from correspondents; to be able to know, on the bills being presented, whether they have orders to accept them or not.—When they chuse to decline accepting a bill, against the article thereof in the book they put *P. i. e.* protest; that, on offering the bill, the bearer may be told he may protest it; on the contrary, if they accept it, they write against it an *A*; adding the date, or day of acceptance. And this, upon being transferred to the debt-book, is cancelled.

Book of Remittances serves to register bills of exchange, or they are remitted by correspondents, to require the payment thereof.—If they be protested for want of acceptance, and returned to those who remitted them; mention is made thereof against each article, by adding a *P* in the margin, and the date of the day when they were returned; then cancelled.

The books of acceptances and remittances have to bear a relation to each other, that many merchants, &c. make but one of the two, which they keep in debtor and creditor; putting acceptances on the side of debt, and remittances on that of credit.

Book of Expenses, a detail of the petty expenses, both domestic and mercantile; which at the end of each month are summed up, and make an article for the cash-book.—*V. Savar. p. 577.*

This book, being a separate account of all the expenses of living, serves to keep both the profit and loss account, and also the cash-book, more distinct: the greater and more considerable articles are to be placed here particularly; but the several small articles, of daily disbursements, only in totals: though under what denominations, and how general or particular the articles of this book are to be made, must be left to every one's choice. All necessary to observe here, is, that the cash paid out on such accounts must be carefully entered here, and thence once a week or month, be transferred to the cash-book, and to the profit and loss account in the ledger; which is debtor to cash for it.—*Vid. Malc. loc. cit. p. 54.*

Book of Numero's or Wares is kept for the easy knowledge of all the goods brought in, sent out, or remaining in a warehouse.—On the left-hand page are entered the quantity, quality, and number or mark of the goods brought in; on the right, the discharge of the goods out of the warehouse, against the respective articles of the first. Thus,

N ^o 1	A bale of white pepper	—weight	400 l.
2	A piece of crimson damask	—ells	63

March 1	Sold to Charles Mitchell.
Apr. 10	Sent to Nichols of Bristol.

Month-Book is numbered in folios like the ledger, and divided into spaces, on the top of each of which are the names of the 12 months of the year; January, February, &c. allowing a whole folio, or what you please, to each month; and a different set of 12 spaces for every different year.—On the left-hand page enter the payments to be made to you, in that month; and on the right-hand page the payments you are to make. Make a column likewise on the left-hand of every page; in which, write the day of payment; and after this, the name of the debtor or creditor; and draw the sum into the money-columns.—*Vid. Malc. p. 64.*

Book of vessels is kept in debtor and creditor; a particular account being kept for each vessel. To the side of debtor, are put victualling, fitting out, wages, &c. To the side of creditor, are put every thing the vessel has produced; whether by way of freight or otherwise. Lastly, the total of each is entered in the journal, upon balancing the account of each vessel.

Book of Workmen is particularly in use among manufacturers, who have considerable works in their hands. It is kept in form of debtor and creditor for each workman employed. On the side of debt is put the matters given them to work; and on that of credit, the work they return.

Book of Cargo, or Loading, livre de bord, is kept by a clerk of a ship; wherein are entered all the goods aboard the vessel, whether those only for freight, or for sale, or exchange; the whole according to the specification in the master's bills of loading.—*V. Savar. D. Comm. Suppl. p. 965.*

Bank-Book. In cities, where there are public banks, as at Venice, Amsterdam, Hamburg, and London, a book is necessary wherein to keep an account of the sums paid to, or received from the bank.

Book, absolutely used, denotes the waste-book, sometimes the journal or day-book.

In this sense it is they say, I have put down such a sum in my book: you shall have an extract of my book, &c.—*V. Savar. D. Comm. T. 1. p. 569. voc. LIVRE.*

Book of Rates is a book established in parliament, shewing at what value goods which pay poundage are to be reckoned at the custom-house.—*Vid. D. Ruff. T. 1. in voc.* See also **CUSTOM, DUTY, TONNAGE, and POUNDAGE.**

The book of rates annexed to the act of tonnage and poundage made in the 12th year of king Charles II. is subscribed with the hand of Sir Harbottle Grimston, then speaker of the house of commons.—An additional book of rates of goods and merchandizes usually imported, and not particularly rated in the former, with rules, orders, &c. is signed by Spencer Compton, Esq; speaker of the house of commons, 11 G. I. c. 7.

BOOK-BINDING, the art of sewing together the sheets of a book, and covering them with a back, &c.

Binding is distinguished from *stitching*, as in the latter, the leaves are only sewed, without bands, or backs.

We say, French-binding, law binding, marble-binding, binding in leather, in wood, in parchment, in sheep, in calf, &c.

Dutch-binding is, where the backs are of vellum.—The Italians are still contented to bind in a coarse, thick paper, called *binding alla Rustica*, the inconvenience of which is its being liable to wear out without careful use.—*V. Barth. de Lib. Legend. Diss. 4. p. 99.*

No doubt, but the art of binding is almost as ancient as the science of composing books; and that both the one and the other followed immediately the first invention of letters. Whatever the matter were whereon men first wrote, there was a necessity of uniting the several parts together; as well for the making them of one piece, as for the better preserving them: hence the origin of *book-binding*; for which, in all appearance, we are indebted to the Egyptians, that learned people, among whom the arts and sciences began to flourish so early.

* According to Olympiodorus (apud Plot.) it was one Philatus, a learned man at Athens, who first taught the use of a kind of glue, to fasten the several leaves together: on which account a flame was erected to him.

The **Manner of binding Books in Volumes**, i. e. of gluing the leaves together, to roll them on round pieces or cylinders of wood, appears the most ancient; though that of binding them square, and of sewing several quires one over another, lays claim to good antiquity. The first of the two, which we call *Egyptian-binding*, held a long time after the age of Augustus; but it is now disused, excepting in the Jewish synagogues, where they continue to write the books of the law on vellum sewed together; making, as it were, only one long page, with two rollers, and their clasps of gold or silver at each extremity.—*V. Reimman. Idea Antig. Liter. p. 243.*

The form now in use is the square binding, which is said to have been invented by one of the Attali, kings of Pergamus; to whom we likewise owe the manner of preparing parchment; called in Latin, from the name of his capital, *Pergamena*, or *Charta Perganea*.

Manner of binding Books. The first operation is to fold the sheets according to the form, viz. into two for folio's, four for quarto's, eight for octavo's, &c. which they do with a slip of ivory or box, called a *folding-stick*: in this the workman is directed by the catch-words and signatures at the bottom of the pages. The leaves thus folded, and laid over each other in the order of the signatures, are beaten on a stone with a hammer, to make them smooth and open well, and then pressed. Being thus prepared, they are sewed in a sewing-press upon pack-threads or cords, which are called *bands*, at a proper distance from each other, and in a convenient number; which is done by drawing a thread through the middle of each sheet, and giving it a turn round each band, beginning with the first, and proceeding to the last. The common number of bands are six in folio's, and five in quarto's, octavo's, &c. After this the books are glued, the ends of the bands being opened, and scraped with a knife, for the more convenient fixing the paste-boards; then the back is turned with a hammer, the book being fixed in a press between boards, called *backing-boards*; in order to make a groove for fixing the paste-boards. The boards being applied, holes are made for fixing the boards to the book; which operation is called *drawing in*. Then the book is pressed, in order for cutting; which is performed by a machine called a *plough*, to which is fixed a knife. After this the book is put into a press called a *cutting-press*, betwixt two boards, the one lying even with the press, for the knife to run upon, the other above it for the knife to cut against.

The book being cut, the paste-boards are squared with a pair of iron-shears; it being then ready for sprinkling, gilding, blacking, or marbling the leaves. The colours with which it is sprinkled, are usually vermilion and sap-green; which is done by a brush made with hog's bristles, holding the brush in one hand, and moving the hair with the other.

In the French-binding, a book is put in parchment, i. e. a slip

slip of parchment, the length of the *book*, is applied on the inside of each paste-board; so, however, as that being cut or indented in the places against the bands, it comes out between the edge of the paste-board and the leaves of the *book* to cover the back: this preparation, called *indorsing*, seems peculiar to the French binders; who are enjoined by ordinance to back their *books* with parchment, on the penalty of 30 livres, and the re-binding of the *book*: it is done in the press, where the back being grated with an iron instrument with teeth, to make the paste take hold, wherewith the parchment is first fattened; they afterwards add strong glue to fortify it.

Manner of gilding books on the edges.—The *book* being put in the press, between two boards, is scraped with a knife called a *scraper*; and after that with another called a *smoother*, in order to take out all feratches. Being thus prepared, they scrape a little yellow oker upon the *book*, then wet it with a little size-water, and rub it off with some clean shavings. The gilding-size is made with the white of an egg, mix'd with water, and beat well together. The leaves being wetted with the size-water with a brush, the gold is then laid upon it, and afterwards dried before the fire. When dried, it is burnished off with a dog's-tooth set in a handle. Blacking the leaves is done with fine antimony, the leaves being wet, and the antimony, rubbed upon them, and burnished off when dry.

On the gold thus applied, they anciently made ornaments, with hot irons of various forms and devices; the practice of which seemed to have been retrieved in France about the beginning of the eighteenth century, and carried to a good perfection by the abbot de Seuil, and others; and called by a new invented name, *antiquing*: but as the modern taste seems rather inclined to simplicity, it is probable these antiquo-modern ornaments will be dropped again.

The headband is now added; which is an ornament of silk of several colours, or even, sometimes, of gold or silver, placed at each extreme of the back, across the leaves; and wove or twisted, sometimes about a fingle, and sometimes a double piece of rolled paper.

For the covers; though the skins used herein, undergo several preparations in the hands of other workmen; yet there are some still left for the *book-binder*, and peculiar to his art: these we shall explain, in case, as being the leather most used; and, as being that to which all the rest, with a little variation, may be referred.—The calf-skin being then moisten'd in water, is cut out to the size of the *book* with a knife. It may be easily imagined, that none of these preparations, except the last, are used in velvet, &c. wherewith *books* are sometimes cover'd; in regard the water would spoil them.

The cover is next smeared over with paste made of wheat-flour; then stretched over the paste-board on the out-side, and doubled over the edges within-side: after having first taken off the four angles, and indented and plaited it at the head-bands.—They then cord the *book*, or bind it firmly between two boards with a kind of whip-cord, to make the cover stick the stronger to the paste-boards and the back; as also to form the bands or nerves the more accurately: in this operation the workman arms his hand with leather, to enable him to pinch it the harder; and uses a pair of pinchers to bring the thread nearer each band.

The *book* is now set to dry; and when dry, uncorded, and the leaves at each end opened, the *book* is washed over with a little paste and water, the edges and squares blacked with ink, and then sprinkled fine with a brush, by striking it either against the hand or a stick, or with larger spots mix'd with vitriol, which is called *marbling*.

The cover is now glazed twice with the white of an egg beaten; and at last polished with a polishing-iron, passed hot over the glazed cover.

If the *book* be required to be lettered, they paste a piece of red morocco on the back, between the first and second band, to receive the title in gold letters; and sometimes a second between the next bands underneath, to receive the number of the volume.

The *binding*, properly so called, is now complet; and there remains nothing but the gilding work on the back and cover; which, as it makes a part of the *book-binder's* business among us, (though with the French, &c. it is a distinct profession) we shall here subjoin.

Manner of gilding books on the backs and covers.—In ordinary *binding*, they gilt little else but the backs, and the outward edges of the cover. On the backs are gilt the title of the *book*, &c. with flowers, roses, knots, stars, &c. between the bands: on the covers are sometimes added compartments, arms, &c. All these ornaments are made with each its several gilding-tool, engraven in relievio; either on the points of punchions, as those of letters, roses, stars, &c. or around little cylinders of brass, as the lines, embroideries, &c. The punchions make their impression by being pressed flat down; and the cylinders by being rolled along by an iron ruler, by means of a double branch; in the middle whereof, they are fitted on an iron stay, or axis, that passes the middle of their diameters.

To apply the gold, they glaze those parts of the leather,

whereon the tools are to be applied, lightly over with a pencil or sponge; and, when half dry, lay over them pieces of leaf-gold cut out near the size; and on these stamp the punchions, or roll the cylinders, both the one and the other reasonably hot. If the figures be large, and require a great relievio, as arms, &c. they are beat down with a mallet or hammer.—The gilding thus finished, they rub off the superfluous gold with a hare's foot; leaving nothing covered with gold, but the places whereon the hot tools had left their impressions.—*V. Savar. T. 2. p. 1373--1377. Voc. RELIEURE.*

Ahaf Fritsch, chancellor of the university of Jena, has a dissertation express concerning *book-binders, de libripogis*; wherein he treats of the laws prescribed these artificers, and the tax or price settled by the magistrate for *binding books* of every sort in sheep-skin, velum, &c.—The rates fixed for *binding* in sheep-skin, velum, &c.—The rates fixed for *binding* in sheep, throughout the electorate of Saxony, are, for large folio's, 1 guilder or florin, 3 groffes; common folio, 1 florin; large quarto, 12 groffes; common quarto, 8 groffes; large octavo, 5 groffes; common octavo, 4 groffes; duodecimo, 3 groffes; sedecimo, 2 groffes.—*V. Fritsch. Traat. de Typogr. Bibliopol. Chartar. & Bibliopog. dist. 4. §. 3.*

BOOK-KEEPING, the art of keeping accounts; that is, of recording the transactions of one's affairs in such a manner, that the true state of any part, or of the whole, may be thereby known with the greatest clearness, exactness, and ease.—*V. Malc. Treat. of Book-keep. c. 1. sec. 1. p. 1.* See also the article ACCOUNTS.

By the *transactions of one's affairs* are meant, either such as relate to the persons with whom we deal, or the things in which we deal; which last are either money, the principal means of commerce, or goods, comprehending all other effects.

By *knowing the true state of one's affairs* is meant, to know what relates to every person we deal with, and every thing we deal in; that is, what every person owes me, or I owe him; and what quantity and value of every kind of effect is in my hand, with the gain and loss on that subject within the time of the account.

The art of *book-keeping* is comprized in the use of several books of accounts, which are partly essential, and partly subsidiary. See the article BOOKS.

Books are either kept *single*, as among retail dealers; or *double*, as among great merchants: for the first, a *journal*, or *day-book*, and a *ledger*, or *post-book*, are sufficient; for the second, there are several others required.

All authors agree, that it was the Italians, particularly those of Venice, Genoa, and Florence, who first introduced the method of *keeping books* double, or in two parts; hence, among us, it is called *The Italian method*.

In this, there are three books, generally held indispensably necessary; *viz.* the *waste-book*, *journal*, and *ledger*: besides, there are others, to the number of thirteen, or more, called *subservient* or *auxiliary books*, used as occasion requires; *viz.* the *cash-book*, *debt-book*, *book of numero's*, of *invoices*, of *accounts-currant*, of *commissions*, *orders* or *advices*, of *acceptances*, of *remittances*, of *expences*, of *copies of letters*, of *vouchers*, and of *workmen*.

These *books* are kept the same, as to substance, in most trading cities in Europe; but not as to coin: each being regulated by that sort of coin which has course in the state where they are.

In England, *books* are kept in *pounds*, *shillings*, and *pence*; in France, in *livres*, *sols*, and *deniers*; in Holland, in *florins*, *patars*, and *penings*; at Dantzic, in *rixdollars*; through most parts of Germany, in *florins*, *crutzers*, and *penings*; at Hambourg, in *marks*, *sols*, and *deniers* *libis*; at Lisbon, in *rees*; at Florence, in *gold crowns*, *sols*, and *deniers*; in Spain, in *maravedis*; sometimes in *rials* or *pieces of eight*; at Messina, and through Sicily, in *ouvers*, *taris*, *grains*, and *piccolis*; at Venice, in *ducats*; in Muscovy, in *rupees*, *altins*, and *groives*: through all the states of the Grand Signior, in *piasters* and *aspers*.—*V. Savar. D. Comm. T. 2. p. 578. seq. voc. LIVRE.*

Book-keeping, though chiefly in use among merchants and great dealers, is yet applicable with advantage to persons of all other conditions; as retailers, stewards, gentlemen of land-estates, &c. with this only difference, that the narrower their affairs and transactions are, the fewer *books* they need to keep, and *vice versa*. The same ways of accounting, which in great and diffused trade prevent confusion, by an artful and regular disposing of things, if applied to mean and narrow dealings, will create confusion, at least will give more ado than needs; since a few things shew themselves readily, and are examined by mere inspection: supposing no other method but a *waste-book* record; every corner whereof, in very small dealings, the owner's eye is acquainted with, so that he can readily turn to what he wants: but this, in larger accounts is impossible, which makes order, the strictest form, and much writing absolutely necessary.—Yet this one rule must be indispensably observed in all cases, *viz.* That a true and exact memorial of every thing belonging to the account be made, just as things occur; and

and if business encrease, so that a nearer approach to the perfection of accounting be necessary, this will serve as a ground-work, on which you may raise the account to what form you please.—But the least a man can do, will be some part of the method explained under the article BOOKS. Of which all methods whatever are a part; as comprehending the greatest simplicity in the waste-book, and art in the ledger.

For a person in a single state, who has no business, but the receiving at certain times in the year a sum of money, which he lays out again for his private and personal expences, a pocket-book is sufficient.

For one in a married state, whose fortune consists also of money, as he has a greater variety of expences, he must be careful to keep an exact account of what cash he receives and pays: and, to make this account more distinct and orderly, it will be best to keep the particulars of the payments in a separate book, and, to bring them into a cash-book once a week, in totals, digested under such denominations as he thinks fit, as *bread, beer, flesh, coals, candles, &c.*—Things thus brought into the cash-account, may be again drawn into an abstract, shewing the total of each kind of expences for every month, by dividing a page into twelve columns, with the names of the twelve months; and then in so many articles on the margin setting the names of the several heads of expences, and against each, under the respective month, the sum of that kind of expences in that month; then will the sum of the money in the columns under each month be the total expence of that month, and the aggregate of these sums the year's expences.—For artificers, handicraftsmen, and the like, they may keep accounts of the expences of living, as above; but it will also be necessary to make a distinct account of the charges and profit of their business, which may easily be done, by an exact account of all they pay or owe for the materials and instruments of their work, with servants wages, and taxes upon their trade; and of all they receive or is due for their work. They may conveniently keep accounts for the materials of their work, to satisfy them of the disposal thereof, and serve as a check on servants who have access to those things, and they must keep accounts for the persons they deal with, both in buying and selling.—For petty traders, who deal in some hundreds of trifling wares, and make sales to the value of a farthing or halfpenny, these cannot pretend to keep orderly accounts; the best they can do is, to be careful that servants do not wrong them; for they have no account of goods; and if you ask what of any kind remains with them, they must go look, if their memory fail.—These can only have a cash-account, which they are to charge once a week with the money received, and discharge for what they give out; it is not convenient that they should touch the cash-box or till, oftner than once a week, when it is completed; but if they do, they must keep a separate account of what they take out, to know what was received. Besides which, they should have a kind of ledger for the persons with whom they deal upon credit, in which they give every debtor or creditor an account, with a debt and credit both on one side, either with a double money column, or constant deductions, as the debts and credits succeed one another.—They may also, for the sake of those, have a memorandum, or day-book, wherein all things of this nature are writ down, and then carried into the other.

For more considerable shop-keepers, who commonly deal in only a few different species of goods, as drapers, mercers, &c. they usually keep a ledger for persons and wares distinct, without any formal connection or reference of the accounts, in their several articles; whereby there can no regular balance be made. In the accounts of persons, they use the formality of a debtor and creditor stile, which is mere show, without the real value of a regular account; there being no opposite corresponding debtors and creditors to be found. For their ledger of wares, as they call it, contains nothing of this; and is but an imperfect contrivance, which they satisfy themselves with, to know how much remains. But the worst is, that in allotting spaces for the accounts of wares, they frequently allow no more than they suppose may serve for the retail of the quantity first entered on that space; and when this is disposed of, take a new space for a new parcel; which in a quick trade is not only troublesome but confused, if there be any of the old parcels remaining; unless they carry it to the new account. In reality, dealers in retail, if considerable in their way, ought not to come short of the utmost pitch of art: at least, they should keep three grand books, a *waste, journal, and ledger*; unless they shall think fit to join the first two into one. The *waste-book* to contain every thing done in the shop, both what is sold on trust, and for cash.—This and the *journal* may be made in one, by marking the debtors and creditors on the margin, against every transference of value.—For the *ledger-book*, because there are commonly many articles of debt to one of credit, on men's accounts with whom they deal, and many articles of credit for one of debt, upon account of wares, they may keep the debt and credit both on one side, by double money columns;

in the one of which let the debt, and in the other the credit be set.

For gentlemen of landed estates, the books necessary to be kept are, 1^o. A great *waste-book*, containing a plain narrative of all things as they occur; as receipts, and payments; every thing given and received; and, in short, whatever is done relating to any thing or person they are concerned with: out of which are to be made up, 2^o. A *cash-book*, containing in a plain narrative stile, upon the debtor-side, all receipts of money; and upon the creditor-side, all payments: and though there be several articles received or paid together, belonging to the same account, which are entered particularly in the waste, yet they may be set down here in a total sum: for example, there is paid 26 l. for divers pieces of household furniture, all particularly mentioned in the *waste-book*, yet in the *cash-book* there needs no more than to say, *paid for household furniture, &c.* 3^o. A book of accounts with tenants, where, in distinct places, every one's charge and discharge may be fairly written, without any great formality of stile; and if it have a show of debtor and creditor side, it will be the more distinct. 4^o. A book of petty accounts with servants and workmen, &c. 5^o. A book of real accounts; containing an account of cattle, corn, and other flock or furniture, to know at all times what you have, and how it is disposed of.—If a gentleman advance no nearer to the artificial part of accounting, he must keep an account with every person, with whom he has dealings; which may be done in the same book with his tenants accounts; only allotting distinct parts for them; the last will take no great room compared with the other: these books of accounts must have indexes.

For factors or stewards on land-estates, a general *waste-book* will be necessary, to contain all matters transacted, relating to their master's concerns, under their management. Out of which let them make a *cash-book*, in the manner above directed; also a *book of real accounts*, that they may know what real effects, besides money, they have the charge of, and how it is disposed of; particularly the corn-rents, which have been delivered by the tenants, and put in the granaries under their charge, to be disposed and given out according to order.—*Vid. Malc. Treat. of Book-keeping, app. p. 7.*

BOOK-SELLER, a professed trader in books; whether he print them himself, or procure them to be printed by others, for sale.

Book-sellers, among us, are the same with *bibliopole* among the ancients, whose office was distinct from that of *librarian*. Petty dealers, or vendors of small wares, like our publishers, were more particularly denominated *libellionis*; whence Statius,—*de casta nigris libellionis*.—*Vid. Stat. Sylv. l. 4. Carm. g. v. 21. Fabr. Theop. p. 1395.*

Authors frequently complain of the arts of *booksellers*: lord Shaftesbury gives the process of a literary controversy blown up by *booksellers*. The publication of books depends much on the taste and disposition of *booksellers*: among the German writers we find perpetual complaints of the difficulty of procuring *booksellers*; many are forced to travel to the book-fairs at Frankfurt, or Leipzig, to find *booksellers* to undertake the impression of their works: at Rome, the Argiletum was the mart of books, as Paul's Church-yard, or Fleetstreet, have been among us: whence that of Martial,

Argiletanus major habitare tabernas,

Cam tibi, parve liber, serinia nostra vacent.

* *Vid. Schoetig, diss. de librar. & bibliop. Saleng. mem. de liter. T. 1. p. 174. Charaz. T. 3. p. 10. seqq. Item p. 15. seqq. Item p. 27. Vid. Martial. Epig. l. 1. ep. 4. v. 1.*

The fairs of Francfort and Leipzig are famous for the resort of *booksellers*, not only from all parts of the empire, but Holland, Flanders, &c. They have each their shop or warehouse, over which is inscribed the name of some celebrated *bookseller* of former times; *officina Elzeviriana, Frobeniana, Morelliana, Janssoniana, &c.* A like conceit has taken some London *booksellers*, to inscribe over their door, *bibliopolium*, as if people could not know a shop to be a *bookseller's* without a Latin name. Even stall-men dignify their stands with *bibliopolium*; and Moorfields may probably, ere long, be surrounded with *bibliopolia*.

Formerly, the offices of *booksellers* and printers were united in the same persons. Labbe gives a list of learned *booksellers*; most of whom were also authors.—Of late days, *booksellers* have drawn their business into less compass, and leaving the labour of composing books to one set of persons, and that of printing them to another, content themselves with the gainful part; thus ministering to the republic of letters not with the head, or the hand, but the purse only. In which respect, not to mention some of our own *booksellers*, the Vander Aa's at Leyden, Gleditsch's and Fritsch's at Leipzig, Mortier's and Westlein's at Amsterdams, and Aldua's at Utrecht; though much below the Stephens's, Aldus's, Vascosans, Frobenius's, and Morels, have nevertheless acquired a just fame.—*Vid. Struv. Intrud. in notis. Rei Literar. t. 11. §. 15. p. 930. Thurman. Bibl. Acad. p. 56. seq. Labbe Biblioth. Biblioth. p. 233. Struv. lib. cit. §. 38. p. 953.*

The chief science of *bookfellers*, is the βιβλιοπωλεία, or knowledge of books; we mean of the titles, different editions, prices and scarcity of them, without regard to their contents, or qualities, otherwise than as these affect the sale of them.—*Vid.* Struv. *Introd. in notit. Rei Literar.* c. 1. §. 1. p. 1. *sq.* Lang. *Inst. Stud. Theol.* c. 1. memb. 2. p. 98. *sq.* See also the article *Book*.

An acquaintance with the *bookfellers*' marks or signs, frequently expressed on the title-pages of their books, is of some use; by reason many books, especially in the last century, have no other designation either of printer, *bookfeller*, or even city.—The *anchor* is the mark of Raphaelengius at Leyden, and the same with a *dolphin* twisted round it, of the Manutii at Venice and Rome; the *Arion* denotes a book printed by Oporinus at Basil; the *caduceus*, or *pegasus*, by the Wechlii at Paris and Francfort; the *cranes*, by Cramoisy; the *compass*, by Plantin at Antwerp; the *fountain*, by Vascosan at Paris; the *sphære* in a balance, by Janfon or Blaeu, at Amsterdam; the *lily* by the Junta's at Venice, Florence, Lyons and Rome; the *mullerry tree*, by Morel at Paris; the *olive-tree*, by the Stephens's at Paris and Geneva, and the *Elzevirs* at Amsterdam and Leyden; the *bird between two serpents*, by the Frobenius's at Basil; the *truth*, by the Comelins at Heidelberg and Paris; the *Saturn*, by Colinaeus; the *printing press*, by Badius Ascensius, &c.—*Vid.* Baill. *Jugon. des sav.* T. 1. P. 2. p. 91. *seqq.*

Bookfellers are a kind of agents, or curators in the republic of letters: in many places, they are ranked among the members of universities, and entitled to the privileges of students: as at Tubingen, Salisburg, and Paris^a, where they have always been distinguished from the vulgar and mechanical traders, and exempted from divers taxes and impositions laid on other companies^b.—*Vid.* Fritsch. *diff. de bibliop.* c. 7. §. 1. *seqq.* ^aSavar. *D. comm. T. 2. p. 535. seq. vsc. Libraire.*

The traffic of books was anciently very inconsiderable; inasmuch that the book-merchants both in England, France, Spain, and other countries were distinguished by the appellation *stationers*, as having no shops, but only stands or stalls in the streets, where they exposed their wares to sale.—*Vid.* Du Cang. *Gloss. Lat.* T. 4. p. 951. *vsc. Stationarii.* During this state, the civil magistrate took little notice of the *bookfellers*; leaving the government of them wholly to the universities, to whom they were supposed more immediately retainers: who accordingly gave them laws and regulations, fixed prices on their books, examined their correctness, and punished them at discretion.—But when, by the invention of printing, books and *bookfellers* began to multiply; it became a matter of more consequence; and the sovereigns took the direction of them into their own hands; giving them new statutes, appointed officers to fix prices^c, and grant licences, privileges^d, &c.—*Vid.* Fritsch. *diff. de bibliop.* c. 4. ^b*Id. ibid.* c. 5. Thurman. *bibl. acad.* p. 10.

Chevillier shews, that the university of Paris had formerly the sole power of creating and appointing *bookfellers*, who were to take an oath to the university; and were reputed part of the academical body, and as such entitled to the exemptions of the other members thereof. They were to give security to the university for their behaviour, and produce attestations of their capacity for the discharge of their office: the university also deposed and expelled them at discretion: they were obliged to appear at all assemblies of the university, when summoned, and assist at the public processions thereof: they were obliged to lend their books to be read, or even copied by such as were disposed to borrow, on certain conditions, prescribed by the university. If they kept any books by them which were not correct, the university punished them: they were not allowed to buy any book of a student without leave of the rector: nor were they allowed to gain above four deniers in a livre, by any copies sold to the members of the university. Every *bookfeller* was obliged to have a catalogue of all his books hung up in the shop, with the prices, as rated by the university: no *bookfeller*, who had not taken the oaths to the university, might sell a book of above ten sols value.—*Vid.* Chevill. *diff. de l'orig. de l'imprim.* l. 4. *Jour. des Sav.* T. 23. p. 240. Savar. *D. Com. T. 2. p. 530. seq. vsc. Libraire.*

This state lasted from the thirteenth century till the invention of printing, and even till the end of the fifteenth century; during which time there were only allowed twenty-four *bookfellers*, two binders, two illuminers, and two sworn book-writers, or copists.—But from that time the kings of France began to take cognizance of them: Lewis XI. thought fit to prescribe some new regulations in 1467: under Francis I. the *bookfellers* were brought wholly under the royal authority, and received statutes from the king.—*Vid.* Savar. *lib. cit.* p. 531.

Ahlf. Fritsch, chancellor of Jens, has a dissertation express concerning *bookfellers*, de *bibliopoliis*, but it is a jejune piece, and besides, half-filled with passages in High Dutch untranslated: what we find in it any way curious is some questions and cases, between *bookfellers* and authors, which he discusses on the principles of the Imperial and Saxon laws; as,—whether any copy-money be due to an author, who has not been able to finish his book by reason of the difficulty of it?—whether a *book-*

feller, who printed the first edition, be entitled to the refusal of the second?—Whether new copy-money be due from the *bookfeller* to an author on a new edition of a book?—Whether a *bookfeller* may reprint a book without the knowledge and consent of the author?—Whether a number of copies be due to the author over and above the copy-money? which he resolves in the affirmative.—And whether a *bookfeller* may seize his books unpaid for, in a student's closet? which also he resolves in the affirmative.—See further concerning *bookfellers*, in the writers on Books and PRINTERS.—More especially in Schoetgenius^b, de la Caille^c, Chevillier^d, and others^e, who have written expressly on the subject.—*Vid.* Fritsch. *tract. de Typogr. & Bibliopoliis*, &c. Jen. 1675. 4^o. *diff. T. c. 6.* ^bChrist. Schoetgenii *diff. de Librariis & Bibliopoliis antiquorum*. Lips. 1710. 4^o. A notice of it is given in Keimm. *Idea syst. antiq. liter.* p. 60. ^cJean de la Caille, *Histoire de l'imprimerie & de la librairie, jusque an 1689*. Par. 1689. 4^o. An extract of which is given in *Journ. des Sav.* T. 17. p. 467. *seq.* ^dAnd. Chevillier *l'Origine de l'imprimerie*. Par. 1695. 4^o. An extract of it is given in *Jour. des Sav.* T. 23. p. 223. *seqq.* Item p. 235. *seqq.* ^eFabric. *Bibl. Antiq.* c. 19. §. 7. p. 607. & Thurm. *Bibl. Acad.* p. 10. Item p. 56.

BOOKING, among merchants; &c. the making an entry of any matter in the journal. See *BOOK*, *BOOK-KEEPING*, and *JOURNAL*.

BOOM, in the sea language, a long pole wherewith they spread out the clue of the fludding-fail, sometimes also that of the main-fail and fore-fail, to make them broader, and receive more wind.

A ship is said to come *booming*, when she makes all the fail she can.

BOOM also denotes a pole with a bush or basket on the top, placed to direct ships how to steer into a channel; otherwise called a *beacon*.

BOOT, *Brodequin*, a kind of torture for criminals; to extort a confession, by means of a boot, flogging, or buskin of parchment; which being put on the leg moist, and brought near the fire, in shrinking squeezes the leg violently, and occasions intolerable pain.

There is also another kind of *boot*; consisting of four thick strong boards bound round with cords: two of these are put between the criminal's legs, and the two others placed one on the outside of one leg, and the other on the other; then, squeezing the legs against the boards by the cords, the criminal's bones are severely pinched, or even broken, &c.

The *boot* is now disused in England; but it subsists still in some other countries, particularly Scotland.

BOOT-boasting. See the article *HOUSING*.

BOOTES, in astronomy, a constellation of the northern hemisphere, whose stars, in Ptolemy's catalogue are 23; in Tycho's 28; in Bayer's 34; in Hevelius's 52; and in Mr. Flamsteed's catalogue 45. Their longitudes, latitudes, magnitudes, &c. are as follow:

Names and situations of the stars.	Longitud.	Latitude.	Magn.
	° ' "	° ' "	" " "
	10 51 56	28 11 26	6
	9 43 34	30 32 0	6
	9 29 51	33 59 22	6
Middle of 3 in the fore leg	13 37 50	26 32 8	4
Southern	14 51 57	25 12 47	4
5			
Last of the tail of ursa major	12 26 17	30 1 28	5 6
	22 34 24	54 24 0	3
	14 10 50	27 31 38	7
North. of the leg	14 59 00	28 6 41	3
	11 00 38	36 33 10	5
10			
Inform. before the preced. thigh	14 27 1	31 28 30	7 6
	12 13 5	36 53 16	7 6
In the prec. thigh	15 43 4	35 41 3	5
	27 9 24	36 34 48	7
	22 8 42	24 51 0	6
15			
Bright one betwixt thighs, Arcturus	23 26 33	22 16 30	6
Preced. in the north hand	19 53 52	30 57 0	1
	25 36 39	38 54 44	4
	23 23 52	25 10 15	6
In the preced. arm	2 37 32	54 39 20	4
20			
Middle one in the hand	22 11 11	28 27 0	5
That following Arcturus	22 46 14	38 55 33	4
Last of three in the hand	22 38 00	31 45 14	6
Small one following the north. hand	22 18 40	60 10 4	4
	1 35 46	58 55 5	6 7
25			
Preced. against the girdle	18 25 50	42 27 57	4
	22 49 58	35 6 13	7
In the preced. shoulder	13 18 18	49 33 0	3
Subseq. against the shoulder	19 31 33	42 8 24	5
South. in the following leg	27 30 5	30 23 18	3 4
30			
In the posterior heel	28 4 21	27 53 42	3
	0 35 28	22 41 32	4 5
That following the preced. arm	20 27 31	25 59 55	6
	9 38 2	55 27 39	6
	23 36 32	40 0 9	6

Names and situation of the stars.	Sign.	Longitud.	Latitude	Magn.
		°	Nor.	
North. in the hind leg	23	27 45	31 17 7	4 5
Against posterior thigh, under the gird.	23	44 35	49 38 21	3
In the hind leg	29	10 33	33 47 28	4
First of three over the head	11	2 48	57 54 1	6
	20	6 51	52 57 48	6 7
40				
In the posterior hand	29	26 43	40 11 33	5
In the head	19	53 41	51 10 38	2
In the wrist of the posterior hand	29	10 20	42 11 40	5
In the extrem. of the staff's handle	m	0 54 38	40 29 15	5
Middle over the head	21	13 28 53	60 33 37	6
45				
In the staff, near the hand	m	0 34 22	41 54 43	6
Posterior over the head	21	13 17 58	61 7 22	7
South of the middle one in the staff	m	0 51 10	45 4 7 5	5
In the hind shoulder	21	28 48 8	49 0 10 3	6
	m	0 55 3	49 9 16	6
50				
That follow the staff towards the crown	2	44 45	46 49 30	5
North of the middle ones in the staff	21	11 44	53 26 56	4
South. in the extrem. of the staff	28	21 36	57 6 35 5	5
More north.	28	24 27	57 14 40	5 4
Another following this	m	0 46 9	57 14 46	6

BORAMETZ. See ZOOPHYTE.

BORAX, a mineral salt, chiefly used in folding, and fusing of metals; sometimes also in medicine, as an emetic and a promoter of delivery.

Borax is usually supposed to *chrysochala*: though M. Geoffroy gives good reasons for believing the modern *borax* a different thing from the *chrysochala* of the ancients. *Vid. Mem. Acad. R. Scienc. an. 1732. p. 549.*

It is divided the ancient *borax* or *chrysochala* into *natural* and *artificial*: the *natural*, according to him, is only a slimy humour running in mines of gold, silver, copper, and even lead; which, being congealed and hardened by the winter's cold, becomes of the consistence of pumice-stone. *Plin. Hist. Nat. l. 33. c. 15.*

For the *artificial*, it is made by letting water run in the veins of the mine, all the winter long, till June; and letting the mine dry the rest of the year.—So that artificial *borax* is no more than the mineral purified and corrupted.

The same naturalist distinguishes it into *black*, *green*, *yellow*, and *white*; which assume their several colours, as well as values, from the different mines wherein they are formed. The moderns also distinguish two kinds of *borax*; *natural*, which is crude; and *artificial*, which is purified and refined. Crude, or natural *borax*, *borace non rifatto*, is a mineral salt, dug out of the earth in several parts of Persia; and found also at the bottom of a torrent, running in the mountains of Purbeth, near the frontiers of White Tartary: when taken up, it is exposed to the air; where it acquires a reddish fatness, which serves to feed it, and prevent its calcining. When in its perfection, it is sent to Amadabat, in the territories of the Great Mogol, where the European merchants buy it.

There is also another kind of natural *borax*, drier, and of a greenish colour, like English copperas; only differing from the former, by its being longer exposed to the air.

For *artificial* or *refined borax*, *borace rifatto*, it was the Venetians who first found out the art of preparing it; or rather, of purifying the natural: it is said to be done by dissolving it in water; then filtering and crystallizing it; using, for that purpose, cotton matches; about which the *borax* crystallizes, like sugar-candy and verdigrise on wood.—The Dutch, after refining it, reduce it into little pieces, like tagged points; and it is thus commonly used.

Borax, refined, either in the Dutch or Venetian manner, should be clear and transparent, almost insipid to the taste; and above all, care must be taken it have no mixture of English allom.

Borax is of some further use in medicine, as it enters the composition of the *unguentum citrinum*. It is also used in the preparation of a fucus for the Ladies.

Agricola says, there is a fossil nitre, as hard as that whereof the Venetians make *borax*: in which he has reason; this nitre being nothing but the Persian *borax* above mentioned.

What he adds, that the Venetian *borax* is made of the urine of young people who drink wine, beat in a brazen mortar to the consistence of an unguent; then mixed with verdigrise and nitre: is not only false, but is a misrepresentation of a passage in Pliny, *Hist. Nat. l. 33. c. 5.*

M. Lemery the younger has made a great number of experiments on *borax*, by which it appears—That *borax* unites with acids both mineral and vegetable; that it absorbs them, and together with them forms new salts of different kinds according to the species of acid employed.—That these acids incorporate themselves in the *borax* as they do in alcaly salts.—In reality, the *borax* is itself a true native alcaly, which does not need any art or decomposition to render it such, as the common alcaly salts do.—That its action on acids is different from that of the common alcaly salts, in that it is peace-

able and raises no commotion with them, &c. *Vid. Mem. Acad. R. Scienc. an. 1728. item an. 1729. p. 400. seqq. item an. 1732. p. 549.* See SUPPLEMENT, article BORAX.

BORDER, in heraldry. See the article BORDURE.

BORDER, among florists, are such leaves as stand about the middle thrum of a flower. See FLOWER.

BORD-FREE. See the article FREE.

BORD-HALFPENNY, or **BROD-HALFPENNY**, money paid in markets, and fairs for setting up boards, tables, and stalls, for the sale of wares.

BORD-LANDS, the demesnes anciently kept by the lords in their hands, for the maintenance of their *board* or table.—This was also anciently called *bordage*.

BORD-SERVICE, called also **BORDAGE**, the tenure of lands, on condition of furnishing provision for the lord's board or table. *Spelm. Gloss. p. 85. voc. Bordarii.*

Some lands in the manor of Fulham, and else where, are still held of the bishop of London, by this service, by the tenants pay sixpence per acre in lieu of finding provision for their lord's table.

BORDURE, or **BORDER**, in heraldry, a kind of addition on the limb of a field, in form of a hem, or girdle, encompassing it all round, and serving as a difference.—See *Tab. Herald. fig. 10* See also the article DIFFERENCE.

The *bordure* must be about one sixth part of the breadth of the field.

Simple bordure is that which is of the same colour or metal throughout; and is the first addition of younger brothers.—There are others, *compoud*, *countered*, *ingrailed*, *indented*, and *charged* with other pieces; which make different additions for younger brothers, in several degrees.

If the line which constitutes the *bordure* be frait, and the *bordure* plain, as they call it in blazoning, the colour of the *bordure* alone is named: as, he beareth gules, a *bordure* or.—

If a *bordure* be charged with any parts of plants or flowers; they say, *verdoy* of trefoils. If it consist of ermines, vary, or any of the furs, the term is, *purfure* of ermines: if the *bordure* be charged with martlets, the word is, *charged* with an enalour of martlets, &c.

BOREALIS Aurora. See AURORA Borealis.

BOREAS, a Greek name, now in popular use, for the north wind.

* Etymologists usually derive the word either from the Greeks *Bor*, clamor, noise; or from *Bora*, *seca*, food; because, forsooth, it creates an appetite, or because it is good for the fruits of the earth, which yield us food: or others chuse to deduce it from the Hebrew *birjab*, food; or from *beri*, calmness; *bor*, purity; or *bar*, corn.—The ancients supposed *boraeas* only blew out of Thrace.

Pezron observes, that anciently, and with much greater propriety, *boraeas* signified the north-east wind, blowing at the time of the summer solstice: he adds, that the word comes from the Celtic *bor*, morning; in regard their principal light, in that season, came from that quarter, whence also the winds then usually blew.

BORÉE, or **BOURÉE**, a kind of dance, composed of three steps joined together by two motions; and begun with a crotchet, rising. The first couplet contains twice four measures, and the second twice eight. It consists of a balance-step and a couplet: it is supposed to come from Auvergne; or thers say from Biscay.

BOROUGH, **BURROUGH**, **BOROW**, or **BURGH**, is frequently used for a town, or corporation which is not a city.

Borough, in its original Saxon *borge*, or *borgh*, is by some supposed to have been primarily meant of a company consisting of ten families, who were bound and combined together as each others pledge. *Braetun l. 3. tr. 2. c. 19.*

Afterwards, as Verstegan has it, *borough* came to signify a town that had something of a wall or inclosure about it: so that all places which among our ancestors had the denomination *borough*, were one way or other fenced or fortified.

But, in later times, the same appellation was also bestowed on several of the *villa insigniores*, or country towns of more than ordinary note, though not walled.

BOROUGH or *borgh* is now particularly appropriated to such towns, and villages, as send burgesses or representatives to parliament.

Boroughs are equally such, whether they be incorporate or not; there being great numbers of our English *boroughs* not incorporated: and, on the contrary, several corporations that are not *boroughs*; *e. gr.* Kingston, Deal, Kendal, &c.

Boroughs are distinguished into those by *charter*, or *statute*; and those by *prescription*, or *custom*.

The number of *boroughs* in England is 149; some whereof send one, some two representatives.

Royal Boroughs, in Scotland, are corporations made of the advantage of trade, by charters granted by several of their kings; having the privilege of sending commissioners to represent them in parliament, besides other peculiar privileges.

These form a body of themselves, and send commissioners, each, to an annual convention at Edinburgh, to consult the benefit of trade, and the general interest of the *boroughs*.

BOROUGH-English, denotes a customary descent of lands or tenements in certain places, whereby they come to the youngest, instead of the eldest son; or, if the owner have no issue, to the youngest, instead of the eldest brother: for that the youngest is supposed, in law, the least able to shift for himself.

BOROUGH-Head, or **Head-Borough**, is the chief man of the decenna, or hundred; chose by the rest to speak and act in their behalf.

In many parishes, *head-borough* also signifies a kind of head constable, where there are several chosen as his assistants, to serve warrants, &c. See **CONSTABLE**.

BOSCAGE, denotes a place set with trees, a grove, or thicket.

In a *Law Sense*, **BOSCAGE**, *Boscagium*, signifies *mast*, or such sustenance as woods and trees yield to cattle.

Among *Painters*, **BOSCAGE** is said to denote a picture or landscape, representing much wood and trees.

BOSCO. See **ATTACHAMENTA de Bosco & Spinis**.

BOSPHORUS*, or **BOSPORUS**, in geography, a long and narrow sea, which it is supposed a bullock may swim over.

* The word is Greek, *Βοσπορος*, formed from *Βοσ*, *bot*, and *πορος*, *passage*.

The name *Bosphorus* is chiefly confined to two freights, in the Mediterranean sea, viz. the *Bosphorus of Thrace*, commonly called the *freights of Constantinople*, or *channel of the Black-sea*; and the *Cimmerian or Scythian Bosphorus*, so called, it seems, from its resemblance to the Thracian; now more commonly the *freights of Kapha*, or *Kiderleri*, from two cities standing on it.

The origin of the name is better agreed on, than the reason why it was first given to the Thracian *Bosphorus*: Nymphius tells us, on the authority of Accarion, that the Phrygians, desiring to pass the Thracian freight, built a vessel, on whose prow was the figure of a bullock; and which was hence called *Βοσ*, *bullock*; and served them for a ferry-boat.—Dionysius, Val. Placcus, Callimachus, Apollodorus, Marcellinus, &c. say, that so being transformed into a cow by Juno, passed this freight swimming, which hence was called *Bosphorus*.—Arrian tells us, that the Phrygians were enjoined by the oracle, to follow the rout which a bullock should mark out to them; and that upon stirring one up, it jumped into the sea to avoid their pursuit, and swam over this freight. Others say, that an ox, tormented by a gad-fly, threw itself in and swam over; and others, that anciently the inhabitants of these coasts, when they would pass over, joined little boats together, and had them drawn over by bullocks, &c.

BOSSAGE, a projecting stone in architecture, laid rough in a building, to be afterwards carved into mouldings, capitals, arms, or the like.

BOSSAGES also denote stones which seem to advance beyond the naked of a building, by reason of indentures, or channels left in the joinings; used chiefly in the corners of buildings, and thence called *rustic quoins*.

The cavities or indentures are sometimes round, sometimes square, sometimes chamfrained, or beveled, sometimes in the diamond form: sometimes they are inclosed with a cavetto, sometimes with a listel.

BOTANY*, the science of plants; or that part of physiology, medicine, and agriculture, which treats of plants, their several kinds, forms, virtues, and uses.

* The word comes from the Greek *βοτανη*, *herb*; and that from *βοτα*, of *Βοα*, *I feed*; because most animals feed on herbs. See **PHYTOLOGY**, &c.

The most eminent *botanists* among the ancients, were Hippocrates, Theophrastus, Dioscorides, Pliny, Galen, &c.—In the sixteenth century, the ancient *botany*, which had been lost a great many ages, was industriously revived; principally by Leoniceus, Brasavolus, Cordus, Fuchsius, Matthiolus, Dalechampius, &c.—In the same age a number of other hands were added to the oar; by whose industry, the art was first brought into a system or body; as Gesner, Dodonæus, Cæsalpinus, Clusius, Lobel, Columna, Prosper Alpinus, the two Bauhins, Plukenet, Bocconi, &c.—Others have come since, and contributed to bring it still nearer perfection, viz. Morrison, Malpighi, Hermannus, Ray, Magnol, Tournefort, Sloan, Sherrard, Linnæus, &c.

BOTARGO, a sort of relishing mess, made of the roes of the mullet-fish; much used on the coasts of the Mediterranean, as an incentive to drink. *Panciroi. Rer. Memor. P. 2. tit. ult. Shaw Trav. p. 155.*

The manner of preparing *botargo* as practised at Martegue in Provence is described by Mr. Ray.—The mullets, *mugiles*, are taken in *burdigs*, which are places in the shallows, inclosed with hedges of reeds. The male mullets are called *allestans*: the females *botar*, of the roes or spawn of which the *botargo* is made, thus:—

They first take out the spawn entire, and cover it round with salt for four or five hours: then they press it a little between two boards or stones; then they wash it; and at last dry it

in the sun for thirteen or fourteen days, taking it in at night. *Ray Trav. p. 396. seq.*

BOTE, **BOTA**, in our old law-books signifies *compensation*, *recompence*, or *amends* for an injury done.

Hence *Man-bate*, satisfaction due for a man slain.

Hence also *boteless*, where no judgment or favour will acquit a man; as *v. gr.* for sacrilege, &c. And hence our common phrase *to bot*, speaking of something given by way of compensation.

Fire BOTE } See the articles, { **FIRE-bote.**

House-BOTE } { **HOUSE-bote.**

BOTTOM-Nails. See the article **NAIL**.

BOTTOMRY, in navigation and commerce, the act of borrowing money on a ship's *bottom*; that is, by engaging the vessel for the repayment of it, so as that, if the ship miscarry, the lender loses the money advanced; but if it arrives safe at the end of the voyage, the borrower is to repay the money lent, with a certain premium or interest agreed on: and this on pain of forfeiting the ship. See **ASSURANCE**.

BOTTOMY, or **BOTOME**, is used in speaking of a cross, which terminates at each end in three knots or buttons, resembling, in some measure, three-leaved grass. See **CROSS**.

A *cross botomy* is the same with what Segoin terms *crux trifida*; and Baron, *globosa crux*: Gibbon, the better to explain the form, renders it *Crux ad singulas eius extremitates in tres gemmas vel nodos, pro trifolii specie, terminata*. He bears argent a cross botomy sable, by the name of *Wintwood*.

—*V. Tab. Herald. fig. 11.*

BOUCHE*, of *Court*, the privilege of having meat and drink at court *scot-free*.

* The word is also written *bouge*, *lounge* and *hudge*; it is mere French, where it signifies *mouth*.—The French still use the phrase, *Avoir bouche a la cour*, that is, to have table or diet at court.

This privilege is sometimes only extended to bread, beer and wine.—It was a custom anciently in use, as well in the houses of noblemen, as in the king's court.

BOULDER-Wall, a kind of walls built of round flints or pebbles, laid in a strong mortar; used where the sea has a heath cast up, or where there are plenty of flints.

BOULTINE, or **BOLTEL**, in architecture, the workman's term for a convex moulding, whose periphery is just $\frac{1}{2}$ of a circle; placed next below the plinth, in the Tuscan and Doric capital.—*See Tab. Archit. fig. 5.*

BOUND-Masonry.

Hide-BOUND. } See the articles { **MASONRY.**

Half-BOUND. } { **HIDE-bound.**

BOUNDARY-Column. } { **HOOF-bound.**

BOUNDS of an Eclipse. See **ECLIPSE**.

BOUNDS of Lands. See **ABUTTALS**.

BOURGERMESTERS. See the article **BURGER-MAISTERS**.

BOURREE. See the article **BOREE**.

BOU TANT*, in architecture.—An *ARC-BOUTANT*, is an arch or buttress, serving to sustain a vault; and which is itself sustained by some strong wall or massive-pile.

* The word is French, and comes from the verb *bouter*, to but, or a-but.

A *Pillar BOUTANT* is a large chain or pile of stone, made to support a wall, terrace, or vault. *Droitil*.

BOU TS-Rimez, a popular term in the French poetry; signifying certain *rhymes*, disposed in order, and given to a poet together with a subject, to be filled up with verses ending in the same words, and in the same order.

The invention of the *bouts rimez* is owing to one Du Lot, a poet, in the year 1649. In fixing the *bouts*, it is usual to chuse such as seem the remotest, and have the least connexion.

Some good authors fancy, that these rhymes are of all others the easiest, that they assist the invention, and furnish the most new thoughts of all others. Sarrafin has a poem on the defeat of the *bouts-rimez*.

The academy of Lanternists at Tholouse have contributed towards keeping in countenance the *bouts-rimez*; by proposing each year a set of 14, to be filled up on the glories of the grand monarch: the victorious sonnet to be rewarded with a fine medal.—An instance hereof may be given in the following one, filled up by P. Commire.

*Tout est grand dans le roi, l'aspect seul de son
Rend ses fiers ennemis plus froids que des
Et qui l'un n'attend que le tems des
Pour se voir succomber sous un bras fi
Qu'on ne nous vante plus les miracles d'
Louis de bien regner lui seroit des
Horace en vain l'egale aux deux dons ses
Mains que mon heros il etoit sage &*

*buſte,
maſſons,
robuſte,
Aguſtes;
leçons:
chanſons:
juſte, &c.*

BOW, *Arvus*, a weapon of offence made of wood, horn, or other elastic matter, which after being strongly bent, by means of a string fastened to its two ends, in returning to its natural state throws out an arrow with great force.

It is also called the *long-bow*; by way of distinction from the *cross-bow*, or *arball*.

The *bow* is the most ancient, and universal of all weapons.

It has been found to obtain among the most barbarous and remote people, and who had the least communication with the rest of mankind. The ancients ascribe its invention to Apollo.

The use of the *bow* and arrow was first abolished in France under Lewis XI in 1481; and in their place were introduced the Swiss arms, that is, the halbard, pike, and broadsword. See ARMS.

The *long bow* was formerly in great vogue in England; and many laws were made to regulate, and encourage its use. The parliament under Henry VIII. complain, "of the dilute of the *long-bow*, heretofore the safeguard and defence of this kingdom, and the dread and terror of its enemies." 33 H. 8. c. 6.

By 33 H. 8. c. 9. for every *bow* of yew, the bowyers of London were obliged to make two of elm, witch-hazel, ash or other wood; and the country bowyers, three.—But this law was afterwards repealed, so far as related to London; and (by 8 EL. c. 10.) every bowyer was obliged to have always by him fifty good and able *bows* of elm, witch-hazel, or ash, well and substantially made, and wrought.—The *best sort* of *bows* of outlandish yew not to be sold for above 6s. 8d.—The *second sort* for 3s. 4d.—The *coarse sort*, called *livery-bows*, for 2s.—By 12 Ed. 4. c. 2. that *bows* might not be wanting, nor the price rise too high, every merchant who imported goods from Venice, or other place, from which *bow-staves* used to be brought, was for every tun of merchandize to import four *bow-staves*; in pain of 6s. 8d. for every *bow-stave* whereof default is so made. And (by 1 R. 3. c. 11.) ten *bow-staves* for every butt of malmsey; in pain of 13s. 4d. for every ton.

Bow, among builders, denotes a beam of wood, or brags, with three long screws that govern or direct a lath of wood or steel to any arch; chiefly used in drawing draughts of ships, and projections of the sphere, or wherever it is requisite to draw large arches.

Bow is also the name of an instrument formerly used at sea for taking the sun's altitude; consisting of a large arch of 90 degrees graduated, three vanes, a flank or staff, a shade-vane, a light-vane, and an horizon-vane.—But it is now out of use.

Bow of a ship is that part of her which is broadest before: it begins at the loof, and compassing about towards the stem, ends at the sternmost part of the fore-castle.

If a ship have a broad round *bow*, they call it a *bald bow*; if she have a narrow thin *bow*, they say she has a *lean bow*.

The piece of ordnance that lies in this place is also called the *bow piece*; and the anchors that hang there, are called her *great and little bowers*. See BOWER, and ANCHOR.

Rain-Bow. See the article RAIN-BOW.

Bow-Bearer, an under-officer of the forest, who is to observe and take notice of all manner of trespasses against vert or venison; and to attach, or cause to be attached, the offenders, in the next court of attachment.

BOWER, an anchor carried at the bow of the ship. See ANCHOR.

There are usually two *bowers*, called *first* and *second*, or the *great and little bower*.

BOWL-Wassel. See the article WASSEL-BOWL.

BOWLING, or *BOW-LINE*, a rope fastened to the leech, or middle part of the outside of the sail in a ship, serving to make the sail stand sharper or closer by a wind.

The *bowling* is fastened by two, three, or four ropes, like a crow's foot, to as many parts of the sail; only the *mizen-bowling* is fastened to the lower end of the yard.

The *bowling* belongs to all sails, except the sprit-sail, and sprit-top-sail; where it is omitted for want of room to hale it forwards by; and thence it is, that those sails cannot be used close by a wind.

When they say, *Ease the bowling*, or *run up the bowling*; they mean, let it more slack.

BOWLING-Knot, denotes a knot that will not slip, by which the *bowling-bridle* is fastened to the crengles.

BOW-Saw. See the article SAW.

BOW-SE, a sea-term, signifying as much as *bale*, or *pull* together.

Thus, *haling upon a tack* is called *bowing-upon a tack*; and when they would have the men pull all together, they cry, *bowse away*.

BOW-SPRIT, or *BOLT-SPRIT*, a kind of mast in a vessel, standing foremost on the prow; and rearing stopways on the head of the main stem: its lower end is fastened to the partners of the fore-mast, and farther supported by the fore-stay: it serves to carry the sprit-sail, sprit-top-sail, and jacksail.—*Vid. Tab. Ship. fig. 1. n. 124. fig. 2. n. 16. See also the article MAST.*

The *bow-sprit* should be twothirds of the length of the main-mast, and its thickness equal to the *mizen-mast*: when it is twelve fathoms five foot long, its yard must be eight fathoms two foot long; and the top-mast of the *bow-sprit*, three fathoms one foot.

BOW-STAVES. See GARDLING of *Bow-staves*.

BOYAR, or *BOIAR*, a term used for a Russian lord, or grandee.

According to Becman, *boyars* are what in other countries are called the upper nobility: he adds, that the Czar of Muscovy, in his diplomas, names *boyars* before *waywodes*. See WAY-WODE.

BOYAU, in fortification, a branch of the trenches; or a line, or cut, which runs from the trenches to cover some spot of ground; being drawn parallel to the defence of the place, that it may not be enlarged, that is, that the shot from the town may not scour along it.

BOYLE'S Lectures, a course of sermons or lectures, set on foot by the honourable Robert Boyle, Esq; in 1691; whose design, as expressed by the institutor, is, to prove the truth of the Christian religion against infidels, without descending to any Controversies among Christians; and to answer new difficulties, scruples, &c.

For the support of this lecture, he assigned the rent of his house in Crooked-lane, to some learned divine within the bills of mortality, to be elected for a term not exceeding three years, by the late archbishop Tennison, and others. But the fund proving precarious, the salary was ill-paid: to remedy which inconveniences, the said archbishop procured a yearly stipend of 50 pound, for ever, to be paid quarterly; charged on a farm in the parish of Brill, in the county of Bucks.

BOYLING. See the articles BOILING and EBULLITION. *BRACE* is commonly taken for a couple, or pair; and in this sense is applied by huntmen to several beasts of game; as a *brace* of bucks, foxes, hares, &c.—They also say, a *brace* of greyhounds.

BRACE, in architecture, denotes a piece of timber framed in with bevil-joints; serving to keep the building from swerving either way.

When a *brace* is framed into a king-piece, or principal rafter, it is called by some a *strut*.

BRACE, BRACCIO, or *Brasse*, also denotes a foreign long measure, answering to our fathom. See FATHOM.

BRACED, in heraldry, is used in speaking of chevrons which are intermingled. He bears azure a chief or, and three chevrons *braced*, in the base of the escutcheon, by the name of *Fitz-hugh*.—*V. Tab. Herald. fig. 17.*

BRACES, in the sea-language, are ropes belonging to all the yards of a ship, except the mizen, two to each yard: being reeved through blocks fastened to pendents seized to the yard-arms.—*See Tab. Ship. fig. 1. n. 11. 21. 50. 68. 89. 112. 130. 139.*

The use of *braces* is, to *square the yard*; that is, to set it square.—Hence, to *brace the yard*, is to bring it to either side. To *traverse the yard*, is to set it any way over-thwart.—To *right the yard*, is to bring it so as it may stand at right angles with the length of the ship.

All *braces* come aftward on; the main-*brace* comes to the poop, the main-top-sail *brace* to the mizen-top, and thence to the main-throuds; the fore and fore-top-sail *braces* come down by the main, and main-top-sail stays, and so of the rest.

The mizen-bowling serves for a *brace* to that yard; and the cross-jack *braces* are brought forward to the main-throuds, whenever a ship sails close by a wind.

BRACHIÆUS, or *BRACHIALIS*, a name given to two muscles of the arm, the one external, the other internal.

BRACHIÆUS Externus arises about the middle and posterior part of the humerus. It joins its fibres with the musculus longus and brevis; and being externally tendinous, they, together, cover all the elbow, and are inserted into the olecranon.—*See Tab. Anat. (Myl.) fig. 7. n. 12.*

BRACHIÆUS Internus lies partly under the biceps; it rises by a fleshy beginning from the middle and internal part of the humerus; and is inserted into the upper and fore-part of the cubitus, by a very short but strong tendon: it serves to bend the arm.—*See Tab. Anat. (Myl.) fig. 1. n. 25. fig. 2. n. 14. fig. 7. n. 11.*

BRACHIAL-Nerves. } See { NERVE.
CORACO-BRACHIALIS. } See { CORACO-BRACHIALIS.

BRACHMANS, a branch of the ancient gymnosophists, or philosophers of India, remarkable for the severity of their lives, and manners.

The Greeks usually give them the name *gymnosophists*; though Clemens Porphyry, &c. make the *brachmans* only a branch of the gymnosophists, whom they divide into two sects, *Brachmans*, and *Somanas*.

There are some in the Indies who still bear the name, and live in the same manner as the ancient *brachmans*: the Portuguese call them *bramanes*, or *branenens*; we usually, *bramins*.

Some say, they derive their name from the patriarch Abraham, whom, in their language, they call *bra hma*, or *brama*. Others deduce it from the name of their God, *brachma*; which some again take to be the same with Abraham: whence Poffel calls them *abrahamenes*. F. Thomassin fetches the word from the Hebrew, *barach*, to *fly* or *escape*; because the *brachmans* retire into the country, and live in deserts. The same author gives us another derivation, *viz.* from the Hebrew, *barach*, *benedice*, *orare*, to *bless*, *pray*; in regard this is their principal occupation.

Porphyry observes, that the ancient *brachmans* succeeded into the

the order, by right of family; whereas the Samaneans were elected into it: the former therefore were all of the same family, the latter of various.

The *brachmans* were perfectly at liberty, paid no taxes, nor were under the command of any person: they lived on herbs, pulse, and fruits; abstaining from all animals, and thinking it an impiety to touch them. The greatest part of the day and night they spent in singing hymns in honour of the deity; praying, and fasting continually. The greatest part of them lived in solitude, without marrying, or possessing any estates. There was nothing they appeared to wish so earnestly for as death; looking on life as a burthenome thing, and waiting with impatience for the separation of their soul and body. This is the account Porphyry gives of them.

Kircher observes, that the *brachmans* held the opinion of Pythagoras, relating to the soul and its transmigration; and led a life in all respects agreeable to his: or rather, it was from the *brachmans*, that Pythagoras borrowed his opinions, his manner of living, &c.

The modern *brachmans* are the successors of the ancient, and the priests or divines of the idolatrous Indians.

Rogers distinguishes six sorts of them; the *Weijnawa*, the *Seivia*, the *Smactra*, the *Schaerwacka*, the *Pasenda*, and the *Tjebetea*.

These are much conversant in astrology and astronomy.

They have so great a veneration for cows, that it is said, they look on themselves as blessed, if they can but die with the tail of one of them in their hand. They sometimes make processions of 400 leagues, drawing after them whole cities and towns; feeding the people, when stopped at the passages of rivers overflowed, in a manner which is said to be miraculous; by giving them every thing they desire, without making any provision.

M. Marshall observes, that whenever they write any thing, they put a figure of one in the first place; to shew, as they say, that they acknowledge but one God. They account the world the body of God, the highest heavens his head, the fire his mouth, the air his breath, the water his seed, and the earth his legs and feet. They maintain a pre-existent state; and, from that, account for the tempers and manners of men in this: they also maintain the metempsychosis, but in a grosser sense than Pythagoras; believing, that the souls of ill men pass into reptiles, insects, and vegetables, for their punishment and purification.—They compute the world to be about 392850 years old; and seem to have some obscure traditions of the Mosaic paradise, Adam, Eve, and the deluge. They have also a notion of God's being incarnate, and living some time among men.

Their religion consists in leading a pure life, washing away their sins in the river Ganges, muttering over divers prayers, and doing strange and incredible penances.—They burn their dead with much ceremony; and srewing the ashes on the place where the deceased first lay after his death, they judge from some figure or impressions pretended to be made on it, into what body his soul is gone; viz. if the impression of the foot of a dog or ox, &c. appear, they give out he is transmigrated into one of those animals; if there be no impression, he is then gone to the starry region.

They have also abundance of cabalistical notions; v. gr. say they, the numbers 28, 35, 27—6, 3, 32, 31—34, 29, 8, 1—4, 5, 30, 33, written in the same order, in the squares of a square figure, and your enemy's name written under it, while you wear it he cannot hurt you, &c. See *Phil. Trans.* N^o 260. See **BANJANS**.

BRACHYGRAPHY, (from *βραχυς*, *short*, and *γραφω*, *scribo*, I write) denotes the art of short-hand writing. See **TACHYGRAPHY**.

BRADS, a slender kind of nails, used in building, having no spreading heads as other nails have. See **NAIL**.

Of these, some are called *joiners brads*, and are for hard wain-scot; others *batten-brads*, for soft wain-scot; and some *bill-brads* or *quarter-heads*, used when a floor is laid in haste, or for shallow joists subject to warp.

BRAILS in a ship, small ropes used in furling the sails across. The *brails* are reeved through blocks, which are seized on either side the ties, a little distance off upon the yard, so that they come down before the sails of a ship, and are fastened at the skirt of the sail to the crengles.—Their use is, when the sail is furled across, to hale up its bunt, that it may the more readily be taken up or let fall.—See *Tab. Ship. fig. 5. n. 6*. These *brails* belong only to the two courses and the mizen-sail. They say, *hale up the brails*, or which is all one, *brail up the sails*, the meaning of which is, that the sail is to be haled up, in order to be furled, or bound close to the yard.

BRAIN, in a general sense, is that large, soft, whitish mass, inclosed in the cranium or skull; wherein all the organs of sense terminate, and the soul is supposed principally to reside.—See *Tab. Anat. (Of the)* *fig. 4. lit. a. a. d. d. d. fig. 5. lit. a. a. b. b.*

The *brain* is encompassed with two meninges, or membranes, called *dura* and *pia mater*.

Its figure is the same with that of the bones that contain it, viz. roundish, oblong, and flat on the sides: it is divided in-

to three principal parts, viz. the *cerebrum*, or *brain strictly so called*, the *cerebellum*, and the *medulla oblongata*: the two latter of which see under their proper heads, **CEREBELLUM**, and **MEDULLA**.

BRAIN, in a more proper sense, is that large globular part which fills the fore and upper part of the skull.

It is divided by a duplicature of the *dura mater*, called from its figure *falx*, into two equal parts, called *right* and *left hemispheres*; though the figure of the *brain* be pretty far from a sphere. It is also separated from the *cerebellum* by another duplicature of the same *dura mater*.

It consists of two kinds of substance; the one cineritious, or ash-coloured, soft and moist; which being the exterior, is also called the *cortex*, or *cortical part of the brain*: the thickness of this is about half an inch, though by reason of the sinus's and futures in the *brain* it appears more.—The other, or inner substance, is white, more solid, as well as more dry than the *cortex*, and is called the *marrow* or *medullary*, and sometimes the *fibrous part*, in contradistinction to the other, which is also called the *glandulous part*.

The *cortex*, according to Malpighi, is formed from the minute branches of the carotid and vertebral arteries; which, being woven together in the *pia mater*, send from each point thereof, as from a basis, little branches, which, being twisted together into the form of a gland, inclose the *medulla*, ordinarily to the thickness of half an inch; but in some places make deeper sinus's and furrows within it. These branches make circumvolutions like the intestines; each of which may be resolved into others, like, but less than the first.

This part, therefore, most authors take to be glandulous; or an assemblage of innumerable minute glands, contiguous to each other, destined for the secretion of animal spirits from the blood, brought hither by the carotids, &c.—These glands, Malpighi observes, are of themselves oval, but by their mutual compressure they become angular; and run waving within each other: several of these connected form others larger; and these again unite into others, from the aggregate whereof are formed tubes, of which the outer *cortex* is composed.—These little glands consist of the branches of the arteries which bring the blood; and of the veins arising at their extremities, which carry it back again; and of secretory tubes concerning the animal spirits, and of excretory ducts for discharging them into the *medulla*: though these are too minute to have ever been seen. See **CORTICAL**.

The inner, or medullary part of the *brain* consists of a number of infinitely fine fibres, arising from the least and minutest branches or filaments of the glands of the *cortex*; as is distinctly seen in the *cerebellum*, though scarce visible in the *cerebrum*: these receive the fluid separated and subtilized, from the glands of the *cortex*; and by means of the nerves, which are no more than productions of this part, distribute it all over the body.

Authors, here, however, are divided; the generality, with Malpighi, making the substance of the *cortex glandulous*, as above; others, with Ruyfch and Leewenhoek, deny any thing like glands in it; and allow nothing but little cryptae, or sinks, opening laterally to the arteries; and thence receiving a juice already secreted from the blood, and transmitting it to the *medulla*.—This doctrine, it seems, is the result of anatomical injections and microscopical observations; but the other, appearing the most consistent with the œconomy of nature in other things, is generally adhered to.

The *cortex* covers the whole medullary substance both of the *brain* and *cerebellum*; so as wherever the cortical substance ends, there the medullary commences; and this in the appendices, ventricles, interstices, and sinus's of the *medulla*, as well as in the external surface. Something medullary, therefore, arising from every point of the *cortex*; at its first rise, it must needs be exceedingly fine and slender: but, being joined with other parts of the same kind, it gradually thickens, and at length becoming sensible, constitutes the *medulla cerebri*, the *corpus callosum*, the *medulla oblongata*, and its crura, the *thalami of the optic nerves*, the *medulla cerebelli*, and its production into the *medulla oblongata*; which, with these additions, forms the *corpora pyramidalia* and *olivaria*, and is extended into the *spinal marrow*.—And from the same medullary substance, both in the cranium, and in the case formed by the union of the vertebrae, arise all the nerves. See **NERVE**; **SCALP**; **CORPUS PYRAMIDALE**, &c. Though the primary fibrillae, or filaments, when united, seem to form one compact body or mass; yet Boerhaave shews, they are really distinct and separate from each other: that thus arising from each part of the *cortex*, and tending as it were to the centre of the sphere, they first form the *medulla*; that others, reflected hence and collected above, form the *corpus callosum* and *fornix*; and below, form the *corpus callosum* and legs of the *medulla oblongata*; that the like fibrillae, arising from the *cerebellum*, join with them: the result of which juncture is the *medulla spinalis*. And lastly, that the like fibrillae arising from the *cortex*, continued within the cavities of the *medulla*, join with them, and add fresh consistence thereto.

Hence we see the reason of the bulk, figure, and position of

the cortex of the *brain*, as well as the use and necessity of the cavities called *ventricles* of the *brain*: of these ventricles there are four; one in each hemisphere, separated by a thin transparent substance, running all along from the fornix under the corpus callosum, and distinguished by the name of the *septum lucidum*: these two are called the *lateral ventricles*.

—The third is under the fornix, and called *rima*: the fourth between the cerebellum and medulla oblongata.

From the whole, it appears past doubt, that the fibres of the *brain* are exceedingly minute canals; that they receive an humour, infinitely the most subtle, fluid, and moveable, of any in the whole body; prepared and secreted by the artful structure of the cortex, driven into these tubules by the force of the heart, and from every part hereof collected into the medulla oblongata.—And this is what some call *animal spirits*, others the *nervous juice*; the great instrument of sensation, muscular motion, &c.

In the space between the two hemispheres of the *brain*, under the falx, or rather under the longitudinal sinus of the dura mater, is a white substance of a texture more compact than the rest of the medulla of the *brain*; and for that reason called *corpus callosum*, which runs along the whole tract of the falx, and receives from each side the terminations of the medulla, interspersed between the several windings of the cortex, and supposed by some to be a kind of base or support to it.—The manner wherein this is formed is shewn above: we shall only add, that, on occasion hereof, some authors, M. Astruc for instance, instead of two substances, *viz.* the cortex and medulla, divide the *brain* into three; *viz.* the uppermost, or *cineritious*, which constitutes the cortex; the middle, which is whiter and denser than the first, and therefore called the *callosus*; and the lowest or innermost, which being intermixed with radii or striæ of the white and cineritious substance, he calls the *striated* part: Astruc adds, that the fluid secreted in the cortex is conveyed into innumerable minute hollow medullary fibrillæ, of the same nature with the callosus substance, and contiguous thereto. This middle, or callosus part, he observes, is not distinguished by any appearance of fibres, but is uniform, homogeneous, elastic, and not unlike the pith of the elder-tree: for which reason, he thinks it may be probably conjectured, to consist of innumerable cells, communicating with each other, divided by the interposition of membranaceous, flexible, elastic, vibrative parietes or columns; which being flowed over by the spirits, and continually exposed to the shakings thereof, constitute the fibres of the *brain*.

Now the secreted fluid flowing equally from each point of the cineritious substance into the callosus, must equally fill and distend the cells thereof: and lest any place should want its share, provision is made for a strict communication; not only by the apertures of the cells into each other, but also by the structure of the *brain*; the upper part communicating with the under, by the septum lucidum; the lateral with the lateral, by the lata commissura; lastly, the fore-parts with the hind-parts, by the crura, brachia, and roots of the fornix. These cells, he continues, being filled, the spirits will proceed to the contiguous striæ of the medullary substance; which, arising from the cortex, compose the striated part of the *brain*: and these striæ rendered narrower and slenderer, and passing without the surface of the *brain*, constitute the first principles of the nerves, &c.

The other parts of the *brain* are the fornix, a production of the medulla: which, at its extremity next the cerebellum, sends out two processes or legs, by whose junction is formed a kind of arch, thence called *fornix*, which separates the third ventricle from the two upper ones.—At the bottom of the fornix are two holes, by which the third ventricle has a communication with the others; that before is called *valvula*, and that behind *anus*.—The third ventricle, or rima, which is in the medulla oblongata, has likewise two apertures; the one the orifice of the *infundibulum*, or funnel, which is a canal reaching to the glandula pituitaria: the other is a duct, whereby the third ventricle communicates with the fourth in the medulla oblongata, under the cerebellum. That fourth ventricle is in the form of a quill, whence it is sometimes called *calamus scriptorius*.

In the lateral ventricles are found the *plexus choroides*, which is an assemblage of minute veins and arteries; and four eminences, the first the *corpora striata*, the others the *thalami nervorum opticorum*.

At the entrance of the canal reaching from the third ventricle to the fourth, is situated the *pineal gland*; so called from the figure of a pine-apple, which it resembles: this gland Des Cartes supposes to be the seat of the soul. Behind the pineal gland are four eminences; two upper and greater, called *nates*; and two smaller and lower, called *testes*. See *MEDULLA Oblongata*, to which all these parts properly belong; see also each part under its proper head, *NATES*, *TESTES*, &c.

The vessels of the *brain*, are nerves, arteries, and veins.—By turning up the *brain*, the origins of the nerves proceeding from it are distinctly seen: these are in number ten pair, *viz.* the olfactory, optic, movers of the eyes, pathetic;

the fifth pair, and sixth pair, called also the gustatoriæ, the auditory nerves, par vagum, and the ninth and tenth pair.

The blood-vessels of the *brain*, are the two internal carotid, and the vertebral arteries.—The first, piercing the dura mater, communicate with the cervicals, and proceeding thence send a branch to the plexus choroides; till arriving at the pia mater, and making several turns and circumvolutions thereon, they terminate, at last, in the little glands that constitute the cortex.—The vertebral arteries, passing the dura mater, go along the under side of the medulla oblongata; till giving branches to the spinal arteries, they join in one branch called the cervical artery, which communicates with the carotides by two branches, as before.—The veins of the *brain* do not run along by the sides of the arteries, as in other parts of the body, but rise from their extremities in the cortex; whence they discharge themselves into the sinus of the dura mater.

For the great bulk of the *brain*, this reason may be assigned; *viz.* that on account of the exceeding subtilty and fineness of the animal spirits, and the slowness in which their secretion must be effected; together with the great quantity of them required in discharging the animal functions; there must of necessity be an infinite number of glands to separate and prepare them.—From the same principle, we fee why the *brain* is much bigger in men than in other animals; and in other animals, why, *cæteris paribus*, it is generally biggest in those which discover the greatest share of sagacity, *v. gr.* in monkeys; by reason a considerable stock of animal spirits is to be employed in the affairs of cogitation, memory, &c. Accordingly, anatomists observe, that in fools the *brain* is smaller (*cæteris paribus*) than in men of sense: this, some may account for, by supposing it the cause of the folly; a sufficient stock of spirits being wanting to reason strongly: and others from the economy of nature, which proportioned the stock of spirits to the expence that would be required.

From the texture, disposition, and tone of the fibres of the *brain*, philosophers ordinarily account for the phenomena of sensation and imagination.—Dr. Astruc goes further, and from the analogy between the fibres of the *brain*, and those of musical instruments, solves the phenomena of judgment and reasoning, and the defects and perfections of both.—He lays it down as an axiom, that every simple idea is produced by the oscillation of one determinate fibre; and every compound idea from cotemporary vibrations of several fibres: that the greater or less degree of evidence follows the greater or less force where the fibre oscillates. Hence he proceeds to shew, that the affirmation or negation of any proposition, consists in the equal or unequal number of vibrations, which the moving fibres, representing the two parts of the proposition, make in the same time: *i. e.* if the vibrations of the fibre that gives the idea of the subject, and those of the fibre which gives the idea of the attribute of a proposition, be isochronal, or make an equal number of vibrations in the same time, we are determined to the affirmation of the proposition; if heterochronal, or the vibrations be unequal, the soul will be determined to a negation, &c. Hence result consonant, dissonant, and harmonical fibres, &c.—The evidence and certainty of a judgment, whether affirmative or negative, he deduces from the greater or less consonance or dissonance of the fibres of the subject and attribute; and a right or wrong judgment from the natural or depraved tone of the fibres of the *brain*.

Hence he takes occasion to observe, that the fibres of the *brain*, from their natural analogy to those of musical instruments, may be perverted several ways; *viz.* by being rendered too dry or too moist, too stiff or too lax, &c. In a phrensy, he thinks the fibres too dry, and too much distended by the heat of the blood, &c. In a mania, these fibres he thinks too rigid, as well as too dry and distended. In a lethargy, they are too much softened by phlegm; in idiocy, or foolishness, they are sometimes too soft, and sometimes too hard. Lastly, he thinks that in melancholy, by the repeated successive vibrations which the attentive meditation of a thing induces, two or more fibres, which of themselves exhibit dissimilar and unequal ideas, are (the other parts remaining found) sensibly brought to an isochronism: so as the soul judging well in other respects, yet in this always makes a false judgment.

The *brain* does not appear absolutely necessary to animal life. We have several instances in authors, of children brought forth alive, and surviving their birth for some time, without any *brain*; and there are some anatomical instances, of animals surviving the loss of their *brain*. Of the first kind, we have a history from Paris, of a child delivered at maturity, and living four days, not only without a *brain*, but even a head: instead of both which, was a mass of flesh like liver found. M. Denys gives another instance, of a child born in 1673, which, setting aside the head, was well formed, but without any *brain*, cerebellum, or medulla oblongata: it had not any cavity for a *brain*, the skull, if such it might be called, being solid: nor was this any way connected to the vertebrae; so that the marrow in the spine had no communication

nication with the head: the optic nerves terminated in the solid bone. M. le Duc gives a third instance, in 1695, where there was neither cerebrum, cerebellum, medulla oblongata, nor even spinal marrow; the cavity that should contain them being extremely shallow, and full of a black livid substance, like congealed blood: he adds, this was the third subject of the kind he had met with. Dr. Prewton, indeed, tells us, that M. du Verney found here a spinal marrow, though of much less consistence than ordinary: in which, however, he could distinguish all the four tunics, and the two substances, *viz.* the cortical and fibrous part, as in the brain. In a word, he takes this to be a brain itself, as much as that in the skull; nay, more so, being more necessary to life, and more sensible, than either the brain or the cerebellum: a wound or compression in the first being always mortal; not so in the latter; as appears from the experiments of M. du Verney and M. Chirac; the first of whom took out the brain and cerebellum of a pigeon; notwithstanding which it lived, fought food, had sense, and performed the common functions of life: the latter took out the brain from a dog, yet it lived; upon taking out the cerebellum it died; but by blowing into the lungs, he observes, he could keep the animal alive, an hour after the loss of the cerebellum. Upon separating the medulla oblongata of another dog from the spinal marrow, and removing it with the brain and cerebellum, he kept the dog alive by blowing into the lungs.—To which may be added, many instances given by Mr. Boyle, not only of animals living a long time after the separation of the head from the body, but even of the copulation and impregnation of some insects under those circumstances: whence it appears, that the spinal marrow is sufficient, on occasion, for the business of sensation, motion, secretion of animal spirits, &c.

Traces of the BRAIN. See TRACE.

BRAN, the skins or hulks of corn, especially wheat, ground, separated from the farina or flour, by a sieve or boulder. *Of wheat-bran* it is that starch-makers make their starch; which is nothing else but the fecula remaining at the bottom of the vessels, wherein the bran has been steeped in water.

BRANCH*, in botany, an arm of a tree, or a part which sprouting out from the trunk, helps to form the head or crown thereof.

* The word, according to Salmassius, comes from the Latin *branca*; in the lower Latin, they said *barga*: others derive it from *brachium*, an arm; and others from *branchia*, the gills of fishes.

The branches of trees, some have observed, almost constantly shoot from the trunk at an angle of 45 degrees: the reason is, that the whole spreading being generally confined within an angle of 90 degrees, as the most becoming and useful disposition; that space could not be well filled up any other way, than by forming all the interfections which the shoots and branches make, with angles of 45 degrees only. A strong argument, that the plastic powers of matter, are under the guidance of a wise being!

Branches are distinguished into various kinds:

Wood BRANCH, according to Quintiny, is such a one as, shooting out from a cut of the preceding year, is naturally of a considerable thickness.

Fruit BRANCH is that which shoots out of a moderate length and breadth from the same cut or pruning.—*Fruit-branches*, he adds, have large eyes, and are very near each other.

BRANCH Half-Wood is that which, being too slender for a wood-branch and too big for a fruit-branch, is cut off, at the length of two or three inches, to make it produce a better shoot, whether wood or fruit.

Spurious Wood-BRANCHES are such as come contrary to the order of nature; or otherwise than from cuts of the preceding year; or which coming on such cuts, are big in the place where they should be small.

To understand this order of nature, it must be observed, 1. That branches should never come, except on those of the last cut; such, therefore, as shoot from other parts are spurious. 2. The order of the new branches is, if there be more than one, that the extreme branch be thicker and longer than that immediately under it; and this bigger and longer again than the third, &c. Hence, if any be big where it should be small, it is called *spurious*.

There are, however, some exceptions: in trees that are vigorous, and yet bear a handsome figure, there cannot well be too many fruit-branches; provided they make no confusion; but for wood-branches, these should not ordinarily be above one suffered to grow, of the several which shoot from each cut of the preceding year. See PRUNING.

Engrafting of BRANCHES. See the article ENGRAFTING.

BRANCHES of Oives, the reins or arches of Gothic vaults; which traversing from one angle to another, diagonal-wise, form a cross between the other arches which make the sides of the square, whereof those arches are diagonals.

BRANCHES of a bridle, in the manage, are two crooked pieces of iron which support the mouth-bit, the chain, and the curb, and which are fastened on one side to the head-stall, on the

other to the reins; serving to keep the horse's head under command.

What way soever the branches of the bit incline, the horse's mouth goes to the contrary. The duke of Newcastle is very particular on the head of branches; explaining their several kinds, and their effects, which are reducible to those of a lever.—The branch is always to be accommodated to the design, either of bringing in, or raising a horse's head, and to the necessary degree; accordingly, we have strong and hardy branches, gentle branches, rude branches, &c.

With regard to their form and structure, branches are either strait, in form of a pistol, for young horses to form their mouth; or, after the constable of France's fashion, for horses that already carry the head well: others are in form of a gigot or leg; others of a bent knee; others in the French fashion, &c.

These are laws in the manage, 1. That the farther the branch is from the horse's neck, the more effect it will have. 2. That short branches, *cæteris paribus*, are ruder, and their effects more sudden than those of longer. 3. That the branch is to be proportioned to the length of the horse's neck.

BRANCHED Velvet. See the article VELVET.

BRANCHIA, *βραγχια*, a name given by the ancient naturalists to the gills of fishes; which are parts composed of cartilages and membranes, in form of leaves; and serving instead of lungs to respire by.—See *Tab. Anat. (Splanch.) fig. 14.*

The branchia, Galen observes, are full of little foramina, big enough to admit air and vapours, but too fine to give passage to water. Piny held, that fishes respire by their gills; but he observes that Aristotle was of another opinion: to whom we may add, among the moderns, Dr. Needham. See SUPPLEMENT, article GILLS.

BRANDY properly denotes a proof-spirit, obtained by simple distillation from real wines, or fermented juices of grapes. The vessels used herein, are usually of copper: and distillers, to cool the liquor more readily, make the neck of the matras, which is very long, and winding like a serpent, pass through a vessel of cold water.

To distil BRANDY, they fill the cucurbit half full of the liquor from which it is to be drawn; and raise it, with a little fire, till about one sixth part be distilled; or till they perceive that what falls into the receiver is not at all inflammable.

The liquor, thus distilled the first time, is called *brandy*; which spirit, purified by another, or several more distillations, is what we call *spirit of wine rectified*.—The second distillation is made in balneo marie, and in a glass cucurbit; and the liquor put therein is distilled to about one half the quantity: which half is further rectified, as long as the operator thinks fit.

To abridge these several distillations, which are long and troublesome, they have invented a chymical instrument, whereby the rectification of spirit of wine is performed, at one single distillation: the description and figure of which instrument may be seen in Galer's *Chymistry*.

To try the goodness of rectified spirit of wine, it must be lighted into a blaze: if then it consumes wholly, without leaving any impurity behind; or, which is surer still, if after putting a little gun-powder in the bottom of the spirit, the gunpowder take fire when the spirit is consumed, the liquor is good.

Those who deal in brandy, (we speak only of that made with wine) chuse it white, clear, of a good taste, and such as will bear the test or proof; *i. e.* such as in pouring into a glass, forms a-top of it a little white lather, which, as it diminishes, makes a circle, called by the French *brandy merchants*, the *chapelet*, by the English the *bead or bubble*; there being no brandy but that well deflegmated, and which retains no superfluous humidity, wherein the bead will be entirely formed.

The chief use of brandy, is as a drink; especially in the cold northern countries; among the negroes in Guiney, who sell one another for a few bottles of brandy; and among the savages of Canada, and other parts of north America, who are infinitely fond of it. It is of some use too in medicine; being said to strengthen the nerves: and in dying, when raised into rectified spirit of wine, being one of the dyers non-colouring drugs.

The greatest part of the brandies in use, and those too, the best, are prepared in France: of the French brandies, those of Bourdeaux, Rochel, Cognac, Nants, and Poitou are the most esteemed; as being of a better taste, finer and stronger, and enduring the bubble-proof longer than any of the rest: those of Anjou, Touraine, and Orleans, claim the second place. They are chiefly sent to Paris and Flanders by the river Loire.

Brandy makes a very considerable article in the French commerce: the number of foreign vessels, wherewith all their ports are full in time of peace, and which are laden, in good measure, with brandy, is incredible. Nants alone furnishes 174000 gallons per annum, and Bourdeaux above twice

twice as much; the other places in proportion. The Dutch take off their hands almost as much as all the rest of Europe. Poland and Sweden are the only nations which are not their customers; these preferring the corn brandies of their own countries; made of grains, to the wine brandies of France. Of *brandy*, both plain and rectified, are prepared various kinds of strong liquors, with the addition of other ingredients, sugars, spices, flowers, fruits, &c. which are afterwards clarified, by passing them through a straining bag, or filtering them through brown paper.—Such are cinnamon waters, aniseed waters, fennel waters, fellery waters, citron waters, &c. A great part of these are brought from Montpellier; where they are supposed to be better prepared than any where else. See SUPPLEMENT, article BRANDY.

Cherry BRANDY. See the article CHERRY.

BRASIL. See the article BRAZIL.

BRASS, a fictitious metal, composed of copper fused with lapis calaminaris, which gives it a hardness, and yellowness. The manner of making *brass* is said to have been kept a secret in Germany for many ages.—The method of preparation among us is as follows. The lapis calaminaris being calcined, and ground as fine as flour, is mixed with ground charcoal; and incorporated, by means of water, into a mass: thus prepared, about seven pounds of the calamine is put into a melting-pot of about a gallon; and over it, about five pounds of copper; which is let down into a wind-furnace eight foot deep, remaining there about eleven hours; in which time it is converted into *brass*.—After melting, it is cast into plates, or lumps: forty-five pounds of crude calamine, produces thirty pounds burnt, or calcined, and sixty pounds of copper make, with calamine, an hundred pounds of *brass*. They sometimes use *brass-bruff* instead of copper; but that is not always to be procured in quantities sufficient; being no more than a collection of pieces of old *brass*.

Pure *brass* is not malleable unless hot; when cold it breaks: after melting twice, it is no longer in a condition to bear the hammer at all: to work it, they put seven pound of lead to an hundred of *brass*; which renders it more soft and pliable. The best *brass* guns are made of malleable metal, not of pure copper and calamine alone; but it is necessary to add coarser metals, to make it run close and sounder, such as lead and pot-metal.

The best proportion for gun-metal, it is said, is for eleven or twelve thousand weight of metal, to use ten thousand pound of copper, nine hundred pounds of tin, and six hundred pounds of *brass*; but the proportion is variable, according to the quality and goodness of the copper.

Bell-metal is a composition of *brass* and tin: and pot-metal of *brass* and lead; twenty pound of lead, is usually put into an hundred pound of pot-metal.

Corinthian BRASS, or *Corinthium*, has been famous in all antiquity: L. Mummius having sacked and burnt the city Corinth, 146 years before our Saviour's time, it is said this precious metal was formed from the immense quantities of gold, silver and copper wherewith that city abounded, thus melted and run together by the violence of the conflagration.—The statues, vessels, &c. formed of this metal were ineffimable: those who speak of it accurately, distinguish it into three kinds; in the first, gold was the prevailing metal; in the second, silver; in the third, gold, silver and copper were equally blended.

BRASS wire. See the article WIRE.

BRAVA Pareira. See PAREIRA brava.

BRAZIL, or BRASIL, an American wood, commonly supposed to have been thus denominated, because first brought from Brezil: though Huet stews it had been known by that name many years before the discovery of that country. *V. Hutiana*, p. 268.

It is denominated variously, according to the places whence it is brought. Thus we have *brasil* from Pernambuco, *brasil* of Japon, of Laron, of St. Martha; and lastly *brazilito*, or Jamaica wood, brought from the Antilles.

The *brasil* tree ordinarily grows in dry barren places, and in the middle of rocks; it is very thick and large, usually crooked and knotty: its flowers, which are of a beautiful red, exhale a very agreeable smell, which strengthens the brain. Though the tree be very thick, it is covered with soft grofs a bark, that when the savages have taken it off the wood, or trunk, which before was the thickness of a man, is scarce left equal to that of his leg.

Brasil wood is very heavy, dry, it crackles much in the fire, and scarce raises any smoke, by reason of its extreme dryness. None of the several kinds have any pith, except that of Japon: that of Pernambuco is esteemed the best. It must be chosen in thick pieces, close, found, without any bark on it; and such as, upon splitting, of pale becomes reddish; and when chewed has a saccharine taste.—It is much used in turned works, and takes a good polish; but its chief use is in dyeing, where it serves for a red colour: it is a spurious colour, however, that it gives; and easily evaporates and fades: nor is the wood to be used without allum and tartar.

From the *brasil* of Pernambuco is drawn a kind of carmine,

by means of acids: there is also a liquid lacca made of it, for miniature.

BRAZING, the foldering or joining of two pieces of iron by means of thin plates of brass, melted between the two pieces to be joined.

If the work be very fine, as when the two leaves of broken saws are to be joined, it is to be covered with beaten borax, moistened with water that it may incorporate with the brass-dust which is here added; and the piece is exposed to the fire without touching the coals, till the brass be observed to run. To *braz* with a still greater degree of nicety, they use a folder made of brass, with a tenth part of tin; or another, one third brass, and two thirds silver; or borax and rosin: observing, in all these manners of *brazing*, that the pieces be joined close throughout; the folder only holding in those places that touch.

The method of *brazing* among farriers, &c. is by beating the two pieces, when hot, over one another: this is more properly called *welding*.

BREACH, in fortification, is a hole, gap, or aperture, made in any part of the works of a town, either by playing cannon, or springing mines; in order to storm the place, or take it by assault.

They say, make good the *breach*; fortify the *breach*; make a lodgment on the *breach*: To clear the *breach* is to remove the ruins, that it may be the better defended.

A practicable *breach* is that where the men may mount, and make a lodgment.—A *breach* ought to be 15 or 20 fathoms wide.—The assailants make their way to it, by covering themselves with gabions, earth-bags, &c.

To batter in BREACH, battre en brèche. See BATTERING.

Mount the BREACH. See the article MOUNT.

BREAD. See the articles AMMUNITION, and MUNITION.

Cornd Bread. } See the articles { CORND.
French Bread. } FRENCH.
Ginger Bread. } GINGER.

Leavened Bread. } See BAKING.
Unleavened Bread. }
Manchet-Bread. }

Cheat Bread. }
BREADTH. See the articles LATITUDE, DIMENSION, AREA, &c.

Hair's BREADTH. } See the articles { HAIR.
Finger's BREADTH. } FINGER.
Hand's BREADTH. } HAND.

BREAKING bulk, the beginning to take a ship's lading or cargo out of the hold.

BREAKING ground, in the military art, the beginning of works for carrying on the siege of a place; more especially the beginning to dig trenches, or approaches. See SIEGE, TRENCH, and FORTIFICATION.

BREAMING. See the article BROOMING.

BREAST, *mamma*, in anatomy, a prominent fleshy part of the human body, on the outside of the thorax, serving to separate the milk.

The *breasts* are much more perfect, more conspicuous, and of more use in women than in men: their magnitude is various; always biggest in time of gestation and lactation. Their figure represents a large section of a globe, having in the middle a prominence terminating in a blunt point, called the *papilla*, or nipple; in the extremity of which are perforations, to which reach lacteal tubes.—About the nipple is a pale brownish circle, called the *areola*.

The internal substance of the *breast* is composed of a great number of glands, of various sizes, and an oval figure, intermixed with globules and vessels of fat. Their excretory ducts, as they approach the nipple, join and unite together, till at last they form seven eight or more small pipes, called *tubuli lactiferi*, which have several cross canals, by which they communicate with one another, to obviate the inconveniences that might accrue from the casual obstruction of one or more of them.—These tubes are not every where of equal capacity, but in some places more, in others less dilated; so as to form cells, which seem contrived to hinder the spontaneous efflux, and to create a necessity of sucking, to fetch out the contents.

Of the concurrence of these tubuli or pipes is the substance of the papillæ in great measure formed; among which is interperped a glandulous substance, serving to keep them from pressing too close on each other: and with it are intermixed abundance of fibres derived from the external teguments of the papillæ; by means whereof, the lacteal tubes are constricted, and the motion of the milk is modified.

Besides these vessels are abundance of fatty globules, called *dactylus adiposus*, which some would have only to fill up the interstices of the glands: but Dr. Drake, after Malpighi, thinks they contribute to the composition of the milk; which seems nothing else but water and oil artfully united. See MILK. In virgins, the tubes which compose the glands of the *breasts*, like sphincter-muscles, contract so closely, that no part of the blood can enter them: but when the womb grows big with a foetus, and compresses the descending trunk of the great

great artery, the blood flows in greater quantity, and with a greater force through the arteries of the *breasts*, and forces a passage into their glands; but, being at first narrow, admits only of a thin water; but growing wider by degrees, as the womb grows bigger, the glands receive a thicker serum; and after birth they run with a thick milk; because that blood which before flowed to the fetus, and for three or four days afterwards by the uterus, beginning then to stop, does more dilate the mamillary glands. In men, the *breasts* are very small, and are chiefly for ornament; though physical histories give instances of those who have had milk in them.

BREATHING. See the article **RESPIRATION**.

BREEDING of fish. See the article **FISH**.

BREEZE, a shifting wind, blowing from the sea and land alternately, during certain hours of the day or night; only sensible near the coasts.

The *sea-breeze*, Dampier observes, commonly rises in the morning about nine, proceeding slowly in a fine small black curl on the water towards the shore: it increases gradually till twelve, and dies about five.—Upon its ceasing the *land-breeze* commences, which increases till twelve; and is succeeded in the morning by the *sea-breeze* again.

BREEZE, in brick-making are small ashes and cinders sometimes made use of, instead of coals, for the burning of bricks. But, as this does not so well answer the end, the use of it is prohibited by 12 G. 1. c. 35.

BREGMA, in anatomy, the same with *sinciput*. See **SINCIPT**.

The *bregma* consists chiefly of two bones, hence also called *bregma*, or *bregmetis ossa*, which are two bones of the cranium, otherwise called *ossa parietalia*.

BREST, or **BREAST**, in architecture, a term used by some, for that member of a column otherwise called the *Tore*.

BREST-SUMMERS, or **BRESSUMERS**, in timber-buildings, are pieces in the outward parts, and in the middle floors, into which the girders are framed.

In the inner parts of a building, the pieces into which the girders are framed are called *summers*. See **SUMMER**.

BREVE, **BREVIS**, *short*, in grammar.—Syllables are distinguished into *longs* and *breves*, according as they are pronounced quicker or more slow: the time of a *breve* is half that of a *long*; or, as the grammarians express it, a *breve* is one time, and a *long* two. See **ACCENT**.

BREVE, in music, is a note or character of time, formed square, without any tail; and equivalent to two measures, or femibreves. See **SEMI-BREVE**, and **CHARACTERS of music**.

BREVE vas. See the article **VAS BREVE**.

BREVIARY, among ecclesiastical writers, denotes the office, or service both for day and night, as performed in the Romish churches.

BREVIARY, is more frequently used for a church-book, containing the office of the *brevari*, that is, the prayers, and other parts of the service, with the several variations to be made therein, according to the several days, canonical hours, feasts, and the like.

D. Mege derives the name *brevari* from hence, that the ancient monks in their journeys, &c. had little books, wherein were the psalms and lessons, read in the choir, collected out of large volumes: and F. Mabillon tells us, he has seen two such books in the archives of Cîteaux; they were not above three fingers broad: their letter was exceedingly small, and consisted mostly in abbreviations, expressing a whole period in a few syllables: whence they had a good title to the appellation of *brevari*, q. d. *abridgements*.

The Roman *brevari* is general, and may be used in every place: but on the model of this have been built various others, peculiarly appropriated to each diocese, and each order of religious.

The *brevari* consists of the services of mattins, lauds, prime, third, sixth, nones, vespers, and the complines, or post-communio; that is, of seven different hours: on account of that saying of David, *Septies in die laudem dixi tibi*. See **HOURS**.

The obligation of reciting the *brevari* every day, which was at first universal, by degrees was reduced to the beneficiary clergy alone, who are bound to do it on pain of mortal sin, and of refunding their revenues, in proportion as they are delinquent herein.—In the fourteenth century, there was a particular reservation in favour of bishops, for passing, on occasion, three days without rehearsing the *brevari*.

The institution of the *brevari* not being very ancient, the lives of the saints were inserted in it, agreeable to the opinions of the times; i. e. full of ridiculous ill-attested facts; which gave a handle to several purgations, or reformations thereof by several councils, particularly those of Trent and Cologne; by several popes, as Pius V. Clement VIII. and Urban VIII. as also by several cardinals and bishops, each of whom lopped off some of the extravagancies, and brought the work nearer to the simplicity of the primitive offices; as acknowledging that in the ancient church there was nothing read but scripture itself.—Cardinal Quignon carried the reformation the farthest; leaving out the little office of the virgin,

the verses, responses, and a great part of the lives of the saints.

The *brevari*es now in use, are almost innumerable: the difference between them consists principally in the number and order of the psalms, hymns, pater-nosters, ave-mary's credo's, magnificats, cantemus's, benedictus's, canticamus's, nunc dimittis's, miserere's, hallelujah's, gloria patri's, &c.

The most eminent, after the Roman *brevari*, are, that of the Benedictines, that of the Bernardines, of the Chartreux, of the Præmonstratenses, of the Dominicans, the Carmelites, the Franciscans, and Jesuits; also that of Cluny, of the church of Lyons, the church of Milan, and the Mozarabic *brevari*, used in Spain.—But in reality there is scarce a church in the communion of Rome, in France, Flanders, Spain, Germany, &c. but what has something particular in the form and manner of its *brevari*: though the differences are generally inconsiderable. See **GALLICAN**, **AMBROSIAN**, &c.

The *brevari* of the Greeks, which they call *ὁδογραφία, horeologium*, q. d. dial, is the same, to a trifle, in almost all the churches and monasteries that follow the Greek rite. The Greeks divide the psalter into twenty parts, *καθίσματα*; which are a kind of rests, pauses, or stations: and each pause is again subdivided into three parts.—In the general, the Greek *brevari* consists of two parts; the one containing the office for the evening, called *προσευχὴ*; the other that for the morning, consisting of mattins, lauds, prime, tierce, sixth, nones, vespers, and complines.—The *brevari* of the Maronites contains some more considerable variations.

Among the people who speak the Slavonic language, or any of its dialects, the *brevari* is rehearsed in the vulgar tongue; as among the Maronites in Syriac, among the Armenians in Armenian, &c.—Those who rehearse the *brevari* in the Slavonic, are divided as to the rite: some following the Roman or Latin rite, as the inhabitants of Dalmatia, and the neighbouring coasts: whereas those who live farther within the continent, as in Hungary, Bosnia, Slavonia, &c. and in Poland, Lithuania, and Muscovy, follow the Greek rite.—The *brevari*es of the Copts and Abyssinians are much alike.

BREVIATOR, an officer under the eastern empire; whose business was to write and transcribe briefs.—At Rome, those are still called *breviators*, or *abbreviators*, who dictate, and draw up the pope's briefs.

BREVIS cubiti, in anatomy, one of the extensor muscles of the cubitus, arising from the external spine of the humerus.

BREVIS radii, one of the supinator muscles of the radius, arising partly from the external condylus of the humerus, and partly from the upper and exterior part of the ulna; and inserted into the superior part of the radius, which it embraces wholly: and serves to turn the pal. of the hand upwards.

BREVIS is also used by some for the third of the extensors of the carpus, which arising from the lower part of the humerus, and running along the radius, terminates in the bone of the carpus, which sustains the middle finger.

Some anatomists join this with the second extensor, and call them *bicornis*, or *radialis externus*: others chuse to distinguish them, in regard they have different origins, and insertions; and that their bellies are separable. See **EXTENSOR**.

BREVIS extensor pollicis pedis.

BREVIS flexor pollicis pedis.

BREVIS peroneus.

BREVIS pronator radii.

BREVIUM custos.

BREVIUM falso retorno.

BREWED wine. See the article **WINE**.

BREWING, the operation of preparing ale, or beer from malt.

The usual process of *brewing* is as follows.—A quantity of water being boiled, is left to cool, till the height of the steam be over; when, so much is poured to a quantity of malt in the mashing-tub, as makes it of a consistence stiff enough to be just well rowed up: after standing thus a quarter of an hour, a second quantity of the water is added, and rowed up as before. Lastly, the full quantity of water is added; and that in proportion as the liquor is intended to be strong or weak.—This part of the operation is called *mashing*. The whole now stands two or three hours, more or less, according to the strength of the wort, or the difference of weather, and is then drawn off into a receiver; and the mashing is repeated for a second wort, in the same manner as for the first; only the water to be cooler than before, and not to stand above half the time.

The two worts are then to be mixed, the intended quantity of hops added, and the liquor close covered up, gently boiled in a copper the space of an hour or two; then let into the receiver, and the hops strained from it into the coolers.—When cool, the barm or yeast is applied; and it is left to work, or ferment, till it be fit to tun up.

For small beer, there is a third mashing, with the water near cold, and not left to stand above three quarters of an hour, to be hopped and boiled at discretion.—For double beer or ale, the two liquors resulting from the two first mashings, must be used as liquor for a third mashing of fresh malt.—

For fine ale, the liquor thus brewed, is further prepared with molasses.

Instead of yeast, some use caustic soap, others flour and eggs, others an essential oil of barley: others a quintessence of malt, others of wine, and others the sal panaritius.

For the properties of the liquors thus brewed, see MALT liquor.

BRIBERY, in common law, is when a person in judicial places takes a gift or reward of any person who has business before him, for doing his office, or by colour of his office, except the king only, unless it be meat and drink.

BRICK, a kind of factitious stone, of a reddish colour*, made of a fatty earth, formed into long squares, four inches in breadth, and eight or nine in length, by means of a wooden mould; and then baked and burnt in a kiln, to serve for the uses of building.

* There are also bricks of a whitish colour. Wulpit, in Suffolk, is famed for this sort.

Bricks appear to be of a very ancient standing; the tower of Babel, and the walls of Babylon being built thereof; as appears both from sacred history, and from the remains thereof still said to be in being. Under the first kings of Rome, they built with massive squared stones, which they learnt from the Tuscans: towards the latter time of the republic, they began to use brick; borrowing the practice from the Greeks; and the greatest, as well as the most durable buildings of the succeeding emperors, as the Pantheon, &c. were built therewith.—In the time of Gallienus the buildings were composed of a row of brick and a row of soft gritty stone, alternately. After him, they laid aside the use of bricks, and returned that of flints.

In the east, they baked their bricks in the sun: the Romans used them crude; only leaving them to dry in the air a long space of time, viz. four or five years.

The bricks used by the Greeks were principally of three kinds; the first called *didagos*, i. e. of two palms; the second *terpadagos*, of four palms; and the third *pentadagos*, of five palms.—They had other bricks, just half each of these, which they joined together to render their work more solid, as well as more agreeable to the eye, by the diversity of figures and sizes of the bricks.

Bricks, among us, acquire various names, according to their forms, dimensions, uses, method of making, place, &c. The principal are,—*Compass bricks*, of a circular form, used in fitting of walls.—*Concave*, or *hollow bricks*, on one side flat, like a common brick, on the other hollowed: used for conveying water under ground.—*Coping bricks*, used for making the indented work, under the coping of walls built with great bricks.—*Coping bricks*, formed on purpose for coping of walls.—*Dutch or Flemish bricks*, used to pave yards and stables, and for soap-boilers vats, and cisterns.—*Clinkers*, such bricks as are glazed by the heat of the fire in making.—*Feather-edged bricks*, are made like the common square bricks, only thinner on one edge than on the other, and used to pen up the brick panels in timber buildings.—*Samel*, or *sandal bricks*, are such as lie outmost in a kiln or clamp, and consequently are soft and useless; as not being thoroughly burnt.—*Great bricks* are those which are twelve inches long, six broad, and three thick: the weight of one being about fifteen pounds: so that 100 weigh 1500, and 1000 of them 15000 pounds: their use is to build fence walls; together with,—*Pilaster*, or *butterfly bricks*, which are of the same dimensions with the great bricks, only they have a notch at one end, half the breadth of the brick: their use is to bind the work at the pilasters of fence-walls, which are built of great bricks.—*Paving bricks*, or *tyles*, are of several sizes in several counties and places. See TYLE, and PAVEMENT.—*Place bricks*, such as are made in a place prepared on purpose for them, near the building they are to be used in.—*Statute*, or *small common bricks*, when burnt, ought to be nine inches long, four and a quarter broad, and two and a half thick*. 100 of these usually weigh about 550 pounds, and 1000, 5500 pounds; about 407 in number, make a ton weight. These are commonly used in paving cellars, hearths, sinks, &c. Thirty or thirty-two, if true measure, will pave a yard square, and 330 will pave a square of 100 foot laid flat; but if laid edge-ways, there must be near double the number.—*Stock-bricks* are to be of the same dimensions; only $\frac{1}{2}$ of an inch thicker.

* By 3 G. 2. c. 22. within 15 miles of London, they are to be $8\frac{1}{2}$ inches long, $4\frac{1}{2}$ broad, and $2\frac{1}{2}$ thick.

Barbaro, in his commentary on Vitruvius, recommends another form of bricks, viz. triangular ones, every side a foot long, and only an inch and half thick.—These, he observes, would have many conveniences above others; as being more commodious in the management, of less expence, and of fairer shew; adding much beauty and strength to the mural angles, where they fall gracefully into an indented work.—Sir H. Wotton wonders they have never been taken into use, being recommended by so great an authority.

The earth whereof bricks are made must not be sandy, which will render them both heavy and brittle; nor must it

be too fat, which will make them crack in drying. They should be made either in the spring, or autumnal season; and when made, they must be sheltered from the sun if it be too hot, and yet be exposed to the air to dry.—If they be made in frosty weather, they are to be covered with sand; if in hot weather, with wet straw.—When they are well dried, they are to be burnt.

The burning of bricks is performed either in a kiln, or a clamp.—In the former, the bricks being set in, and the kiln covered with pieces of bricks, they put in wood, to dry them with a gentle fire; and this they continue till they are pretty dry, which is known by the smook's turning from a whitish to a thin black smook. They then cease to put in wood, and proceed to burn with brush, furze, straw, heath, brake, or fern faggots; having first dammed up the mouth of the kiln with a thin log, i. e. pieces of bricks piled upon one another, and closed with wet brick-earth, instead of mortar: then they continue to put in more faggots, till the kiln and its arches look white, and the fire appear a-top of the kiln; upon which they slacken the fire for an hour, and let all cool by degrees. This they continue to do, alternately heating and slackening, till the ware be thoroughly burnt; which is usually effected in 48 hours.

About London, they chiefly burn in clamps, built of the bricks themselves, after the manner of arches in kilns; with a vacancy between each brick's breadth, for the fire to play through: but with this difference, that instead of arching, they truss or span it over, by making the bricks project one over another, on both sides of the place, for the wood and coals to lie in, till they meet and are bounded by the bricks at the top, which close all up. The place for the fuel is carried up straight on both sides, till about three foot high: then they fill it almost with wood, and over that lay a covering of sea-coal; and then over-span the arch: but they strew sea-coal also over the clamp, betwixt all the rows of bricks; lastly, they kindle the wood, which gives fire to the coal: and when all is burnt out, they conclude the bricks sufficiently burnt.

By 12 G. 1. c. 35. earth or clay, designed for making bricks for sale, shall be dug, and turned at least once between the first of November, and the first of February, and not be made into bricks till after the first of March: and no bricks be made for sale but between the first of March and twentieth of September.—And no spanish to be mixed with the earth, or breeze in the burning of bricks.—And all bricks are to be burnt either in kilns or distinct clamps, each sort by itself.

By 3 G. 2. c. 22. there may be mixed with the brick-earth any quantity of sea-coal ashes, sifted or screened through a sieve or serech half an inch wide, and not exceeding twenty loads to the making one hundred thousand bricks: each load not exceeding thirty-five bushel.—And breeze may be mixed with coal in the burning of bricks in clamps for sale, &c.—Stock-bricks and place-bricks may be burnt in one and the same clamp, so as the stock-bricks be set in one distinct parcel, and not mixed or surrounded with place-bricks.

For the more effectual securing the observation of these laws, it was enacted, by 12 G. 1. c. 35. for the better discovering of offenders, that the master and wardens of the company of tylers and brick-layers should have power to search brick-kilns, &c. but they having permitted, and even encouraged divers persons to make bricks contrary to the directions in the said act; by 2 G. 2. c. 15. they are divested of that power; and any two, three, or more persons, appointed by the justices of peace, are empowered, within fifteen miles of London, to go, in the day-time, into any grounds, sheds, or places, where any clay, or earth shall be digged, or digging, for bricks or pantiles; or any bricks or pantiles shall be making, or made for sale; and there to view, search, and inspect the same, &c.—Offenders to forfeit twenty shillings for every thousand of unlawful bricks, and 10s. for every thousand of such tiles: one moiety to the use of the prosecutor, the other to the poor of the parish where the offence shall be committed.

Goldman observes, that bricks will have double the strength, if, after one burning, they be steeped in water, and burnt afresh. If the brick-earth be too fat, it must be tempered with sand; and that trodden out again, first by cattle, then by men. Bricks made of common earth, melt, nay vitrify, by too much heat: for which reason, the kilns are made of stones that will themselves calcine, that the vehemence of the fire may be broken by them: besides which, they usually place other bricks, made of an argillous earth, which will melt, next the fire.

BRICK-WALLS. } See the articles } WALL.
Flemish-Bricks. } FLEMISH.

Oil of BRICKS is oil of olives, imbibed by the substance of bricks, and afterwards distilled from it.—The pieces of brick being heated red-hot in live-coals, are extinguished in a trough half filled with oil of olives: being then separated, and the brick thus saturated with oil, and grossly pounded, it is put into a retort, and placed in a reverberatory furnace; and thus is drawn an oil, which the apothecaries call *oleum de lateribus*, and some chymists oil of the philosophers: it is used for resolving tumours

tumours in the spleen, also against palsies, epilepsies, &c. See OIL.

BRICK-LAYER. See TYLER.

BRIDGE, an edifice either of stone or timber, consisting of one or more arches erected over a river, canal, or the like, for the convenience of crossing, or passing over from one side to the other.

A bridge may be considered as a road over water. See ROAD. Janus is made, by some learned men, the first inventor of bridges, as well as of ships, and crowns: their reason is, that in several ancient Greek, Sicilian, and Italian coins, there are represented on one side a Janus, with two faces, and on the other, a bridge, or a crown, or a ship. The parts of a bridge are the *piers*, or *legs*, *pila*; the *arches*; the *pavement*, or way over for cattle and carriages; the *foot-banks* on each side for foot-passengers; the *rail* or parapet, which incloses the whole; and the *butments*, or ends of the bridge on the banks.

Bridges are a sort of edifices very difficult to execute, on account of the inconvenience of laying foundations, and walling under water. The earliest rules and instructions relating to the building of bridges are given by Leon Baptista Alberti, *Archit.* l. 8. Others were afterwards laid down by Palladio, l. 3. Serlio, l. 3. c. 4. and Scamozzi, l. 5. all of which are collected by M. Blondel, *Cours d'Archit.* P. 5. l. 1. p. 629. seq. The best of them are also given by Goldsmid, *Baukunst*, l. 4. c. 4. p. 134. and Hawkmoor, *Elst.* Lond. *Bridg.* p. 263. seq. M. Gautier has a piece expressly on bridges, ancient and modern. *Trait. des Ponts.* Paris 1716. 12.

The conditions required in bridges are, that they be well-designed, commodious, durable, and suitably decorated.—The piers of stone-bridges are to be equal in number, that there may be one arch in the middle, where commonly the current is strongest. Their thickness is not to be less than a sixth part of the span of the arch, nor more than a fourth. They are commonly guarded in front with an angular starling or spur, to break the force of the current; though this defence is sometimes also turned semicircularly: in the ancient bridges, it is always a right angle; which has the advantage of being stronger and more durable than acute ones. The strongest arches are those whose sweep is a whole semicircle.—For the rails, the height, ornaments, and the like, they are left to discretion.—It is even complained, that no demonstrative reasons are given of the several proportions of the most essential parts of bridges: much of which is still left to the discretion of the builder, to be regulated according to the circumstances, design, place, magnitude, &c. of the designed edifice. M. Gautier wishes, that mathematical persons would take the structure and proportions of bridges into their consideration, in order to bring things to more certainty and precision, founded on unvariable geometrical truth. Something of which kind has been attempted by M. de la Hire, in *Mém. Acad. R. Scienc.* an. 1712. p. 70. and the Marquis de l'Hopital, in *Act. Erud. Lips.* 1695. p. 56.

The breadth of a bridge, according to Baptista Alberti, ought to be the same as that of the highway which abuts on it: the breadth of the piers is to be one third of the aperture of the arches; the starlings to be one half the breadth of the piers, and to rise above the greatest height to which the water ever mounts.

In the bridges of Avignon, St. Esprit, and Lyons, there is this remarkable, that they are not straight, especially the two former, but bent, having an angle, whose convexity is turned towards the stream, to break the force thereof: the pont St. Esprit, Dr. Robinson observes, is bowed in many places, making unequal angles, especially in those parts where the stream is strongest. The great pier in the middle of London-bridge, as we are told, was intended to serve for a steady to the whole machine, instead of making an angle, as in the above-mentioned bridges.

The famous bridge of Venice, called the *Rialto*, consists but of a single arch, and that a flat or low one; passing for a master-piece of art; being built in 1591, on the design of Michael Angelo: the span of the arch is ninety-eight feet one half, and its height above the water only twenty-three feet.—Poulet also mentions a bridge, of a single arch, in the city Munster in Bothnia, much bolder than that of the Rialto at Venice. But those are nothing to a bridge in China, built from one mountain to another, consisting of one single arch 400 cubits long, and 500 cubits high, whence it is called the *flying bridge*: a figure of it is given in the *Philosophical Transactions*. Kircher also speaks of a bridge in the same country 360 perches long, without any arch; supported only by 300 pillars.

To secure the piers of bridges, they sometimes diminish the current of the river, either by lengthening its course, by making it more winding (a method sometimes used by the ancients in rendering their rivers navigable) or by stopping the bottom of a rapid river, with rows of banks, stakes, or piles, which break the current.

The piers of a bridge always diminish the bed of a river: suppose this diminution one fifth, it will follow, that in case of inundations, the bed must be sunk or hollowed one fifth more

than before, since the waters gain in depth what they have lost in breadth. Add, that as the quantity of the water remains still the same, it will pass with greater velocity by one fifth in the place where such contraction is: all which conduces to wash away the foundation. The stream, thus augmented in velocity, will carry away silts and stones, which before it could not stir.

The foundations of bridges are to be laid at the season of the year when the waters are lowest, as in autumn; and if the ground be rocky, hard gravel, or stony, the first stones of the foundation may be laid on the surface, without digging deeper; but if the soil be soft sand, or gravel, it will be necessary to turn off the water, and dig till you come to a firm bottom; at least, if this cannot be done, part of the water must be carried off, and the rest kept dry, and piled; that side of the river where you are to work is to be inclosed with coffer-dams, and the current to have its liberty on the other side. Palladio's directions are, first, to make choice of that place in a river which has the least depth of water, and where the ground is even and firm, especially rock or gravel stone; secondly, to avoid those places where there are vorages, or whirlpools, and where the bottom is soft sand or gravel, in regard such matters are easily carried away by the violence of water, which in time alters the bed of a river, and saps the foundation of the piers; thirdly, to pitch on a straight part of a river, since otherwise the turns and windings being worn away in time, the bridge is in danger of being left insulate; besides being liable to be choaked up with the fish and other matters commonly gathered in the turns of rivers.

BRIDGES are either built of stone, or timber, according as there is a conveniency, or plenty of the one material or the other in the place.

Stone-BRIDGES are composed of piers, arches, and butments, made of hewn stone, sometimes also intermixed with brick; as, the bridge of Tholouse, the plinths whereof are of stone, as also the quoins of the arches, and some bonding courses, and copings; but the rest, as the arches, walls, and butments, of brick.

Wooden-BRIDGES, called by the Latins, *pontes sublevis*, consist of beams and joists sustained by punctions, well cramped and bound together.

Sturminus has a dissertation expressly on the structure of a wooden-bridge: *Diss. de Ponte Sublevis*. Francof. 1709.

Russhen-BRIDGE, *pont de jonc*, is made of large sheaves of rushes growing in marshy grounds, which they cover over with boards or planks. They serve for crossing ground, that is boggy, miry, or rotten.

The Romans had also a sort of subitaneous bridges made by the soldiers, of boats, or sometimes of casks, leathern bottles or bags, or even of bullocks-bladders blown up, and fastened together, called *ascosephi*. *Plin.* l. Ant. T. 2. p. 464. seq. *voe. Pontes*. Du Cange *Gloss. Lat. T. 1. p. 350*. M. Couplet gives the structure of a portable bridge, 200 foot long, easily taken asunder and put together again, and which forty men may carry.—*Vid.* Du Hamel *Hist. Reg. Acad. Scienc.* l. 3. *lett.* 5. c. 4. p. 273.

Frezier speaks of a wonderful kind of bridge at Apurima in Lima, made of ropes, formed of the bark of a tree.—*Vid.* *Frez. Voyag. South-Sea*, p. 184.

Pendent or Hanging BRIDGES, called also *Philosophical BRIDGES*, are those not supported either by posts or pillars, but hung at large in the air, only sustained at the two ends, or butments.—Instances of such bridges are given by Palladio, and others.—*Vid.* *Vogels Modern. Bau-Kunst. Tab. 26. seq.* Wolf. L. Math. p. 277. *voe. Brucke. Kirch. Mund. Subterr.* l. 1. c. 3. T. 1. p. 14.

Dr. Wallis gives the design of a timber-bridge, seventy foot long, without any pillars, which may be useful in some places where pillars cannot conveniently be erected. *Phil. Trans.* N^o 163. p. 714. Dr. Plot assures us, that there was formerly a large bridge over the cattle-ditch at Tutbury in Staffordshire, made of pieces of timber none much above a yard long, and yet not supported underneath, either with pillars, or arch-work, or any other sort of prop whatever.—*Vid.* Plot. *Nat. Hist. Stafford.* c. 9. §. 88. p. 383.

Draw-BRIDGE, *Pons subduclarius*, is such a one as is made fast only at one end, with hinges; so that the other end may be lifted up; in which case the bridge stands upright, to hinder the passage of a moat, or the like.

There are others made to draw back, to hinder the passage, and to thrust over again to afford a passage. And others, which open in the middle; half of which turns away to one side, and the other half to the other; being joined again at pleasure: but these have this inconvenience, that one half of them remains on the enemy's side.

The Marquis de l'Hopital has given the construction of a curve, in which a weight will always be a counter-balance to a draw-bridge; which the younger Bernoulli has shewn to be no other than the cycloid.—*Vid.* *Act. Erud. Lips.* an. 1695. p. 56. *seq.*

Flying-BRIDGE, *Pont volant*, or *Pons duclarius*, an appellation given to a bridge made of pontoons, leathern boats, hollow beams,

beams, casks, or the like, laid on a river, and covered with planks for the passage of an army.

Flying-BRIDGE, *Pont volant*, more particularly denotes a *bridge* composed of one or two boats joined together, by a sort of flooring, and surrounded with a rail or ballustrade; having also one or more masts, to which is fastened a cable, supported at proper distances by boats, and extended to an anchor, to which the other end is fastened, in the middle of the water. By which contrivance, the *bridge* becomes moveable, like a pendulum, from one side of the river to the other, without other help than the rudder.—Such *bridges* sometimes also consist of two *fores*, for the quicker passage of a great number of men; or that both infantry and cavalry may pass at the same time.—*Davil*.

Flying or Floating-BRIDGE is ordinarily made of two small *bridges*, laid one over the other, in such manner, as that the uppermost stretches and runs out, by the help of certain cords running through pulleys placed along the sides of the under-*bridge*, which push it forwards till the end of it joins the place it is designed to be fixt on.

When these two *bridges* are stretched out at their full length, so that the two middle ends meet, they are not to be above four or five fathoms long, because if longer they will break.

Their chief use is for surprizing out-works, or posts that have but narrow moats.

In the memoirs of the royal academy of sciences, we find a new contrivance of a *floating-bridge*, which lays itself on the other side of the river.—*Vid. Hist. Acad. R. Scient. an. 1713. p. 104.*

BRIDGE of Communication is a *bridge* made over a river; by which two armies or forts, separated by the river, have a free communication with one another.

BRIDGES of Boats are either made of copper, or wooden boats fastened with stakes, or anchors; and laid over with planks.

One of the most notable exploits of Julius Cæsar, was the expeditious making a *bridge* of boats over the Rhine: Modern armies carry copper boats, called *pontoons*, to be in readiness for the making *bridges*: several of these being joined side by side, till they reach a-cross the river, and planks laid over them, make all plain for the men to march on.

There are fine *bridges* of boats at Beaucaire, and Rouen which rise and fall with the water; and that at Seville is said to exceed them both.

The *bridge* of boats at Rouen, built in lieu of the stately stone-*bridge* erected there by the Romans, is represented by a modern writer, as the wonder of the present age; it always floats and rises, and falls with the tide, or as land-waters fill the river; it is near 300 yards long, and is paved with stone just as the streets are: carriages with the greatest burdens go over it with ease, and men and horses with safety, though there are no rails on either hand. The boats are very firm, and well moored with strong chains; and the whole well locked to, and constantly repaired, though now very old.

BRIDLE, of an horse, is an assemblage of various members or parts; as the *bit*, or *snaffle*; the *head-stall* or leathers from the top of the head to the rings of the bit; the *fillet*, over the forehead, and under the forehead; *throat-band*, which buttons from the head-band under the throat; *reins*, the part held in the hand; *nose-band*, going through loops at the back of the head-stall, and buckled under the cheeks: to which add the *trench*, the *covazan*, *martingal*, and *chaff baller*.

BRIEF, *BREVE*, in common law, a writ whereby a man is summoned or attached to answer any action: or more largely, it is taken for a writing issued out of any of the king's courts of record at Westminster, whereby something is commanded to be done in order to justice, or the execution of the king's command.

It is called *brief*, *breve*, quia *brevis intentionem presentis exponit*; because couched in a few plain words, without preamble, &c.

BRIEF is also used for a letter patent, granting a licence to a subject, to make a collection for any public or private use.

Apostolical BRIEFS denote letters which the pope dispatches to princes, and other magistrates, touching any public affair.

They are thus called, as being very concise, and written on paper, without preface or preamble; by which they are distinguished from *bulls*, which are more ample, and always wrote on parchment, and sealed with lead or green wax; whereas *briefs* are sealed with red wax, and with the seal of the fisherman, or St. Peter in a boat; a seal never applied but in the pope's presence.

The *brief* is headed with the name of the pope, apart; and commences with *Dilecto filio salutem, & apostolicam benedictionem*, &c. after which he proceeds directly to the matter in hand, without further preamble.

Briefs are not subscribed by the pope, nor with his name, but with that of his secretary. Pope Alexander VI. instituted a college of secretaries for *briefs*; since which time, they have been made much longer and more ample than before. See *BREVIATOR*.

Formerly *briefs* were only dispatched about affairs of justice; but now they are likewise used in matters of benefices, expectative graces, and dispensations.

BRIGADE *, in the military art, a party or division of a body of soldiers, whether horse or foot, under the command of a brigadier.

* The word is French; some derive it from the Latin *briga*, a *brigue*, or secret intrigue: Du Cange fetches it from *brigand*, an ill-disciplined soldier, who scour the country, and plunders it of every thing, without waiting for the enemy: as the armies of Arabs, Tartars, &c. The origin of *brigand* is again deduced from *brigandine*, a sort of armour used in the army raised by the Parisians, during the captivity of their king John in England, notorious for their robberies.

There are two sorts of *brigades*, according to the French way of accounting: 1°. A *brigade of an army*, which is a body of horse of ten or twelve squadrons: or of foot, of five or six battalions.—And in this way, an army is sometimes divided into eight *brigades*; four of horse, and four of foot.

2°. A *brigade of a troop of guards* which is a third part thereof, when the troop consists of fifty soldiers; but only a sixth when it consists of 100; that is, in the former case, the troop is divided into three *brigades*, in the latter into six.

BRIGADE-Major, or *Major of a BRIGADE*, is an officer appointed by the brigadier to assist him in the management and ordering his *brigade*; in which he acts as a major-general does in an army. See *MAJOR*.

BRIGADIER General, an officer that commands a brigade of horse or foot in an army.

The *brigadier* is an officer of importance; being the next in order below a major-general, or, in the French army, to the marshal de camp.

BRIGANDINE, a coat of mail; a kind of ancient defensive armour, consisting of thin jointed scales or plates, pliant and easy to the body.

Some confound it with *haubergeon*; and others with *brigantine*, a low long vessel. See *HAERGEON*.

BRIGANTINE, a small, light, flat, open vessel, which goes both with sails and oars, and is either for fighting or giving chase.

It has usually twelve or fifteen benches on a side for the rowers, a man and an oar to each bench. *Brigantines* are principally used by the Corsairs, all the hands aboard being soldiers, and each having his musket ready under his oar.

BRILLIANT diamonds. See *DIAMOND*.

BRIMSTONE. See the article *SULPHUR*.

Flower of BRIMSTONE. See the article *FLOWER*.

BRINE, water replete with saline particles. See the article *SALT*.

By *A. c. 21*, are prohibited.—*Brine* taken out of brine-pits, or brine-pans, used by some for curing or pickling of fish, without boiling the same into salt.—and rock-salt, without refining it into white-salt.

BRINGERS-UP, in a battalion, are the whole last rank of men in it, or the hindmost man in every file. See *FILE*.

BROAD. See *PIECE*.

BROCADE, in commerce, a sort of stuff, or cloth of gold, silver, or silk, raised and enriched with flowers, foliages, or other figures, according to the fancy of the manufacturer.

Formerly, the term was restrained to cloths wove either wholly of gold, both wove and warp, or of silver, or of both together: but by degrees it came likewise to pass for such as had silk intermixed, to fill up, and terminate the flowers of gold and silver.

At present, any stuff of silk, satin, or even simple taffety, when wrought, and enriched with flowers, &c. obtains the denomination of *brocade*.

BROKEN numbers. See *NUMBER*, and *FRACTION*.

BROKERS are of three kinds; *exchange-brokers* *stock-brokers*, and *pawn-brokers*.

Exchange-BROKERS are a sort of negotiators, who contrive, make, and conclude bargains between merchants and tradesmen, in matters of money or merchandise, for which they have a fee, or premium. See *EXCHANGE*.

These, in our old law-books, are called *broggers*, and in Scotland, *broccaris*, *i. e.* according to Skene, mediators or intercessors in any contract, &c. See *PROXINETA*.

They make it their business to know the alteration of the course of exchange, to inform merchants how it goes, and to notify to those who have money to receive or pay beyond sea, who are proper persons for negotiating the exchange with; and when the matter is accomplished, that is, when the money is paid, they have for brokerage two fillings per 100 pounds sterling.

In France, till the middle of the seventeenth century, their *exchange brokers* were called *courtiers de change*; but by an arret of council in 1639, the name was changed for that more creditable one of *agent de change, banque, & finance*: and in the beginning of the eighteenth century, to render the office still more honourable, the title of *king's counsellors* was added.

At Grand Cairo, and several places of the Levant, the Arabs, who

who do the office of *exchange-brokers*, are called *consuls*: the manner of whose negotiating with the European merchants has something in it so very particular, that we have referred it to a distinct article.

The *exchange-brokers* at Amsterdam, called *makelaers*, are of two kinds; the one like the English, called *sworn brokers*, because of the oath they take before the *burgomasters*; but the others negotiate without any commission, and are called *walking brokers*.—The first are in number 395; whereof 375 are Christians, and 20 Jews: the others are near double that number: so that in Amsterdam there are near 1000 *exchange-brokers*.—The difference between the two consists in this; that the books and persons of the former are allowed as evidence in the courts of justice; whereas, in case of dispute, the latter are disowned, and their bargains disannulled.

The fee of the sworn *exchange-brokers* of Amsterdam is fixed by two regulations, of 1613, and 1623, with regard to matters of exchange, to eighteen fols for 100 livres de gros, or 600 florins; i. e. three fols for 100 florins; payable, half by the drawer, and half by the person who pays the money. But custom has made considerable alterations herein.

In the east, all affairs are transacted by a sort of *brokers*, whom the Persians call *delah*, i. e. great talkers. The manner of making their markets is very singular: after the *brokers* have launched out into long, and usually impertinent discourses; coming towards a conclusion, they only converse with their fingers. The buyer and seller's *broker*, each take the other by the right hand, which they cover with their coat, or a handkerchief: the finger stretched out, stands for coat; bent, for five; the tip of the finger for one; and the whole hand for 100; and the hand clenched, for 1000. They will express even pounds, shillings, and pence by their hands. During all this mystic commerce, the two *brokers* appear as cold and composed, as if there were nothing passing between them.

Stock-BROKERS are those employed to buy and sell shares in the joint stock of a company or corporation. See COMPANY, SUBSCRIPTION, and AGENT.

Pawn-BROKERS are persons who keep shops, and let out money to necessitous people upon pledges, for the most part on usurious conditions.

There are more properly called *pawn-takers*, or *talley-men*, sometimes *friseurs* or *friseurs*.

Of these is to be understood the statute of 1 Jac. 1. c. 21: by which it is enacted, That the sale of goods, wrongfully gotten, to any *broker* in London, Westminster, Southwark, or within two Miles of London; shall not alter the property thereof.—If a *broker*, having received such goods, shall not, upon the request of the right owner, truly discover them, how and when he came by them, and to whom they are conveyed; he shall forfeit the double value thereof to the said owner. In the cities of Italy, there are companies established by authority, for the letting out money on pawns; called *mounts of piety*: an honourable title, like that of *charitable corporation*, but little becoming such institutions; inasmuch as the loan is not *gratis*.

In some parts of Italy, they have likewise *mounts of piety* of another kind, wherein they only receive ready money, and return it again with interest at so much per annum.—At Bologna they have several such *mounts*; which are distinguished into *Frank* and *perpetual*: the interest of the former is only four per cent. in the latter, seven.

BRONCHIA*, in anatomy, the little tubes into which the trachea is branched, at its entrance into the lungs; and which are distributed through every part thereof, serving for the conveyance of the air in respiration.

* The word is Greek, *βρογχια*, where it signifies the fame. See TRACHEA, LUNGS, and RESPIRATION.

The *bronchia* consist of cartilages like the trachea; only here the cartilages are perfectly circular, without any membranous hard part: they are joined together by the membranes that invest them, and are capable of being shot out lengthwise in inspiration; and of being drawn into each other in expiration.

BRONCHIAL artery is an artery of the lungs, which arises from the descending trunk of the aorta, or intercostals; and, embracing the trachea, pursues the course of the bronchia, accompanying all the branches thereof through their whole progress. See Tab. Anat. (Angeiol.) fig. 1. n. 20.

BRONCHIAL vein arises from the intercostals, or the azygos, accompanies the artery, and divides into the same number of branches with it.

The artery brings blood to the bronchia, for the nutrition thereof, and of the vesicles of the lungs; and the vein carries it off again to the cava, where it soon terminates.

The *bronchial artery* is sometimes single; but more frequently double; sometimes triple.

BRONCHOCELE*, a pendulous tumour, or pock, with a large round neck, rising on the bronchial part of the trachea, very frequent in the Alps.

* The word is Greek, formed from *βρογχος*, *bronchus*, wind-pipe; and *κελε*, swelling.

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BRONCHOTOMY*, in chirurgery, the operation of cutting into the windpipe, to prevent suffocation in a quinsy; or an incision made in the trachea or wind-pipe between two of its annuli or rings, in order to give passage for the breath, when there is danger of suffocation, from an inflammation of the larynx, &c.

* The word comes from the Greek *βρογχος*, wind-pipe; and *τομή*, *secto*, I cut.

Bronchotomy, called also *Laryngotomy*, is thus performed.—The body of the patient being prepared, an incision is made between the third and fourth annuli, or rings of the aspera arteria, an inch below the bottom of the larynx; the skin and integuments divided, and the muscles removed; a silver tube is applied, and the cause of the disease removed; and the wound healed; nourishing clysters being applied in the mean time, if deglutition be impracticable.

Dr. Musgrave observes, that in all medicine there is not one method that works so great a change, for the better, in so short a time.—However, it is seldom practised, in regard that gap which appears on the cutting a throat, (the divided parts being then drawn towards their more fixed ends) together with the great efflux of blood when the jugulars and carotid arteries are also wounded, create in most men a dread of the operation, and make many believe all w. unads of the trachea mortal.—The same author makes no scruple however to say it ought to be practised in quinsies, and other dangers of suffocation from causes of a like nature with them; from an extraordinary cure which he himself had wrought in this way.

BROOD*, the young of fish and fowls.

* The word is derived from the Saxon *brodan*, to breed; which alludes to *βρω*, to be big with young.

BROOD of sea-fish is spawned, and lies in still waters, where it may have rest to receive nourishment, and grow to perfection. And here it is often destroyed by wears, draw-nets, and nets with canvas, or like engines in the bottoms of them; in harbours, havens, and creeks.—Every wear near the main sea takes, in twelve hours, sometimes five bushels, sometimes ten, sometimes twenty or thirty.—None for the future to fish within five miles of the mouth of any harbour or creek, with any draw-net or drag-net, under three inches mesh, viz. an inch and half from knot to knot, except for the taking of smoulds in Norfolk only.—3 Jac. 1. c. 12.

For the preventing hereof, by 3 Jac. 1. c. 12, it is also enacted, That none shall erect a wear, or wears, along the sea-shore, or in any haven, or creek, or within five miles of the mouth of any haven, or creek; or shall willingly defile of the spawn, or fry of fish; on pain of 10*l.* to be divided betwixt the king and the prosecutor. Neither shall any one fish in any of the said places, with any net of a less mesh than three inches and an half betwixt knot and knot (except for the taking of smoulds in Norfolk only), or with a canvas net, or other engine, whereby the spawn or fry of fish may be destroyed; on pain to forfeit the said engine or net, and 10*l.* in money, to be divided betwixt the poor of the parish, and the prosecutor.

BROOMING, or *BREAMING* of a ship, the burning off the fish she has contracted on her sides, with straw, reeds, broom, or the like, when she is on a careen, or on the ground. See CAREENING.

BROTHER*, *Frater*, a term of relation between two male children, sprung from the same father, or mother, or both.

* *Scaliger* and *Vossius* derive *frater* from *φρατρις*, for *φρατρις*, which properly signifies a person who draws water in the same well; *φρατρις*, in Greek, signifying well and *φρατρις*, a company of people, who have a right to draw water out of the same well.—The word, it is said, came originally from the city Argos, where there were only a few wells distributed in certain quarters of the city, to which those of the same neighbourhood alone repaired.

The ancients applied the term *brother* indifferently to almost all who stood related in the collateral line, as uncles, and nephews, cousins-german, &c.—This we learn not only from a great many passages in the old testament; but also from profane authors: Cicero, in his *Philippics*, says, “Antonia was both wife and sister of Mark Anthony; because she was daughter of his brother C. Antonius.” And as to cousins, Tullus Hostilius, in Dionysius Halicarnassus, calls the Horatii and Curatii, *brothers*; because they were sister's children.

* The language of the Jews, bishop Pearson observes, included in the name of *brother* not only the direct relation of *fraternity*, but also the larger of *consanguinity*. We are brethren, says Abraham to Lot, Gen. xiii. 8, where Lot was only his nephew.—So Jacob told Rachel that he was her father's *brother*, Gen. xxix. 12, where he was only her father's nephew.—This consideration has been urged with good advantage against the Antidicomariaries, who, from the mention made of the *brothers* of Jesus, (John ii. 12. Math. xii. 46) have impugned the perpetual virginity of the mother of Christ.

Among us, it is customary for kings to give the title *brother* to each other; the union in coronation being esteemed to create a kind of *brotherhood*. Nor is the custom modern: Menander mentions a letter of Cosroes king of Persia, to the

emperor Justinian, beginning thus: Cosroes king of kings, &c. to the emperor Justinian *my brother*.

Kings now also give the same appellation to the electors of the empire: and the like was given by the king of France to the present king of Sardinia, while only duke of Savoy. In the civil law, *brothers*, *fratres*, in the plural, sometimes comprehends sisters; as *Lucius & Titia, fratres*, l. 38. D. de famil. *Tres fratres, Titius, Mevius, & Seia*, l. 35. D. de pactis.

BROTHERS German, fratres Germani. See GERMAN.

BROTHER is more particularly used to denote the relation between monks of the same convent.

In which sense they say, *brother Zachary, brother Bonaventure, &c.* In English, we more usually say *frat* Zachary, &c. from the French word *frere, brother*.

This appellation is borrowed from the primitive Christians, who all called each other *brothers*: but it is principally used for such of the religious as are not priests; those in orders are generally honoured with the title of *fathers, patres, peres*; whereas the rest are only simply *brothers*.

The monks of St. Dominic are particularly called *preaching brothers, or, friars predicants*: those of St. Francis, *minor brothers*, those of charity, *ignorant brothers, &c.*

Lay-BROTHERS. See the article LAY.

In the military orders, the knights are also called *brothers*.— In the order of Malta, there is a particular class, who are called *sewing brothers*; consisting of such as cannot give proof of their nobility. In Latin they are denominated *fratres clementes*. See MALTA.

BROTHERS by adoption. See the article ADOPTION.

Two *brothers*, who have only the same father, are called *fratres consanguinei*: and those who are only descended from the same mother, *fratres uterini*.

BROTHERS of the rasy-crafts. See ROSICRUCIAN.

Sworn BROTHERS, fratres conjurati. See FRATRES.

BROTHERHOOD. See the article FRATERNITY.

BROWN Sugar. See the article SUGAR.

BROWNISTS, a religious sect, which sprung out of the Puritans, towards the close of the sixteenth century; their leader, Robert Brown*.

* Robert Brown, who put himself at the head of this sect, and wrote divers books in their behalf, was a man of good parts, and some learning. He was born of a good family in Rutlandshire, and related to the lord treasurer Burleigh. He had been educated at Cambridge; but first published his notions, and began to inveigh openly against the discipline and ceremonies of the church, at Norwich, in the year 1580, from which time he underwent divers persecutions from the bishops; in so much that he boasted he had been committed to no less than thirty-two prisons, in some of which he could not see his hand at noon-day. At length, with his congregation, he left the kingdom, and settled at Middleburgh in Zealand; where they obtained leave of the States to worship God in their own way, and form a church according to their own model. Which they had not long done, ere this handful of men, just delivered from the severities of the bishops, began to differ among themselves, and crumble into so many parties, that Brown, their pastor, grew weary of his office; and, returning to England in 1589, renounced his principles of separation; and was preferred to the rectory of a church in Northamptonshire; and died in 1630.

The revolt of Brown was attended with the dissolution of the church at Middleburgh, but the sects of *Brownists*, which he had sown in England, were so far from being destroyed, that Sir Walter Raleigh, in a speech in 1592, computes no less than twenty thousand followers of it.

The occasion of their separation was not any fault they found with the faith, but only with the discipline and form of government of the other churches in England. They equally charged corruption on the episcopal form; and on that of the Presbyterians, by confessories, classes, and synods: nor would they join with any other reformed church; because they were not assured of the sanctity and regeneration of the members that composed it; on account of the toleration of sinners, with whom they maintained it an impiety to communicate. They condemned the solemn celebration of marriages in the church; maintaining, that matrimony being a political contract, the confirmation thereof ought to come from the civil magistrate. They would not allow any children to be baptized of such as were not members of the church, or of such as did not take sufficient care of those baptized before. They rejected all forms of prayer; and held that the lord's prayer was not to be recited as a prayer; being only given for a rule or model, whereon all our prayers are to be formed.

The form of church-government which they established was democratical. When a church was to be gathered, such as desired to be members of it made a confession of it; and signed a covenant, by which they obliged themselves to walk together in the order of the gospel. The whole power of admitting and excluding members, with the decision of all controversies, was lodged in the brotherhood. Their church-officers were chosen from among themselves, for preaching the word, and taking care of the poor, and separated to their several offices by fasting, prayer and imposition of hands of some of the brethren. But they did not allow the priesthood

to be any distinct order, or to give any indelible character. As the vote of the brotherhood made a man a minister, and gave him authority to preach the word, and administer the sacraments among them; so the same power could discharge him from his office, and reduce him to a mere layman again.

And as they maintained the bounds of a church to be no greater than what could meet together in one place, and join in one communion; so the power of these officers was prescribed within the same limits. The minister or pastor of one church could not administer the Lord's supper to another, nor baptize the children of any but those of his own society. Any lay-brother was allowed the liberty of prophesying, or of giving a word of exhortation to the people; and it was usual for some of them, after sermon to ask questions, and reason upon the doctrines that had been preached. In a word, every church, on the *Brownists*' model, is a body corporate, having full power to do every thing which the good of the society requires, without being accountable to any class, synod, convocation, or other jurisdiction whatever. Most of their discipline has been adopted by the Independents, a party which afterwards arose from among the *Brownists*.

The laws were executed with great severity on the *Brownists*; their books were prohibited by queen Elizabeth, and their persons imprisoned, and many of them were hanged. The ecclesiastical commission, and the star-chamber, in fine, distressed them to such a degree, that they resolved to quit their country. Accordingly many families retired and settled at Amsterdam, where they formed a church, and chose Mr. Johnson their pastor; and after him Mr. Aynsworth, author of the learned commentary on the Pentateuch. Their church flourished near an hundred years. See *Neal. Hist. of New Eng. T. i. c. 2. p. 58.*

BRUARIA, turbaria. See the article TURBARIA.

BRUMALIA*, or **BROMALIA**, a feast of Bacchus, celebrated among the ancient Romans, during the space of thirty days; commencing on the twenty-fourth of November, and ending the twenty-sixth of December.

* The word comes from *bruma*, the day of the winter solstice; in regard of the time when the feast was held: though others derive it from *brunus*, or *brunius*, names of Bacchus.

The *brumalia* were instituted by Romulus, who used during this time to entertain the fenae.

BRYONY, WHITE, a medicinal root, anciently much used as a powerful purgative, especially of ferocities; but now chiefly retained as a uterine detergent; in which quality it enters the composition of an official water denominated from it *aqua bryoniae*, generally prescribed against hysterical disorders.

M. Boulduc found, by a chymical analysis, that *bryony* consists only of saline principles, without any resin: wherein it differs from *mechoacan*, which, in other respects, it much resembles. He adds, that it has more virtue taken in substance than in any other manner; which is common to this, with most other purgatives. The *black bryony* is a diuretic. See SUPPLEMENT, article BRYONIA.

BUBBLES, BULLÆ, in physics, little round drops or vesicles of any fluid filled with air, and formed either on its surface, upon the addition of more of the fluid, as in raining; or in its substance, upon a vigorous intestine commotion of its parts.

Bubbles are dilatate or compressible, *i. e.* they take up more or less room, as the included air is more or less heated, or more or less pressed from without; and are round, because the included aura acts equally from within all around. Their coat or cover is formed of the minute particles of the fluid, retained either by the velocity of the air, or by the brisk attraction between those minute parts and the air.

It is these little *bubbles*, rising up from fluids, or hanging on their surface, which form the white skum a-top; and it is these same *bubbles* which form the steam or vapour rising up from liquors in boiling, &c. the manner of which see under **BOILING, VAPOUR, &c.**

BUBBLE, in commerce, is a cant-name, lately given to a sort of projects, for the raising of money on imaginary grounds; very frequent in the years 1720,—21.

The pretended design of these undertakings was, to raise a stock, for the retrieving, setting on foot, or carrying on some promising and useful branch of trade, manufacture, machinery, or the like. In order to which, proposals were given out, shewing the advantages of the design, and inviting persons into it. The sum necessary to carry on the affair, together with the profits expected from it, were divided into a certain number of shares, or subscriptions, to be purchased by persons disposed to adventure therein.—The real design, in some, was to raise a sum for the private advantage of the projectors; to be laid out by them in South-sea stocks, &c. in hopes, by the rise thereof, to be able to refund the subscribers money, with profit to themselves. In others, the design was absolutely to defraud the adventurers of their subscription-money, without any view to restitution.

There was a third kind somewhat different: the projectors of these, to proceed the more secretly, proposed to have books opened, and subscriptions taken at some time to come; and in the mean time took money, by way of premium, to entitle

title persons to be admitted subscribers, as soon as the affair should be ripe for dividing into shares. Several thousand shares were, thus, very frequently bestowed in one day; and premiums, from one shilling to some pounds, paid thereupon, to the profits of the projectors.

The number of *bubbles*, and their qualities, were very extraordinary: some of them too authorized by patents; and in others, the projectors and their proprietors formed into corporations: some for fisheries, some for insurances, some for the digging of mines, &c. Posterity, doubtless, will be surprized to hear of *bubbles* for clearing the streets, others for furnishing shoes, others for stockings, others for physic, others for the maintenance of bastard children, others for the buying bad titles, others for the lending of money, &c.

BUBBLING-Waters. See the article WATER.

BUBO *, in medicine and surgery, denotes a tumour, sometimes inflammatory, and sometimes scirrhous, gathering chiefly in the glands of the inguen, or groin.

* The word comes from the Greek βύβων, *inguen*; the usual place of such tumours.

There are two kinds of *bubo's*, the one called *benign*, or mild, the other *malignant*.—Malignant *bubo's* are divided into *pestilential* and *venereal*: the former arise in pestilential fevers, &c. The latter are the product of impure embraces; and frequently the forerunner of the pox.—When a *bubo* is encompassed with a circle of several colour, it is a sign it is pestilential, and it is generally mortal.

BUBONOCELE *, a tumour in the groin; occasioned by the descent either of the epiploon, or the intestines, through the perforation of the muscular obliquus descendens.

* The word comes from the Greek βύβων, *inguen*, and κελος, *tumor*.

The *bubonocèle* is the same with what is otherwise also called *ramex* and *hernia inguinalis*. See HERNIA. It is a species of rupture; though chirurgeons call it an *incomplete* one; and is common to women as well as men.

BUCCALES Glandulæ are small glands dispersed over the inner side of the cheeks and lips, which separate a spittle useful in mastication, and digestion.

BUCCANERS, or **BUCANEERS**, a term frequent in the West-Indies, properly used for a kind of savages, who prepare their meat on a grate, or hurdle made of Brazil wood, placed in the smoak, at a good height from the fire, and called *buccan*.

Whence also the little lodges raised for the preparation of their food are called *buccans*; and the action of dressing it *buccaning*.

Meat *buccaned* is said to have an excellent taste, the vermilion colour of a rose, and a charming smell; all which it retains many months. Oxemelin, from whom we have this, adds, that the neighbouring people send their sick hither, that by eating their *buccaned* meat they may be recovered.

The origin of the word is referred to the people of the Caribbee Islands, who used to cut their prisoners of war in pieces, and lay them on hurdles with fire underneath; which they called *buccaning*, i. e. roasting and smoaking together: hence our *buccaners* took both their name and their custom; with this difference, that what the former did to men, these did to animals caught in hunting.

The Spaniards, Savary tells us, call the *buccaners* in their territories *matadores*, that is, *killers*, and *monsters*, that is, *butchers*; the English call theirs, *cow-killers*.

The *buccaners* are of two distinct professions; the one only hunt bulls for their skins, the other beasts for their flesh. The art of *buccaning*, Oxemelin describes thus, the beast being dead, and the bones stripped out, the flesh is cut into pieces of the length of the arm, and salted, and the next day laid on the *buccan*, which consists of twenty or thirty bars laid across, half a foot from each other: under this they raise a thick smoak, adding the skin and bones of the beast to heighten it.

This is found vastly better than any simple fewel; in regard the volatile salts of those parts are by this means communicated to the flesh, and give it such a relish, as that after a little of this *buccaning*, the nicest palate will eat it without further preparation.

BUCCELLARI *, Βυκελλαρῖοι, an order of soldiery under the Greek emperors, appointed to guard and distribute the ammunition-bread.

* The word is formed from *bucellus*, a kind of loaf, or cake of a circular figure.

The *bucellarii* were also called, in respect of their country, *gallogreci*, or *helenogalatae*, q. d. Greeks of Galatia: sometimes *maryandini*.

Authors are much divided as to the office and quality of the *bucellarii*: some give the denomination to parasites in the courts of princes and great men, maintained at their table and expences. In reality, among the Visigoths, *bucellarius* was a general name for all clients or vassals, who lived at the expence of their lords. Spelman rather supposes them to answer to what among us are called *tenants by military service*.—Others represent the *bucellarii* as stationary soldiers in the provinces, who, when the emperor commanded, marched

before and behind him as his body-guard.—According to others, they were men whom the emperors employed in putting persons to death secretly.

BUCCINA *, an ancient military, or rather musical instrument, used in war; especially for proclaiming the watches of the night, and giving notice to the soldiery when they were to mount, and when quit the guard.

* The word comes from *bucca*, mouth, and *cano*, I sing, because played on by the mouth: others suppose it formed from the Greek βύβων, or βύβων, which signifies the same, formed from βου, bullock, and *cano*, I sing, because anciently made of bullocks horns; others from the Hebrew *buk*, a trumpet. Varro will have it to have been originally formed by *oo-motopia*, from *lou bou*, alluding to the sound it gives: Others, with more probability, derive it from *buccinum*, the name of a shell-fish.

The *buccina* is usually considered as a species of tuba, or trumpet; from which however in propriety it appears to have differed, not only in respect of figure, which in the tuba was strait, and in the *buccina* recurve or crooked, but in sound; that of the *buccina* being sharper, and audible to a greater distance than the trumpet-sound.

The *buccina* approached nearest to the cornu, or horn: originally the two seem to have been the same; though in after-times a difference arose; the name *buccinum* being restrained to the lesser sort, and the cornu to the larger.—Some also take the *buccina* to have been less crooked than the cornu, which made a full femicircle.

Varro assures, that the *buccinæ* were also called *cornua*, horns; because originally made of the horns of cattle, as is still done among some people. Servius intimates, as if they were at first made of goats or rams horns; and accordingly in scripture, the like instruments used both in war, and in the temple, are called *rams-horns*, *keren-jobel*, and *sopherath hajjebelim*, or *buccinæ* of rams.

BUCCINATOR, in anatomy, a muscle on each side the face, common to the lips and cheeks; making the inner substance of the latter.—Its fibres run from the processus coronæ of the lower jaw, to the angle of the mouth, and adhere to the upper part of the gums of both jaws: through its middle pass the upper ductus salivales. By this is contracted the cavity of the mouth, and the meat thrust forward to the teeth in mastication.

It has its name from *buccina*, trumpet; because, when swelled, it enlarges the cheeks, as in blowing a trumpet.—See Tab. Anat. (Myol.) fig. 1. n. 10.

BUCENTAUR *, the name of a large state-vessel, used by the Venetians in the ceremony of espousing the Sea, performed each Ascension-day with much pomp.

* The word comes from the Greek, βυκενταυρος; composed of βου, a particle of augmentation, used to denote an enormous greatness; and κενταυρος, *centaur*. Justiniani adds two other etymologies: the first from *bis*, and *taurus*, or rather *centaurus*, the name of one of Æneas's vessels in Virgil: the other from *bucenaurus*, for *decentaurus*, a word forged to signify a vessel capable of holding 200 men.

P. Justiniani gives a very precise description of the *bucenaur*; and adds, that its origin is carried up as high as the year of Christ 1311; though others trace it higher, to the year 1177, when the emperor Frederic Barbarosa came to Venice, to make peace with the republic and the pope: at which time the pope, in consideration of the services the state had done him, in sheltering him in their city, when he had been driven out of his own, granted them several privileges; and made a present to the doge of a gold ring, which is the origin of that, yearly cast by the dogs, from the *bucenaur*, into the sea.

It is on Ascension-day, that the doge, being advanced in the *bucenaur* a little way into the gulph, throws a gold ring into the sea; and says, "We marry thee, O sea, in token of that true and perpetual dominion which the republic has over thee."

The archduchess Maria Josepha, married to the prince of Saxony, on the day of her entry into Dresden, was received in a magnificent galley, finely rigged, and called a *bucenaur*, because built after the model of that of Venice. *Pelnitzz Mem. T. 4. p. 74. seq.*

BUCEPHALUS, Βυκεφαλός. See the article HORSE.

BUCK. See the article HUNTING.

BUCKLER *, a piece of defensive armour, used by the ancients to screen their bodies from the blows of their enemies.

* The word comes from the barbarous Latin *bucularium*, of *bucula*, the umb or middle point of this weapon, which had usually a head or mouth represented prominent thereon.

The *buckler* of Achilles is described in Homer, that of Æneas in Virgil, that of Hercules in Hesiod: Ajax's *buckler* was lined with seven bulls hides.

The shield succeeded the use of the *buckler*: yet the Spaniards still retain the *sword and buckler*, in their night-walks. *Bucklers*, on medals, are either used to signify public *virtus*, rendered to the Gods for the safety of a prince; or that he is esteemed the defender and protector of his people.—These were particularly called *vestive bucklers*, and were hung at altars, &c.

BUCOLICS*, *Pastorals*; a kind of poems relating to shepherds, and their flocks.

* The word is derived from the Greek, *Buc*, and *κότος*, *cibus*, meat; hence *Bucolus*, to feed cattle; and *Bucolus*, *bubulus*, a herdman.

Bucolic poetry is the most ancient of all the kinds of poetry; and is supposed to have had its origin in Sicily, amidst the mirth and diversions of the shepherds; and to have been inspired by love, and idleness: by degrees, their rural gallantries were brought under rules, and became an art. The concerns of the flocks, the beauties of nature, and the pleasures of a country-life, were their principal subjects. Mofchus, Bion, and Theocritus, were the most agreeable among the ancient *bucolic* poets. See *Eclogue*, and *Idyllion*. Fontenelle observes, that Theocritus's style is sometimes a little too *bucolic*. Some authors attribute the invention of *bucolic* poetry to a shepherd called *Daphnis*; and others to *Bucolus*, son of Laomedon: but this appears all fiction.

BUDDS, among gardeners, denote the first tops of most fall-plants, &c. reputed preferable to all other less tender parts. See *SALLET*. Such are young ashen keys, broom buds, and the like.

BUD, is used in the country language for a weaned calf of the first year; so called, because the horns are then in the bud.

BUDGE. See the article *BOUCHE*.

BUFET, in building. See the article *BEAUFET*.

BUFFS, in commerce, a sort of leather prepared from the skin of the buffalo, or wild bull, a beast resembling an ox, but longer and bigger; having large thick horns, short black hair, and a very small head; common enough in the Levant, particularly about Smyrna, and Constantinople; where, as well as in Italy, it is frequently tamed, and wrought as we do oxen.

The skin of the buffalo being dressed in oil, after the manner of *flannery*, or *chamois*, makes what we call *buff*; skin; anciently much used among the military men, for a kind of coats or doublets; and still retained by some of our grenadiers, as well as the French gend'armery, on account of its exceeding thickness and firmness. It is also used for waist-belts, pouches, &c.

Buff-skins, or *Buff*-leather, makes a very considerable article in the English, French, and Dutch commerce, at Constantinople, Smyrna, and along the coasts of Africa.

The skins of elks, oxen, and other like animals, when dressed in oil, and prepared after the same manner as that of the buffalo, are likewise denominated *buff*; and used for the same purposes.—In France, there are a good number of considerable manufactories employed in the preparation of such skins; particularly at Corbeil, Paris, and Rouen: their first establishment is owing to the Sieur Jabac, a native of Cologne. The manner of preparation see under the article *SHAMMY*.

BUFFET. See the article *BEAUFET*.

BUFFOON, a droll, or mimic, who diverts the public by his pleasantries, and follies.

Menage, after *Salmastius*, derives the word from *buffo*; a name given to those who appeared on the Roman theatre with their cheeks blown up; that receiving blows thereon, they might make the greater noise, and set the people a laughing. Others, as *Rhodiginus*, makes the origin of *buffoonery* more venerable; deriving it from a feast instituted in Attica, by K. Erichtheus, on occasion of a priest, called *Buphon*: who after having sacrificed the first bullock on the altar of Jupiter Polion, or guardian of the city, fled hastily away, without any apparent reason; leaving the ax and other instruments on the ground, nor could he be stopped, or ever found afterwards. The instruments were hereupon delivered up to the judges, and solemnly tried; the ax found guilty, and the rest acquitted. This sacrifice was kept up in the same manner the following years: the priest died, as the first; and the ax was condemned. As the whole ceremony was perfectly burlesque, the words *buffions* and *buffooneries* have been since applied to all ridiculous mummeries and farces: this history is related by *Rhodiginus*.

BUGGERY, in our laws, signifies the crime of sodomy.

Sir Edward Coke defines *buggery*, *carnalis copula contra naturam, & hoc vel per confusionem specierum*, (viz. by a man's or woman's coupling with a brute beast) *vel sexuum*, by a man's having to do with a man, or a woman with a woman.—Each of which is felony, without benefit of clergy: in ancient times, such offenders were burnt by the common law.

Buggery is usually excepted out of a general pardon. The practice is said to have been introduced into England by the Lombards; by whom it is usually supposed to have been borrowed from the *Bongres*, or *Bulgarians*.

The heifer of the *Bulgarians* was anciently also called *buggerie*.

BUILDING, a fabric, or place erected by art, of stone, or timber, either for shelter from the weather; or for security, magnificence, or devotion.

Regular BUILDING is that whose plan is square, its opposite sides equal, and the parts disposed with symmetry,

Irregular BUILDING is that, on the contrary, whose plan is not contained within equal or parallel lines, either by the nature of its situation, or the artifice of the builder; and whose parts have not any just relation to one another in the elevation.

Insulated BUILDING is that which is not attached, joined, or contiguous to any other; but is encompassed with streets, or some open square, or the like; as St. Paul's, the Monument, &c.

A BUILDING is said to be *engaged*, when it is encompassed with others, and has no front towards any street or public place, nor any communication without, but by a back passage.

An *Interred*, or *Sunk* BUILDING, is that whose Area is below the adjacent street, court, or garden, &c. and whose lowest courtes of stone are hidden.

Felicien considers three kinds of buildings in architecture, viz. *sacred buildings*; as the temples and groves of the ancients, and our churches, chapels, &c.—*Public buildings*; as basilics, or courts of justice, tombs, theatres, amphitheatres, triumphal arches, gates, bridges, aqueducts, &c.—*Domestic or private buildings*, as palaces, and houses. Each of which see under their proper heads, *BASILICA*, *CHURCH*, *AMPHITHEATRE*, &c.

BUILDING is also used for the art or act of constructing, or raising an edifice.—In which sense it comprehends, as well the expences, as the invention and execution of the design thereof.

In building there are three things chiefly in view, viz. convenience, firmness, and delight.—To attain these ends, Sir Henry Wotton considers the whole subject under two heads, viz. the *seat or situation*, and the *work or structure*.

For the Situation of a BUILDING, either that of the whole is to be considered, or that of its parts.—As to the *first*, regard is to be had to the quality, temperature, and salubrity of the air; the convenience of water, fuel, carriage, &c. and the agreeableness of the prospect.

For the second, the chief rooms, studies, libraries, &c. are to be towards the east; offices that require heat, as kitchens, distillatories, brew-houses, &c. to the south: those that require a cool fresh air, as cellars, pantries, granaries, &c. to the north: as also galleries for painting, museums, &c. which require a steady light.—He adds, that the ancient Greeks and Romans, generally situated the front of their houses to the fourth: but that the modern Italians vary from this rule.

—Indeed, in this matter, regard must still be had to the country; each being obliged to provide against its respective inconveniences: so that a good parlour in Egypt, might make a good cellar in England.—The situation being fixed on, the next thing to be considered is the

Work or Structure of the BUILDING, under which come first the principal parts, then the accessories, or ornaments.—To the principals, belong first, the materials; then the form, or disposition.

The *Materials of a BUILDING* are either stone, as marble, free-stone, brick, for the walls, &c. or wood, as fir, cypresses, cedar, for posts and pillars of upright use; oak for beams, summers, and for joining and connection.

For the Form or Disposition of a BUILDING, it must either be simple or mixed.—The simple forms are either circular or angular: and the circular ones either complete, as just spheres; or deficient, as ovals.

The circular form is very commodious, of the greatest capacity of any; strong, durable beyond the rest, and very beautiful: but then it is found of all others the most chargeable; much room is lost in the bending of the walls, when it comes to the centre of the roof: on these considerations it was, that the ancients only used the circular form in temples and amphitheatres, which needed no comparison.—Oval forms have the same inconveniences, without the same conveniences; being of less capacity.

For angular figures, Sir Henry Wotton observes, that building neither loves many, nor few angles: the triangle, *v. gr.* is condemned above all others, as wanting capacity and firmness; as also, because irresolvable into any other regular figure in the inward partitions, besides its own.—For figures of five, six, seven, or more angles, they are fitter for fortifications than civil buildings. There is, indeed, a celebrated building of Vignola, at Caprarola, in form of a pentagon; but the architect had prodigious difficulties to grapple with, in disposing the lights, and saving the vacuities. Such buildings then, seem rather for curiosity than convenience; and for this reason, rectangles are pitched on, as being a medium between the two extremes. But again, whether the rectangle is to be just a square or an oblong, is disputed: Sir Henry Wotton prefers the latter, provided the length do not exceed the breadth by above one third.

Mixed figures, partly circular and partly angular, may be judged of from the rules of the simple ones; only they have this particular defect, that they offend against uniformity. Indeed uniformity and variety may seem to be opposite to each other: but Sir H. Wotton observes, they may be reconciled; and for an instance, he mentions the structure of the human body, where both meet.—Thus much for the first grand division, viz. the whole of a building,

The Parts of a BUILDING, Baptista Alberti comprises under five heads; viz. the foundation, walls, apertures, partition, and cover.

For the foundation, to examine its firmness, Vitruvius orders the ground to be dug up; an apparent solidity not to be trusted to, unless the whole mould cut through be found solid: he does not indeed limit the depth of the digging; Palladio limits it to a sixth part of the height of the building: this Sir Harry Wotton calls the *natural foundation*, whereon is to stand the substruction, or ground-work, to support the walls, which he calls the *artificial foundation*: this then is to be the level; its lowest ledge, or row, of stone only, close laid with mortar, and the broader the better; at the least, twice as broad as the wall: lastly, some add, that the materials below should be laid just as they grew in the quarry; as supposing them to have the greatest strength in their natural posture. De Lorieu enforces this, by observing, that the breaking or yielding of a stone in this part but the breadth of the back of a knife, will make a cleft of above half a foot in the fabric above.—For pallification, or piling the ground-plot, so much commended by Vitruvius, we say nothing; that being required only in a moist marshy ground, which should never be chosen: nor perhaps are there any instances of this kind, where it was not necessity that drove them to it.

For the walls, they are either entire and continued, or intermitted; and the intermissions are either columns or pilasters. Entire, or continued walls, are variously distinguished; by some, according to the quality of the materials, as they are either stone, brick, &c. others only consider the position of the materials; as when brick or square stones are laid in their lengths, with sides and heads together, or the points conjoined, like a network, &c.

The great laws of muring are, that the walls stand perpendicular to the ground-work; the right angle being the cause of all stability: that the massiest and heaviest materials be lowest, as fitter to bear than be borne; that the work diminish in thickness, as it rises; both for ease of weight and expence: that certain courses, or ledges of more strength than the rest, be interlaid, like bones, to sustain the fabric from total ruin, if the under parts chance to decay: and lastly, that the angles be firmly bound; these being the nerves of the whole fabric, and commonly fortified, by the Italians, on each side the corners, even in brick buildings, with squared stones; which add both beauty and strength. See WALL. The intermissions, as before observed, are either columns or pilasters: whereof there are five orders, viz. *Tuscan, Doric, Ionic, Corinthian, Composite*; each of which see distinctly considered under its respective head, *TUSCAN, DORIC, &c.* see also COLUMN, PILASTER, and ORDER.

Columns and pilasters are frequently, both for beauty and majesty, formed archwise; the doctrine of which see under ARCH.

For the apertures, they are either doors, windows, stair-cases, chimneys, or conduits for the sullage, &c. which see under their heads, DOOR, WINDOW, &c.—Only, with regard to the last, it may be observed, that art should imitate nature in these ignoble conveyances, and separate them from sight, where a running water is wanting, into the most remote, lowest, and thickest part of the foundation; with secret vents, passing up through the walls like tunnels to the open air; which the Italians all commend for the discharge of noisome vapours. See SEWERS, &c.

For the partition, or distribution of the ground-plot into apartments, &c. Sir H. Wotton lays down these preliminaries; that the architect never fix his fancy on a paper-draught, how exactly soever set off in perspective; much less on a mere plan, without a model, or type of the whole structure, and every part thereof, in pastboard or wood; that this model be as plain and unadorned as possible, to prevent the eye's being imposed on; and that the bigger this model, the better.

In the partition itself, there are two general views, viz. the *gracefulness*, and *usefulness* of the distribution, for rooms of office and entertainment; as far as the capacity thereof, and the nature of the country will allow.—The gracefulness will consist in a double analogy, or correspondence; first, between the parts and the whole, whereby a large fabric should have large partitions, entrances, doors, columns, and in brief, all the members large: the second, between the parts themselves, with regard to length, breadth, and height. The ancients determined the length of their rooms, that were to be oblong, by double their breadth; and the height by half their breadth and length added together. When the room was to be precisely square, they made the height half as much more

as the breadth: which rules the modern take occasion to dispense with; sometimes squaring the breadth, and making the diagonal thereof the measure of the height; and sometimes more. This deviating from the rules of the ancients is ascribed to M. Angelo.

The second consideration in the partition is, the *usefulness*; which consists in the having a sufficient number of rooms of all kinds, with their proper communications, and without distraction. Here the chief difficulty will lie in the lights and stair-cases: the ancients were pretty easy on both these heads, having generally two cloistered open courts, one for the women's side, the other for the men: thus the reception of light into the body of the building was easy, which among us must be supplied, either by the open form of the building, or by graceful recesses or breaks, by terracing a story in danger of darkness, and by abajours, or sky-lights.—For casting the stair-cases, it may be observed, that the Italians frequently distribute the kitchen, bake-house, buttery, &c. under ground, next above the foundation, and sometimes level with the floor of the cellar; raising the first ascent into the house fifteen feet or more: which, beside the removing of annoyances out of the sight, and gaining so much room above, does, by elevating the front, add a majesty to the whole. Indeed, Sir H. Wotton observes, that in England the natural hospitality thereof will not allow the buttery to be so far out of sight; besides, that a more luminous kitchen, and a shorter distance between that and the dining room are required, than that compartment will well bear.

In the distribution of lodging-rooms, it is a popular and ancient fault, especially among the Italians, to cast the partitions so, as when the doors are all open, a man may see through the whole house; this is grounded on the ambition of shewing a stranger all the furniture at once: an intolerable hardship on all the chambers, except the inmost, where none can arrive but through all the rest, unless the walls be extreme thick for secret passages: nor will this serve the turn, without at least three doors to each chamber; a thing inexcusable except in hot countries: besides its being a weakening to the building, and the necessity it occasions of making as many common great rooms as there are stories, which devours a great deal of room, better employed in places of retreat; and must likewise be dark, as running through the middle of the house.

In the partition, the architect will have occasion for frequent shifts; through many of which his own sagacity, more than any rules, must conduct him. Thus, he will be frequently put to struggle with scarcity of ground; sometimes to damn one room for the benefit of the rest, as to hide a buttery under a stair-case, &c. at other times, to make those the most beautiful which are most in sight: and to leave the rest, like a painter, in the shadow, &c.

For the covering of the building; this is the last in the execution, but the first in the intention: for who would build, but to shelter? In the covering, or roof, there are two extremes to be avoided, the making it too heavy or too light: the first will press too much on the under-work; the latter has a more secret inconvenience; for the cover is not only a bare defence, but a band or ligature to the whole building; and as such requires a reasonable weight. Indeed, of the two extremes, a house top-heavy is the worst. Care is likewise to be taken, that the pressure be equal on each side; and Palladio wishes, that the whole burthen might not be laid on the outward walls, but that the inner might likewise bear their share.—The Italians are very curious in the proportion and gracefulness of the pent or slopeness of the roof; dividing the whole breadth into nine parts, whereof two serve for the height of the highest top or ridge from the lowest; but in this point, regard must be had to the quality of the region; for, as Palladio insinuates, those climates which fear the falling of much snow, ought to have more inclining pentices than others. Thus much for the principal or essential parts of a building.

For the *accessories*, or ornaments, they are fetched from painting and sculpture. The chief things to be regarded in the first are, that no room have too much, which will occasion a surfeit; except in galleries, or the like: that the best pieces be placed where there are the fewest lights: rooms with several windows are enemies to painters, nor can any pictures be seen in perfection, unless illuminated, like nature, with a single light: that in the disposition regard be had to the posture of the painter in working, which is the most natural for the posture of the spectator; and that they be accommodated to the intentions of the room they are used in.

For sculpture, it must be observed, that it be not too abundant; especially at the first approach of a building, or

at the entrance, where a Doric ornament is much preferable to a Corinthian one: that the niches, if they contain figures of white stone, be not coloured in their concavity too black, but rather dusky; the light being dispelled with too sudden departures from one extreme to another. That fine sculptures have the advantage of nearness, and coarser of distance; and that in placing of figures aloft, they be reclined a little forwards: because, the visual ray extended to the head of the figure is longer than that reaching to its feet, which will of necessity make that part appear further off; so that to reduce it to an erect posture, it must be made to stoop a little forwards. M. le Clerc, however, will not allow of this respiciation, but will have every part in its just perpendicular.

As to the stone and stucco, used in *buildings*, which are fresh and white at first, and are commonly supposed to be discoloured with the air, moisture, smog, &c. the true cause thereof is, that they become covered with a minute species of plants, which alter their colour. A sort of lichens yellowish, brownish, or greenish, which commonly grow on the barks of trees, do grow also on stones, mortar, plaster, and even on the flats of houses, being propagated by little light seeds, dispersed by the wind, rain, &c. The best preservative known, is lime.

To judge of a BUILDING, Sir H. Wotton lays down the following rules.—That before fixing any judgment, a person be informed of its age; since, if apparent decays be found to exceed the proportion of time, it may be concluded, without further inquisition, either that the situation is naught, or the materials or workmanship too slight.—If it be found to bear its years well, let him run back, from the ornaments and things which strike the eye first, to the more essential members; till he be able to form a conclusion, that the work is commodious, firm, and delightful; the three conditions, in a good *building*, laid down at first, and agreed on by all authors.—This, our author esteems the scientific way of judging.

Vassari proposes another; *viz.* by passing a running examination over the whole edifice, compared to the structure of a well-made man; as, whether the walls stand upright on a clean footing and foundation; whether the *building* be of a beautiful stature; whether, for the breadth, it appear well burnished; whether the principal entrance be on the middle line of the front, or face, like our mouths; the windows, as our eyes, set in equal number and distance on both sides; the offices, like the veins, usefully distributed, &c.

Vitruvius gives a third method of judging; summing up the whole art under these four heads: *ordination*, or setting the model and scale of the work; *disposition*, the just expression of the first design thereof: (which two, Sir H. Wotton thinks, he might have spared, as belonging rather to the artificer than the censurer;) *eurythmy*, the agreeable harmony between the length, breadth, and height of the several rooms, &c. *symmetry*, or the agreement between the parts and the whole; *decor*, the due relation between the *building* and the inhabitant, whence Palladio concludes, the principal entrance ought never to be limited by any rule, but the dignity and generosity of the master. And lastly, *distribution*, the useful casting of the several rooms, for office, entertainment, or pleasure.—These last four are ever to be run over, ere a man pass any determinate censure: and these alone, Sir Henry observes, are sufficient to condemn or acquit any *building* whatever.

Dr. Fuller gives us two or three good aphorisms in *building*; as,—1^o. Let not the common rooms be several, nor the several rooms common: *i. e.* the common rooms not to be private or retired, as the hall, galleries, &c. which are to be open; and the chambers, &c. to be retired.—2^o. A house had better be too little for a day, than too big for a year. Houses therefore to be proportioned to ordinary occasions, not extraordinary.—3^o. Country-houses must be substantives, able to stand of themselves: not like city *buildings*, supported and sheltered on each side by their neighbours.—4^o. Let not the front look aquint on a stranger; but accost him right, at his entrance.—5^o. Let the offices keep their due distance from the mansion-house; those are too familiar, which are of the same pile with it.

The method of *building*, both in Barbary and the Levant, seems to have continued the same from the earliest ages, without the least alteration or improvement. *Shaw Trav.* p. 273.

Section of a BUILDING. See the article SECTION.

BULAFLO, a musical instrument, much used by the Negroes of Guiney, &c.

It consists of several pipes made of hard wood, set in order; which diminish by little and little in length, and are tied together with thongs of thin leather twisted about small round wands, put between each of the pipes, so as

to form a small interstice. They play on it with sticks, the ends of which are covered with leather, to make the sound less harsh. *Froger Voyag.* p. 36. *seq.*

BULB, BULBUS, in botany, a thick root, nearly round, composed of several skins, or coats, laid one over another; sending forth from its lower part a great number of fibres.—Such are the roots of the common onion, the daffodil, the hyacinth, &c.

The same denomination is sometimes also given to tuberos roots, composed of one solid continuous substance, without any skins laid over one another.

Dr. Grew observes, that in *bulbous* plants, as well as many other perennial ones, the root is annually renewed, or repaired, out of the trunk or stalk it felt: that is, the basis of the stalk, continually and insensibly descends below the surface of the earth; and hiding it self therein, is, both in nature, place, and office, changed into a true root. Thus, in brownwort, the base sinking by degrees, becomes the upper part of the root; the next year the lower part; and the next it rots away, a fresh supply coming.

BULIMY*, BULIMIA, or BULIMUS, an enormous appetite, attended with fainting, and coldness of the extremities.

* The word is Greek, βουλμία, or βουλιμος, formed of βου, ox; and λιμος, hunger; as importing that the patient has the stomach of an ox; or, as others term it, sufficient to eat up an ox; which however would be better βουφαγία, than βουλμία. In reality, there needs not so much straining to account for the origin of the word, which may be more easily and naturally accounted for after Varro and Suidas; from the particle βου, which is prefixed by the Greeks to divers words, only as an intensive; and λιμος, hunger, *g. d.* a great hunger: much as they say βουταις, for a great boy; βουλικος, for a large fig.

In the Philosophical Transactions, we have an account of a person affected with a *bulimy*, to such a degree that he would eat up an ordinary leg of veal at a common meal, and would feed on fowls, &c. he was cured by throwing up several worms, of the length and thickness of a tobacco-pipe. See HUNGER.

BULK of a ship, denotes her whole content in the hold for stowage of goods.

Breaking BULK. See the article BREAKING.

Bulk HEADS are partitions made across a ship, with boards of timber, whereby one part is divided from another.—The *bulk-head afore* is the partition between the fore-castle and gratings in the head, and in which are the chafe-ports.—See *Tab. Ship.* fig. 2. n. 11. 24. 48. 85. 95. 99. 102, 115.

BULL*, in ecclesiastical writers, denotes an instrument dispatched out of the Roman chancery, sealed with lead; answering to the edicts, letters patent, and provisions, of secular princes.

* The word *bull* is derived from *bulia*, a seal; and that from *bulia*, a drop, or bubble; or, according to others, from the Greek βουλι, council; according to Pezron, from the Celtic *buil*, or *bul*, a bubble.

The *bull* is the third kind of apostolical rescript, and the most in use, both in affairs of justice, and of grace. It is wrote on parchment; by which it is distinguished from a *brief* or simple *signature*, which is on paper. A *bull* is properly a signature enlarged: what the latter comprehends in a few words, the former dilates and amplifies. Yet the *bull* is not to take in more matter than the signature; being only to amplify the stile in clauses of ceremony.

If the *bulls* be letters of grace, the lead is hung on silken threads; if they be letters of justice and executory, the lead is hung by a hempen cord.—They are all wrote in an old roman Gothic letter.

The *bull*, in the form wherein it is to be dispatched, is divided into five parts, *viz.* the narrative of the fact; the conception; the clause; the date; and the salutation, in which the pope takes on himself the quality of *servant of servant of God, servus servorum Dei*.

Properly speaking, it is the seal, or pendant lead alone that is the *bull*: it being that which gives it both the title, and authority. The seal presents, on one side, the heads of St. Peter and St. Paul; on the other, the name of the pope, and the year of his pontificate. See SEAL.

By *bulls*, jubiles are granted: without them no bishops, in the Romish church, are allowed to be consecrated. In Spain, *bulls* are required for all kinds of benefices; but in France, &c. simple signatures are sufficient; excepting for bishoprics, abbeys, dignities, and priories conventual. According to the laws of the Roman chancery, no benefice exceeding twenty-four ducats per annum, should be conferred without *bulls*: But the French would never submit to this rule, except for such benefices as are taxed, in the apostolical chamber: for the rest, they reserve the right of dissembing the value, expressing it in general terms:

tertus; Cujus & illi forsan annexorum fructus 24 ducatum auri, de camera secundum communem estimationem, valore annuum non excedunt.

The bulls brought into France are limited and moderated by the laws and customs of the land, before they are registered; nor is any thing admitted till it have been well examined, and found to contain nothing contrary to the liberties of the Gallican church: these words, *propria motu*, in a bull, are sufficient to make the whole be rejected in France.

Nor do the Spaniards admit the papal bulls implicitly; but having been examined by the King's council, if there appear any reason for not executing them, notice thereof is given to the pope by a supplication; and the bull, by this means, remains without effect: and the like method of proceeding with the court of Rome is observed by most of the rest of the courts of Europe, in the papal communion.

To *subornate bulls* is, to make publication thereof, by one of the three commissaries to whom they are directed; whether he be the bishop or official. This publication is sometimes opposed; but when it is, the fault is not charged on the pope who issued the bull; but an appeal is brought to him against the person who is supposed to make it: thus the fault is laid, where it is known not to be just, to evade affronting the pontiff.

The bull in *cena domini* is a bull read every year on Maundy-thursday, in the pope's presence; containing various excommunications and execrations, against heretics, those who disobey the see, who disturb or oppose the exercise of ecclesiastical jurisdiction, &c.

After the death of the pope, no bulls are dispatched during the vacancy of the see: to prevent any abuses, therefore, as soon as the pope is dead, the vice-chancellor of the Roman church takes the seal of the bulls; and in the presence of several persons, orders the name of the deceased pope to be erased; and covers the other side, on which are the heads of St. Peter and St. Paul, with a linen cloth; sealing it up with his own seal, and giving it thus covered to the chamberlain, to be preserved, that no bulls may be sealed with it in the mean time.

Golden BULL * is a denomination peculiarly given to an ordinance, or statute, made by the emperor Charles IV. in 1356, said to have been drawn up by that celebrated lawyer, Bartoli, and still reputed the *magna charta*, or fundamental law of the empire.

* It is thus called from a golden seal fixed to it, such as were used by the emperors or Constantinople, annexed to their edicts. Spelman also speaks of a golden bull used in a treaty of alliance between our Henry VIII. and Francis I. of France.

Till the publication of the *golden bull*, the form and ceremony of the election of an emperor were dubious and undetermined; and the number of electors was not fixed. This solemn edict regulated the functions, rights, privileges, and pre-eminences of the electors.

The original, which is in Latin, on vellum, is kept at Frankfurt. On the backside of it there are several knots of black and yellow silk; to which hangs a bull, or seal of gold.

This ordinance, containing thirty articles, was approved of by all the princes of the empire, and remains still in force.

—The election of the empire is by it declared to belong to seven electors; three of them ecclesiastics, viz. the archbishop of Mentz, Treves, and Cologne; and four seculars; viz. the king of Bohemia, prince Palatine, duke of Saxony, and marquis of Brandenburg.

BULL'S eye, in astronomy. See ALDEBARAN.

BULLETT *, an iron or leaden ball, or shot, wherewith fire-arms are loaded.

* Some derive the word from the Latin *bulletus*, others from the Greek βυλλιον, to throw.

According to Merfenne, a bullet, shot out of a great gun, flies 92 fathom in a second of time, which is equal to 589 English feet; and, according to Huygens, it would be 25 years in passing from the earth to the sun: but, according to some very accurate experiments of Mr. Derham, it flies, at its first discharge, 510 yards in five half seconds; which is a mile in a little above seventeen half seconds: allowing therefore the sun's distance 86051398 English miles, a bullet would be 32 years and a half in its passage at the full speed.

Bullets are of various kinds, viz. *red-hot bullets*, made hot in a forge; intended to set fire to places where combustible matters are found.

Blow bullets, shells made cylindrical, with an aperture and a fusee at one end, which giving fire to the inside, when in the ground, it bursts, and has the same effect with a mine.

Chain-bullets, consisting of two balls, joined by a chain three or four foot apart.

Branch bullets, two balls joined by a bar of iron five or six inches a-part.

Two-headed bullets, called also *angels*, being two halves of a bullet joined by a bar, or chain: these are chiefly used at sea, for cutting of cords, cables, sails, &c.

Quarter BULLET. See the article QUARTER.

BULLET moulds. See the article MOULD.

BULLION, denotes gold or silver in the mass, or billet.

Silver and gold, whether coined or uncoined, (though used for a common measure of other things) are no less a commodity than wine, tobacco, or cloth; and may, in many cases, be exported as much to national advantage, as any other commodity.—No nation can ever be considerable in trade, that prohibits the exportation of bullion.—And it is more for the public advantage to export gold or silver coined, than uncoined: since, in the former, we have the advantage of the manufacture.—See *Treat. on E. I. Trad.* 4^o. 1681. p. 4. *Child on trade*, p. 73.

BULLION is also used for the place where the king's exchange is kept; or where gold and silver is brought in the lump to be tried, or exchanged.

BULLOCKS eye, in architecture. See the article EYE.

BULWACK, *propugnaculum*, in the ancient fortification, amounts to much the same with *bastion* in the modern.

BUMICILLI, a sect of Mahometans in Africa, said to be great forcers; they fight against the devil, as they say; and frequently run about cover'd with blood and bruises, in a terrible fright: they sometimes counterfeit combats with him at noon-day, and in the presence of numbers of people, for the space of two or three hours, with darts, javelins, scimiters, &c. laying desperately about them, till they fall down on the ground oppressed with blows: after resting a moment, they recover their spirits and walk off.

What their rule is, is not well known; but they are said to be an order of religious.

BUNT of a sail is the middle part of it, purposely formed into a kind of bag, or pouch, that it may catch and receive the more wind.

The *bunt* is chiefly used in top-sails; for courses are for the most part cut square, or at least with a small allowance for *bunt* or compass.—They say, the *bunt holds much leeward wind*; that is, it hangs too much to leeward.

BUNT-lines are small lines made fast to the bottom of the sails, in the middle part of the bolt-rope to a crengle; and so are reeved through a small block, seized to the yard: their use is to trice up the *bunt* of the sail, for the better furling it up.—See *Tab. Ship.* fig. 1. n. 48. 74. gr. 116.

BUOY, at sea, a piece of wood, or cork, sometimes an empty cask well closed, swimming on the surface of the water, and fastened by a chain or cord to a large stone, piece of broken cannon, or the like; serving to mark the dangerous places near a coast, as rocks, shoals, wrecks of vessels, anchors, &c.

In lieu of *buoys*, are sometimes placed pieces of wood, in form of masts, in the conspicuous places: sometimes large trees are planted in a particular manner; in number, two at the least, to be taken in a right line, the one hiding the other; so as the two may appear to the eye no more than one.

Buoy is also used for a piece of wood, or a barrel at sea, fastened so as to float directly over the anchor; that the men who go in the boat to weigh the anchor may certainly know where the anchor lies.

BURDEN *, or rather **BURDON**, in music denotes the drone, or deepset found of an organ; being that produced by the thickest pipe.

* The word is French, *bourdon*; formed, according to some, from the law Saxon *burden*, *crepitum emittens*, to break wind backwards. Others will have *bourdon* originally to signify a buz, or hum, as that of bees; answering to the Latin, *bombus*; and formed by onomatopoeia.

The modern *bourdon* answers to the note which the Greeks called *περολυβισσισμοσ*.

BURDEN also denotes the pipe *, or string it self, by which such found is given.

* Math. Paris will have the name *burdon* to have been originally given this pipe, on account of its resemblance to a pilgrim's staff, anciently called also *burdo*.

BURDEN of a ship is its content, or the number of tons it will carry.

To determine the *burden* of a ship, multiply the length of the keel, taken within board, by the breadth of the ship, within board, taken from the midship beam from plank to plank, and the product by the depth of the hold, taken from the plank below the keelson, to the under part of the upper deck plank; and divide the last product

duct by 94, and the quotient is the content of the tonnage required. See **FREIGHT**, &c.

BURFORD saddle. See the article **SADDLE**.

BURGAGE, a tenure proper to boroughs and towns, whereby the inhabitants hold their lands or tenements of the king, or other lord, at a certain yearly rate.

BURGESS, an inhabitant of a borough, or walled town; or one who possesses a tenement therein.

In other countries, *burgess* and citizen are confounded together, but with us they are distinguished.

The word is also applied to the magistrates of some towns; as the bailiff, or *burgesses* of Leominster.

BURGESS is now ordinarily used for the representative of a borough-town in parliament.

Filius vero burgensis, etatem habere tunc intelligitur cum diferte fecerit denarios numerare & pannos ulnare, &c.

BURGRAVE* properly denotes the hereditary government of a castle, or fortified town, chiefly in Germany.

* The word is compounded of *bourg*, town, and *graf*, or *grave*, count.

BURGHMASTERS*, **BOURGERMASTERS**, or **BURGMESTERS**, chief magistrates in the cities of Germany, Holland and Flanders; to whom belongs the giving of orders for the government, administration of justice, policy, and finances of the place: though the authority and office is not every where alike; each city having its particular laws and statutes.

* The word is formed from the two Flemish words, *burger*, burgess or citizen; and *mesler*, master. Some express it in Latin by *consul*, others by *senator*.—M. Bruneau observes, that *burg-hermaester*, in Holland, answers to what is called *alderman* and *sheriff* in England; *attorney* at Compiegne, *capitoul* at Toulouse, *consul* in Languedoc, &c.

BURGLARY, an unlawful entering into another man's dwelling, wherein some person is, or into a church in the night-time; in order to commit some felony, or to kill some person, or to steal something thence, or do some other felonious act: whether the same be executed or not.

The like offence, by day, we call *house-breaking*, &c. It shall not have benefit of clergy.

BURGMESTERS. See the article **BURGHMASTERS**.

BURGMOTE, a borough-court; or court held for a town or borough. See **MOTE**, and **COURT**.

BURLESQUE, a jocose kind of poetry, chiefly used in the way of drollery, and ridicule, to deride persons, and things.

The word, and the thing too, seem to be both modern: F. Vavassor maintains, in his book *de ludicra dictione*, that *burlesque* was absolutely unknown to the ancients; against the opinion of some others, that one Raintovius, in the time of Ptolemy Lagus, turned the serious subjects of tragedy into ridicule: which, perhaps, is a better plea for the antiquity for farce, than of *burlesque*.

The Italians seem to have the justest claim to the invention of *burlesque*. The first author in this kind was Bernia; he was followed by Lalli, Caporali, &c. From Italy it passed into France, and became there so much the mode, that in 1649 appeared a book under the Title of, *The passion of our Saviour in burlesque verse*. Thence it came into England; but the good sense of the English never adopted or owned it, notwithstanding one or two have excelled in it.

BURN, in a medicinal sense, denotes a solution of the continuity of a part of the body, by the force of fire.

Of *burns*, physicians usually make several degrees: the first, when there are only a few pustules raised on the skin, with a redness, and a separation of the epidermis from the genuine skin.—The second when the skin is burnt, dried, and shrunk, but without any crust or scab.—The third is, when the flesh, veins, nerves, &c. are shrunk, and form a scab.

Lustitanus recommends an unguent, made of the ashes of laurel-leaves burnt, with hog's fat dropped on them, for a *burn*; or, on occasion, the unguentum populeum, with vine-leaves laid over it.—Panarole observes, that clay laid on a *burn* abates the pain; and that the brewers in Holland, use a decoction of ivy for the cure of *burns*.

Burns, however, are not only diseases, but in some cases remedies: M. Homberg observes, that in the ile of Java, the natives cure themselves of a colic, otherwise mortal, by burning the soles of their feet; and cure themselves of a panaris, by dipping their finger in boiling water several times.

Travellers relate many other cases of other diseases cured by *burning*; and we see the effects of it our selves, in horses, hounds, birds of prey, &c.

A kind of downy matter brought from the Indies, has been likewise used for the gout; applied, by *burning* it on the part affected.

M. Homberg gives us instances of two women cured, the one of a violent disease in the head and eyes, and the other of a disease in the legs and thighs, by the accidental *burning* of those parts. He adds, that *burning* may cure in three manners; either by putting the peccant humours into a greater motion, and making them take new routs; or by dissolving and breaking their viscosity; or by destroying the canals which brought them in too great quantities.

Heart-BURN. See the article **HEART**.

BURNING, the action of fire on some pabulum or fuel, whereby the minute parts thereof are torn from each other, put into a violent motion; and some of them assuming the nature of fire themselves, fly off *in orbem*, while the rest are diffipated in form of vapour, or reduced to ashes. See **FIRE**.

BURNING, or **BRENNING**, in our ancient customs, denotes an infectious disease, got in the flews, by conversing with leud women; supposed to be the same that we now call the *venereal disease*.—Whence that disease is argued to be much more ancient than the common epocha of the siege of Naples.

The chief objection against *burning* being the same with the venereal disease is, that the remedies prescribed against the former, would be ineffectual in the latter: but, it is not to be expected, the measures of the ancient physicians should be calculated for the removing of any malignity in the mass of blood or other juices, as in the modern practice; inasmuch as they looked on the disease as merely local, and the whole of the cure to depend on the removal of the symptoms: besides this, it is matter of frequent observation, that some diseases grow more violent, and others more remis in course of time: so that the remedies which might have availed for the ancient *breunning*, may now fail as to the modern *pox*.

The process for the cure, as delivered by J. Arden, chirurgeon to K. Henry IV. is thus;—*Contra incendium virgæ virilis interius ex calore & excoaratione, fiat talis syringa (i. e. injectio) lenitiva. Accipe lac mulieris masculinum nutritis, & parum saccharum, oleum viole & pistane: quibus commixtis per siringam infundatur.*

In an ancient MS. written about the year 1300, is a receipt for *breunning of the pynyl yat men clepe the apygalle*; *galle* being an old word for a running sore. And in another MS. written fifty years after, is a receipt for *burning in that part by a woman*. Simon Fish, a zealous promoter of the reformation, in his *Supplication of beggars*, presented to King Henry VIII. 1530, speaking of the Romish priests, says, "They catch the pocks of one woman, and bare "them to another; they be burnt with one woman, "and bare it to another; they catch the leproy of one "woman, and bare it to another." And Boord, a priest and physician in the same reign, begins one of his chapters of his *Breviary of health*, thus: "The 19th chapter doth "shew of the *burning* of an harlot." The same author adds, that if a man be burnt with an harlot, and do meddle with another woman within a day, he shall burn the woman he shall meddle withal: and as an immediate remedy against the *burning*, he recommends the washing the pudenda two or three times with white-wine, or else with sack and water.—In another MS. of the vocation of John Bale to the bishopric of Ossory, written by himself, he speaks of Dr. Hugh Weston (who was dean of Windfor in 1556, but deprived by cardinal Pole for adultery) thus: "At this day is leacherous Weston, "who is more practised in the art of *breach-burning*, "than all the whores of the stews.—He not long ago "brent a beggar of St. Botolph's parish.—" See **STEWES**.

BURNING-fever. See the article **FEVER**.

BURNING-glass, or **burning-mirror**, a machine whereby the sun's rays are collected into a point; and by that means their force and effect extremely heightened, so as to burn objects placed therein.

Burning-glasses are of two kinds: the first convex, called *lentes caustica*; which transmit the rays of light, and in their passage refract or incline them towards the axis; having the property of lens's, and acting according to the laws of refraction.

The second, which are the more usual, are concave; very improperly called *burning-glasses*, being usually made of metal: these reflect the rays of light, and, in that reflection, incline them to a point in their axis; having the properties of specula or mirrors; and acting according to the laws of reflection: which see under **MIRROR**, and **REFLECTION**.

The first, or convex kind, authors suppose to have been unknown to the ancients; but the latter they are generally allowed to have been acquainted with. Historians tell us, that Archimedes, by means hereof burnt a whole fleet. And though the effect related be very improbable, yet does it sufficiently prove such things were then known. The machines then used, no body doubts, were metallic and concave; and had their focus by reflexion: it being agreed, that the ancients were unacquainted with the refracted foci of convex glasses. Yet, M. de la Hire has discovered even these, in the *Clouds* of Aristophanes; where Strepsiades tells Socrates, of an expedient he had to pay his debts, by means of a round transparent stone or glass, used in lighting of fires; by which he intended to melt the bond: which in those days was written on wax. The glass here used to light the fire, and melt the wax, M. de la Hire observes, could not be concave; since a reflected focus coming from below upwards, would have been exceedingly improper for that purpose: and the old scholiast of Aristophanes, confirms the sentiment. Pliny makes mention of globes of glass and crystal, which being exposed to the sun, burnt the clothes and flesh on people's backs; and Lactantius adds, that a glass sphere, full of water, and held in the sun, lighted the fire even in the coldest weather: which incontestably proves the effects of convex glasses.

Indeed, there is some difficulty in conceiving how they should know such glasses burnt, without knowing they magnified; which it is granted they did not, till towards the close of the thirteenth century, when spectacles were first thought on. For as to those passages in Plautus which seem to intimate the knowledge of spectacles, M. de la Hire observes, they do not prove any such thing: and he solves this, by observing, that their *burning-glasses* being spheres, either solid, or full of water, their foci would be one fourth of their diameter distant from them: if then their diameter were supposed half a foot, which is the most we can allow, an object must be at an inch and a half's distance to perceive it magnified: those at greater distances do not appear greater, but only more confused, though the glass than out of it. It is no wonder, therefore, the magnifying property of convex glasses was unknown, and their *burning* one known: it is more wonderful there should be 300 years between the invention of spectacles and telescopes.

Every concave mirror, or speculum, collects the rays dispersed through its whole concavity, after reflexion, into a point or focus, and is therefore a *burning mirror*.

Hence, as the focus is there where the rays are the most closely contracted, if it be a segment of a large sphere, its breadth must not subtend an arch above eighteen degrees: if it be a segment of a smaller sphere, its breadth may be thirty degrees; which is verified by experiment.

As the surface of a mirror, which is a segment of a larger sphere, receives more rays than another of a less, if the latitude of each subtend an arch of eighteen degrees; or even more, or less, provided it be equal; the effects of the greater mirror will be greater than those of the less.

And, as the focus is contained between the fourth and fifth part of the diameter, mirrors that are segments of greater spheres *burn* at a greater distance than those which are segments of a smaller.

Since, lastly, the *burning* depends on the union of the rays; and the union of the rays on the concave spherical figure, it is no wonder, that even wooden mirrors, gilt, or those prepared of alabaster, &c. covered with gold; nay, even that those made of paper, and covered with straw, should be found to *burn*.

Among the ancients, the *burning* mirrors of Archimedes and Proclus are eminent; by one of which, the Roman ships besieging Syracuse, under the command of Marcellus, according to the relations of Zonaras, Tzetzes, Galen, Eustathius, &c. and by the other, the navy of Vitalian besieging Byzantium, according to the same Zonaras, were burnt to ashes.

Among the moderns, the most remarkable *burning* mirrors, are those of Settala, of Vilette, and Tschirnhausen, and the new complex one of Mr. Buffon. Settala, canon of Padua, made a parabolical mirror, which, according to Schottus, burnt pieces of wood, at the distance of fifteen or sixteen paces.

M. Tschirnhausen's mirror, at least, equals the former, both in bigness and effect.—The following things are noted of it in the *Acta eruditorum*. 1. Green wood takes fire instantaneously, so as a strong wind cannot ex-

tinguish it. 2. Water boils immediately, and eggs in it are presently edible. 3. A mixture of tin and lead, three inches thick, drops presently, and iron or steel-plate becomes red-hot presently, and a little after burns into holes. 4. Things not capable of melting, as stones, bricks, &c. become soon red-hot, like iron. 5. Slate becomes first white, then a black glass. 6. Tiles are converted into a yellow glass, and shells into a blackish yellow one. 7. A pumice-stone emitted from a volcano, melts into white glass: and, 8. A piece of a crucible also vitrifies in eight minutes. 9. Bones are soon turned into an opaque glass, and earth into a black one.—The breadth of this mirror is near three Leipzig ells, its focus two ells distant from it: it is made of copper, and its substance is not above double the thickness of the back of a knife.

Vilette, a French artist of Lyons, made a large mirror, which was bought by Tavernier, and presented to the king of Persia; a second, bought by the king of Denmark; a third presented by the French king to the Royal Academy; a fourth has been in England, where it was publicly exposed.—The effects hereof, as found by Dr. Harris and Dr. Desaguliers, are, that a silver six-pence is melted in 7" and $\frac{1}{2}$ "; a king George's half-penny in 16", and runs with a hole in 34". Tin melts in 3", cast iron in 16", slate in 3"; a fossil shell calcines in 7"; a piece of Pompey's pillar at Alexandria, vitrifies in the black part in 50", in the white 54"; copper ore in 8": bone calcines in 4", vitrifies in 33". An emerald melts into a substance like a turquoise stone; a diamond weighing four gr. loses $\frac{1}{4}$ of its weight: the asbestos vitrifies; as all other bodies will do, if kept long enough in the focus: but when once vitrified, the mirror can go no further with them.—This mirror is seventy-seven inches wide; and is ground to a sphere of seventy-six inches radius; so that its focus is about thirty-eight inches from the vertex. Its substance is a composition of tin, copper, and tin-glass.

Every lens, whether convex, plano-convex, or convexo-convex, collects the sun's rays, dispersed over its convexity, into a point by refraction; and is therefore a *burning glass*. The most considerable of this kind known, is that made by M. de Tschirnhausen: the diameters of his lens's are three and four feet; the focus at the distance of twelve feet, and its diameter an inch and half. To make the focus the more vivid, it is collected a second time by a second lens parallel to the first; and placed in that place where the diameter of the cone of rays formed by the first lens, is equal to the diameter of the second: so that it receives them all; and the focus from an inch and a half, is contracted into the space of eight lines, and its force increased proportionably.

Its effects, among others, as related in the *Acta Erud. Lipsiæ*, are, that it lights hard wood, even moistened with water, into a flame, instantly; that water, in a little vessel, begins to boil presently; all metals are melted; brick, pumice stone, Delph wares, and the asbestos stone, are turned into glass; sulphur, pitch, &c. melted under water: the ashes of vegetables, woods, and other matters, transfused into glass. In a word, every thing applied to its focus, is either melted, turned into calx, or into smoak; and the colours of jewels, and all other bodies, metals alone excepted, are changed by it. He observes, that it succeeds best when the matter applied is laid on a hard charcoal well burnt.

Though the force of the solar rays be here found so stupendous; yet the rays of the full moon, collected by the same *burning-glass*, do not exhibit the least increase of heat.

Further, as the effects of a *burning* lens depend wholly on its convexity, it is no wonder that even those prepared of ice produce fire, &c. A lens of that kind is easily prepared, by putting a piece of ice into a skittle, or hollow segment of a sphere, and melting it over the fire, till it accommodate it self to the figure thereof.

Nor will those ignorant of dioptrics be less surprised to see flame, and the effects thereof, produced by means of the refraction of light in a glass bubble with water. See LENS.

Wollius tells us, that an artist of Dresden made *burning* mirrors of wood, bigger than those of M. Tschirnhausen or Vilette, which had effects at least equal to any of them.—Traberus teaches how to make *burning* mirrors of leaf gold; viz. by turning a concave, laying its inside equally with pitch, and covering that with square pieces of the gold, two or three fingers broad, fastening them on, if need be, by fire. He adds, that very large mirrors may be made, of thirty, forty,

Briffonius, Modius, and others, mention a pleasant way of selling meat, used for some ages among this people: the buyer was to shut his eyes, and the seller to hold up some of his fingers; if the buyer guessed aright, how many it was the other held up, he was to fix the price; if he mistook, the seller was to fix it. This custom was abolished by Aprouius, prefect of Rome; who in lieu thereof introduced the method of selling by weight.

The French call a place set apart either for the slaughter of cattle, or exposing their flesh to sale, a *butchery*, *baucherie*. The English distinguish; calling the latter a *fish-shamble*, or *market*, the former a *slaughter-house*.—Nero built a noble edifice of this kind at *Rome*; on which occasion was struck that medal, whose reverse is a building supported by columns, and entered by a person of four steps; the legend, MAC. AVG. S. C. *Mæcellum Augusti Senatus-consulto*.

By 1 Jac. 1. c. 22. no *butcher* shall gash, slaughter, or cut any hide of any ox, bull, steer, or cow, in slaying thereof; or otherwise, whereby the same shall be impaired and hurt, on the penalty of 20*s*. for each hide so cut.

No *butcher* shall water any hide, except in June, July, and August; or offer to sale any hide which is putrid and rotten.

No *butcher* shall kill any calf, to sell, being under five weeks old.—Nor use the craft and mystery of a tanner.

BUTIER. } See the articles } *Arch-Butier*.

BUTLER'S-*Als*. } ALE.

BUTTLERAGE of *Wines*, an imposition on sale wine; brought into the land; which the king's butler, by virtue of his office, may take of every ship, viz. two shillings of every ton imported by strangers.

BUTMENTS*, in architecture, those supports or props, on, or against which the feet of arches rest.

* The word comes from the French *bouter*, to abut or terminate on any thing; or rather from *buter*, to prop.

The name *butment* is also given to little places taken out of the yard, or the ground-plot of an house, for butteries, sculleries, &c.

BUTT is used for a vessel, or measure of wine, containing two hogsheads, or 126 gallons.—Otherwise called *pipe*.

A *butt* of currants, is from fifteen to twenty-two hundred weight.

BUTT, or BUTT-End, in the sea-language, denotes the end of any plank, which joins to another on the outside of a ship, under water.

Hence, when a plank is loose at one end, they call it *springing a butt*; to prevent which, ships are usually bolted at the *butt heads*, that is, at the plank's end.

BUTTER*, a fact, unctuous substance, prepared, or separated from milk, by heating or churning it.

* The word is formed from the Greek, *βουτυρον*, a compound of *βου*, cows, and *τυρον*, cheese; q. d. cows cheese.—Some authors, out of regard to this etymon, affect to write the word *buttyr*, and *butyr*.

The way of making *butter*, in Barbary, is by putting their milk or cream into a goat's skin; suspended from one side of the tent to the other, and pressing it to and fro in one uniform direction. This quickly occasions the necessary separation of the unctuous and wheyey parts. *Shaw Trav. p. 241*.

It was late ere the Greeks appear to have had any notion of *butter*; Homer, Theocritus, Euripides, and the other poets, make no mention of it; and yet are frequently speaking of milk and cheese: and Aristotle, who has collected abundance of curiosities relating to the other two, is perfectly silent on this. Pliny tells us, that *butter* was a delicate dish among the barbarous nations; and was that which distinguished the rich from the poor.

The Romans used *butter* no otherwise than as a medicine, never as a food. Schookius observes, that it is owing to the industry of the Dutch, that there is any such thing as *butter* in the East-Indies: that in Spain, *butter* is only used medicinally, for ulcers; and adds, that the best opiate for making the teeth white, is the rubbing them with *butter*.

Cl. Alexandrinus observes, that the ancient christians of Egypt burnt *butter* in the lamps at their altars, instead of oil; and the Abyssinians, according to Godignus, still retain a practice much like it: Clemens finds a religious mystery in it.—In the Roman churches, it was

anciently allowed, during Christmas-time, to use *butter* instead of oil; by reason of the great consumption thereof other ways.

Schookius has a just volume, *de butyro & avarisane casei*; where the origin and phenomena of *butter* are handled in form: he enquires whether *butter* was known in Abraham's days, and whether it was the diet he entertained the angels with? He examines how it was prepared among the Scythians; whence arise its different colours; teaches how to give it its natural colour; how to churn it, salt it, keep it, &c.

That part of Suffolk called High-Suffolk, being a rich soil, is for a long track of ground wholly employed in dairies; and they again are famous for the best *butter*, and perhaps the worst cheese in England: the *butter* is barrelled, or often pickled up in small casks, and sold, not in London only, but sent even to the West-Indies; from whence, we are told by the British traveller, he has known it to have been brought back to England again, perfectly good and sweet, as at first.

By 13 & 14 Car. II. c. 26. no *butter* which is old or corrupt, shall be mixed or packed with that which is new and sound.—Nor any whey-*butter* be mixed or packed with *butter* made of cream.—But each sort shall be packed separately.—No *butter* shall be salted or saved with any great salt, but all with small salt.

BUTTER, *butyrum*, is also used to express several chemical substances—as, *butter* of antimony, of arsenic, of wax, of tatar, &c. on account of their form of consistence, resembling those of *butter*. See ANTIMONY, ARSENIC, WAX, &c.

BUTTING-Pillar. See the article PILLAR.

BUTTOCK of a ship is her full breadth right a-stern from the tuck upwards.—According as a ship is built, broad or narrow at the transom, she is said to have a *broad* or *narrow buttock*.

BUTTONS make an article in dress, whose form and use is too familiar to need a description.—The matter whereof they are made is various; as metal, silk, mohair, &c.

Metal BUTTONS are various; both with regard to the matter and manner of making: besides those cast in moulds, much in the manner of other small works, (see FOUNDERY) there are now made great quantities with thin plates, or leaves of gold, silver, and brass; especially of the two last.—The invention of these *buttons* being very late, as not having been set on foot before the beginning of the eighteenth century; and their structure very ingenious, though but of indifferent use, we shall here subjoin it.

Manner of making plated BUTTONS. The metal to be used being reduced into thin plates, or leaves, of the thickness intended, (either by the goldsmith or brailer) is cut into little round pieces, of a diameter proportionable to the wooden mould they are to cover: this cutting is performed with a sharp punch, on a leaden block or table.—Each piece of metal thus cut, and taken off from the plate, is reduced to the form of a *button*, by beating it successively in several spherical cavities, with a round piece of iron in form of a punchion; still beginning with the flattest cavity, and proceeding to the more spherical, till the plate have got all the relieve required: and the better to manage so thin a plate, they form ten or twelve to the cavities at once; and also boil the metal to make it more ductile.

The inside thus formed, they give an impression to the outside, by working it with the same iron punchion, in a kind of mould, like the minter's coins, engraven *en creux*, or indentedly; and fastened to the block or bench. The cavity of this mould, wherein the impression is to be made, is of a diameter and depth suitable to the form of *button* to be struck in it; each kind requiring a particular mould. Between the punchion and the plate is placed some lead, which contributes to the better taking off all the strokes of the graving; the lead, by reason of its softness, easily giving way to the parts that have relieve; and as easily insinuating itself into the trace, or engraving of the dentures.

The plate thus prepared, makes the upper part or shell of the *button*.—The lower part is formed of another plate, made after the same manner, but flatter, and without any impression. To this last, is soldered a little eye made of wire of the same metal, for the *button* to be fastened by.

The two plates are soldered together, with a wooden mould, covered with wax, or other cement, between; in order to render the *button* firm and solid: for the

B U T

wax entering all the cavities formed by the relievo of the other side, sustains it, prevents its flattening, and preserves its boss or design.—Ordinarily, indeed, they content themselves to cover the naked mould with the shell; and in this case, for the fastening, they pass a thread or gut a-crofs through the middle of the mould.

BUTTRESS, a *butment*, or mass of stone, or brick, serving to prop or support the sides of a building, wall or the like, on the outside; where it is either very high, or has any considerable load to sustain on the other side, as a bank of earth, &c.

The theory and Rules of *butresses*, or props for easing walls, are ranked among the desiderata of architecture. See **ARCH**, and **ARC-BOUTANT**.

BUTTRESS, **BUTTRICE**, or **BUTTERIS**, likewise denotes a tool, used by farriers, to pierce the sole of a horse's foot, which is overgrown; to pare the hoof; to fit the shoe, and to cut off the skirts of the sole, that overcast the shoe.

B Y Z

BY-LAWS*, **BYE-LAWS**, or **BI-LAWS**, private or peculiar orders, and regulations for the good government of a city, court, or other community, made by general consent of the members thereof; being not repugnant to the general laws of the realm.

* The word is formed from the Saxon *by*, habitation, vill, and *Laȝa*, *q. d. lex villæ*, or town-law.—They are also called *birlaws*, *byrlaws*, and *burlaws*, *bilager*, and *bellagines*.

Such is the custom in Kent of deciding controversies among neighbours about boundaries, by the feneschals, or balliffs.

In Scotland, those are called *laws of burlaw*, or *byrlaw*, which are made and determined by neighbours, elected by common consent in burlaw-courts; wherein cognizance is taken of complaints betwixt neighbour and neighbour.—The men thus chosen as judges or arbitrators are called *burlaw-men*, or *byrlaw-men*.

BYZANT. See the article **BEZANT**.

BYZANTIA blata. See the article **BLATTA**.



C, THE third letter, or second consonant of the alphabet. C, is formed, according to Scaliger, from the α of the Greeks, by retrenching the stem or upright line; tho' others derive it from the γ of the Hebrews, which has, in effect, the same form; allowing only for this, that the Hebrews, reading backwards, and the Latins, &c. forwards, each have turned the letter their own way. However, the *c* not being the same as to found with the Hebrew *Caph*; and it being certain the Romans did not borrow their letters immediately from the Hebrews, or other Orientals, but from the Greeks; the derivation from the Greek *K* is the more probable. Add, that F. Montfaucon, in his Paleographia, gives us some forms of the Greek *K*, which come very near that of our *C*; this, for instance, C ; and Suidas calls the *C*, the Roman Kappa. All grammarians agree, that the Romans pronounc'd their *g* like our *c*, and their *c* like our *k*: F. Mabillon adds, that Charles the Great was the first who wrote his name with a *C*; whereas all his predecessors of the same name wrote it with a *K*: and the same difference is observed in their coins.

C, was also a numeral letter among the Romans, signifying an hundred: according to the verse,

Non plus quam centum C litera fertur habere.

Some add, that a dash over it, made it signify an hundred thousand; but it would be hard to find an instance of this among the antients.

C is also an abbreviature. See ABBREVIATURE.

In proper names, *C*, was us'd for *Citus*; as, *C. Cæsar*, &c. Their lawyers us'd it single for *Codice* or *Consule*, and double, *CC*, for *Consulibus*.

C was also us'd in their courts, as a letter of condemnation, and stood for *condemno*; in opposition to *A*, which signified *absolvit*.

C (in Music) denotes the highest part in a thorough bass.

CABBALA,* a mysterious kind of science, delivered by revelation to the antient Jews, and transmitted by oral tradition to those of our times; serving for interpretation of the books both of nature, and scripture.

* The word is also written *Cabala*, *Cabala*, *Kabala*, *Kabala*, *Cabala*, *Cabalistica*, *Art Cabala*, and *Gabala*.—It is originally Hebrew, קבלה *Kabbalah*; and, properly signifies reception; or formed from the verb קבל *Kibel*, to receive by tradition, or from father to son; especially in the Chaldee and Rabbinical Hebrew.

Cabballa, then, primarily denotes any sentiment, opinion, usage, or explication of scripture transmitted from father to son. In this sense the word *Cabballa* is not only applied to the whole art; but also to each operation perform'd according to the rules of that art. Thus it is, R. Jac. ben Apher, surnam'd Baal Hatturim, is said to have compiled most of the *Cabballa's* invented on the books of Moses before his time.

As to the origin of the *Cabballa*: the Jews believe, that God gave to Moses on mount Sinai, not only the law, but also the explication of that law; and that Moses, after his coming down, retiring to his tent, rehears'd to Aaron both the one and the other. When he had done, Aaron standing on the right hand, his sons, Eleazar and Ithamar, were introduced to a second rehearsal: This over, the 70 elders that composed the Sanhedrim were admitted; and lastly the people, as many as pleas'd: to all which, Moses again repeated both the law and explication, as he receiv'd them from God. So that Aaron heard it four times, his sons thrice, the elders twice, and the people once. Now, of the two things which Moses taught them, the laws, and the explanation, only the first were committed to writing; which is what we have in Exodus, Leviticus, and Numbers: As to the second, or the explication of those laws, they were contented to impress it well in their memory, to teach it their children; they, to theirs, &c. Hence, the first part they call simply the law, or the written law; the second, the oral law, or *Cabballa*. Such is the original notion of the *Cabballa*.

Some Rabbins, however, pretend that their fathers receiv'd the *Cabballa* from the prophets, who receiv'd it from the angels. R. Abr. ben Dior says expressly, that the angel Raziel was Adam's Master, and taught him the *Cabballa*; that Japhiel was Shem's Master; Tiedekiel, Abraham's; Raphael, Isaac's; Pehiel, Jacob's; Gabriel, Joseph's; Meratron, Moses's; Malathiel, Elias's, &c.

Among these explications of the law, which, in reality, are little else but the several interpretations and decisions of the Rabbins on the laws of Moses, some are mystical; consisting of odd abstruse significations given to a word, or even to the letters whereof it is compos'd: whence, by different combinations, they draw meanings from scripture, very different from those it seems naturally to import. The art of interpreting scripture after this

manner, is call'd more particularly *Cabballa*: And 'tis in this last sense the word is more ordinarily us'd among us.

This *Cabballa*, call'd also *Artificial Cabballa*, (to distinguish it from the first kind, or simple tradition) is divided into three sorts:— the first, called *Gematria*, consists in taking letters as figures, or arithmetical numbers, and explaining each word by the arithmetical value of the letters whereof it is compos'd; which is done various ways.

The second is call'd *Notarikon*; and consists either in taking each letter of a word for an entire diction; as *g*, ג *בראשית* the first word of Genesis, for החיות *Yam-Tehomoth*, He created the firmament, the earth, the sea, and the deep: or in making one entire diction out of the initial letters of many; as out of these, $\text{אטא גבור לעולם אדנאי}$ *Atah-Gibbor-Leholam-Adonai*; Thou art great for ever, oh Lord; by only taking the initial letters, they form the *Cabballistic* name of God, אגלא *Agla*.

The third kind, called *Themarab*, q. d. changing, consists in changing and transposing the letters of a word; which is done various ways: 1^o. by separating them; and thus, *g*, from *Berechit*, i. e. *in principio*, they make ברא מינו עולם *i. e. ppsit fundamentum*; just as in playing with words, we sometimes separate *Sun-mus*, *Ter-minus*, or *Sus-tinea-nus*. 2^o. By transposing the letters, and ranging them in a different manner: thus, from the same word *Berechit*, they make *a-betifi*, the first of *Tzeri*; and because this is taken from the first word in the history of the creation of the world, they thence conclude, the world was created on the first day of the month *Tzeri*. 3^o. By taking one letter for another, with respect to the different relations they acquire in considering the alphabet different ways: thus, dividing the Hebrew alphabet of twenty two letters, into two parts, and taking the first of either of these moieties for the first of the other, the second for the second, &c. by this means of *Tabel*, an unknown name mention'd in Isaiah, they form *Renla*, the name of a King of Israel. Another manner of changing the letters, is by taking the alphabet two ways, first in the common way, then backwards, and changing mutually the two first letters, then the two second, &c. By this means, of לב רמי *i. e. ppsit fundam. who rise against me*, they make בשרדמי *the Chaldeans*; and thence conclude, that those God here spake of are Chaldeans. These two last kinds are also called צירוף *Association*, and *Combination*.

The *Cabballa* hitherto spoke of, may be called *Speculative Cabballa*; in opposition to the following, which may be called *practical Cabballa*.

CABBALA is also applied to the use, or rather abuse, which visionaries and enthusiasts make of the text of scripture, for discovering futurity, by the study and consideration of the combination of certain words, letters, and numbers in the sacred writings.—All the words, terms, magic figures, numbers, letters, charms, &c. us'd in the Jewish magic, as also in the hermetical science, are comprized under this species of *Cabballa*. But 'tis only the Christians that call it by this name, on account of the resemblance this art bears to the explications of the Jewish *Cabballa*: for the Jews never use the word *Cabballa* in any such sense, but ever with the utmost respect and veneration.

It is not, however, the magic of the Jews alone which we call *Cabballa*, but the word is also us'd for any kind of magic: in which sense it is, that the Abbe de Villars applies it, in his *Comte de Cabalis*; where he exposes the ridiculous secrets of the sacred *Cabballa*, as the Rosicrucian *Cabballists* call it. These suppose there are elementary people, under the name of *Sylphs*, *Gnomes*, *Salamanders*, &c. and hold, that this science introduces people into the sanctuary of nature. They pretend, the Hebrews knew these aerial substances; that they borrowed their *Cabballistic* knowledge from the Egyptians; and have not yet forgot the art of conversing with the inhabitants of the air.

CABBALISTS, a sect among the Jews, who follow and practise the *Cabballa*, or interpret scripture according to the rules of the literal *Cabballa*, above laid down. See **CABBALA**.

The Jews are divided into two general sects; the Karaites, who refuse to receive either tradition, or the talmud, or any thing but the pure text of scripture: And the Rabbinitis or Talmudists, who, beside this, receive the traditions of the antients, and follow the Talmud.

These latter are again divided into two other sects; pure Rabbinitis, who explain the scripture in its natural sense, by grammar, history, and tradition; and *Cabballists*, who to discover hidden mystical senses, which they suppose God to have couched therein, make use of the *Cabballa*, and the mystical rules and methods above-mention'd.

There are Visionaries among the Jews, who believe that Jesus Christ wrought his miracles by virtue of the myteries of the *Cabbala*. Some learned men are of opinion, that Pythagoras and Plato learn'd the *Cabbalistic* art of the Jews in Egypt; and fancy they fee evident footsteps thereof in their philosophy: others, on the contrary, say, it was the Philosophy of Pythagoras and Plato, that first furnish'd the Jews with their *Cabbala*. Be this as it will, it is certain that in the first ages of the church, most of the heretics gave into the vain notions of the *Cabbala*: particularly the Gnosticks, Valentinians, and Basilidians. Hence arose the ΑΡΡΑΞΑΣ, and the multitude of talismans, wherewith the Cabinets of the virtuosi were stock'd.

CABINET, or **CABBINET**, the most retired place in the finest apartment of a building; set apart for writing, studying, or preserving any thing very precious.

A complete apartment consists of an hall, antichamber, chamber, and *cabinet*; with a gallery on one side.

CABINS,* or **CABBINS**, in a ship, are small cells, or apartments for the officers of the ship to lie in; very narrow, and in form of armories or presses; used in several parts of the ship, particularly on the quarter deck, and on each side of the steerage.

* The word comes from the French *Cabane*, Spanish *Cabana*, or *Italian Capanna*, a little draw hut; and that from the Greek *καβανα*, a stall or manger.

CABIRIA, **KABEIPIA**, religious feasts held by the antient Greeks of Lemnos, and Thebes, in honour of the Gods *Cabiri*.

These feasts were very antient, and prior even to the time of Jupiter; who is said to have restored them: they were held by night. Children above a certain age were here consecrated; which consecration was supposed to be a preservative against all dangers of the sea, &c.

The ceremony of consecration, called *Σερωσις* or *Σερωσις*, *q. d.* enthronizing, consisted in placing the initiated youth on a throne, the priests dancing round him: the badge of the initiated was a girdle or scarf.

When a person had committed any murder, the *Cabiria* gave him an asylum.—Mourning is very particular in the proof of each of these points.

CABLE,* a thick long three strand rope, ordinarily of hemp, serving to hold ships firm at anchor, and to tow vessels in large rivers.

* The word *Cable*, comes from the Hebrew word *Cabel*, cord. Du Cange derives it from the Arabic, *Habl*, cord, or *babala*, vineire. Menage, from *Capulum*, or *Cabulum*; and that from the Greek *καβυλον*, or the Latin, *Camelus*.

The term *Cable* is sometimes also applied to the cordage used to raise mally loads, by means of cranes, wheels, and other like engines: though, in strictness, *Cable* is not to be applied to ropes of less than three Inches circumference. Every *Cable*, of whatever thickness it be, is composed of three strands; each strand of three twists; and each twist of a certain number of caburns, or threads of rope-yarn, more or less, as the *Cable* is to be thicker or smaller.

To make a *Cable*: after forming the strands, they use staves; which they first pass between the strands, that they may turn the better, and be intertwisted the more regularly together. And to prevent any entangling, a weight is hung at the end of each strand. The *Cable* being twisted as much as needs, is untwisted again three or four turns, that the rest may the better retain its state.

The number of threads each kind of *Cable* is to be composed of, is always proportioned to its length and thickness; and it is by this number of threads, that its weight and value are ascertained. A cable of three inches circumference, or 1 inch diameter, consists of 48 ordinary threads, and weighs 192 pounds; one of 10 inches circumference, of 483 threads, and weighs 1940 pounds; a *Cable* of 20 inches, of 1943 threads, and weighs 7772 pounds. The seamen say, The *Cable* is well laid, when it is well wrought, or made.

Serve the *Cable*, or plat the *Cable*, i. e. bind it about with ropes, clouts, &c. to keep it from gauling the haufe.

To splice a *Cable*, is to make two pieces fast together, by working the several strands of the rope one into another.

To coil the *Cable*, is to roll it up round in a ring; of which, the several rolls one upon another are called *Cable tire*.

Pay more *Cable*, that is, let it more out from the ship, that the boat which carries the Anchor may the more easily drop it into the sea.

Pay cheap the *Cable*, that is, put or hand it out apace.

Yer more *Cable*, that is, let more out.

When two *Cables* are spliced together, it is call'd a *shot* of a *Cable*.

Every merchant vessel, how small soever, has three *Cables*, viz. the main or maffer *Cable*, which is that of the chief anchor; the common *Cable*, and the small one. The ordinary length of the great *Cable*, is 110 or 120 fathoms or braces. Hence, at sea, **CABLE**, or **CABLE'S-LENGTH**, is also used for a measure of 120 fathom.

CABLED flutes, in architecture, such flutes as are fill'd up with raised or swelling pieces in form of *Cables*. See **FLUTING**.

CABLED, in heraldry, is applied to a cross formed of the two

ends of a ship's *Cable* — Sometimes also to a cross cover'd over with rounds of rope; more properly called a cross corded.

CABOCHED, **CABOSHED**, or **CABOSSED**, in heraldry, is where the head of a beat is cut off behind the ears, by a section parallel to the face; or by a perpendicular section: in contradistinction to coup'd; which is done by a horizontal line; besides that it is farther from the ears than *Cabosfing*.

CACAO, or **COCOA**, in natural history and commerce, a kind of nut, about the size of a moderate almond; the seed or fruit of a tree of the same name, growing in several parts of the *West-Indies*; chiefly in the provinces of Guatimala and Nicaragua, and in the Caribbe islands.

The native Mexicans call the *Cacao* tree, *Cucubua Guabmitl*; and the Spaniards, *Cacaotal*.—It resembles our cherry-tree; but is so very delicate, and the foil it grows in so hot, that to guard it from the sun, they always plant it in the shade of another tree, called mother of *Cacao*.

The fruit is enclosed in a kind of pod, of the size and figure of a cucumber; except that it begins and ends in a point. Within the pod, which is half a finger thick, is form'd a plexus of white fibres, very succulent, a little acid, and good to appease thirst. In the middle of these fibres are contain'd 10, sometimes 12, and sometimes more, as far as forty seeds, of a violet colour, and dry as acorns. Each seed, which is covered with a little bark or rind, when stripped thereof, separates into five or six unequal pieces, in the middle whereof is a kernel having a tender bud, very difficult to preserve.

Of this seed, with the addition of Vanilla, and some other ingredients, the Spaniards, and, after their example, the rest of Europe, prepare a kind of conserve, or cake; which, diluted in hot water, makes that delicious, wholesome drink, called Chocolate: for the preparation, &c. whereof, see **CHOCOLATE**.

This precious fruit, the Spaniards make so considerable a trade of, that there are some who make 5000 l. sterling, *per annum*, from a single garden of *Cacao's*. There are two kinds of *Cacao's*; the most common, which is likewise the best, is of a dark colour, bordering on red, and round: The other is called *Patlax*, which is white, larger, thicker, and flatter; its quality is defective. Some druggists, however, sell four kinds; viz. the great and little *Caracao*, and the great and little *Cacao* of the islands: these, however, may be probably reduced to the two kinds above mentioned: it being only the greatness and smallness that multiplies the names and kinds.

The *Cacao* nuts, are esteem'd by the Mexicans as anodyne; and used, eaten raw, to assuage pains of the bowels. They also procure a kind of butter or oil from them, as sweet as that of almonds, and drawn in the same manner; which is excellent for burns.

In some parts of America, the *Cacao* seeds are used by the Indians as money; twelve or fourteen, are esteem'd equivalent to a Spanish Real, or six-pence three farthings sterling.

CACHEXY,* *Καχεξια*, in medicine, an ill state or disposition of body: wherein, the nutrition is deprav'd throughout the whole habit: accompanied with a swelling, or bloating of the fleshy parts; and a paleness and lividness of complexion.

* The word is Greek; formed from *κακος*, ill, and *ἔξις*, habit or disposition.

It ordinarily arises from a debility, or foulness of the stomach or viscera; sometimes from an ulcer in the reins, in persons that have the stone, and other the like causes. The external causes are unwholesome food, frequent drunkenness, excessive study, much walking, suppression of the menfes, immoderate loss of blood, chronic fevers, obstructions, &c.

According to Boerhaave, *Cachexia* may arise either from a vitiated state of the nutritious juice, from some disorder of the vessels that are to receive it, or from a defect in the faculty that should apply it. The juices, he observes, may be depraved, either from the quality of the food; as if it be farinaceous, leguminous, fat, fibrous, sharp, aqueous, or viscous; from the want of motion; from the organs being vitiated by too much weakness, or too much strength: And these, again, may be occasioned by immoderate secretions, and evacuations of any kind, the schirrosity of some of the viscera, or the retention of something that should be secreted: And hence, a diminution of the solids, or a repletion of the liquids with things that cannot pass: Whence arise two notable ill effects of this evil; viz. a leucophlegmatia, and an anasarous dropfy.

According to the various colour, quantity, tenacity, acrimony, and fluidity of the nutritious liquor, arise also various disorders, as the effects of the *Cachexia*; *v. g.* paleness, yellowness, lividness, greenness, blackness, or redness of the skin; heaviness, windiness, palpitation of the heart and arteries increased with the least motion; crude thin urine; spontaneous watry sweats; and, at length, a leucophlegmatia and dropfy. For the vessels that receive the nutritious juice, there cannot well be assigned any universal fault; unless their too great laxity, and the disorders accruing from them, may be admitted as such. Lastly, nutrition is impeded and perverted, by a defect in the faculty that should apply it; as when the circulating force, is either too languid or too violent.

CACHU, **CACHOU**, or **CATECHU**. See the article **CATECHU**.

CACO.

CACOCYHMIA *, *Κακοχυμία*, a vicious state of the vital humours, especially of the mass of blood; arising either from a disorder of the secretions, or excretions, or from external contagion.

* The word is Greek; compounded of *κακος*, ill, and *χυμος*, juice.

Gorræus gives the name *Cacochymia* to the abundance, or excess of any ill humour; whether it be bile, pituita, or whatever, provided there be only one that thus offends in quantity; and *Pléthora* he calls the abundance or excess of all the humours together.

CACOPHONIA *, *Κακοφωνία*, in grammar and rhetoric, the meeting of two letters, or syllables, which yield an uncouth, and disagreeable sound.

* The word is Greek; compounded of *κακος*, evil, and *φωνη*, voice.

CADARI, or **KADARI**, a sect in Mahometanism, who assert free-will, attribute the actions of men to men alone, not to any secret power determining the will; and deny all absolute decrees, and predestination.

The author of this sect was Mabel ben Kaled-Al Gihoni, who suffered martyrdom for it. The word comes from the Arabic, *كادار*, *Kadara*, Power. *Ben Aun* calls the *Cadarians*, the *Magi*, or Manichees of the Mussulmen.

CADÉ, a cag, cask, or barrel; used in the book of rates for a determinate number of some sorts of fish.—Thus a cade of herrings, is a vessel containing the quantity of 500 herrings, and of sprats 1000.

CADENCE, in music, denotes a kind of close, or rest, either at the end of a song, or of some of its parts, into which it is divided as into members, or periods.

The word seems a metaphor, drawn from the dancing-school, where it properly signifies a pause, or fall from motion to rest.

A *Cadence* is properly when the parts fall, and terminate on a chord, or note, the ear seeming naturally to expect it. Regularly it is to be made on the final or dominant, though sometimes also on the mediant, or middle chord of a mode.

Cadences in singing answer nearly to points, or stops in discourse.

They are rests contrived to favour the weakness of the performers, as well as the hearers, of a musical composition. Men are not able to sustain their attention, or their voice beyond the space of two measures; even in this short interval we perceive the song to fall, and tend rapidly to a pause, or rest: the notes which introduce these pauses, are called *Cadences*, in the proper conducting and expressing of which a great part of the musicians skill depends. The chief *Cadence* or close is the Key itself, in which the bass must always conclude; the next in dignity is the fifth above, and the next to that the third. Or if the bass be sharp, the fourth or second above the key.

In modulation, *Cadences* are made on several keys, though still with some relation to the principal one; the harmony must always return to the key appropriated to the piece, and often terminate there by middle as well as final *Cadences*.

Cadences usually occur in every two measures, and always in the note which begins the measure they happen in. It requires a nice taste to distinguish the tonic note on which the *Cadence* essentially fall; for that they usually seem to fall on another note presented in the song. It is by the natural progression of the fundamental bass that we are enabled to make the discovery. As often as this bass falls a fifth, or rises a fourth, there is a *Cadence*.

In reality, this disposition imitates a close so well that when we come to the first found of this *Cadence*, we find ourselves as it were forced to fall on the other, so that it requires an extraordinary effort of the voice to sustain itself on the first, or only to fall a third. Hence it is that the first found which makes its fifth of the tonic is called its dominant, being in reality the top, or highest part of the harmonical system, and that furthest from the fundamental found: Thus *sol* is the dominant of *ut*; and *re*, of *sol*. In making a *Cadence*, the bass must always fall a fifth, or rise a fourth.

CADENCE, in the ancient music, denotes a series or succession of musical notes, in certain intervals, which strike the ear agreeably; and especially at the close of a song, couplet or stanza. In which sense, *Cadence* amounts to much the same with *Rhythmus*. Some musicians call a shake, a *Cadence*; but that is to confound terms.

CADENCE, in oratory and poetry, denotes the running of verse, or prose; otherwise called the numbers, and by the antients the *ῥυθμος*. See **RHYTHMUS**.

CADENCE, in the modern dancing, is when the several steps, and motions follow, or correspond to the notes, or measures of the music.

CADETS, the younger brothers of a family: A term naturalized in our language from the French.

At Paris, among the citizens, the *cadets* have an equal portion with the eldest: In other places, the eldest has all. According to the custom of Spain, one of the *Cadets*, in great families, takes the mother's name.

CADET also denotes a young gentleman soldier, who to attain to some knowledge in the art of war, and in expectation of preferment, chuses to carry arms as a private man in a company of Foot.

Cadet differs from volunteer, as the former takes pay, though

only that of a private man, whereas the latter serves without pay.

Formerly there were only allowed two *Cadets* in each company. In 1682, the king of France established companies of *Cadets*, wherein the young gentry were trained up to war, and taught the arts and exercises belonging thereto, as riding, fencing, mathematics, &c.

CADI *, among the Turks and Saracens, denotes an ordinary judge, who decides in all civil controversies within the district of a town, or city, though subject to appeals to superior judges.

* The word is Arabic *قاضي* or *قاضي*, *Cadi*, *q. d.* judge, formed of *ق* to judge. d'Herbelot writes it *Cadli*.

The term *Cadi* used absolutely, denotes the judge of a smaller town or village; those of cities being called *Mollas*, or *Moulas*, sometimes *Moulti-Cadis*, or *great Cadis*.

CADILESCHER, or **CADI-LESKER** *, a capital officer of justice among the Turks, answering to a chief justice among us.

* The word comes from the Arabic *Kadi*, judge, the particle *Al*, and *Aschar*, army; as being at their first institution, chiefly judges of the soldiery: Of whose crews they have still the sole cognizance. d'Herbelot writes the name *Cadli-lesker*, or *Cadli-aker*.

Each *Cadilescher* has his particular district: d'Herbelot makes two *Cadileschers* in the empire; Rycourt adds a third: with him the *Cadilescher* of Europe, or Romania is the first; that of Asia, or Anatolia the second; and that of Egypt the third.

CADIZADELITES, a sect among the Mussulmen. The *Cadizadelites* are a kind of stoics, who avoid all feasting and diversion, and affect an uncommon gravity in all they do or say.

Those of them who inhabit the frontiers of Hungary, &c. agree in many things with the christians; and drink wine, even in the fast of the Ramazan.

They read the Slavonic translation of the Bible, as well as the Alcoran. Mahomet, according to them, is the Holy Ghost, which descended on the apostles at the feast of pentecost.

CADMI, in pharmacy, a mineral substance, whereof there are two kinds, *natural* and *artificial*.

The *natural Cadmia*, again, is of two sorts; the one containing arsenick, and called cobalt; the other containing zink, called calamine, or lapis calaminaris.

The *artificial cadmia* is prepared from copper, in furnaces: Of this there are five kinds; the first called *botrytis*, as being in form of a bunch of grapes; the second, *ostracitis*, as resembling a Sea-shell; the third, *placitis*, because resembling a crust; the fourth, *caputis*, dusty; and the fifth, *calamitis*: This last hangs round certain iron rods, wherewith the matter of the copper is stirred in the furnace, which being shaken off, bears the figure of a quill, called in latin *calamus*.

The *Cadmia Botrytis* is found in the middle of the furnace, the *ostracitis* at the bottom; the *placitis* at the top; and the *caputis* at the mouth of the furnace.

This *Cadmia* is desiccative and deterfive, it is generally used in sinking ulcers; which by means hereof are brought to cicatrize. The *botrytis* and *placitis*, are also good in diseases of the eyes.

See Supplement, Articles CALAMINARIS and COBALT.

CADRITES, a kind of religious among the mahometans; whose founder was Abdul Cadri, a great philosopher and lawyer; whence they fetch their name, *Cadrites*.

They live in common, and in a kind of monasteries; which, however, if they are allowed to quit, if they request it, and to marry; on condition of their wearing black buttons on their garments, to distinguish them from the rest of the people.

In their monasteries, each Friday, they pass the greatest part of the night in running round, holding each others hand, and crying incessantly *bbat*, living, one of the names of God: One of their number plays all the time on a flute, to animate them in this extravagant dance.

CADUCEUS, or **CADUCEUM**, Mercury's rod, or sceptre; a wand entwisted with two serpents, born by that Deity as the ensign of his quality and office.

The poets attribute wondrous virtues to the *Caduceus*; as that of throwing people into a sleep, raising the dead, &c. It was also used by the antients as a symbol of peace, and concord: The Romans sent the Carthaginians a javelin and a *Caduceus*, offering them their choice, whether of war or peace.

Among that people, those who denounced war were called *sciales*, and those who went to demand peace, *Caduceatores*; because they bore a *Caduceus* in their hand.

The *Caduceus* found on medals, is a common symbol, signifying good conduct, peace, and prosperity. The rod expresses power, the two serpents prudence, and the two wings diligence.

CADUCUS morbus, in medicine; see the article EPILEPSY.

CÆCUM, in anatomy. See the article COECUM.

CÆMENT, in a general sense, any composition of a glutinous, or tenacious nature, proper to bind, unite, or keep things in cohesion.

The word is also written *Cement*, and even *Ciment*. It is formed from the latin *cementum*, of *cado*, I beat.—Tho' M. Felibien observes, what the ancient architects call'd *Cementum*, was a very different thing from our *Cement*. The name *Cement*, with

with them, stood for a kind of masonry, or manner of laying the stones; and even for the quality of the stones; as when the walls were built of rude, unequal stones. In reality, the stones were cut for such work, but not squared nor uniform: So that *Cæmenta* stood opposed to *quadrati lapides*.

Mortar, folder, glue, &c. are *Cæments*. The Bitumen brought from the Levant, is said to have been the *Cæment* used in the walls of Babylon. See BITUMEN.

Equal quantities of powder'd glass, sea-salt and iron filings, mixed with loam, make one of the hardest and most durable *Cæments* that is known. The juice of garlic, M. Perrault assures us, is a *Cæment* for broken glass and china ware.

CÆMENT, is particularly used in architecture, for a strong, binding sort of mortar, used to bind, or unite bricks or stones together, for some kinds of mouldings; or to make a block of bricks, for the carving of scrolls, capitals, &c.

It is of two sorts: The hot *Cæment*, which is the most common, is made of rosin, bees-wax, brickduſt, and chalk, boiled together. The bricks to be *cæmented* are heated, and rubbed one upon another, with *Cæment* between.

The cold *Cæment* is less used; it is made of cheshire cheefe, milk, quick lime, and whites of eggs.

CÆMENT, is also used among goldsmiths, engravers, jewellers, &c. for a composition of fine brickduſt, well sifted, rosin, and bees-wax; in use among those artificers to keep the metals to be engraved, or wrought on, firm to the block, &c. as also to fill up what is to be chiselled.

CÆMENT, in chemistry, is a compound mass, or saline powder, used for the purifying of gold, and consuming the impurer metals mix'd therewith.

CÆMENTS are prepared of such salts and other ingredients, as by their acrimony corrode and separate the silver, copper, or other matters from the body of gold. Some authors make but two kinds of *Cæments*, *common* and *royal*. The first made of brickduſt, nitre, and verd'grease; the second of sal gemmæ and armoniac, each one part; two parts of common salt, and four of bole; the whole reduced into a paste with urine. But many other compositions are given by le Mort, le Febure and others. Paracelsus has a book express'd on the several kinds of *Cæments*. See Supplement, article CEMENT.

CÆMENTATION, a manner of purifying gold from other metals, by means of *Cæment*.

It is performed thus: Thin plates, or laminae, are stratified in a crucible with the royal *cæment*; the crucible is cover'd up, and encompassed with fire for 10 or 12 hours, till being thus calcined, the salts have imbibed and consumed the impurities of the gold. This method of refining is much inferior to that by means of antimony; in regard, the salts, if not sufficiently corrosive, leave other metals remaining with the gold; and if too corrosive and acrimonious, they frequently eat away the gold itself. See REFINING.

CÆSAR, among the Romans, was a long time used for the heir intended, or presumptive of the empire; as king of the Romans is now used for that of the German empire.

Thus Constantius Chlorus, and Galerius were proclaimed *Cæsars* by Diocletian and Maximian; Licinius by Galerius; Constantine the great, by Constantius; Constantine the younger, Constantius and Constant, by their father Constantine; and Junius Gallus and Julian, by Constantius.

The *Cæsars* were a kind of adjuncts or associates of the empire, *Participes imperii*. They wore the imperial mantle, purple, and diadem, and walked with other marks of the sovereign dignity: They were created like the emperors, by putting on the purple robe.

The dignity of *Cæsar* remained the second of the empire, till Alexius Comenus having erected Nicephorus Melissenus *Cæsar* by contract; and it being necessary to confer some higher dignity on his own brother Isaacus, he created him Sebastocrator, with the precdency over Melissenus, ordering that in all acclamations, &c. Isaacus Sebastocrator should be named the second, and Melissenus *Cæsar* the third.

The title took its rise from the cognomen, or surname of the first emperor, C. Julius *Cæsar*, which by a decree of the Senate all the succeeding emperors were to bear. Under his successor, the appellation Augustus being appropriated to the emperors, in complement to that prince, the title *Cæsar* was given to the second person in the empire, though it still continued also to be given to the first: And hence the difference between *Cæsar* used simply, and *Cæsar* with the addition of Imperator Augustus.

Authors are divided as to the origin of the word *Cæsar*, the cognomen of the Gens Julia: Some after Servius, derive it from *Cæsaries*, head of hair; urging, that the first who bore it, was distinguished by his fine head of hair, which occasioned the title. The more common opinion is, that the word *Cæsar* comes à *cæso matris Utero*; because his mother's womb was cut open to give him birth.

Others derive it from hence, that the first who bore the name killed an elephant in battle, à *Cæso Elephante*, which in the Mauritian tongue is called *Cæsar*. This opinion Bircherodius supports on the credit of an ancient medal, whereon is seen an elephant with the word CÆSAR.

CÆSARIAN Section, the operation of extracting the Fœtus from the mother, whether living or dead, by an incision through the abdomen into the Uterus. See DELIVERY, &c.

This is sometimes also denominated the *Cæsarian* birth, Partus *Cæsareus*; by the Greeks, *ὄρετροτομία*, or *παρτοβασία*.

It appears from experience, that wounds in the muscles of the Epigastrum, or Peritonæum, and those in the matrix, are not mortal; so that the belly of the mother may be sometimes opened to give passage for the child: But then it is not without great danger; on which account, this operation is very rarely practised, except on women newly dead. Those brought into the world in this manner, are called *Cæsares*, and *Cæsiones*, à *cæso matris Utero*; as were C. Julius Cæsar, Scipio Africanus, Manlius, and our Edward 6.

CÆSTUS*, a large leathern gantlet, loaded with lead, used in the combats, or exercises of the ancient Athlete.

* It was called *Cæstus*, à *cædendo*, from *cædo* to strike, or beat.

Calepine says, it was a kind of a club with leaden balls hanging from it, suspended by leathern thongs: But he was mistaken, it being only a leathern thong studded with nails of lead or iron; part of it was twisted round the hand and arm, to prevent their being broke or dislocated.

CÆSURA, in the ancient poetry, is when in the scanning of a verse, a word is divided, so as one part seems cut off, and goes to a different foot from the rest, e. g.

Menti | ri no | li num | quam men | dacia profunt.

Where the Syllables *ri*, *li*, *quam*, and *men* are *Cæsures*.

CÆSURA, more properly denotes a certain agreeable division of the words, between the feet of a verse; whereby the last syllable of a word becomes the first of a foot.

As in—*arma virumq; Cano Troje qui primus ab oris.*

where the syllables *no* and *je* are *Cæsures*.

CÆSURA, in the modern poetry, denotes a rest, or pause towards the middle of a long Alexandrine verse; by which the voice and pronunciation are aided, and the verses as they were divided into two hemisticks.

In Alexandrine verses, of 12 or 13 syllables, the *Cæsura* must always be on the sixth; in verses of 10 on the fourth; and in those of 12 on the sixth: Verses of eight syllables must not have any *Cæsura*.

CÆTERIS Paribus, a latin term, in frequent use among mathematical, and physical writers.

The words literally signify, *the rest*, or *the other things being alike, or equal*, which expresses pretty nearly their meaning as a term.

Thus, we say, the heavier the bullet, *cæteris paribus*, the greater the range, i. e. by how much the bullet is heavier, if the length and diameter of the piece, and the quantity and strength of the powder be the same, by so much will the utmost range or distance of Carriage of a piece of ordnance be greater.

Thus also, in a physical way, we say, the velocity and quantity of blood circulating in a given time, through any section of an artery, will, *cæteris paribus*, be according to its diameter, and nearness to, or distance from the heart.

CAIMACAN*, or CAIMACAM, a dignity in the Ottoman empire, answering to that of lieutenant, or vicar among us.

* The word is composed of the two Arabic words, *Caim machum*, q. d. he who holds the place, or discharges the function of another.

There are usually two *Caimacans*; one resides at Constantinople, who is the governor thereof: the other attending the grand vizir, in quality of his lieutenant.—Sometimes there are three *Caimacans*; one constantly attending the grand signior, another the grand vizir, and a third constantly at Constantinople; who examines affairs of policy, and regulates them in great measure.

The *Caimacan* that attends the vizir, only officiates when at a distance from the grand signior; his function ceasing, when the vizir is with the sultan. The *Caimacan* of the vizir is his secretary of state, and the first minister of his council.

CAINITES, or CAINIANS, a sect of ancient hereticks, who paid extraordinary honours to those persons represented in scripture as the worst of mankind; so called from Cain, whom they esteemed their patriarch, and the chief object of their veneration. The *Cainites* were a branch of the gnostics: they held, that Cain and Eſau, Lot, and those of Sodom, were born of a most eminent celestial virtue; that Abel, on the contrary, was born of a virtue much less eminent: to Cain, and others of the same order, who, according to them, had a mighty knowledge of all things, they associated Judas, whom they held in so much esteem, that they had a book among them called the gospel of Judas. S. Epiphanius relates, and at the same time refutes, their errors.

CALAMINARIS Lapis, CALAMIN Stone, a kind of fossil of some use in medicine, but of more in foundry; being used to make copper yellow, i. e. to convert it into brass. It is either of a brownish colour, as that of Germany, and England; or reddish, as that about Liege, and in some parts of France; which is accounted the best, because turning yellow by calcination. It is dug out of mines, usually in small pieces; having always eyes, sometimes veins, of lead in it; though it be not always found in lead-mines.—We have mines of *Calamin* at Wrington in Somersetshire, and elsewhere. It is generally dug in barren rocky ground; its courses running, usually, at 6 o'clock, as they call

call it, *i. e.* from east to west; sometimes at 9, and sometimes at 12, or perpendicular, which is accounted the best.

When dug, it is washed, or budded, as they call it, in a running water, which carries off the impure and earthy parts; leaving the lead, *Calamine*, and sparry parts at bottom: They then put it in a sieve, and shaking it well in water, the lead mixed with it links to the bottom, the sparry parts get to the top, and the *Calamine* lies in the middle: Thus prepared, they bake it in an oven four or five hours; the flame being so contrived as to pass over, and so to heat and bake the *Calamine*; stirring and turning it all the while with iron rakes. This done, they beat it to powder and sift it; picking out of it what stones they find: And thus it is fit for use.

For the manner of applying *Calamine* in the preparation of Brass: See BRASS.

Besides the two natural *Calamines*, this and Cobalt, there are two artificial ones: The best is that called *pompholyx*, the other *tutty*. *Calamine* is of some medicinal virtue, being astringent, deicative, and detensive; and is much used for taking off films from the eyes of horses, &c. See Supplement, article CALAMINARIS.

CALAMITA, in pharmacy, a term sometimes used for styrax, because antiently put up in canes, *Calami*, to preserve it. See Supplement, article CALAMITA.

CALAMUS Aromaticus, in pharmacy, a spicy, bitterish root, produced by a peculiar kind of water plant, growing in the Levant, and even in several parts of England; it is about the thickness of a goose-quill, and is much used as a cephalic, and stomachic; especially against complaints arising from a cold, weak stomach.

The *Calamus Aromaticus* is the same with what is otherwise denominated *Acorus*.

It is also called *Calamus odoratus*, and *Calamus amarus*; sometimes *Calamus vernus*, or *officinalis*, to distinguish it from another sort called *adulterinus*: In English, it is called the *sweet cane*, or *sweet-smelling flag*.

The best is that which is greyish without and reddish within, its pulp white, and taste somewhat bitter; but its leaves as well as roots, sweet-scented.

CALAMUS Scriporius, in anatomy, is a dilatation of the fourth ventricle of the brain; so called from its figure, which resembles that of a quill. See BRAIN.

CALATRAVA, a military order, instituted in 1158, by Sancho III. king of Castile, on the following occasion: The Moors going to attack the little city *Calatrava*, and the templars who held it, surrendering it up to the king, on a suspicion of their inability to defend it, Diego Velasquez, a Cistercian monk, but a man of quality, persuaded Raimond abbot of Fitero, a monastery of Cistercians, to beg *Calatrava* of the king. He obtained it; and Raimond and Diego put themselves in it; being followed by a great number of people who joined them out zeal, for the defence of *Calatrava*. The Moors abandoning the enterprize, many of those who came to the defence of the city, entered the order of the Cistercians; and that under a habit more fit for military than monastic exercises. Accordingly they began to make excursions on the Moors; and this was the rise of the order of *Calatrava*.

The first grand master was Garcias; under whose government the order was confirmed by Alexander III. in 1164. In 1489, Ferdinand and Isabella, with the consent of pope Innocent VIII. reunited the grand mastership of *Calatrava* to the Spanish crown: So that the kings of Spain are now become perpetual administrators thereof.

The knights bear a cross gules, fleury with green, &c. Their rule and habit was originally that of the Cistercians; but their dress was a little shortened on account of their exercises: And in process of time they were permitted a secular habit.

CALCANEUM, or CALCANEUS, in anatomy, the same as Calx, Os Calcis, Calcas, or the heel-bone.

It lies under the astragalus, to which it is articulated by ginglymus; behind it is a large protuberance, which makes the heel, and into which the Tendo Achillis is inserted.

CALCANTHUM, in mineralogy, see the article CHALCANTHUM.

CALCEDONY*, *Lapis CALCEDONIUS*, one of the lowest prized among precious stones; diversified with various colours, partly transparent, and partly opaque.

* Salmasius derives the word by corruption from *Carcedonius*; taking the modern *Calcedony* to be the same with the *Lapis Carcedonius* of the antients.

The *Calcedony*, or *Calcidony*, nearly resembles the common agate, and is reputed a species thereof: Its colour is a misty grey, clouded with blue, yellow, or purple. It is supposed to be the white agate of the antients; though we sometimes find pieces of it blackish.

It is very fit for the graver; and much used, either to engrave arms, &c. upon, as being harder and preferable to crystal, if good, or to paint them on the backside. In some parts, vases, cups, religious beads, &c. are made thereof. The clearest and best is that with a pale cast of blue.

Bellonius says, it is so common among the Turks, that it serves them for threshing their corn; but he seems to be mistaken.

Neri shews how to make artificial *Calcedonies* of the colour of agate and oriental jaspers. See Supplement, article CALCEDONY.

CALCEDONIUS is also a term used by the jewellers, for a defect in some precious stones; when, in turning them, they find white spots, or stains, like those of the *Calcedony*.

This defect is frequent in granates and rubies. The Lapidaries usually remedy it by hollowing the bottom of the stone.

CALCINATION, the act of calcining any matter; *i. e.* of reducing it into a calx, or very subtil white powder, by fire.

Calcination, sometimes also called *chemical Pulverization*, is the next degree of the power of fire beyond that of fusion: For when fusion is longer continued, not only the more subtil particles of the body itself fly off, but the particles of fire do likewise insinuate themselves in such multitudes, and are so dispersed and blended throughout its whole substance, that the fluidity which was first caused by the fire, can no longer subsist. From this union arises a third kind of body, which being very porous and brittle, is easily reduced to powder. For the fire having penetrated every where into the pores of the body, the particles are both hindered from mutual contact, and divided into minute atoms; so that they are easily reducible into the finest powder.

CALCINATION, in a more extensive sense, includes also the solution of metalline bodies by corrosive matters.

In this sense, *Calcination* is divided into *actual*, and *potential*.

Actual CALCINATION, is that effected by actual fire, of wood, coals, or other fuel, raised to a certain heat, according to the nature of the substance to be calcined.

Actual Calcination, is subdivided into *incineration*, and *reverberation*; to this head also belongs the *extinction* of things ignited.

Potential CALCINATION, is that procured by potential fire, *viz.* by salts, sulphurs and other drugs, which have, as it were, the force of fire; as strong waters, corrosive spirits, &c.

Gold is calcined by a reverberatory fire, with mercury, and sal armoniac. Silver with common salt and alkali salt. Copper with salt and sulphur; iron with sal armoniac and vinegar; tin with antimony, lead and sulphur; mercury with aqua fortis: This last also, as well as most other minerals, calcines with fire alone, without any other ingredient. See Supplement, article CALCINATION.

CALCULATION, the act of computing several sums, by adding, subtracting, multiplying, or dividing. See ARITHMETIC.

An error in *Calculation* is never protected or secured by any sentence, decree, &c. In stating accounts there is always understood, *salvo errore calculi*.

The word *Calculus* is used in this sense, in allusion to the practice of the antients, who used *Calculi* or little stones, in making computations, in taking suffrages, and in keeping accounts, &c. as we now use counters, figures, &c.

CALCULATION is more particularly used to signify the computations in astronomy and geometry, for making tables of logarithms, ephemerides, finding the times of eclipses, &c.

CALCULATION of Clock and Watch-work. See CLOCK and WATCH-WORK.

CALCULUS*, in medicine, the disease of the stone in the bladder, or kidneys.

* The term is pure latin, and signifies, literally, a little pebble.

The *Calculus* in the bladder is called *Lithiasis*; and in the kidneys, *Nephritis*.

CALCULUS Literalis, or *Literal CALCULUS*, is the same with specious arithmetick; so called, from its using the letters of the alphabet: In contradistinction to numeral arithmetic, which uses figures.

In the *literal Calculus*, given quantities are expressed by the first letters, *a b c d*; and quantities sought by the last *x y z*, &c. Equal quantities are denoted by the same letters.

CALCULUS Differentialis, is a method of differencing quantities; or of finding an infinitely small quantity, which being taken infinite times, shall be equal to a given quantity: Or, it is the arithmetick of the infinitely small differences of variable quantities.

The foundation of this *Calculus*, is an infinitely small quantity, or an infinitesimal, which is a portion of a quantity incomparable to that quantity, or that is less than any assignable one; and therefore accounted as nothing; the error accruing by omitting it being less than any assignable one, *i. e.* less than nothing. Hence two quantities, only differing by an infinitesimal, are reputed equal.

The better to conceive the nature of an infinitesimal, suppose, that in measuring the height of a mountain, while you are looking through the sights, the wind blows off the smallest grain of dust; the height of the mountain is, then, less by the diameter of the dust than before: But as the mountain is still found of the same height, whether the dust be there or not, its diameter has nothing to do in the present case; and passes for nothing, *i. e.* is infinitely small. Thus, in astronomy, the diameter of the earth is an infinitesimal, in respect of the distance of the fixed stars: And the same holds in abstract quantities.

titles. The name infinitesimal, therefore, is merely relative, and involves a relation to another quantity; and does not denote any real ens or being.

Now infinitesimals are called *differentials*, or differential quantities, when they are considered as the differences of two quantities. Sir Isaac Newton calls them *moments*; considering them as the momentary increments of quantities; v.g. of a line generated by the flux of a point; or of a surface by the flux of a line.

The *differential Calculus*, therefore, and the doctrine of fluxions are the same thing under different names; the former, given by M. Leibnitz, and the latter by Sir Isaac Newton: each of whom lay claim to the discovery.

There is, indeed, a difference in the manner of expressing the quantities, resulting from the different views wherein the two authors consider the infinitesimals; the one as moments, the other as differences: Leibnitz, and most foreigners, express the differentials of quantities by the same letters as variable ones, only prefixing the letter *d*; thus the differential of *x* is called *dx*; and that of *y*, *dy*: Now *dx* is a positive quantity, if *x* continually increase; negative if it decrease.

The English, with Sir Isaac Newton, instead of *dx*, write (with a dot over it) for *dy*, &c. which foreigners object against, on account of that confusion of points, which they imagine arises, when differentials are again differenced; besides, that the printers are more apt to overlook a point than a letter.

Stable quantities being always expressed by the first letters of the alphabet *da = a*, *db = b*, *dc = c*; wherefore *d(x + y - a) = dx + dy*, and *d(x - y + a) dx - dy*. So that the differencing of quantities is easily performed, by the addition or subtraction of their compounds.

To difference quantities that multiply each other; the rule is, first, multiply the differential of one factor into the other factor, the sum of the two factors is the differential sought: thus, the quantities being *xy*, the differential will be *x dy + y dx*, i. e. *d(xy) = x dy + y dx*. Secondly, if there be three quantities mutually multiplying each other, the factum of the two must then be multiplied into the differential of the third: thus, suppose *vx y*, let *vx = t*, then *vxy = ty*; consequently *d(vxy) = t dy + y dt*: But *dt = v dx + x dv*. These values, therefore, being substituted in the antecedent differential, *t dy + y dt*, the result is *d(vxy) = vx dy + vy dx + x y dv*. Hence it is easy to apprehend how to proceed, where the quantities are more than three.

If one variable quantity increase, while the other *y* decreases, it is evident *y dx - x dy* will be the differential of *xy*.

To difference quantities that mutually divide each other: The rule is, first, multiply the differential of the divisor into the dividend, and, on the contrary, the differential of the dividend into the divisor; subtract the last product from the first, and divide the remainder by the square of the divisor; the quotient is the differential of the quantities mutually dividing each other. See *FLUXIONS*.

CALCULUS Integralis, or Summatorius, is a method of integrating, or summing up moments, or differential quantities; i. e. from a differential quantity given, to find the quantity from whose differencing the given differential results.

The *integral Calculus* therefore, is the inverse of the differential one: Whence the English, who usually call the differential method, *fluxions*, give this *Calculus*, which ascends from the fluxions, to the flowing or variable quantities; or, as foreigners express it, from the differences to the sums; by the name of the *inverse method of fluxions*. See *FLUXIONS*.

Hence, the integration is known to be justly performed, if the quantity found according to the rules of the *differential Calculus*, being differenced, produce that proposed to be summed. See *SUMMATORY Calculus*.

Suppose *f* the sign of the sum, or integral quantity; then *f y dx* will denote the sum, or integral of the differential *y dx*. To integrate, or sum up a differential quantity: It is demonstrated, first, that *f dx = x*: Secondly, *f(dx + dy) = x + y*; thirdly, *f(x dy + y dx) = xy*; fourthly, *f(mx^{m-1} dx - x^m) = xm*; fifthly, *f(xⁿ) = xⁿ⁺¹ / (n+1)*; sixthly, *f(y dx - x dy) = y² - x²*.

Of these the fourth and fifth cases are the most frequent; wherein the differential quantity is integrated, by adding a variable unity to the exponent, and dividing the sum by the new exponent multiplied into the differential of the root; v.g. the fourth case, by *m - (1 + 1) dx*, i. e. by *m dx*.

If the differential quantity to be integrated, do not come under any of these formula's, it must either be reduced to an integrable finite, or an infinite series, each of whose terms may be summed.

It may be here observed, that, as in the analysis of finites, any quantity may be raised to any degree of power; but *vice versa*, the root cannot be extracted out of any number required: So in the analysis of infinities, any variable or flowing quantity may be differenced; but, *vice versa*, any differential cannot be integrated. And as in the analysis of finites, we are not yet arrived at a method of extracting the roots of all equations; so neither has the *integral calculus* arrived at its perfection: And as in the

former we are obliged to have recourse to approximation; so in the latter we have recourse to infinite series, where we cannot attain to a perfect integration. See *SERIES*.

CALCULUS Exponentialis, is a method of differencing exponential quantities, or of finding and summing up the differentials or moments of exponential quantities; or at least bringing them to geometrical constructions.

By exponential quantity, is here understood a power, whose exponent is variable; v.g. *x^a a^x*, where the exponent *x* does not denote the same in all the points of a curve, but in some stands for 2, in others for 3, in others for 5, &c.

To difference an exponential quantity: there is nothing required but to reduce the exponential quantities to logarithmic ones; which done, the differencing is managed as in logarithmic quantities:—Thus, suppose the differential of the exponential quantity *x y* required, let

$$\frac{x = z}{\text{Then will } y/x = lz}$$

$$\frac{lx dy + y dx : x = dz : z}{z lx dy + zy dx : x = dz}$$

That is, $x^y lx dy + y x^{y-1} dx = dx x dz$.

CALEFACTION, a school term for the action of fire in heating a body: or the impulse which the particles of a hot body impress on other bodies around.

The word is particularly used in pharmacy; where *Calcraftio* is distinguished from *Cocctio*; the first being applied, where the thing is only heated without boiling.

CALENDAR*, **CALENDARIUM**, a distribution of time, accommodated to the use of life; or a table, or almanack, containing the order of days, weeks, months, feasts, &c. happening throughout the year. See *TIME*, *YEAR*, *MONTH*, *FEAST*, &c.

* It is called *Calendar* from the word *Calendæ*, antiently wrote in large characters at the head of each month. See *CALENDAS*.

The *Roman Calendar*, which continues still in use, owes its origin to Romulus; but it has undergone various reformations since his time. That legislator distributed time into several periods, for the use of the people under his command: But as he was much better versed in matters of war than of astronomy, he only divided the year into ten months; making it begin in the spring, on the first of March; imagining the sun made his course thro' all the seasons in three hundred and four days.

Romulus's *Calendar* was reformed by Numa, who added two more months, January and February, placing them before March: So that his year consisted of three hundred fifty-five days, and begun on the first of January. He chose, however, in imitation of the Greeks, to make an intercalation of forty-five days, which he divided into two parts; intercalating a month of twenty-two days at the end of each two years; and at the end of each two years more, another month of twenty-three days; which month, thus interposed, he called *Marcedonius*, or the intercalary February.

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

The *Roman*, called also *Julian Calendar*, from its reformer Julius, is disposed into quadriennial periods; whereof the three first years, which he called *Communes*, consist of three hundred sixty-five days; and the fourth, *Bissextile*, of three hundred sixty-six; by reason of the six hours, which in four years make a day, or somewhat less; for in one hundred thirty-four years, an intercalary day is to be retrenched. On this account it was, that pope Gregory XIII. with the advice of Clavius and Cæconius, appointed that the hundredth year of each century should have no Bissextile, excepting each fourth century: That is, a subtraction is made of three bissextile days in the space of four centuries; by reason of the eleven minutes wanting in the six hours whereof the bissextile consists. See *BISSEXTILE*. This reformation of the *Calendar*, or the new stile, as we call it, commenced on the fourth of October, 1582, when ten days were thrown out at once; so many having crept

into the computation since the time of the council of Nice, in 325; by the defect of eleven minutes.

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

In this *Calendar*, the vernal equinox is supposed to be fixed to the 21st day of March; and the cycle of 19 years, or the golden numbers, constantly to indicate the places of the new and full moons; yet both are erroneous. And hence arose a very great irregularity in the time of Easter. To shew this error the more apparently, let us apply it to the year 1715: in this year, then, the vernal equinox falls on the 10th of March; and therefore comes too early by 11 days. The paschal full moon falls on the 7th of April; and therefore too late, with regard to the cycle, by three days. Easter, therefore, which should be on the 10th of April, will be that year on the 17th. The error, here, lies only in the metempsychosis, or post-position of the moon, through the defect of the lunar cycle. If the full moon had fallen on the 11th of March, Easter would have fallen on the 13th of March: and therefore the error arising from the anticipation of the equinox, would have exceedingly augmented that arising from the post-position. These errors, in course of time, were so multiplied, that the *Calendar* no longer exhibited any regular Easter. Pope Gregory XIII. therefore, by the advice of Aloysius Lilius, in 1582, threw 10 days out of the month of October, to restore the equinox to its place, *viz.* the 21st of March; and thus introduced the form of the Gregorian year, with such a provision, as that the equinox should be constantly kept to the 21st of March. The new moons and full moons, by advice of the same Lilius, were not to be indicated by golden numbers, but by epacts. The *Calendar* however is still retained in England, without this correction. Whence there is a difference of 11 days between our time and that of our neighbours.

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

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

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

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

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

Construction of a CALENDAR, or Almanack. 1^o. Compute the sun's and moon's place for each day of the year; or take them from Ephemerides. 2^o. Find the dominical letter, and by means thereof, distribute the *Calendar* into weeks. 3^o. Compute the time of Easter, and thence fix the other moveable feasts. 4^o. Add the immoveable feasts, with the names of the martyrs.

5^o. To every day add the sun's and moon's place, with the rising and setting of each luminary; the length of day and night; the crepuscula, and the aspects of the planets. 6^o. Add, in the proper places, the chief phases of the moon. And the sun's entrance into the cardinal points; *i. e.* the solstices and equinoxes; together with the rising and the setting, especially heliacal, of the planets, and chief fixed stars. Means for each whereof, will be found under the proper heads.

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

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

Geloban CALENDAR, is a correction of the Persian *Calendar*, made by order of sultan Galeleddan, in the 467th year of the Hegira: of Christ 1389.

CALENDAR, is also used for the catalogue, or fasti, antiently kept in each church, of the saints, both universal, and those particularly honoured in each church; with their bishops, martyrs, &c. *Calendars*, are not to be confounded with martyrologies: for each church had its peculiar *Calendar*; whereas the martyrologies regarded the whole church in general: containing the martyrs and confessors of all the Churches. From all the several *Calendars* was formed one martyrology: so that martyrologies are posterior to *Calendars*. See MARTYROLOGY.

There are still some of these *Calendars* extant; particularly a very antient one of the church of Rome, made about the middle of the IVth century: comprehending also the festivals both of the heathens and christians, which were then very few in number. F. Mabillon has also printed the *Calendar* of the church of Carthage; made about the year 483. The *Calendar* of the church of Ethiopia; and that of the Coptes, published by Ludolphus seem to have been made after the year 760. The *Calendar* of the Syrians, printed by Genebrard, is very imperfect: that of the Muscovites, published by F. Papebroch, in most respects agrees with that of the Greeks, published by Genebrard. The *Calendar* published by Dom. d'Achery, under the title of *The solar year*, is no more than the *Calendar* of the church of Atlas. The *Calendar* published in 1687, at Augsburg, by Beckius, is apparently that of the antient church of Augsburg, or rather Strasbourg, wrote towards the close of the 10th century. The Mosarabic *Calendar*, still used in the five churches of Toledo, the Ambrosian of Milan, and those of England, before the reformation; have nothing in them but what is found in those of the other western churches; *viz.* the saints honoured throughout, and those peculiar to the church where they are used.

CALENDER,* a machine used in the manufactories, for pressing certain stuffs, silks, and even linens; to make them smooth, even, and glossy: it is also used for watering, or giving the waves to tabbies and mohairs.

* The word is formed from the French *Calandre*, or Spanish *Calandra*, which signify the same; and which some derive further from the Latin *Cylindrus*; in regard the whole effect of the machine depends upon a cylinder. Borel derives the name from that of a little bird, of the swallow kind; in regard of the agreement between the feathers of the bird, and the impression of the machine.

The *Calendar* consists of two large wooden rollers, round which the pieces of stuff are wound: these are put between two large close polished planks of wood; the lower serving as a fixed base; and the upper moveable, by means of a skrew like that of a crane; with a rope, fastened to a spindle which makes its axis: this upper part is of a prodigious weight, sometimes fifty or sixty thousand pound. It is this weight that gives the polish, and makes the waves on the stuffs about the rollers, by means of a shallow indenture or engraving cut in it. The rollers are taken off, and put on again, by inclining the machine.

CALENDIS, CALENDÆ,* *Kalendas*, in the Roman chronology, the first day of every month.

* The word is formed from the Latin, *Calo*, or rather, Greek, *καλο*, I call, or proclaim; by reason, before the publication of the Roman Fasti, it was one of the offices of the Pontifices to watch the appearance of the new moon, and give notice thereof to the Rex Sacrificulus; upon which a sacrifice being offered, the Pontiff summoned the people together in the capitol; and there with a loud voice proclaimed the number of *Calends*, or the day whereon the noons would be; which he did by repeating this formula, as often as there were days of *Calends*, *Calo Jano Novella*. Whence the name *Calendæ* was given thereto, from *Calo*, *Calare*. This is the account given by Varro. Plutarch, and after him Gaza, derives the word from *Clam*, *Quia Jano Calendæ clam fit*. But this is far-fetched. Others derive the appellation hence, that the people being convened on this day, the pontiff called, or proclaimed the several feasts or holy days in the month; a custom which continued no longer than the year of Rome 450; when C. Flavius, the Curule *Ædile*, ordered the Fasti, or *Calendar*, to be set up in publick places, that every body might know the difference of times, and the return of the festivals.

The *Calends* were reckoned backwards, or in a retrograde order: thus, *v. g.* the first of May being the *Calends* of May, the last, or thirtieth of April, was the *Præidæ Calendarum*, or second of the *Calends* of May; the twenty ninth of April, the third of the *Calends*, or before the *Calends*: and so back to the thirteenth, where the *ides* commence; which are, likewise, numbered invertedly to the fifth, where the *nones* begin; which are numbered after the same manner to the first day of the month, which is the *Calends* of April. See *NONES*, and *IDES*. The rules of computation by *Calends*, are included in the following verses.

*Prima dies mensis cuiusque est diæta Calendæ:
Sex majus Nonas, October, Julius, & Mars;
Quatuor at reliqui: habet Idus quilibet Osto.
Inde dies reliquos omnes die esse Calendaris;
Quas retro numerans dices a mense sequentis.*

To find the day of the *Calends* answering to any day of the month we are in, see how many days there are yet remaining of the month, and to that number add two: for example; suppose it the twenty-second of April; it is then the tenth of the *Calends* of May. For April contains thirty days; and twenty-two taken from thirty, there remains eight; to which two being added, the sum is ten.

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

CALENTURE, an inflammatory fever, frequent at sea, attended with a delirium; wherein the patients imagine the sea to be green fields; and, if not prevented, will leap over-board: which way they are frequently lost. See *Supplement*, article *CALENTURE*.

CALIBER, or *CALIPER*, in a general sense, notes the extent of any round thing in thickness, or diameter.

In which sense we say, a column is of the same *Caliber* as another, when they are both of the same diameter.

CALIBER, more particularly denotes the bore, or width of a piece of ordnance, or other fire-arms; or the diameter of the mouth thereof; or of the ball it carries.

The *Caliber* is the rule by which all the parts of a cannon or a mortar, as well as of its carriage, are proportioned.

CALIBER-Compasses, a sort of *Compasses* made with arched legs, to take the diameter of round, or swelling bodies.

Caliber-compasses, are chiefly used by gunners, for taking the diameters of the several parts of a piece of ordnance, or of bombs, bullets, &c. Their legs are therefore circular, and move on an arch of brass, whereon are marked the inches, and half inches; to show how far the points of the *Compasses* are opened asunder. Some are also made for taking the diameter of the bore of a gun or mortar.

The gaugers also sometimes use *Calibers*, to embrace the two heads of any cask, in order to find its length.

The *Calibers* used by carpenters and joiners, is a piece of board notched triangular-wise in the middle for the taking of measure.

CALIBER, or *CALIBER-Rule*, is an instrument, wherein a right line is so divided, as that the first part being equal to the diameter of an iron or leaden ball of one pound weight, the other parts are to the first, as the diameters of balls of two, three, four, &c. pounds, are to the diameter of a ball of one pound. The *Caliber* is used by engineers, from the weight of the ball given, to determine its diameter, or *Caliper*; or *vice versa*.

The *Caliber* (*Tab. Fortif. Fig. 2.*) consists of two thin pieces of brass, six inches long; joined by a rivet, so as to move quite round each other, the head, or one end of the piece is cut circular; and one half of its circumference is divided into every second degree. On the other half are divisions from one to ten; each, again, subdivided into four: the use of which divisions and subdivisions, is, that when the diameter of a bullet, &c. not exceeding ten inches, is taken, the diameter of the semicircle, will, among the divisions, give the length of that diameter taken between the points of the *Calibers*, in inches and fourth parts.

The degrees on the head, serve to take the quantity of an angle; the method of which is obvious. If the angle be inward, apply the outward edges to the planes that form the angle; the degree cut by the diameter of the semicircle, shews the quantity of the angle sought. For an outward angle, open the branches till the points be outwards, and applying the straight edges to the planes that form the angle, the degrees cut by the diameter of the semicircle shew the angle required; reckoning from 180, towards the right-hand.

On one branch of the *Calibers*, on the same side, are, First, six inches; and each of these subdivided into ten parts. Secondly, a scale of unequal divisions, beginning at two, and ending at ten; each subdivided into four parts. Thirdly, two other scales of lines, shewing, when the diameter of the bore of a piece is ta-

ken with the points of the *Calibers* outwards, the name of the piece, whether iron or brass; *i. e.* the weight of the bullet it carries; or that it is such or such a pounder, from one to forty two pounds.

On the other branch of the *Calibers*, on the same side, is a line of cords to about three inches radius; and a line of lines on both branches, as on the sector; with a table of the names of the several pieces of ordnance. On the same face is a hand graved, and a right line drawn from the finger towards the center of the rivet; shewing, by its cutting certain divisions made on the circle, the weight of iron shot, when the diameter is taken with the points of the *Calibers*. Lastly, on the circle, or head, on the same side, are graved several geometrical figures inscribed in each other, with numbers; as a cube, whose side is supposed one foot; a pyramid on the same base and altitude, and the proportions of their weight, &c. a sphere, inscribed in a cube; a cylinder, cone, circle, square, &c.

CALIDUCTS, a kind of pipes, or canals, disposed along the walls of houses and apartments; used by the ancients for the conveyance of heat to several remote parts of the house, from one common furnace.

CALIDUM Innatum, &c. See the article *HEAT*.

CALIPH, *CALIF*, *KALIPH*,* in oriental affairs, denotes a successor of Mahomet, in the spiritual as well as temporal empire erected by that legislator. See the article *MAHOMETAN*.

* The word is originally Arabick, *Khalifah*, which properly denotes a successor, or heir.—Some pretend that it comes from a verb which signifies not only to succeed, but also to be in the place of another, not only as his heir, but as his vicar; in which sense, it was, according to Erpenius, that the Saracen emperors and high-priests were called *Caliph*, as being God's vicars or stewards. But the more received opinion is, that they took this title as being Mahomet's successors.

After the death of Mahomet, Abubeker having been elected by the Mussulmans to supply his place, he would take no other title but that of *Khalifah resullallah*, *i. e.* the vicar of the prophet, or messenger of God. Omar coming afterwards to succeed Abubeker, represented to the Mahometan chiefs, that if he took the quality of vicar or successor of Abubeker, the vicar or successor of the prophet, the word vicar would in course of time come to be repeated and multiplied without end: upon which, at the motion of Mogairah, Omar took the title of *Emir Mowmenin*, that is, Lord, or Prince of the Believers: an appellation accepted and born by all the legitimate *Caliphs*, or successors of Mahomet, from that time. Not but they still retained the title *Caliph* without other addition.

The *Caliphs* in the Mahometan, bear a near affinity to the popes in the Christian religion.

Vattier observes, they called themselves *Vicars of God*, and that the Mahometan sultans, and kings fell down before them, and kissed their feet: for which reason, V. de Beauvais, scruples not to call them the Mahometan popes.

CALIPPIC Period, in chronology, a series of seventy six years, returning perpetually round; which elapsed, the middle of the new and full moons, as its inventor Calippus, an Athenian, imagined, return to the same day of the solar year.

Meton, a hundred years before, had invented the *period* or cycle of nineteen years; (see *METONIC CYCLE*.) assuming the quantity of the solar year, 365 d. 6 h. 18' 56" 50; 314 34"; and the lunar month, 29 d. 12 h. 45' 47" 263 484 205. But Calippus considering that the Metonic quantity of the solar year was not exact, multiplied Meton's *period* by 4, and thence arose a *period* of 76 years, called the *Calippic*. The *Calippic period* therefore contains 27759 days: and since the lunar cycle contains 235 lunations, and the *Calippic period* is quadruple of this, it contains 940 lunations.

It is demonstrated, however, that the *Calippic period* itself is not accurate; that it does not bring the new and full moons precisely to their places, but brings them too late by a whole day in 553 years.

CALIX, or *CALYX*. See the articles *CALIX*, and *CHALICE*.

CALIXTINS, a name given to those among the Lutherans, who follow the sentiments of George Calixtus, a celebrated divine, towards the middle of the sixteenth century, who opposed the opinion of St. Augustin, on predestination, grace, and free will.

The *Calixtus* are esteem'd a kind of Semi-Pelagians. Calixtus maintained, that there is in all men a certain power of understanding and willing; with natural knowledge sufficient: And that a good use being made of these, God will give us all the means necessary to arrive at the perfection to which revelation directs them.

CALIXTINS, also denote a sect in Bohemia, about the middle of the fifteenth century, who asserted the use of the cup, as essential to the eucharist.*

* And hence their name; which is formed from the Latin, *Calix* of *καλιξ*, a Cup. See *CALYX*.

CALKING, or *CALKING*, in the sea language, &c. See the article *CAULKING*.

CALL, in hunting, a lesson blown upon the horn, to comfort the hounds.

Amongst fowlers, *Calls* are a sort of artificial pipes, made to catch several sorts of birds, by imitating their notes, to allure them to the net. See Supplement, article CALLS.

CALENDER, in the manufactures. See CALENDER.

CALLIBER, or CALIBER. See the article CALIBER.

CALLIGRAPHUS*, antiently denoted a copist, or scrivener, who transcribed fair, and at length, what the notaries had taken down in notes, or minutes; which comes pretty near to what we call *Ingraving*.

* The word is Greek, Καλλιγραφε; compounded of καλλος, beauty, and γραφειν, I write; q. d. καλλος γραφειν, ob scribentis elegantiam.

The minutes of acts, &c. were always taken in a kind of cypher, or short-hand; such as the notes of Tyro in Gruter: by which means the notaries, as the latins called them, or the Επιμνηστροφοι and Ταχυγραφοι, as the Greeks called them, were enabled to keep pace with a speaker, or person who dictated. These notes being understood by few, were copied over fair and at length, by persons who had a good hand, for sale, &c. and these were called *Calligraphi*; a name frequently met with in the ancient writers.

CALLUS, or CALLOSITY, in a general sense, denotes any cutaneous hardness, whether fleshy, or bony, and whether natural or preternatural.

In which sense, *Clavi*, or corns, are a species of *Callus*. See CLAVUS.

CALLUS, is also frequently used for a kind of node, which joins the extremities of a fractured bone.

The Formation of a *Callus* seems to be as follows: The juice that feeds the bone, running along its fibres, becomes extravasated in the place where those fibres are broke: so that stopping, and gathering together round the extremities of the fracture, it there dries, knits, and hardens, to a consistence like a strong glue; leaving only a little inequality in the place where it is formed.

Callus's frequently grow so firm as to supply the place of whole bones. In the *Phil. Transact.* we have an instance of a *Callus* supplying the place of the Os Humeri, taken out upon its being carious, by Mr. Fowler; and another of a *Callus* supplying the place of the Os Femoris, and the person as strong as ever, and walking without any lameness, by Mr. Sherman.

CALLUS, is also a hard, dense, insensible knob, or substance, rising on the hands, feet, &c. by much friction, and pressure against hard bodies.

CALOGERI, Καλογεροι, or CALOYERS, monks, or religious, in Greece, both male and female; inhabiting, particularly, mount Athos, but diffeminated also throughout all the churches of the east. They follow the rule of St. Basil, and make vows like the western Religious. There has never been any reform among them, but they still retain their original institution, keep their former habit, &c. to a tittle. Tavernier observes, they live a very retired austere life, eating no flesh; and keeping four lents, besides a great number of fasts, with great strictness. They eat no bread till they have earn'd it by the labour of their hands. During their lents, some do not eat above once in three days, others but twice in seven. Most of the night they spend in weeping and praying.

Some authors observe, that the word *Calogerus* is applied particularly to such, among their religious, as are become venerable by age, and the austerity of their life. It may be added, that though *Caloyers*, among us, be a general name, and comprehend all the Greek monks; yet, in Greece itself, their priests, or regulars, are called *Hieromonachi*, Ἱερομοναχοι.

The Turks also use the word *Caloyers* for their dervices, or religious Mussulmen. See DERVIS.

CALOMEL, in pharmacy, a name given to *Mercurius Dulcis*, further sublimated to a fourth time, or upwards. The denomination *Colomel* rather seems to have first belonged to the *Aethiops mineral*; from καλας, pulcher, fair; and αλας, niger, black: for that white or pale bodies rubbed herewith, become black.

Some will have it first given to *Mercurius Dulcis*, by a whimsical chymist, who employed a black in his laboratory; whose complexion, as well as that of the mercury, he alluded to in the term: the medicine being fair, and the operator black.

CALOTTE, a cap, or coil of hair, fatten, or other stuff; used first for necessity, but now become an ecclesiastical ornament, in France, &c.

It was first wore by cardinal Richlieu: the red *Calotte* is a badge of a cardinal. See the article CAP.

CALOTTE, in architecture, a round cavity, or depression, in form of a cup, or cap, lathed, and plastered, used to diminish the rise, or elevation of a chapel, cabinet, alcove, &c. which, without such an expedient, would be too high for other parts of the pile.

CALQUING, or CALKING, a term in painting, &c. used where the back-side of any design is covered with black-lead or red chalk; and the strokes or lines traced through on a waxed plate, wall, or other matter; by passing lightly over each stroke of the design with a point, which leaves an impression of the colour on the plate or wall.

CALTROP, or CALTHROP, an instrument with four iron points, disposed triangular-wise; so as there are always three

points bearing on the earth, the fourth being in the air. Several of these fixed in the ground where the cavalry is to pass, stick into the horses feet, and embarrass them. Hence *Caltrop* is also made the name of a plant, whose fruit resembles this machine.

CALVARIA, or CALVA, the scalp, or upper part of the head; so called from its growing bald first. See HEAD, and CALVITIES.

CALVARY*, a term used in catholic countries for a kind of chapel of devotion, raised on a hillock near a city; in memory of the place where Jesus Christ was crucified near Jerusalem.

* The word comes from the Latin, *Calvarium*, and that from *Calvus*, bald; in regard the top of that hillock was bare, and destitute of verdure: which is also signified by the Hebrew word *Golgotha*.

Such is the *Calvary* of St. Valerian, near Paris; which is accompanied with several little chapels, in each whereof is represented in sculpture one of the mysteries of the passion.

CALVINISM, the doctrine and sentiments of *Calvin* and his followers, with regard to matters of religion. *Calvinism* subsists in its greatest purity in the city of Geneva; and from thence it was first propagated over France, the United Provinces, and England. In France it was abolished by the revocation of the Edict of Nantz, in 1685. It has been the prevailing religion in the United Provinces, ever since the year 1572. In England it has dwindled since the time of queen Elizabeth; and is now chiefly confined among the dissenters: though it still subsists, a little allayed, in the articles of the established church; and in its rigor in Scotland. Of the thirteen Swiss Cantons, there are six who profess *Calvinism*; which likewise obtains in the Palatinate; except that of late popery is there becoming the reigning religion.

The distinguishing tenets of *Calvinism*, are, 1st, That predestination and reprobation are prior to the preience of good or evil works. 2^{dly}, That predestination and reprobation depend on the mere will of God; without any regard to the merits or demerits of mankind. 3^{dly}, That God gives to those whom he has predestinated a faith which they cannot lose; a necessitating grace, which takes away the freedom of the will; and that he imputes no sin to them. 4^{thly}, That the reprobates cannot do any good work, by reason of original sin, which cleaves to them. 5^{thly}, That men are justified by faith only.—The modern *Calvinists* reject or palliate some of these articles.

In France the *Calvinists* are distinguished by the name of *Huguenots*; and, among the common people, by that of *Parpaillets*. In Germany they are confounded with the Lutherans, under the general title *Protestants*; only sometimes distinguished by the name *Reformed*.

F. Gaultier finds an hundred heresies in *Calvinism*; but F. Francis Feu-Ardent improves vastly on the list; making the heresies no less than one thousand four hundred.

CALVITIES, or CALVITIUM, in medicine, baldness, or a falling off the hair, especially of that of the sinciput, without being able to grow again; the moisture of the head, which should feed it, being dried up by some disease, old age, or the immoderate use of powder, &c.

CALX, literally signifies, lime; a sort of stone burnt, or calcined in a kiln for that purpose, to be used in the making of mortar, &c.

CALX, in chemistry, is a kind of ashes, or fine friable impalpable powder, which remains of metals, minerals, &c. after they have undergone the violence of a fire for a long time; and by that means have lost all their humid parts. See CALCINATION.

Gold and silver, after they have been reduced to a *Calx*, may always be again recovered to their former form and nature.

Calx of tin, is called *Plumb*; and is of considerable use in polishing steel, mirrors, &c. See PUTTY.

Calx of brass, is called *Aes ustum*. See AES USTUM.

Calx of lead, is denominated *Ceruss*. See CERUSS.

For *Calx of antimony*, see ANTIMONIUM Diaphoreticum.

CALX, in anatomy; see the article CALCANEUS.

CALYX, or CALIX, in a general sense denotes a cup. See CUP and CHALICE.

CALYX, in botany, is sometimes applied to a flower whose body, or even a part of it, is formed in manner of a cup or *Chalice*: such is that of a tulip, &c. See FLOWER.

Puny defines the *Calyx* the cavity in the middle of a flower where-in the stamina and apices are contained. Aulonius calls it *Calathus*.

CALYX, is more particularly used for that outward greenish cover which encompasses and defends the petals and other parts of a flower: serving also as a basis, or support to the whole. In which sense *Calyx* is the same with what is otherwise called *Perianthium*, and by Dr. Grew the *Empalement*.

The *Calyx* is that set of leaves which involves the Petals, as the Petals do the immediate organ of generation.

Mollet describes the *Calyx*, as the cup of a flower before it opens; or the soft husks or skin in which a flower first, and often afterwards the seed of herbs, and fruit of trees, are covered.

The *Calyx* is in some plants of one entire piece, as in pinks, &c. and in some is divided into several; as in roses, &c. Saffron has no *Calyx*; its flower comes out of the earth before its leaves.

CAMAEU *, or **CAMAYEU**, a word used to express a peculiar sort of onyx: also by some to express a stone, whereon are found various figures, and representations of landscapes, &c. formed by a kind of Lulus Nature; so as to exhibit pictures without painting.

* The word comes from *Camētia*, a name the orientals give to the onyx, when they find, in preparing it, another colour; as who should say, a second stone.

CAMAEU is also applied by others to those precious stones, as onyx's, cornellians, and agats, whereon the lapidaries employ their art to aid nature, and perfect those representations.

CAMAEU is also used for a painting, wherein there is only one colour; and where the lights and shadows are of gold, wrought on a golden, or azure ground.

When the ground is yellow, the French call it *Girage*; when grey, *Griffaille*. This kind of work is chiefly used to represent Basso Relievo's: the Greeks call pieces of this sort *Μεροζαυατα*. See Supplement, article **CAMÆA**.

CAMALDULIANS, or **CAMALDUNIAN**s, an order of religious, founded by St. Romulad, in 1099; or, according to others, in 960, in the horrible desert of Camaldoli, situated in the state of Florence, on the Appenines.

Their rule is that of St. Benedict; and their houses by the statutes, are never to be less than five leagues from cities.

The *Camaldulians* have not bore that title from the beginning of the order; till the close of the XIth century they were called *Romuldiani*, from the name of their founder. Till that time, *Camaldulan* was a particular name for those of the desert *Camaldoli*, and D. Grandi observes, was not given to the whole order, in regard it was in this monastery that the order commenced; but because the regulation was best maintained here.

CAMBER-Beam, in building, a piece of timber cut archwise, or with an obtuse angle in the middle, commonly used in platforms; as church leads, and on other occasions, where long and strong beams are required.—A *Camber-beam* is much stronger than another of the same size; since being laid with the hollow side downwards; as they usually are, it represents a kind of arch.

CAMBLET *, or **CHAMLET**, a stuff sometimes of wool, sometimes silk, and sometimes hair, especially that of goats with wool or silk: in some, the warp is silk and wool twisted together, and the woof hair.

* *Menage* derives the French word *Camelot* (whence our *Camblet*) from *Ramboloto* a Levantine term for stuffs made with a fine hair of a Turkish goat: whence the word *Cymatilis* for Turkish *Camelot*. Others call it *Capellota*, from *Capellum*, the goat. Bochart makes *Zambelot*, a corruption of the Arabic *Giamal*, a *Camel*. Others etch *Camblet* from the bare Latin *Camelus*: on which footing *Camblet* should properly signify, a stuff made of Camel's hair.

England, France, Holland, and Flanders, are the chief places of this manufacture; Brussels exceeds them all in the beauty and quality of its *Camblets*: Those of England are reputed the second.

Figured CAMELETS, are those of one colour, whereon are stamped various figures, flowers, foliage, &c. by means of hot irons, which are a kind of moulds, passed, together with the stuff, under a press. These are chiefly brought from Amiens and Flanders: The commerce of these was antiently much more considerable than at present.

Water CAMELETS, those which, after weaving, receive a certain preparation with water; and are afterwards passed under a hot press, which gives them a smoothness and lustre.

Waved CAMELETS, are those whereon waves are impressed, as on tabbies; by means of a calender, under which they are passed and repassed several times.

The manufacturers, &c. of *Camblets*, are to take care they do not acquire any false and needless plaits; it being almost impossible to get them out again: This is notorious, even to a proverb: we say, a person is like *Camblet*, he has taken his plait.

CAMBRING, or **CAMBARING**.—The seamen say, a *deck lies Cambring*, when it doth not lie level, but higher in the middle than at either end.—Also, if the ship's keel be bent in the middle upwards, (which may happen from her lying a-ground on a place, where neither her aft nor fore-part touch it, and from many other reasons taken from her make) they say, *She is camber-keeled*.

CAMELEON, **CHAMELEON**, in natural history, a little animal, famous among antient and modern writers, for a faculty it is supposed to have, of changing its colour, and assuming those of the objects near it.

The *Camelion*, or *Chameleon* is of the lizard kind; only its head is somewhat bigger than that of the common lizard. It has four feet, and a long flat tail; whereby it can hang to the branches of trees, as well as with its feet. In Egypt there are some a foot long, including the tail; but those of Arabia do not much exceed half that length. Its snout is long, its back sharp; its skin, from the head to the last joint of the tail, plaited, and rough, say some, like a saw: Dr. Goddard says, 'tis grained, like a shagreen; the biggest grains, or globular inequalities, being about the head; the next on the ridge of the back. Its head is without any neck, as in fishes: it has two little apertures in the head,

that serve for nostrils; it has no ears, nor does it either make or receive any sound. Its eyes are big, and versatile this or that way, without moving the head, and ordinarily, it turns one of them quite the contrary way to the other. The tongue is half the length of the animal; consisting of a white flesh, round as far as the tip, which is flat and hollow; somewhat like an elephant's proboscis, or trunk; and accordingly, some call it a *trunk*. This it can dart out very nimbly, and draw back again, over a bone which reaches from the root, half its length; much as a silk stocking is drawn off and on the leg.

It is a common tradition, that the *Camelion* lives on air; but experience shews the contrary. The great use of its tongue is to catch flies, by shooting it briskly upon them, and entangling them in its proboscis: Some say, the tongue is tipped with a glutinous matter, which the flies stick to; and at the R. Academy of Sciences, they frequently observed one to catch and swallow flies; they found also the signs of them in its excrements; and, when it was dissected, the stomach and intestines were found full of them.

M. Perrault assures us, that when at rest, and in the shade, the colour of the *Camelion* is somewhat various: that at Paris, was of a bluish grey; but, when exposed to the sun, this grey changed into a browner or darker grey; and its less illuminated parts into divers colours; forming spots, half the bigness of a finger's end, some of them of an Iabella colour: the grains of the skin, not illuminated at all, resembled a cloth, mixed of divers colours. That at London, described in the *Philosophical Transactions*, by Dr. Goddard, was mixed of several colours, like a mottled cloth: the colours discernible, were a green, a sandy yellow, and a deeper yellow, or liver colour; but one might easily imagine some mixture of moss, or all colours. He adds that upon excitation, or warming, it suddenly became full of black spots, of the bigness of a great pin's head, equally dispersed on the sides, &c. all which afterwards would vanish. M. Perrault observes somewhat like this of the Paris *Camelion*; viz. that upon handling and stirring it, it would appear speckled, or stained with dark spots, bordering on green. He adds, that wrapping it up in a linnen cloth, for two or three minutes, it would sometimes be taken out whitish; though not constantly so: nor did it take the colour of any other stuff it was wrapped in. So that what Theophrastus and Plutarch write, that it assumes all the colours it comes near, excepting white, is exactly contrary to experience. Monconys assures us, that the *Camelion*, when placed in the sun, appears green, though in a place where there is no grass, or other green object; that by the candle it appears black, tho' placed on white paper; and that, when shut up in a box, it becomes yellow and green: and he asserts, it never takes any other than these four colours.

Naturalists are very little agreed, as to the reason or manner of this change of colour: some, as Seneca, maintain it is done by suffusion; others, as Solinus, by reflexion; others, as the Cartesianists, by the different disposition of the parts that compose the skin, which give a different modification to the rays of light; others; as Dr. Goddard, ascribe the change to the grains of the skin; which, in the several postures, he thinks, may show several colours; and, when the creature is in full vigour, may have, as he terms it, *rationem speculi*; that is, the effect of mirrors, and reflect the colours of bodies adjacent.

These hypotheses are all deficient enough, and there is still room for a new one; the *Camelion*, then, is represented to us as an exceeding lean skinny animal; inasmuch, that the Italians call it a *living skin*. M. Perrault observes, of that which he dissected in the king's library, that one hour it appeared to be a meer skin, and nothing else; and yet the next it would appear fat and plump. Hence we gather, that it must have an extraordinary command over the skin, as to tension or laxness; since by swelling its bulk its skin will be filled, the fibres thereof stretched, and the pores lessened: and again, by withdrawing its grossness, the skin will be left lank and shriveled, one part wrapping over another: Which is confirmed by what we have already observed, that its skin is usually seen to be full of rugæ, or little plaits. Now the animal having it in his power to fill the skin more or less, has it in its power not only to alter the tone and texture of the fibres, upon which their reflexive quality, in a great measure, depends; but also to bring parts into light which before lay concealed, or to conceal such as before lay open: and it is more than probable, that the parts which are ordinarily covered, are of a somewhat different colour from those constantly open to the air.

On these principles, probably, all the phenomena in the *Camelion's* colour may be solved. The animal, it is evident, has a power to reflect different coloured rays from the same parts; also to make certain parts reflect, and to prevent others reflecting; and, hence that variety, that medley of colours.

Mathioli relates several superstitious notions of the antients touching the *Camelion*; as, that its tongue torn out, while alive, helped the bearer to gain his law suit; that burning its head and throat with oaken wood, or roasting its liver on a red tile, made thunder and rain. That its right eye, torn out while living, and steeped in goat's milk, took away pearls in the eye; that its tongue tied about a woman with child, made her delivery safe.

That

That its right jaw removed all fear; and that its tail stopped the course of rivers: Pliny assures us that Democritus had composed a whole book of such follies.

CAMELEON, CHAMELEON, in astronomy, one of the constellations of the southern hemisphere, near the pole, and invisible to us.

CAMERA Obscura, in optics, a machine, or apparatus representing an artificial eye; whereon the images of external objects received through a double convex glass, are exhibited distinctly, and in their native colours, on a white matter placed within the machine, in the focus of the glass.

The first invention of the *Camera Obscura*, is ascribed to Baptista Porta.

The Use of the CAMERA Obscura is manifold: It serves to very good purposes in explaining the nature of Vision; and hence it is that some call it *the Artificial Eye*. It affords very diverting spectacles; both by exhibiting images perfectly like their objects, and each clothed with their native colours; and by expressing at the same time, all their motions: Which latter, no other art can imitate. By means of this instrument, especially by the third contrivance under mentioned, a person unacquainted with designing, will be able to delineate objects to the last accuracy and justness; and another well versed in painting, will find many things herein to perfect his art.

The Theory of the CAMERA OBSCURA, is contained in the following proposition.

If an object AB, (Tab. Opticks, Fig. 16.) radiate through a small aperture C, upon a white wall opposite thereto; and the place of radiation behind the aperture *bCa* be dark; the image of the object will be painted on the wall, in an inverted situation.

For, the aperture C being very small, the rays issuing from the point B, will fall on *b*; those from the points A and D, will fall on *a* and *d*: Wherefore since the rays issuing from the several points are not confounded; when reflected from the wall, they will carry with them a certain species of the object, and exhibit its appearance on the wall. But since the rays AC and BC intersect each other in the aperture, and the rays from the lowest points fall on the highest; the situation of the object will of necessity be inverted.

Hence, since the angles at D and *d* are right, and the vertical ones at C are equal; B and *b*, and A and *a*, will be also equal; consequently, if the wall, where the object is delineated, be parallel to it, *ab*: A B: *dC*: D C. That is, the height of the image will be to the height of the object, as the distance of the object from the aperture is to the distance of the image from the aperture.

Construction of a CAMERA OBSCURA, wherein the images of external objects shall be represented distinctly, and in their genuine colours, either in an inverted, or an erect situation. 1. Darken a chamber, one of whose windows looks into a place fit with various objects; leaving only a little aperture open in the one shutter. 2. In this aperture fit a lens, either plano-convex, or convex on both sides; to be a portion of a large sphere. 3. At a due distance, to be determined by experience, spread a paper, or a white cloth, unless there be a white wall for the purpose; for on this, the images of the desired objects will be delineated invertedly. 4. If it be rather desired to have them appear erect, it is done either by means of a concave lens placed between the centre and the focus of the first lens; or by receiving the image on a plane speculum inclined to the horizon under an angle of 45°; or by means of two lens's included in a draw-tube, in lieu of one.—Note, if the aperture do not exceed the bigness of a pea, the objects will be represented, even though there be no lens at all used.

To render the images clear and distinct, it is necessary the objects be illuminated by the sun's light: They will be still brighter, if the spectator first stay a quarter of an hour in the dark. Care must likewise be taken, that no light escape through any chinks; and that the wall be not too much illuminated. Farther, the greater distance there is between the aperture and the wall, the larger and more distinct will the images be; but the rays becoming, thus, too much dilated, the brightness of the image is weakened, till at length it become invisible.

Construction of a portable CAMERA OBSCURA. 1. Provide a little chest, or box of dry wood, (Tab. Opticks, Fig. 17.) of the figure of a parallelepiped; its breadth about ten inches, and its length two or more feet; according to the different magnitude of the diameter of the lens's. 2. In the plane BD fit a sliding tube EF with two lens's; or, to fit the image at a less distance from the tube, with three lens's convex on both sides: The diameter of the two outer, or forwarder, to be $\frac{1}{2}$ of a foot; that of the inner lens, *v. g.* $\frac{1}{4}$. 3. Within the chest, at a proper distance from the tube, set up an oiled paper, perpendicularly, GH, so as images thrown upon it may be seen through. Lastly, in I make a round hole, so as a person may look conveniently thro' it with both eyes.

If then the tube be turned towards the objects, (the lens's being at their proper distance, to be determined by experiment) the objects will be delineated on the paper GH, erect as before.

Another portable CAMERA may be thus made. 1. In the middle of a cistula, or chest, (Tab. Opticks, Fig. 18.) raise a little turret, either round or square H I, open towards the object A B. 2. Behind the aperture, incline a little plain mirror *a b*, to an angle of 45°, which may reflect the rays, A *a* and B *b*, upon a lens convex on both sides G, included in a tube G L. 3. At the distance of the focus thereof, place a table covered with a white paper EF, to receive the image *a b*. Lastly, in N M make an oblong aperture to look through.

CAMISADE,* in the art of war, an attack by surprize, in the night, or at the point of day; when the enemy are supposed a-bed.

* The word is said to have took its rise from an attack of this kind; wherein, as a badge, or signal to know one another by, they bore a shift, in French called *Cbemisè*, or *Camisè*, over their arms.

CAMISARDS,* or **CAMISARS**, an appellation given by the French to the Calvinists of the Cevennes, who formed a league, and took up arms, in their own defence, in the year 1688.

* The reason of the name is disputed. Some derive it from *Camisade*, in regard of the suddenness of their attacks and incursions from their mountains; others from *Camisè*, which in that Country signifies a shift; either by reason they wanted, or plundered linen for shifts; or wore cloaths that resembled shifts. Others, with more probability, from *Camis*, a high or beaten road; by reason the roads were infested by the *Camisards*.

CAMP, a spacious post, or spot of ground, where an army rests, intrenches itself, or plants a piquet-watch, to lodge secure either in tents, or barracks.

The *Camp* is sometimes covered by an intrenchment; sometimes only by the advantage of its post: Sometimes it is inclosed with *Chevaux de Frise* laid across each other; the ordinary practice of the old prince of Orange.

The chief skill of a general lies in the art of incamping well: This the Romans were unacquainted with, till the war with Pyrrhus; from whose *Camp* they learned to model their own. Till then, they knew not how to post themselves to advantage, nor with any order in their *Camp*.

An *Incampment*, or *standing Camp*, is always to have the advantage of water, forage and fuel; with the means of covering and retrenching itself.

Rhœ, describing the great Mogul's *Camp*, says, it is twenty English miles round, and contains more space than the largest city in Europe; that it is composed of 800000 men, and 40000 elephants; and what increases the miracle is, that all these tents are pitched in four hours time.

Flying-CAMP, is a strong body of horse or dragons, to which are sometimes added foot; commanded usually by a lieutenant-general.

This always keeps the field, making frequent motions both to cover the garrisons in possession, and to infiltrate and keep the adversary in continual alarm, and oblige him to make diversions.

CAMPAIGN, a military term, signifying the space of time during which armies are maintained, yearly, in the field.

The Germans begin their *Campaign* very late; usually waiting for harvest: The French are always early, and begin sometimes in winter, by which they have reaped great advantages.

CAMPANULOUS, or **CAMPANIFORMIS**, an appellation given to those plants whose flowers resemble the shape of a bell.

CAMPECHE WOOD, a kind of wood brought from Yucutan, a province of America, and used in dying.

The heart of the tree, which alone is used, is at first red; after it has been felled some time, it becomes black; and, if steeped in water, gives a black tincture, such as may be wrote white. It is very heavy, and burns admirably, and gives a clear lasting flame.

CAMPHOR, or **CAMPHIRE**,* a white, shining, transparent, friable, inflammable, odoriferous, volatile gum, or resin, of a bitterish taste, and very hot in the mouth; flowing from a tree of the same name, frequent in the islands of Borneo, and Ceylon, and the neighbouring mountainous coasts of India; resembling a walnut tree.

* The word comes from the Arabic *Capur*, or *Capbur*; and which signify the same thing.

Campher distills from the tree in manner of a gum; and as is said, most plentifully in the time of earthquakes and storms. M. Lermery says, the *Campher* is found at the foot of the tree; where it thickens into little grains of different figures and sizes; very dry, friable, light, and of a bitterish taste. These little grains falling on one another, adhere lightly together, and form masses; which being squeezed a little by the fingers, granulate again into small corpuscles, like fat.

Some authors make two different kinds of *Campher*, according to the different parts of the tree where they are found: That in the veins of the wood, is said to be different from that which oozes out upon breaking the bark.

The *Campher*, it is said, being at first dusky, is whitened either by the sun or the fire. In effect, we have but little of the raw natural *Campher* among us; the Dutch take care that it come all refined by sublimation, and prepared to our hands.

Manner of refining crude CAMPHOR. The method is to set it to sublime in subliming pots; when the vessel is half full, it is stop-

ped, and placed over a gentle fire; where only the purest part rises at first; but, by degrees, the whole is sublimed, except a Caput Mortuum, or earthy matter sticking at bottom: They then melt it with a gentle heat, and run it into moulds to give it what figure they please.—It is so volatile, and apt to evaporate in smoke, that the merchants ordinarily inclose it in line-seed, that the viscosity of that grain may keep its particles together.

Campbor has various uses; as in fire-works, in making varnish, &c. In the courts of the eastern princes, it is burnt, together with wax, to illumine the night. It is exceedingly inflammable, so as to burn and preserve its flame in water; and in burning it consumes wholly, leaving no scoria behind: But its principal use is in medicine.

Campbor is the most efficacious diaphoretick known; its great subtilty diffusing itself through the substance of the parts, almost as soon as the warmth of the stomach has set it in motion. It is used also in caries of the bones, as a detergent in wounds, to resist gangrenes, &c. When mixed with the subtille fangens of cantharides, it prevents their injuring the bladder; its exquisite fineness inablg it to follow them into all the meanders of the vessels, and to flesh their aperities.

Dr. Quincy observes, that *Campbor* begins to be mixed, and that to good purpose, with mercurials, to guard against their stimulating properties, and to send them into the finest passages, to operate by fusion, and the force of impulse. For not only Mercurius Dulcis or Calomei, may be hereby restrained from manifest operation in the glands about the mouth; but also the mineral Turbith, which of itself acts very strongly by stool and vomit, when mixed with *Campbor*, will be much less felt in those respects; and will go into the farthest circuit of motion, and promote the cutaneous discharge, in a more efficacious manner than any medicine of less specific gravity.

M. Lemery endeavoured at a chymical analysis of *Campbor*, but in vain; either its parts were too fine and volatile to be carried to any greater degree of purity or subtilty by any chymical process; or it was owing to the close union of its principles, which in all appearance must be an oil and a volatile salt, that they could not be separated.

Campbor, he observes, does not dissolve in aqueous or phlegmatic liquors; but in sulphurous ones it does; not in alkalines, nor even in some acids: but in spirit of nitre it dissolves perfectly; and is the sole resin that does so. This dissolution is ordinarily called *Oil of Campbor*; and it is to this the medicinal virtue of *Campbor* in wounds, gangrenes, and caries is ascribed. They do not take it internally, for fear of its sharpness and corrosiveness; though M. Lemery has found good effects from two or three drops by the mouth, in obstructions and fits of the mother; in these cases indeed, he generally mixed it with as much oil of amber.

There is a common verse to the discredit of *Campbor*, as if its smell emaculated:

Camphora per Nares castrat odore Mares.

But the proverb, according to Scaliger and Tulpius, is false. *Campbor*, being boiled in aqua vitæ, in a close place, till the whole be evaporated; if a lighted torch or candle be introduced, the air in the whole place will immediately catch fire, and appear in a flame, without doing any damage to the place or the spectators.

It has been found, in Ceylon, that the root of the tree which yields cinnamon, yields, by incision, a matter that has a strong smell of *Campbor*, and many of its virtues; whence naturalists, by mistake, have supposed that all *Campbor* came from that tree.

—There is also a smell of *Campbor* in several other plants, as in camphorata, abrotanum, rosemary, &c.

What is called *artificial CAMPHOR*, is prepared with gum sandarach, and white vinegar distilled, kept twenty days in horfunding, and afterwards exposed a month to the sun to dry; at the end of which, the *Campbor* is found, in form of the crust of a white loaf.—This is also called *Juniper Gum*, *white Varnish*, and *Mastic*.

CAMPUS *Maii*, in antient customs, an anniversary assembly of our ancestors, held on May-day; where they confederated together for defence of the Kingdom against all its enemies.

CAMUS, a person with a low, flat nose, hollowed or sunk in the middle.

The tartars are great admirers of *Camus* beauties. Rubruquis observes, that the wife of the great lenghis Kam, a celebrated beauty, had only two holes for a nose.

CANAL, CANALS in anatomy, a duct, or passage, thro' which any of the juices, or fluids of the body flow.

CANAL of the *Larmier*, the hollowed plafond or fossit of a cornice; which makes the pendant mouchette. See LARMIER, and SOFFITO.

CANAL of the *Volute*, in the Ionic capital, is the face of the circumsolutions, enclosed by a listel.

CANALES *Semicirculares*, in anatomy, are three *Canals*, in the labyrinth of the ear; which open by as many orifices into the vestibulum.

They are of three different sizes, *Major*, *Minor*, and *Minimus*. In different subjects, they are frequently different; but are always

alike in the same: The reason, Valsalva ingeniously conjectures to be, that as a part of the tender auditory nerve is lodged in these *Canals*, so they are of three several sizes, the better to suit all the variety of tones; some of the *Canals* suiting some tones, and others others. And though there be some difference in the form and size of these *Canals* in different persons; yet these should be any discord in the auditory organs, these *Canals* are always in exact conformity to one another, in the same man.

CANALIS, or CANALICULUS *Arterialis*, in anatomy, a vessel, observed in fœtus's, but which after delivery, grow useless, and disappears. It is a little tube, which joining the pulmonary artery and aorta, serves to convey the blood out of one into the other, without passing through the lungs. See Fœtus.

CANCELIER, in falconry, is when a light flown hawk, in her stooping, turns two or three times upon the wing, to recover her self before she seizes.

CANCELLING,* in the civil law, an act whereby a person consents, that some former deed be rendered null, and void.—This is otherwise called *Rescissio*.

* The word comes from the Latin *Cancellare*, to incompass, or pale a thing.

In the proper sense of the word, to *cancel*, is to deface an obligation, by passing the pen from top to bottom, or across it; which makes a kind of chequer lattice, which the Latins call *Cancelli*.

CANCER, in astronomy, one of the twelve signs of the zodiack; ordinarily represented on the globe in form of a crab, and in astronomical books denoted by a figure much resembling that of the number of sixty-nine.

The Stars in the sign *Cancer*, Ptolemy makes 13; Tycho 15; Bayer and Hevelius 29; Mr. Flamsteed no less than 71.—Their order, names, places, longitude, latitude, magnitude, &c. in the *Britannick Catalogue*, are as follows.

Names and Situations of the Stars.	Longitudo.	Latitude.	Magnit.
	° ' "	° ' "	
In extremity of preced. north foot	23 49 13	4 52 46 A	6
	22 49 38	4 43 11 B	6
	24 24 46	3 12 35 A	6
Subsequent and more southerly	23 4 11	4 27 15 B	6
	24 45 22	4 0 29 A	7
5			
In the preced. and more fourth foot	24 10 40	1 35 13 B	8
	26 18 34	7 5 30 A	5
	24 36 38	2 16 12 B	7
In the preced. north foot, fourth	25 9 26	1 19 13 B	5
	27 1 42	6 24 35 A	7
10			
In the second north foot, upper	24 47 23	5 36 4 B	6 7
	24 54 49	5 18 44 B	4
	27 22 31	5 19 31 A	6
under	27 0 22	2 17 52 A	5 6
Against the tail, Ptolem. 25th. II	27 48 15	5 42 25 A	7
15			
Agst. the extrem. of the 2d so. foot	28 30 17	6 41 26 A	7
The north of the 3d north foot	29 56 19	10 19 6 A	4 3
In the origin of the 3d north foot	26 38 3	7 27 32 B	6
In the back, behind the tail	29 27 6	4 20 33 B	6
	29 27 6	1 2 39 A	6
20			
The first in the 4th north foot	Ω 1 22 2	8 30 57 A	7
	Ω 27 52 13	8 25 40 B	6 7
The second	28 10 35	7 30 0 B	6
In the orig. of preced. north's claw	28 44 18	5 10 36 B	7
Subsequent, and more southerly	Ω 0 20 20	2 7 51 A	7
25			
The last of three	Ω 28 7 9	8 27 31 B	6
	Ω 1 34 58	6 22 16 A	6
The second	Ω 29 15 40	4 53 44 B	6 7
	Ω 1 39 24	4 45 26 A	7
The third	Ω 29 55 16	4 59 48 B	6
30			
The preced. so. of □ of the breast	Ω 1 24 42	0 47 46 A	6 5
Fourth and subsequent	0 15 14	5 5 16 B	7 8
Preced. north in the □ of the breast	1 5 29	1 32 32 B	6 7
	3 33 1	8 31 50 A	6
	1 53 21	0 51 52 B	7
35			
The preced. in the 3d southern foot	4 48 42	8 39 1 A	6
The subsequent	5 4 30	8 40 4 A	6
	2 50 50	1 18 18 B	7
Nebulous stars in the middle of the breast, called <i>Præsepe</i> .	3 5 25	1 6 22 B	6
	3 5 9	1 18 37 B	7
40			
Subseq. no. in the □ called <i>N. Apsilus</i>	3 13 0	3 9 41 B	4
Preced. in the 4th fourth foot	5 29 18	5 20 41 A	6
	1 11 49	12 10 46 B	7
Southern star in □ called <i>Sa. Apsilus</i>	4 23 40	0 3 46 B	4
In the north claw	2 0 53	10 23 40 B	5
45			
In the extrem. of the 4th so. foot	6 32 22	7 44 58 A	6
Subsequent in the southern foot	6 31 15	5 39 1 A	6
First over the northern claw	2 12 44	14 18 33 B	7
First of those following the n. claw	3 23 2	10 15 12 B	6
	6 37 13	2 16 16 A	6

Names and Situations of the Stars.	Signs.	Longitude.	Latitude.	Magnit.
50				
Second	♈	3 26 1	10 21 47	B 6
Third	♈	3 41 1	10 24 34	B 6
Preced. in the middle of the n. claw		3 6 12	12 35 34	B 6
Fourth		4 10 51	10 8 24	B 5
Second		2 59 35	14 59 41	B 5
55				
That preced. the southern claw		8 46 33	5 30 32	A 7
2d and Subf. in middle of the claw		3 59 42	12 29 1	B 7
First in the orig. of the fourth claw		8 2 56	1 53 16	A 6
Second and fourth		8 3 51	1 36 45	A 6
Third		3 41 0	14 40 46	B 6
60				
In the southern claw		9 18 40	5 6 27	A 4
The last of four		4 7 20	14 37 49	B 6
Fifth of those following the n. claw		3 59 42	12 29 1	B 7
In the northern eye		6 42 57	7 15 3	B 6
Last of those following the n. claw		6 0 44	10 38 38	B 6
65				
In the extr. of the apert. of n. claw		6 18 14	12 34 6	B 6
		7 23 58	9 46 2	B 6
Subsequent in the southern claw		11 50 44	5 36 8	A 5
In the southern eye		8 52 45	5 23 24	B 5
		9 7 14	5 24 49	B 8
70				
In the aperture of the fourth claw		11 41 7	1 8 31	A 7
		12 19 48	0 58 45	A 6

Tropic of CANCER in astronomy, a lesser circle of the sphere parallel to the equator; and passing through the beginning of the sign Cancer.

CANCER, in medicine, a roundish, hard, ragged, immovable tumour, of an ash, or livid colour; incomplect round with branched turbid veins, full of black foul blood; situate chiefly in the glandular parts: so called, as some will have it, from the resemblance it bears in figure to the crab-fish, or, as others say, because, like that fish, when once it has got hold, it is scarce possible to drive it away.

It begins without any pain, and appears, at first, like a chinch pea; but grows apace, and soon becomes very painful.

The Cancer arises principally on the lax glandular parts, as the breasts and emunctories: It is most frequent in women, especially such, says Stollterfoth, as are barren, or live in celibacy. The reason of its appearing in the breasts more than other parts, is, that being full of glands, with lymphatics and blood-vessels among them, the smallest contusion, compression, or puncture, extravasates those liquors; which growing, by degrees, acrimonious, form the Cancer. Hence, the makers of the art say, that a Cancer is that in the glands, which a caries is in the bones, and a gangrene in the fleshy parts. The Cancer, however, is sometimes found in other soft, spongy parts of the body; and there have been some found in the gums, belly, neck of the matrix, ureter, lips, nose, cheeks, abdomen, thighs, and even the shoulders.

A Cancer arising on the legs, is called a *Lupus*; on the face, or nose, a *Noli me tangere*.

Cancers are divided, according to their several stages, into occult, and open or ulcerated.

Occult CANCERS are those not arrived at their state, or not yet burst.

Ulcerated CANCERS, are known by their roughness and fulness of holes, through which oozes a fishy, stinking, glutinous matter, frequently yellowish; by their pungent pain, which resembles the pricking with a thousand pins; and by their blackness; the swelling of the lips of the ulcer; and the veins about it, which are blackish, tumid, and varicous.

Sometimes the extremities of the blood-vessels are gnawed off, and the blood issues out. In a Cancer of the breast, the adjacent flesh is sometimes so consumed, that one may see into the cavity of the thorax. It occasions a slow fever, a loathing, oftentimes faintings, sometimes a dropy, and lastly death.

The immediate cause of a Cancer, seems to be a too corrosive volatile salt, approaching to the nature of arsenic, formed by the stagnation of the humours. Stollterfoth observes, that it has been frequently cured by mercury and salivation. Some take the ulcerous Cancer to be nothing else but an infinite number of little worms, which devour the flesh by degrees. The Cancer is allowed the most terrible evil that befalls the body: it is usually cured while yet a small tumor, of the bigness of a nut, or at most of a small egg, by extirpation: when it feizes the breast, or is burst into an ulcer, amputation takes place.

CANDIDATE *, a person who stands for some post or place, either of honour or profit.

* The word is Latin. *Candidatus*, formed of *Candidus*, white, by reason of a white shining garment *Toga Candida*, wherein those who aspired to preferments in ancient Rome, were habitated at the time of their appearing for the same, especially at the publick assemblies, in order to distinguish them from the crowd.

CANDIDATI *militis*, were an order of soldiers of tall stature, who served as the emperor's body guards, to defend him in fight. VOL. I.

They were thus denominated, because clothed in white, either that they might be the more conspicuous and their actions more taken notice of, or because they were considered as in the way to higher preferments. Cedrenus observes, that it was the younger Gordian who instituted the *Candidati*, as also the *Profectores* and *Scholares*. The *Scholares* were chose out of the troops, and consisted of persons who best understood the art of war: and out of these *Scholares* were chose the *Candidati*, who were such as were tallest and strongest, and had moyst of the martial air; and were proper to inspire terror, says the chronicon of Alexandria. The *Profectores* were a middle order.

CANDLE *, a cotton or linen wick, loosely twisted, and covered with tallow, wax, or sperma-ceti, in a cylindrical figure; which being lighted at the end, serves to illumine a place in the absence of the sun.

* The word *Candle* comes from the Latin *Candela*, and that from *Candor*, of *Candens* I burn; whence also the middle age Greek *κνιδηλα*.

A Tallow Candle, to be good, must be half sheep's tallow, half bullock's; the fat of hogs making them gutter, give an ill smell, and a thick black smoak.

Tallow Candles are of two kinds; the one *dipped*, the other *moulded*: the first, which are those in ordinary use, are of an old standing; the latter are said to be the invention of the Sieur le Brez, at Paris. The manufacture of the two kinds is very different, excepting in what relates to melting of the tallow, and making the wick, which is the same in both.

Method of making CANDLES. The tallows being weighed and mixed in their due proportion, are cut or hacked into pieces, to facilitate their melting, and thrown into a pot or boiler, having a cavity of some depth running round the top, to prevent its boiling over. Being, thus, perfectly melted, and skimmed, a certain quantity of water is thrown in, proportioned to the quantity of tallow; this serves to precipitate the impurities of the tallow, which had escaped the skimmer, to the bottom of the vessel. The tallow, however, intended for the three first dips, must have no water; in regard, the dry wick, imbibing the water readily, makes the *Candles* spit and crackle in the burning. The melted tallow is now emptied through a sieve into a tub, having a tap for letting it out, as occasion requires. The tallow thus prepared, may be used after having stood three hours; and will continue fit for use twenty-four hours in summer, and fifteen in winter.

For the wicks, they are made of spun cotton, which the chandlers buy in skeins; and wind off three or four together, according to the intended thickness of the wick, into bottoms, or clues, whence they are cut out with an instrument contrived for that purpose, into pieces of the length of the *Candle* required; then put on the sticks, or broches, or else placed in the moulds, as the *Candles* are intended to be either dipped or moulded.

Making of dipped CANDLES. The liquid tallow is drawn off, from the tub above-mentioned, into a vessel called the mould, sink, or abyss, of an angular form, perfectly like a prism, except that it is not equilateral; the side on which it opens being only ten inches high; and the others, which make its depth, fifteen. On the angle, formed by the two great sides, it is supported by two feet, and is placed on a kind of bench, in form of a trough, to catch the droppings, as the *Candles* are taken out each dip. At a convenient distance from this, is seated the workman, who takes two sticks, or broches, at a time, strung with the proper number of wicks; viz. sixteen, if the *Candles* are to be of eight in the pound; twelve, if of six in the pound, &c. and holding them equidistant, by means of the second and third finger of each hand, which he puts between them, he immerses the wicks two or three times for their first lay, and, holding them some time over the opening of the vessel to let them drain, hangs them on a rack, where they continue to drain and grow hard. When cooled, they are dipped a second time, then a third, as before; only for the third lay they are but immersed twice, in all the rest thrice. This operation is repeated more or less times, according to the intended thickness of the *Candle*. With the last dip they neck them; i. e. plunge them below that part of the wick where the other lays ended.

It must be observed, that during the operation, the tallow is stirred from time to time, and the stick supplied with fresh tallow. When the *Candles* are finished, their peaked ends, or bottoms, are taken off; not with any cutting instrument, but by passing them over a kind of flat brazen plate, heated to a proper pitch by a fire underneath; which melts down as much as is requisite.

Method of making Mould CANDLES. These *Candles* are made in moulds of different matters: brass, tin, and lead are the most ordinary. Tin is the best, and lead is the worst. Each *Candle* has its mould, consisting of three pieces, the neck, shaft, and foot: the shaft is a hollow metal cylinder, of the diameter and length of the *Candle* proposed: At the extremity of this is the neck; which is a little metallic cavity, in form of a dome; having a moulding within-side, and pierced in the middle with a hole big enough for the wick to pass through. At the other extremity is the foot, in form of a little tumel, through which the liquid tallow runs into the mould. The neck is soldered to the shaft, but the foot is moveable, being applied when the wick

is to be put in, and taken off again when the *Candle* is cold. A little beneath the place where the foot is applied to the shaft, is a kind of firing of metal, which serves to support that part of the mould, and to prevent the shaft from entering too deep in the table to be mentioned hereafter. Lastly, in the hook of the foot, is a leaf of the same metal, soldered within-side, which advancing into the centre, serves to keep up the wick; which is here hooked on, precisely in the middle of the mould. The wick is introduced into the shaft of the mould, by a piece of wire, which being thrust through the aperture of the hook, till it come out at the neck, the wick is tied to it; so that in drawing it back, the wick comes along with it, leaving only enough a-top for the neck; the other end is fastened to the hook, which thus keeps it perpendicular. The moulds, in this condition, are disposed in a table pierced full of holes, the diameter of each being about an inch: these holes receive the moulds inverted, as far as the firing in the foot. Being thus placed perpendicularly, they are filled with melted tallow, (prepared as before) drawn out of the tap into a tin pot; and thence poured into the foot. After the moulds have stood long enough to cool, for the tallow to have arrived at its consistence, the *Candle* is taken out, by taking off the foot, which brings the *Candle* along with it. Those who aim at perfection in their work, bleach or whiten their *Candles*, by fastening them on rods or broches, and hanging them out to the dew, and earliest rays of the sun, for eight or ten days: care being taken to screen them in the day-time from the too intense heat of the sun; and in the night from rain, by waxed cloths.

Wax CANDLES are made of a cotton or flaxen wick, slightly twisted, and covered with white or yellow wax.—Of these there are several kinds; some called *Tapers*, used to illumine churches, and in processions, funeral ceremonies, &c. and others used on ordinary occasions.

For the first kind, their figure is conical, still diminishing from the bottom, which has a hole to receive the point in the candlestick, to the top which ends in a point: the latter kind are cylindrical. The first are either made *with a ladle*, or *with the hand*.

Manner of making Wax CANDLES with the Ladle. The wicks being twisted, and cut off at the proper length, a dozen of them are tied by the neck, at equal distances, round an iron circle, suspended directly over a large basin of copper tinned, and full of melted wax: a large ladle full of this wax, is poured gently, by inclination, on the tops of the wicks, one after another; so that running down, the whole wick is thus covered: the surplus returning into the basin; and where it is kept warm by a pan of coals underneath it. They thus continue to pour on the wax, till the *Candle* arrive at its destined bigness: still observing, that the three first ladles be poured on at the top of the wick, the fourth at the height of $\frac{1}{2}$, the fifth at $\frac{2}{3}$, and the sixth at $\frac{3}{4}$; by which means the *Candle* arrives at its pyramidal form. The *Candles* are then taken down hot, and laid aside of each other, in a feather-bed folded in two, to preserve their warmth, and keep the wax soft: They are then taken and rolled, one by one, on an even table, usually of walnut-tree, with a long square instrument of box, smooth at the bottom. The *Candle* being thus rolled and smoothed, its big end is cut off, and a conical hole is made in it.

Manner of making Wax CANDLES by the Hand. The wick being disposed, as in the former, they begin to soften the wax, by working it several times in hot water, contained in a brass caldron, tinned, very narrow and deep. A piece of the wax is then taken out, and disposed, by little and little, around the wick, which is hung on a hook in the wall, by the extremity opposite to the neck; so that they begin with the big end, diminishing still, as they descend towards the neck. In other respects, the method is the same here, as in the former case; only that they are not laid in the bed, but are rolled on the table, just as they are formed. It must be observed, however, that in the former case, water is always used to moisten the several instruments, to prevent the wax from sticking; and in the latter, lard, or oil of olives, for the hands, table, &c.

Cylindrical Wax CANDLES, are either for the *Table*, or *Drawn*. The first kind are made of several threads of cotton, loosely spun, and twisted together, covered with the ladle, and rolled, as the conical ones, but not pierced.

Wax CANDLES drawn, are so called, because actually drawn, in the manner of wire, by means of two large rollers, or cylinders of wood, turned by a handle, which turning backwards and forwards several times, pass the wick through melted wax, contained in a brass basin; and at the same time through the holes of an instrument, like that used for drawing wire, fastened at one side of the basin: so that, by little and little, the *Candle* acquires any bulk, at pleasure, according to the different holes of the instrument through which it passes: By this method, may four or five hundred ells length be drawn, running. The invention of this was brought from Venice by Pierre Blesimare, of Paris, about the middle of the last century.

Sale, or Auction by Inch of CANDLE; is, when a piece of *Candle* being lighted, people are allowed to bid while it burns, but as soon as extinct, the commodity is adjudged to the last bidder.

There is also a kind of *Excommunication by Inch of CANDLE*; wherein, the time a lighted *Candle* continues burning, is allowed

the sinner to come to repentance, but after which, he remains excommunicated to all intents and purposes.

CANDLEMASS,* a feast of the church, held on the second of February, in honour of the purification of the blessed virgin.

* It takes its name either from the number of lighted candles used by the Romish church in the processions of this day: Or because, before *Masi*, the church consecrated *Candles* for the whole year.

Candlemas is also called, in antient writers, *Hypopante*; and among moderns, the *Purification*.

Some will have this feast to have been instituted by pope Gelasius, in lieu of the heathen lupericalia; and that procession was thereon made with lighted *Candles* round the fields and grounds, by way of exorcism. Hence Bede says, "It is happy for the church to have changed the illustrations of the heathens, held in the month of February, around the fields, for the processions with hallowed *Candles*, in remembrance of that divine light wherewith Christ illumined the world, whence he was filed by Simeon, a light to lighten the Gentiles." Others ascribe the origin of *Candlemas* to pope Vigilus, in the year 536; and suppose it substituted for the feast of Proserpine, held with burning tapers by the heathens in the beginning of February.

CANDY, in speaking of sugar, denotes a preparation of that substance, made by melting, and crystallizing fix or seven times over to render it hard, and transparent. See *SUGAR*.

CANDYING, makes an operation in pharmacy, as well as confectionary. Those simples which are preserved in substance by boiling in sugar being said to be *Candied*: Though the performance hereof is now turned over to the confectioner from the apothecary, to whom originally it belonged.

CANE, CANNA, a long measure, frequent in Italy, Spain, and the fourth parts of France; of greater or less length, according to the places where it is used.

At *Naples*, the *Canna* is equal to seven foot $\frac{3}{4}$ inches, English measure: the *Canna* of Tholouse, and the upper Languedoc, is equal to the vara of Arragon, and contains five feet $\frac{8}{9}$ inches; at Montpellier, in Provence, Dauphine, and the lower Languedoc, to six English feet $\frac{5}{8}$ inches.

CANEPHORÆ, Kanneqoi, in antiquity, were two virgins of quality at Athens, kept in Minerva's temple in the Acropolis, who at the feast of the Panathenea, carried baskets on their heads with something secret or mysterious therein, delivered to them by the priests.

The baskets were usually crowned with flowers, myrtles, &c.—The *Canephoræ*, in these ceremonies, always marched the first; the philosopher or priest next, and the choir of music followed.

CANEPHORIA, was a ceremony, which made part of a feast, celebrated by the Athenian virgins on the eve of their marriage-day. The *Canephoræ*, as practised at Athens, consisted in this; that the maid conducted by her father and mother, went to the temple of Minerva; carrying with her a basket full of presents, to engage the goddess to make the marriage happy; or rather, as the scholiast of Theocritus has it, the basket was intended as a kind of honourable amends made to that goddess, the protectress of virginity, for abandoning her party; or it was a ceremony to appease her wrath.

CANICULA, is a name given to one of the stars of the constellation Canis major; called also simply the *Dog-star*; by the Greeks, *σείριος, Sirius*. Pliny and Galen also give the appellation Procyon to the *Canicula*; though in propriety, Procyon is the name of another star, in the lesser Dog. See *PROCYON*.

Canicula is the tenth in order in the Britannic catalogue, in Tycho's and Ptolemy's it is the second. It is situate in the mouth of the constellation; and is of the first magnitude; being the largest, and brightest of all the stars in the heavens. Its longitude, latitude, &c. see among those of the other stars of *CANIS major*.

From the rising of this star, not cosmically, or with the sun, but heliacally, that is, its emersion from the sun's rays, which now happens about the fifteenth day of August, the antients reckoned their *Dies Caniculares*, or dog-days. See *CANICULAR*.

The Egyptians and Ethiopians begin their year at the rising of *Canicula*; reckoning to its rise again the next year, which is called the *Annis Canarius*.

CANICULAR Days, Dies CANICULARES, properly denote a certain number of days, preceding and ensuing the heliacal rising of *Canicula*, or the dog-star, in the morning.

Some authors tell us from Hippocrates and Pliny, that the day the *Canicula* rises, the sea boils, wine turns sour, dogs begin to grow mad, the bile increases and irritates, and all animals grow languid; and that the diseases ordinarily occasioned in men by it, are burning fevers, dysenteries, and phrenies.

The Romans sacrificed a brown dog every year to *Canicula* at its rising, to appease its rage. They supposed *Canicula* to be the occasion of the sultry weather, usually felt in the dog-days; but by mistake: in five or six thousand years more, *Canicula* may chance to be charged with bringing frost and snow; for it will rise in November or December.

CANINE Appetite, an inordinate hunger, to the degree of a dis-ease. See *BULIMIA*.

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CANINE Teeth, CANINI Dentes, in anatomy, are two sharp, edged teeth in each jaw; one on each side, placed between the Incisors and Molares.

They are pretty thick and round, and end in a sharp point; they have each usually but one root, which is longer than the roots of the Incisors. Their proper use is to pierce the aliment.— Because the fore-teeth are not only apt to be pulled outwards by the things we hold and break with them, but are likewise more subject to blows than the Molares: therefore above two thirds of them are buried in their alveoli, or sockets; by which their resistance of all lateral pressures, is much greater than that of the Molares. Keill.

CANINUS Mafculus, the fame as Elevator Labii Superioris. See ELEVATOR.

CANIS Major, the great Dog; in aftronomy, a constellation of the fouthern hemisphere, below Orion's feet, though fomething to the weftward of him: whose ftars Ptolemy makes 18; Tycho observed only 13; in the Britanick catalogue they are 32. Their order, names, places, longitude, magnitude, &c. are as follow.

Names and situations of the ftars.	Longi- tude	Latitude.	Magni- tude.
Preced. } of the bright informs	0 1 11	0 1 11	2
Subf. } before pofter. feet of the dog	17 51 51	57 24 15	2
In the preced. pofterior foot	22 7 5	59 14 20	2
In the extrem. of the anterior foot	3 6 8	53 24 57	2 3
Inform. under the pofterior foot	2 52 58	41 17 47	2
	4 12 39	56 44 8	5
Preced. of two in the lower knee	6 20 54	46 36 17	5
Subfeq. and fourth of the fame	7 21 25	46 5 36	5
South. in the upper knee	7 16 48	41 46 23	7
North. in the fame knee	7 25 41	42 21 25	5
	7 41 57	41 19 24	5
Exceeding bright one in mouth, Sirius	9 49 1	39 32 8	1
South. and preced. in the breast	9 59 38	37 19 38	5
In the lower leg	10 58 50	43 53 11	6
In the north ear	14 3 13	55 11 25	4
	11 52 53	34 44 34	5
Preced. of the contig. in the breast	12 55 56	42 54 49	6
Preced. of two in the fhoulder	13 59 34	46 48 52	5
South. of the contig. in the breast	13 26 56	43 2 18	7
In the head	12 44 29	36 41 50	4
Third of thofe following in breast	13 54 59	42 45 46	6
South. in the neck	12 32 8	39 39 32	4
Bright one under belly, betw. thighs	16 24 46	51 23 57	2 3
	17 12 31	50 16 0	4
North. of two in the neck	15 17 41	38 1 59	3
Subfeq. of two in the fhoulder	16 41 25	46 10 13	5 4
Bright one in the middle of the body	19 3 30	48 29 37	2 3
	20 12 26	47 53 49	7
	20 59 52	48 12 38	6
	21 18 34	48 36 51	5
	21 56 10	46 15 37	6
Bright one in the tail	22 3 25	46 38 30	5
	25 12 16	50 38 56	2 3

CANIS Minor, the little Dog, in aftronomy, a constellation of the northern hemisphere; called alfo by the Greeks, *Procyon*, and by the Latins *Antecanis*, and *Canicula*. The ftars in the constellation *Canis minor*, are in Ptolemy's catalogue 17. Their order, names, places, longitude, latitude, magnitude, &c. are as follow.

Names and situations of the ftars.	Longi- tude	Latitude.	Magni- tude.
In the head	16 48 34	10 16 12	6
North. in the neck	17 19 58	12 36 42	6
South. in the neck	17 51 52	13 31 30	3
Under thofe as in the fhoulder	18 1 23	12 51 51	6
	18 18 14	14 49 14	6
Informis, over the neck	17 56 31	9 45 18	6
North. againft preced. pofter. foot	20 10 40	19 37 58	6
Middle	20 14 7	18 31 51	7
South.	20 28 33	18 6 22	6
In the thigh, Procyon	21 30 21	15 57 55	1 2
Informis, towards the tail	22 11 5	10 17 57	6 5
In the hind leg	23 19 47	18 53 0	5
	26 57 30	18 6 10	6
Preced. in the Δ of inf. fol- } north.	28 39 12	23 47 56	5
lowing this to the fou. }	28 30 11	21 29 56	5
Latter in the faid Δ	27 56 51	17 47 51	5
	0 49 33	22 37 35	4

CANKER, fometimes denotes a fpeck made by a fharp humour, which gnaws the flefh almoft like a cauftic; very common to children, in their mouth efppecially.

CANKER, is alfo a difeafe incident to trees; which makes the bark rot and fall. See BARK, and DISEASES of plants.

CANNON,* in war, a military engine, or fire-ain for throwing iron, lead, or ftone bullets, by force of gun-powder, to a place directly oppofite to the axis of the cylinder whereof it confifts.

* The word feems derived from the Italian *Canone*, an augmentation of *Canis*, Cane; in regard a Cannon is long, ftraight, and hollow, like a cane.

The firft Cannons were called *Bombardæ*, from *Bombus*; by reafon of their noife.

The parts and proportions of a Cannon about eleven foot long, are, its barrel, or cavity, nine foot; its fulcrum, or fupport, fourteen; and its axis feven; the bore, or diameter of the mouth fix inches, and two lines the play of the ball: the diameter of the ball therefore fix inches; and its weight thirty three pounds. The metal thick about the mouth, two inches; and at the breech fix. It weighs about five thoufand fix hundred pounds: its charge is from eighteen to twenty pounds. It carries, point-blank, fix hundred paces; and loads ten times in an hour, fometimes fifteen; in a day one hundred and twenty times. Its bed fifteen foot broad, and twenty long, for the rebound. It requires twenty horfes to draw it.

Larrey makes brafs Cannon the invention of J. Owen; and fays, the firft known in England, were in 1535. Cannons, however, he owns, were known before; and observes, that at the battel of Crefli, in 1346, there were five pieces of Cannon in the Englifh army; which were the firft that had been feen in France: Mezeray alfo fays, that king Edward ftruck terror into the French army, by five or fix pieces of Cannon; it being the firft time they had feen fuch thundering machines.

Cannons are made cylindrical, that the motion of the ball may not be retarded in its paffage; and that the powder, when on fire, may not flip between the ball and the furface of the Cannon, which would hinder its effect. Wolfius would have the Cannon always deereafe, towards the mouth or orifice: in regard, the force of the powder always deereafes, in proportion to the fpace through which it is expanded. The new Cannons, after the Spanifh manner, have a cavity, or chamber at bottom of the barrel, which helps their effect. A Cannon is found to recoil two or three paces after explofion; which fome account for from the air's ruftling violently into the cavity, as foon as it is difcharged of the ball: but the real caufe, is the powder's acting equally on the breech of the Cannon, and the ball.

For a battering-piece, whose ball is thirty-fix pounds, there muft be two cannoners, three chargers, and thirty pioners. Cannons are diftinguifhed from the diameters of the balls they carry; but this diftinction is different in different nations. The proportion of their length to their diameter, depends rather on experience, than any reafoning *a priori*; and has been accordingly various, in various times and places: the rule is, that the gun be of fuch a length, as that the whole charge of powder be on fire ere the ball quit the piece. If it be made too long, the quantity of air to be driven out before the ball, will give too much refiftance to the impulf; and that impulf ceafing, the friftion of the ball againft the furface of the piece, will take off fome of its motion. Formerly, Cannons were made much longer than at prefent; till fome made by chance 2½ foot fhorter than ordinary, taught them that the ball moves with a greater impetus through a lefs fpace than a larger. This Gustavus king of Sweden proved by experience in 1624; when an iron ball, forty eight pounds weight, was found to go farther from a new fhort Cannon, than another ball of ninety fix pounds out of an old, longer piece: whereas, in other refpects, it is certain the larger the bore and ball, the greater the range.

The names of the feveral Cannons, their length, their weight, and that of their balls, as they obtain among us, are as in the following table.

NAMES of CANNON.	Weight of an iron ball.	Weight of the Cannon.	Length of the Cannon.
<i>Cannon Royal</i>	48 lb.	8000 lb.	12 Feet
<i>Demi-Cannon large</i>	36	6000	12
<i>Demi-Cannon ordinary</i>	32	5600	12
<i>Demi-Cannon leaft</i>	30	5400	11
<i>Culverin largeft</i>	20	4800	12
<i>Culverin ordinary</i>	17 lb. 5 oz.	4500	12
<i>Culverin leaft</i>	15	4000	11
<i>Demi-Culverin ordinary</i>	10 11	2700	11
<i>Demi-Culverin leaft</i>	9	2000	10
<i>Saker ordinary</i>	6	1500	10
<i>Saker leaft</i>	4 12	1400	8
<i>Minion largeft</i>	3 12	1000	8
<i>Minion ordinary</i>	3 4	800	7
<i>Falcon</i>	2 8	750	7
<i>Falconet</i>	1 5	400	6
<i>Rabinet</i>	8	300	5.6 Dig.
<i>Bafe</i>	5	200	4.6

CAN

The greatest range of a *Canon* is ordinarily fixed at an elevation of 45°. Dr. Halley shews it to be at 44°. M. S. Julian adjusts the ranges of the several pieces of *Canon*, from the weight of the ball they bear: the charge of gun-powder being always supposed in a subduple ratio of the weight of the ball: thus,

Weight of a leaden ball.	Horizontal range.	Greatest range.	Weight of a leaden ball.	Horizontal range.	Greatest range.
33 lbs.	600 Paces.	6000	12	450	5000
24	700	6000	8	400	1500
16	800	8000	2	150	1500

The same author adds, that a ball thrown to the distance of six hundred paces, sinks nine, ten, eleven, twelve, nay, thirteen foot within ground. For the *Methods of casting Cannons*, see **FOUNDRIE**.

For the metal of *Cannons*, it is either iron, or which is more usual, a mixture of copper, tin, and brass: the tin is added to the copper, to make the metal more dense and compact: so that the better or heavier the copper is, the less tin is required. Some to a hundred pounds of copper, add ten of tin, and eight of brass: others, ten of tin, five of brass, and ten of lead. Braudius describes a method of making *Cannons* of leather, on occasion: and it is certain the Swedes made use of such in the long war of the last century; but these burst too easily to have much effect. It is found by experience, that of two *Cannons* of equal bore, but different lengths; the longer requires a greater charge of powder than the shorter, in order to reach the same range. The ordinary charge of a *Canon*, is for the weight of its gun-powder to be half that of its ball. After each thirty discharges, the *Canon* is to be cooled, with two pints of vinegar, mixed with four of water, poured into the barrel; the touch-hole being first stopped.

CANNULA, or **CANULA**, in chirurgery, a little tube, or pipe, which the chirurgeons leave in wounds and ulcers, that they dare not, or chuse not to heal up; because still suppurating.

The *Canula* is to be made of gold, silver, or lead; and is perforated, that the pus entering within it, may fall upon a sponge, dipped in spirit of wine, and placed at the orifice, to keep the ulcer warm, and to prevent the external air from entering: Some of these *Canulae* have rings, whereby to keep them fast in the wound; and others have holes with ribbons through them, to bind them down. Some are round, others oval, others crooked.

There is a particular kind of *Canula*, formed taper-wise, with a screw fastened to one end, in manner of a cock: its use is, for the discharge of the water out of the abdomen, after tapping, in an ascites, or dropsy. To this end it is inserted into the body, through a hole made near the navel; with a pointed instrument, and sometimes a punch; and is fastened into its place by a bandage, and guarded from any injury of the cloaths, &c. by a case or cover. It has this advantage over the common tapping; that by means thereof, the water is drawn out when, and in what measure the patient pleases. See **PARCENTESIS**.

There are likewise a kind of copper, or iron *Canulae*, made for the more convenient application of actual cauteries: they are made very shallow, and are, in effect, little more than hoops; through the aperture whereof, the actual cautery is conveyed; which, by this means, is kept from damaging the adjacent parts.

CANOE, a denomination given to the little boats used by the savages in both Indies, as well as by the negroes in Guinea, made chiefly of the trunks of trees dug hollow, sometimes of pieces of bark fastened together.

CANON, a person who possesses a prebend, or revenue allotted for the performance of divine service, in a cathedral, or collegiate church.

Canons are of no great antiquity: Pafchier observes, that the name *Canon* was not known before Charlemaign: at least, the first we hear of, are in Gregory de Tours, who mentions a college of *Canons* instituted by Baldwin XVI. archbishop of that city, in the time of Clotharius I.

Original *Canons* were only priests, or inferior ecclesiasticks, who lived in community; residing by the cathedral church, to assist the bishop; depending entirely on his will, supported by the revenues of the bishoprick; and living in the same house, as his domesticks, or counsellors, &c. They even inherited his moveables, till the year 816; when this was prohibited by the council of Aix la Chapelle. By degrees, these communities of priests, shaking off their dependence, formed separate bodies; whereof the bishops, however, were still heads. In the Xth century, there were communities or congregations of the same kind, established even in cities where there were no bishops: these were called *Collegiates*; in regard, they used the terms *Congregation* and *College* indifferently: the name *Chapter*, now given to these bodies, being much more modern. Under the second race of the French kings, the *Canonical*, or collegiate life, had spread itself all over the country; and each cath-

CAN

edral had its chapter, distinct from the rest of the clergy. But they were not yet destined to a life so easy as now-a-days, They had the name *Canon*, from the Greek *κανον*, which signifies three different things, a *Rule*, a *Person* or *fixed revenue to live on*, and a *Catalogue* or *Matricula*. Hence, some say, they were called *Canons*, by reason of the pension or prebend; (whence they are sometimes also denominated *Sportulantes Praetres*;) others hold, they were called *Canons*, because obliged to live according to the canonical rules and institutions, which were given them; and others, as M. de Marca, because their names were inserted in the *Matricula*, or catalogue of the cathedral.

In time, the *Canons* freed themselves from their rules, the observance relaxed, and, at length, they ceased to live in community, yet they still formed bodies; pretending to other functions besides the celebration of the common office in the church, yet assuming the rights of the rest of the clergy; making themselves a necessary council of the bishop; taking upon them the administration of a see during a vacancy, and the election of a bishop to supply it. There are even some chapters exempt from the jurisdiction of the bishop, and owning no head but their dean. After the example of cathedral chapters, collegiate ones also continued to form bodies, after they had abandoned living in community.

Canons, are of various kinds; as *Cardinal Canons*, which are those attached, and, as the Latins call it, *Incardinati* to a church, as a priest is to a parish.

Domicillary Canons, were young *Canons*, who not being in orders, had no right in any particular chapters.

Excellitative Canons, were such as without having any revenue or prebend, had the title and dignities of *Canons*, a voice in the chapter, and a place in the choir; till such time as a prebend should fall.

Foreign Canons, were such as did not officiate in the *Canonries* to which they belonged.—To these were opposed *Mansionary Canons*, or *Canons Residentiary*.

In a manuscript ordinary, at Rouen, mention is made of *Canons of thirteen marks*; which, perhaps, was the revenue of their *Canonicate*.

In the church, at London, were *Canons minor*, or little *Canons*, who officiated for the great ones. At Lucca there are *Mixed Canons*. There were also *Canons of poverty*; and *Canons ad succurrendum*, who were made *Canons* at the point of death, to partake of the prayers of the chapter.

Lay or *Honorary Canons*, are such among the laity, as have been admitted, out of honour and respect, into some chapters of *Canons*.

Such as are the counts of Anjou, in the church of St. Martin de Tours; the kings of France, of St. Hilary in Poitiers, &c. the emperor, of St. Peters, &c.

Canons Regular, are *Canons* that still live in community; and who, like religious, have, in process of time, to the practice of their rules, added the solemn profession of vows.

They are called *Regulars*, to distinguish them from those *Canons* who abandon living in community, and at the same time, the observance of the *Canons* made as the rule of the clergy, for the maintenance of the ancient discipline.

The *Canons* subsisted in their simplicity till the XIth, others say the XIIIth century, when some of them separating from the community, took with them the name of *Canons*, or *acephalous Priests*, because they declined to live in community with the bishop; and those who were left, thenceforth acquired the denomination of *Canons Regular*, and adopted most of the professions of the rule of St. Augustine.

It is disputed to which class the *Canons Regular* belong, whether to the clergy or the religious; both the cleric and monastic state being united in them. The point of priority and precedence is hotly contested also, both between the *Regular Canons* and the priests; and the *Regular Canons*, and simple monks: the double capacity of the *Canons* is the foundation of this controversy.

Tertiary Canons, those who had only the third part of the revenues of the *Canonicate*.

Charlemaign ordained, that those who were admitted into the clerical, that is, the *Canonical* life, should be obliged to live canonically, and according to the rule prescribed them; obeying their bishops as monks do their abbot: by this means it was, that the spirit of monachism became introduced into cathedrals; for the clerks being tied to certain rules, became half monks; and instead of applying themselves to the function of the priesthood, shut themselves up in cloisters: whence the houses where they resided took the name of monasteries, and were to be kept enclosed; as appears by the synodical statutes of Hincmar, in 874. So that there were two kind of Monasteries, the one for monks, the other for *Canons*.

Singing, in a little time, became the chief employ of *Canons*, and is now almost the whole business they have left.

In the VIIIth century, S. Chrodegand made a rule for the *Canons*, which was received by them all, and is still extant in thirty four articles, drawn chiefly from that of St. Benedic't, but accommodated to the clerical life. In this are prescribed their penances, habits, &c. There was a second rule made in 816, at

at the request of Charlemaign, by the bishops then convened at Aix la Chapelle, on account of the Roman indiction; composed of extracts from the fathers and councils.

CANON, in an ecclesiastical sense, is a law or rule; either of doctrine or discipline, enacted especially by a council, and confirmed by the authority of the sovereign. See *LAW*.

Canons are properly decisions of matters of religion; or regulations of the polity and discipline of a church, made by councils, either general, national or provincial.

Such are the *Canons* of the council of Nice, of Trent, &c. See *COUNCIL*, and *CANON LAW*.

There have been various collections of the *Canons* of the eastern councils; but four principal ones, each ampler than the preceding. The first, according to Usher, *A. D.* 380, containing only those of the first oecumenical council, and the five provincial ones: they were but 164 in number. To these, Dionysius Exiguus, in the year 520, added the 50 *Canons* of the apostles, and those of the other general councils. The Greek *Canons*, in this second collection, end with those of the council of Calcedon; to which are subjoined, those of the council of Sardica, and the African councils. The fourth and last collection comes down as low as the second council of Nice; and it is on this that Ballamon and Zonaras have commented.

There is a great dispute about the apostolical *Canons*, usually ascribed to St. Clement, Bellarmine, Baronius, &c. will have them to be genuine *Canons* of the Apostles: Hincmar, De Marca, Beveridge, &c. take them to be framed by the bishops who were the apostles' disciples in the second or third century; but Daille, &c. maintain them to have been forged by some heretic in the sixth century. The Greek church allow eighty-five of them, and the Latins only fifty; though there are eighty four in the edition given of them in the *Corpus Juris Canonici*.

CANON is also used for the authorized catalogue of the sacred writings. See *BIBLE*.

The ancient *Canon*, or catalogue of the books of the Old Testament, was made by the Jews, and is ordinarily attributed to Efdras. This is the *Canon* allowed to have been followed by the primitive church, till the council of Carthage; and, according to St. Jerom, this consisted of no more than twenty-two books; but that council enlarged the *Canon* very considerably, taking into it the books which we call apocryphal; which the council of Trent has further enforced; enjoining all these to be received as books of holy scripture, upon pain of anathema, and being attained of heresy.

The Romanists, in defence of this *Canon*, say, that it is the same with that of the council of Hippo, held in 393, and with that of the third council of Carthage, at which were present forty-seven bishops, and amongst the rest, St. Augustin; who declared that they received it from their fathers.

Some of the fathers distinguish the inspired writings into three classes, *Proto-Canonical*, *Deutero-Canonical*, and *Apocryphal*. See *DEUTERO-CANONICAL*.

Paschal CANON, a table of the moveable feasts, shewing the day of Easter, and the other feasts depending on it, for a cycle of nineteen years.

The *Paschal Canon* is supposed to be the calculation of Eusebius of Cesarea, and to have been done by order of the council of Nice. See *EASTER*.

CANON, in monastic orders, a book wherein the religious of every convent have a fair transcript of the rules of their order, frequently read among them as their local Statutes.

This is also called *Regula*, as containing the rule and institution of their order.

The *Canon* differs from the *Missale*, *Martyrologium*, and *Necrologium*. See *MISSAL*.

CANON, again, is used for the catalogue of saints acknowledged and canonized in the Romish church.

CANON is also used, by way of excellence, in the Romish church, for the secret words of the mass, from the preface to the *Pater*; in the middle of which the priest consecrates the host. The common opinion is, that the *Canon* of mass commences with *Tu igitur*, &c. The people are to be on their knees, hearing the *Canon*; and are to rehearse it to themselves, so as not to be heard.

The *Canon* is by some pretended to have been put into its present form by St. Jerom, by order of pope Siricius. Others ascribe it to pope Siricius himself, who lived towards the close of the fourth century. The council of Trent declare the *Canon* of the mass to have been framed by the church; and to be composed of the words of Jesus Christ, his Apostles, and the first popes.

CANON, in the ancient music, is a rule or method of determining the intervals of notes.

Ptolemy, rejecting the Aristoxenian way of measuring the intervals in music, by the magnitude of a tone, (which was supposed to be formed by the difference between a diapente and a diatesseron) thought that musical intervals should be distinguished, according to the ratio's or proportions which the sounds terminating those intervals bear to one another, when considered according to their degree of acuteness or gravity; which, before Aristoxenus, was the old Pythagorean way. He therefore made

the diapason consist in a double ratio; the diapente in a sesquialterate; the diatesseron, in a sesquitercian; and the tone itself in a sequioctave; and all the other intervals, according to the proportion of the sounds that terminate them: wherefore, taking the *Canon*, (as it is called) for a determinate line of any length, he shews how this *Canon* is to be cut accordingly, so that it may represent the respective intervals: and this method answers exactly to experiment, in the different lengths of musical chords.—From this *Canon*, Ptolemy and his followers have been called *Canonici*; as those of Aristoxenus were called *Musici*.

CANON, in geometry and algebra, a general rule for the solution of all cases of a like nature with the present inquiry.

Thus every last step of an equation is a *Canon*; and, if turned into words, becomes a rule to solve all questions of the same nature with that proposed.

Natural CANON of Triangles, is a table of sines, tangents, and secants together: so called, because serving principally for the solution of triangles.

Artificial CANON of Triangles, is a table wherein the logarithms of sines and tangents are laid down. See *SINE*.

CANON LAW, a collection of ecclesiastical constitutions, decisions, and maxims, taken partly from scripture, partly from the ancient councils, and partly from the decrees of popes, and the reports and sayings of the primitive fathers, whereby all matters of polity in the Romish church are regulated.

The *Canon Law* that obtained throughout the west, till the twelfth Century, was the collection of *Canons* made by Dionysius Exiguus in 520; the capitularies of Charlemaign, and the decrees of the popes, from Siricius to Anastasius.—No regard was had to any thing not comprised in these; and the French still maintain the rights of the Gallican church to consist in their not being obliged to admit any thing else, but to be at liberty to reject all innovations made in the canonical jurisprudence since that compilation, as well as all papal decrees before Siricius.

Indeed, between the eighth and eleventh centuries, the *Canon Law* was mixed and confounded with the papal decrees, from St. Clement to Siricius; which till then had been unknown: this gave occasion to a new reform, or body of the *Canon Law*; which is the collection still extant, under the title of *The concordance of the discordant Canons*, made in 1151, by Gratian, a Benedictin monk, from texts of scripture, councils, and sentiments of the fathers, in the several points of ecclesiastical polity.

This work he divided according to the order of matters, not of times and councils, as had been done before: so that upon the appearance of this, all the ancient collections immediately sunk. It is divided into three parts: the first into an hundred and eight distinctions; the second into thirty-six causes, and the third into five distinct parts: the second part of the *Canon Law* consists of the decrees of the popes, from 1150, to pope Gregory IX. in 1229.

In 1297, pope Boniface continued the papal decrees as far as his time: this part the French make particular exception to, by reason of that pope's differences with their king Philip the fair. To these, pope John XXII. added the *Clementines*, or the five books of the constitutions of his predecessor Clement V. And to all these were after added, twenty constitutions of the said pope John, called the *Extravagantes*; and some other constitutions of his successors.

All these compose the body, or *Corpus of the Canon Law*; which, including the *Comments*, makes three volumes in folio; the rule and measure of church government: indeed, with us, since the reformation, the *Canon Law* has been much abridged and restrained; only so much of it obtaining, as is consistent with the common and statute laws of the realm, and the doctrine of the established church.

CANONNESS, in the Romish church, a woman who enjoys a prebend, affixed, by the foundation, to maids; without their being obliged to renounce the world, or make any vows.

There are few of these, except in Flanders and Germany: they are rather looked upon as a seminary and retreat of girls for marriage, than an engagement for the service of God.

CANONNESSES of St. Augustine, or *Regular CANONNESSES*, are a kind of religious, who follow the rules of St. Augustine; of which there are various congregations.

CANONIZATION,* a declaration of the pope, whereby, after a great deal of solemnity, he enters into the list of saints, some person who has lived an exemplary life, and wrought miracles.

* The word *Canonization* seems to be of later origin than the thing; there being no instance of the use of the word before the twelfth century, whereas St. Uldaricus was canonized in the tenth. The term is formed from *Canon*; in regard the primitive *Canonizations* were only orders of the popes, or bishops, whereby persons eminent for piety, &c. were inserted in the *Canon* of the mass, that they might be commemorated in the service: for that in those days, the use of martyrologies was unknown in the church.

Mabillon distinguishes two kinds of *Canonization*; a general, and

particular, the first made by a general council, or a pope; the second, by a bishop, a particular church, or a provincial council.

There are instances likewise of *Canonizations*, or at least of something very like them, by abbots.

At first, only martyrs were *canonized*; but by degrees they came to confessors, &c. It is disputed whether martyrdom do not supply the want of miracles?

Canonization antiently consisted in inserting the saint's name in the sacred diptychs, or *Canon* of saints; in appointing a proper office for invoking him, and erecting churches under his invocation, with altars for mass to be celebrated on; taking up the body from the place of its first burial, and the like ceremonies: by degrees, other formalities were added; and processions were made with the saint's image in triumph; the day of his death is declared a feast; and to render the thing still more solemn, Honorius III. in 1225, added several days indulgence to a *Canonization*.

It is a great dispute among the learned, when the right of *Canonization*, which it is owned was antiently common to ordinaries, especially metropolitans and princes, with the pope, became first peculiar to the pope? Some say, Alexander III. made this reserve to the holy see. The Jesuits of Antwerp in their Propyleum assert, it was not established till two or three ages ago; and then by a mere custom, which passed tacitly into a law; which appears not to have been generally received in the tenth and eleventh centuries. This, however, is pretty certain, that it was generally allowed before pope Alexander III.; the archbishop of Vienne in France, and his suffragans, acknowledge it in an authentic manner in the year 1231, by a letter written to Gregory IX. desiring him to *canonize* Stephen, bishop of Die, who died in 1208. *Quia nemo*, say they, *quantalibet meritorum prerogativa polleat, ab ecclesia dei pro sancto habendus, aut venerandus est, nisi prius per selem apostolicam ejus sanctitas fuerit approbata.*

CANONRY, or **CANONICATE**, the benefice filled by a *Canon*. *Canonicate* is distinguished from *prebend*, in that the *prebend* may subsist without the *Canonicate*, whereas the *Canonicate* is inseparable from the *prebend*. It is to the *Canonicate*, not to the *prebend*, that the right of suffrages and other privileges are annexed. See **PREBEND**.

CANTALIVERS, in building, pieces of wood framed into the front, or sides of a house, to sustain the mouldings and eaves over it.

Cantalivers are the same with modillions, except that the former are plain, and the latter carved. They are both a kind of cartouches set at equal distances under the corona of the cornice of a building.

CANTALIVER-CORNICE, is a cornice with *Cantalivers* or modillions under it.

CANTATA, in musick, a sort of song, or composition, intermixed with recitatives, airs, and variety of motions: ordinarily intended for a single voice, with a thorough bass; sometimes for two, three, or more voices, with one or more violins, or other instruments.

The *Cantata* passed from Italy into France, and thence to us: it has something in it extremely fantastical and capricious, and seems only to please by its variety. The word is Italian, where it signifies the same thing.

CANTHARIDES. * *Kanbarides*, in medicine, a kind of poisonous insects, with wings and feet like beetles; much used as an epispastic for the raising of blisters.

* The word is formed from *cantharus*, the name of a sort of beetle, and called also *scarabaeus venenosus*; the *Cantharides* are properly a species of the beetle or scarab kind.

Cantharides, called also *Spanish flies*, though they ought rather to be denominated *Spanish beetles*, are produced from a kind of little worms, hatched on wheat, the leaves of the poplar, &c. There are various kinds of *Cantharides*, but all of a greenish and golden hue; the best are those which appear with different colours, having yellow lines running across their wings; thick, and fresh. They are killed by exposing them over a very strong vinegar, which is made to boil for that purpose; after which they are dried, and may be preserved a year or two.

Cantharides are very sharp and corrosive, abounding with a subtle, caustic, volatile salt; whereby they become exceedingly injurious to the bladder, so as to ulcerate it, even when applied externally, if suffered to lie on too long. They are much commended in fevers, as they raise and strengthen a low trembling pulse, give relief in delirious ravings, soporiferous stupors, loss of reason, &c. (the common symptoms of high and dangerous fevers) they often also reduce continual fevers to regular and distinct remissions; and so make way for the bark; cleanse and open the obstructed glands, and lymphatics; bring on critical sweats, &c.

Dr. Morgan accounts for these effects of *Cantharides* thus: "The subtle and volatile pungent parts of which the *Cantharides* consist, being carried into the blood, and passing with the lymph or serum into the glandular pipes, act there

"by dissolving, attenuating, and rarifying the viscid cohesions of the lymph; and by stimulating the nervous coats of the vessels, they throw off their stagnant viscidities, and thus restore the circulation and free drain of lymph from the arteries to the veins; cleanse the expurgatory glands, and bring on critical sweats, and urines. Thus, the extremely subtle, active, and pungent volatile salts, derived from the *Cantharides*, purge the glands and lymphatics universally; much after the same manner as common cathartics do the guts." *Philosoph. princip. of medicine*, p. 304.

Cantharides are seldom used internally: in the *Philosoph. Transact.* indeed, we have instances of their internal use, and that with success, by Mr. Yonge, in dropical and other cases; sometimes mixed with camphor, and sometimes without; only well washed down with large draughts of posset, pisan, emulsions, or the like. The form wherein he tells us he uses to administer this fiery insect, is that of a soft pill, or bolus, composed of three *Cantharides* prepar. *Troch. e Myrrha* ʒiʒ. *Sen. Ani. gr. vi. Rob. Cynob. q. l.* This, in stubborn suppressions of the menes and lochia, in difficult childbirth, and retention of the secundines, he finds does wonders: he adds, that the heat or pain it occasions in the neck of the bladder, is much short of what he has an hundred times seen, and sometimes felt, from the application of an epispastic to the back.

Their principal use however is in vesicatories, to raise blisters on the skin; and by that means to turn off and discharge some flux of ill humours.

Cantharides are sometimes applied to the temples for the tooth-ach: the farriers use them in several diseases of horses. They must be chosen new, dry, and whole: they will not keep above two years, without spoiling or moulding into a dust, which is of no use.

CANTHUS, in anatomy, the corner, or angle of the eye; formed by the commissure or joining of the upper and lower eyelids. See **EYE**.

That corner next the nose, is called the *great, inner, and domestic Canthus*; and by some physicians the *fountain*. — The other, towards the temples, is called the *little, or external Canthus*.

CANTHUS, in chemistry, the lip of a vessel; or that part of the mouth of a vessel, which is a little hollowed, or depressed, for the easy pouring off a liquor.

Hence, to pour by decantation, is to pour through that place.

CANTON,* a quarter of a city, considered as separated and detached from the rest.

* The word seems formed from the Italian *Cantone*, a square stone, or corner stone.

CANTON is also more frequently used for a small country, or district, under its separate government.

Such are the thirteen Swiss *Cantons*; each of which forms a republic apart; but all are leagued together; and constitute what is called the Helvetic body, or commonwealth of the Swisses.

CANTON, in heraldry, is one of the nine honourable ordinaries: being a square portion of the escutcheon parted from the rest.

It has not any fixed proportion; though regularly it should be less than a quarter: it is often only a ninth part, and used as an addition, or difference, frequently to express bastardy.

The *Canton* is sometimes placed at the right corner, and sometimes at the left; in which latter case, it is called a *Canton sinister*. Its form is expressed in *Tab. Herald. fig. 12.* — He bears ermin, a *Canton* argent, charged with a cheveron gules.

CANTON, is also used for the spaces left between the branches of a cross or saltier.

CANTONED, a word used in architecture, when the corner of a building is adorned with a pilaster, an angular column, rustick quoins, or any thing that projects beyond the naked of the wall.

CANTONED, **CANTONNET**, or **CANTONIZED**, in heraldry, is when the four *Cantons*, or spaces round a cross, or saltier, are filled up with any pieces. — He bears gules, a cross argent, *cantonned* with four scollop shells.

The word is also used when there are little pieces in the *Cantons*, or spaces of any principal figure of an escutcheon. Thus the saltier of Lenox is *Cantonned* with four roses.

CANVAS, or **CANVASS**, a coarse sort of linen cloth, usually woven open, and regularly, in little squares; serving for divers domestic purposes; and especially for the ground of tapestry work, and painting.

CANVAS, is also used, among the French, for the model, or first words, whereon an air, or piece of music is composed, and given to a poet to regulate and finish. The *Canvass* of a song, is certain notes of the composer, which shew the poet the measure of the verses he is to make. Thus, Du Lot says, he has *Canvass* for ten fennets against the mules.

CAP, a garment serving to cover the head, and made nearly of the figure thereof.

The era of *Caps* and hats, is referred to the year 1449; the first seen in these parts of the world being at the entry of Charles VII. into Rouen: From that time they began, by little and little, to take place of the hoods, or chaperoons, that had been used till then. M. le Genre, indeed, goes further back; they began,

began, says he, under Charles V. to let fall the angles of the hood upon the shoulders, and to cover the head with a cap, or bonnet: when this cap was of velvet, they called it *mortier*; when of wool, simply *bonnet*: the first was laced, the latter had no ornament, besides two horns, raised a moderate height, one of which served in covering and uncovering. None but kings, princes, and knights, were allowed the use of the mortier. The *Cap* was the head-dress of the clergy and graduates. Pasquier says, that it was antiently a part of the hood wore by the people of the robe; the skirts whereof being cut off, as an incumbrance, left the round *Cap* an easy commodious cover for the head; which round *Cap* being afterwards assumed by the people, those of the gown changed it for a square one, first invented by a Frenchman, called Patrouillet: He adds, that the giving of the *Cap* to the students in the universities, was to denote that they had acquired full liberty, and were no longer subject to the rod of their superiors; in imitation of the antient Romans, who gave a *Pileus*, or *Cap*, to their slaves, in the ceremony of making them free: whence the proverb, *Vocare servos ad Pileum*. Hence, also, on medals, the *Cap* is the symbol of liberty, whom they represent holding a *Cap* in her right hand, by the point.

The Chinese have not the use of the hat, like us; but wear a *Cap* of a peculiar structure, which the laws of civility will not allow them to put off; it is different for the different seasons of the year: that used in summer, is in form of a cone, ending at top in a point. It is made of a very beautiful kind of mat, much valued in that country, and lined with fatten; to this is added, at top, a large lock of red silk, which falls all around as low as the bottom: so that, in walking, the silk fluctuating regularly on all sides, makes a graceful appearance; sometimes, instead of silk, they use a kind of bright red hair, the lustre whereof no weather effaces. In winter they wear a plush *Cap*, bordered with martlet's or fox's skin; as to the rest like those for the summer. Nothing can be neater than these *Caps*; they are frequently fold for eight or ten crowns: but they are so short that the ears are exposed.

Square-Cap.—The *Cap*, or *Bonnet*, is a mark, or ornament of certain characters: Thus churchmen, and the members of universities, students in law, physic, &c. as well as graduates, wear *square Caps*. In most universities, doctors are distinguished by peculiar *Caps*, given them in assuming the doctorate. Wickliff calls the canons of his time *Bisforcats*, from their *Caps*. Pasquier observes, that in his time, the *Caps* wore by the churchmen, &c. were called *square Caps*; though in effect, they were round, yellow *Caps*.

The *Cap* is sometimes also used as a mark of infamy: in Italy, the Jews are distinguished by a yellow *Cap*; at Luca by an orange one. In France, those who had been bankrupts, were obliged ever after to wear a green *Cap*, to prevent people from being imposed on in any future commerce. By several arrets in 1584, 1622, 1628, 1688, it was decreed, that if they were at any time found without their green *Cap*, their protection should be null, and their creditors empowered to cast them into prison: but the thing is not now executed.

CAP, in a ship, is a square piece of timber, put over the head, or upper end of a mast, having a round hole to receive the mast. By these *Caps*, the top-masts, and top-gallant-masts, are kept steady and firm in the wrestle-trees; where their feet stand; as those of the lower masts do in the steps. See *Tat. Ship*, fig. 1. n. 31. 58. 76. 101. 113. 143. and fig. 1. n. 15.

Priest's-Cap, in fortification. See *BONNET à Prêtre*.

CAPACITY, in a general sense, an aptitude, or disposition to retain, or hold any thing.

Our law allows the king two *Capacities*, a natural, and a political; in the first he may purchase lands to him, and his heirs; in the latter to him and his successors.—The clergy have the like.

CAPARASON *, or *CAPARISON*, the covering, or clothing laid over an horse; especially a sumpter, or horse of state.

* The word is Spanish, being an augmentative of *Cape*, *Capus*, head.

Antiently, the *Caparasons* were a kind of iron armour, where-with horses were covered in battel.

CAPE, in geography, a *Head-land*; or a piece of land running out beyond the rest, into the sea.

Sicily was called by the antients *Trinacria*, by reason of its three *Capes*, or promontories, represented on medals, by three mens legs joined together at the top of the thigh, and bent in the knee; which pretty nearly resembles the triangular figure of that island.

CAPE, in law, a writ touching plea of lands and tenements; so termed, from the word which carries the chief intention or end of it.

Cape, is of two kinds, the *magnum* and *parvum*; which in their effect are alike, as to the taking hold of things immovable: though in certain circumstances they differ; 1^o. In that the *Cape magnum*, or *grand Cape* lies before; and the *Cape parvum*, or *petit Cape*, after appearance. 2^o. *Cape magnum* summons the defendant to answer to the default; and besides to

the demandant: *Cape parvum* only to the default. It is called *petit Cape*, not because of its small force; but because contained in few words.

CAPE magnum is thus defined in the old *Nat. brev.* "Where a man hath brought a *Precipe quod reddat* of a thing that touches plea of land, and the tenant makes default of the day to him given in the original writ; then this writ shall be for the king to take the land into his hands: and if the tenant come not at the day given him by the writ, he loses his land."

CAPE parvum, or *petit Cape*, is thus defined, *ibid.* "Where the tenant is summoned in plea of land, and comes at the summons, and his appearance is recorded; and at the day given him, prays the view; and having it granted, makes default: then shall this writ issue for the king, &c."

CAPE ad valentiam, a species of *Cape magnum*, so called from the end to which it tends: It is thus described, "Where I am impleaded of lands, and I vouch to warrant another, against whom the summons *ad warrantandum* hath been awarded, and the sheriff comes not at the day given; then, if the defendant recover against me, I shall have a writ against the vouchee; and shall recover so much in value of the lands of the vouchee if he has so much: otherwise, I shall have execution of such lands and tenements as defend to him in fee; or, if he purchase afterwards, I shall have a re-summons against him: and if he can say nothing, I shall recover the value."

CAPELLA, in astronomy, a bright star of the first magnitude, in the left or preceding shoulder of the constellation Auriga.

In Ptolemy's and Tycho's catalogues, it is the third in order of that constellation. In the Britanic catalogue, the fourteenth: Its Longitude is 17°, 31', 41"; its Latitude 22°, 51', 47".

CAPER, *CAPPARIS*, the bud or blossom of a shrub of the same name, gathered green, ere it expand into a flower; dried in a shady place, till withered, then infused in vinegar; to which, at last, salt is added: after which, it is put up in barrels to be used as a pickle, chiefly in fauces; and sometimes also in medicine, as being very aperitive, and entering certain compositions for diseases of the spleen.

All the *Capers* sold throughout Europe, are brought from about Toulon, in France; except some some small salt *Capers* from Majorca, and a few flat ones from about Lyons.

The bark of the *Caper*-tree, when dried, is much prescribed by the French physicians in oppilations of the spleen.

CAPHAR, a toll, or duty, imposed by the Turks on the Christian merchants, who carry or send merchandises from Aleppo to Jerusalem.

The *Caphar* was first settled by the Christians themselves when masters of the Holy Land, for the support of troops and forces, posted in the more difficult passes, to watch the Arabs, and prevent their pillages. But the Turks, who have continued, and even raised the toll, abuse it; exacting arbitrary sums of the Christian merchants and travellers, on pretence of guarding them from the Arabs; with whom they yet frequently keep an understanding, and even favour their robberies.

CAPHURA, *Καφουρα*, the same with *Campbor*. See the article *CAMPBOR*.

CAP-AGA, or *CAP-AGASSI*, a Turkish officer, who is governor of the gates of the Seraglio; or grand master of the Seraglio.

The *Cap-aga* is the first dignity among the white eunuchs: He is always near the person of the grand signior: he introduces ambassadors to their audience: no body enters, or goes out of the grand signior's apartment but by his means. His office gives him the privilege of wearing the turban in the Seraglio, and of going every where on horseback. He accompanies the grand signior to the apartment of the sultana's, but stops at the door without entering. His appointment is very moderate; the grand signior bears the expence of his table, and allows him at the rate of about sixty French livres per day: but his office brings him in abundance of presents; no affair of consequence coming to the emperor's knowledge, without passing through his hand. The *Cap-aga* cannot be Bathed when he quits his post.

CAPIAS, a writ or process, which is of two sorts; one before judgment, called *Capias ad Respondendum*; granted in an action personal, when the sheriff, upon the first writ of distress, returns, *Nihil habet in balliva nostra*.

The other is a writ of execution after judgment, which is also of various kinds; as, *Capias ad satisfaciendum*, *Capias pro Fine*, *Capias Utrogatum*, &c.

CAPIAS ad satisfaciendum, is a writ of execution after judgment; lying where a man recovers in an action personal, as for debt, damage, &c. in which cases, this writ issues to the sheriff, commanding him to take the body of him against whom the debt is recovered; who is to be kept in prison till he make satisfaction.

CAPIAS condactus ad proficiendum, an original writ, which lies, by the common law, against any soldier who has covenanted to serve the king in war, and appears not at the time and place appointed.

appointed. It is directed to two of the king's serjeants at arms, to arrest and take him wherever he may be found; and to bring him *coram concilio nostro*, with a clause of assistance.

CAPIAS pro Fine, is where one being by judgment fined to the king, upon some offence against a statute, does not discharge it according to the judgment: By this writ, therefore, his body is to be taken, and committed to prison till he pay the fine.

CAPIAS Ultragatum, a writ which lies against one outlawed upon any action, personal or criminal; by which the sheriff is ordered to apprehend the party outlawed, for not appearing on the exigent, and keep him in safe custody till the day of return; when he is to present him to the court, to be there further ordered for his contempt.

CAPIGI, a porter, or doorkeeper of the Turkish Seraglio.

There are about five hundred *Capigis*, or porters in the Seraglio, divided into two companies; one consisting of three hundred, under a chief called *Capigi-Bassa*: who has a stipend of three ducats *per day*: The other consists of two hundred, distinguished by the name of *Cuccicapigi*; and their chief *Cuccicapigi-Bassa*, who has two ducats. The *Capigis* have from seven to fifteen *aspers per day*; some more, others less. Their business is to assist the Janizaries in the guard of the first and second gates of the Seraglio: sometimes all together; as when the Turk holds a general council, receives an ambassador, or goes to the mosque; and sometimes only in part; being ranged on either side, to prevent people entering with arms, any tumults being made, &c. The word, in its original, signifies gate.

CAPILLAMENT, literally signifies *Hair*; being formed of the Latin *Capillus*, of *Caput*; q. d. *Hair of the Head*. Hence the word is figuratively applied to several things, which, on account of their length, or their fineness, resemble hairs: As,

CAPILLAMENTS of the Nerves, the fine fibres, or filaments, whereof the nerves are composed.

“Is not vision performed chiefly by the vibrations of this medium, excited in the bottom of the eye by the rays of light; and propagated through the solid, pellucid, and uniform *Capillaments* of the optic nerves, to the sensorium? Newt. Opt. p. 328.

CAPILLAMENTS, in botany, more usually called *stamina*, are those small threads, or hairs, which grow up in the middle of flowers; and are headed with little knobs, called *Apices*. See **STAMINA**, and **APICES**.

CAPILLARY, of the Latin *Capillus*, a hair; is applied to several things, to imitate their exceeding smallness, or fineness, resembling that of a hair.

CAPILLARY Vessels, in anatomy, are the least, minutest, insensible ramifications of the veins and arteries; which, when cut, or broke, yield but very little blood.

The *Capillary vessels* should be conceived as vastly finer than hairs: they are best compared to the threads of cobwebs, and are sometimes called *evanescent vessels*.

CAPILLARY, or CAPILLACEOUS Plants, a species of plants, thus denominated from their form, and manner of growth, as having no principal stalk, or stem, with branches, &c. shooting out of the same; but growing from the ground, like hairs from the head: and bearing their seed in little tufts, or prominencies, on the backside of their leaves.

The principal of these, is the *Capillus Veneris*, or *Adiantum*; from which the rest take their name.

The *Capillaries* are distinguished into those with an undivided leaf, as the hemionitis, and the phyllitis: those with a singly divided leaf, and which have the leaf either cut, or jagged in, but not divided into pinnae, clear home to the main rib; as, polypodium, lonchitis, scolopendria, adiantum, and acrostichon. Or else the leaf divided quite home to the rib, and hanging like pinnae; as the chamafelix marina, and the trichomanes: Those which have the leaf doubly divided, or at least once subdivided, the first division being into branches, and the second into pinnae; as the hemionitis multifida, the filix mas, filix palustris, and filix faxatilis. Lastly, those which have the leaf trebly divided, or thrice subdivided; first into branches, then into little twigs, and after this into pinnae: such are, the filix scandens of Brasilia, the filix florida, or osmunda regalis; the filix mas ramosa, the filix femina vulgaris, the adiantum album floridum, and the dryopteris nigra.

All the *Capillaries* are reputed of use in medicine, especially in the making of Pectoral syrups; to which, wonderful virtues are attributed. But, in effect, only the *Capillary* of Montpellier, adiantum album Monspeliense, and that of Canada, adiantum album Canadense, are regularly used for that purpose: the rest only serve to counterfeit them.

The ancients thought that the *Capillaries* were all without seed; and some of the moderns, particularly Dodonæus, have given into the opinion. But Bauhine, and other of the more accurate observers, maintain they have all their seed. Cæsius says, he has seen them with a microscope: since him, Mr. W. Cole, and others, have observed them with still more curiosity; the capsule, or seed vessels, are in some less by half than a small grain of common sand, in others much less; yet some of them contain about one hundred seeds.

CAPILLARY Tubes, in physics, are little pipes, whose canals are the narrowest possible; not such, whose diameters do not exceed that of a common hair; for none such can be made: the usual diameter of *Capillary tubes*, is a half, third, or fourth of a line: though Dr. Hook assures us he drew tubes in the flame of a lamp much smaller, as fine almost as a thread of a cobweb. See **TUBE**.

The *Ascent of Water, &c. in CAPILLARY Tubes*, is a famous phenomenon which has long embarrassed the philosophers: let one end of a small tube, open at both ends, be immersed in water, and the liquor within the tube will rise to some sensible height above the external surface: or, immerge two or more tubes in the same fluid, one of them a *Capillary* one, and the other considerably larger; the water will ascend considerably higher in the *Capillary* tube than the other; and this in the reciprocal ratio of the diameters of the tubes.

This effect, authors have commonly imputed to the unequal pressure of the air in unequal tubes: the air, say they, consists of ramose, spongy parts, intermingled and embarrassed among each other: now, a column of such air being supported perpendicularly incumbent on the canal of a small *Capillary* tube; part of the pressure of the column will be spent on the sides, or surface of the tube; so that the column will not act with its whole weight on the subjacent fluid, but will lose a greater or less proportion of its weight, as the diameter of the tube is the smaller. But this solution is destroyed, by the experiment's succeeding *in vacuo*, as well as in open air.

Others, as Mr. Hauksbee, &c. have recourse to the attraction of the annuli of the concave surface of the tube; to which opinion Dr. Morgan subscribes: “Part of the gravity of the water in the tube, says that author, being taken off, by the attractive power of the internal concave surface of the glass; the fluid within the tube, by the external greater weight or pressure, must ascend so far, as to compensate for this diminution of gravity by the attraction of the glass.” He adds, that as the power of attraction in tubes, is in a reciprocal ratio of the diameters; by lessening the said diameter, or by supposing the tubes still smaller and smaller, “water, or any other fluid, may be thus raised to any assignable height.” *Phil. princ. of medicine*, p. 88, &c.

But this author is somewhat overlen: for since in every *Capillary Tube*, the height to which the water will spontaneously ascend, is reciprocally as the diameter of the tube; it follows, that the surface containing the suspended water is always a given quantity. But the column of water suspended in every tube, is as the diameter of the tube: therefore, if the attraction of the containing surface be the cause of the water's suspension; it will follow, that equal causes produce unequal effects; which is absurd. And, again, not only his solution, but his phenomenon also is stretched too far: for it is not in all fluids that the phenomenon obtains; but in mercury the very contrary is found: that fluid in a tube, not rising so high as the level of that in the vessel; and the defect being found the greater as the tube is smaller.

We must, therefore, recur to Dr. Jurin's solution of this phenomenon, which is well supported by experiments: “The suspension of the water, (on that gentleman's system) is owing to the attraction of the periphery of the concave surface of the tube, to which the upper surface of the water is contiguous and adheres.” This being the only part of the tube, from which the water must recede upon its subsiding; and consequently the only one which, by the force of its cohesion and attraction, opposes the descent of the water. This he shews to be a cause proportional to the effect; in regard, the periphery, and the suspended column, are both in the same proportion as the diameter of the tube. The suspension thus accounted for, the seemingly spontaneous ascent will easily be solved: for since the water that enters a *Capillary* tube as soon as its orifice is dipped therein, has its gravity taken off by the attraction of the periphery, with which its upper surface is in contact, it must necessarily rise higher; partly by the pressure of the stagnant water, and partly by the attraction of the periphery, immediately above that which is already contiguous to it.

CAPILLARY Fracture. See the article **CAPILLATION**.

CAPILLATION, or, CAPILLARY Fracture, according to some writers, is a fracture in the skull, so small that it can scarce be perceived; but yet it often proves mortal. See **FRACTURE**.

CAPISTRUM, in surgery, a *Head-stall*, or bandage used in case of injuries of the head, especially fractures of the jaw.

CAPITAL, of the Latin *Caput*, is used on various occasions, to express the relation of a head, chief, or principal: Thus,

CAPITAL City, intimates the principal city of a kingdom, province, or state: as, London is the *Capital*, or *Capital City* of England; Moscow of Russia; Constantinople of the Ottoman empire; Rouen of Normandy, &c. See **METROPOLIS**, and **CITY**.

CAPITAL, or **CAPITAL Stock**, in commerce, is the fund, or stock of a trading company or corporation; or the sum of money which they jointly furnish, or contribute to be employed in trade.

The *Capital* of the East-India company, at its first erection, was 369891 l. sterling, which was afterwards doubled; and is now computed at upwards of 1703422 l. 500 pounds in the *Capital Stock* of this company, entitles the person to a vote in the general courts thereof.

The power given by parliament to the South-Sea company, to increase their *Capital*, was the source of all the mischief which ensued in the year 1720.

CAPITAL Crime, is that which subjects the criminal to a *Capital* punishment; i. e. to the loss of life, either natural or civil.

CAPITAL Lees, are the strong lees made by the soap-boilers, from pot-ashes.

They are also used in surgery, as a caustic; and to make the lapis infernalis.

CAPITAL Letters. See the article **CAPITALS**.

CAPITAL Medicines, in pharmacy, are the great, or principal preparations of the shops; these are remarkable for the number of their ingredients, and their extraordinary virtues, such as Venice Treacle, Mithridate, &c.

CAPITAL, in architecture, the uppermost part of a column or pilaster, serving as the head, or crowning thereof; placed immediately over the shaft, and under the entablature.

CAPITAL of a column, properly, is that whose plan is round.

Whereas the **CAPITAL of a Pilaster**, is that whose plan is square; or at least rectilinear.

The *Capital* is a principal, and essential part of an order of column or pilaster, it is made different in the different orders; and is that which chiefly distinguishes and characterizes the orders themselves.

Tuscan CAPITAL, is the most simple and unadorned; its members, or parts, are but three, viz. an Abacus; under this an Ovolo, or quarter round; and under that, a Gorge, or Colarino. The gorge, or neck terminates in an astragal, or fillet belonging to the fust, or shaft.—See *Tab. Archit. Fig. 24*.

The character of this *Capital*, whereby it is distinguished from the Doric, &c. is that the abacus is square, and quite plain, and has no ogee or other moulding; and that there are no anulets under the ovolo.

Indeed, authors vary a little as to the character of the Tuscan *Capital*. Vignola gives the abacus a fillet, in lieu of an ovolo. Vitruvius and Scamozzi, add an astragal and fillet, between the ovolo and neck: Serlio only a fillet; Philander rounds the corners of the abacus. In the Trajan column there is no neck; but the astragal of the shaft is confounded with that of the *Capital*.

The height of this *Capital* is the same with that of the Base, viz. one module, or semidiameter. Its projecture is equal to that of the circure at the bottom of the column; viz. $\frac{1}{2}$ of the module.

Doric CAPITAL, beside an abacus, an ovolo, and a gorge, in common with the Tuscan, this has three anulets, or little square members, underneath the ovolo, in lieu of the astragal in the Tuscan; and a talon, cima, or ogee, with a fillet over the abacus.

Authors vary, too, as to the characters of this *Capital*: Palladio, Vignola, &c. put roses under the corners of the abacus, and in the neck of the *Capital*.

The height of this *Capital*, Vitruvius, &c. makes one module; and its projecture 37 minutes and an half.—See *Tab. Archit. Fig. 28*.

Ionic CAPITAL is composed of three parts; an abacus, consisting of an ogee and a fillet; under this a rind, which produces the volutes, or scrolls, the most essential part of this *Capital*; and at the bottom, an ovolo, or quarter round: the astragal, under the ovolo, belongs to the shaft. The middle part is called a rind, or bark, from its supposed resemblance to the bark of a tree laid on a vase, whose brim is represented by the ovolo, and seeming to have been thrunk up in drying, and to have twisted into the volutes.

The Ovolo is adorned with eggs, as they are sometimes called, from their oval form: The Greeks call it the *Echinos*.

The height of this *Capital*, M. Perrault makes eighteen minutes; its projecture one module, seven tenths.—See *Tab. Archit. Fig. 32*.

The differences in the character of this *Capital*, flow mostly from the different management of the volutes; and consist in this: that in the antique, and some of the modern, the eye of the volute answers not the astragal of the top of the shaft, as Vitruvius and most of the moderns make it: that the face of the volutes, which usually make a flat, is sometimes curved and convex, so as the circumvolutions go advancing outwards; as is frequent in the antique: that the border, or rim of the scroll in the volute, is sometimes not only a plain sweep, as ordinarily; but the sweep is accompanied with a fillet: That

the leaves which invest the balluster, are sometimes long and narrow; sometimes larger and broader; that the two faces of the volutes are sometimes joined at the outer corner; the ballusters meeting in the inner, to make a regularity between the faces on front and back of the building, with those of the sides: that among the moderns since Scamozzi, the *Ionic Capital* has been altered, and the four faces made alike, by taking away the balluster, and following all the faces of the volutes inwards, as in the composite: that Scamozzi, and some others, make the volutes to spring out from the ovolo, as from a vase, after the manner of the modern composite; whereas in the antique, the bark passes between the ovolo and abacus quite straight, only twisting at its extremities to form the volute. And lastly, that of late years, the sculptors have added a kind of little festoons, springing from the flower whose stalk lies on the first circumvolution of the volute; and supposed to represent the locks of hair hanging down on both sides of the face. See **IONIC**.

Corinthian CAPITAL, is much the richest: it has no ovolo; and its abacus is very different from those of the Tuscan, Doric, or Ionic; as having its faces circular, and hollowed inward, with a rose in the middle of each sweep. Instead of an ovolo, and annulets, here is only a brim of a vase; and the neck is much lengthened and enriched with a double row of eight leaves in each, bending their heads downwards; and between them, small stalks arising: whence spring the volutes; which do not resemble those of the *Ionic Capital*; and which, instead of the four in the Ionic, are here sixteen: four on each side, under the four horns of the abacus, where the volutes meet in a small leaf, which turns back towards the corner of the abacus. The leaves are divided, each making three ranges of lesser leaves, whereof they are composed; each lesser leaf is, again, generally parted into five, called *Olive Leaves*; sometimes into three, and called *Laurel Leaves*. The middle leaf, which bends down, is parted into eleven. In the middle, over the leaves, is a flower, shooting out between the stems and volutes, like the rose in the abacus. The height of this *Capital* is two modules $\frac{1}{2}$, and its projecture one $\frac{1}{2}$.

The differences in the character of this *Capital*, are, that in Vitruvius, &c. the leaves are in form of the acanthus; whereas in the antique, they are more ordinarily olive leaves: that their leaves are usually unequal, the undermost being made commonly tallest, sometimes the shortest; though sometimes they are all equal. Sometimes the leaves are ruffled; sometimes quite plain; the first row generally belly out towards the bottom, but are sometimes straight: sometimes the horns of the abacus are sharp at the corners, which seems agreeable to the rules of Vitruvius; but they are more commonly cut off. There is some difference too in the form and size of the rose. Again, the volutes are sometimes joined to each other; sometimes wholly separate: sometimes the spires of the volutes continue twisting even to the end of the same course; and sometimes they turn back again near the centre, in the form of an S.—See *Tab. Archit. Fig. 21, and 26*.

Composite CAPITAL, is so called, because composed of members borrowed from the *Capitals* of the other columns. It takes a quarter round, or ovolo, from the Doric; an astragal under this; together with volutes, or scrolls, from the Ionic; and a double row of leaves from the Corinthian, which it resembles in most other things; consisting, generally, of the same members, and the same proportions. In the middle of the abacus is a flower; and under the thorns, leaves which return upward, as in the Corinthian. Indeed, instead of stalks in the Corinthian, the *Composite* has small flowers, lying close to the vase or bell; twisting round towards the middle of the face of the *Capitals*, and terminating in the rose.

The height of the *Composite Capital*, is two modules $\frac{1}{2}$, and its projecture one module $\frac{1}{2}$, as in the Corinthian.—See *Tab. Archit. Fig. 30*.

The differences of the character of this *Capital*, consist in this; that the volutes, which ordinarily descend, and touch the leaves, are in some works of the antique separate from them: that the leaves, which are generally unequal in height, the lower rank being tallest, are sometimes equal: that the volutes of the moderns generally spring out of the vase; whereas, in the antique, they ordinarily run straight the length of the abacus, over the ovolo, without striking into the vase: that the volutes, whose thickness is contracted in the middle and enlarged above and below in the antique, have their sides parallel in the works of the moderns: And lastly, that the volutes, which have been hitherto both by the antients and moderns, made as if solid, are now much lighter and more airy; the folds standing hollow, and at a distance from each other.

For the proportions of the several members of the **CAPITALS** of Columns, see **COLUMN**. See also each member under its proper head; as **ABACUS**, **ACANTHUS**, **VOLUTE**, &c. Some architects distinguish the *Tuscan* and *Doric Capitals*, which have no ornaments, by the title of *Capitals of mouldings*; and the three others, which have leaves and ornaments, they call *Capitals of Sculpture*.

Angular CAPITAL, is that which bears the return of an entablature, at the corner of the projection of a frontispiece.

CAPITAL of a Balluster, is that part which crowns the Balluster; which sometimes bears a resemblance to the *Capitals* of some columns; particularly the Ionic.

CAPITAL of a Niche, is a kind of little canopy over a shallow niche, covering or crowning a statue.

CAPITAL of a Triglyph, is the plat-band over the Triglyph; called by Vitruvius *Tenia*. It is sometimes also a Triglyph which does the office of a *Capital* to a Doric pilaster.

CAPITAL of a Bastion, in fortification, is a line drawn from the angle of the polygon, to the point of the Bastion.

The *Capitals of Bastions* are from thirty-five to forty fathom long, from the point of the Bastion to the point where the two demigorges meet. See *BASTION*.

CAPITALS, in printing, large, or initial letters, wherein titles, &c. are composed, and with which all periods, verses, &c. commence.

All proper names of men, countries, kingdoms, terms of arts, sciences, and dignities, usually begin with *Capitals*.

The English printers have carried *Capitals* to a pitch of extravagance; making it a rule, to begin almost every substantive with a *Capital*; which is a manifest perversion of the design of *Capitals*, as well as an offence against beauty and distinctness. Some of them begin now to retrench their superfluous *Capitals*, and to fall into the measures of the printers of other nations. See *LETTER*.

CAPITATE Plantæ, in botany, are those plants whose flowers are fistular, composed of many edged and hollow little flowers; they were thus called by Mr. Ray, because their scaly calyx (or cup of the flower) most usually swells out into a large and round head, containing within it the pappous seed: as in the carduus, centaury, knap-weed, cinara, cirium, lappa maj. cyanus, &c.

CAPITATION, a tax, or imposition raised on each person, in consideration of his labour, industry, office, rank, &c. This kind of tribute is very ancient, and answers to what the Greeks called *επισημασιον*; the Latins *Capita*, *Capitatio*, and *Tributum*, or *Tributum Capitis*, or *Capitulare*; by this term taxes on the person, are distinguished from taxes on merchandise; which were called *Vestigalia*, *quia vehebantur*.

CAPITATION also denotes a certain sum of money imposed per head, in exigencies of state.

CAPITE, in law, an ancient tenure, whereby a person held of the king immediately, as of his crown; either by knight's-service, or soccage.

By a statute, 12 Car. II. all such tenures by knight's-service of the king, or of any other person, knight's services in *Capite*, or soccage, with all rights, &c. are annulled. See *Soccage*.

*CAPITOL**, *CAPITOLIUM*, in antiquity, a famous fort, or castle, on the *Mons Capitolinus* at Rome, wherein was a temple dedicated to Jupiter, thence also denominated *Capitolinus*, in which the senate anciently assembled; and which still serves as the city-hall, or town-house, for the meeting of the conservators of the Roman people.

* It had its name *Capitol*, from *Caput*, a man's head, said to have been found fresh, and wet bleeding, upon digging the foundation of the temple, built in honour of Jupiter. Atrobus adds, that the man's name was *Tolus*, whence *Caput-tolium*.

The first foundations of the *Capitol* were laid by Tarquin the elder, in the year of Rome 139. His successor, Servius, raised the walls; and Tarquin the proud finished it, in the year 221. But it was not consecrated, till the third year after the expulsion of the kings, and establishment of the consulate. The ceremony of the dedication of the temple, was performed by the consul Horatius, in 246.

The *Capitol* consisted of three parts; a nave, sacred to Jupiter; and two wings, or sides, to Juno and Minerva: It was ascended to by stairs; Lipsius reckons one hundred in number, by reason there were so many in the ascent of the Tarpeian rock. The frontispiece and sides were encompassed with galleries, wherein those who had the honour of a triumph, entertained the senate at a magnificent banquet, after the performance of sacrifice to the gods. Both inside and outside were enriched with infinite ornaments; the statue of Jupiter, with his golden thunderbolt, his scepter and crown, were the most distinguished.

In the same *Capitol* there were likewise a temple to Jupiter the guardian, and another to Juno; with the mint: and on the descent of the hill, was the temple of Concord. The *Capitol* was burnt under Vitellius, and rebuilt under Vespasian. It was burnt a second time by lightning, under Titus, and was again restored by Domitian.

Antiently, the name *Capitol* was likewise applied to all the principal temples, in most of the colonies throughout the Roman empire; as, at Constantinople, Jerusalem, Carthage, Ravenna, Capua, &c.—That of Tholouse, has given the name of *Capitolis* to its chevins, or sheriffs.

CAPITOLINE Games, *Ludi*, *CAPITOLINI*, were annual games, or combats instituted by Camillus, in honour of Jupiter *Capitolinus*, and in commemoration of the *Capitol's* not being surprized by the Gauls.

Plutarch tells us, that a part of the ceremony consisted in the publick cryers putting up the Hetrurians to sale by auction. They also took an old man, tying a golden bulla to his neck, such as were wore by their children, and exposed him to the publick derision. Pestus says, they dressed him in a prætexta, hung a bulla at his neck; not as accounting him a child, but because this was an ornament of the kings of Hetruria.

There was also another kind of *Capitoline* games, called *Agones Capitolini*, instituted by Domitian, and celebrated each five years; wherein there were rewards and crowns bestowed on the victorious poets, and put on their heads by the emperor himself. These games became so celebrated, that the manner of accounting time by lustres, which had obtained till then, was changed; and they began to count by *Capitoline* games, as the Greeks by olympiads. The feast was not for poets alone, but also for athletes, orators, historians, comedians, musicians, &c.

CAPITULAR, or *CAPITULARY*, denotes an act passed in a chapter, either of knights, canons, or religious.

The *Capitularia*, or *Capitulars* of Charlemaign, Charles the bald, &c. are the laws, both ecclesiastical and civil, made by those emperors in the general councils, or assemblies of the people: which was the way the constitutions of most of the ancient princes were made; each person present though a Plebeian, setting his hand to them.

Some distinguish these from laws; and say, they were only supplements to laws.—They had their name, *Capitulars*, because divided into *Capitula*, chapters or sections.

In these *Capitulars* did the whole French jurisprudence antiently consist.—In process of time, the name was changed for that of *Ordonnances*.

Some distinguish three kinds of *Capitulars*, according to the difference of their subject matter: Those on ecclesiastical affairs, are real canons, extracted from councils; those on secular affairs, real laws; those relating to particular persons, or occasions, private regulations.

CAPITULATION, a treaty made with the garrison, or inhabitants of a place besieged; whereby they surrender themselves up, on certain articles and conditions stipulated with the besiegers.

CAPITULATION, denotes also a kind of treaty, *παρά conventa*, or original contract drawn up by the electors, before the election of an emperor; which the emperor is to ratify before his coronation, and to observe inviolably in the course of his reign.

These imperial *Capitulations* have only been obtained since the time of Charles V. They were occasioned, by the jealousy the German princes had entertained of the too great power of the emperor. Frederic, duke of Saxony, surnamed the *Wise*, passes for the author of the imperial *Capitulations*; he declining the empire, which was offered him after the death of Maximilian, and advising the electors to chuse Charles V. under such conditions as might secure the liberty of the empire.

CAPITULUM, in botany, the head, or compound flower of any plant; being composed of many leaves and threads, or stamina, closely connected in a globous, circular, or discous figure: as the flowers of bluebottles, scabious, carduus, &c.

CAPIVI, see *COPIVI*.

*CAPNOMANCY**, *Καπνομαντια*, a kind of divination by means of smoak, used by the antients in their sacrifices.

* The word comes from the Greek *καπνος*, smoak; and *μαντια*, divination.

The general rule was, when the smoak was thin, and light, and rose straight up, it was a good omen; if the contrary, it was an ill one.

There was also another species of *Capnomancy*, consisting in the observation of the smoak rising from poppy and jessamin seed, cast upon lighted coals.

CAPONIERE, or *CAPONNIERE*, in fortification, a covered lodgment, sunk four or five foot into the ground, encompassed with a little parapet about two foot high, serving to support several planks covered with earth.

The *Caponiere* is large enough to contain fifteen or twenty soldiers; and is usually placed in the glacis on the extremity of the counterfarp, and in dry moats; having little embrasures for the soldiers to fire through.

*CAPRA**, in astronomy, a denomination given to the star *Capella*: and sometimes also to the constellation *Capricorn*. See *CAPELLA*, and *CAPRICORN*.

* Some represent *Capra*, or the she goat, as a constellation in the northern hemisphere, consisting of three stars, comprized between the 4th and 5th degree of latitude. The poets say, it is Amalthea's goat, which suckled Jupiter in his infancy. Horace making mention of it, calls it, *Insana lydera Caprae*.

CAPRA Saltans, or *CAPRÆ Saltantes*, in meteorology, a fiery meteor, or exhalation, which sometimes appears in the atmosphere, and is not fired in a straight line, but with inflexions, and windings in and out, resembling the caperings of a goat.

CAPREOLUS, in botany, the clasper, or tendril, by which vines, pease, and such-like creeping plants, fasten themselves

CAP

to those things which stand near, or are designed to support them.

CAPREOLATÆ Plantæ, are such plants as turn, wind, and climb along the surface of the earth, and sticks or trees, by means of their Caprells, or tendrils: as, gourds, melons, cucumbers, &c.

CAPRICORN, in astronomy the tenth sign of the Zodiac; from which also the tenth part of the ecliptic takes the same denomination.

The character whereby Capricorn is represented in astronomical writings is, ♑.

The ancients accounted Capricorn the tenth sign, and when the sun arrived thereat, it made the winter solstice, with regard to our hemisphere: but the stars having advanced a whole sign towards the east, Capricorn is now rather the eleventh sign; and it is at the sun's entry into sagittary, that the solstice happens: though the ancient manner of speaking is still retained.

This sign is represented on ancient monuments, medals, &c. as having the fore-part of a goat, and the hind-part of a fish; which is the form of an Ægyptian: and sometimes, simply under the form of a goat.

The stars in the constellation Capricorn, in Ptolemy's and Tycho's catalogue, are twenty-eight; in that of Hevelius twenty-nine: though it is to be observed, one of those in the tail, of the sixth magnitude, marked in Tycho's book the twenty-seventh, was lost in Hevelius's time. Mr. Flamsteed, in the Britannic catalogue, gives fifty one stars in Capricorn.—The order, names, longitudes, latitudes, magnitudes, &c. whereof, are as follows.

Names and Situations of the Stars.	Right Ascension	Longitude	Latitude	Magnitude
In the extrem. of the preced. horn	♑ 28 6 58	0 11	7 27 4 B	7
	28 10 28		7 13 18 B	6
	29 11 41		7 15 34 B	6
The preced. star in the subseq. horn	27 26 1	2 3 23 A		6
	29 27 19	7 1 31 B		4
The last of the contiguous stars	29 32 21	6 58 6 B		3
That under the eye	28 21 41	0 29 29 B		6
The middle star in the subseq. horn	0 6 56	6 35 52 B		6
Molt fourth of 3 in the subseq. horn	♑ 29 43 57	4 37 27 B		3
Foremost of 3 in the nose	0 43 55	0 56 6 B		6
North of these	0 51 9	1 14 17 B		6
South of those in the nose	0 54 10	0 26 9 B		5 6
North of two in the neck	3 28 57	3 19 30 B		6
More fourth	3 58 44	3 23 26 B		6
	3 20 53	0 15 46 B		6
That under the upper knee	2 50 11	6 58 23 A		5
	3 50 59	3 22 34 A		6
In the lower and bent knee	3 37 5	8 55 5 A		6
	6 47 24	0 28 9 A		6 7
	7 34 16	1 51 10 A		6 7
	8 17 2	0 29 38 A		6
Preced. and nor. of 3 in mid. of body	8 25 55	2 57 43 A		5
Preced. of 2 in the back	9 31 40	0 33 0 A		5
That in the shoulder	7 30 46	8 3 38 A		6
South. in the middle of the body	8 57 52	4 31 8 A		6
	9 24 57	3 36 46 A		6
Second in the middle of the body	9 22 7	3 58 9 A		6
Subsequent	10 42 44	4 29 50 A		6
Last of 3 in the middle of the body	12 10 39	0 43 40 B		6
	12 2 31	2 7 23 A		6
	12 16 0	1 39 3 A		7
Subseq. of 2 in the back	13 21 50	1 20 13 A		5
	12 33 35	5 17 26 A		6
1st of contiguous ones under belly	12 36 49	6 57 36 A		5
	13 8 8	5 50 27 A		6
	13 15 20	6 31 45 A		6
Subseq. of the same	15 10 57	5 22 15 A		6
	15 8 37	5 31 19 A		6
	15 52 53	4 36 56 A		6
Preced. in south. fin	17 27 42	2 31 18 A		4 3
Preced. in root of the tail	15 42 16	8 53 38 A		6
	18 40 49	0 9 13 A		6
Subseq. in south fin	17 19 5	4 48 36 A		5
Preced. in north part of the tail	18 53 46	0 37 41 A		6
Subsequent	19 0 0	1 1 54 A		6
	21 5 31	4 13 51 B		6
North. in extrem. of the tail	21 19 31	3 56 38 B		6
Another, subsequent	20 41 4	1 57 24 B		5
Middle in north. part of the tail	19 13 14	2 32 19 A		3
Subseq. in root of the tail	20 36 58	1 58 24 B		6
	21 29 12	0 39 10 A		5

Tropic of CAPRICORN, a lesser circle of the sphere, parallel to the equator; passing through the beginning of Capricorn. See TROPIC.

CAP

CAPRIOLES*, in horsemanship, are leaps which a horse makes in one and the same place, without advancing forwards; and that in such manner, that when he is in the air, at the height of his leap, he yerks or strikes out with his hind legs as near and even together, and as far out as he can stretch them; in which action, he clacks, or makes a noise with them.

* The word comes from Caprius, a diminutive of Caper, Goat.

The Capriole is the most difficult of all the high raised airs: there are several kinds of Caprioles; as, a right Capriole, back Capriole, side Capriole, brake Capriole, the open Capriole, &c.

CAPSQUARES, in gunnery, strong plates of iron, which come over the trunnions of a gun, and keep it in the carriage.

These are fastened by hinges to the prize-plate, that they may lift up and down. They form a part of an arch in the middle, to receive a third part of the thickness of the trunnions; for two thirds of them are let into the carriage, and the other end is fastened by two iron wedges, which are called the fore-locks and keys.

CAPSTAN, a large cylinder, or barrel placed perpendicularly on the deck of a ship, and turned by four levers, or bars which cross it; serving by means of a cable which winds round the cylinder, to draw up vast burdens fastened to the end of the cable.

By the Capstan it is, that vessels are drawn ashore, and hoisted up to be refitted; the heaviest goods are unloaded, anchors weighed, and sails hoisted, &c.

There are two Capstans in a vessel: the main Capstan placed behind the mainmast, standing on the first deck, and reaching four or five feet above the second: this is also called double Capstan, because serving two decks for drawing of anchors: and because its force may be doubled by applying hands on each deck. It has bars, whelps, a pannel, &c. for turning and stopping it.—See Tab. Ship. Fig. 2. n. 112.

And the jeer Capstan, or little Capstan, this stands on the second deck, between the mainmast and the mizzen: its use is, chiefly, to heave upon the jeer rope, or to heave upon the viol, to hold off by when the anchor is weighing; and on other occasions where a less force is required, than to weigh the anchors, &c. See n. 71.

The French call that an English Capstan, where there are only half bars used; and which, for that reason, is only half perforated: this is thicker than the others.

There is also a flying Capstan, which may be moved from place to place.

The terms belonging to the use of the Capstans, are, Come up Capstan, that is, slacken the cable which you heave by; in a like sense they also say, Launch out the Capstan.

Paul out the Capstan, signifies, stop it from going back.

CAPSULA*, or CAPSELLA, denotes a bag, pouch, or receptacle of divers kinds of things.

* The word is a diminutive of the latin Capsa, literally signifying, a little box, or case; particularly a bag, or sachel, wherein boys carry their books, &c. to school.

CAPSULA, among botanists, denotes the seed-vessel of a plant. Those plants whose seeds are inclosed in Capsulae are denominated Angiospermus; and those whose seeds have no Capsules, Gymnospermus.

CAPSULA Communis, or of the Porta, is a membrane arising from the Peritonæum, and inclosing the trunk of the vena porta after its entrance into the liver, as a case, or cover; dividing it self into the same number of branches, and accompanying all, even its smallest ramifications.

The same Capsula, or membrane, likewise incloses the Porus Biliaris, and other vessels of the liver; whence it takes the name of Capsula Communis.

CAPSULA Cordis, a membrane investing the heart: more usually called the Pericardium.

CAPSULÆ Atrabiliaris, in anatomy, called also Renes succenturiati and Glanulæ Renales; are two glands situate near the kidneys: called Atrabiales, from a black liquor found in their cavity, and Succenturiati and Renales, from their position.

They are about the bigness of a nux vomica; their figures are somewhat various; in some bodies round, in others triangular, square, &c. The membrane wherewith they are covered is very fine: their cavity is pretty large for their bulk. Their use is very obscure; probably it is to secrete the black humour found in their cavity, which being afterwards discharged by their duct into the emulgent, mixes with the blood; and serves, according to some, as a ferment; according to others, only to dilute its thickness: in a fetus, they are almost as big as the kidneys.

CAPSULÆ Seminales, are the same with Vesiculæ Seminales. See VESICULÆ Seminales.

CAPSULA, in chymistry, is an earthen vessel, in form of a pan; wherein things are frequently placed, that are to undergo very violent operations of the fire.

CAPSULATE Plants, CAPSULATE Plantæ, are such as have a tetrapetalous regular flower, consisting of four distinct petals in each flower, and which bear their seeds in short Capsulae: by which they are distinguished from the Siliculosæ, which have their seed in long cases, or pods. These are more usually called Plantæ Siliculosæ.

CAPTAIN, a military officer, whereof there are various kinds, and degrees, distinguished by their commands; as,

CAPTAIN of a Company, or *Troop*, is an inferior officer, who commands a company of foot, or troop of horse, under the colonel.

In the like sense, we say, *A Captain of dragoons*, of grenadiers, of marines, of invalids, &c.

In the horse and foot guards, the *Captains* are stiled *Colonels*; being usually persons of rank, and general officers of the army. In the colonel's company of a regiment, *i. e.* the first company, or that whereof he himself is *Captain*, the commanding officer is called *Captain Lieutenant*.

Lieutenant CAPTAIN, is the *Captain's* second; or the officer who commands the company under the *Captain*, and in his absence. See **LIEUTENANT**. In some companies, &c. he is also called *Captain Lieutenant*.

CAPTAIN Lieutenant, is he who commands a troop, or company, in the name and place of some other person, who has the commission, with the title, honour, and pay thereof; but is distinguished withal, on account of his quality, from performing the functions of his post.

Thus, the colonel, being usually likewise *Captain* of the first company of his regiment; that company is commanded by his deputy, under the title of *Captain Lieutenant*.

So in England, France, &c. the king, prince, dauphin, &c. have usually the titles, dignities, &c. of *Captains of the Guards*, *Gens de Armes*, &c. the real duty of which offices, is performed by *Captains Lieutenant*.

Reformed CAPTAIN, is one, who, upon a reduction of the forces, has his commission and company suppressed; yet is continued *Captain*, either as second to another, or without any post or command at all.

CAPTAIN General, of an army, is the general, or commander in chief.

CAPTAIN of Militia, is he who commands a company of trained-bands, or a troop of light-horse.

CAPTAIN Bosphorus, signifies the Turkish high-admiral. See **BA-SHAW**.

CAPTAIN of a Ship, is a sea officer whereof we make two kinds; the one of a ship of war, the other of a trading vessel: though, in propriety, the title *Captain* belongs only to the commander of ships of war.

CAPTAIN of a Ship of war, is the commanding-officer of a ship, galley, fire-ship, or the like.

CAPTAIN of a Merchant-Ship, is the master thereof; or he who has the command or direction of the ship, her crew, lading, &c. This officer is more usually called the *Master*; especially in ordinary voyages.

On the mediterranean, he is called the *Patron* or *Patroon*; and in long voyages, as to the East Indies, South Sea, &c. the *Captain*.

The proprietor of the vessel appoints the *Captain*, or Master; and the *Captain* is to form the crew, and chuse and hire the pilots, mates, seamen, &c. though when the proprietor and master reside on the same spot, this is usually done in concert with the proprietor.

CAPTION, in law, is when a commission is executed, and the commissioner's names subscribed to a certificate, declaring when and where such commission was executed.

The *Captain* usually commences with these words, *Virtute istius commissionis nos*, &c. or, *Executio istius commissionis patet in quadam scheda annexata*, &c. or, *Capt. & cogn. die*, &c. or, *Capt. fuit hec res*.

CAPTIVE, a slave, or person taken by the enemy in war, or by a pirate or corsair. See **SLAVE**, **PIRATE**, &c.

CAPTURE, a prize, or prey; particularly that of a ship taken at sea.

Thus we say, the French *Captures*, to the number of twenty five, were brought into port.

CAPTURE also denotes an arrest, or seizure of a criminal, debtor, &c. at land.

CAPUCHINS *, religious of the order of St. Francis, in its strictest observance.

* The *Capuchins* are thus called, from *Capra*, or *Capucbon*, a stuff cap, or cowl, wherewith they cover their head.

They are clothed with brown, or grey; are always bare-footed; and never to go in a coach, nor ever shave the beard.

The *Capuchins* are a reform made from the order of minors, commonly called *Cordeliers*, set on foot in the sixteenth century, by Matthew Baschi, a religious observant of the monastery of Montefalcone; who, being at Rome, said he was advertised several times from heaven, to practise the rule of St. Francis to the letter. Upon this, he made application to pope Clement, in 1525, who gave him permission to retire into a solitude; and not only him, but as many others as would embrace the strict observance: which some did accordingly. In 1528 they obtained the pope's bull. In 1529, the order was brought into compleat form; Matthew was elected general, and the chapter made constitutions. In 1543, the right of preaching was taken from the *Capuchins* by the pope: but in 1545, it was restored to them again with honour. In 1578, there were seven-teen general chapters in the order of *Capuchins*.

CAPUT Baroniae, the head of the barony, in antient customs, denotes the antient or chief seat, or castle of a nobleman, where he made his usual residence, and held his court; sometimes also called *Caput honoris*, or the head of the honour.

The *Caput baroniae* could not be settled in dowry; nor could it be divided among the daughters, in case there were no son to inherit; but was to descend entire to the eldest daughter, *Cæteris filiabus aliunde satisfactis*. See **BARONY**.

CAPUT Draconis, or the *Dragon's Head*, in astronomy, the name of the moon's ascending node. See **NODE**.

CAPUT Gallinaginis, or *Galli Gallinacei*, cock's head, is a kind of septum, or spongy border, at the extremities or apertures of each of the vesiculae females; serving to prevent the seed coming from one side, from rushing upon, and so stopping the discharge of the other.

Some will have its use to be, to prevent the impulse of the seed from dilating the orifices of the vesiculae, and so oozing out, except when assisted by the compression of the surrounding parts; as in copulation: but this, according to Dr. Drake, is rather the office of a distinct caruncle placed at each orifice, and acting as a valve.—See *Tab. Anat.* (Splanchn) fig. 8. lit. 9.

CAPUT Mortuum, in chymistry, the fæces remaining of any body, after all the volatile and humid parts, as the phlegm, spirit, salt, &c. have been extracted therefrom, by force of fire.

What remains after distillation, is properly called *Fæces*. This, ere it be *Caput Mortuum*, must likewise have passed the retort or open fire.

The *Caput mortuum*, called also *Terra damata*, is found in form of a friable, porous matter, without taste or smell: it is ranked among the chymical elements; and supposed to constitute the dry, fixed, earthy, and solid part of all mixed bodies. As an element, it is more commonly expressed by the name *Earth*.

It is what the chymists call a *passive Element*, or *Principle*; serving as the basis or support of the active ones.

The term is sometimes more immediately restrained to the remains of vitriol, after distillation; otherwise called *Colcothar Vitrioli*.

The *Caput mortuum* is never pure, but there is still some active principle remaining in it, and particularly a fixed salt. See **SALT**. Thus the *colcothar vitrioli*, exposed to the air, is reconverted into vitriol.

CAR, or **CARR**. See the article **CARR**.

CARABE, or **KARABE**, denotes yellow amber. See **AMBER**.

CARABINE, a small sort of fire-arm, shorter than a fusil, and carrying a ball of twenty four in the pound; born by the light horse, hanging at a belt over the left shoulder.

The *Carabine* is a kind of medium between the pistol, and the musquet; and bears a near affinity to the harquebus, only that its bore is smaller.

It was formerly made with a match lock, but of late only with a flint lock.

The barrel is two foot and a half long, and is sometimes furrowed spirally within, which is said to add to the range of the piece.

CARABINEERS, a sort of light horse, carrying longer *Carabines* than the rest; and used sometimes on foot. See **CARABINE**.

The French, of late days, have formed entire cors of these *Carabineers*, which cannot but have good effect; this being a sort of soldiery chosen out of the whole cavalry, and better paid than the rest.—There are but few of them in the English army.

CARACOD *, in the manage, a motion which a cavalier makes half round; or a half turn from left to right; changing hands; that his enemy may be uncertain on which side he intends to attack: whether in front, or flank.

* The word comes from the Arabic *Garagel*, and that from the Hebrew, *Carac*, *involvere*: but we have it immediately from the Spanish; where *Caracol* signifies properly a *snail*, and figuratively the evolution described above.

CARACOL, is also the half turn each horseman in an army makes after his discharge, to pass from the front of the squadron to the rear.

CARACOL, is sometimes also used in architecture, for a staircase in a helical, or spiral form.

CARACT, * or **CARAT**, a denomination given to the weight, which expresses the degree of goodness, fineness, and perfection, or imperfection of gold. See **GOLD**.

* The word is also written, *Carraç*, *Carraç*, *Karraç* and *Karret*. Its original is contested: Menage, after Alciat, derives *Carat* from the Greek *κερατιον*, which was a kind of small weight: Savot, with more probability, from *καρρατιον*, a tribute-penny, or small coin struck for that purpose; urging, that as the fineness of silver is denominated from a coin called a *penny*; so it is most likely the fineness of gold should be estimated from a gold coin, in former days called *Carat* from *Charastion*. Others derive the word simply from *Charaster*; but we chuse rather to follow Kennet, who derives it from *Carada*, a term which this author observes antiently denoted any weight, and came not till of later days to be appropriated to that which expresses the fineness of gold, and the gravity of diamonds.

The Mint-men fix the highest purity and perfection of gold at twenty-

ty-four *Caratls*; and the several degrees are estimated from the divisions hereof, which are called *Grains*: but it is to be observed, that what care soever is taken in purifying gold, to clear it from dross, it can never be brought to twenty-four *Caratls*; but still comes short, at least $\frac{1}{2}$ of a *Caratl*, or a grain: this grain they call a *sixteenth*; and this sixteenth they subdivide into two eighths; and each of those eighths into two sixteenths: On which calculation, they say, gold may be purified as far as the first sixteenth of the second eighth, but no further.

Gold of twenty two *Caratls*, is that which has twenty-two parts of fine gold, and two of silver, or other metal; or that which in refining loses two parts in twenty-four of its weight.

The goldsmiths generally work in gold of twenty-two *Caratls*: by the laws of France they are prohibited from working in gold below twenty-three *Caratls*.

Caratl sine, as above, is the twenty-fourth part of the goodness of a piece of pure gold.

Caratl price, is the twenty-fourth part of the value of an ounce or mark of gold.—They also sometimes say, the *Caratl weight*, which is the twenty-fourth part of the weight of the ounce or mark. Two troy grains make a *Caratl grain*.

CARACT,* is also the weight used in weighing diamonds, pearls, and precious stones; where it consists of four grains.

* In this sense, the word is by some supposed to be derived from the Greek *καρσιον*, a fruit which the Latins call *Siliqua*, and we *Carob bean*; each of which may weigh about four grains of wheat: whence the Latin *siliqua* has also been used for a weight of four grains.

CARAITES, a sect among the antient Jews; whereof there are still some subsisting in Poland, Russia, Constantinople, Cairo, and other places of the Levant; whose distinguishing tenet and practice it is, to adhere closely to the words and letter of the scripture, exclusive of allegories, traditions, and the like.

Leo of Modena, a rabbin of Venice, observes, that of all the heresies among that people, before the destruction of the temple, there is none now left but that of the *Carraim*, a name derived from *micra*, which signifies the pure text of the bible; because of their keeping to the Pentateuch, observing it to the letter, and rejecting all interpretations, paraphrases, and constitutions of the rabbins.

Aben Ezra, and some other rabbins, treat the *Caraites* as Sadducees; but Leo de Juda calls them, more accurately, *Sadluces reformed*; in regard they believe the immortality of the soul, paradise, hell, resurrection, &c. which the ancient Sadducees denied. He adds, however, that they were doubtless originally real Sadducees, and sprung from among them.

M. Simon, with more probability, supposes them to have risen hence, that the more knowing among the Jews, opposing the dreams and reveries of the rabbins, and using the pure text of scripture to refute their groundless traditions, they had the name *Carraim* given them; which signifies as much as the barbarous latin, *scripturarii*; i. e. people attached to the text of scripture. The other Jews give them the odious name *Sadluces*, from their agreement with those sectaries on the head of traditions.

Scaliger, Vossius, and Spanheim, rank the *Caraites* among the Sabaeans, Magi, Manichees, and Musulmen, but by mistake: Wolfgang Fabricius, &c. say, the Sadducees and Esseni were called *Caraites*, in opposition to the Pharisees: others take them for the doctors of the law so often mentioned in the gospel: but these are all conjectures. Josephus and Philo make no mention of them; which shews them to be more modern than either of those authors. In all probability, this sect was not formed till after the collection of the second part of the Talmud, or the Gemara; perhaps not till after the compiling of the Mishna in the third century.—The *Caraites* themselves pretend to be the remains of the ten tribes led captive by Salmanassar.

Wolffius, from the *Memoirs of Marдохеus*, a *Carait*, refers their origin to a massacre among the Jewish doctors, under Alexander Jannæus, their king, about one hundred years before Christ: for that Simeon, son of Schetach, and the queen's brother, making his escape into Egypt, there forged his pretended traditions; and at his return to Jerusalem, published his visions; interpolating the law after his own fancy, and supporting his novelties on the notices which God, he said, had communicated by the mouth of Moses, whose depository he was: he gained many followers; and was opposed by others, who maintained, that all which God had revealed to Moses was written. Hence the Jews became divided into two sects, the *Caraites*, and *Traditionaries*: among the first, Juda, son of Tabbai, distinguished himself; among the latter, Hillel. Wolffius reckons not only the Sadducees, but also the Scribes, in the number of *Caraites*. But the address of the Pharisees prevailed against them all; and the number of *Caraites* decreased: Anan indeed, in the eighth century, retrieved their credit a little; and rabbi Schalomon in the ninth. Matters went pretty well with them till the fourteenth, but since that time they have been on the declining hand.

The *Caraites* are but little known; their works coming only into very few hands, even among the greatest Hebraists. Buxtorf never saw more than one; Selden two; but M. Trig-

land says, he has recover'd enough to speak of them with assurance. He asserts, that soon after the prophets had ceased, the Jews became divided on the subject of works, and supererogation: some maintaining their necessity from tradition; whilst others, keeping close to the written law, set them aside; and it was from these last that *Caraitism* commenced. He adds, that after the return from the Babylonish captivity, the observance of the law being to be re-established, there were several practices found proper for that end; and these, once introduced, were looked upon as essential, and appointed by Moses; which was the origin of Pharisaism; as a contrary party, continuing to keep close to the letter, founded *Caraitism*.

The modern *Caraites*, Leo of Modena observes, have their synagogues, and ceremonies; they pretend to be the sole proper Jews, or observers of the laws of Moses; calling the rest by the term *Rabbainim*, or *followers of the Rabbins*: these hate the *Caraites* mortally; refusing to ally, or even to converse with them, and treating them as *manzarim*, or bastards; because of their rejecting the constitutions of the rabbins relating to marriages, repudiations, purifications of women, &c. This aversion is so great, that if a *Carait* would become a rabbinist, he should never be received by the other Jews.

The *Caraites*, however, do not absolutely reject all kind of traditions; but only such as do not appear well grounded. Selden, who is very express on this point, in his *Uxor Hebraica*, observes, that besides the mere text, they have certain interpretations which they call *hereditary*, and which are proper traditions. Their theology only seems to differ from that of the other Jews, in that it is purer, and clearer of superstition; they give no credit to the explications of the Cabalists, chimerical allegories, nor to any constitutions of the Talmud, but what are conformable to the scripture, and may be drawn from it by just and necessary consequences: of these we shall give three notable instances.

The first relating to the *Mazzuzot*, or parchments which the Jews tie at all the gates through which they use to pass. The second regarding the *Thephillin* or phylacteries, mentioned in the new testament: and the third, the prohibition of eating milk, with flesh. The two first, the Jews pretend, are formally ordained in Deuteronomy, where it is said, "Thou shalt bind them as a sign on thy hands, and they shall serve thee as frontlets (headfalls) between thy eyes; thou shalt write them on the posts of thy house." The *Carait* Aaron, in his comment on these words, maintains, they are not to be taken literally, as the rabbins do, but figuratively; as intimating, that the Jews, whether entering or going out, should be always mindful of them. For the *Thephillin*, the *Caraites* rally the rabbinists on their praying with their phylacteries, or thongs of leather fastened to their forehead; comparing them to bridled asses. This passage the *Caraites* interpret figuratively; and in their interpretation agree with St. Jerom, who takes notice of the delusion of the Pharisees, "in writing the decalogue on parchment, rolling it up, and tying it to their forehead with thongs, to have it always before their eyes." For the third point, the rabbins say, it is commanded in that text, "Thou shalt not feede a kid in his mother's milk;" but the *Caraites* get clear of it by explaining the passage by another, "Thou shalt not kill the mother when with young," which is natural.—Nor have the Jews any thing to object in behalf of their interpretation, but its being that of their doctors. Thus the *Caraites* exempt themselves from an infinite number of ceremonies and superstitions, which the rabbins have established among the other Jews.

Yet, in many things, they retain all the superstition of the rabbins. Schupart, in his treatise *de festa Karraorum*, treating of their dogmata, observes, that they are in all respects as precise and ceremonious as the most rigid traditionary, in what relates to the observance of the sabbath, passover, feast of atonement, of tabernacle, &c. That they observe prayers and fastings; and wear the *zitzi*, or pieces of fringe, on the corners of their garments. They hold, that all sin is effaced by repentance; in which they differ from the rabbins, who hold, that some are only effaced by death. As for circumcision, they do not believe it necessary, with the traditionaries, that there be blood shed; Add, that when a child dies before it be eight days old, the rabbinists circumcise it after it is dead, that it may not appear uncircumcised at the resurrection; whereas the *Caraites*, when they perceive the child in danger, chuse rather to circumcise it before the eighth day. In matters of divorce, the *Caraites* agree with the other Jews; and observe the same rules and restrictions in the killing and dressing of beasts; but they differ from them in the kinds of legal impurities and pollutions.

Peringer observes of the *Caraites* in Lithuania, that they are very different, both, in aspect, language, and manners, from the rabbinists, wherewith that country abounds. Their mother tongue is the Turkish; and this they use in their schools and synagogues. In visage they resemble the Mahometan Tartars. Their synagogues are posited north and south; and the reason they give for it, is, that Salmanasser brought them northward; so that, in praying, to look to Jerusalem, they must turn to the south. He adds, that they admit all the books of the old testa-

ment; contrary to the opinion of many of the learned, who hold that they reject all but the Pentateuch. Caleb, a *Caravite*, reduces the difference between them and the rabbinites to three points: 1st, In that they deny the oral law to come from Moses, and reject the cabbala. 2d, In that they abhor the talmud. 3d, In that they observe the feasts, as the sabbaths, &c. much more rigorously than the rabbins do. To this may be added, that they extend the degrees of affinity, wherein marriage is prohibited almost to infinity.

CARANNA, a hard, brittle, resinous gum, brought from some parts of the West Indies, as Carthage and New Spain; of an aromatic flavour, and sometimes used in medicine, as a cephalic.

CARAT, **CARRAT**, or **CARACT**. See the article **CARACT**.

CARAVAN,* or **CARAVANNE**, in the east, a troop, or company of travellers, merchants, and pilgrims, who for their greater security march in a body, through the deserts, and other dangerous places, infested with Arabs and robbers.

* The word comes from the Arabic *Cairawan*, or *Cairoan*; and that from the Persian *Karwan*, or *Cârwan*, negotiator, a trader or dealer. V. Perlit. Itin. Mund. ed. Hyde, p. 61.

There is a chief, or Aga, who commands each *Caravan*, and has under him a number of janizaries, or other forces, sufficient for their defence. The *Caravans* incamp every night near wells, or rivulets known to the guides; and observe a discipline as regular as in war. They chiefly use camels for their vehicles, by reason of their enduring a world of fatigue, eating little, and passing three or four days without drinking.

The grand signior gives one fourth part of the revenues of Egypt, to defray the expence of the *Caravan* that goes yearly to Mecca, to visit Mahomet's tomb: the devotees, in this *Caravan*, are from forty thousand to seventy thousand; accompanied with soldiers to protect them from the pillage of the Arabs, and followed with eight or nine thousand camels, laden with all necessary provisions for so long a passage across deserts.

Days journeys are distinguished in the east, into journeys of horse-*Caravans*, and *Caravans of camels*: those of horses are equal to two of camels. There are several *Caravans* which go yearly from Aleppo, Cairo, and other places, to Persia, Mecca, Thebes, &c. There are also *sea Caravans* established on the same footing, and for the same purposes: such is the *Caravan of vessels*, from Constantinople to Alexandria.

CARAVAN, is also an appellation given to the voyages, or campaigns, which the knights of Malta are obliged to make at sea, against the Turks and Corsairs; in order to arrive at the commandries and dignities of the order.—They are thus called, because the knights have frequently seized the *Caravan* going from Alexandria to Constantinople.

CARAVANSERA,* a large public building, or inn, destined to receive and lodge the *Caravans*.

* The word comes from the Arabic *Cairawan*, or Persian *Karwan* or *Cârwan*, a *Caravan*, and *Serai*, a large house.

Of these *Caravanseras*, or, as Chardin calls them, *Caravanse-rais*, there are a great number throughout the east; erected out of the charity and magnificence of the princes, &c. of the several countries.

Those of Schiras and Casbin, in Persia, are said to have cost sixty thousand crowns each. They are open to people of all religions and countries, without any questions asked, or any money required.

The *Caravanse-rais* are usually huge square buildings, with a spacious court in the middle thereof. They are encompassed with galleries and arches, under which runs a kind of banquettes, or elevation, some feet high, where travellers rest themselves, and make their lodgings as well as they can; their baggage, and the beasts that carry them, being fastened at the foot of the banquettes. Over the gate, there are frequently a sort of little chambers; which the *Caravanse-rais* lets out, at a very dear rate, to such as have a mind to be to themselves.

Though the *Caravanse-rais* serve in lieu of inns; yet there is this essential difference between them and our inns, that the traveller finds nothing at all in the *Caravanse-rais*, neither for himself nor his cattle; but must carry all his provisions and necessaries with him. They are chiefly built in dry, barren, desert places; and are generally furnished with water from a great distance, and at a vast expence: there being no *Caravanse-rais* without its well of water. There are several of them in cities: where they serve not only as inns, but as shops, warehouses, and even exchanges.

There are few cities in the east without their *Caravanse-rais*; especially within the dominions of Turkey, Persia, and the great Mogul. Those of Constantinople, Ispahan, and Agra, the capitals of three empires, are distinguished for their magnificence and commodiousness.

In Turkey, none but the grand signior's mother and sister, with the visiers and bashaws, who have been in three battles against christians, are allowed to build a *Caravanse-rais*.

CARAVANSERASKIER, the director, steward, or intendant of a *Caravanse-rais*.

At Ispahan, there are *Caravanse-rais* in manner of halls, or exchanges, where goods are laid up, and exposed to view; for which the *Caravanse-rais* is accountable, in consideration of a certain fee.

CARAWAY, or **CARUI**, a medicinal seed, produced from a plant of the same name, by botanists called *Carui Officinarium*, or *Cuminum Pratense*.

The seed of the carvi or *Caraway*, is narrow, longish, furrowed on the back, and of a brisk aromatic taste.

It is one of the greater hot seeds, and is esteemed stomachic, and diuretic; it dispels wind, and strengthens digestion, &c. The English and Germans make great use of it; particularly in biscuits, comfits, feed cakes, and other foods; and confections.

CARBUNCLE,* among ancient naturalists, is a sort of stone, whereof Pliny and Theophrastus relate many fabulous wonders.

* The name is formed of the latin *Carbunculus*, q. d. a burning-coal: the Greeks also call it *καρβυκός*, coal. Pliny, treating of the *Carbuncle*, distinguishes twelve sorts of it.

Many of the antients, and some of the moderns after them, have supposed the *Carbuncle* to be taken from the dragon's head; and we read of many a cavalier, who went to combat with dragons, on purpose to gain this invaluable jewel.—Vartoman assures us, that the King of Pegu used no other light in the night-time, but that of his *Carbuncle*, which cast a blaze like that of the sun.

CARBUNCLE, among modern lapidaries, is a stone of the ruby kind, very rare, and of a rich glowing blood red colour.

Some say it is not entitled to the appellation unless it exceed twenty carats weight. Otherwise it is only a ruby: See *Supplement*, article **CARBUNCULUS**.

CARBUNCLE, in medicine, is a malignant tumor, arising sometimes on one part, and sometimes on another; accompanied with a painful heat, mortification, lividness, and at last a blackness of the part. See **ANTHRAX**.

The Greeks call it *Anthrax*, the Latins *Carbunculus*, sometimes also *Carbo*; and the French *Charbon*, all importing coal, from the resemblance of its scab to a coal of fire. It is sometimes pestilential, and sometimes not.—When it arises without pustles, it is properly called *Pruna*; when with, *Ignis Persicus*.

It usually begins with one or more pustles, under which is formed a putrid ulcer; sometimes with a scab, without any pustle; the ulcer being formed under the scab. Within the tumor is a kernel, very painful; sometimes red, and sometimes livid, or blackish.

The *Carbuncle* is owing to a sharp, caustic, malignant, saline humour, which gnaws and corrupts the part whereon it is discharged.

CARBUNCLE, in heraldry, a charge, or bearing, consisting of eight radii, or spokes; four whereof make a common cross, and the other four a saltire; see Tab. *Herald*, Fig. 13.

Some call these radii *Buttons*, or *Staves*; because round, and enriched with buttons, or pearly, like pilgrims flaves; and frequently tipped, or terminated with flower-de-luces. Others blazon them, royal scepters, placed in saltire, pale and fesse.

CARBUNCULATION, the blasting, or scorching of the new-sprouted buds of trees, or plants, either by excessive heat, or excessive cold.

CARCASSE, the corpse, or body of a dead animal. Thus, we say, *The Carcasses* of the soldiers, horses, &c. were seen long afterwards on the field of battle.

The *Carcasse* of a fowl, capon, partridge, leveret, rabbit, &c. is what remains thereof, after the four members, or limbs, have been cut off, viz. the legs and wings.

CARCASSE, in architecture, is the shell, or ribs of a house; containing the partitions, floors, rafters, &c. made by the carpenter, &c. The *Carcasse* is otherwise called the *Framing*; see **FRAMING**.

CARCASSE,* or **CARCASS**, in war, a kind of bomb, usually oblong, or oval, rarely circular; consisting of a shell, or case, sometimes of iron, with holes; but more commonly of a coarse strong canvas, pitched over, and girt with iron hoops; filled with combustible matters, as hand grenades, ends of muskets, loaded pistols, and preparations of gunpowder, &c. Its use is to be thrown out of a mortar, to set houses on fire, and do other execution.

* It has the name *Carcasse*, because the circles which pass from one ring, or plate, to the other, seem to represent the ribs of a human *Carcasse*.

CARCINOMA,* *Καρκινωμα*, in medicine, a tumor more usually called a *Cancer*. See **CANCER**.

* The word comes from *καρκινος*, *Cancer*, and *ωμα*, *deposite*, to feed upon.

CARCUS, in war, the same as *Carcasse*; see **CARCASSE**.
CARDAMOMUM, or **CARDAMOM**, a medicinal seed, of the aromatic kind, contained in capsulae, or pods, brought from the East Indies; and used in the composition of Venice treacle, and many other medicines.

This seed is distinguished into three kinds, according to the several sizes of the pods; viz. *major*, *minus*, and *maximum*, or great, lesser, and greatest: but the taste, smell, colour, and form of the grain, is the same in all; being of a purple colour, angular, of a sharp biting taste, and a strong penetrating smell.—The last kind is also called *grains of paradise*; but the first excels the rest, both

both in smell, taste, and virtue: It is this that enters the composition of the Theriaca.

The *Cardamoms* warm, and deterge: they strengthen the nobler parts, dissipate wind, and help digestion; and are used in diseases of the brain, stomach, and womb.

CARDIACS, * **CARDIACA**, in a general sense comprehend all medicines beneficial to the heart; whether internally, or externally applied.

* The word comes from the Greek *καρδία*, *Cor*: the heart being reputed the immediate seat of their operation.

CARDIACS, in a more particular sense, denote medicines which raise the spirits, and give present strength, and cheerfulness. These amount to the same with what are popularly called *Cardials*.

Cardials are remedies antiently supposed to exert themselves immediately in comforting and strengthening the heart: but the modern physicians rather suppose them to produce their effect, by putting the blood into a gentle fermentation, whereby the springs, before decayed, are repaired and invigorated; and the tone and elasticity of the fibres of the vessels restored: the consequence of which, is a more easy and brisk circulation.

CARDIACUS Plexus, in anatomy, a Plexus, or piece of network, formed of a ramification of the Par vagum, or eighth pair of nerves.

CARDIALGIA, * **CARDIALGY**, in medicine, a violent sensation of heat, or acrimony, felt towards the upper or left orifice of the stomach, though seemingly at the heart; sometimes accompanied with palpitations of the heart, fainting, and a propensity to vomit: better known by the name of *cardiac passion*, or *heart-burn*.

* The word is compounded of the Greek *καρδία*, which denotes either the heart, or the left orifice of the stomach, and *αλγέ*, pain.

It is supposed to be occasioned by some sharp humour, or acrimonious aura, which pricks and vellicates that orifice, and the adjoining parts.

Blancard makes the disease consist in a gnawing and contraction of the par vagum, and the intercostal nerves implanted in the stomach; proceeding from a pungent vellicating matter in the stomach itself: which, by means of the consent of parts, affects the heart; straitning and contracting it so, as sometimes to occasion swooning.

CARDINAL, * a term serving to express the relation, or quality, of prime, principal, or most considerable.

* The word is formed of the Latin *Cardo*, a hinge; it being on these fundamental points, that all the rest of the same kind are supposed to turn.

Thus justice, prudence, temperance and fortitude, are called the four *Cardinal Virtues*, as being the basis of all the rest.

CARDINAL Points, in cosmography, are the four interfections of the horizon, with the meridian, and the prime vertical circle. See **POINT**.

Of these, two, *viz.* the interfections of the horizon and meridian, are called *North* and *South*, with regard to the poles they are directed to.

To determine the places of these points, see **MERIDIAN Line**. The other two, *viz.* the interfections of the horizon and first vertical, are called *East* and *West*.

The *Cardinal Points*, therefore, coincide with the four *Cardinal* regions of the heavens; and are 90° distant from each other. The intermediate points are called *Collateral Points*.

CARDINAL Points of the Heaven, or, of a *Nativity*, are the rising, and setting of the Sun, the Zenith, and Nadir.

CARDINAL Winds, are those that blow from the *Cardinal* points.

CARDINAL Numbers, in grammar, are the numbers one, two, three, &c. which are indeclinable; in opposition to the ordinal numbers, first, second, third, fourth, &c. See **NUMBER**.

CARDINAL, * is more particularly used for an ecclesiastic prince, one who has a voice, both active and passive, in the Roman conclave, at the election of a pope.

* Some say, the *Cardinals* were so called from the Latin *Incardinatio*, which signifies the adoption any church made of a priest of a foreign church, driven thence by misfortune; and add, that the use of the word commenced at Rome and Ravenna; and the revenues of the churches of which cities being very great, they became the common refuge of the unhappy priests of all other churches.

The *Cardinals* compose the pope's council, or senate: in the Vatican is a constitution of pope John, which regulates the rights and titles of the *Cardinals*; and which declares, that as the pope represents Moses, so the *Cardinals* represent the seventy disciples, who, under the pontifical authority, decide private and particular differences.

Cardinals, in their first institution, were only the principal priests, or incumbents of the parishes of Rome. In the primitive church, the chief priest of a parish, who immediately followed the bishop, was called *Presbyter Cardinalis*; to distin-

guish him from the other petty priests, who had no church, nor preferment: the term was first applied to them in the year 150; others say, under pope Silverster, in the year 300. These *Cardinal* priests were alone allowed to baptize, and administer the eucharist. When the *Cardinal* priests became bishops, their *Cardinalate* became vacant; they being then supposed to be raised to a higher dignity.—Under pope Gregory, *Cardinal* priests, and *Cardinal* deacons, were only such priests or deacons, as had a church or chapel under their particular care: And this was the original use of the word. Leo IV. in the council of Rome held in 853, calls them *Presbyteros sui Cardinalis*; and their churches, *Parochias Cardinales*.

The *Cardinals* continued on this footing till the eleventh century: but as the grandeur and state of his holiness became then exceedingly augmented, he would have his council of *Cardinals* make a better figure than the antient priests had done. It is true, they still preserved their antient title; but the thing expressed by it was no more. It was a good while, however, ere they had the precedence over bishops, or got the election of the pope into their hands; but when they were once possessed of those privileges, they soon had the red hat and purple; and growing still in authority, they became at length superior to the bishops, by the sole quality of being *Cardinals*.

Du Cange observes, that originally there were three kinds of churches: the first or genuine churches were properly called *Parishes*; the second *Deaconries*, which were chapels joined to hospitals, and served by deacons; the third were simple *Oratories*, where private masses were said, and were discharged by local and resident chaplains. He adds, that to distinguish the principal, or parish churches from the chapels, and oratories, the name *Cardinalis* was given them. Accordingly, parish-churches gave titles to *Cardinal* priests; and some chapels also, at length, gave the title of *Cardinal Deacons*.

Others observe, that the term *Cardinal* was given not only to priests, but also to bishops and deacons who were attached to certain churches; to distinguish them from those who only served them *en passant*, and by commission. Titular churches, or benefices, were a kind of parishes, *i. e.* churches assigned each to a *Cardinal* priest; with some stated district depending on it, and a font for administering of baptism, in cases where the bishop himself could not administer it.—These *Cardinals* were subordinate to the bishops; and accordingly, in councils, particularly that held at Rome in 868, subscribed after them. It was not, however, only at Rome, that priests bore this name; for we find there were *Cardinal* priests in France; thus, the curate of the parish of St. John de Vignes, is called in old charters the *Cardinal* priest of that parish.

The title of *Cardinal* is also given to some bishops, *quatenus* bishops; *e. g.* to those of Mentz and Milan: the archbishop of Bourges is also, in antient writings, called *Cardinal*; and the church of Bourges a *cardinal church*. The abbot of Vendome calls himself *Cardinalis Natus*.

The *Cardinals* are divided into three classes, or orders; containing six bishops, fifty priests, and fourteen deacons; making in all, 70: which constitute what they call the *Sacred College*. The *Cardinal* bishops, who are, as it were, the pope's vicars, bear the titles of the bishopricks assigned to them; the rest take such titles as are given them: the number of *Cardinal* bishops has been fixed; but that of *Cardinal* priests and deacons, and consequently the sacred college itself, is always fluctuating. Till the year 1125, the college only consisted of fifty-two, or fifty-three: the council of Constance reduced them to twenty-four; but Sixtus IV. without any regard to that restriction, raised them again to fifty-three, and Leo to sixty-five. Thus, as the number of *Cardinal* priests was antiently fixed to twenty-eight, new titles were to be established, in proportion as new *Cardinals* were created.—For the *Cardinal* deacons, they were originally no more than seven, for the fourteen quarters of Rome; but they were afterwards increased to nineteen, and after that were again diminished.

According to Onuphrius, it was pope Pius IV. who first enacted, in 1562, that the pope should be chosen only by the senate of *Cardinals*: whereas, till that time, the election was by all the clergy of Rome. Some say, the election of the pope rested in the *Cardinals*, exclusive of the clergy, in the time of Alexander III. in 1160. Others go higher still, and say, that Nicholas II. having been elected at Sicuna, in 1058, by the *Cardinals* alone, occasioned the right of election to be taken from the clergy, and people of Rome; only leaving them that of confirming him by their consent; which was at length, however, taken from them. P. Papebroch conjectures, that it was Honorius IV. who first introduced bishops into the sacred college; by admitting the bishops suffragans of the pope, to whom, of right, it belonged to name him; and of these constituting the first class of *Cardinals*.

The *Cardinals* began to wear the red hat at the council of Lyons, in 1243. The decree of pope Urban VII. whereby it is appointed, that the *Cardinals* be addressed under the title of *Eminence*, is of the year 1630: till then they were called *Illustissimi*.

CARDINAL has also been applied to secular officers.

Thus, the prime ministers in the court of the emperor Theodosius, are called *Cardinales*: Calliodorus, L. VII. *Formal.* makes mention of the *Cardinal* Prince of the city of Rome; and in the list of officers of the duke of Bretagne, in 1447, we meet with one Raoul de Thorel, *Cardinal* of Quillart, chancellor, and servant of the viscount de Rohan: which shews it to have been an inferior quality.

CARDING, in the manufactures, a preparation of wool, cotton, hair or flax, by passing it between the iron points, or teeth, of two instruments, called *Cards*, to comb, disentangle, and range the hairs or fibres thereof; and to dispose it for spinning, &c.

Before the wool be *carded*, it is oiled, or greased with oil; whereof, one fourth of the weight of the wool is required, for wool destined for the woof of stuffs; and one eighth for that of the warp. See **CLOTH**.

CARDO, in anatomy, the second vertebra of the neck; so called, because the head turns upon it.

CARDS,—*Playing CARDS*, are little pieces of fine thin pastboard, whereon are printed divers points and figures; a certain number, or assemblage of which, serve for the performance of divers games: as basset, ombre, piquet, whist, &c.

The method of making *playing Cards*, seems to have given the first hint to the invention of printing; as appears from the first specimens of printing at Haerlem, and those in the Bodleian library.

Making of CARDS.—The cutting of the moulds, or blocks, for these *Cards*, is precisely the same as that used for the first books; and a sheet of wet or moist paper is laid on the form or block, which is first lightly brushed over with an ink, made of lamp-black mixed with starch and water; and then rubbed off with a round list, in the hand. The *Court-Cards* they colour by help of several patterns, called *Stanchles*; consisting of papers cut through with a penknife; within the apertures, or incisions of which, the several colours, as red, &c. are severally applied; (for at the first printing, the *Card* has only a mere out-line.) These patterns are painted with oil colours, to keep them from wearing out by the brushes: being laid on the pastboard, they slide a brush full of colour loose over the pattern; which leaving the colour within the apertures, forms the face or figure of the *Card*.

This, very probably, was the way of their first printing at Haerlem; as might have been discovered long ago, if it had been considered, that the great letters in our old manuscripts of nine hundred years ago, are apparently done by the illuminers, after this method of *Card-making*.

CARDS, in commerce, and the manufactures; see **CARDING**.

CARDUUS, in natural history and botany, a name common to divers species of plants, in English called *Thistles*.

The plants of this class most in use, are the *Carduus Benedictus*, and *Carduus Fullonum*. See *Supplement, article CARDUUS*.

CARDUUS Benedictus, is a medicinal plant, of the thistle kind, chiefly used in infusion, as a gentle emetic, in fevers and certain nausæas.

Antiently it was much in vogue, as a cardiac, sudorific, and alexipharmic; and in those qualities, it was prescribed in many cases: but it is now succeeded by other medicines less nauseous, and more effectual; though still retained in some of the official compositions, with those intentions.

Some distil a water from it, which they use in cordial and sudorific potions.

CARDUUS Fullonum, is also called the *Fuller's Weed*, or *Teazel*. See **TEAZEL**.

CARENNING, * a term, in the sea language, used for the laying a vessel on one side, to caulk, stop up leaks, and refit or trim the other side.

* The word comes from the French *Carener*, which signifies the same, formed of the Latin *Carina*, the keel of a ship.

A ship is said to be brought to a *Careen*, when the greatest part of her lading, &c. being taken out, and a pontoon, or another vessel lower than herself, laid by her side, she is haled down to it as low as occasion requires, *v. g.* a fourth or fifth strake; and then kept, by the weight of ballast, ordnance, &c. as well as by ropes, lest it should strain her masts too much.

This is done with design to trim her sides, or bottom, to caulk her seams, or to mend any fault she has under the water. Hence, when a ship lies on one side in sailing, she is said to *fall on the Careen*.

Ships of war are generally *careened* every three years.

The *Half Careen*, is when they can only *careen* half the ship; not being able to reach so low as the bottom of the keel.

CAREER, or **CARRIER**, in the manage, a place inclosed with a barrier, wherein they run the race.

The word is also used for the race, or course of the horse itself, provided it do not exceed two hundred paces.

In the antient circus, the *Career* was the space the bigg, or quadrigæ, were to run at full speed, to gain the prize. See **CIRCUS**.

CAREER, in falconry, is a flight or tour of the bird, about one hundred and twenty yards.

If the mount more, it is called a *double Career*; if less, a *semi-Career*.

CARET, in grammar, a character of this form, (´) denoting that there is something interted, or interlined, which should regularly have come in where the character is placed.

CARGO, the lading or freight of a ship. See **FREIGHT**.

The *Cargo* of this vessel is of such or such a commodity. This is the proper season for a *Cargo* of codfish, of wines, &c.

CARGO is sometimes also used for an invoice of the goods where-with a ship is laden. See **INVOICE**.

CARIATIDES, or **CARIATES**, in architecture; see **CARYATIDES**.

CARICOUS, * or **CARYCOUS Tumor**, a swelling resembling the figure of a fig; such as are frequently found in the piles.

* The word comes from *Carica*, a kind of fig; which is from *Carya*, a country where they are frequent, and from whence they are sometimes brought.

CARIES, in medicine, a solution of continuity in a bone, attended with a waste of its substance, occasioned by some acrimonious matter corroding the same.

The *Caries*, is a kind of rotteness, or putrefaction peculiar to the hard, or bony parts of the body; answering to a gangrene or mortification in the soft, or fleshy part: or, according to others, to an abscess, or ulcer therein.

Caries's arise either from a constant afflux of vicious humours, or from their extreme acrimony; or from a bruise, compound fracture, luxation, ulcer, venereal disorder, corrosive medicines, or from their being stripped or laid bare of their flesh, and long exposed to the air, &c.

The usual medicines in a *Caries*, are tinctures of euphorbium, myrrh, and aloes; or powders of the same, with the addition of iris, birthwort of either kind, gentian, &c. and particularly the powder of diapente. After using the tinctures, the powders are applied on lint, in form of a pledget. An actual cautery, applied to the carious part through a canula, &c. is frequently found successful.

Anatomists, in dissecting of bodies, frequently find *carious* bones; particularly those of the jaws, legs, &c. where nothing of that kind was suspected during the person's life-time; nor any disorder felt therefrom: Mr. Cheselden conjectures, that the cure of a *carious* bone might be directly attempted, without waiting, as our churgeons usually do, for an exfoliation.

CARINA, a Latin term, properly signifying the keel of a ship; or that long piece of timber running along the bottom of the ship, from head to stern; upon which the whole structure is built, or framed. See **KEEL**.

CARINA, is also frequently used for the whole capacity or bulk of a ship; containing the hull, or all the space below the deck.

Hence, the word is also sometimes used, by a figure, for the whole ship.

CARINA, is also used in the antient architecture.—The Romans gave the name *Carina* to all buildings in form of a ship, as we still give the name *Nave*, to the middle or principal vault of our Gothic churches; because it has that figure.

CARINA, among anatomists, is used for the fibrous rudiments, or embryo of a chick, appearing in an incubated egg.

The *Carina* consists of the entire vertebrae, as they appear after ten or twelve days incubation.

It is thus called, because crooked, in form of the keel of a ship. Botanists, also for the like reason, use the word *Carina*, to express the lower petalum of a papilionaceous flower.

CARINÆ, were also weepers; or women hired, among the antient Romans, to weep at funerals: they were thus called from *Caria*, the country whence most of them came. See **FUNERAL**.

CARIPI, * a kind of cavalry in the Turkish army. The *Caripi*, to the number of about one thousand, are not slaves, nor bred up in seraglios or seminaries, like the rest; but are generally Moors, or renegade Christians, who having followed adventures, and being poor, and having their fortune to seek, by their dexterity and courage have arrived at the rank of horse guards to the grand signior. They march with the Ulufagi on the left hand, behind him; their pay is twelve aspers per day.

* The word *Caripi* signifies poor, and stranger; an appellation said by Chalcondylas, to have been given them because chiefly brought out of Egypt, Africa, &c.

CARISTIA, or **CHARISTIA**. See the article **CHARISTIA**.

CARLINA, or **CAROLINA**, a plant, of the thistle kind, said to have been discovered by an angel to Charlemaign, to cure his army of the plague: whence its denomination.

Its root is of service as a diuretick and sudorific, in all pestilential disorders. Botanists more usually call it *Chamaeleon allus*. See *Supplement, article CARLINA*.

CARLINGS, or **CARLINES**, in a ship, two pieces of timber lying fore and aft, along from one beam to another, directly over the keel; serving as a foundation for the whole body of the ship.

On these the ledges rest, whereon the planks of the deck, and other matters of carpentry are made fast. The *Carlings* have their ends let into the beams called *Culver-tail-ribs*.—See *Tab. Ship*, Fig. 2. n. 29. 37. 60. and 92.

CARLING Knees, are timbers going athwart the ship, from the sides to the hatch-way, serving to sustain the deck on both sides.

CARMELITES, an order of religious, making one of the four tribes of mendicants, or begging friars; and taking both the name, and origin from *Carmel*, a mountain of Syria, formerly inhabited by the prophets Elias and Elifsa, and by the children of the prophets; from whom this order pretends to descend in an uninterrupted succession.

The manner in which they make out their antiquity, has something in it too ridiculous to be rehearsed. Some among them pretend they are descendants of J. C. Others go further, and make Pythagoras a *Carmelite*, and the ancient Druids regular branches of their order.

Phocas, a Greek monk, speaks the most reasonably; he says, that in his time, viz. in 1185, Elias's cave was still extant on the mountain; near which were the remains of a building, which intimated there had been antiently a monastery; that some years before, an old monk, a priest of Calabria, by revelation, as he pretended, from the prophet Elias, fixed there, and assembled ten brothers. In 1209, Albert, patriarch of Jerusalem, gave the solitaries a rigid rule; which Papebroch has since printed. In 1217, or, according to others, 1226, pope Honorius III. approved and confirmed it; though it was afterwards mitigated by Innocent IV. S. Louis brought some of these *Carmelites* with him from the Holy Land into France. Many of the popes give them the title of *Brothers of the blessed Virgin*.

This order is eminent for the devotion of the scapulary, for its missions, and for the great number of saints it has stocked the Romish church withal. In the last century, there were four canonizations in this order, viz. of St. Theresa, S. Andrew Corlin, S. Mag. de Pazzi, and S. J. de la Croix.

The order of the *Carmelites* is divided into two branches, viz. *Carmelites of the antient observance*, called the *mitigated*, or *moderate*; and those of the *strict observance*, called *Bare-footed Carmelites*.

The *antient observance* has only one general, under whom are forty provinces; and the congregation of Mantua, which has a vicar-general.

The *strict observance* has two generals; one in Spain, having six provinces, under his command; and another in Italy, with twelve in several parts of Europe.

Bare-footed CARMELITES, are a reform of the antient *Carmelites*, set on foot in 1540, by S. Theresa; so called from their going bare-footed.

She began with the convents of nuns, whom she restored to the primitive austerity of the order, which had been mitigated by Innocent IV. in 1245; and at length carried the same reform among the friars. Pius the V. approved the design, and Gregory III. confirmed the reform in 1580.

There are two congregations of bare-footed *Carmelites*, which have each their general; and their several constitutions: the one the *Congregation of Spain*, divided into six provinces; the other called the *Congregation of Italy*, comprehending all the rest, not depending on Spain.

Knights of Mount CARMEL, are a military order of knights hospitaliers, instituted in 1607, by Henry IV. of France, under the title, habit, and rule of *our lady of mount Carmel*; and in consequence of a bull of pope Paul V. in 1608, united to the order of St. Lazarus of Jerusalem, with all its commendaries, priories, and other goods for its endowment.

The founder proposed it to consist of one hundred French gentlemen, who should be obliged, in times of war, to march close to the kings of France, as their guard.

Authors are much divided, whether to call this a new institution, or a reformation of that of S. Lazarus; though it is generally carried for the former. See LAZARUS.

CARMEN*, an antient term among the Latins, used, in a general sense, to signify a verse; but in a more peculiar sense to signify a spell, charm, form of expiation, execration, &c. couched in a few words, placed in a mystic order, on which its efficacy depended.

* Pezron derives *Carmen*, from the Celtic *Carm*, the shout of joy, or the verses which the antient bards sang, to encourage the soldiers before the combat; adding that the Greek *χαρμ*, signifies combat and joy: which is true; but then it does not come from the Celtic *Carm*, but from *χαρμ*, I rejoice.

Some fetch the origin of the poetical *Carmina*, or verses, hence; and say, they took that name from their resemblance to these spells: others, on the contrary, say, that the spells had their origin from the poetical verses, and took their name from their resemblance thereto: it is at least certain, that many of the antient charms wherewith diseases were supposed to be cured, were metrical verses, to which, in those ages, greater efficacy was ascribed than to mere words or prose.

Vigeneré, again, derives *Carmen* from *Carmenta*, because that prophetess couched her predictions in verses, or short periods: but others say, the prophetess took the name *Carmenta* from *Carmen*, on the same account.

CARMENTALIA, a feast among the old Romans, celebrated annually on the 11th of January, in honour of *Carmenta*, or *Carmenitis*, a prophetess of Arcadia, mother of Evander, with whom she came into Italy sixty years before the Trojan war.

The solemnity was also repeated on the 15th of January, which is marked in the old calendar by *Carmenalia Relata*.

This feast was established on occasion of a great fecundity among the Roman dames, after a general reconciliation with their husbands, with whom they had been at variance, in regard of the use of coaches being prohibited them by an edict of the senate.

It was the women who celebrated this feast: he who offered the sacrifices, was called *Sacerdos Carmentalis*.

Authors are divided about the origin of the word *Carmen*: *Vigeneré* says, the prophetess was so called *quasi carens mente*, out of her senses, or out of her self; by reason of the enthusiasm she frequently fell into. Others say, she took her name from *carmen*, verse; because her prophecies were couched in verses: but *Vigeneré*, as before noted, maintains *Carmen* to be derived from *Carmenta*.

CARMINATIVES*, in medicine, are remedies, whether simple or compound, used in colics, and other flatulent distempers, to dispel the wind. See WIND.

* The word comes from the Latin *Carminare*, to card, or tease wool, and figuratively to attenuate and discuss wind, or vapours, and promote their discharge by perspiration. Though Dr. Quincy makes its origin more mysterious: he says, it comes from the word *Carmen*, taking it in the sense of an invocation, or charm; and makes it to have been a general name for all medicines which operated like charms, i. e. in an extraordinary manner. Hence, as the most violent pains were frequently those arising from pent-up wind, which immediately ceased upon dispersion; the term *Carminative* became in a peculiar sense applied to medicines which gave relief in windy colics, as if they cured by enchantment. But this derivation appears a little too much strained.

The four *Carminative* flowers, are those of camomile, melilot, motherwort, and dill.

CARMINE, a bright red or crimson colour, bordering somewhat on purple, used by painters in miniature; and sometimes by painters in oil, though rarely, by reason of its excessive price. *Carmine* is the most valuable product of the cochineel mite; it is a fecula or sediment, subsiding to the bottom of the water, wherein are steeped cochineel couan, and about: some add rocou, but this gives the *Carmine* too much of the orange cast. To be good, it must be almost an impalpable powder.

Some make *Carmine* with brasse wood, fernambouc, and gold leaf, beat in a mortar, and steeped in white wine vinegar; the scum arising from this mixture, upon boiling, when dried, makes a sort of *Carmine*: but this kind is much inferior to the former.

CARNATION, *Flesh-colour*, in painting, is understood of all the parts of a picture in general which represent flesh; or those parts of human figures which are naked and without drapery.

Titian and Corregio, in Italy, and Rubens and Van Dyke in Flanders, excelled in *Carnations*.

It may be here observed, that the word *Carnation* is not properly used for any particular part of the person painted, but for the whole nudity of the piece. See COLOURING.

CARNEL.—The building of ships first with their timber and beams, and after bringing on their planks, is called *Carnel-work*, to distinguish it from clench-work.

Vessels also which go with mizzen-sails instead of main-sails, are by some called *Carnels*.

CARNIVAL, or **CARNAVAL**, a season of mirth and rejoicing, observed with great solemnity by the Italians, and particularly at Venice.

* The word is formed of the Italian *Carnovale*; which Mr. Du Cange derives from *Carn a val*, by reason the flesh then goes to pot, to make amends for the season of abstinence ensuing. Accordingly, in the corrupt Latin, he observes, it was called *Carnelovenen*, and *Carnisjritivum*; as the Spaniards still denominate it, *Carnes tollenda*.

The *Carnival* time commences from twelfth day, and holds till lent.—Fests, balls, operas, concerts of music, intrigues, marriages, &c. are chiefly held in *Carnival* time.

CARNIVOROUS, **CARNIVORUS**, an epithet applied to those animals which naturally feed, and feed on flesh.

It is a dispute among naturalists, whether or no man be naturally *Carnivorous*? some contend that the fruits of the earth were intended as his sole food, and that it was necessity in some places, and luxury in others, that first prompted them to feed upon their fellow-animals. Pythagoras and his followers looked on it as a great impiety; and strictly abstained

from all flesh, from the notion of a metempsychosis: and their successors, the Bramins continue the same to this day.

The consideration Gassendus chiefly insists on, why man should not be *Carnivorous*, is the structure and conformation of our teeth; the most of them being either incisores or molitores; not such as *Carnivorous* animals are furnished with, proper to tear flesh; except the four *Canini*: as if nature had rather prepared us for cutting herbs, roots, &c. than for eating meat.

To which may be added, that when we do feed on flesh, it is not without a preparatory coction, by boiling, roasting, &c. And even then, as Dr. Drake observes, it is the hardest digestion of all other foods, and is prohibited in fevers, and many other distempers: and lastly, that children are rather averse to all animal foods, till their palates become vitiated by custom; and the breeding of worms in them, is generally ascribed to the too hasty eating of flesh.

To these arguments, Dr. Wallis subjoins another; which is, all quadrupeds which feed on herbs or plants, have a long colon, with a cœcum at the upper end of it, or somewhat equivalent, which conveys the food, by a long and large progress, from the stomach downwards, in order to its slower passage and longer stay in the intestines; but that in *Carnivorous* animals such cœcum is wanting, and instead thereof there is a more short and slender gut, and quicker passage through the intestines.—Now, in man, the cœcum is very visible: a strong presumption that nature, who is still consistent with herself, did not intend him for a *Carnivorous* animal.—It is true, the cœcum, is but small in adults, and seems of little or no use; but in a fetus, it is much larger in proportion: and it is probable, our customary change of diet, as we grow up, may occasion this shrinking.

CARNOSA Membrana, } in anatomy; see **PANNICULUS**
CARNOSUS Panniculus, }

Carnosus, and **MEMBRANE**.

CARNOSITY, is used by some authors for a little fleshy excrescence, tubercle, or wen, formed in the urethra, the neck of the bladder, or yard, which stops the passage of the urine.

Carnosities are very difficult of cure: they are not easily known, but by introducing a probe into the passage, which there meets with resistance. They usually arise from some venereal malady ill managed.

CARO, in anatomy, &c. See the article **FLESH**.

CARO Musculosa quadrata, in anatomy, a muscle so called by Fallopius and Spigelius, but more popularly *palmaris brevis*. See **PALMARIS**.

CAROLINE, an epithet given to the four books composed by order of Charlemagne, to refute the second council of Nice, with regard to the worship of images.

The *Caroline* books contain one hundred and twenty heads of accusation against that council, and are couched in very harsh, reproachful terms. Some authors doubt of the antiquity and genuineness of these books: they are attributed by some to Angelman, bishop of Metz; by others to Alcuin; but others, with more reason, ascribe them to the bishops of France; alledging, that pope Adrian having sent Charlemagne the acts of the council in 790, he gave them to be examined by the French bishops; and that the *Caroline* books were the answer they returned.

They were sent to the pope about the time of the council of Frankfort; and were first printed in 1549, by M. Du Tillet, bishop of Meaux, under the name of *Elia Phyllira*.

CAROLUS, an ancient English broad piece of gold, struck under K. Charles I. whose image and name it bears. Its value of late has been estimated at twenty-three shillings sterling; tho' at the time when it was coined, it is said to have only been rated at twenty shillings.

CAROTIDS, *Kαρῶνιδες*, in anatomy, two arteries of the neck, on each side, serving to convey the blood from the aorta, to the brain.—See *Tab. Anat. (angeiol.) fig. 1. n. 5. 13. 13. (osteol.) fig. 5. 1. 2. 3. 3. lit. xx. yy. (splanch) fig. 12. lit. p.*

The right *Carotid* arises from the subclavian, just where that springs out of the porta; but the left immediately out of the aorta. They both lie pretty deep, and being defended by the *aspera arteria*, pass free from any compression, and without sending out almost any branches, straight to the cranium. Just before their arrival there, they send forth the external *Carotid*; and passing the *os petrosum*, proceed on with some circumvolutions, till laying aside their muscular membrane, and giving branches to the dura mater, they pass along the cranium, defended by the sides of the *sella turcica*, and *dura mater*: and sending branches to the outer parts of the *pia mater*, and in the nerves, they at last reach the cerebrum; where dividing into infinite ramifications, they are lost in the cortical part; or perhaps proceed even into the medullary part thereof.

Hippocrates and the antients placed the seat of drowiness in these arteries, whence they had the name *Carotids*, *q. d. soporariae*, from *καρῶν*, drowiness.—for the same reason they were also called *Lethargica* and *Apoplectica*.

CARP-Fishing. See the article **Carp-FISHING**.

CARPÆA, from *Καρπια*, a kind of dance, or military exercise in use among the Athenians and Magnesians, performed by two persons; the one acting a labourer, the other a robber.

The labourer, laying by his arms, goes to sowing and ploughing; still looking warily about him, as if afraid of being surprized: the robber at length appears, and the labourer quitting his plough, betakes himself to his arms, and fights in defence of his oxen. The whole was performed to the sound of flutes, and in cadence.

Sometimes the robber was overcome, and sometimes the labourer; the victor's reward being the oxen and plough.

The design of the exercise, was to teach and accustom the peasants, to defend themselves against the attacks of ruffians.

CARPENTERS-Work, in a building, includes the framing, flooring, roofing; the foundation, carcase, doors, windows, &c.

CARPENTER'S Joint-rule. See the article **RULE**.

CARPENTRY, * the art of cutting, framing, and joining large pieces of wood, for the uses of building. See **BUILDING**.

* The word is derived from the Latin *Carpentum*, a Car, or Cart.

Carpentry is one of the arts subservient to architecture, and is divided into two branches, *House Carpentry*, and *Ship Carpentry*; the first employed in raising, framing, roofing, flooring, &c. of houses, &c.

The second is the construction of vessels for sea; as ships, barks, barges, boats, &c.

The rules and practices in *Carpentry*, as to planing, sawing, mortising, tenancing, scribing, paring, moulding, &c. are much the same as those in joinery: so likewise are the tools, or instruments, and the stuff is the same in both; all the difference between the two arts consisting in this, that joinery is used in the smaller and more curious works. And *Carpentry* in the larger, stronger, and coarser.

Fr. Pyrat assures us, that the art of *Carpentry* is in its greatest perfection in the Maldives islands: their works, there, he observes, are so artfully managed, that they will hold tight and firm without either nails or pins. He adds, they are so curiously put together, that no body can take them asunder, but those acquainted with the mystery.

CARPET, a sort of covering, worked either with the needle, or on a loom; to be spread on a table, trunk, an estrade, or even a passage, or floor.

Perlian and Turkey *Carpets* are those most prized; especially the former: *Carpets* that had a hair or thag on one side only, were called by the antients *Tapetes*; such as had a thag on both sides, were called *Amphitapetes*.

Among jockeys, to *shave the Carpet*, is to gallop very close, or near the ground; a fault foreigners charge on English Horses. See **GALLOP**.

Figuratively, an affair, proposal, &c. are said to be brought on the *Carpet*, when they are under consideration, &c.

CARPOBALSAM, or **CARPOBALSAMUM**, * the fruit of the tree which yields the true oriental balm, or balsam; very much resembling, both in figure, size, and colour, that of turpentine.

* The word comes from the Greek *Καρπος*, fruit, and *Βαλσαμῶν*, balm.

The *Carpobalsamum* is an oblong fruit with a short footstalk, a brown wrinkled rind, marked with four ribs; of a grateful taste and smell.

It is seldom found in shops; some substituting Jamaica pepper, and others cubens in its place.

CARPOCRATIANS, a branch of the antient gnosticks, so called from *Carpocrates*, who in the second century revived, and improved upon the errors of Simon Magus, Menander, Saturninus, and other gnosticks.

He owned, with them, one sole principle and father of all things, whose name, as well as nature, was unknown. The world, he taught, was created by angels, vastly inferior to the first principle. He opposed the divinity of Jesus Christ; making him a mere man, begotten carnally on the body of Mary by Joseph, though possessed of uncommon gifts, which set him above other creatures. He inculted a community of women; and taught, that the soul could not be purified, till it had committed all kinds of abominations; making that a necessary condition of perfection. See **GNOSTICS**.

CARPUS, *καρπῶν*, in anatomy, the wrist; or that part between the palm of the hand, and the arm.—See *Tab. Anat. (osteol.) fig. n. 9. and 7. n. 12.*

The *Carpus*, called also *Brachiale*, consists, according to some, of seven, according to others, of eight bones of different figures and bulks, placed in two ranks, four in each: the first rank is articulated with the two fossils; the second with the bones of the metacarpus. They are strongly tied together by the ligaments which come from the radius, and by the annular ligament thro' which the tendons which move the fingers pass: although this ligament be thought but one, yet it gives a particular case to every tendon which passes through it.

The Arabians call it *Rafseta*; the Latins sometimes *Carpinus*.

CARRAT, **CARAT**, or **CARACT**. See the article **CARACT**.

CARR,

CARR*, CARRUS, a kind of rolling throne, used in triumphs, and at the splendid entries of princes.

* The word is from the ancient Gaulish, or Celtic, *Carr*; mentioned by Casar, in his commentaries, under the name *Carrus*.

Plutarch relates, that Camillus having entered Rome in triumph, mounted on a *Carr* drawn by four white horses, it was looked on as too haughty an innovation. See TRIUMPH.

CARR, is also used for a kind of light, open chariot. Pontanus observes, that Erichonius was the first that harnessed horses, and joined them in a *Carr*, or chariot.

The *Carr*, on medals, drawn either by horses, lions, or elephants, usually signifies, either a triumph, or an apotheosis: sometimes a procession of the images of the gods, at a solemn supplication; and sometimes of those of some illustrious family at a funeral.—The *Carr* covered, and drawn by mules, only signifies a *Consecration*, and the honour done any one of having his image carried at the games of the Circus.

The *Carr* used by the ladies, was called *Pileatum*, *Carpentum*, and *Baserna*.

CARRIAGE, a vehicle for the conveyance of persons, goods, &c. from place to place.

CARRIAGE of a Cannon, is the frame, or timber-work whereon it is mounted; serving to point and direct it for shooting, and to convey it from place to place.

The CARRIAGE of a field-piece, consists of two wheels, which carry long and strong wooden beams, or cheeks, between which the cannon is as it were framed, moving on its trunnions as on a center: When it is required to move them, they add a vantage-train, composed of two smaller wheels.

The ordinary proportion, is for the *Carrriage* to have $\frac{1}{2}$ of the length of the gun; the wheels to be half the length of the piece in height: four times the diameter, or caliber, gives the depth of the planks at the fore end; in the middle $\frac{3}{4}$.

The CARRIAGE of a Ship gun, consists of two wheels, without spokes.

CARRIAGE, in agriculture, denotes a sort of furrow, cut for the conveyance of water, to overflow, or improve the ground.

CARRIERE, see the article CAREER.

CARROUSAL*, or CARROUSAL, properly a course, or contest of chariots and horses: or a magnificent entertainment, on occasion of some public rejoicing: consisting in a cavalcade of several persons, richly dressed, and equipped after the manner of the ancient cavaliers, divided into squadrons, meeting in some public place, and practising jousts, tournaments, and other noble exercises. The word is since become of more general use, and given to any merry meetings.

* The word comes from the Italian *Carrosetta*, a diminutive of *Carrus*, chariot. Tertullian ascribes the invention of *Carrouzals* to *Circus*; and will have them instituted in honour of the sun, her father: whence some derive the word from *Carrus*, or *Carrus Solis*.

The Moors introduced cyphers, liveries, and other ornaments of their arms, with trappings, &c. for their horses. The Goths added crests, plumes, &c.

CARR-TAKERS, are officers of the king's household, who, when the court travels, have charge to provide waggons, carts, &c. to transport the king's furniture and baggage.

CARTE BLANCHE, a French term, seldom used but in this phrase, To give, or send any one the *Carte blanche*; i. e. to send him a blank paper, signed, for him to fill up with what conditions he pleases.

CARTEL, a letter of defiance, or a challenge to single combat; much in use when those combats were practised, for the deciding of difficult, and not otherwise to be determined, controversies at law. See DUEL.

CARTESIAN Philosophy, or CATESIANISM, the system of philosophy advanced by Des Cartes, and maintained by his followers, the *Cartesians*.

The *Cartesian Philosophy* is founded on two great principles, the one metaphysical, the other physical. The metaphysical principle is this, *I think, therefore I am*. This principle has been attacked and defended, with a world of spirit, and a world of zeal and partiality on both sides: for, though it be true, that we are as sure by an inward perception or consciousness that we exist, as that we think; yet it is true, too, that the conclusion of this reasoning *I am*, is drawn from the antecedent *I think*: since to think, supposes to be, or exist; and the mind sees clearly the necessary connection between thinking and being.

But this principle Des Cartes should not have proposed as a new discovery: the world knew ere he taught it, that in order to think, it is required to be; and that he who actually thinks, actually exists.

The physical principle of *Cartesianism* is this, that *nothing exists but substances*: which appears a dangerous principle to the divines; and is accordingly controverted every day in the schools of the catholics; who undertake to prove, that there are absolute accidents.

Substance he makes of two kinds; the one a substance that thinks; the other, a substance extended. Actual thought, therefore, and actual extension, are the essence of substance: so that the thinking substance cannot be without some actual thought; nor can any thing be retrenched from the extension of a thing, without taking away from it its substance.

The first article of this is refuted by Mr. Locke, who shews, that thinking is not essential to the soul, or that its essence does not consist in thought; but that there are various occasions wherein it does not think at all. The latter is stiffly opposed by the Jesuits, &c. as inconsistent with the doctrine of transubstantiation; but is much better confuted by the modern writers, from the principle of the Newtonian philosophy.

The essence of matter being thus fixed in extension, Des Cartes naturally concludes there is no vacuum, nor any possibility thereof in nature; but that the world is absolutely full: for mere space is precluded, by his principle: in regard, extension being implied in the idea of space, matter is so too. If there were any such thing as a vacuum, says he, it might be measured: the vacuum, therefore, is extended, and of consequence is matter; every thing extended being matter.

These principles of physics once supposed, Des Cartes explains mechanically, and according to the laws of motion, how the world was formed; and whence the present appearances of nature do arise. He supposes, that God created matter of an indefinite extension; that he divided this matter into little square portions, or masses full of angles; that he impressed two motions on this matter; one, whereby each part revolved round its centre; another, whereby an assemblage, or system of them, turned round a common centre: whence arose as many different vortices, or eddies, as there were different masses of matter, thus moving round common centers.

These things thus set a-going, the consequences, according to Des Cartes, in each vortex, will be as follows: the parts of matter could not move and revolve among each other, without having their angles gradually broke; and this continual friction of parts and angles, must produce three elements: the first, an infinitely fine dust, formed of the angles broke off; the second, the spheres remaining, after all the angular irregularities are thus removed: these two make the matter of his first and second element. And those particles not yet rendered smooth and spherical, and which still retain some of their angles and hamous parts, make the third element.

Now the first, or subtlest element, according to the laws of motion, must take up the center of each system, or vortex, by reason of the smallness of its parts: and this is the matter which constitutes the sun, and the fixed stars above, and the fire below. The second element, composed of spheres, makes the atmosphere, and all the matter between the earth and the fixed stars; in such manner, as that the largest spheres are always next the circumference of the vortex, and the smallest next its center. The third element, or the hooked particles, is the matter that composes the earth, all terrestrial bodies, comets, spots in the sun, &c.

This system, though very artfully concerted, yet carries with it more of the air of a romance, than of a just philosophy. Accordingly, both divines and philosophers cry out on it: the first, that it leads to atheism, by furnishing the maintainers of an eternal matter, with means how, from the laws of motion, to account for the production of the world: though, it is certain, Des Cartes supposed a deity; and so must all who admit his philosophy; else whence will they derive that motion of matter, which of itself is destitute of any such principle?

But the philosophers have much better pleas against it; and the elements, subtle matter, hooked atoms, vortices, and other machines, are now nearly on the same footing with the occult qualities of the ancient peripatetics.

Indeed, Des Cartes, by introducing geometry into physics, and accounting for natural phenomena from the laws of mechanics, did infinite service to philosophy; and contributed, both by his practice and example, to purge it from that venerable rust, which in a long succession of ages it had contracted: accordingly, to him, in some measure, is owing the present system of mechanical, and even the Newtonian philosophy.

Cartesianism was once ready to be prohibited by the parliament of Paris; and had been so, in effect, but for a burlesque address presented to the first president.

CARTESIANS, a sect of philosophers, who hold or assert the *Cartesian* principles.

Rene des Cartes, the noble founder of this sect, was of Bragne, born in the year 1596. His monument informs us, "That having mastered all the learning of the schools, which proved short of his expectation, he betook himself to the army, in Germany and Hungary; and there spent his vacant winter hours, in comparing the mysteries and phenomena of nature, with the laws of mathematics; daring to hope, that these might unlock the other. Quitting, therefore, all other pursuits, he retired to a little village near Egmond, in Holland; where spending twenty-five years in continual reading and meditation, he effected his design.

He was a person of great genius and penetration, both as to the invention, and orderly ranging and disposing of things. He began a new method of philosophy, and finished it, on his own foundation. His reputation in foreign nations, appears on his monument; which consists of four faces, inscribed with so many encomiums. It was erected at Stockholm, where he died, in the year 1650, by Monsieur Chanut, the king of France's resident in that court. But his bones were afterwards removed to Paris, at the charge of M. d'Alibret, who also erected a handsome monument over them, in the church of St. Genevieve.

CARTHUSIANS, an order of religious, instituted by S. Bruno, about the year 1086; remarkable for the austerity of their rule, which obliges them to a perpetual solitude, a total abstinence from flesh, even at the peril of their lives; and absolute silence, except at certain stated times.

Their houses were usually built in deserts, their fare sparse, and their discipline severe. It is observed, that the monastical piety is still better preserved in this, than in any of the other orders. M. l'Abbe de la Trappe, however, endeavours to shew, that the *Carthusians* do not live up to the austerity enjoined by the ancient statutes of Guignes, their fifth general. M. Maffion, at present general of the order, answers the abbat; and shews that what he calls the statutes, or constitutions of Guignes, are, in reality, only customs compiled by father Guignes; and that they did not become laws till long after.

CARTILAGE, in anatomy, a smooth, solid, uniform, flexible, elastic part of an animal; softer than a bone, but harder than any other part.

Cartilages seem to be nearly of the same nature with bones, and only to differ as more or less hard. There are some very hard, and which even become bony with time; as those, *v. g.* which form the sternum. Others are softer, and serve to compose entire parts; as those of the nose, ears, &c. where an easy gentle motion is required; their natural elasticity serving them in the place of antagonistic muscles.

There are others softer still, partaking of the nature of Ligaments, and thence called *Ligamentous Cartilages*.

There are *Cartilages* of various figures, acquiring various names from the things they resemble: one is called *Annularis*, because it resembles a ring; another *Xiphoides*, from its resembling the point of a dagger; a third *Scutiformis*, because made like a buckler; and so of the rest. See each under its proper head.

Cartilages have no cavities for marrow; nor any membranes, or nerves, for sensation. Their uses are to prevent the bones from being damaged or wounded by a continual friction; to join them together by a Synchondrosis; and to contribute, in great measure, to the well forming of several parts; as the nose, ears, trachea, eyelids, &c.

CARTON*, or, as we pronounce it, **CARTOON**, in painting, a design, made on strong paper, to be afterwards calqued through, and transferred on the fresh plaster of a wall, to be painted in fresco. See **DESIGN**.

* The word, in the original French, signifies *thick paper*, or *pasteboard*.

CARTON is also used for a design coloured, for working in mosaic, tapestry, &c. The *Cartoons* preserved at Hampton-Court, are designs of Raphael Urbin; intended for tapestry. See Richardson in his Essay on Painting, where he spends a great part of a chapter on the Colouring of the *Cartoons*.

CARTOUCH*, a wooden case about three inches thick, girt round with marlin, and loaden with two, three, or four hundred musket balls, besides six or eight balls of iron of a pound weight; to be fired out of a hobit, or small sort of mortar, chiefly for the defence of a pass, or the like.

* The *Cartouch* is also called by the French *Gargouze*, *Gargouche*, or *Gargouffe*.

In cannon of calivernets or other posts, which defend the passage of the ditch, or the like, *Cartouches* have a terrible effect: since bursting asunder they spread the shot they are loaden with far and wide. There are divers other forms and compositions of *Cartouches*, and some made for guns.

CARTOUCH is also used for what is more frequently called a *Cartidge*. See the article **CARTIDGE**.

CARTOUCH*, also denotes an ornament in architecture, sculpture, &c. representing a scroll of paper; being usually in form of a table, or flat member, with wavings; whereon is some inscription, or device, ornament of armory, cypher, or the like.

* The word is French, formed from the Italian *Cartaccio*, which signifies the same.

Cartouches are sometimes drawn on paper, as in the titles of maps, &c. and are sometimes made of stone, brick, plaster, wood, &c. for buildings.

CARTIDGE*, in the military art, the charge or load of a fire-arm, wrapped up in a thick paper, pasteboard, or parchment; to be the more readily charged, or conveyed into the piece.

* *Cartidges* are the same with what the French call *Cartouches*; from which word Skinner scruples not to derive *Cartridge*.

Those of cannon and mortars, are usually in cases of pasteboard, or tin, sometimes of wood, half a foot long; taking up the place

of the bullet in the piece, to whose caliber the diameter is proportioned. Those of muskets, pistols, and small arms, only contain the charge of powder, with a ball wrapped up in thick paper.

CARVING. See the article **SCULPTURE**.

CARUNCULA, **CARUNCLE**, a term in anatomy, properly signifying a little piece of flesh, being a diminutive of the Latin *Caro*, flesh.

The name *Caruncula*, is applied to several parts of the body: as,

CARUNCULÆ Cuticulares Alæ, a name which some anatomists give the nymphæ. See **NYMPHÆ**.

CARUNCULÆ Lacrymales, are two little eminences, one in each great canthus, or corner of the eye; separating the two puncta lachrymalia.

Some restrain the appellation *Lachrymalis* to the *Caruncule* in the greater, or inner canthus; calling that in the lesser canthus *Innominata*.

Bartholin, and some other anatomists, mistake the *Caruncule* for lachrymal glands; which they suppose placed on the punctum lachrymale, to prevent the continual shedding of tears. But Dionis shews the mistake, and maintains them to be no glands, but only duplicatures of the inner membrane of the eyelids. Some anatomists say, they help to keep the two puncta open, when the eyes are shut. See **EYE**.

CARUNCULÆ Myristiformes, in anatomy, are four little *Caruncles*, or fleshy knobs, about the size of myrtle-berries, whence their name; found adjoining to, or rather in the place of the hymen, in the parts of generation in women.

Some suppose them to be largest in maids, and to grow less and less by the use of venery; but others, with more probability, make them the consequences of venery in the first copulation; deriving them from the broken membrane of the hymen, whose fragments shrunk up they appear to be. See **HYMEN**.

CARUNCULÆ Papillares, or *Mamillares*, are little protuberances on the inside of the pelvis of the kidneys, made by the extremities of the tubes which bring the serum from the glands in the exterior parts, to the pelvis.

They were first discovered by Carpus; and thus called, from their resembling a little teat or pap. They are in form of acorns heads, and are less red than the flesh, as well as harder than the same. They are about the bigness of a pea, but larger at top than at bottom; ending, as it were, in a point, in the place where they are perforated to let the urine fall into the Pelvis. See **KIDNEYS**.

CARUS, *Kagos*, in medicine, a species of lethargic disease, consisting in a profound sleep, with a sudden deprivation of sensation, and motion, and an acute fever.

The *Carus* differs from a Coma in this, that the patient, in the latter, answers when interrogated; but not in the former; from a lethargy it is distinguished by the fever which attends it, which the lethargy is free from; and by the return of sensation, which the lethargic person finds when agitated or pricked: from a proper apoplexy, by the freedom of respiration, which is always hurt in an apoplexy; from an epilepsy, in that there is no motion or froth at the mouth in the *Carus*: from a syncope, by the pulse, which is high, and the face ruddy; whereas the pulse is low, and the face cadaverous in the syncope: from an hysterical suffocation, in that the patient hears and remembers things in the latter, not in the former. See *Supplement*, article **CARUS**.

CARYATIDES, or **CARIATES**, in architecture, a kind of order of columns, or pilasters, under the figures of women, dressed in long robes, serving to support entablatures.—See *Tab. Archit.* fig. 38.

The origin of the *Caryatides* is related by Vitruvius: the Greeks, he observes, having taken the city *Carya*, led away their women captives; and to perpetuate their servitude, represented them in their buildings, as charged with burdens, such as those supported by columns.

The *Caryatides*, M. le Clerc observes, are not now represented as among the antients, *viz.* as symbols of slavery, with hands tied before and behind; those characters being supposed injurious to the fair sex. Among us, they are represented as images of justice, prudence, temperance, &c. Their legs are always to be close to each other, and even across; their arms are laid flat to the body, or to the head, or at least as little spread as possible; that as they do the office of columns, they must have, as near as possible, the figure thereof. Sometimes their arms are cut off, for the greater delicacy; as in the hall of the Swiss guards in the Louvré: but M. le Clerc does not approve such mutilations.

When insulated, they should never have any great weight to support; and their entablature and pedestal are ordinarily to be Ionic.—When they join to a wall, &c. it is advisable to put a console over them, which may appear to sustain the weight of their entablature; otherwise, as they represent women, they do not seem so proper to sustain great loads.—When they are made in form of angels, the same author would have them support the entablature, which in that case is to be Corinthian, with their hands.

The ancients made the *Corymbes* frequently to support baskets, or corbels of flowers; and these they called *Cansera*, or *Cistifera*. See CANEPHORÆ.

CASCADE * a steep fall of water, from a higher into a lower place.

* The word is French, formed of the Italian *Cascata*, which signifies the fame; of *casere* to fall; and that from the Latin *cadere*.

Cascades are either natural, as that of Tivoli, &c. or artificial, as those of Versailles, &c. and either falling with a gentle descent, as those of the Scaux; in form of a buffet, as at Trianon; or down steps, in form of a perron, as at St. Clou; or from balon to balon, &c.

CASCANES, or CASCANES, in fortification, are holes and cavities in form of wells, made in the Terreplein, near a rampart; from whence a gallery, dug in like manner under ground, is conveyed, to give air to the enemies mine.

CASE (in grammar) is understood of the different inflections, or terminations of nouns; serving to express the different states, or relations they bear to each other, and to the things they represent.

There is a great diversity among grammarians, with regard to the nature and number of *Cases*: they generally find six *Cases*, even in most of the modern languages, which they call the *Nominative, Genitive, Dative, Accusative, Vocative, and Ablative*: But this seems only in compliance with their own ideas, which are formed on the Greek or Latin, and which they transfer to other languages.

The truth is, if, by *Case*, be only meant an occasional change in the termination of a noun, or name, which seems to be the just idea of *Case*, (regard being had either to the reason of the thing, or the found of the word *Casus*, from *cadere*, to fall;) there will in this sense be just as many *Cases* as there are different terminations of nouns in the same number, i. e. in some languages more, in others less, and in others none at all.

Indeed, the generality of authors either have not any precise notion of *Cases* at all, or they wander strangely from that notion: for they always reckon five *Cases* of nouns in the Greek, and six in the Latin: Though several of these *Cases* be frequently alike, as the *Genitive* and *Dative* singular, of the first declension of the Latin; the *Dative* and *Ablative* plural of the second, &c. the *Genitive* and *Dative* dual of the Greek, &c.

—So that the termination is not the sole criterion of the *Case*.

It seems, however, much more agreeable to the principles of grammar, which only considers words materially, to make as many different *Cases*, as there are changes in the terminations of a name; which would free the English, and other modern tongues, from the embarass of *Cases*; most of them expressing the various relations, not by changes in termination, as the ancients, but by the apposition of articles and prepositions. On this footing it is certainly wrong to say, *v. g.* that of a father, is the *genitive Case* of father; and *to a father*, the *dative*; for *of* and *to* are no part of the name *father*; they are no closes or terminations, but articles, or modificatives, which shew the different relation of the word *father*. And the same may be said of the *Cases* of nouns, in the French, Italian, Spanish, Portuguese tongues, &c.

But the case is otherwise in the Greek name *πατρις*, or the Latin *patris*; which are real *Cases* of the words *πατηρ*, and *pater*, and different from those words: and somewhat like this may be said of the Hebrew, Arabic, Armenian, Polish, and German languages; which in the same number admit of changes in the terminations of words: and yet in these languages, *Cases* are pretty different from what they are in the Greek and Latin. The Hebrew names, for instance, are not properly declined by *Cases*: the relation expressed by the *genitive Case*, is true, occasions an alteration in them; but then this alteration, instead of being in the noun governed, as in the Latin, in the Hebrews is in that which governs; as *בן אביר* *verbum falsitas*; where the change is not in *בן* *falsitas*, but in *אביר* *verbum*.

F. Galanus makes ten *Cases* in the Armenian; observing, that besides the six ordinary *Cases*, there is one which serves to express the instrument wherewith anything is done; another for narration, to express the subject; a third to shew that one thing is in another; and a fourth to shew a relation between one thing and another.—Authors make but three *Cases* in the Arabic, as having only three terminations, *on, in, and an*. It must be observed, however, that though many of the languages have not properly any *Cases* of nouns; yet most, if not all of them, have a kind of *Cases* in their pronouns, without which it would be hard to conceive the connection, or syntax of a discourse; and which, therefore, make a necessary part of grammar. See the relations expressed by each *Case* under its proper head, *NOMINATIVE, GENITIVE, DATIVE, &c.*

CASE, in printing, a large flat oblong frame, placed alope, divided into several compartments, or little square cells; in each of which are lodged a number of types, or letters of the same kind; whence the compositor takes them out, each as he needs it, to compose, and make a page, or form.

They say, a *Case*, or rather pair of *Cases*, of Greek, of Hebrew, of Plea, &c.

CASE-HARDENING, a method of preparing iron, so as to render its outer surface hard, and capable of resisting the file, or any edged tool. It is used by file-cutters for coarse files; by gunsmiths, to harden the barrels of guns; and by others, on other occasions.

The process of *Case-hardening* is thus: they take hoofs, or horns of oxen or cows, dry them in an oven, and powder them; then put an equal quantity of bay salt to this, and mingle both together with stale urine, or whitewine vinegar: some of this mixture they lay upon loam, and wrap it about the iron, putting also more loam over all. Then they lay it on the hearth of a forge to dry and harden; and when it is dry and hard, they put it into the fire, and blow till they give the lump a blood-red heat, but no greater: then it is taken out and quenched, and the *Case-hardened* iron is taken out of the *Case*.

CASEMATE, or CASEMENT, in architecture, denotes a hollow moulding, which some architects make $\frac{1}{2}$ of a circle, and others $\frac{1}{4}$. See MOULDING.

CASEMATE, or CAZEMATE, in fortification. See the article CAZEMATE.

CASERNS, or CAZERNS, in fortification, little rooms, or huts, erected between the ramparts, and the houses of fortified towns, or even on the ramparts themselves; to serve as lodgings for the soldiers of the garison, to ease the garison.

There are usually two beds in each *Casern*, for six soldiers to lye, who mount the guard alternately; the third part being always on duty.

CASES *Reserved*, in the Romish polity, are considerable sins, the absolution of which is *reserved* by the superiors to themselves, or their vicars.

There are some *Cases reserved* by the pope, and others by the bishops: in convents some are *reserved* by the chapter, &c. None but these, or their vicars, can absolve in such *Cases*; except at the article of death, when all *reserved Cases* are absolvible by the ordinary.

CASE-SHOT, are musket-bullets, stones, or little pieces of iron, or the like, put up into *Cases*, and so shot out of great guns.

Case-shot is chiefly used at sea, to clear the enemies decks when they are full of men.

CASH, in commerce, the stock or ready money, which a merchant, or other person has in his present disposal, to negotiate; so called from the French term *Caisse*, i. e. chest, or coffer, for the keeping of money.

M. Savary shews, that the management of the *Cash* of a company, is the most considerable article; and that whereon its good or ill success chiefly depends.

CASHIER, the *Cash-keeper*; he who is charged with the receiving, and paying the debts of a society.

In the generality of foundations, the *Cashier* is called *Treasurer*.

CASING of Timber-work, is the plastering a wooden house all over on the outside with mortar; and striking it, yet wet, by a ruler, with the corner of a trowel, or the like instrument, to make it resemble the joints of free-stone; by which means, the whole house appears, as if built thereof.

CASK, * a piece of defensive armour, wherewith to cover the head, and neck; otherwise called *Helmet*, and *Head-piece*.

* The word is French, *Casque*, formed from *Cassum*, or *Cassus*, a diminutive of *Cassis*, a helmet.

Le Gendre observes, that antiently, in France, the Gen d'Armes all wore *Casks*. The king wore a *Cask* gilt; the dukes and counts, silvered; gentlemen of extraction, wore them of polished steel; and the rest of plain iron.

The *Cask* is frequently seen on antient medals; where we may observe great varieties in the form and fashion thereof; as the Greek fashion, the Roman fashion, &c. F. Joubert makes it the most antient of all coverings of the head, as well as the most universal: Kings, emperors, and even gods themselves are figured therewith. That which covers the head of Rome, has usually two wings, like those of mercury: and that of some kings, is furnished with horns, like those of Jupiter Ammon, and sometimes barely bulls, or rams horns, to express uncommon force.

CASK, in heraldry, the same with helmet.

CASK, is also used as a common name for vessels of divers kinds; in contra-distinction from the liquor, or other matter contained therein. See VESSEL.

Thus a hoghead of spirits, &c. is said to weigh 4 C. $\frac{1}{2}$ and 22 L. *Cask* and liquor; a punchion, 6 C. $\frac{1}{4}$ and 2 L. *Cask* and liquor. See TUN, &c.

A *Cask of Sugar*, is a barrel of that commodity, containing from eight to eleven hundred weight.—A *Cask of almonds*, is about three hundred weight.

CASSATION, * in the civil law, the act of abrogating, or annulling any act or procedure. See ANNULING, &c.

* The word comes from the Latin *quassare*, to quash, or shake down.

The occasions of *Cassation* are 1st, when a decree is directly contrary to another decree; and both against the same party. 2^{dly}, When decrees are directly contrary to the express decision of statutes, or customs. 3^{dly}, When the formalities prescribed by the laws have not been observed.

CASSIA, *Kassia*, in medicine and pharmacy, a purgative fruit, brought from the east, being the produce of a tree of the same name, called in English the *pudding pipe tree*.

This is sometimes more particularly denominated *Cassia fistula*, *κασσία συστυλή*, by way of distinction from another drug called *Cassia lignea*. See *CASSIA LIGNEA*.

There are four kinds of *Cassia*, alike in properties, and nearly in figure; being all in long black pods: but very different, if considered with regard to the trees that produce them. These are, the *Cassia of the Levant*, that of *Egypt*, that of *Brazil*, and that of the *Antilles islands*.

CASSIA of the Levant, is the fruit of a very high tree, whose bark is ash-coloured, its wood very firm, and its grain close; towards the center, its wood is of an ebony black, towards the circumference yellowish: its flowers are yellowish, and produce a fruit in form of a long pod, rounded and massive; of a reddish colour, bordering on black. When ripe, it is full of a black, sweetish pulp, divided by little woody cells: in this pulp are found little hard grains, in manner of stones, shaped like hearts, which are the seed of the tree. This *Cassia* must be chosen new, in large pods, heavy, and of a tan colour; the bark, when broke, fine and white within, full of a black soft pulp of a sweetish taste.

CASSIA of Egypt, is like that of the Levant, except that the tree is higher, and the leaves narrower; the fruit smaller, and the bark fatter.

CASSIA of Brazil, is the largest of all: some of the pods are found four or five inches in circumference. This kind is not very common in the shops.

CASSIA of the islands, is that now chiefly used; though heretofore the popular *Cassia* was the Levantine. It is sent from the Antilles; where it is produced in such abundance, that the vessels, in their home voyages, use it as ballast: whence it is, that we find it so often foul and dirty: the tree that yields it resembles a peach-tree. Its flowers, which are yellow, grow in clusters; and, as they decay, leave behind them a fruit or pod an inch thick, and a foot (sometimes two) long. The fruit, while in its growth, is green; when ripe, it becomes of a dark violet colour. This is chosen in the same manner as that of the Levant.

When the pod is entire, and the pulp not yet taken out, it is most properly called *Cassia fistula*, or *Cassia in the cane*. For use, the pulp is taken out, and driven through a hair sieve. The apothecaries have little of the better kind, but what is old, and boiled up with sugar to make it keep.

Cassia, when green, as also the flowers of the *Cassia* tree, are candy'd in the Levant and the islands; and have almost the same effects with the common *Cassia*, which is the basis of most of the purgative electuaries.

The *Tincture of Cassia*, is a slight infusion of the pulp with the seed.

The *Extract of Cassia*, is nothing but the pulp separated from the shell and the seeds; with the addition of a certain quantity of sugar to preserve it from turning sour.

CASSIA LIGNEA, or **XYLOCASSIA**, is the bark of a tree much like that which bears the cinnamon; and growing promiscuously with it in the island of Ceylon.

The two barks are gathered and dried in the same manner; in smell and taste are nearly alike; they are equally sweet, poignant and agreeable; and their colour, form, and thickness scarce differ at all. But the *Cassia* is the fatter, and more mucilaginous; and in chewing dissolves in the mouth, without leaving any thing woody behind; whereas the woody part of cinnamon still remains though ever so well chewed.—Some authors will have the tree which bears cinnamon bear the *Cassia* too; and make the only difference between them to consist in this, that the first comes from Ceylon, and the latter from the coast of Coromandel. See **CINNAMON**.

CASSIOPEIA, in astronomy, one of the constellations of the northern hemisphere, situate next to Cepheus.

In 1572, there appeared a new star in this constellation, which at first surpassed in magnitude and brightness Jupiter himself; but it diminished by degrees, and at last disappeared, at the end of eighteen months. It alarmed all the astronomers of that age, many of whom wrote dissertations on it; among the rest, Tycho Brahe, Kepler, Maurolycus, Licetus, Grammeus, &c. Beza, the landgrave of Helle, Rofa, &c. wrote to prove it a comet, and the same which appeared to the Magi at the birth of Jesus Christ, and that it came to declare his second coming: they were answered on this subject by Tycho.

The stars in the constellation *Cassiopeia*, in Ptolemy's catalogue, are thirteen; in Tycho's twenty eight; but in the Britannic catalogue, Mr. Flamsteed makes them fifty six. The order, names, longitudes, latitudes, magnitudes, &c. whereof, are as follow:

Names and Situations of the Stars.	R ^{ight} Ascension.	Longitude.	Latitude.	Magnit.						
					0	1	11	0	1	11
	γ	21 6 44	56 46 0	6						
		21 28 46	56 26 16	6						
		27 43 32	57 10 23	5						
		23 53 29	54 3 47	6						
North, in the top of the chair-back		26 46 31	52 39 52	7						
5										
South, in the top of the chair-back	δ	1 9 41	55 7 46	6						
In the preced. arm of the chair	γ	26 46 25	51 9 16	6						
	δ	25 52 31	49 22 58	6						
		3 28 57	53 57 9	6						
		6 4 6	55 10 10	6						
10										
In the middle of the chair back, the Lucida Cathedræ)	δ	0 48 7	51 13 50	3 2						
		5 59 21	54 1 25	7						
		12 9 23	55 1 42	7						
A small one against the hair	δ	0 22 24	45 38 49	6						
In the bottom of the chair back, over the seat)	δ	8 20 18	52 14 40	4						
15										
In the head		12 47 43	54 59 49	6 7						
In the breast, Schedir.		0 47 7	44 41 44	4						
Preced. of the north in the rod	γ	3 30 21	46 35 54	3 2						
South in the rod	γ	29 9 55	41 25 41	6						
20		27 6 12	38 18 52	6						
Middle in the rod	δ	25 15 51	59 53 44	6						
In the girdle	γ	23 10 27	39 17 43	6						
In the rod, the left of the north.	δ	25 14 26	59 41 9	6						
25		5 52 56	47 4 17	4						
Preced. against the navel		0 41 51	41 16 2	5						
Over the seat of the chair		7 52 45	47 29 25	6						
Lark of centig. ones against the navel		9 38 44	48 47 35	3						
In the hind arm		8 19 23	47 32 19	5 6						
Preced. in south. part of the frame		6 36 54	43 23 18	5						
30		19 31 31	54 13 8	5 6						
		14 57 40	50 36 12	6						
That under the hind arm		15 46 12	51 13 51	6						
That preced. the knee to the south.		7 28 30	43 5 16	4						
Preced. of the midd. in f. part of seat		11 13 15	45 4 6	6						
20 39 40		52 49 54	6							
35										
That against the knee		13 37 15	46 23 26	3						
Preced. in north. part of the frame		23 28 45	54 11 22	6						
That following the knee		14 8 14	44 58 53	6						
North. in the frame		27 23 40	55 58 20	5 6						
Midd. in north. part of the frame		25 12 29	53 52 38	5 6						
40										
Last of the midd. in f. part of frame		22 34 51	51 50 16	6 5						
		16 31 53	45 30 18	6 5						
That in the leg		20 26 48	47 31 50	3						
Last of 4 in fourth part of the frame		24 51 16	51 38 41	6 5						
45	II	4 49 8	58 6 56	6 5						
South, of the following, in north. Part of the frame)	δ	27 37 23	53 11 18	4 5						
North, of the same	II	3 28 12	57 11 9	5						
	II	29 15 46	54 21 3	4 5						
	II	1 51 14	55 56 47	6						
	II	22 13 42	47 44 14	6						
50										
		22 36 18	48 5 2	7						
		29 0 45	53 24 16	7						
		25 21 29	48 53 9	6						
In the extremity of the foot		27 53 53	48 57 31	4						
55	II	3 23 39	53 12 19	6						
		8 4 50	53 28 17	5 6						

CASSOCK,* a kind of surtout, or long upper garment, wore over the rest of the habit; particularly by the clergy, and anciently likewise by the laity.

* The word comes from the French *Casaque*, a horseman's coat; some derive that again, by corruption, from a garment of the *Cassacks*: Covarruvias, from the Hebrew *Casab*, to cover; whence the Latin *Casa*, cottage; and *Casula*, a diminutive of *Casa*, another name of the *Cassack*. Lally, others derive the name *Cassock*, as well as the thing, from the ancient *Caracalla*, a sort of upper garment which hung to the heels.

CASTALDUS, } See the article **GASTALDUS**.

CASTALDY, }
CASTANETS, **CASTAGNETTES**, or **CASTANETTAS**, a kind of musical instrument, wherewith the Moors, Spaniards, and Bohemians, accompany their dances, farabands, and guitars. It consists of two little round pieces of wood dried, and hollowed in manner of a spoon, the concavities whereof are placed on one another, fastened to the thumb, and beat from time with the middle finger, to direct their motions and cadences. The *Castagnets* may be beat eight or nine times in the space of one measure, or second of a minute.

CASTELLAN, the name of a dignity or office in Poland. The *Castellans* are senators of the kingdom, but senators of the lower class, and, in diets, sit on low seats, behind the palatines or great senators. They are a kind of lieutenants of provinces, and command a part of a palatinate under the palatine. See **PALATINE**.

CASTING,

CASTING, in foundry, is the running of a melted metal into a mould prepared for that purpose.

CASTING of Candles, is the filling the moulds with tallow.

CASTING of Gold, Silver, or Copper in plates. See **COINING**.

CASTING of Lead on cloth, is the using a frame or mould covered with woollen-cloth and linen over it, to cast the lead into very fine sheets.

CASTING of Metals, of Letters, Bells, Figures, &c. See **FOUNDERY**.

CASTING in Sand or Earth, is the running of a metal between two frames or moulds filled with sand or earth, wherein the figure the metal is to take, has been impressed, *in creux*, by means of the pattern.

The goldsmiths also use the bone of the cuttle-fish, to mould and cast their lesser works of gold and silver; that bone, when dried, being reducible to a kind of a fine pumice, very susceptible of all impressions. See **CUTTLE-BONE**.

CASTING in Stucco or Plaster, is the filling with fine liquid plaster, a mould that had been taken in pieces from off a statue or other piece of sculpture, and run together again. There are two things to be observed with regard to the mould: the first, that it be well soaked with oil before the plaster be run, to prevent its sticking; the second, that each piece whereof it consists, have a pack-thread, to draw it off the more easily when the work is dry.

CASTING, in falconry, is any thing given an hawk to purge and cleanse his gorge.

Of these there are two kinds, *viz.* plumage, *i. e.* feathers; and cotton: the latter whereof is generally in pellets about the bigness of hazel-nuts, made of soft fine cotton, and conveyed into her gorge after supper. In the morning she will have *cast* them out; at which time they are to be observed, and from the colour and condition they are found in, the state of her body is conjectured. If they be *cast* out round, white, and not tinkling, nor very moist, it is an indication all is well; if otherwise, particularly if black, green, stinky, or like the like, is distemper'd. The *casting* of plumage is observed after the same manner as that of cotton.

CASTING, in joinery, &c.—Wood is said to *cast* or warp, when, either by its drought or moisture, or the drought or moisture of the air, or other accident, it shoots or shrinks; in prejudice to its flatness or straightness.

CASTLE, in a modern sense, is a place fortified by nature, or art, either in a city or country, to keep the people in their duty, or to resist an enemy.

A *Castle* is a fort of little *Cittadel*. See **CITTADEL**.

CASTLE, in the sea language, denotes an elevation on the deck of a vessel; or a part of the deck, fore and aft, raised above the rest.

Fore Castle, Castello di prora, &c. See **FORE-CASTLE**.

Hind-CASTLE, Castello di poppa. See **POOP**.

CASTLE-WARD, or CASTLE-GUARD, CASTELGARDUM, or Wardum Castri, an imposition laid on such as dwell within a certain compass about any *Castle*, towards the maintenance of those who watch and ward the *Castle*.

The word is also sometimes used for the circuit itself, inhabited by such as are subject to this service.

CASTOR, in astronomy, a moiety of the constellation Gemini; called also *Apulo*. See **GEMINI**.

CASTOR, and Pollux, in meteorology, a fiery meteor, which at sea appears sometimes sticking to a part of the ship, in form of one, two, or even three or four fire-balls: when one is seen alone, it is more properly called *Helena*; two are denominat'd *Castor and Pollux*, and sometimes *Tyndarides*.

Castor and Pollux, are commonly judg'd to portend a cessation of the storm, and a future calm; being rarely seen till the tempest is high spent. *Helena* alone portends ill, and witnesses the severest part of the storm yet behind.

CASTOREUM, or CASTORIUM, in pharmacy, a medicinal matter enclosed in bags or puffs near the anus of the castor, or beaver; falls taken for the testicles of that animal.

The bags in which the *Castoreum* is contained, are about the bigness of a goose-egg, and found indifferently in males and females; the liquor enclosed, serves to give the castor an appetite, being pressed out of its receptacles, on occasion, by the foot: when taken off, the matter dries and condenses, so that it may be reduced to a powder; by hanging in the chimney it soon becomes of the consistence of wax. It is oily, of a sharp, bitter taste, and a strong disagreeable smell. It is used to fortify the head and nervous parts, it raises the languishing spirits, resists poisons, and provokes the menses in women. It is used in lethargies, apoplexies, vertigo's, tremblings, suffocations of women, and on other occasions. Bartholine, and other authors, ascribe to it a wonderful property of precipitating things to the bottom of the water.

For the choice of *Castoreum*, the best is that of Russia; that of Canada is much inferior; the largest bags, and those that smell strongest, are the most esteemed, especially when heavy, and well fished. Care is to be taken that it have not been adulterated with honey or other drugs, to increase its weight, which is known by squeezing it; the sophisticated be-

ing softish, and yielding a liquid, stinking honey; and the natural, hard and heavy, of a brisk smell, and full of filaments.

Castoreum is used in the composition of Venice treacle and Mithridate, besides various other hyfterick and cephalick medicines. They draw an oil from it called *Oil of Castor*; and it is also used abroad while in its liquid state, to make several kinds of unguents.

The Russian way of curing *Castoreum*, is described in the *Philosophical Transactions* thus: "To prepare the matter of the beaver's stones, (the bags it should be) boil a proper quantity of water, with half a shovell full of wood-ashes, tie the bags in couples, and put them in the boiling water for half a quarter of an hour. Lay birch-bark on the fire, and smoke the bags well over it for an hour, till they be well dried; hang them up for a week or more, till perfectly dry and hard, they may then be packed up for use or exportation."

CASTOR Skin, the fur or skin of an amphibious animal called the *Castor*, or beaver, sometimes found in France, Germany, and Poland, but most abundantly in the province of Canada in North America: formerly it appears also to have been found in England. But there is no such animal known among us now. V. Ray's Synops. An. Quad. p. 213.

Its chief use is in the composition of hats, furs, &c. Besides this, in 1669, an attempt was made to employ it in other merchandizes; accordingly a manufactory was settled in the Fauxbourg S. Antoine near Paris, where they made cloths, flannels, stockings, &c. of *Castor*, with a mixture of wool. The manufactory flourished for a while, but soon decayed, it being found by experience that the stuffs lost their dye when wet, and that when dry again they were harsh, and stiff as flax.

The merchants distinguish three kinds of *Castor*, though all equally the skins of the same animal; these are *New Castor, Dry Castor, and Fat Castor*: *New Castor*, called also *Winter Castor*, and *Muscovite Castor*, because ordinarily refered to send into Muscovy, this is that taken in the winter-huntings. This is the best, and most esteemed for rich furs, as having lost none of its hair by moulting. *Dry Castor*, or lean *Castor*, is the result of the summer-huntings; when the beast is moulted, and has lost part of its hair; this being much inferior to the former, is little used in furs; but mostly in hats. *Fat Castor*, usually called *Old coat*, is that which has contracted a certain fat, unctuous humour, by sweat exhaled from the bodies of the savages, who have wore it for some time: this, though better than the dry, is yet only used for hats.

After the hair is cut off the skin to be used in hats, the pelt or skin it self, is used in various uses, *viz.* for the covering of mails and trunks, in slippers, &c.

CASTRAMETATION,* the art, or act of incamping, *i. e.* of placing and disposing an army in camp. See **CAMP**.

* The word is more used in speaking of the incampments of the ancients, than those of the moderns. It comes from the Latin *Castrum*, camp; and *Metari*, to measure, or lay out.

CASTRATION, in chirurgery, the operation of gelding, *i. e.* of cutting off the testicles, and putting a male animal out of a capacity of generation.

Castration is much in use in Asia, especially among the Turks, who practise it on their slaves, to prevent any commerce with their women. The Turks *castrate* to the purpose, making a general amputation both of testicles and yard. *Castration* also obtains in Italy, where it is used with a view to preserve the voice for singing. See **EUNUCH**.

Castration is sometimes found necessary on medicinal considerations, as in mortifications and some other diseases of the testicles, especially the sarcocele and varicocele. Some have also used it in maniac cases.

CASTRATION is also in some sort practised on women: Athenæus mentions, that king Andrarmythes was the first who *castrated* women. Helychius and Suidas say Gyges did the same thing. Galen observes, that women cannot be *castrated* without danger of life, and Dalechampus, on the forementioned passage of Athenæus, holds, that it is only to be understood of simple pad-locking.

CASU consimilis, a writ of entry, where a tenant by courtseel, or for life, aliens in fee or in tail, or for another's life: it takes its name hence, that authority being given by Stat. West. 2. to the clerks in chancery, to make new forms, as often as any new case should arise, not under any of the old forms; they framed this writ to the likeness of the other called *Casu proviso*.

CASU Proviso, a writ of entry, given by the statute of Gloucester, in case where a tenant in dower aliens in fee, or for term of life, or in tail: and lies for him in reversion against the alienee.

CATABAPTIST,* a person averse from baptism; particularly from that of infants.

* The word is compounded of the preposition *κατα*, which, in composition, signifies against, contrary; and *βαπτισμα*, I wash, called also *Dragon's Tail*.

CATACAUSTIC Curves, in the higher geometry, the species of caustic curves formed by reflection. See **CAUSTIC curve**.

CATACHRESIS,* *Καταχρησις*, a figure in rhetoric, whereby an improper word is used instead of a proper one.

* The word is formed from the Greek *καταχρησις*, *abuter*, I abuse;

C A T

I abuse; of *χρῆσις*, against, or contrary to; and *χρῆσις*, I use.

The *Catabresis* is, when for want of a word proper to express a thought, we use, or rather abuse a word that comes somewhat near it: as when we call a person who has killed his mother, master, or prince, *Parricide*; which word, in propriety, is only applicable to him who has murdered his father.

Thus, *Vir græcis ipse caper*; to build a horse, or ride on a switch, are *Catabreses*.

CATAclysmus, *κατακλιςμῶς*, a Greek name for a deluge, or inundation of waters.

CATACOMBS,* or **CATACUMBS**, *κατακῦμβρα*, denote grotto's, or subterraneous cavities, for the burial of the dead.

* Some derive the word *Catcomb* from the places where ships are laid up, which the modern Latins and Greeks call *Cunabæ*. Others say, that *Cata* was used for *ad*, and *Catcomb* for *adivum boi*: Accordingly, Dadin says, they antiently wrote *Catatumboi*. Others derive the word from the Greek *κατα*, and *κῦμβῶς*, a hollow, cavity, or the like.

Catcombs are also denominated *Cryptæ*, and *Cameteria*. Antiently, the word *Catcomb* was only understood of the tombs of St. Peter and St. Paul; and M. Chastelain observes, that among the more knowing of the people of Rome, the word *Catcomb* is never applied to the subterraneous burying-places hereafter to be mentioned, but only to a chapel in St. Sebastian, one of the seven statal churches; where the antient Roman calendars say, the body of St. Peter was deposited, under the consulate of Tullius and Bassus, in 258.

CATACOMB, is more particularly used in Italy, for a vast assemblage of subterraneous sepulchres about Rome, chiefly at about three miles from that city in the Via Appia; supposed to be the sepulchres of the martyrs; and which are visited accordingly, out of devotion; and reliques thence taken, and dispersed throughout the catholic countries; after having been first baptized by the pope, under the name of some saint.

These *Catcombs*, are said by many to be caves, or cells, wherein the primitive Christians hid, and assembled themselves together; and where they interred such among them as were martyred. Each *Catcomb* is three foot broad, and eight or ten high; running in form of an alley, or gallery, and communicating with others: in many places, they extend within a league of Rome. There is no masonry or vaulting therein, but each supports it self: the two sides, which we may look on as the parietes, or walls, were the places where the dead were deposited; which were laid lengthwise, three or four rows over one another, in the same *Catcomb*, parallel to the alley. They were commonly clofed with large thick tiles, and sometimes pieces of marble, cemented in a manner inimitable by the moderns. Sometimes, though very rarely, the name of some of the deceased is found on the tile; frequently, a palm is seen, painted, or engraven; or the cypher Xp, which is commonly read *pro Christo*.

The opinion held by many protestant authors is, that the *Catcombs* are heathen sepulchres, and the same with the puticuli mentioned by Festus Pompeius; maintaining, that whereas it was the practice of the antient Romans to burn their dead, the custom was, to avoid expence, to throw the bodies of their slaves to rot in holes of the ground: and that the Roman Christians, observing, at length, the great veneration paid to reliques, resolved to have a stock of their own: entering, therefore, the *Catcombs*, they added what cyphers and inscriptions they pleased, and then shut them up again, to be opened on a favourable occasion. Those in the secret, add they, dying, or removing, the contrivance was forgot, till chance opened them at last. But this opinion has even less of probability than the former.

Mr. Montro, in the *Philosophical Transactions*, takes a medium between the two extremes. He supposes the *Catcombs* to have been originally the common sepulchres of the first Romans, and dug in consequence of these two opinions, that shades hate the light; and they love to hover about the places where the bodies are laid.

Laying up the bodies in caves, is certainly the original way of disposing of the dead; and appears to have been propagated by the Phenicians, throughout the countries to which they sent colonies: the interring as we now do, in the open air, or in temples, was first introduced by the Christians. When an antient hero died, or was killed in a foreign expedition, as his body was liable to corruption, and for that reason unfit to be transported intire, they fell on the expedient of burning, in order to bring home the ashes, to oblige the manes to follow; that so his country might not be destitute of the benefit of his tutelage. It was thus burning seems to have had its original; and by degrees it became common to all who could bear the expences of it, and took place of the antient burying: thus *Catcombs* became disused among the Romans, after they had borrowed the manner of burning from the Greeks; and now, none but slaves were laid in the ground.

C A T

Places thus prepared, might afford convenient reforments for the primitive Christians; but could never be built by them. When the empire became christian, they were again disused; till the reading of I know not what author, who mentions them, occasioned them to be again looked into.—As to the famed cypher Xp, it is observed to have been in use among the antients, long before christianity arose. The abbot Bencini says, it was composed of the Greek letters XP, under which something mystical was comprehended; but no author gives any account what that mystery was.

CATACOUSICS, called also **CATAPHONICS**, the science of reflected sounds; or that part of acoustics which considers the properties of echoes.

CATADUPA,* a cataract, or water-fall. See **CATARACT**.

* The word comes from the Greek *καταδῦσις*, of *χρῆσις*, downwards; and *δῦσις*, a noise.

CATADUPI, *καταδῦσις*, an appellation given by the antients, to the inhabitants about the cataracts of the Nile.—See **CATARACT**.

The *Catadupi* are represented as all deaf; being made so by the continual din of the falling waters.

CATAFALCO, an Italian term, literally signifying *Scaffold*. It is chiefly used for a decoration of architecture, sculpture, and painting; raised on a timber scaffold, to shew a coffin, or tomb, in a funeral solemnity.

CATAGMATICS, medicines proper to solder, and unite broken bones; by promoting the formation of a callus.

* The word comes from the Greek *καταμάω*, fracture; formed of *κατα* signifi, and *μαῶ*, or *αἰνῶμαι*, I break.

The principal *Catagmatics*, are the Armenian bole, gum tragacanth, osteocolla, Cyprus nuts, frankincense, aloes, and acacia. See **CONSOLIDATION**.

CATALECTIC,* a term in poetry.—The antients called *Catalectic Verses*, those which wanted either feet or syllables; in opposition to *Acatalectic*, which are compleat verses, wanting nothing.

* The word comes from the Greek *κατα*, and *λεγω*, *defino*, I end.

CATALEPSIS, *καταληψις*, or **CATALEPSY**, in medicine, a kind of apoplexy; or a drowsy disease, wherein the patient is taken speechless, senseless, and fixed in the same posture wherein the disease first seized him; and his eyes open, without seeing, or understanding.

This disease is very rare, nor is its cause easy to assign. Boerhaave takes the immediate cause to be an immobility of the common sensory, in the situation of the first vessels; whence comes an absolute stagnation of the blood in the brain, and a cessation of all the functions of the brain, as well as those depending thereon; the muscles alone remaining in their first tension; and respiration, and the pulse preserved, though generally weak.

It is usually preceded by a long intermitting fever, a melancholic dry temperature, a suppression of the menses, or hæmorrhoids, great frights, and intense; continued meditation on one object.

Upon dissection, the arteries and veins of the cerebrum are found very turgid, and the blood close rammed in them: it is sometimes cured by copious hæmorrhages of the nose; sternutatories, vomitives, and vesicatories, are likewise applied to good purpose.

It seldom passes into any other disease; tho' sometimes into an epilepsy, convulsions, madness, or atrophy; but it commonly ends in death.

CATALOGUE, *κατάλογος*, a list, or enumeration of the names of several books, men, or other things; disposed according to a certain order.

The jesuits of Antwerp have given us a *Catalogue* of the popes; which makes what they call their *Prophylæum*.

CATALOGUE of the Stars, is a list of the fixed stars, disposed in their several constellations; with the longitudes, latitudes, &c. of each.

The first who undertook to reduce the fixed stars into a *Catalogue*, was Hipparchus Rhodius, about one hundred and twenty years before Christ; in which he made use of the observations of Tymocharis and Arifillus, for about one hundred and eighty years before him. Ptolemy retained Hipparchus's *Catalogue*; though he himself made abundance of observations, with a view to a new *Catalogue*, about the year of Christ 880. Albategni, a Syrian, brought down the same to his time. Anno 1437, Ulugh Beigh, king of Parthia and India, made a new *Catalogue* of the fixed stars; since translated out of Persian into Latin, by Dr. Hyde. The third who made a *Catalogue* from his own observations, was Tycho Brahe; who determined the places of seven hundred and seventy-seven stars, for the year 1600; which Kepler, from other observations of Tycho, afterwards increased to the number of one thousand, in the Rudolphine tables. At the same time, William, landgrave of Hesse, with his mathematicians, Christopher Rothmannus, and Justus Byrgius, determined the places of four hundred fixed stars, by his own observations; which Hevelius prefers to those of Tycho's Ricciolus,

Riccioli, in his *Astronomia reformata*, determined the places of one hundred and one stars, for the year 1700, from his own observations: for the rest, he followed Tycho's *Catalogue*; altering it where he thought fit. Anno 1677, Dr. Halley, in the island of St. Helena, observed three hundred and fifty southern stars, not visible in our horizon. The same labour was repeated by F. Noel, in 1710, who published a new *Catalogue* of the same stars constructed for the year 1687. The next was J. Hevelius, who made a *Catalogue* of 1888 fixed stars: where of nine hundred and fifty had likewise been observed by the ancients; three hundred and fifty-five by Dr. Halley; and only six hundred and three by himself.

The last, and greatest, is the *Britanick Catalogue*, compiled from the observations of the accurate Mr. Flamsteed; who for a long series of years devoted himself wholly thereto. As there was nothing wanting either in the observer, or apparatus, we may look on this as a perfect work, so far as it goes. It is pity the impression had not passed through his own hands: that now extant, was published by authority, but without the author's consent: it contains two thousand seven hundred and thirty-four stars. There was another published in 1725, pursuant to his testament.

CATAMITE, **CATAMITUS**, a *Ganymedes*, or boy kept for sodomy. See **SODOMY**.

CATAPAN, or **CATIPAN**, a name the later Greeks, about the twelfth century, gave the governor of their dominions in Italy.

Ughellus, and others, say, *Catapan* was the same with *Capitanus*; formed therefrom by metathesis, or transposition: others derive it from *κατα*, *justa*, and *παρ*, *omne*; in which sense, *Catapan* was a governor general, or magistrate, who had the direction of all: others will have it derived from *κατα παντοκρατορας*, that is, next after the emperor. In which sense, *Catapan* was a second master. *Secundus Dominus*. Du Cange derives it from *κατα πανω*, captain; which the Greeks applied to every governor, and even every man of quality.

CATAPASM *, *Καταπασμα*, a dry medicine, composed of a mixture of powders to be sprinkled on the body.

* The word comes from the Greek *κατα*, in, and *πασσω*, I sprinkle.

There are *Cataplasms* of divers kinds: some odoriferous, used in the way of perfume: others fortifying, applied to the stomach, heart, or head; and others escharotic, for eating off dead flesh.

CATAPELTA, an instrument of punishment, in use among the ancients. It consisted in a kind of press, composed of planks, between which the criminal was crushed to death.

CATAPHORA *, *Καταφορα*, a kind of lethargy, or drowsy disease; the same with what is otherwise called *Coma*. See the article **COMA**.

* The word is compounded of *κατα*, or *κατω*, downwards; and *φορα*, to bear.

CATAPHRYGIANS, ancient heretics; so called, as being of the country of Phrygia.

They were orthodox in every thing, setting aside this, that they took Montanus for a prophet, and Priscilla and Maximilla for true prophetesses, to be consulted in every thing relating to religion; as supposing the holy Spirit had abandoned the church. See **MONTANISM**.

CATAPLASM *, *Καταπλασμα*, popularly called *Poultice*, an external medicine, in form of a pulp; of a soft consistence, like an unguent, or cerat; composed of various liquors, parts of plants, oils, unguents, &c. according to the variety of intentions.

* The word comes from the Greek *καταπλασσω*, *illino*, I smear, or apply outwardly.

Its ordinary uses are, to alluage pain, and soften, resolve, disperse, or suppurate matter collected in the external parts of the body.

The common *Cataplasma* for these intentions, is composed of white-bread, milk, yolks of eggs, saffron and oil of roses.

CATAPULTA *, a military machine, used among the ancients, for throwing huge stones, and sometimes large darts, and javelins, twelve or fifteen foot long, on the enemy.

* The word is originally Greek, *καταπαλτης*, formed *απο* *πεπαλτης*. See **PELTA**.

The *Catapulta* is said to be the invention of the Syrians. Some authors make it the same with the *Ballista*; others dissent.

CATAPUTIA, a medicinal plant, commonly called the *lesser Spurge*. It purges with such a violence, both upwards and downwards, that few physicians now venture to prescribe it. See *Supplement, article CATAPUTIA*.

CATARACT of *Water*, a fall, or precipice, in the channel, or bed of a river; caused by rocks, or other obstacles, stopping the course of its stream: from whence the water falls with a noise and impetuosity.

* The word comes from the Greek *καταρρασσω*, *cum impetu decido*, I tumble down with violence; compounded of *κατα*, down; and *ρασσω*, *dejiro*, I throw down.

Such are the *Cataracts* of the Nile, the Danube, Rhine, &c. Strabo calls that a *Cataract*, which we call a *Gefade*; and what we call a *Cataract*, the ancients usually called a *Catadupa*. Herminius has an express dissertation, *De admirandis mundi Cataractis supra & subterraneis*; where he uses the motion of a new sense; signifying, by *Cataract*, any violent motion of the elements.

CATARACT, in medicine, a suffusion of sight, arising from a little film, or pellicle, which swimming in the aqueous humour of the eye, and getting before the pupil, intercepts the rays of light.

The *Cataract* is supposed to be formed by a condensation of the more viscous parts of the aqueous humour, between the uvea and the crystalline: though some take it to be a pellicle, detached from the crystalline itself; which is only an assemblage of several little pellicles, laid over one another.

There are two kinds of *Cataracts*, the *Genuine* and *Spurious*; the first owing to a humour amassed in the eye, coagulated and fixed therein, and destroying its use: the latter arising from fumes or vapours, thrown upon the eye by some accident; as in a fever, &c.—The genuine *Cataract* has several degrees, and several names: at first the patient sees, as it were, clouds, moats, flies, &c. diffused over the objects in view: thus far the *Cataract* is called *Imaginary*; there being nothing yet appearing to the eye of another person. As the suffusion increases, the pupil begins to appear of a sea-green colour; sometimes like the air full of clouds; and then the *Cataract* is called *Water*, or *water-fall'n*, when the evil is arrived at its height, and the matter is sufficiently coagulated, the patient loses all sight; the pupil ceases to be transparent, and becomes white, or brown, or of some other colour: this last state is what we properly denominate a *Cataract*.

Couching of **CATARACTS**. For the cure of a *Cataract*, recourse is had to the operation of couching; which is performed by running a steel needle into the eye, through the adnata, by the edge of the cornea, on the side of the little canthus, till it arrive at the middle of the *Cataract*; and then turning the needle round, they twist the *Cataract* about its point, till being thus reduced into a little compass, it is brought down beneath the pupil, and *couch'd*, or lodged in the bottom of the eye, and there left: thus the impediment being removed, the light gets admission.—To render the operation effectual, care must be taken, that the pellicle or *Cataract* be ripe, or arrived at its consistence, so as it may be easily rolled up; that its parts be not crush'd, or broke in rolling up, and lodged so secure, as not to rise up again by its elasticity; and perhaps also, that it may dissolve and consume at the bottom of the eye.

This is the popular theory of *Cataracts*, which some modern physicians and surgeons, as Heister, Brisseau, Maitre Jan, &c. oppose, and substitute a new one in its place: their opinion is, that instead of couching, or laying a little membrane, or pellicle, it is the crystalline itself that is thus couch'd, and lodged in the bottom of the vitreous humour. This they suppose to have been condensed, and to have lost its transparency; whence, instead of being an instrument of vision, it proves an obstacle to it, by shutting out the rays from the retina. This alteration of its transparency, they say, is accompanied with a change of colour; it sometimes becomes greenish; and on this account is called by the Greeks *Glaucoma*.—The *Glaucoma* and *Cataract* therefore, in their opinion, are the same thing: though in the other hypothesis they are very different; the first being reputed incurable, but not the latter.

The chief reason urged in behalf of this latter hypothesis, in the royal academy of sciences, where it was propos'd, is, that after the operation of couching, the person cannot see without a convex lens.—Now if no more were done, than the taking away the pellicle from before the crystalline, it would be in the same condition as before, and would make the same refractions; nor would any lens be necessary: whereas, supposing the crystalline couch'd, it is evident the lens will be required to supply its place.—To which is answer'd, that there have been instances of persons who have seen, after couching, without any lens; at least, it is granted, that immediately after the operation, several persons have seen very distinctly: and though lens's soon become necessary, yet the first moment wherein they saw without, seems to be a proof that the crystalline was not couch'd.

M. de la Hire, in confirmation of the antient system, assigns this reason for the necessity of a lens, after the operation, *viz.* that the vice which produced the *Cataract* is still subsisting in the aqueous humour; which being too thick and muddy, lets too few rays pass: a falling to be repaired by a lens, which throws a greater quantity of rays on the retina.—He adds some experiments made on the eyes of oxen; the result of which was, that the crystalline could never be laid perfectly in the bottom of the eye, but still stuck up in part, so as to stop up part of the passage of the rays; partly on account of its bulk, and partly on that of its being sustained by the aqueous and vitreous humour: he adds, that in the operation of couching, the needle is apt to scratch the anterior surface of the crystalline, and open the membrane wherewith it is enveloped; the consequence of

which will be wrinkles, which will render the refractions irregular, and change the direction of the rays which should all meet in the same point; so as to spoil the representation of objects. Lastly, it is insisted, that if the crystalline be couched, the patient would not see at all, for want of the necessary refractions.

M. Antoine, on the other hand, relates, that upon opening a person whom he had couched on both eyes, he found the two crystallines actually couched, and lodged at the bottom, between the vitreous humour and the uvea, where they were left by the needle; and yet the person saw without either: which shews, both that the operation of couching the crystalline is practicable, and that vision may be performed without it. In effect, the vitreous and aqueous humour, upon removing the crystalline may be supposed to run into the cavity, to assume the figure of its mould, and to perform the refractions and offices of the crystalline; it being found, by experiment, that the refraction is the same in both humours.

To shew, however, that there are *Cataracts* distinct from Glaucomas, M. Littere produced before the society an eye of a man blind twenty-two years; wherein was a distinct *Cataract*, or pellicle, which closed the aperture of the pupil.

CATARRH,* in medicine, a preternatural distillation, or defluxion of a sharp, ferous humour from the glands, especially about the head and throat, upon the parts subjacent.

* The word is Greek, *καταρρῆσις*, formed from *καταρρῆσις*, *deflatus*, I flow down.

*Catarrh*s are, generally, occasioned by a diminution of insensible perspiration on taking cold; the effect whereof is, that the lymph, that should pass by the skin, oozes out upon those glands; and being thus extravasated, occasions irritations, coughs, and all the usual symptoms. See **COUGH**. Degory deduces all diseases from *Catarrh*s; which he looks upon as the feminary of most disorders of the body.

Etmuller distinguishes a *hot* and a *cold Catarrh*; the first attended with an unnatural heat and pain, and a phlogosis of the whole body; the excreted lymph being exceeding thin and sharp: in the cold kind, all the symptoms are more remiss.

There is also a *suffocative Catarrh*, seated in the larynx, and epiglottis, which it constricts; and thus obstructing respiration, endangers strangling.

*Catarrh*s are cured by softening the ferous humours, and augmenting perspiration, by means of diaphoretics, narcotic medicines, and diuretics.—Smoking of tobacco is recommended as excellent in all *catarrhal* affections: in obstinate *Catarrh*s, recourse is sometimes had to issues and blisters.

*Catarrh*s do not arise from the head only, but sometimes also from other parts of the body; the lymphatic vessels, wherein the ferocities are contained, as well as the glands that separate them, being distributed all over the body.

CATASTASIS,* in poetry, the third part of the ancient Drama; being that wherein the intrigue, or action set on foot in the epitasis, is supported, carried on, and heightened, till it be ripe for the unravelling in the catastrophe.

* The word comes from the Greek *καταστασις*, *constitution*, this being, as it were, the mean, tenor, state, or constitution of the piece.

CATASTROPHE, in poetry, the change or revolution of a dramatic poem; or the turn which unravels the intrigue, and terminates the piece.

The *Catastrophe*, made the fourth, and last part in the ancient drama; or that immediately succeeding the catastasis.

The *Catastrophe* is either *simple* or *implex*; whence also the fable and action are denominated.

In the first there is no change in the state of the principal persons, nor any discovery or unravelling; the plot being only a mere passage out of agitation, to quiet and repose. This *Catastrophe* is rather accommodated to the nature of the epoea, than of tragedy. Indeed we meet with it in some of the antients, but it is out of doors among the moderns.—In the second, the principal person undergoes a change of fortune; sometimes by means of a discovery, and sometimes without.

The qualifications of this change or peripetia are, that it be probable, and necessary: in order to be probable, it is required it be the natural result or effect of the foregoing actions, *i. e.* must spring from the subject itself, or take its rise from the incidents; and not be introduced merely to serve a turn. The discovery in the *Catastrophe*, must have the same qualifications as the *Catastrophe* itself, whereof it is a principal part: it must be both probable and necessary. To be probable, it must spring out of the subject itself; not be effected by means of marks, or tokens, rings, bracelets, or by a mere recollection, as is frequently done, both by the antients and moderns. To be necessary, it must never leave the persons it concerns in the same sentiments they had before, but always produce either love or hatred. Sometimes the change consists in the discovery; sometimes it follows at a distance; and sometimes results immediately from it, which last is the most beautiful kind: and thus it is in *Oedipus*.

Mr. Dryden thinks a *Catastrophe* resulting from a mere change in the sentiments and resolutions of a person, without any further machinery, may be so managed as to become exceedingly beautiful, nay preferable to any other.—It is a dispute among the critics, whether the *Catastrophe* should always fall out happily, and favourably on the side of virtue, or not? *i. e.* whether virtue is always to be rewarded, and vice punished, in the *Catastrophe*? but the reasons on the negative side seem the strongest. Aristotle prefers a shocking *Catastrophe*, to a happy one; in regard, the moving of terror and pity, which is the aim of tragedy, is better effected by the former than the latter.

Bossu divides the *Catastrophe*, at least, with regard to the epoea, into the unravelling, or *denouement*, and the *achievement*, or *finishing*; the last of which he makes the result of the first, and to consist in the hero's passage out of a state of trouble and agitation, to rest and quiet. This period is but a point without extent, or duration; in which it differs from the first, which comprehends every thing after the knot, or plot laid. He adds, that there are several unravellings in the pieces; in regard there are several knots, which beget one another: the finishing, is the end of the last unravelling.

CATCH-LAND, such land, particularly in Norfolk, which is not certainly known to what parish it belongs; so that the parson who first gets the tithes there, enjoys it for that year, by right of preemption.

CATCH-POLE, or **CATCH-POLE**, a term now used, by way of reproach, for a bailiff's follower, or assistant. See **BAILIFF**.

Antiently, it was a term of credit, applied to those we now call *Serjeants of the Mace*, *Bailiffs*, or any other that use to arrest men on any action.

CATECHU, a medicinal aromatic substance brought from the East-Indies; called also *Cachebu*, and *Japan Earth*, and when prepared, ranked in the number of perfumes. See **JAPAN Earth**.

Notwithstanding the great use of *Catechu*, before that of coffee and tea, and its being still frequently used by many people, especially in France, its nature and origin was long but little known, even among the ablest physicians: some, from its being called *Japan Earth*, ranked it among the medicinal earths, and pretend it is found on the tops of mountains, covered with the roots of cedars, whose food they said it was: and that being washed in the rivers, and dried in the sun, it was formed into a kind of paste; which brought into Europe, served as the basis of several pastels, or lozenges, called *Cachebu*.

Others, with more probability, rank it among the gums; and maintain it to be formed of the inspissated decoction of a tree in the East-Indies, called *Cachous*; growing chiefly in the kingdom of Cochinchina. Lastly, others took it to be a factitious composition of several other drugs; especially of the juice of areca, extract of liquorice, and calamus aromaticus, and the bark of a tree called by the Indians *Catechu*.

Cachebu, or *Catechu*, is of much esteem in medicine: among other effects attributed to it, it is supposed to stop a cough, and fortify the stomach; besides its sweetening and perfuming the breath, when taken in an impalpable powder, mixed with gum tragacanth. See **Supplement**, article **CATECHU**.

CATECHUMEN,* *καταχουμῆν*, a candidate of baptism; or a person who prepares himself for the receiving thereof.

* The word comes from the Greek *καταχουμῆν*, I hear any thing spoken or delivered by word of mouth; compounded of *κατα*, and *χουμῆν*, I sound.

The *Catechumens* were distinguished from the *fidèles*, not only by name, but also by their place in the church: they were disposed, with the penitents, in the portico, or gallery, at the extremity of the church, opposite to the choir. They were not allowed to assist at the celebration of the eucharist; but after sermon, the deacon dismissed them with this formula proclaimed three times, *ha Catechumeni, missa est*.

There were divers orders or degrees of *Catechumens*, in those churches and ages where the term of catechizing for two or three years was observed: but what the precise number and appellations of these orders were, is not agreed on. The Greek expositors of the ancient canons usually make but two *ordres*, *viz.* the *imperfecti Catechumens*, and the *perfecti*, *i. e.* the beginners, or those just admitted into the class, and the proficient who were prepared for baptism.—Cave follows the same division, with this difference, that he makes the imperfect to be those who were yet reputed heathens.—Beveridge likewise makes two sorts of *Catechumens*, though he denominates them differently, *viz.* the *Audientes*, or hearers, who only staid in the church to hear the sermon and scriptures read; and the *Commiscentes*, or kneelers, called also *Substratores*, who staid to receive the minister's prayer and benediction also.—Suicer, and Basnage, make much the same division of the *Catechumens*, *viz.* into *Audientes* and *Competentes*; the latter of whom were properly such as were candidates, or petitioners for baptism.—Maldonat adds to these a third class, called *Pœnitentes*; comprehending such *Catechumens* as were under the discipline and censures of the church.

Cardinal

Cardinal Bona, augments the number to four kinds, viz. the *Audientes, Genuflectentes, Compentes, and Elefii*. Bingham also distinguishes four kinds of *Catechumens*, though in a manner somewhat different from Bona; making the *Competentes* and *Elefii*, to be but one and the same order: but advancing another order antecedent to all these, and not mentioned by any of the former writers, viz. *Catechumens* instructed privately and without doors, before they were allowed to enter the church.

CATEGOREMA, *Κατηγορημα*, properly denotes the name whereby a *Category*, or class of beings is represented. See **CATEGORY**.

CATEGORY *, *Κατηγορια*, in logic, a system, or assemblage, of all the beings contained under any genus, or kind; ranged in order.

* The word *Category*, was borrowed by the schools from the forum, or courts of justice: for as, in a trial, the plaintiff, or prosecutor, in accusing the criminal, or prisoner, must charge him expressly, or affirm that he did this or that, in positive terms; whence the word *Category*, viz. from *κατηγορειν*, to aver, or declare a charge or accusation: so in the doctrine of *Categories*, every higher may be expressly, and absolutely predicated or affirmed of every lower.

The school philosophers distribute all beings, all the objects of our thoughts or ideas, into certain genera, or classes, in order to get a more distinct and precise notion thereof; which classes the Greeks call *Categories*, and the Latins *Predicaments*.

The ancients, after Aristotle, generally make ten *Categories*: under the first, all substances are compris'd; and all accidents under the nine last; viz. quantity, quality, relation, action, passion, time, place, situation, and habit; which are usually expressed, or signified, by the following technical diction.

Arbor, sex, servus, ardore, refrigerat, vstus
Rari, cras, flubo, nec tunicatus ero.

These ten *Categories* of Aristotle, which logicians make such mysteries of, are now almost out of doors; and, in effect, are of little use: the less, as being things purely arbitrary, without any foundation, but in the imagination of a man, who had no authority to prescribe laws for ranging the objects of other peoples ideas. Accordingly, some philosophers think all nature may be better considered under these seven things, spirit, matter, quantity, substance, figure, motion, and rest: and others make but two *Categories*, *substance* and *accident*.

CATENA, in anatomy, a muscle, otherwise called *Tibialis anticus*. See **TIBIALIS**.

CATENARIA, in the higher geometry, a curve line, which a chain, or rope forms itself into, by its own weight, when hung freely, between two points of suspension, whether those points be horizontal or not.

To conceive the general nature or character of this curve, suppose a line heavy and flexible, (see *Tab. Geom. fig. 25*.) the two extremes of which, F and D, are firmly fixed in those points; by its weight it is bent into a certain curve FAD, which is called the *Catenaria*.

Let BD and *b d* be parallel to the horizon, AB perpendicular to BD, and D *d* parallel to AB; and the points B *b* infinitely near to each other. From the laws of mechanics, any three powers in equilibrio, are to one another, as the lines parallel to the lines of their direction, (or inclined in any given angle) and terminated by their mutual concourse: hence, if D *d* express the absolute gravity of the particle D *d*, (as it will, if we allow the chain to be every way uniform) then D *d* will express that part of the gravity, that acts perpendicularly upon D *d*; and by the means of which, this particle endeavours to reduce itself to a vertical position: so that if this lineola *d d* be constant, the perpendicular action of gravity upon the parts of the chain will be constant too; and may therefore be expressed by any given right line *a*.

Farther, the lineola D *d*, will express the force which acts against that conatus of the particle D *d*, (by which it endeavours to restore itself into a position perpendicular to the horizon) and hinders it from doing so. This force proceeds from the ponderous line DA, drawing according to the direction D *d*; and is, *ceteris paribus*, proportional to the line DA, which is the cause of it. Supposing the curve FAD, therefore, as before, whose vertex (the lowest point of the *Catena*) is A, axis AB, ordinate BD; fluxion of the axis *d* = B *b*; fluxion of the ordinate *d d*; and the relation of these two fluxions is thus, viz. *d d*: D *d*: : *a*: DA curve; which is the fundamental property of the curve, and may be thus expressed (putting AB = *x*, and BD = *y*, and A D = *c*) ; $\frac{a \cdot x}{c} = \frac{y \cdot dy}{dx}$

CATERER. See the article **POURVEYOR**.

CATHARI. See **ALBIGENSES**.

CATHERETICKS *, or **CATHERETIC Medicines**, are such as serve to consume, and eat off fungus, or proud flesh growing in wounds, ulcers, and the like.

* The word is Greek. *καταρηνος*, formed from *καταρω*, sometimes used for *depositor*, or *consumo*, *absumo*, I eat, consume, &c. of *κατα*, and *αρω*, I take away.

Cathereticks, are otherwise denominated *Sarcophagous Medicines* q. d. *flesh-eaters*. See **SARCOPHAGUS**, &c.

Such are red precipitate, burnt alum, res ustum, blue vitriol, &c.

CATHARINE, *Knights of St. CATHARINE* of *M. Sinai*, an ancient military order, erected for the assistance and protection of pilgrims going to pay their devotions to the body of *St. Catharine*, a virgin of Alexandria, distinguished for her learning, and said to have suffered martyrdom under Maximian.

The body of the martyr having been discovered on mount Sinai, caused a great concourse of pilgrims; and travelling being very dangerous by reason of the Arabs; an order of knighthood was erected in 1063, on the model of that of the holy sepulchre, and under the patronage of *St. Catharine*: the knights of which obliged themselves by oath to guard the body of the faint, keep the roads secure, observe the rule of *St. Basil*, and obey their grand master. Their habit was white, and on it were represented the instruments of martyrdom whereby the faint had suffered, viz. a half-wheel armed with spikes, and traversed with a sword stained with blood.

CATHARTICS, or **CATHARTIC Medicines**, are remedies which promote evacuation by stool.

Cathartics are the same with what we otherwise denominate *Purgatives*.

Cathartics are of three principal kinds, *mild, moderate, and violent*: the first purge gently, as *Cassia, Manna, Tamarinds, Rhubarb, Sena, &c.* the second pretty briskly, as *Jallop, Scammony, &c.* the third severely, as *Colocynth, Hellebore, Laureola, &c.* See each under its proper article.

Cathartics are likewise divided by some into *Cholagogues, Phlegmagogues, Melanagogues, and Hydragogues*; the first supposed to purge bile, the second pituita, the third melancholy, and the fourth serosities.

For the theory of *Cathartics*, and the manner wherein they operate, see **PURGATIVES**.

CATHEDRAL *, a church wherein is a bishop's see, or seat.

* The word comes from the Greek *καθεδρα*, chair, of *καθηζομαι*, *sedeo*, I sit

The denomination *Cathedral* seems to have taken its rise from the manner of sitting in the ancient churches, or assemblies of primitive christians: in these, the council, i. e. the elders and priests, was called *Presbyterium*; at their head was the bishop, who held the place of chairman, *Cathedrals* or *Cathedraticus*; and the presbyters, who sat on either side, were also called by the ancient fathers, *Assessores Episcoporum*. The episcopal authority did not reside in the bishop alone, but in all the presbyters, whereof the bishop was president.

A *Cathedral* therefore, originally, was different from what it is now; the christians, till the time of Constantine, having no liberty to build any temple; by their churches they only meant their assemblies; and by *Cathedrals*, nothing more than confessories.—Whence appears the vanity of some authors, especially the Spaniards, who pretend their *Cathedrals* to have been built in the times of the apostles.

CATHERETIC. See the article **CATHERETIC**.

CATHERINE. See the article **CATHARINE**.

CATHETER *, *Καθετηρ*, among chirurgians, a hollow probe, or instrument, usually of silver, somewhat crooked, to thrust up the yard, into the bladder; in order to assist in making urine, when the passage is stopped by the stone, gravel, caruncles, &c.

* The word is formed from *καθημινα*, *immitto*, in regard this instrument is used to be impelled into the bladder.

CATHETUS, in geometry, a perpendicular; or a line, or radius, falling perpendicularly on another line, or surface.

Thus, the *Catheti* of a *rectangled triangle*, are the two sides that include the right angle.

CATHETUS of Incidence, in catoptrics, is a right line drawn from a radiant point, perpendicular to the reflecting line, or the plane of the speculum, or mirror.

CATHETUS of Reflection, or of the *Eye*, a right line drawn from the eye, or from any point of a reflected ray, perpendicular to the plane of reflection, or of the speculum. See **REFLECTION**.

CATHETUS, in architecture, is a perpendicular line, supposed to pass through the middle of a cylindrical body, as a column.—See *Tab. Archit. fig. 41. lit. a*.

CATHOLICK, *Καθολικος*, denotes a thing that is universal, or general.

Theodosius the great, first introduced the term *Catholick* into the church; appointing by an edict, that the title should be applied, by way of pre-eminence, to those churches who adhered to the council of Nice, in exclusion of the Arians, &c.—*Catholicism*, however, soon changed hands; for under the emperor Constantius, Arianism became so predominant, that the Arians were called the *Catholicks*.

CATHOLICK King, is a title which has been hereditary to the king of Spain, ever since the time of Ferdinand and Isabella. Colombiere says, it was given them on occasion of the expulsion of the Moors. The Bollandists pretend, it had been bore by their predecessors, the Visigoth kings of Spain; and that Alexander VI. only renewed it to Ferdinand and Isabella. Others say, that Philip de Valois first bore the title; which was given him

him after his death by the ecclesiasticks, on account of his favouring their interests.

In some epistles of the ancient popes, the title *Catholic* is given to the kings of France, and of Jerusalem, as well as to several patriarchs and primates.

CATHOLIC Furnace, is a little furnace, so contrived, as to be fit for all kinds of operations, which do not require an intense fire.

CATHOLICON, in pharmacy, a kind of soft purgative electuary; so called, as being supposed universal; or a purger of all humours.

Different authors give different recipes for it: that called *Catholicon Nicolai* was long in use; it consists of sixteen ingredients, the chief whereof are tamarinds, cassia, fena, and rhubarb. It was called the double Catholicon, when there was a double portion of fena and rhubarb.

The **CATHOLICON for Chylsters**, only differs from this, in that it had no rhubarb, and that honey was used in it instead of sugar. See **CLYSTER**.

CATKINS, or **CATLINGS**, in phytology, an assemblage of sum-mets, hanging down from certain trees in manner of a rope, or cat's tail; serving as the male-blossoms, or flowers of the trees by which they are produced.

CATLIN, among surgeons, is a dismembring knife, for cutting off any corrupted part of a body.

CATOPISIS, in medicine, a disorder of the sight; more usually called *Myopia*. See **MYOPIA**.

CATOPTICS*, the science of reflex vision; or that branch of optics, which delivers the laws of light, reflected from mirrors, or specula. See **OPTICS**. Under which head, the doctrine and laws of *Catoptics* are laid down.

* The word comes from the Greek *κατοπτρον*, *Speculum*; of *κατα*, and *οπταμαι*, *video*, I see.

CATOPTICAL Dial, a dial which exhibits objects by reflected rays. See **REFLECTING Dial**.

CATOPTIC Telescope, a telescope that exhibits objects by reflection. See **REFLECTING Telescope**.

CATOPTIC Cistula, a machine, or apparatus, whereby little bodies are represented extremely large; and near ones extremely wide, and diffused through a vast space; with other agreeable phenomena: by means of mirrors, disposed by the laws of *Catoptics*, in the concavity of a kind of chest.

Of these there are various kinds, accommodated to the various intentions of the artificer: some multiply the objects; some deform them; some magnify, &c.—The structure of one or two of them, will suffice to shew how infinite more may be made.

To make a **CATOPTIC Cistula** to represent several different scenes of objects, when looked in at different foramina, or holes.

Provide a polygonous cistula, or chest, of the figure of the multi-lateral prism *ABCDE F*, (Plate *Optics*, Fig. 19.) and divide its cavity by diagonal planes *EB*, *FC*, *DA*, intersecting each other in the centre, into as many triangular locules, or cells, as the chest has sides. Line the diagonal planes with plain mirrors: in the lateral planes make round holes, through which the eye may peep within the locules of the chest. The holes are to be covered with plain glasses, ground within-side, but not polished, to prevent the objects in the locules from appearing too distinctly. In each locule are to be placed the different objects, whose images are to be exhibited; then covering up the top of the chest with a thin transparent membrane, or parchment, to admit the light; the machine is compleat.

For, from the laws of reflection, it follows, that the images of objects, placed within the angles of mirrors, are multiplied, and appear some more remote than others; whence the objects in one locule, will appear to take up more room than is contained in the whole chest. By looking, therefore, through one hole only, the objects in one locule will be seen, but those multiplied, and diffused through a space much larger than the whole chest: thus every new hole will afford a new scene: according to the different angles the mirrors make with each other, the representations will be different; if they be at an angle greater than a right one, the images will be monstrous, &c.

The parchment that covers the machine, may be made pellucid, by washing it several times in a very clear lye, then in fair water, and tracing it tight, and exposing it to the air to dry. If it be desired to throw any colour on the objects, it may be done by colouring the parchment. Zahnus recommends verdigrise ground in vinegar, for green; decoction of Brazil wood, for red, &c. He adds, that it ought to be varnished, to make it more pellucid.

To make a **CATOPTIC Cistula** to represent the objects within it prodigiously multiplied, and diffused through a vast space.

Make a polygonous cistula, or chest, as before, but without dividing the inner cavity into any apartments or locules; (Plate *Optics*, Fig. 19.) line the lateral planes *CBHI*, *BHLA*, *ALMF*, &c. with plane mirrors, and at the foramina, or apertures, pare off the tin and quicksilver, that the eye may see through: place any objects in the bottom *MI*, v. g. a bird in a cage, &c.

Here, the eye looking through the aperture *hi*, will see each object placed at bottom, vastly multiplied, and the images removed at equal distances from one another. Hence, were a large multangular room, in a prince's palace, lined with large mirrors, over which were plain pellucid glasses to admit the light; it is evident the effects would be very surprizing and magnificent.

CATOPTROMANCY*, *κατοπτρομαντεία*, a kind of divination, among the antients; so called, because consisting in the application of a mirror. See **MIRROR**.

* The word is formed from *κατοπτρον*, *Speculum*, and *μαντεία*, *Divinatio*.

Pausanias says, it was in use among the Achæians, where those who were sick, and in danger of death, let down a mirror, or looking-glass, fastened by a thread, into a fountain before the temple of *Ceres*; then, looking in the glass, if they saw a ghastly disfigured face, they took it as a sure sign of death: on the contrary, if the face appeared fresh and healthy, it was a token of recovery.—Sometimes glasses were used without water, and the images of things future, they say, were represented in them.

CATROPITIF, see **AGONISTIC**.

CAVA, in anatomy, the name of a vein, the largest in the body, terminating in the right ventricle of the heart; where it opens with a large mouth, to convey to it the blood brought from all the parts of the body, by the branches of the other veins, which all terminate in the *Cava*.—See *Tab. Anat.* (Splanchn) Fig. 1. lit. c. 12. lit. ee. (Angeli) Fig. 6. lit. b. and cc.

At its entrance into the right ventricle, it has three membranous valves, called *Tricuspidæ*, or *Triglobinæ*, from their triangular figure; so accommodated, as to allow the blood's passage from the *Cava* to the heart, and to prevent its return.

The *Cava* is divided into the *ascending* and *descending* parts: the *ascending Cava*, is that which arises from the lower parts; so called, because the blood hereby conveyed to the heart, mounts, or ascends.—The *descending Cava* comes from the upper parts; and is so called, because the blood hereby brought from the head, and other parts, descends.

CAVALCADE, a formal, pompous march, or procession of horsemen, equipages, &c. by way of parade, or ceremony, as to grace a triumph, public entry, or the like.

CAVALIER, or **CAVALEER**, a horseman, or person mounted on horseback: especially if he be armed withal, and have a military appearance.

Antiently, the word was restrained to a knight, or *miles*. See **KNIGHT**. The French still use *Chevalier* in the same sense. See **CHEVALIER**.

CAVALIER, in fortification, a mount, or elevation of earth, either round, or oblong; having a platform on the top, bordered with a parapet, to cover the canon placed on it, and cut with embrasures to fire through; serving to overlook and command all around the place.

Cavaliers are raised in sieges on the bastions and curtains of ramparts, in order to fire on the eminences around, and oblige them to get farther off, as well as to scour the trenches. But the gorge of the bastion is the place where *Cavaliers* are most properly erected; those raised on the curtain being rather called *Platforms*.

CAVALIERS, or **CAVALEERS**, considered as a faction. See **TORY**.

CAVALRY*, a body of soldiers, who fight, or march on horseback.

* The word comes from the French *Cavaliere*, and that from the corrupt Latin *Caballus*, a horse; whence *Caballarius*, and *Cavallarius*, in the later Latin, and *καβαλλαρης*, in the Greek.

The *Cavalry* is usually divided into horse and dragons. The horse are either regimental, or independent troops; to which latter sort belong the horse guards, and in France, the gendarmes and musketeers who serve on horseback.—The dragons and regimental horse form what they call the *Light Cavalry*: the troopers the *Heavy Cavalry*.

When an army is ranged in order of battle, the *Cavalry* is posted on the wings.

Bodies of *Cavalry*, ranged in form of battle, are called *Squadrons*.

The Romans, in their first wars, were unacquainted with the use of *Cavalry*, and made their whole force consist in infantry; inasmuch, that even in the engagement, they made their horse dismount, and fight on foot; never reluming their horses, but to pursue the enemy the better when routed. It was the *Cavalry* of *Pyrrhus*, that first occasioned them to alter their sentiments; but especially that of *Hannibal*, which struck them with such a terror, that the invincible Roman legions durst not attack them on even ground.

CAUDA Draconis, the dragon's tail, in astronomy, the name of the moon's southern, or descending node. See **NODE**.

CAVEAR, **CAVIA**, or **KAVIA**, a kind of food, or pickle, in mighty use and repute throughout Muscovy; and lately introduced upon the English table.

The *Cavia*, or *Cavear*, is the roe, or spawn of the sturgeon, taken out, salted, and dried in the sun, or by the fire. The Italian merchants settled at Moscow, drive an incredible trade with *Cavear*; the fish being caught in prodigious quantities at the mouth of the Volga, and other rivers which empty themselves into the Caspian Sea. They cure, or prepare the roes on the spot, and thence send them in this form of *Cavear* up the Volga to Moscow, to be there distributed throughout that vast empire; where it is of wonderful service to the people, on account of the three lents there observed with great severity.

The English import considerable quantities of this commodity from Archangel; though not so much for home consumption, as to supply the French and Italians. To be good, it should be of a reddish brown colour, and very dry. It is eat with oil and lemon; sometimes with vinegar: some eat it alone with bread; and others only as a sauce, or pickle, like anchovies.

CAVEAT, in law, a bill entered in the ecclesiastical court, to stop the proceedings of one who would prove a will to the prejudice of another. See **PROBATE**.

CAVERN, **CAVERNA**. See the article **GROTTO**.

CAVERNOSA Corpora, in anatomy, called also *Corpora nervosa*, and *spongiosa*, are two cavernous bodies, of an indeterminate length and thickness, whereof the penis is principally composed. —See *Tab. Anat.* (planch) fig. 8. lit. aa. bb. and tt.

Their internal substance is rare, and spongy; and when filled with blood and spirits, it dilates and swells: in which, the tension, or erection of the yard consists.

They have two distinct beginnings from the lower side of the ossa pubis; whence they increase in bulk, till their meeting with the corpus cavernosum urethrae, where they join into one, and are retained by means of a septum composed of their outer tunics: their other extremities are capped with the glans.

CAVERNOSUM Corpus Urethrae, a third spongy body of the penis; so called, because the urethra, or urinary passage of the penis, is inclosed by it.

Its figure, contrary to that of the two corpora cavernosa, is largest at its extremities, and least in the middle; its upper part is in the perineum, and is called its *Bulb*, from its figure. Its external membrane is thin, and divided lengthwise by a septum. The middle part of this *Corpus* is nearly cylindrical; but the passage for the urine is not along the centre, but inclines to its upper part, next the body of the penis; its lower extremity dilating itself, forms the glans.

CAVERNOSA Corpora of the Clitoris, are two nervous or spongy bodies, like those of the penis; they have their origin from the lower part of the os pubis, on each side; and uniting together, constitute the body of the clitoris, as those do that of the penis. See **CLITORIS**.

Indeed, they have no perforation analogous to that of the penis; but they have a septum, or membranous partition, running all along between them, and dividing them from the glans, to its divarication at the os pubis, where they are called *Crura Clitoridis*.

CAVERNOSUM Corpus of the Pudendum. See **RETICULARIS Corpus**.

CAVESON,* in the manage, a kind of musroll, put on a horse's nose, which binds or locks him in, and serves in breaking, managing, and tutoring him.

* The word comes from the Spanish *Caveca*, or *Cabeça*, head.

The *Cavesons* for breaking young horses, are usually of iron, made semicircularly, of two or three pieces turning on joints; others are twisted, others flat, others hollow in the middle, and indented like saws, called *Mordants*: though these last are now banished the academies.—The rope and leather *Cavesons*, serve for passing the horse between two pillars.

CAVETTO,* in architecture, a hollow member, or moulding, containing a quadrant of a circle, and having an effect just contrary to that of a quarter-round: it is used as an ornament in cornices.—See *Tab. Archit.* fig. 6.

* The word is Italian, and is no more than a diminutive of *Cavus*, hollow.

M. Felibien observes, that the workmen confound the *Cavetto* with a scotia, but improperly; the *Cavetto* being in effect only half a scotia: yet he himself is chargeable with the same oversight. See **SCOTIA**.

When in its natural situation, the workmen frequently call it *Gula*, or *Guelle*; and when inverted, *Gorge*.

CAVIA, or **CAVIAC**. See the article **CAVEAR**.

CAVIN, in the military art, a natural hollow fit to cover a body of troops, and hereby facilitate their approach to a place.

A *Cavin* near a place besieged is of great advantage to the besiegers; as by help hereof they can open trenches, make places of arms, keep guards of horse, and the like, without being exposed to the enemies shot.

CAUKING,* or **CALKING of a ship**, implies the driving in oakum, or somewhat of that kind into the seams, or commensures of the planks, to prevent the ship's leaking.

* Kennet derives the word from the barbarous Latin *Calcistrata*, shoing.

CAUL, in anatomy, a membrane in the abdomen, covering the greatest part of the guts; called, from its structure, *Reticulum*, but most frequently *Omentum*. See **OMENTUM**.

CAUL is likewise a little membrane, found on some children, encompassing the head, when born.

Drelincourt takes this *Caul* to be only a fragment of the membranes of the fetus; which ordinarily break at the birth of the child.

Lampridius tells us, that the midwives fold this *Caul* at a good price to the advocates, and pleaders of his time; it being an opinion, that while they had this about them, they should carry with them a force of persuasion which no judge could withstand: the canons at one time forbid the use of it; because some witches and forerers, it seems, had abused it.

CAULICOLES,* **CAULICULI**, in architecture, denote those eight lesser branches, or stalks, in the Corinthian capital, which spring out from the four greater, or principal caules, or stalks.—See *Tab. Archit.* fig. 26. lit. FF.

* The word comes from the Latin *Caulis*, the stalk, or stem of a plant.

The volutes of this order, are sustained by four caules, or primary branches of leaves; from which arise these *Caulicoles*, or lesser foliages.

Some authors confound the *Caulicoles* with the volutes themselves; some with the helices in the middle, and some with the principal stalks whence they arise.

CAULIFEROUS Herbs, are such as have a true *Caulis*, stalk, or trunk, which a great many have not; as the capillaries, &c.

CAUSALITY, in metaphysics, the power, or action of a cause in producing its effect. See **CAUSE**.

It is a dispute, among the school philosophers, whether, and how the *Causality* is distinguished from the cause and effect? Some hold it a mode, or modal entity, superadded to the cause, &c. others contend for its being the cause itself, only considered *principiative* and *terminative*, &c.

CAUSE, **CAUSA**, that which contributes to the production of an effect; or that by virtue whereof a thing is done, or from which it proceeds.—In which sense, *Cause* stands essentially related to effect.

First Cause, is that which acts of itself, and from its own proper power, or virtue;—in this sense, God is the only *First Cause*.

Second Causes, are those which derive the power, and faculty of acting, from a first *Cause*.—Such *Causes* do not properly act at all; but are acted on: and therefore are improperly called *Causes*: of which kind are all those that we call *Natural Causes*.

F. Malebranche denies second, or natural *Causes*, to have any force, power, or efficacy to produce any effect; and thinks the notion in itself inconceivable. It is certain the philosophers are strangely puzzled, and divided about the manner of their agency: some maintain them to act by their matter, figure, and motion; others by a substantial form; many by accidents, or qualities; some by matter and form; and others by certain faculties different from all these.

Some maintain, that the substantial form produces forms; and the accidental, accidents; others, that forms produce other forms and accidents; others, lastly, that accidents alone are capable of producing accidents, and even forms.—Again, those, for instance, who say that accidents may produce forms, by the virtue they have received from the form to which they are joined, do not all mean the same thing: some will have it, that these accidents are only the force or virtue of the substantial form; others, that they receive the influence of the form, and only act by virtue thereof: others, lastly, that they are only instrumental *Causes*.

Again, the philosophers are divided as to the action whereby *Second Causes* produce their effects: some maintain, that the causality cannot be produced, since it is that which produces; others will have them to act truly by their action; but they are still at a loss about that action.

Such variety is there in the sentiments even of modern philosophers; and those too our neighbours: nor are the ancients, and those at a distance from us, better agreed: Avicenna, v. g. does not allow that corporeal substances can produce any thing but accidents. His system, according to Ruvio, is this: God produces, immediately, a most perfect spiritual substance; this produces another less perfect; that a third: and thus to the last; which last produces all the corporeal substances; and those corporeal substances accidents. But Avicenna, not being able to conceive how corporeal substances, which cannot penetrate one another, should be capable of altering one another, will have it, that only spirits are capable of acting on bodies; because nothing else can penetrate them.

CAUSES, in the school of philosophy, are distinguished into, *Efficient CAUSES*, which are the agents that produce any thing,

Material CAUSES, the subjects whereon the agent works, or whereof the thing is formed: thus, marble is the matter or *Material Cause* of the statue.

And *Final* CAUSES, are the motives which induce a man to act; or the end for which the thing is done; thus, victory and peace are the *Final Causes* of war.

Some add the *Exemplary* CAUSE, which is the model the agent forms, or proposes, and by which he conducts himself in the action: but this is not properly any *Cause* at all.

Formal CAUSE, the change resulting from the action; or that which determines a thing to be this, and distinguishes it from every thing else: thus, the soul is held the form, or *Formal Cause* of man, &c.

CAUSES, again, are distinguished into *Physical* or *Natural*, and *Moral*.

A *Physical* Cause, is that which produces a sensible corporeal effect: thus, the sun is the *Physical Cause* of heat.

A *Moral* CAUSE, is that which produces a real effect, but in things immaterial: thus, repentance is the *Cause* of forgiveness.

Others define a *Physical Cause* to be that which produces its effect by a physical virtue; and a *Moral Cause*, that which determines the *Physical Cause*, though not necessarily, to produce the effect: in which sense, it is also called a *Dispositive*, *Excitative*, and *Impulsive Cause*.

Thus, the sun is the *Physical Cause* of light; a stone that breaks the skull, is a *Physical Cause* of death: and thus the advice, in-treaty, commands, or menaces which determine us, though not necessarily, to do, or not to do any thing, are *Moral Causes*.

In this sense, a *Moral Cause* is only applicable to a free intelligent agent: and it is this notion of a *Moral* and *Physical Cause*, that is the most just, clear, and distinct.

CAUSES, again, are considered, either as *Universal*, or *Particular*; *Principal*, or *Instrumental*; *Total*, or *Partial*; *Univocal*, *Equivocal*, &c.

An *Equivocal* CAUSE, is that which is of a different kind and denomination from its effect: thus it is the sun is said to be the *Cause* of the animals it produces.

An *Instrumental* CAUSE, is that used by the principal to produce its effect; or which is excited to produce an effect, beyond the measure of its own perfection.

A *Partial* CAUSE, that which concurs with some other in producing the effect.

A *Particular* CAUSE, is that which can only produce a single effect, or a certain kind of effects.

A *Principal* CAUSE, is that which gives motion to the instrument, or which does not operate beyond its own natural efficacy.

A *Total* CAUSE, is that which produces the whole effect.

An *Univocal* CAUSE, is that which is of the same kind and denomination with its effect: as a man the *Cause* of a man.

An *Universal* CAUSE, is that which by the extent of its power may produce all effects.

The Cartesians resolve all physical *Causes* into occasional ones.

Occasional CAUSES, are only the *Occasions*, not the direct *Causes* of their effects. See OCCASION.

The soul, say those philosophers, is not able to act on the body; nor the body reciprocally on the soul: to keep up an intercourse between them, God, on occasion of a motion of the body, impresses a sensation on the soul; and, on occasion of a sentiment of the soul, impresses a motion on the body. The motions, therefore, of the soul and body, are only *Occasional Causes* of what passes in the one or the other: thus, say they, the stroke or percussion, is only the *Occasional Cause* of the motion produced in the body struck: it is God is the direct efficient *Cause*. And thus the action of objects on our organs, is not the efficient *Cause* of our ideas and perceptions, but merely the *Occasional Cause*, which determines God to act on the mind, according to the laws of the union of soul and body. But the consequences that follow from this fine reasoning are very unlucky, not to say ridiculous: thus, it is not the cannon-ball that kills the man, or beats down the wall, but it is God that does it: the motion of the cannoner, whose arm, moved by the power of God, applied fire to the powder, determined God to inflame that powder; the powder inflamed, determined God to drive out the ball; and the ball driven, with an inconceivable rapidity, to the exterior surface of the body of a man, or a wall, determines God to break the bones of the man, or beat down the wall, &c. A coward, who runs away, does not run away at all; but the motion of his pineal gland, agitated by the impression of a squadron of enemies coming on him, with bayonets at the ends of their muskets, determines God to move the coward's legs, and carry him from them.

It has been often said, in a moral sense, that the world is a comedy, and that each man only acts his part; but it may be here said, in a strict physical one, that the universe is a puppet-show, and each man a punchinello, making a great deal of noise without speaking, and bustling without moving.

CAUSEWAY,* or CAUSEY, a massive construction of stone, stakes, and fascines; or an elevation of fat, viscid earth, well

beaten; serving either as a road, in wet marshy places, or as a mole to retain the waters of a pond, or prevent a river from overflowing the lower grounds.

* The word comes from the French *Chauffee*, antiently wrote *Chauffes*; and that from the Latin *Calceata*, or *Calata*; according to Somner and Spelman, *à calcando*. Bergier rather takes the word to have had its rise à *pedum calcetis, quibus terantur*.

CAUSSIDICUS. See ADVOCATE.

CAUSTICS, in physic, those medicines which by their violent activity, and the heat thence occasioned, destroy the texture of the parts to which they are applied.

Caustics, amount to the same with what are otherwise denominated *Pyrotics*, and *Escharotics*. They are also usually confounded with cauteries; though some distinguish them; restraining *Caustics* to those medicines which do not burn thro' the part, nor leave an eschar; and cauteries to those which do.

Caustics are used to eat off proud fungous flesh; they also penetrate within hard callous bodies, and liquify the humours; and are particularly applied in abscesses and imposthurations, to eat through to the suppurated matter, and give it vent: sometimes also to make issues in parts where cutting is difficult or inconvenient.

The principal medicines of this class, are burnt alum, sponge, cantharides, and other vesicatories; as also orpiment, calc viva, vitriol, ashes of the fig-tree, the ash, and wine lees; the salt of the lixivium whereof soap is made; sublimate mercury, red precipitate, &c. See each described under its proper article.

Crystals of Luna, and lapis infernalis, made of silver and spirit of nitre, become *Caustics* by that mixture.

CAUSTIC Curve, in the higher geometry, a curve formed by the concurrence, or coincidence of the rays of light reflected, or refracted from some other curve.

Every curve has its twofold *Caustic*: accordingly, *Caustics* are divided into *Catacaustics*, and *Diacustics*; the one formed by reflection, the other by refraction.

Caustic Curves, are usually supposed to be the invention of M. Tschirnhausen, who first proposed them to the academy of sciences, in 1682.—They have this remarkable property, that when the curves that produce them are geometrical, they are equal to known right lines.

Thus, the *Caustic* formed by reflected rays from quadrant of a circle, which came at first parallel to the diameter, is equal to $\frac{2}{3}$ of the diameter: which is a sort of rectification of curves that preceded the invention of the new doctrine of infinites, on which most of our rectifications are built.

The academy appointed a committee to examine the new curves, viz. Meil. Cassini, Mariotte, and De la Hire, which last doubted much of the description, or generation M. De Tschirnhausen gave of the *Caustic* by reflection from a quadrant of a circle. The author refused to discover all his method; and M. De la Hire persisted in holding the generation suspicious. M. Tschirnhausen, however, was so confident of it, that he sent it to the Leipzig journalists, though without any demonstration.

CAUSTIC-Glasses. See the article BURNING-Glasses.

CAUTERY,* CAUTERIUM, a medicine wherewith to burn, sear, eat through, or corrode some solid part of the body.

* The word is originally Greek, καυτηρ, or καυτηριον, formed from καω, I burn.

Cauteries are of two kinds, *Actual* and *Potential*.

Actual CAUTERIES, are those which produce an instantaneous effect: as, fire, or a red-hot iron; these are applied in the fistula lachrymalis, after extirpations of cancers, amputations of legs, or arms, &c. in order to stop the hemorrhages, and produce a laudable supuration. They are sometimes also applied to carious bones, abscesses, and malignant ulcers, in order to open a passage for the discharge of the peccant humours. The irons used on these occasions, are sometimes crooked at the extremity, and that variously, according to the various occasions: whence some are called *Cutellary*, others *Punctual*, others *Olivary*, &c.—M. Homberg assures us, that a great part of the medicine of the people of Java, and other parts of the East-Indies, consists in burning, or the application of *Actual Cauteries*; and that there is scarce any disease but they will happily cure thereby.

The *Actual* Cautery, or hot iron, is frequently applied for the making of issues, in parts where cutting is difficult or inconvenient: it makes a little round hole, which is to be filled up with a pea, or an ivy berry, to keep it open for the humours to pass through. Pareus describes a method of making *velvet*, or *silken Cauteries*; (*Cauteria serica vel habsferica*) so called, either because they give no pain, or because he purchased the secret at a dear rate from a certain chymist.

The *Cautery* described by Galen is a brazen tube, through which a little red-hot iron is thrust to the part.

Cauteries are chiefly applied to the nape of the neck, between the first and second vertebra, the exterior part of the arm, &c.

POTENTIAL CAUTERIES, are compositions of *caustic* medicines, usually of quick-lime, soap, and the like. See **CAUSTICS**.

CAUSEWAY. See the article **CAUSEWAY**.

CAXA, a little coin, made of lead, mixed with scoria of copper; struck in China, but current chiefly at Bantam, in the rest of the island of Java, and in some of the neighbouring islands. See **COIN**.

It is somewhat smaller than the French double, and has a square hole through the middle; by means whereof, several of them are hung on the same string: this string, which they call *Santa*, usually contains two hundred *Caxas*, equivalent to nine French deniers, or somewhat less than three farthings sterling. Five fantes tied together, *i. e.* a thousand *Caxas*, make a *tapacou*.—Nothing can exceed the brittleness of the *Caxa*; a string never falls to the ground without breaking at least ten or twelve pieces. Leaving them a night steeped in salt water, they cling so firm to one another, that they are not to be separated without breaking one half of them. The Malais call them *Cas*, and the Javese, *Pitis*.

The *Caxas* are of two kinds, *great* and *small*: the *small* are those we have been speaking of; three hundred thousand whereof, are equal to fifty-six livres five sols, Dutch money. The *large* are old *Caxas*; six thousand whereof are equal to the piece of eight, or four shillings sixpence sterling. These are nearly the same with the *caches* of China, and the *caffies* of Japan.

CAZEMATE,* in fortification, a kind of vault or arch of stonework, in that part of the flank of a bastion next the curtain; somewhat retired or drawn back towards the capital of the bastion; serving as a battery, to defend the face of the opposite bastion, and the moat, or ditch. See **BASTION**.

* The name comes from a vault, formerly made to separate the platforms of the upper and lower batteries; each of which was called in Italian *Casa Armata*, and in the Spanish *Casemata*. Though others derive the word from *Casa à Matti*, house of fools: *Cazarruoi*, from *Casa* and *mata*, low house.

The *Cazemate*, sometimes, consists of three platforms, one above another; the highest being on the rampart: but they commonly content themselves to withdraw the last within the bastion.

The *Cazemate* is also called the *low place*, and *low flank*, as being at the bottom of the wall next the ditch; sometimes the *retired flank*, as being that part of the flank nearest the curtain, and the centre of the bastion: it was formerly covered with an epaulement, or a massive body either round or square, which prevented those without from seeing within the batteries; whence it was also called *covered flank*.

It is now rarely used, by reason the enemy's batteries are apt to bury the artillery of the *Casemate* in the ruins of the vault: besides, that the terrible smok made by the discharge of the cannon, render it intolerable to the men.—Hence, instead of the ancient *covered Cazemates*, later engineers have contrived open ones, only guarded by a parapet, &c.

CAZEMATE, is also used for a well with several subterraneous branches, dug in the passage of the bastion, till the miner is heard at work, and air given to the mine.

CELLING,* in architecture, the top, or roof of a lower room; or a covering of plaster, over laths nailed on the bottom of the joists that bear the floor of the upper room; or where there is no upper room, on joists for the purpose: hence called *Celling Joists*.

* The word *Celling* answers pretty accurately to the Latin *Lacunar*, every thing over head.

Plastered *Ceilings* are much used in England, more than in any other country: nor are they without their advantages, as they make the room lightsome; are good in case of fire; stop the passage of the dust; lessen the noise over head; and, in summer, make the air cooler.

CELARENT, among logicians, a mode of syllogism, wherein the major and conclusion are universal negative propositions, and the minor an universal affirmative.

E. gr. e. None whose understanding is limited can be omniscient.
I. A. Every man's understanding is limited;
r. Ent. Therefore no man is omniscient.

CELEBATE,* or **CELEBACY**, the state of a person who lives out of marriage. See **MARRIAGE**.

* Scaliger derives the word from the Greek *κελην*, bed, and *κεληνο*, linque, I leave: others say it is formed from *caeli beatitudo*, q. d. the blessedness of heaven.

The *Celebate* of the clergy, which is still rigorously kept up among the Romanists, is of a pretty ancient standing: it was first proposed by the council of Nice, but without passing; it was, however, in some measure admitted by the western councils of Elvira, Arles, Tours, &c. though not absolutely enjoined. Such among the priests as piqued themselves on the faculty of continence took the hint; inasmuch, as towards the close of the fourth century, there were few but made a profession of a voluntary *Celebate*. In 441, the council of Orange ordered those to be deposed who did not abstain from their wives: but it was

Gregory the seventh, who first brought ecclesiastics to admit the *Celebate* as a law. In the council of Trent, it was proposed to fet the clergy at liberty again from the yoke of *Celebate*; and this was even made an article of the Interim of Charles the fifth, but the pope could not be brought into it.

St. Jerom and Epiphanius observe, that in their time none were admitted into the priesthood, but those who were unmarried, or who abstained from their wives.

CELERES,* in antiquity, a body, or regiment of guards of the ancient Roman kings, established by Romulus; consisting of three hundred youths chosen from the best families of Rome, and approved by the suffrages of the Curiae of the people, each of which furnished ten.

* The name comes from *Celer*, quick, ready; and was given them, because of their promptness to obey the king; or, as some will have it, from the name of their first tribune; others say, from one *Celer*, a comrade of Romulus, who assisted him in the combat with his brother Remus, and is said to have slain that Prince.—Some say, the *Celeres* were the same with those afterwards called *Troffuli*, on account of their taking the city Trofulum in Hebrunia, alone, without the assistance of any infantry.

The *Celeres* always attended near the king's person, to guard him, and to be ready to carry his orders, and to execute them. In war, they made the vanguard in the engagement, which they always began first: in retreats, they made the rear-guard.

Though the *Celeres* were a body of horse, yet they usually dismounted, and fought on foot: their commander was called *Tribune*, or *Præfext* of the *Celeres*. They were divided into three troops, of one hundred each, commanded by a captain called *Centurio*. Their tribune was the second person in the kingdom. See **TRIBUNES**, **CAVALRY**, &c.

Plutarch says, Numa broke the *Celeres*: if this be true, they were soon re-established; for we find them under most of the succeeding kings: witness the great Brutus who expelled the Tarquins, and who was tribune of the *Celeres*.

CELERITY, in mechanics, is the velocity of a moving body; or that affection of a body in motion, whereby it is enabled to pass over a certain space, in a certain time. See **VELOCITY**; see also **MOTION**.

CELESTINS, an order of religious, reformed from the Bernardines, in 1224, by pope Celestin the fifth, then only Peter de Mourchon, or Morron, of Ifernina in Naples; and established in 1264, by pope Urban the fourth, and confirmed by Gregory the tenth, in 1274.

They were introduced into France by Philip the Fair, who requested a dozen of them from the general of their order, by his ambassador at Naples, in 1306.—It is a kind of proverb with them, *Voilà un plaisant Celestin*.

CELLIAC, or **COELIAC** Passion. See the article **COELIAC**.

CELLITES, **CELLITÆ**, an order of religious, founded by Alexius a Roman: in Italy they are called *Alexians*; but in Germany and the Low-countries, where they have monasteries, *Cellites*, *i. e.* people inhabiting in cells.

CELLS,* **CELLÆ**, **CELLULÆ**, are little houses, apartments, or chambers; particularly those wherein the ancient monks, solitaries, and hermits lived in retirement.

* Some derive the word from the Hebrew *סִד*, *i. e.* a prison, or place where any thing is shut up.

The same name is still retained in divers monasteries. The dormitory is frequently divided into so many *Cells*, or lodges.

The Carthusians have each a several house, which serves them as a *Cell*.

The hall wherein the Roman conclave is held, is divided by partitions into divers *Cells*, for the several cardinals to lodge in.

CELLS, in anatomy, are little bags, or bladders, where fluids or other matters are lodged; called also *Loculi*, *Cellule*, &c.

The name is also given by botanists to the partitions in the husks, or pods where the seeds of plants lie.

CELLS, are also the little divisions, or apartments in honey-combs, where the honey, young bees, &c. are distributed: these are always regular hexagons.

CELLULÆ, *Adiposæ*, in anatomy, the *Loculi*, or little *Cells* wherein the fat of bodies in good habit is contained. See **ADIPSÆ** and **ADIPOSE**.

These are co-extended with the skin itself, except on the forehead, the eyelids, penis, and scrotum. In emaciated bodies, these *Cells* being unprovided of their fat, appear like a kind of flaccid, transparent membrane.

CEMENT, or **CÆMENT**. See the article **CÆMENT**.

CEMENTATION, or **CÆMENTATION**. See **CÆMENTATION**.

CENOBITE, or **COENOBITE**. See **COENOBITE**.

CENOTAPHI,* *Κενοτάφιοι*, an empty tomb, or a monument without a body under it; erected only by way of honour to the deceased.

* The word is originally Greek, compounded of *κεν*, empty, and *τάφ*, tomb.

CENSER. See the article **ALTAR**.

CENSOR,* in antiquity, one of the prime magistrates in ancient Rome; whose business was to survey, and rate the people, and to inspect and correct their manners.

* The word is derived from *Censere*, because he assessed and valued every man's estate, registering their names, and placing them in a proper century, that the Romans might know their own strength: though others say, the *Censurs* were so called on account of their other office, *viz.* as being comptrollers, or correctors of manners and policy.

There were two *Censurs*, first created in the year of Rome 311, upon the senate's observing, that the consuls were too much taken up with matters of war, to be at leisure for looking near enough into private affairs. The two first were Papirius and Sempronius: their authority extended over every person; and they had a right to reprehend the highest. At first they were taken out of the senate; but after the plebeians had got the consular open to them, they soon arrived at the *Censorship*: M. Rutilius was the first; who having been twice consul, and dictator, in the year 402 demanded the office of *Censor*.—The custom was, to elect two; the one of a patrician family, the other, a plebeian: and upon the death of either, the other was discharged from his office, and two new ones elected; but not till the next lustrum.—In the year 414, a law was made, appointing one of the *Censurs* to be always elected out of the plebeians; which held in force till the year 622; when both *Censurs* were chosen from among the people; after which time, it was shared between the senate and people.

This office was so considerable, that none aspired to it till they had passed all the rest: so that it was looked on as surprizing, that Crassus should be admitted *Censor*, without having been either consul or pretor.—The term of this office was at first established for five years; but that institution only lasted nine: Maenertinus the dictator, in the year 420, made a law, restraining the *Censure* to a year and an half; which was afterwards observed very strictly.

The business of the *Censurs*, was to register the effects, &c. of the Roman citizens; and to impose taxes, in proportion to what each person possessed. Cicero reduces their functions to the numbering of the people; the correction and reformation of manners; the estimating the effects of each citizen; the proportioning of taxes; the superintendance of tribute; the exclusion from the temples; and the care of the publick places. They had also a right, *senatu ejicere*, to expel from the senate such of the members as they judged unworthy of the dignity; as well as to break and cashier the knights who failed in their duty, by taking from them the publick horse, *equum adimere*.

The republic of Venice, has at this day a *Censor* of the manners of their people, whose office lasts six months.

CENSORS of books, are a body of doctors, or other officers, established in divers countries, to examine and give their judgment of all books, ere they go to the press; and to see they contain nothing contrary to the faith, and good manners.—In England we had formerly an officer of this kind, under the title of *Licensor of the press*; but since the revolution the press has been open.

M. Bayle compares authors soliciting the approbation of *Censurs*, or licensers, to the shades wandering on the banks of Styx, and waiting with impatience for a passage to the other shore. He applies to them these two verses of Virgil.

*Tententque manus, ripa ulterius amore:
Nasuta sed tristis munc hos munc accipit illos.*

At Paris, the *faculty of Theology* claim the privilege of *Censurs*, as granted to them by the pope; and it is certain they had been in possession of it for many ages: but in the year 1624, a new commission of four doctors were created, by letters patent, the sole public or royal *Censurs*, and examiners of all books; and answerable for every thing contained therein. The faculty, however still maintain their claim, by taking occasion, now and then, to give their approbations to books.

CENSURE, *CENSURA*, is popularly used for a judgment, whereby some book, person, or action, is blamed or condemned; more particularly for a reprimand made by a superior, or person in authority.

Ecclesiastical CENSURES, are the publick menaces which the church makes, or pains and penalties incurred by disobeying what she enjoins; or rather, the pains and punishments themselves; as interdiction, excommunication, &c.

Till the time of the reformation, the kings of England were subject to the *Censures* of the church of Rome; but the kings of France have always maintained themselves exempt from them. In effect, there is no instance of excommunication of any of their first race of kings, till Lotharius's excommunication by pope Nicholas I. for putting away his wife Tetberge; which is reckoned the first breach of the liberties of the Gallican church: yet the pope durst not hazard his excommunication on his own authority, but took care to have it confirmed by the assembly of the bishops of France; and the same precaution was afterwards observed by the other popes. But in after times the French kings asserted their rights to better purpose; for pope Benedict XIII. having *confused* Charles VI. laid the nation under an interdict:

upon which the parliament of Paris, by an arret in 1408. ordered the bull to be torn; and Julius II. having excommunicated Louis XII. the assembly general at Tours *confused* the popes *Censures*.

The canonists distinguish two kinds of *Censures*; the one *de jure*, the other *de facto*, or by sentence.

CENSURE, is also a custom in several manors in Cornwall and Devon, whereby all the tenants above the age of sixteen, are called to swear fealty to the lord, to pay two-pence per poll, and a penny per annum, ever after, as cert-money, or common fine. See **CERT-MONEY**.

CENSUS, among the Romans, was an authentic declaration made by the several subjects of the empire, of their respective names, and places of abode, before proper magistrates, in the city of Rome, called *Censurs*; and in the provinces *Censitors*, by whom the same were registered.

This declaration was accompanied with a catalogue, or enumeration in writing, of all the estates, lands, and inheritances they possessed; their quantity, quality, place, wives, children, tenants, domesticks, slaves, &c.

The *Census* was instituted by king Servius; and was held every five years. It went through all the ranks of people, though under different names: that of the common people was called *Census*, or *Lustrum*; that of the knights *Census*, *Recensio*, *Recognitio*; that of the senators, *Levitas*, *Relevitia*.

Hence, also, **CENSUS** came to signify a person who had made such a declaration: in which sense it was opposed to *incensus*, a person who had not given in his estate or name to be registered.

In the Voconian law, **CENSUS** is also used for a man, whose estate, in the *Censur's* books, is valued at 100000 sesterces.

CENTAUR,* **CENTAURUS**, in astronomy, a part or moiety of a southern constellation, in form, half man, half horse, usually joined with the wolf.

* The word comes from the Greek *κενταυρος*; formed of *κενταυρος*, *κενταυρος*, bull, q. d. Bull-pricker.

CENTAURUS cum Lupo, **CENTAUR** with the *Wolf*, in astronomy, a constellation of the southern hemisphere; whose stars, in Ptolemy's catalogue, are nineteen; in Tycho's four; in the Britanic catalogue, thirteen. The order, names, longitudes, latitudes, magnitudes, &c. whereof, are as follow:

Names and Situations of the Stars.	Longitude.		Latitude.		Magnitude.
	°	'	°	'	
Inform. before the head	25	42	21	33	5
Preced. in the head of the Centaur	2	22	1	20	3
South. in the head.	3	41	36	21	34
Middle	3	25	20	2	20
Subseq. and north. in the head	3	26	53	18	56
In hind shoulder of the Centaur	8	0	18	21	59
South. of 2 in anterior foot of wolf	20	21	34	12	57
Subseq. and north. of the same	20	39	49	11	28
Preced. of cent. before neck of lupus	23	10	26	17	6
Subsequent	23	37	3	17	37
Preced. of 2 in the wolf's nose	26	21	24	14	25
Contiguous to that	27	2	37	14	34
Subseq. in the nose	28	50	10	13	7

CENTAURY the Lesser, **CENTURIUM Minus**, is a small and low plant, with leaves growing by pairs, and a flower consisting of a purple petal, cut into five segments, and a tubulous calyx divided in like manner.—Its leaves are esteemed a good bitter, and very serviceable to the stomach, either in the compositions of that kind, or *per se*, in decoction or infusion, which is best made in wine. It dissolves and absterges viscid humours; is good against worms, and by some also is extolled as an Alexipharmic, Febrifuge, &c.

CENTER, or **CENTRE**,* in a general sense, denotes a point equally remote from the extremes of a line, figure, or body; or the middle of a line, or plane, by which a figure or body is divided into two equal parts.

* The word is Greek, *κεντρος*, which primarily signifies a point; being formed from the verb *κεντραω*, *pingere*, to prick.

CENTER of a Bastion, is a point in the middle of the gorge of the Bastion, whence the capital line commences; and which is ordinarily at the angle of the inner polygon of the figure. See **BASTION**, &c.

CENTER of a Battalion, the middle of a battalion; where is usually left a large square space, for lodging the cloaths and baggage.

CENTER of a Circle, is a point in the middle of a circle, or circular figure, from which all lines drawn to the circumference are equal.

Euclid demonstrates, that the angle at the *Center* is double to that at the circumference; *i. e.* the angle made by two lines drawn from the extremes of an arch to the *Center*, is double that made by two lines drawn from those extremes to a point in the circumference.

CENTER of a Conic Section, is the point wherein all the diameters concur.

This point, in the ellipsis, is within the figure; and, in the hyperbola, without.

CENTER of a Curve, of the higher kind, is the point where two diameters concur.

Where all the diameters concur in the same point, Sir Isaac Newton calls it, the *general Center*.

CENTER of a Dial, is that point where its gnomon or stile, which is placed parallel to the axis of the earth, intersects the plane of the dial; and from thence, in those dials which have *Centers*, all the hour-lines are drawn. If the plane of the dial be parallel to the axis of the earth, it can have no *Center* at all; but all the hour-lines will be parallel to the stile, and to one another.

CENTER of an Ellipsis, is that point where the two diameters, the transverse and the conjugate, intersect each other.

CENTER of Gravitation, or *Attraction*, in physics, is that point to which a revolving planet, or comet, is impelled, or attracted by the force or impetus of gravity.

CENTER of Gravity, in mechanics, is a point within a body, through which if a plane pass, the segments on each side will be equal, and equi-ponderate, i. e. neither of them can move the other.

Hence, if the descent of the *Center of gravity* be prevented, or if the body be suspended by its *Center of gravity*, it will continue at rest.

The whole gravity of a body may be conceived united in its *Center*; and therefore, in demonstrations, it is usual for the body to substitute the *Center*.

Through the *Center of gravity* passes a right line, called the *Diameter of Gravity*: the intersection, therefore, of two such diameters determines the *Center*.

The plane whereon the *Center of gravity* is placed, is called the *Plane of Gravity*: so that the common intersection of two such planes determines the diameter of gravity.

In homogenous bodies, which may be divided lengthwise into similar and equal parts, the *Center of gravity* is the same with the *Center of magnitude*. If, therefore, a line be bisected, the point of section will be the *Center of gravity*.

Common CENTER of gravity of two bodies, is a point so situated, in the right line joining the *Centers* of the two bodies, as that, if the point be suspended, the two bodies will equiponderate, and rest in any situation.—Thus, the point of suspension in a common balance, or in a Roman stilyard, where the two weights equiponderate, is the common *Center of gravity* of the two weights.

Laws of the CENTER of gravity.—1. If the *Centers of gravity* of two bodies A and B, (Tab. *Mechan.* fig. 13. n^o. 2.) be joined by the right line AB, the distances BC and CA of the common *Center of gravity C*, from the particular *Centers of gravity B* and *A*, are reciprocally as the weights A and B: see this demonstrated under *BALANCE*.

Hence, if the gravities of the Bodies A and B be equal, the common *Center of gravity C*, will be in the middle of the right line AB. Again, since A : B :: BC : AC; it follows that A . AC : B . BC; whence it appears, that the powers of equi-ponderating bodies are to be estimated by the factum of the mass, multiplied into the distance from the *Center of gravity*; which factum is usually called the *Momentum* of the weights.

Further, since A . B :: B C . AC, A + B . A :: B C + AC . BC. The common *Center of gravity*, therefore C, of two bodies, will be found, if the factum of one weight A, into the distance of the separate *Centers of gravity* A B, be divided by the sum of the weights A and B. Suppose, v. g. A = 12, B = 4, A B = 24; therefore, B C = 24 . 12 : 16 = 18. If the weight A be given, and the distance of the particular *Centers of gravity* A B, together with the common *Center of gravity* C; the weight of B will be found = to A . A C : B C; that is, dividing the moment of the given weight, by the distance of the weight required from the common center of gravity. Suppose, A = 12, B C = 18, A C = 6; then B = 6, 12 : 18 = 12 : 3 = 4.

2. To determine the common *Center of gravity* of several given bodies a, b, c, d, (fig. 13.) in the right line A B. Find the common *Center of gravity* of the two bodies a and b, which suppose in F; conceive a weight a + b applied in F; and in the line F E, find the common *Center of gravity* of the weights a + b and c; which suppose in G. Lastly, in B G, suppose a weight a + b + c applied, equal to the two a + b and c; and find the common *Center of gravity* between this and the weight d, which suppose in H; this H will be the common *Center of gravity* of the bodies a, b, c, d. And in the same manner might the common *Center of gravity* of any greater number of bodies be found.

3. Two weights D and E, (fig. 14.) being suspended without their common *Center of gravity* in C, to determine which of them preponderates, and how much. Multiply each into its distance from the *Center of suspension*; that side on which the factum is greatest, will preponderate; and the difference between the two, will be the quantity wherewith it preponderates. Hence, the moments of the weights D and E, suspended without the *Center of gravity*, are in a ratio compounded of the

weights D and E, and the distances from the point of suspension: Hence also the momentum of a weight suspended in the very point C, will have no effect at all in respect of the rest D E.

4. To determine the preponderation where several bodies a, b, c, d, (fig. 15.) are suspended without the common *Center of gravity* in C. Multiply the weights c and d into their distances from the point of suspension C E and E B; the sum will be the momentum of their weights, or their ponderation towards the right: then multiply the weights a and b into their distances, A C and C D, the sum will be the ponderation towards the left: subtracting therefore, the one from the other, the remainder will be the preponderation required.

5. Any number of weights, a, b, c, d, being suspended without the common *Center of gravity* in C, and preponderating towards the right; to determine the point F, from whence the sum of all the weights being suspended, the ponderation shall continue the same as in their former situation.

Find the momentum wherewith the weights c and d preponderate towards the right; since the momentum of the sum of the weights to be suspended in F, is to be equal to it, the momentum now found, will be the factum of C F into the sum of the weights: this, therefore, being divided by the sum of the weights, the quotient will be the distance C F, at which the sum of the weights is to be suspended, that the preponderation may continue the same as before.

6. To find the *Center of gravity* in a parallelogram and parallelepiped. Draw the diagonals A D and E G, (Fig. 16.) likewise C B and H F; since each diagonal, A D and C B, divides the parallelogram ACDB into two equal parts, each passes through the *Center of gravity*; consequently, the point of intersection I, must be the *Center of gravity* of the parallelogram. In like manner, since both the plane CBFH and ADGE, divide the parallelepiped into two equal parts, each passes through its *Center of gravity*; so that the common intersection I K, is the diameter of gravity, the middle whereof is the *Center*.

After the same manner may the *Center of gravity* be found in prisms and cylinders; it being the middle point of the right line that joins the *Centers of gravity* of their opposite bases.

7. In regular polygons, the *Center of gravity* is the same with the *Center of the circumscribed parallelogram*.

8. To find the *Center of gravity* of a cone and a pyramid. The *Center of gravity* of a cone, is in its axis A C, (Fig. 17.) If then A P = x, P p = d x, the weight in the same cone is p r x . d x . 2 a²; and therefore its momentum p r x² . d x . 2 a². Hence the sum of the momenta p r x² . 8 a²; which divided by the sum of the weights p r x² . 6 a², gives the distance of the *Center of gravity* of the portion AMN, from the vertex A = 6 a² . p r x² : 8 a² . p r x² = 3/4 x = 3/4 A P; wherefore, the *Center of gravity* of the entire cone, is distant from the vertex, 3/8 of A C. And in the same manner is found the distance of the *Center of gravity* from the vertex of the pyramid 3/4 A C.

9. To determine the *Center of gravity* in a triangle B A C (Fig. 18.) Draw the right line A D, bisecting the base BC in D; since Δ B A D = Δ D A C, each may be divided into the same number of little weights, applied in the same manner on each side to the common axis AD: so that the *Center of gravity* of the Δ B A C, will be in A D. To determine the precise point in that, let A D = a, B C = b, P = x, M N = y; then will A P : M N :: A D : B C

x : y :: a : b
Hence, y = b x : a. Draw A E = perpendicular to B C; then A D : A E :: A P : A Q; and therefore, A Q = e x : a, and Q q = e d x : a. Whence, the momentum y x d x = c b x² d x : a², and f y x d x = c b x² : 3 a²; which fun divided by the area of the triangle A M N = c b x² : 2 a²; gives the distance of the *Center of gravity* from the vertex = 2 a b x² : 3 a b x² = 2/3 x. If then for x, be substituted a, the distance of the *Center of gravity* of the Δ, from the vertex, will be found 2/3 a.

10. For the *Center of gravity* in a parabola, (Fig. 19.) Its distance from the vertex A, is found the space A F. In a cubical paraboloid, the distance of the *Center* from the vertex, is 3/4 A P. In a biquadratic paraboloid, 5/8 A P. In a surdsolid paraboloid, 7/8 A P. In the exterior parabola A S T, the *Center of gravity* is at the distance A L. In the cubical paraboloid, 3/4 A Q. In a biquadratic paraboloid, 5/8 A Q. In a surdsolid paraboloid, 7/8 A Q.

11. The *Center of gravity* in the arch of a circle, is distant from the *Center of the arch* by a line, which is a third proportional to the quadrant and the radius.—In a sector of a circle, the distance of the *Center of gravity* from the *Center of the circle*, is to the distance of the *Center of gravity* of the arch, as two to three.

For the *Center of gravity* of segments, lines, parabolic conoids, spheroids, truncated cones, &c. as being cases more operose, and at the same time more out of the way; we refer to Wolfius and others.

12. To determine the *Center of gravity* in any body mechanically. Lay the given body H I, (fig. 20.) on an extended rope, or on the edge of a triangular prism F G, bringing it this and that way, till the parts on either side are in Æquilibrio; the plane, whose side is K L, passes through the *Center of gravity*. Balance it again on the same, only changing its situation: then

will the cord or the side MN, pass through the *Center* of gravity; so that the intersection of the two lines MN and KL, determines the point O in the surface of the body required. The same may be done by laying the body on a horizontal table, (as near the edge as is possible, without its falling) in two positions, lengthwise and breadthwise: the common intersection of the two lines contiguous to the edge, will be its *Center* of gravity. Or, it may be done by placing the body on the point of a style, &c. till it rest in acquilibrium. It was by this method, Borelli found the *Center* of gravity in an human body, to be between the nates and pubis; so that the whole gravity of the body is there collected, where nature has placed the genitals: An instance of the wisdom of the creator, in placing the membrum virile in that place, which of all others is the most convenient for the affair of copulation.

13. "Every figure, whether superficial or solid, generated by the motion of a line, or figure, is equal to the factum of the generating magnitude, multiplied into the way of its *Center* of gravity, or the line its *Center* of gravity describes." See the demonstration hereof, under the article CENTRO BARYC Method.

The preceding elegant theorem is looked on as one of the noblest geometrical discoveries made in the last age; and is the foundation of the methodus centro-baryca. Pappus, indeed, gave the first hint long ago; but it was the jesuit Guldinus that brought it to maturity. Leibnitz shews it will hold, if the axis, or *Center*, be continually changed during the generating motion: The corollaries are too numerous to be here detailed.

CENTER of an Hyperbola, is a point in the middle of the determinate or transverse axis.

CENTER of Motion, is a point round which one or more heavy bodies, that have one common *Center* of gravity, revolve; *v. gr.* If the weights P and Q (Tab. *Mechanics*, fig. 21.) revolve about the point N, so as when P descends, Q ascends, N is said to be the *Center* of motion.

It is demonstrated in mechanics, that the distance IN, of the *Center* of gravity of any particular weight, from the common *Center* of gravity, or the *Center* of motion N, is perpendicular to the line of direction I p.

CENTER of Oscillation, a point wherein, if the whole gravity of a compound pendulum be collected, the several oscillations will be performed in the same time as before.

Hence, its distance from the point of suspension, is equal to the length of a simple pendulum, whose oscillations are isochronal with those of the compound one.

Laws of the CENTER of Oscillation. 1. If several weights DFHB, (Tab. *Mechanics*, fig. 22.) whose gravity is supposed collected in the points DFHB, constantly retain the same distance between themselves and the point of suspension A; and the pendulum thus compounded, performs its oscillations about A; the distance of the *Center* of oscillation O, from the point of suspension OA, will be had by multiplying the several weights into the squares of the distances, and dividing the aggregate by the sum of the momenta of their weight.

2. To determine the *Center* of oscillation in a right line AB, (fig. 23.) Let AB = a, AD = x, then will the infinitely small particle DP = dx, be the momentum of its weight x dx; consequently the distance of the *Center* of oscillation in the part AD, from the point of suspension A = ∫ x dx : ∫ x dx = 1/2 x² : 1/2 x = 1/3 x. If then for x be substituted a, the distance of the *Center* of oscillation in the right line AB = 1/3 a. In this manner is found the *Center* of oscillation of a wire, oscillating about one of its extremities.

3. To determine the *Center* of oscillation of the rectangle RIHS, (fig. 19.) suspended in the middle point A, of the side RI, and oscillating about its axis RI. Let RI = SH = a, AP = x; then will Pp = dx, and the element of the area; consequently one weight = a dx, and its momentum a x dx. Wherefore, ∫ a x dx : ∫ a dx = 1/2 a x² : 1/2 a x = 1/3 x, indefinitely expresses the distance of the *Center* of oscillation, from the axis of oscillation in the segment RCDI. If then for x be substituted the altitude of the whole rectangle R = b, we shall have the distance of the *Center* of oscillation from the axis = 1/3 b.

For the *Center* of oscillation in an equilateral triangle, ASH, oscillating about its axis RI, parallel to its base SH; its distance from the vertex A, is found = 2/3 of AE the altitude of the triangle. Of an equilateral triangle SAH oscillating about its base SH, its distance from the vertex A is found = 1/3 AE the altitude of the triangle.

For the *Center* of oscillation in an equilateral triangle SAH, suspended by an inflexible thread void of gravity, AB, and oscillating about its axis parallel to its base SH; its distance from the vertex, is found = 1/3 the altitude of the triangle.

For the *Centers* of oscillation of parabolas, and curves of the like kind, oscillating about their axis, parallel to their bases, they are found to be as follows.

In the Apollonian parabola, the distance of the *Center* from the axis, = 2/5 A E.

In a Cubical paraboloid, the distance of the *Center* of oscillation from the axis = 7/8 A E.

In a Biquadratic paraboloid, the distance of the *Center* from the axis, = 5/7 A E.

In solid and plane figures agitated laterally, *i. e.* about the axis

of oscillation, perpendicular to the plane of the figure, the investigation of the *Center* of oscillation is somewhat difficult; in regard all the parts of the weight, by reason of their unequal distance from the point of suspension, do not move with the same velocity; as is shewn by Huygens, in his *Horol. Oscill.* He found, in this case, the distance of the *Center* of oscillation, from the axis in a circle, to be 2/3 of the diameter: in a rectangle, suspended by one of its angles, 2/3 of the diagonal: in a parabola, suspended by its vertex, 2/3 of its axis, and 2/5 of the parameter; suspended from a point in the middle of the base, 2/3 of the axis, and 2/5 the parameter; in the factor of a circle, 2/3 of a right line which is to the radius as the arch to the subtense: in a cone, 2/3 of the axis, and 1/2 of the third proportional to the axis, and a semi-diameter of the base: in a sphere, suspended from a point in the surface, 2/3 of the diameter: in the same, suspended from a point without the sphere, (as is usually the case in pendulums) 2/3 of a third proportional to two quantities composed of the semi-diameter and length of the thread, and the semi-diameter itself: in a cylinder, 2/3 of the altitude, and 1/2 a right line, which is to the semi-diameter of the base, as that is to the altitude.

CENTER of Percussion, in a moving body, is that point wherein the percussion is the greatest, wherein the whole percussive force of the body is supposed to be collected: or about which the impetus of the parts is balanced on every side. See PERCUSSION.

Laws of the CENTER of Percussion. — 1. The *Center* of Percussion is the same with the *Center* of Oscillation, where the percussive body revolves round a fixed point; and is determined in the same manner, *viz.* by considering the impetus of the parts, as if many weights applied to an inflexible right line, void of gravity; *i. e.* by dividing the sum of the factums of the impetus's of the parts, multiplied by their distances from the point of suspension, by the sum of the impetus's. What, therefore, has been above shewn of the *Center* of Oscillation, will hold of the *Center* of Percussion, where the percussive body moves round a fixed point. See *CENTER* of Oscillation.

2. The *Center* of Percussion is the same with the *Center* of Gravity, if all the parts of the percussive body be carried with a parallel motion, or with the same celerity: for the momenta are the facta of the weights into the celerities. Wherefore, to multiply equiponderating bodies by the same velocity, is the same thing as to take equal-multiples; but the equal-multiples of equiponderating bodies, themselves equiponderate; therefore, equivalent momenta are disposed about the *Center* of gravity: consequently the *Center* of percussion in this case, coincides with that of gravity; and what is shewn of the one, will hold of the other.

CENTER of Conversion, in mechanics, a term first used by M. Parent. Its signification is thus conceived: if a stick be laid on a stagnant water, and drawn by a thread fastened to it, so that the thread always makes the same angle with the stick; always, *v. g.* a right angle; the stick will be found to turn on one of its points, which will be immovable; and which point is termed the *Center* of Conversion. For the greater ease, the thread may be conceived fastened to one end of the stick.

This effect arises from the resistance of the fluid, and the manner wherein it divides: for, imagine the first moment of traction; it is certain, here, the resistance of the parts of the fluid to be displaced, tends to turn the stick around the point to which the thread is fastened, as on a *Center*: so that in the present instance, the staff would describe precisely the quadrant of a circle: after which, the fluid would no longer bear the stick lengthwise; but in a particular motion, in such manner, as that the free end of the stick, and the parts nearest it, would describe larger arches of circles than the rest, and have a greater velocity. The resistance therefore of the fluid, which tends to impress a circular motion on the stick, around the point to which the thread is fastened, tends to impress a greater velocity on the parts next the other extremity; or, which is the same thing, those parts require a greater velocity to surmount the resistance of the fluid: so that the stick will not have that circular motion around the point to which the thread is fastened; or, the resistance of the fluid is greater towards the free extreme of the stick, and still lessens towards the other extreme. Now, all the columns, or threads of water, which resist the stick, must be supposed of the same length, or the same mass. One may therefore find on the stick such a point, as that taking a great number of those threads on that side which resists the least, and a less number on that side where they resist the most; there will be an exact compensation, and the forces be equal on each side: it is this point is the *Center* of Conversion. And as the same reasoning has place in all motions of traction made in the same manner, this *Center* is always the same point.

The grand question here arising, is to know precisely in what point the *Center* of conversion is found: this M. Parent has determined by an infinite deal of calculation. If the stick drawn by one extremity be a straight line divided into twenty parts, reckoning from the thread, the *Center* of conversion, he finds, will be nearly on the 13th. If it be not a line, but a surface or a solid, there will be some change in the situation of the *Center* of conversion, according to the surface or the solid.

If in lieu of a body swimming in a fluid, we suppose it laid on a rough uneven plane; the resistance of this plane to the motion of the body, will always be divided in the same manner, and determine the same *Center* of conversion. This resistance is, precisely, what we call *friction*, so prejudicial to the effects of machines.

CENTER of a *Parallelogram*, or *Polygon*, the point wherein its diagonals intersect.

CENTER of a *Sphere*, is a point from which all the lines drawn to the surface, are equal.

The *Center* of the *Semicircle*, by whose revolution the sphere is generated, is also that of the sphere.

Hermes Trismegistus defines God an intellectual sphere, whose *Center* is every where, and circumference no where.

CENTO,* in poetry, a work wholly composed of verses, or passages promiscuously taken from other authors; only disposed in a new form, or order: so as to compose a new work, and make a new meaning.

* The word is Latin, *Cento*, which primarily signifies a cloak made of patches; and that from the Greek *κενταυρος*: the Roman soldiers used these *Centos*, or pieces of old stuff patched over each other, to guard themselves from the strokes of their enemies. Though others say, that *Centos* were properly the patches of leather, &c. wherewith their galleries or screens, called *Vinea*, were covered; under which the besiegers made their approaches towards any place.

Ausonius has laid down the rules to be observed in composing *Centos*. The pieces, he says, may be taken either from the same poet, or from several; and the verses may be either taken entire, or divided into two; one half to be connected with another half taken elsewhere: but two verses are never to be taken running, nor is much less than half a verse to be taken. Agreeably to these rules, he has made a pleasant nuptial *Cento* from Virgil.

Proba Falconia has wrote the life of Jesus Christ, in *Cento's* taken from Virgil: the like is done by Alex. Ross, in his *Christiades*; and by Stephen de Pleurre, canon regular of St. Victor at Paris; an instance of whose *Cento's* on the adoration of the Magi, is as follows.

Adoratio Magorum, Matt. 2.

6, Æ. 255. Ecce autem primi sub lumina solis, Et ortus,
2, Æ. 694. Stella facem ducens multa cum luce cucurrit:
5, Æ. 526. Signavitque Fiam* cœli in regione serena. 8, Æ. 528.
3, Æ. 700. Tum Reges* (credo quia fit divinitus illis) 1, G. 415.
1, G. 416. Ingenium, Et rerum fato prudentia major
11, Æ. 98. Extenti videntur* que cuique est copia leti 5, Æ. 100.
7, Æ. 333. Munera portantes* molles sua thura Sabæ, 1, G. 57
3, Æ. 464. Dona debine auro gravia,* myrraque marentem. 12, Æ. 100.
9, Æ. 659. Agnovere Deum Regem,* Regunque Paventem. 6, Æ. 548.
1, G. 418. Mutare vias,* perficere ordine votis: 10, Æ. 548.
6, Æ. 116. Insuper per iter,* spolia in sua quisque recepit. 12, Æ. 126.

CENTRAL, something relating to a *Center*. See **CENTER**. Thus, we say, *Central Eclipse*, *Central Fire*, *Central Forces*, *Central Rule*, &c.

CENTRAL Forces, the vires, or powers whereby a moving body either tends towards the center of motion, or recedes from it. *Central Forces* are divided into two kinds, with regard to their different relations to the center, viz. the *Centripetal*, and the *Centrifugal*.

Laws of CENTRAL Forces. 1. The following rule, for which we are obliged to the Marquis de l'Hôpital, opens at once all the mysteries of *Central Forces*: suppose a body of any determinate weight to move uniformly round a center with any certain velocity; find from what height it must have fallen to acquire that velocity: then, as the radius of the circle it describes is to double that height, so is its weight to its centrifugal force. Hence, it is easy to infer, that,

2. If two bodies, equal in weight, describe peripheries of unequal circles in equal times, their *Central Forces* are as their diameters AB, and HL. (Tab. *Mechanicks*, fig. 25.) And hence, if the *Central Forces* of two bodies, describing peripheries of two unequal circles, be as their diameters, they pass over the same in equal times.

3. The *Central Force* of a body moving in the periphery of a circle, is as the square of the infinitely small arch AE, divided by the diameter AB. Since then a body, by an equable motion, in equal times describes equal arches AE; the *Central Force* wherewith the body is impelled in the periphery of the circle, is constantly the same.

4. If two bodies describe different peripheries by an equable motion, their *Central Forces* are in a ratio, compounded of the duplicate ratio of their celerities, and the reciprocal one of their diameters. Hence, if the celerities be equal, the *Central forces* will be reciprocally as their diameters; and if the diameters AB and HL be equal, i. e. if each moveable proceed in the same periphery, but with unequal celerities, the *Central forces* will be in a duplicate ratio of the velocities.

If the *Central forces* of the two bodies moving in different peripheries be equal, the diameters of the circles AB, and HL, will be in a duplicate ratio of the celerities.

5. If two bodies, moving in unequal peripheries, be acted on by the same *Central force*, the time in the larger is to that in the smaller, in a subduplicate ratio of the greater diameter AB, to the less HL; wherefore, $T^2::D:d$, that is, the diameters of the circles in whose peripheries those bodies are acted on by the same *Central force*, are in a duplicate ratio of the times. Hence also the times wherein similar peripheries or arches are run over by bodies impelled by the same *Central force*, are in proportion to their velocities.

The *Central forces* are in a ratio, compounded of the direct ratio of the diameters, and the reciprocal one of the squares of the times, by the entire peripheries.

6. If the times wherein the bodies are carried through the same entire peripheries, or similar arches, be as the diameters of the circles, the *Central forces* are reciprocally as the same diameters.

7. If a body move uniformly in the periphery of a circle, with the velocity it acquires by falling the height AL; the *Central force* will be to the gravity, as double the altitude AL, to the radius CA.—If therefore the gravity of the body be called G, the centrifugal force will be $2AL.G:CA$.

8. If a heavy body move equably in the periphery of a circle, and with the velocity which it acquires by falling the height AL, equal to half the radius; the *Central force* will be equal to the gravity.—And again, if the *Central force* be equal to the gravity, it moves in the periphery of the circle, with the same gravity which it acquires in falling a height equal to half the radius.

9. If the *Central Force* be equal to the gravity, the time it takes up in the entire periphery, is to the time of its fall through half the radius, as the periphery to the radius.

10. If two bodies move in unequal peripheries, and with an unequal velocity, the which is reciprocally in a subduplicate ratio of the diameters; the *Central forces* are in a duplicate ratio of the distances from the center of the forces, taken reciprocally.

11. If two bodies move in unequal peripheries, with celerities which are reciprocally as the diameters; their *Central forces* will be reciprocally as the cubes of their distances from the center of their forces.

12. If the velocities of two bodies moving in unequal peripheries, be reciprocally in a subduplicate ratio of the diameters; the times wherein they pass the whole periphery, or similar arches, are reciprocally in a triplicate ratio of the distances from the center of the forces: wherefore, if the *Central forces* be reciprocally in a duplicate ratio of the distances from the center, the times wherein the entire peripheries, or similar arches, are passed over, are reciprocally in a triplicate ratio of the distances.

13. If a body move in a curve line, in such manner as that the radius CB, Fig. 25. n. 2. drawn from it to the fixed point C, placed in the same plane, describes areas BAC, BCE, &c. proportional to the times, or equal in any given time, it is sollicitated towards the point C, by a centripetal force.

14. If a body proceed according to the direction of the right line AD, and be sollicitated by a centripetal force towards a fixed point C, placed in the same plane; it describes a curve, whose cavity is towards C, and whose foveal area, comprehended between two radii AB and CB, are proportional to the times.

15. However the *Central forces* differ from one another, they may be compared together; for they are always in a ratio compounded of the ratio of the quantities of matter in the revolving bodies, and the ratio of the distances from the center; and also in an inverse ratio of the squares of the periodical times. If then you multiply the quantity of matter in each body by its distance from the center, and divide the product by the square of the periodical time, the quotients of the division will be to one another in the said compound ratio, that is, as the *Central forces*.

16. When the quantities of matter are equal, the distances themselves must be divided by the squares of the periodical times, to determine the proportion of the *Central forces*: in that case, if the squares of the periodical times be to one another, as the cubes of the distances, the quotients of the divisions, as well as the *Central forces*, will be in an inverse ratio of the squares of the distances.

17. When the force by which a body sollicitated towards a point is not every where the same, but is either increased or diminished, in proportion to the distance from the center; several curves will thence arise in a certain proportion. If the force decreases, in an inverse ratio of the squares of the distances from that point, the body will describe an ellipsis, which is an oval curve, in which there are two points called *Foci*, and the point towards which the force is directed falls upon one of them; so that in every revolution, the body once approaches to, and once recedes from it. The circle also belongs to that sort of curves, and so in that case the body may also describe a circle. The body may also (by supposing a greater celerity in it) describe the two remaining conic sections, viz. the parabola and hyperbola-curves, which do not return into themselves: on the contrary, if the force increases with the distance, and that in a ratio

ratio of the distance itself, the body will again describe an ellipse; but the point to which the force is directed is the center of the ellipse; and the body, in each revolution, will twice approach to, and again twice recede from that point. In this case also, a body may move in a circle, for the reason above-mentioned.

CENTRAL Rule, is a rule, or method discovered by our countryman, Thomas Baker, rector of Nympton in Devon, whereby to find the center of a circle designed to cut the parabola in as many points, as an equation to be constructed hath real roots.

Its principal use is in the construction of equations; and he has applied it with good success as far as biquadratics.

The *Central rule* is chiefly founded on this property of the parabola: that if a line be inscribed in that curve perpendicular to any diameter, a rectangle formed of the segments of the inscript is equal to a rectangle made of the intercepted diameter and parameter of the axis.

The *Central rule* has the advantage over Cartes's, and De Lattres's methods of constructing equations, in that both these latter are subject to the trouble of preparing the equation by taking away the second term. This we are freed from in Baker's method, which shews us how to construct all equations not exceeding the fourth power by the intersection of a circle and parabola, without the omission or change of any terms. See *Phil. Transf.* N^o. 157.

CENTRIFUGAL Force, is that whereby a body revolving round a center, endeavours to recede from it.

It is one of the established laws of nature, that all motion is of it self rectilinear; and that the moving body never recedes from its first right line, till some new impulse be superadded in a different direction: after that new impulse, the motion becomes compound, but it continues still rectilinear; though the direction of the line be altered. To move in a curve, it must receive a new impulse, and that in a different direction, every moment; a curve n it being reducible to right lines, unless infinitely small ones. If then a body continually drawn towards a center, be projected in a line that does not go thro' that center, it will describe a curve; in each point whereof, A (Tab. *Mechanicks*, fig. 25.) it will endeavour to recede from the curve, and proceed in the tangent AD: and, if nothing hindered, it would actually proceed; so as in the same time wherein it describes the arch AE, it would recede the length of the line DE, perpendicular to AD, by its *Centrifugal Force*. The *Centrifugal Force*, therefore, is as the right line DE, perpendicular to AD; supposing the arch AE infinitely small.

The effect of the *Centrifugal Force* is such, that a body, obliged to describe a circle, always describes the largest it possibly can: a greater circle being, as it were, less circular, and less distant from a right line than a small one. A body therefore suffers more violence, and exerts its *Centrifugal Force* more when it describes a little circle, than when a large one: that is, the *Centrifugal Force* is always proportional to the circumference of the curve in which the revolving body is carried round.

It is the same in other curves as in circles; for a curve, whatever it be, may be esteemed as composed of an infinity of arches of infinitely small circles, all described on different radii; so as that it is at those places where the curve has the greatest curvity, that the little arches are most circular: thus, in the same curve, the *Centrifugal Force* of the body that describes it, varies according to the several points wherein it is found.

CENTRIPETAL Force, is that power whereby a moveable body, impelled in the right line AG, (Fig. 25.) is perpetually drawn out of its rectilinear motion, and sollicit to proceed in a curve.

The *Centripetal Force*, therefore, is as the right line DE to AB; supposing the arch AE infinitely small. Hence, the *Centripetal* and *Centrifugal* forces are equal.

CENTRO-BARYC Method, in mechanics, is a method of measuring, or determining the quantity of a surface, or a solid, by considering it as formed by motion, and multiplying it into the way of its center of gravity.

The doctrine is comprised in the following theorem, with its corollaries.

Every figure, whether superficial or solid, generated by the motion of a line or a figure, is equal to the factum of the generating magnitude into the way of its center of gravity, or the line which its center of gravity describes.

Demonst. For suppose the weight of the whole generating magnitude collected in the center of gravity; the whole weight produced by its motion, will be equal to the factum of the weight moved, into the center of gravity. But when lines and figures are considered like homogeneous heavy bodies, their weights are as their bulks: and therefore, the weight moved is the generating magnitude; and the weight produced, that generated. The figure generated, therefore, is equal to the factum of the magnitude, into the way of its center of gravity. Q. E. D.

Corol. 1. Since a parallelogram ABCD, (Tab. *Mechanicks*, fig. 26.) is described, if the right line AB, proceed according to the direction of another AC, with a motion still parallel to itself; and the way of the center of gravity E, is equal to the

right line EF, perpendicular to CD, that is, to the altitude of the parallelogram; its area is equal to the factum of the base CD, or the describent line into the altitude EF.

Corol. 2. In the same manner it appears, that the solidity of all bodies described by a plane descending according to the direction of any right line AC, is had by multiplying the describing plane by the altitude.

Corol. 3. Since a circle is described, if the radius CL (Fig. 27.) revolve round a center C, and the center of gravity of the radius CL, be in the middle F; the way of the center of gravity is a periphery of a circle X, described by a subduple radius: consequently the area of the circle, is equal to the factum of the radius CL, into the periphery described by the subduple radius CF.

Corol. 4. If a rectangle ABCD, (Tab. *Mechanicks*, fig. 28.) revolve about its axis AD; the rectangle will describe a cylinder, and the side BC the superficies of a cylinder. But the center of gravity of the right line BC, is in the middle F; and the center of gravity of the generating plane in the middle G, of the right line EF. The way of this latter, therefore, is the periphery of a circle described by the radius EG; that of the former, the periphery of a circle described by the radius EF. Wherefore, the superficies of the cylinder is the factum of the altitude BC, into the periphery of a circle described by the radius EF, or the base. And the solidity of the cylinder, is the factum of the generating rectangle ABCD, into the periphery of a circle described by the radius EG, which is subduple of EF, or of the semidiameter of the cylinder.

Suppose, *v. gr.* the altitude of the describing plane, and therefore of the cylinder BC = a; the semidiameter of the base DC = r; then will EG = $\frac{1}{2}r$; and supposing the ratio of the semidiameter to the periphery = 1 : m, the periphery described by the radius $\frac{1}{2}r$ = $\frac{1}{2}mr$. Therefore, multiplying $\frac{1}{2}mr$ by the area of the rectangle AC = ar; the solidity of the cylinder will be = $\frac{1}{2}mar$. But $\frac{1}{2}mar$ = $\frac{1}{2}r.mr.a$ the area of the circle described by the radius $\frac{1}{2}r$. It is evident, therefore, the cylinder is equal to the factum of the base into the altitude.

Corol. 5. In like manner, since the center of gravity of the right line AB, (Tab. *Mechanicks*, fig. 17.) is in the middle M, and the surface of a cone is described, if the triangle ABC revolve about its axis; if PM = $\frac{1}{3}C$; the superficies of the cone will be equal to the factum of its side AB, into the periphery described by the radius PM, or the subduple of the semidiameter of the base BC.

Suppose, *v. gr.* BC = r, AB = a; the ratio of the radius to the periphery 1 : m; then will PM = $\frac{1}{3}r$, and the periphery described by this radius = $\frac{1}{3}mr$. Therefore, multiplying $\frac{1}{3}mr$ into the side of the cone AB, the product is the superficies of $\frac{1}{3}amr$. But $\frac{1}{3}amr$ is also the factum of $\frac{1}{3}a$ and mr ; therefore, the surface of the cone is the product of the periphery, into half the side.

Corol. 6. If the triangle ACB, (Tab. *Mechanicks*, fig. 29.) revolve about an axis, it describes a cone; but if CB be bisected in D, and the right line AD be drawn, and AO = $\frac{2}{3}AD$; the center of gravity will be in O. The solidity of the cone, therefore, is equal to the factum of the triangle CAB, into the periphery described by the radius PO; but AD : AO :: BD : OP; and AO = $\frac{2}{3}AD$, and DB = $\frac{1}{3}CB$. Therefore, OP = $\frac{1}{3}BD$ = $\frac{1}{6}CB$.

Suppose, *v. gr.* BC = r, AB = a; the ratio of the radius to the periphery 1 : m. Then will OP = $\frac{1}{6}r$ the periphery described by this radius = $\frac{1}{6}mr$; the triangle ACB = $\frac{1}{2}ar$; and therefore, the solidity of the cone = $\frac{1}{6}mr \cdot \frac{1}{2}ar$ = $\frac{1}{12}amr^2$. But $\frac{1}{12}amr^2$ = $\frac{1}{6}r.mr \cdot \frac{1}{2}a$. Or, the factum of the base of the cone into the third part of the altitude. See TRIANGLE.

This elegant theorem, which may be ranked among the chief inventions in geometry of the last age, was taken notice of long ago by Pappus; but the jesuit Guldinus was the first who fet it in its full light, and exhibited its use in a variety of examples. Several other geometers, after Guldinus and Pappus, have also used it in measuring solids, and surfaces generated by a rotation round a fixed axis; especially before the late invention of the integral calculus: and it may still take place in some cases, where the integral calculus would be more difficult. M. Leibnitz has observed, that the method will hold, though the axis or center be continually changed during the generative motion.

CENTRUM, in geometry, mechanics, &c. See CENTER.

CENTRUM Phonicum, in acoustics, is the place where the speaker stands in polysyllabic and articulate echoes.

CENTRUM Phonicumpticum, is the place, or object that returns the voice in an echo.

CENTRUM Tendinum, in anatomy, a point, or center, wherein the tails of the muscles of the diaphragm meet.

This center is perforated towards the right side, for the vena cava; towards the left, backward: Its fleshy part gives way to the gula. The descending trunk of the great artery, thoracic duct, and vena azygos, pass between its two inferior processes. See DIAPHRAGM.

C E P

CENTRY Box, a wooden cell, or lodge, made to shelter the centinel, or sentry, from the injuries of the weather.

In a fortification, such lodges are usually placed on the flanked angles of the bastions, on those of the shoulder, and sometimes in the middle of the curtain.

CENTUMVIRATE, among the Romans, a court composed of one hundred magistrates, or judges, appointed to decide private differences between the people.

CENTURION, **CENTURIO**, among the Romans, an officer in the infantry, who commanded a *Century*, or an hundred men.

The first *Centurion* of the first cohort of each legion, was called *Primipilus*, *Primipilus*, or *Primipili Centurio*, sometimes *Primus Centurio*: he was not under the command of any tribune, as all the rest were; and had four *Centuries* under his direction. He guarded the standard, and the eagle of the legion.

CENTURY, a thing divided, or ranged into an hundred parts. At the time when the Roman people were assembled for creating of magistrates, establishing of laws, or deliberating of publick affairs, they were divided into *Centuries*; and to the end their suffrages might be more easily collected, they voted by *Centuries*: this was done in the *campus martius*; and these assemblies were hence called *Comitia Centuriata*.

The Roman cohorts were distributed into decuries, commanded by decurions; and *Centuries* by centurions. Each cohort consisted of six *Centuries*, and a legion of sixty. See **COHORT**.

CENTURY, in chronology, is the space of one hundred years. Church history is computed chiefly by *Centuries*, commencing from our Saviour's incarnation.

In this sense, we say, the first *Century*; the fathers of the second *Century*; the councils of the third *Century*, &c.

CENTURIES of Magdeburg, a celebrated ecclesiastical history, divided into thirteen *Centuries*, containing thirteen hundred years, ending at 1298; compiled by several learned protestants of Magdeburg.

The chief of the *Centuriators*, was Matthias Flacius Illyricus. It is said that Baronius undertook his annals, purely to oppose the *Magdeburg Centuriators*.

CEPHALÆA. See **CEPHALALGIA**.

CEPHALIC*, in medicine, is applied to anything belonging to the head, or its parts. See **HEAD**.

* The word is Greek κεφαλικος, formed of κεφαλη, caput, head.

CEPHALICS, or **CEPHALIC Medicines**, are such as are proper for disorders of the head.

These are generally of a volatile, spirituous, or aromatic nature, or at least they are joined with such; and are supposed to be of service, by the volatility of their particles insinuating into the nerves, and mixing with the animal spirits directly, as well as by the common circulation. Fixed bodies can only become *Cephalic* by accident.

Thus, spirit of lavender is supposed directly to act upon the nerves of the palate, &c. upon which account, it is frequently taken dropped on sugar, or bread: and fat volatile, by smelling to, is supposed to be assiduous to the head, by its volatile particles entering the olfactory nerves. As to aromatic *Cephalics*, as the species of diambra, powder de gutteta, nutmegs, &c. they act chiefly by their aromatic parts warming the nervous system, and increasing their vibrations, by which the nervous fluid circulates more freely.

CEPHALIC Vein, in anatomy, is a vein of the arm between the skin and the muscles, divided into two branches, *External* and *Internal*. The external goes down to the wrist, where it joins the basilica, and turns up to the back of the hand: the internal branch, together with a sprig of the basilica, makes the mediana.—See *Tab. Anat. (angeiol.) fig. 6. lit. n.*

It is thus called, in regard the antients used to open it in disorders of the head; from a mistaken notion that it had a nearer concern with the head than any of the other veins.

CEPHALALGIA, in medicine, is understood, in the general, of any head-ach; but properly signifies, only a fresh one.—When it becomes inveterate, it is called *Cephalæa*; and, when it only possesses half the head, *Hemicephala*.

CEPHALOPHARYNGÆI, in anatomy, two muscles of the orifice of the œsophagus called the *Pharynx*.

They have their origin in the articulation of the head with the first vertebra, and are inserted into the upper part of the pharynx; they serve to draw it upwards and backwards.

CEPHEUS, in astronomy, a constellation of the northern hemisphere; whose stars in Ptolemy's catalogue are thirteen; in Tycho's eleven; in Hevelius's forty; in the Britanic catalogue thirty-five. The order, names, longitudes, latitudes, magnitudes, &c. whereof, are as follow.

C E R

Names and Situations of the Stars.	Signs	Longitude	Latitude.	Magnit.
In the preced. foot	♌ 0 1 11	0 1 11	0 1 11	4 5
In the preced. arm	♌ 28 50 35	75 27 46		4 5
In the bend of the preced. arm	♌ 0 39 5	73 56 57		4 5
	♌ 0 14 30	71 45 45		4 5
	♌ 14 58 25	74 5 20		4 5
In the preced. shoulder	♌ 8 31 3	68 56 8		3
5				
		14 18 55	69 59 15	6
		20 30 19	70 2 57	6
		1 18 35	71 8 15	3
		10 42 11	66 47 28	6
In the girdle, against the preced. side	♌ 10 5 8	65 29 2		5
10				
	♌ 4 14 37	70 15 33		5
	♌ 9 35 24	65 2 27		7
	♌ 7 16 41	70 22 40		6
	♌ 4 7 6	61 39 14		6
That preced. the tiara	♌ 7 41 48	64 52 51		6
15				
In Cepheus's neck	♌ 10 58 16	62 54 22		7
	♌ 10 27 45	69 22 27		5 6
In the breast	♌ 19 55 16	65 45 41		5
	♌ 15 33 22	64 18 27		6
	♌ 16 29 2	64 36 41		6
20				
Middle of 3 in the tiara	♌ 9 40 7	61 9 27		4 5
North. and small. of the same	♌ 11 41 33	61 54 23		6
South in the tiara	♌ 8 42 5	59 58 31		4
	♌ 8 40 54	68 25 29		5
25				
	♌ 18 32 2	63 24 27		7
That following the tiara	♌ 24 5 28	63 57 16		6
	♌ 13 20 14	59 32 50		4 5
Between the feet, double	♌ 26 30 10	68 31 58		6
	♌ 26 37 31	68 23 7		5 6
30				
	♌ 22 54 40	62 2 10		6
Preced. in the following arm	♌ 13 24 51	66 59 34		6
In the following leg	♌ 23 58 46	62 36 40		4
Letter in the hind arm	♌ 19 16 3	65 31 44		5
In the hind foot	♌ 5 42 38	61 23 20		5
	♌ 25 48 15	64 36 47		3
35				

CEPI Corpus, in law, a return made by the sheriff, upon a capias, or other process to the like purpose; signifying, that he hath taken the body of the party.

CERATE*, **CERATUM**, in medicine, a kind of stiff unguent, or liniment, made of oil and wax, with other ingredients; used externally in several diseases, especially those of the skin.

* It takes its name from its capital ingredient, wax, called in Latin *Cera*.

Its consistence is thicker than that of a liniment; the last having usually two ounces of wax to two of oil; but the *Cerate*, four of wax to two of oil: yet it is thinner than a plaster.

There are *Cerates* of various kinds, *refrigerative*, *Emaciac*, &c. *Cerate of Sulphur*, of *Saunders*, *refringent Cerate of Bricks*, *Divine Cerate*, &c.

There is a particular one, called the *Refrigerative Cerate of Galen*, made of white wax and oleum rolat. umphacin.

CERATION, **CERATIO**, in chymistry, the operation of waxing. See the article.

CERATOGLOSSUM*, **Κερατογλωσσον**, in anatomy, a pair of muscles of the tongue, thus described by Mr. Cowper: "The *Ceratoglossum* has a broad fleshy origination, at the superior part of the os hyoides, laterally; whence it ascends to its insertion, at the root of the tongue. This, with its partner, acting, draw the tongue into the mouth directly: if only one of them act, it moves the tongue on one side."

* The word is derived from the Greek κερα, horn, and γλωσσα, tongue; its form bearing some resemblance to a horn.

CERCELE, in heraldry. A *Cross*; **CERCELE**, is a cross, which opening at the ends, turns round both ways, like a ram's horns. See **CROSS**.

CERDONIANS, antient heretics, who maintained most of the errors of Simon Magus, Saturninus, and the Manichees.

They took their name from their leader *Cerdon*, a Syrian, who came to Rome in the time of pope Hyginus; and there abjured his errors: but he did this in appearance only; for he was afterwards convicted of persisting in them, and accordingly was cast out of the church again.

Cerdon asserted two principles, the one good, and the other evil: this last, according to him, was creator of the world, and the God that appeared under the old law. The first, whom he called *unknown*, was the father of Jesus Christ; who, he taught, was only incarnate in appearance, and was not born of a virgin; nor did he suffer death but in appearance. He denied the resurrection, and rejected all the books of the Old Testament, as coming from an evil principle. Marcion, his disciple, succeeded him in his errors. Whence the Marcionites.

CEREA, in antiquity, feasts of Ceres, instituted by Triptolemus, son of Caelus king of Elufine in Attica, in gratitude for his having been instructed by Ceres, who was supposed to have been his nurse, in the art of cultivating corn, and making bread.

There were two feasts of this kind at Athens; the one called *Eleufinia*, the other *Thefophorbia*.

What both agreed in, and was common to all the *Cerealia*, was, that they were celebrated with a great deal of religion and purity; so that it was esteemed a great pollution to meddle, on those days, in conjugal matters.

It was not Ceres alone that was honoured here, but also Bacchus. The victims offered were hogs, by reason of the waste they make in the products of the earth: whether there was any wine offered, or not, is matter of much debate among the critics. Plautus and Macrobius seem to countenance the negative side; Cato and Virgil the positive. Macrobius says, indeed, they did not offer wine to Ceres; but mulsum, which was a composition of wine and honey boiled up together: and that the sacrifice made on the 21st of December to that goddess and Hercules, was a pregnant sow, together with cakes and mulsum; and that this is what Virgil means by *Miri Baccho*. *Vide* Salmastius, Lambin, &c.

The *Cerealia* passed from the Greeks to the Romans, who held them for eight days successively; commencing, as generally held, on the fifth of the ides of April. It was the women alone who were concerned in the celebration, all dressed in white: the men, likewise in white, were only spectators. They eat nothing till after sun-set; in memory of Ceres, who in her search after her daughter, took no repast but in the evening.

After the battle of Cannæ, the desolation was so great at Rome, that there were no women to celebrate this feast, by reason they were all in mourning; so that it was omitted that year.

CEREBELLUM, or **CEREBEL**, in anatomy, the hinder part of the brain.—See *Tab. Anat. (offeol.) fig. 5. litt. cc.*

The *Cerebellum* is esteemed a kind of little brain by itself, as the word imports, which is a diminutive of *Cerebrum*.

It is placed in the hinder and lower part of the skull, underneath the hind part of the brain, or cerebrum: it lies open to the cerebrum at bottom; but at top it is separated from it by a duplicature of the dura mater. Its figure somewhat resembles a flat bowl, broader than it's long.

Its substance is harder, drier, and more solid than that of the brain, but of the same nature and kind; being composed like it, of a cortical, or glandulous; and a medullary part: the branches of which last, when opened, resemble those of a tree, meeting in the middle, and forming a kind of stem, which runs quite through it. Its colour is yellowish, that of the brain being whiter.

Its surface is unequal, and furrowed, but not so much as that of the cerebrum; appearing rather as if laminated, like some shells; the middle circles being the largest and deepest: between the laminæ are duplicatures of the pia mater. The fore and hind parts of the *Cerebellum* are terminated by apophyses; called *Vermiformes*, from the resemblance they bear to worms: it is joined to the medulla oblongata by two processes, called by Willis, *Pedunculi*.

Besides these, there are two or three other medullary processes, which passing across the medulla oblongata, form an arch; from the discoverer called *Pons Varoli*.

The blood-vessels of the *Cerebellum* are the same with those of the cerebrum; and the use the same, *viz.* to separate the nervous juice from the blood, and convey it through the several parts of the body.

Dr. Willis, however, distinguishes between the functions of the *Cerebrum*, and *Cerebellum*; making the first the principle of voluntary motions, and actions; and the last the principle of involuntary ones, *viz.* that of respiration, the motion of the heart, &c.

It is commonly asserted, that a wound either in the cortex, or medulla of the *Cerebellum*, is mortal; which it is not in the brain, from which there have been entire parts taken away without harm. The truth is, we have instances of people living some time not only without any cerebrum, but also without any *Cerebellum*.

CEREBRUM, in anatomy, the brain, properly so called; in contra-distinction from the *Cerebellum*. See **BRAIN**.

CEREMONY*, an assemblage of several actions, forms, and circumstances, serving to render a thing more magnificent and solemn.

* The word comes from the Latin *Cæremonia*, quasi *Cæceris munia*, on account of the great number of ceremonies used in making the offerings to Ceres: or by reason the first religious ceremonies were those of Ceres: hence Cicero calls *Cærem* antiquissimam, religiosissimam principem omnium sacrorum, quæ apud omnes gentes fuerunt. Valerius Maximus derives it from *Cære* and *Munia*: *Cære* was a little town near Rome, where the Romans made offerings to the gods, with uncommon ardor and officiousness, on occasion of the fear they were in of the Gauls, who then lay before Rome. Others deduce it from *Cærus*, an antient Latin word, which signifies holy or sacred: some from the Greek *καίσιμος*, to rejoice.

CERINTHIANS, antient heretics, who denied the deity of Jesus Christ.—They took their name from Cerinthus, one of the first heresiarchs in the church, being cotemporary with St. John.

Cerinthus was a zealous defender of the circumcision, as well as the Nazarenes and Ebionites. St. Epiphanius says, he was the head of a faction which rose at Jerusalem against St. Peter, on account of some uncircumcised persons with whom that apostle had eat. He believed that Jesus Christ was a mere man, born of Joseph and Mary; but that in his baptism, a celestial virtue descended on him in form of a dove; by means whereof he was consecrated by the holy Spirit, and made Christ. It was by means of this celestial virtue, therefore, that he wrought so many miracles; which, as he received it from heaven, quitted him after his passion, and returned to the place whence it came: so that Jesus, whom he called *pure man*, really died and rose again; but that Christ, who was distinguished from Jesus, did not suffer at all.

Some authors ascribe the book of the *Apocalypse* to Cerinthus; adding, that he put it off under the name of St. John, the better to authorize his reveries touching Christ's reign in the flesh: and it is even certain he published some works of this kind, under the title of *Apocalypses*.

St. Epiphanius observes, that when a *Cerinthian* died without baptism, another person was baptized in his stead.

They received the gospel of St. Matthew, to countenance their doctrine of circumcision, from Christ's being circumcised; but they omitted the genealogy. And they discarded the epistles of St. Paul, because that apostle held circumcision abolished.

CEROMA, originally denoted a mixture of oil and wax, with which the antient wrestlers rubbed themselves, not only to make their limbs more sleek, and less capable of being laid hold of, but more pliable, and fit for exercise.

CERTIFICATE, a testimony given in writing, to assure and notify the truth of any thing to a court of justice, or the like. See **TESTIMONIAL**.

CERTITUDE, is properly a quality of the judgment, importing an adhesion of the mind to the proposition we affirm; or the strength wherewith we adhere to it.

Certitude is of the same nature with the evidence that produces it: the evidence is in the things that the mind sees and considers, *i. e.* in the ideas; *Certitude* is in the judgment the mind makes of those ideas.

The schoolmen distinguish two kinds of *Certitude*: the one of *Speculation*, arising from the evidence of the thing; the other of *Adhesion*, which arises from the importance thereof: this last they apply to matters of faith.

Further, the schools distinguish three other kinds of *Certitude*, with regard to the three different kinds of evidence whence they arise.

Metaphysical CERTITUDE, is that arising from a metaphysical evidence: such is that a geometrician has of the truth of this proposition, "That the three angles of a triangle are equal to two right ones."

Physical CERTITUDE, is that arising from physical evidence: such is that a man has that there is fire on his hand, when he feels it blaze, and feels it burn.

Moral CERTITUDE, is that founded on moral evidence: such is that a person has, that he has got, or lost a cause, when his attorney and friends send him an express notice of it, or a copy of the judgment, &c.

Moral Certitude, is frequently equivalent to metaphysical *Certitude*. Thus a criminal who hears the sentence read frequently makes no doubt either of his condemnation or execution; and yet has nothing, here, beyond a moral *Certitude*; for, metaphysical *Certitude* he has none: neither has he any physical *Certitude*, except as to what relates to the reading of the sentence, and the action of the executioner when he takes him into his possession.

In the *Philosophical Transactions*, we have an algebraic calculation of the degrees of moral *certitude*, arising from human testimony in all its cases; whether immediate, mediate, concurring, oral, or written.

The author thereof shews, that if the report pass through several reporters hands ere it arrive, each conveying $\frac{1}{2}$ of *Certitude*, after 12 transmissions, it will only be an equal lay, whether it be true or not: if the proportion of *Certitude* be fixed at $\frac{2}{3}$, it will come to half from the 70th hand; if at $\frac{3}{4}$, from the 69th hand.

For concurring evidences, if two reporters have each $\frac{1}{2}$ of certainty, they will both give an assurance of $\frac{3}{4}$, or of 35 to 1; if three, of $\frac{7}{8}$; and the co-attestation of 10 would give $\frac{1023}{1024}$, of certainty; that of a 20th, $\frac{1048576}{1048577}$. He shews, farther, that if there be six particulars in a narrative, all equally remarkable; and that he to whom the report is given has $\frac{1}{2}$ of *Certitude* for the whole; there is 35 to 1 against the failure in any one certain particular.

He proceeds to compute the certainty of tradition, both oral and written, in whole and part; successively transmitted, and also co-attested by several successors of transmitters.

CERT-MONEY, *Head-money*, a common fine, paid yearly by the tenants of several manors to the lords thereof; and sometimes to the hundred, *pro Certo Lete*, for the certain keeping of the lect.—This, in ancient records, is called *Certum Lete*.

CERVICAL * *Nerves*, are seven pair of nerves, so called, as having their origin in the *Cervix*, or neck.—See *Tab. Anat.* (osteol.) fig. 6. lit. dd.

* They are thus called from the Latin *Cervix*, neck.

The first pair arises between the first and second vertebrae of the neck; and contrary to the rest, comes out before and behind; whereas the other six pair come out laterally from the junctures of the vertebrae, through particular perforations: this first pair goes to the muscles of the head and ear. The second pair, according to Dr. Willis, contributes the main branch towards the formation of the diaphragmatic nerves; which, according to Vieussens, spring only from the fourth and sixth pair. The three last pair, joining with the two first of the dorsum, or thorax, make the brachial nerves. All the *Cervical Nerves* send innumerable branches to the muscles, and other parts of the head, neck, and shoulders.

CERVICAL Vessels, among anatomists, denote the arteries, veins, &c. which pass through the vertebrae and muscles of the neck, up to the skull.

CERVICALES Descendentes, a pair of muscles, antagonists to the sacro-lumbares; coming from the third, fourth, fifth, and sixth vertebra of the neck.

Most authors reckon these, though improperly, a production and part of the sacro-lumbus.

CERVIX, in anatomy, properly denotes the hind part of the neck; as contra-distinguished from the fore-part, which is called *Jugulum*, or the throat.

CERVIX of the Uterus, the neck of the uterus, or that oblong canal, or passage between the internal and external orifices, and which receives and incloses the penis like a sheath, whence it is also called *Vagina*. See **UTERUS**, and **VAGINA**.

The *Cervix Uteri*, in maids, is very narrow, except in the time of the menses; scarce wide enough to admit a goose's quill: its inner extremity is called the *Osculum Internum*, which is kept sealed up with a kind of glutinous matter, issuing from the glands about it.

CERUMEN, a thick, viscous, bitter excrementitious humour, separated from the blood by proper glands placed in the meatus auditorius, or outer passage of the ear.

This is also called *Cerumen aurium*, in English, *Ear-wax*. See **EAR**.

CERUSSE, or **CERUSE**, a white calx of lead, used in painting, and cosmetics; made by calcining that metal, in the vapour of vinegar.

Cerusse is made of thin laminae, or plates of lead, made up into rolls, and so placed as to receive and imbibe the fumes of vinegar, contained in a vessel set over a moderate fire.

The laminae are, by means hereof, converted into a white rust; which they gather together, and grinding it up with water, form it into little cakes. Cardan shews how to make a sort of *Cerusse* of tin and urine.

Cerusse makes a beautiful white colour, and is much used by the painters, both in oil and water colours. It makes the principal ingredient in the focus used by the ladies for the complexion. Taken inwardly, it is a dangerous poison; it soon shews its malignity, spoiling the breath and teeth, and hastening wrinkles, and all the symptoms of old age.

The best *Cerusse*, is that of Venice; but this is rare: that chiefly used, is either English or Dutch, both of which have more chalk in them than white lead; the latter, however, is the better of the two.—Fallopian speaks of a native *Cerusse*, but every body else knows it to be factitious.

CESAR. See the article **CÆSAR**.

CESARIAN Section. See **CÆSARIAN Section**.

CESAVII, a writ which lies in divers cases; upon this general ground, that he against whom it is brought, has for two years ceased or neglected to perform such service, or pay such rent, as he is obliged to by his tenure; and has not upon his lands or tenements sufficient goods or chattels to be distrained.

A *Cessavit* only lies for annual service, rent, and such like, not for homage or fealty.—The forms and species of *Cessavit* are various; as *Cessavit de Cantaria*, *Cessavit de Frodsfirma*, *Cessavit per Biennium*.

CESSION, in a legal sense, an act whereby a person surrenders up, and transmits to another person, a right which belonged to himself.

Cession is a general term, the species whereof are, a *Surrender*, *Relinquishment*, *Transfer*, and *Subrogation*; which see.

Cession is particularly used in the civil law, for a voluntary and legal surrender of a person's effects to his creditors, to avoid imprisonment.

This practice still obtains in France, and other countries; and is done by virtue of letters patent granted in favour of the poor and honest. The *Cession* originally carried with it a mark of infamy, and obliged the person to wear a green cap, or bonnet;

at Lucca an orange one: to neglect this, was to forfeit the privileges of the *Cession*. This was originally intended to signify, that the *Cessionary* was become poor through his own folly.

The Italian lawyers describe the ceremony of *Cession* to consist in striking the bare breech three times against a stone, called *Lapis Vituperii*, in the presence of the judge. Formerly it consisted in giving up the girdles and keys in court; the antients using to carry at their girdles the chief utensils wherewith they got their living; as the scrivener his escritore, the merchant his bag, &c.

The form of *Cession* among the antient Romans and Gauls was as follows. The *Cessionary* gathered up dust in his left hand, from the four corners of the house, and standing on the threshold, holding the door-post in his right hand, threw the dust back over his shoulders, then stripping into his shirt, and quitting his girdle and bag, he jumped with a pole over a hedge; hereby letting the world know, that he had nothing left, and that when he jumped, all he was worth was in the air with him.

This was the *Cession* in criminal matters: in civil cases, it was sufficient to lay a broom, switch, or broken straw on the threshold. This was called *Chrens-cruda per durpillum & festucam*.

CESSION, in the ecclesiastical law, is one manner of vacating or voiding an ecclesiastical benefice.

Cession is an implicit kind of resignation, understood where a person does some act, or takes on himself some charge, which is inconsistent with his holding the benefice he was before possessed of.

By the statute, if a clerk have one benefice of 8*l.* per annum value, and takes another, of what value soever, with cure of souls, and without dispensation, the former living is, *ipso facto*, void: and this kind of avoidance of a living is called *Cession*.

What is called by *Cession* in other benefices, is called by *Creation* in relation to a bishoprick; for if an incumbent be made a bishop, his benefice is said to be void by *creation*.

CESSIONARY, a *Bankrupt*.

CESSOR, in law, one dilatory, and delinquent in his duty, or service, and who thereby incurs the danger of the law, and is liable to have the writ *Cessavit* brought against him.

Where it is said the tenant *cessith*, it is meant he ceaseth to do his duty, or service to which he is bound.

CESTUI, a French term, literally signifying *He*, or *Him*; frequently used in our old law-writings. Thus,

CESTUI qui Trust, is he who has lands in trust, &c. committed to him for the benefit of another.

CESTUI qui Vie, one for whose life any lands or tenements are granted.

CESTUI qui Use, he to whose use another man is infeoffed in lands or tenements.

CESTUS *, among antient poets, a fine embroidered girdle worn by Venus, endowed with a faculty of charming and conciliating love.

* The word is also written *Cestum*, and *Ceston*: It comes from the Greek *κεσθ*, a *Girdle*, or other thing embroidered, or wrought with the needle; whence also *Incestus*; a term used at first for any naughtiness by undoing the girdle, &c. but now restrained to that between persons near akin. See **INCEST**.

CESTUS, or **CÆSTUS**, was also a large leathern gantlet, garnished with lead, used in the combats or exercises of the antient Athlete. See **CÆSTUS**.

CESURE, or **CÆSURA**, in poetry. See **CÆSURA**.

CETACEOUS *, in natural history, a term applied to all large sea fishes, and beasts, which bear a resemblance to the whale. See **FISH** and **WHALE**.

* The word is formed of the Latin *Cetus*, whale.

The horn usually called the *Unicorn's Horn*, is found to be the tooth of a *Cetaceous* fish in the icy sea, called *Narwal*. See **Supplement**, article **CETACEOUS**.

CETERIS Paribus. See **CÆTERIS Paribus**.

CETUS, in astronomy, the *Whale*; a large constellation of the northern hemisphere, under *Pices*, and next the water of *Aquarius*.

The stars in the constellation *Cetus*, in Ptolemy's catalogue are twenty-two; in Tycho's twenty-one; in Hevelius's twenty-two; in the Britannic catalogue seventy-eight. The order, names, longitudes, latitudes, magnitudes, &c. whereof, are as follow.

Names and situations of the stars.	Longitude.	Latitude.		Magnit.
		Equin.	South.	
	0	0	0	
	18 36 40	14 14 15		6
Of those in triangle preced. the tail, by Ptolemy ranked among the intormes of A-quarius.	19 25 37	16 14 22		4 5
	22 28 40	10 5 0		5
	21 57 12	15 16 3		5
	21 12 12	18 45 54		5
North. in the extrem. of the tail	26 35 0	10 0 41		4 3
	22 50 22	13 27 15		6
	1 43 50	2 42 0		6 7
	0 59 31	6 36 23		6
	2 18 26	6 47 23		6 5

CHA

CHA

Table with columns: Names and Situations of the Stars, Signs, Longitude, Latitude South, Magnit. Contains star positions like Bright, and fourth. of the tail N. of those prec. in the square of the breast, etc.

There are Chains of divers matters, sizes, and forms, and for divers uses.—Ports, rivers, streets, &c. are clothed with iron Chains: rebellious cities are punished by taking away their Chains, and barriers.

The arms of the kingdom of Navarre are, Chains Or, in a field Gules. The occasion hereof is referred to the kings of Spain leagued against the Moors; who having gained a celebrated victory against them in 1212, in the distribution of the spoils, the magnificent tent of Miralumin fell to the king of Navarre; as being the first that broke and forced the Chains thereof.

A Gold CHAIN, is one of the ornaments or badges of the dignity of a lord-mayor of London; and remains to the person, after his being divested of that magistrature, as a mark that he has passed the Chair.

Something like this, Chorier observes, obtained among the ancient Gauls: the principal ornament of their people in power and authority was a gold Chain, which they wore on all occasions; and even in battle to distinguish them from the common soldiers. Hist. de Dauph. Lib. III. p. 130.

CHAIN also denotes a kind of string, of twisted wire; serving to hang watches, tweezer-cases, and other valuable toys upon.

The invention of this piece of curious work was owing to the English; whence, in foreign countries, it is denominated the English Chain. It was some time before foreigners undertook to imitate them, and at last with no extraordinary success: those of Paris have come nearest. These Chains were at first usually either of silver or gold, some of gilt copper; the thread, or wire of each kind must be very fine.

For the Fabric, or making of these CHAINS; a part of the wire is folded into little links of an oval form; the longest diameter about three lines; the shortest, one. These, after they have been exactly folded, are again folded into two; and then bound together, or interwove, by means of several other little threads of the same thickness; some whereof, which pass from one end to the other, imitate the warp of a stuff; and the others, which pass transverse, the woof. There are at least four thousand little links in a Chain of four pendants; which are, by this means, bound so equally, and withal so firmly together, that the eye is deceived, and takes the whole to consist of one entire piece.

CHAIN-Pump. See Pump, and BUR-Pump.

CHAIN-Shot, in war, two bullets, or rather half-bullets, linked together by a Chain: their use at sea is to shoot down yards, or masts; or to cut the shrouds, or any other rigging of a ship.

CHAIN, in surveying, is a measure consisting of a certain number of links of iron wire, usually 100; serving to take the dimensions of fields, &c. by. See MEASURE, and SURVEYING.

This is what Merfenne takes to be the arpentium of the ancients.

The Chain is of various dimensions, as the length or number of links varies: that commonly used in measuring land, called Gunter's Chain, is in length four poles, or perches; or sixty-fix foot, or a hundred links; each link being seven inches 2/3.

That ordinarily used for large distances, is in length 100 feet; each link one foot.

For small parcels, as gardens, &c. is sometimes used a small Chain of one pole, or sixteen foot and a half length; each link one inch 2/3.

Some, in lieu of Chains use ropes; but these are liable to several irregularities; both from the different degrees of moisture, and of the force which stretches them. Schwenterus, in his practical geometry, tells us, he has observed a rope sixteen foot long, reduced to fifteen in an hour's time, by the mere falling of a hoar frost. To obviate these inconveniences, Wolfius directs, that the little strands whereof the rope consists, be twisted contrary ways, and the rope dipped in boiling hot oil, and when dry, drawn through melted wax. A rope thus prepared, will not get or lose any thing in length, even though kept under water all day.

Use of the CHAIN in surveying.—The manner of applying the Chain in measuring lengths is too popular to need description.

In entering down the dimensions taken by the Chain, the Chains and links are separated by a dot: thus a line sixty-three Chains fifty-five links long, is wrote 63.55. If the links be short of 10, a cypher is prefixed; thus 10 Chains, 8 links, are wrote 10.08.

To find the area of a field, &c. the dimensions whereof are given in CHAINS and links. 1st, Multiply the lines by one another, according to the rules given under AREA; and from the product cut off five figures towards the right; those remaining on the left will be acres. 2dly, Multiply the five figures cut off by four; and cutting off five again from the product on the right, those remaining on the left will be rods. Lastly, Multiply the five thus cut off by forty; and cutting off five, as before, on the right, those remaining on the left are square perches.

To take an angle DAE, (Tab. Surveying, fig. 1.) by the Chain: measure a small distance from the vertex A along each leg, w. g. to d and e; then measure the distance d e: to lay this down, draw

CHACE, } See CHASE.
CHACING, } See CHASING.
CHACCOON*, or CHACONE, a kind of dance, in manner of a faraband, borrowed from the Spaniards, and by them from the Moors. The bass always consists of four notes, which proceed in conjunct degrees: and whereon they make divers concords and couplets, with the same burden.
* The word is formed of the Spanish Chacona; not as others pretend from the Italian Ceccone, a blind man, the inventor.
CHAFEE-Wax, or CHAUFEE-Wax, an officer in chancery, whose business is to fit the wax for the sealing of writs, patents, and other instruments issued thence.
CHAGREEN, or CHAGRIN, in commerce. See the article SHAGREEN.
CHAIN, CATENA, a series of several rings, or links, fitted into one another.

draw A E at pleasure, and from your scale set off the distance measured on it. See SCALE.

Then, taking in your compasses the length measured on the other side, on the vertex A, as a center, describe an arch $d c$; and on the point c , as a center, with the measured distance of $c d$, describe another arch $a b$. Through the point where this intersects the former arch, draw a line A D. So is the angle plotted; and its quantity, if required, may be measured on a line of chords. See CHORD.

To take the plan or plan of any place, as A B C D E, (fig. 2.) by the Chain. Draw a rough sketch of the place by eye; and measuring the several sides A B, B C, C D, D E, enter down the lengths on the respective lines: then if the plan be to be taken within side of the place, instead of measuring the angles, as before, measure the diagonals A D, B D. Thus will the figure be reduced into three triangles, whose sides are all known, as in the former case; and may be laid down on paper, according to the method above.

If the plan be to be taken without side the place, the angles must be taken thus; *v. g.* for the angle B C D, produce the lines B C and C D to any certain equal distance, *v. g.* to a and b , five Chains; and measure the distance of $a b$. Thus have you an isosceles triangle C a b, wherein the angle $a C b = B C D$ its opposite one is had: thus is the quantity of B C D found, and the angle laid down as before.

By the Chain to find the distance between two objects inaccessible in respect of each other. From some place, as C, (fig. 3.) whence the common distance to each object A and B, is accessible in a right line; measure the distance C A, which suppose fifty Chains; and continue the line to D, *viz.* fifty more: measure also B C, which suppose thirty Chains; and produce the line to E, *viz.* thirty more. Thus will be formed the triangle C D E, equal and similar to the triangle A B C; consequently the distance D E, being measured, will give the inaccessible distance required.

By the Chain to find the distance of an inaccessible object, *v. g.* the breadth of a river. On one side place a pole, four or five foot high, perpendicularly, having a slit a-top, with a straight piece of wire, or the like, two or three inches long, put through the same. This is to be slipped up or down, till, looking along it, you find it point full on the other side of the river; then turning the pole with the wire in the same direction, observe the point on the dry land, to which it points when looked along as before: measure the distance from the pole to this last point; it is the same with that of the first required.

CHAIR, CATHEDRA, was antiently used for the pulpit, or suggestion, whence the priest spoke to the people.

It is still applied to the place whence professors and regents in universities deliver their lectures, and teach the sciences to their pupils: Thus, we say, the professor's Chair, the doctor's Chair, &c.

Curule CHAIR, was an ivory seat placed on a carr, wherein were seated the prime magistrates of Rome, and those to whom the honour of a triumph had been granted.

CHAIR is also applied by the Romanists to certain feasts, held antiently in commemoration of the translation of the see, or seat of the vicarage of Christ, by St. Peter.

The perforated Chair, wherein the new elected pope is placed, F. Mabillon observes, is to be seen at Rome: but the origin thereof he does not attribute, as is commonly done, to the adventure of pope Joan; but says there is a mystery in it; and it is intended, forsooth, to explain to the pope those words of scripture, that God draws the poor from out of the dust and mire.

CHAIR-MAN, the president, or speaker of an assembly, company, &c. See PRESIDENT, &c.

We say, the Chair-Man of a committee, &c.

CHAISE, a sort of light open chariot, or calash.

CHALASTIC Medicines,* are such as have the faculty of relaxing the parts; when, on account of their extraordinary tension, or swelling, they occasion pain.

* The word comes from the Greek χαλασ, I loosen, relax.

Of this kind are butter, and many oils, &c.

CHALAZA, among naturalists, a white knotty kind of string at each end of an egg, formed of a plexus of the fibres of the membranes whereby the yolk and white are connected together. See EGG.

Its use, according to Harvey, is to be as it were the poles of this microcosm, and the connection of all the membranes twisted and knit together; whereby the liquors are not only conserved, each in its place, but also in its due position to the rest.

Mr. Derham adds, that they also serve to keep one and the same part of the yolk uppermost, let the egg be turned which way it will, which is done by the following mechanism: the Chalazae are specifically heavier than the whites wherein they swim; and being braced to the membrane of the yolk, a little out of the axis, they cause one side of the yolk to be heavier than the other. The yolk being thus by the Chalazae made buoyant, and kept swimming in the midst of two whites, is by its own heavy

side kept with the same side always uppermost: which uppermost side he imagines to be that wherein the Cicatricula lies.

CHALCANTHUM, χαλκάνθος, the same with vitriol. See VITRIOL.

Some have also used Chalcanthum corruptly for colcothar, or vitriol rubified.

CHALCEDONY, or CALCEDONY. See the article CALCEDONY.

CHALCIDIC, CHALCIDICUM, or CHALCEDONIUM,* in the antient architecture, a large magnificent hall belonging to a tribunal, or court of justice.

* Testus says, it took its name from the city Chalcis; but he does not give the reason. Philander will have it to be the court, or tribunal, where affairs of money and coinage were regulated; so called from χαλκός, Brass, and δίκη, Justice. Others say, the money was struck in it; and derive the word from χαλκός, and οίκος, House.

In Vitruvius, it is used for the auditory of a basilica: in other of the antient writers, for a hall, or apartment, where the heathens imagined their gods to eat. See BASILICA.

CHALCITIS, a kind of vitriolic mineral, reddish like copper, friable, and having yellow shining veins within.

It has the taste of the blue vitriol of copper, and dissolves very easily in aqueous liquors. There are two other minerals, called Misi and Sory, very much like the Chalcitis. In effect, the antients contounded them together; and not only the misi and sory, but also the melanteria; or rather, they imagined a successive transmutation of the four minerals, which began with Chalcitis, then became misi, then melanteria, and lastly sory, where it lived.

The moderns make these four distinct matters; though the chief difference between them, is supposed to lie in the different tenacity or grossness of their substance.

Some say, the misi is formed on the Chalcitis, as verdigrise on copper, being properly its rust; and that Chalcitis is formed in the same manner on the sory.

This is certain, they are all found in copper mines: but the modern druggists know little of any of them.

The Chalcitis is brought from Germany: it is very caustic and escharotic. Its chief use is in the composition of venice-treacle: in lieu of it are frequently substituted chalcanthum rubified, or coppersas. See Supplement, articles CHALCITIS, MISI, SORY, and MELANTERIA.

CHALCOGRAPHY, the art of engraving on copper and brass. See ENGRAVING.

CHALDEE, or CHALDAIC, Language, that spoke by the Chaldeans, or people of Chaldaea.

The Chaldee is a dialect of the Hebrew.

CHALDEE Paraphrase, in the rabbinical style, is called Targum. See TARGUM.

There are three Chaldee paraphrases in Walton's polyglot; *viz.* that of Onkelos, that of Jonathan son of Uzziel, and that of Jerusalem.

CHALDRON, CHALDER, or CHAUDRON of coals, a dry English measure, consisting of thirty-six bushels heaped up, according to the sealed bushel kept at Guild-hall, London.

The Chaldron should weigh two thousand pounds.—On ship-board, twenty-one Chaldrons of coals are allowed to the score. See COAL.

CHALICE, the cup, or vessel used to administer the wine in, in the eucharist; and, by the Romanists, in the mass.

Bede affirms, that the Challice, used by Jesus Christ at the supper, had two handles, and held just half a pint; which the antients imitated. In the primitive times the Challices were of wood: pope Zephyrine first appointed them to be of silver and gold; though others ascribe this to Urban I. Leo IV. forbade tin and glass; as did likewise the council of Calcey in England: Horn Lindanus, and Beatus Rhenanus, who had seen some of the antient Challices in Germany, observe, that they had a pipe, or tube, fitted artfully to them, through which the people sucked, instead of drinking.

CHALK, a white fusile substance, usually reckoned as a stone; but Dr. Sars thinks, without reason, since, when examined by the hydrostatical balance, it is found to want much of the weight and consistence of a real stone: so that he thinks it more justly ranked among the earths.

This he observes to be the case, not only in Chalk, but various other bodies, taken for granted to be stones; some whereof are nearer to earth than stone; others nothing but earth, sulphur, metal, &c.

Chalk is of two sorts; the first, a hard, dry, strong Chalk, used for making of lime. The other a soft, unctuous Chalk, used to manure lands; as easily dissolving with rain and soft: It is best for cold, sour ground, and promotes the yielding of corn; it sweetens grass so as to cause cattle to fatten speedily, and cows to give thick milk.

Chalk is also used in medicine, as an astringent, an absorbent, and a sweetener; and is celebrated for curing the heart-burn, beyond any thing whatsoever. See Supplement, article CRETAE.

CHALLENGE*, a cartel, or invitation to duel, or other combat. See **DUEL**.

* The word *Challenge* was antiently latined *Calumnia*.

CHALLENGE, in law, is an exception made to jurors who are returned to pass on a trial.

Challenge to the jurors, is either made to the array, or to the poll: to the array, as when the whole number is excepted against, as partially empannelled. To the poll, as when particulars are excepted against, as not indifferent.

Challenge to the jurors, is also divided into *Challenge Principal*, and *Challenge per Cause*; i. e. upon cause or reason alledged.

Challenge Principal, otherwise called *Challenge Peremptory*, is what the law allows without cause alledged, or further examination: thus a prisoner at the bar, arraigned on felony, may peremptorily challenge twenty, one after another, alledging no cause but his own dislike; and they will be set aside, and new ones chosen in their room. In case of high-treason, no *Challenge peremptory* was formerly allowed; but by Stat. 7. Gul. III. liberty is given peremptorily to challenge thirty-five.

Yet there seems to be a difference between *Challenge principal* and *Challenge peremptory*; the latter being only in matters criminal, and without any cause alledged; the former mostly in civil cases, and with assigning some such cause, as being found true, the law allows; v. g. if either party alledge, that one of the jurors is the son, brother, cousin, or tenant of the other, the exception is good. Also in the plea of the death of a man, or in any action real or personal, where the debt or damages amount to forty shillings, it is a good *Challenge* to a juror, that he cannot dispend forty shillings per annum of freehold.

Challenge upon Reason or Cause, is when the party does alledge some such exception as is sufficient upon acknowledgment of the truth of it; v. g. if the son of the juror have married the daughter of the other party, or the like.

CHALLENGE, in hunting. When hounds at first finding the scent of their game, presently open, and cry, the huntmen say, *they challenge*.

CHALYBEAT, in medicine, something that partakes of the nature of steel, or iron; or that is impregnated with particles of those metals.

Chalybeats act chiefly as absorbents, and deobstruents. Iron, M. Lemery observes, is a mixture of an oily substance with a metallic matter; but the oil is predominant in the mixture: and between the parts mixed are large pores. Hence, Iron becomes easily dissolvable; and its oil easily disengages itself, but when once decomposed, i. e. when once the oil is separated from the pure, ferruginous, or metallic part, no dissolvent has any effect on the caput mortuum.

Hence appears the absurdity of that common practice, of calcining iron to such a degree, as to convert it into what the chymists call a *Crocus*, or saffron. This operation must of necessity take away all, or most of the oily substance, and leave nothing but the indissoluble caput mortuum. The oil here separated should properly have been separated by the heat of the stomach; whence, according to Mr. Lemery, it would have carried into the blood a new spirituous, salutary juice: he observes also, that iron acts as an absorbent, from the largeness of its pores, and the ads wherewith all kinds of salts, even gross ones, insinuate themselves into them: even scorbutic acids are absorbed thereby. Further, it is not all that peccant acids enter iron; but in entering they also expel and express that salutary juice, which is also put in motion, and disposed to be evacuated by the natural heat. Thus is iron doubly advantageous, both by the oil it furnishes the blood withal, and by the salts it frees it from. The action of the particles of a *Chalybeat*, by their elasticity, together with the momentum they give the blood by their ponderosity, make it not only preferable to most other deobstruents, but also proper in other cases; especially where there is a viscosity of the juices; the blood deauperated, and where the circulation is languid; as in most hectic and hypochondriac cases.

CHAM, or KHAN*, the title given to the sovereign princes of Tartary.

* The word, in the Persian signifies, *mighty lord*, in the Slavonic, *emperor*. Sperslingius, in his dissertation on the Danish term of majesty, *konig*, king, thinks the Tartarian *Cham* may be well derived from it; adding, that in the north they say *Kan, Kannon, Konge, Konning*, &c.

The term *Cham*, is also applied among the Persians, to the great lords of the court, and the governors of provinces.

CHAMADE*, in war, a certain beat of a drum, or sound of a trumpet, which is given the enemy as a signal, to inform them of some proposition to be made to the commander; either to capitulate, to leave have to bury their dead, make a truce, or the like.

* Menage derives the word from the Italian *Chiamata*, of *clamare*, to cry.

CHAMBER*, in building, a member of a lodging, or piece of an apartment, ordinarily intended for sleeping in; and called by the latins *Cubiculum*.

* The word comes from the Latin *Camera*; and that, according

to Nicod, from the Greek *καμαρα*, *Vault*, or *Curia*; the term *Chamber* being originally confined to places arched over.

A compleat apartment is to consist of a hall, antichamber, *Chamber*, and cabinet.

Bed-CHAMBER. See the article *Bed-Chamber*.

Privy-CHAMBER.—*Gentlemen of the Privy-CHAMBER* are servants of the king, who are to wait and attend on him and the queen at court, and in their diversions, progresses, &c.

Six of these are appointed by the lord chamberlain, together with a peer, and the master of the ceremonies, to attend all ambassadors from crowned heads in their public entries. Their number is forty-eight.

Their institution is owing to king Henry VII. As a singular mark of favour, they are empowered to execute the king's verbal command, and without producing any written order; their person and character being deemed sufficient authority.

CHAMBER in Policy, is used for the place where certain assemblies are held; also, for the assemblies themselves.

Of these there are various kinds; some established for the administration of justice, others for matters of commerce, &c. Of the first kind among us are the

Star-CHAMBER, *Camera Stellata*, or *Chambre de Etoilets*, so called because the roof was originally painted with stars: This is of an antient standing, but its authority was very much heightened by Henry VII. and Henry VIII. who appointed, by two several statutes, that the chancellor, assisted by others there named, should have power to hear complaints against retainers, embracers, misdemeanors of officers, and other like offences, which through the power and authority of those who committed them did lift up the head above other faults; and for which inferior judges were not so meet to give correction, and the common law had not sufficiently provided.

By the statute 17 Car. I. the court called *Star-chamber*, and all jurisdiction, power, and authority thereto belonging, are, from August the first, 1641, absolutely dissolved.

Imperial CHAMBER, is a court or jurisdiction held antiently at Spire, but since transferred to Wertlar; in which are determined the differences arising among the princes and cities of the empire.

It was at first ambulatory: In 1473 it was fixed to Augsburg, then removed to Frankfort; and thence to Worms, in 1497: afterwards it was removed to Nuremberg and Rati-bon; again to Worms and Nuremberg; and from this last to Eslingen; thence, in 1527, to Spire; where Charles V. rendered it sedentary, in 1530.

At its first institution it consisted of sixteen assessors; but the reformation ensuing, occasioned the number to be increased: by the treaty of Osnabrug, in 1648, there were appointed fifty assessors; whereof twenty-four were to be protestants, and twenty-six catholics; besides five presidents, two of them protestants, the rest catholics.

As the princes or circles of the empire are not always exact in filling up the vacancies in this *Chamber*, the number of assessors is now reduced to sixteen.

This *Chamber* has a right of judging by appeal, and is the last resort, of all civil affairs of all the states and subjects of the empire, in the same manner as the Aulic council residing at Vienna. Processes are here almost immortal, by reason of the infinite number of ceremonies and formalities wherewith they are embarrassed.

The *Imperial Chamber* is frequently afraid to pronounce sentence, for fear of exposing its awards to some disgrace; the princes sometimes not permitting such to be executed as displease them.

CHAMBER of Accounts, is a sovereign court in France, where accounts are rendered of all the kings revenues; inventories and a-vowals thereof registered; oaths of fidelity taken, and other things relating to the finances transacted. The French have also,

Ecclesiastical CHAMBERS, which judge, by appeal, of differences arising on the raising of tythes: of these *ecclesiastical Chambers* there are nine; viz. at Paris, Bourdeaux, Rouen, Lyons, Tours, Thoulouse, Bourges, Pau, and Aix: they usually consist of the archbishop of the place, as president; other archbishops and bishops, a deputy of each of the dioceses, and three counsellors of parliament. The *Chamber* chuses as many counsellors out of the clergy as it thinks proper; as also a promoter.

Apostolical CHAMBER, at Rome, is that wherein affairs relating to the revenues and domains of the church and the pope are transacted.

CHAMBER of Audiences, or **grand CHAMBER**, a jurisdiction in each parliament of France.

At the first institution of their parliaments, there were two *Chambers*, and two kinds of counsellors; the one the *grand Chamber* for audiences, the counsellors whereof were called *logeurs*, who only judged; the other the *Chamber of inquests*; the counsellors whereof were called *Rapporteurs*; who only reported processes by writing.

CHAMBER of the Edict, or *Mi-party*, was a court established by virtue of the edicts of pacification, in favour of those of the reformed religion: wherein the number of judges of either religion

gion were the fame; and to which recourse was had in all affairs wherein any of the protestants were concerned. This *Chamber* is now suppressed.

CHAMBER of London. See **CHAMBERLAIN.**

CHAMBERS of Commerce, are assemblies of merchants and dealers, where they treat about matters relating to commerce. Of these there are several, established in most of the chief cities of France, by virtue of an arret of the 30th of August 1701. Indeed there were some before this general establishment, particularly one at Maricelles, and another at Dunkirk.

CHAMBER in War, is used for the place where the powder of a mine is lodged.

The *Chamber of a Mine* is a cavity of five or six cubick feet; generally made of a cubical form.

CHAMBER of a Mortar, or *Canon* of the new make, is a cell, or cavity at the bottom of the barrel, or chase, where the charge of powder is lodged.

The different form of the *Chamber*, is found by experiment to have an influence on the range of the piece. A cubical *Chamber* carries the ball to a less distance than a circular one; and that less than a cylindrical one.

CHAMBERLAIN *, an officer who has the management, or direction of a chamber.

* The word *Chamberlain*, according to Ragueau, originally signified a gentleman who was to sleep in the king's bed chamber, at his bed's feet, in the absence of the queen.

There are almost as many kinds of *Chamberlains* as chambers: The principal are as follow.

Lord Great CHAMBERLAIN of England, an officer of great antiquity and honour; being ranked the sixth great officer of the crown: a considerable part of his function is at the coronation of a king; when he dresses him, carries the coif, sword, and gloves to be used on that occasion; the gold sword and scabbard to be offered by the king; and the robe royal and crown: he also undresses him, and waits on him at dinner; having for his fee the king's bed, and all the furniture of his chamber, the night-apparel, and the silver basin wherein the king washes, with the towels.

To him likewise belongs the provision of every thing in the house of lords, in the time of parliament; to which end he has an apartment near the lords house. He has the government of the palace of Westminster; and issues out warrants for preparing, fitting out, and furnishing Westminster-hall, against coronations, trials of peers, &c.

He disposes of the sword of state, to be carried by whom he pleases; and when he goes to parliament, is on the right hand of the sword, the lord marshal being on the left. On all solemn occasions, the keys of Westminster-hall, of the Court of Wards, and Court of Requests, are delivered him.

To him belong livery and lodging in the king's court; and he has certain fees from every bishop at his doing homage to the king, and from every peer at his creation. Under his command are, the gentleman-usher of the black rod, the yeoman-usher, and door-keepers.

This honour was long held by the earls of Oxford; viz. from the time of Henry I. by an estate-tail, or inheritance, but in the three last coronations by the marquis Lindsey, after duke of Ancester, by an estate or inheritance from a daughter and heir general, claimed, but controverted.

Lord CHAMBERLAIN of the Household, an officer who has the oversight and direction of all officers belonging to the king's chamber, except the precinct of the bed-chamber; which is absolutely under the groom of the stole.

He has the oversight and direction of the officers of the wardrobe, of the removing wardrobes, beds, tents, revels, musick, comedians, hunting, messengers, trumpeters, drummers, handicrafts, and other tradesmen retained in the king's service: as also of all sergeants at arms, physicians, apothecaries, surgeons, barbers, the king's chaplains, &c. and administers the oath to all officers above stairs.

There are also **CHAMBERLAINS of the king's courts,** of the *Exchequer*, of *North Wales*, of *Chester*, of the *city of London*, &c. in these cases, this officer is commonly the receiver of all rents and revenues belonging to the place whereof he is *Chamberlain*.

When there is no prince of Wales, and earl of Chester, the *Chamberlain* of Chester hath the receipt and return of all writs coming thither out of any of the king's courts.

In the *Exchequer*, there are two *Chamberlains*, who keep a controulment of the pells of receipts, and exitus, and have certain keys of the treasury and records: they also keep the keys of that treasury where the leagues of the king's predecessors, and divers antient books, as *Dooms-day Book*, and the *Black Book* of the *Exchequer* remain.

The **CHAMBERLAIN of London** keeps the city money, which is laid up in the chamber of London, an apartment in Guild-hall: he also preside, over the affairs of masters and apprentices; and makes free of the city, &c.

His office lasts but for a year, being chosen annually on Midsummer-day: but the custom usually obtains, to refuse the

fame person; unless he have been chargeable with any misdemeanor in his office.

Vice-CHAMBERLAIN. See **VIC-CHamberlain.**

CHAMBRANLE, in architecture and joinery, the border, frame, or ornament of stone, or wood, surrounding the three sides of doors, windows, and chimneys.

The *Chambranle* is different in the different orders: when it is plain, and without mouldings, it is called simply and properly, *Band*, *Case*, or *Frame*.

The *Chambranle* consists of three parts; the two sides, called *Ascendants*; and the top, called the *Traverse*, or *Supercilium*.

The *Chambranle* of an ordinary door, is frequently called *Door-Case*; of a window, *Window-Frame*.

CHAMELOT, in commerce. See **CAMBLÉ.**

CHAMFER, or **CHAMFERET**, in architecture, an ornament consisting of half a scotia; being a kind of finial furrow, or gutter on a column: called also *Strix*, and *Stria*.

CHAMFERING, or **CHAMFERAINING**, is used for cutting the edge, or end of any thing a-flope, or bevel. See the article **BEVEL**.

CHAMPAIN. See **CAMPAIGN**, and **CHAMPION**.

A Point CHAMPAIN, in heraldry, is a mark of dishonour in the coat of arms of him who kills a prisoner of war after he has cried quarter.

CHAMPARTORS, or **CHAMPERTORS**, are those who move pleas, or suits, or cause them to be moved, either by their own procurement or others; and sue them at their proper costs, to have part of the land, or other matter in variance: against whom lies a writ of *Champarty*.

CHAMPARTY *, or **CHAMPERTY**, in law, a maintenance of any man in his suit, upon condition of having part of the thing in question, be it lands or goods; in case it be recovered.

* The word comes from the French *Champ*, field, and *parti*, divided; the field, or thing contested for, being supposed to be divided between the *Champarter*, or maintainer, and the person in whose right he sues.

This seems to have been an antient grievance; for notwithstanding several statutes against it, and a form of writ accommodated to them, in the time of Edward I. yet in that of Edward III. it was enacted, That whereas redress on the former statute was only to be had in the king's-bench, which then followed the court; for the future it should likewise be cognizable by the justices of the common pleas, and judges of assize.

CHAMPION *, properly signifies, a person who undertakes a combat, in the place or quarrel of another: though the word is also sometimes used for him who fights in his own cause. See **COMBAT**.

* Hottoman defines *Champion*, certator pro alio datus in duello, à campo dicitur, qui circus erat decertantibus definitus: hence also the word *Camplight*.

Du Cange observes, that *Champions*, in the just sense of the word, were persons who fought in lieu of those who being obliged by custom to accept the duel, had yet a just excuse for dispensing with it, as being too old, or infirm, being ecclesiastick, or the like. He adds, that the *Champions* were usually retained, or hired for sums of money, and were held infamous.

There were also some vassals, who by the faith and homage sworn to their lords, were obliged to fight for them in case of need.

Some authors hold, that any person was allowed the benefit of a *Champion*, excepting parricides, and those accused of very heinous offences.

This custom of deciding differences by combat, was derived from the north; whence it passed into Germany, and, with the Saxons, into England, and insensibly through the rest of Europe. See **DUEL**.

When two *Champions* were chose to maintain the pro and the con, it was always required there should be a decree of the judge to authorize the combat: when the judge had pronounced sentence, the accused threw a gage, or pledge, ordinarily a glove, or gantlet; which being taken up by the accuser, they were both taken into safe custody till the day of battel appointed by the judge.

If either of them fled after this, he was declared infamous, and deemed to have committed the crime in question. Nor were the accuser and accused now allowed to make up the matter; at least, not without the consent of the judge; which was never granted, without making the lord satisfaction for the right of inheritance to the effects of the vanquished.

Before the *Champions* took the field, their heads were shaved, and they made oath that, "They believed the person who retained them was in the right; and that they would defend his cause to the utmost of their power." The weapons they used in the combat were a sword and buckler; some say, in England, only a club and buckler: when on horseback, they were armed at all points. Their weapons were blessed in the field by the

the priest, with a word of ceremony; and each took an oath he had no charm upon him.

The action began with railing, and giving each other ill language; at the sound of a trumpet they were to go to blows: after the number of blows or rencounters expressed in the cartel, the judges of the combat threw a rod into the air, to advertize the *Champions* that the combat was ended. If it lasted till night, or ended with equal advantage on either side, the accused was reputed victor.

The punishment of the vanquished, was that which the crime merited whereof he was accused: if it were a capital crime, the vanquished was disarmed, led out of the field, and immediately executed, together with the party whose cause he maintained. If the conquered *Champion* fought in the cause of a woman, she was burnt.

CHAMPION of the king, is an officer whose business is, at the coronation of a king of England, to ride into Westminster-hall, armed cap-a-pe, when the king is at dinner, and throw down his gantlet by way of challenge; pronouncing, by a herald, "That if any man shall deny, or gainsay the king's title to the crown, he is there ready to defend it in single combat, &c." Which done, the king drinks to him, sending him a gilt cup with a cover, full of wine; which the *Champion* drinks, and has the cup for his fee.

This office, ever since the coronation of Richard II. has been continued in the family of Dymocke, who held the manor of Scrivelsby in Lincolnshire, hereditary from the family of the Marmions, who had it before, by grand feignantry; on condition that the lord thereof should be the king's *Champion*.

CHAMPION, or rather **CHAMPAIN-Lands**, are lands not inclosed; or large fields, downs, or places without woods or hedges.

CHAMOIS, **CHAMMY**, or **Shammy**. See the article **SHAMMY**.

CHANCE, a term we apply to events, to denote that they happen without any necessary, or foreknown cause. Our aim is, to ascribe those things to *Chance*, which are not necessarily produced as the natural effects of any proper cause: but our ignorance and precipitancy lead us to attribute effect to *Chance*, which have necessary and determinate causes.

When we say a thing happens by *Chance*, we really mean no more, than that its cause is unknown to us: not, as some vainly imagine, that *Chance* it self can be the cause of any thing. From this consideration, Dr. Bentley takes occasion to expose the folly of that old tenet, *The world was made by Chance*.

The case of the painter, who unable to express the foam at the mouth of a horse he had painted, threw his sponge in despair at the piece, and, by *Chance*, did that which he could not before do by design, is an eminent instance of the force of *Chance*: yet, it is obvious, all we here mean by *Chance*, is, that the painter was not aware of the effect; or that he did not throw the sponge with such a view: not but that he actually did every thing necessary to produce the effect; inasmuch, that considering the direction wherein he threw the sponge, together with its form, specific gravity, the colours wherewith it was smeared, and the distance of the hand from the piece, it was impossible, on the present system of things, that the effect should not follow.

Chance is frequently personified, and erected into a chimerical being, whom we conceive as acting arbitrarily, and producing all the effects, whose real causes do not appear to us: in which sense, the word coincides with the *Τυχη*, *Fortuna* of the ancients.

CHANCE is also confounded with *Fate*, and *Destiny*.

CHANCE is also used for the manner of deciding things, the conduct or direction whereof, is left at large, and not reducible to any determinate rules or measures; or where there is no ground for preference: as at cards, dice, lotteries, &c.

For the Laws of CHANCE, or the proportion of Hazard in Gaming, see GAME.

The ancient *Sors*, or *Chance*, M. Placette observes, was instituted by God himself; and in the Old Testament, we find several standing laws and express commands which prescribed its use on certain occasions: hence, the scripture says, *The Lot, or Chance, fell on St. Matthias*; when it was in question who should fill Judas's place in the apostolate.

Hence also arose the *sortes sanctorum*; or method of determining things among the ancient Christians, by opening some of the sacred books, and pitching on the first verse they cast their eye on, as a sure prognostick of what was to befall them. The *sortes Homericae, Virgiliana, Prænestina*, &c. used by the heathens, were with the same view, and in the same manner. See **SORTES**.

St. Augustin seems to approve of this method of determining things future, and owns that he had practised it himself; grounded on this supposition, that God presides over *Chance*; and on *Proverbs* xvi. v. 33.

Many among the modern divines, hold *Chance* to be conducted in a particular manner by providence, and esteem it an extraordinary way which God uses to declare his will, and a

kind of immediate revelation.

CHANCE-MEDLEY, in law, the accidental killing of a man, not altogether without the killer's fault, though without any evil intent.

Stamford calls it, *Homicide by misadventure*: West calls it *Homicide mixed*; and says, it is when the killer's ignorance or negligence is joined with the *Chance*: as supposing a man lopping trees by the highway, and a bough falling chance to kill a passenger; the party here offends in not having given warning, whereby the slain might have been induced to take more heed.

CHANCELLOR*, is properly that part of the choir of a church, between the altar, or communion table, and the balustrade, or rail that incloses it; where the minister is placed at the celebration of the communion.

* The word comes from the Latin *Cancellus*, which in the lower Latin is used in the same sense, from *Cancelli*, lattices, or crosses bars, wherewith the *Chancelli* were antiently inclosed, as they now are with rails.

The right of a seat and a sepulchre in the *Chancell*, is one of the privileges of founders of a Church.

CHANCELLOR, an officer, supposed originally to have been a notary, or scribe, under the emperors, and named *Cancellarius*, because he sat behind a lattice, called in Latin *Cancellus*, to avoid being crouded by the people.

Naude says, it was the emperor himself who sat and rendered justice within the lattice; the *Chancellor* attending at the door thereof, whence he took his title.

Others say, he had it from this, that all letters, addresses, petitions, &c. to the king, being first examined by him, were cancelled where amiss; others, because all patents, commissions, and warrants coming from the king, were examined and cancelled by him. Others, because he cancelled and annulled the sentences of other courts.

Du Cange, from Joannes de Janua, fetches the original of the word *Chancellor* from Palestine, where the houses being flat, and made in form of a terrace, with parapets or pallisades called *Cancelli*; those who mounted these houses to rehearse any harangue, were called *Cancellarii*: whence the name passed to those who pleaded at the bar, which he calls *Cancelli forenses*, and at length to the judge who presided; and lastly to the king's secretaries.

This officer is now in great authority in all countries: the person who bears it with us, or the

Lord High CHANCELLOR of England, is the first person of the realm, next after the king, and princes of the blood, in all civil affairs. He is the chief administrator of justice next the sovereign; being the judge of the court of chancery.

All other justices are tied to the strict law, but the *Chancellor* has the king's absolute power to moderate the rigor of the written law, to govern his judgment by the law of nature and conscience, and to order all things *secundum equum et bonum*. Accordingly, Stamford says, the *Chancellor* has two powers, the one absolute, the other ordinary; meaning, that though by his ordinary power he must observe the same form of procedure as other judges, yet in his absolute power he is not limited by any written law, but by conscience and equity.

The offices of *Lord Chancellor* and *lord keeper*, are by the statute 5 *Edw.* made the same thing; till that time they were different; and frequently subsisted at the same time in different persons: sometimes the *lord Chancellor* had a *Vice-Chancellor*, who was keeper of the seal.

The keeper was created *per traditionem magni Sigilli*, but the *lord Chancellor* by patent, though now that he has the keeper's office, he is created in like manner by giving him the seal. The *Chancellor* is likewise speaker of the house of Lords. See **PARLIAMENT**.

Though he be sole judge of the court of chancery, yet in matters of much difficulty he sometimes consults the other judges; so that this office may be discharged by one who is no professed lawyer, as antiently it commonly was. He has twelve assistants, or coadjutors, antiently called *Clerici*, as then being in holy orders, now *Masters in Chancery*, the first whereof is the *Master of the Rolls*. See **MASTER of the Rolls**, **MASTERS in Chancery**, &c.

CHANCELLOR of a Diocese, is a judge of the bishop's court, held in the cathedral of each diocese.

He was antiently called *Ecclesiasticus*, and *Ecclesiae Causidicus*, the church-lawyer. See **BISHOP'S COURT**.

CHANCELLOR of a Cathedral. His office is thus described in the Monastic: *viz.* to hear the lessons, and lectures read in the church, either by himself or his vicar; to correct and set right the reader when he reads amiss; to inspect schools, to hear causes, apply the seal, write and dispatch the letters of the chapter, keep the books, take care there be frequent preachings, both in the church and out of it, and assign the office of preaching to whom he lists.

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CHANCELLOR of the *Dutchy of Lancaster*, is an officer, the head of that court; whose business is to judge and determine all controversies between the king, and his tenants of the dutchy land; and otherwise to direct all the king's affairs relating to that court. See **DUTCHY Court**.

CHANCELLOR of the *Exchequer*, is an officer, supposed by some to have been created for moderating extremities in the exchequer.

He sometimes sits in that court and the exchequer-chamber, and, with the rest of the court, orders things to the king's best benefit. He is always in commission with the lord treasurer for letting lands accruing to the crown by dissolution of abbies, and otherwise: he has power, with others, to compound for forfeitures on penal statutes, bonds, and recognizances entered into by the king.

He has a great authority in managing the royal revenue, and in matters of first-fruits.

The court of equity, in the exchequer-chamber, is held before the lord treasurer, *Chancellor*, and barons, as that of common law before the barons only.

CHANCELLOR of an *University*, is he who seals the diplomas or letters of degrees, provision, &c. given in the university.

The *Chancellor* of Oxford is their chief magistrate, elected by the students themselves: his office is *durante vita*, to govern the university, preserve and defend its rights and privileges, convoke assemblies, and do justice among the members under his jurisdiction.

Under the *Chancellor* is the *Vice-Chancellor*, who is chosen annually; being nominated by the *Chancellor*, and elected by the university in convocation. His business is to supply the *Chancellor's* absence.

At his entrance upon his office, he chuses four *Pro-Vice-Chancellors*, out of the heads of colleges, to one of whom he deposes his power in his absence.

The *CHANCELLOR* of *Cambridge*, is in most respects the same with that of Oxford, only he does not hold his office *durante vita*, but may be elected every three years.

He has under him a commissary, who holds a court of record of civil causes, for all persons of the university under the degree of masters of arts.

The *Vice-Chancellor* of Cambridge is chosen annually by the senate, out of two persons nominated by the heads of the several colleges and halls.

CHANCELLOR of the *Order of the Garter*, and other military orders, is an officer who seals the commissions, and mandates of the chapter and assembly of the knights, keeps the register of their deliberations, and delivers ads thereof under the seal of the order. See **GARTER**.

CHANCERY, the grand court of equity, and conscience, instituted to moderate the rigor of the other courts that are tied to the strict letter of the law.

The judge of this court is the lord high chancellor, whose jurisdiction see under **CHANCELLOR**.

The proceedings of this court are either *Ordinary*, like other courts, according to the laws, statutes, and customs of the nation, by granting out writs remedial and mandatory, writs of grace, &c. Or *Extraordinary*, according to equity and conscience, by bills, answers, and decrees, to examine frauds, combinations, trusts, secret uses, &c. to soften the severity of common law, and rescue people from oppression; to relieve them against cheats, unfortunate accidents, breaches of trust, &c.

Out of the court of *Chancery*, are issued writs or summons's for parliaments and convocations, edicts, proclamations, charters, protections, patents, safe conducts, and writs of moderate misericordia, &c.

Here are also sealed and enrolled letters patent, treaties and leagues, deeds, writs, and commissions.

The officers of this court, beside the lord chancellor, who is supreme judge, are, the master of the rolls, who, in the chancellor's absence, hears causes, and gives decrees; and twelve *Masters of Chancery*, who are assistants, and sit by turns on the bench.

For the equity part of this court are six clerks, who have each under him about fifteen more, in the nature of attorneys of the court: two chief examiners, for examining witnesses, who have each five or six clerks apiece: one principal register, who has four or five deputies: clerk of the crown, who makes writs, commissions &c. Warden of the Fleet, Sergeant at arms, who bears the mace before the chancellor; and the usher and crier of the court.

To the common law part belong the twenty-four curfitors, and their clerks, who make out original writs; clerks of the petty bag; clerks of the hanaper; controller of the hanaper; clerk of appeals; clerk of the faculties; sealer; chafe-wax; clerks of the patents, of presentations, dismissions, licenses to alienate, enrollments, protections, subpoenas, affidavits, &c. See each under its proper article.

CHANDELIER, or **CHANDELEER**, in fortification, a wooden frame, wherein are laid fascines or faggots, to cover the work-

CHA

men instead of a parapet.—See **Tab. Fortif.** fig. 25.

Chandeliers are sometimes also made to prevent the enemy from seeing what passes within.

The difference between *Chandeliers*, and blinds, consists in this, that the former serve to cover the pioneers before, and the latter also cover them over head.

CHANGE, in commerce, &c. See **EXCHANGE**.

CHANGER, or **CHAUINGER**, an officer belonging to the king's mint, who changes money for gold, or silver bullion. See **MINT**.

Money-CHANGER, is a banker, who deals in the exchange, receipt, and payment of monies. See **BANKER**.

CHANGES, in arithmetic, &c. the permutations or variations of any number of quantities; with regard to their position, order, &c.

To find all the possible Changes of any number of quantities, or how oft their order may be varied:

Suppose two quantities *a* and *b*. Since they may be either wrote *a b* or *b a*, it is evident their *Changes* are 2=2. 1. Suppose three quantities *a b c*: their *Changes* will be as in the margin; *c a b* as is evident by combining *c* first with *a b*, then with *b a*; and hence the number of *Changes* arises 3. 2. 1=6. If *a b c* the quantities be 4, each may be combined four ways with each order of the other three; whence the number of *c b a* *Changes* arises 6. 4=4. 3. 2. 1=24. Wherefore, if *b c a* the number of quantities be supposed *n*, the number of *b a c* *Changes*, will be $n \cdot n - 1 \cdot n - 2 \cdot n - 3 \cdot n - 4 \cdot \&c.$ If the same quantity occur twice, the *Changes* of two will be found *b b*, of three *b a b*, *a b b*, *b b c*; of four *c b a b*, *b c a b*, *b a b c*. And thus the number of *Changes* in the first case will be 1=2. (2. 1): 2. 1; in the second, 3=(3. 2. 1): 2. 1; in the third, 12=(4. 3. 2. 1): 2. 1.

If a fifth letter be added, in each series of four quantities, it will beget five *Changes*, whence the number of all the *Changes* will be 60=(5. 4. 3. 2. 1): 2. 1. Hence if the number of quantities be *n*, the number of *Changes* will be $(n \cdot n - 1 \cdot n - 2 \cdot n - 3 \cdot n - 4 \cdot \&c.) : 2. 1$. From these special formulae may be collected a general one, viz. if *n* be the number of quantities, and *m* the number which shews how oft the same quantity occurs; we shall have $(n \cdot n - 1 \cdot n - 2 \cdot n - 3 \cdot n - 4 \cdot n - 5 \cdot n - 6 \cdot n - 7 \cdot n - 8 \cdot n - 9 \cdot \&c.) : (m - 1 \cdot m - 2 \cdot m - 3 \cdot m - 4 \cdot \&c.)$. The series being to be continued, till the continual subtraction of unity from *n* leave 0. After the same manner we may proceed further, till putting *n* for the number of quantities, and *l, m, r, &c.* for the number that shews how oft any of them is repeated, we arise at an universal form, $(n \cdot n - 1 \cdot n - 2 \cdot n - 3 \cdot n - 4 \cdot n - 5 \cdot n - 6 \cdot n - 7 \cdot n - 8 \cdot \&c.) : (l \cdot l - 1 \cdot l - 2 \cdot l - 3 \cdot l - 4 \cdot l - 5 \cdot \&c. \cdot m \cdot m - 1 \cdot m - 2 \cdot m - 3 \cdot \&c.) : r \cdot r - 1 \cdot r - 2 \cdot r - 3 \cdot r - 4 \cdot r - 5 \cdot \&c.$

Suppose, for instance, $n = 6, l = 3, r = 0$. The number of *Changes* will be $(6 \cdot 5 \cdot 4 \cdot 3 \cdot 2 \cdot 1) : (3 \cdot 2 \cdot 1 \cdot 3 \cdot 2 \cdot 1) = (6 \cdot 5 \cdot 4) : 3 \cdot 2 = 2 \cdot 5 \cdot 2 = 20$.

Hence, suppose thirteen persons at a table, if it be required how oft they may change places; we shall find the number 13. 12. 11. 10. 9. 8. 7. 6. 5. 4. 3. 2. 1 = 6227020800.

In this manner may all the possible anagrams of any word be found in all languages, and that without any study: suppose, *o. g.* it were required to find the anagrams of the word *amor*, the number of *Changes* will be

a	o	a	m	r	o	a	m	a	r	o	a	r	o	m			
a	o	m	r	o	a	m	a	r	o	a	r	o	m				
m	a	o	m	o	r	a	a	o	m	r	a	o	m	r			
a	m	o	a	r	a	o	m	r	a	o	m	r	a	o			
r	o	m	a	o	r	a	m	o	r	a	m	r	a	o			
o	m	a	o	r	m	a	r	o	a	m	a	r	o	m			
m	o	a	o	m	r	a	o	a	m	r	a	o	m	r			
m	a	o	a	m	a	r	a	o	m	r	a	o	m	r			
														r	a	o	m

The anagrams therefore of the word *amor*, in the Latin tongue, are *roma, roma, maro, rama, armo*. See **ANAGRAM**.

Whether this new method of anagrammatizing be like to prove of much service to that art, is left to the poets.

CHANNEL, in anatomy, chirurgery, &c. See **CANAL**.

CHANNEL, or *bed of a river*. See **RIVER**.

CHANNEL is also applied to divers arms of the sea, where the water runs within the land; or to certain narrow seas, confined between two adjacent continents, or between an island and continent.

In this sense, we say, *St. George's Channel*, the *British Channel*, the *Channel of the Black Sea*, of *Constantinople*, &c.

CHANNEL, in building. See **GUTTER**.

CHANNEL of the *Volute*, in the Ionic capital, is the face of its circumvolution; inclosed by a listel. See **VOLUTE**.

CHANNEL of the *Larmier*, is the hollow fossit of a cornice, which makes the pendant mouchette. See **LARMIER**.

CHANNELINGS. See the article **FLUTINGS**.

CHANT, **CANTUS**, is used for the vocal music of churches. In church history we meet with divers kinds of *Chant*, or *Song*: the first is the *Ambrosian*, established by St. Ambrose. See **AMBROSIAN Chant**.

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The second, the *Gregorian Chant*, introduced by pope Gregory the great, who established schools of *Chantors*, and corrected the church song.

This is still retained in the church under the name of *Plain Song*: at first it was called the *Roman Song*.

The *Plain*, or *Gregorian Chant*, is where the choir and people sing in unison, or all together in the same manner.

CHANT-Royal. See the article COMEDY.

CHANTLATE, in building, a piece of wood fastened near the ends of the rafters, and projecting beyond the wall, to support two or three rows of tiles, so placed to prevent the rain-water from trickling down the sides of the wall.

CHANTOR, or CHAUNTOR, a person who sings in the choir of a cathedral.

All great chapters have *Chantors* and chaplains to ease and assist the canons, and officiate in their absence.

St. Gregory first instituted the office of *Chantors*, erecting them into a body, called *Schola Cantorum*: though Anastasius seems to attribute their rise to pope Hilary, who lived an hundred years before Gregory.

But the word grows obsolete in this sense, and instead thereof we use the word *Chorister*, or singing-man.

CHANTOR is used, by way of excellence, for the precentor, or master of the choir; which is one of the dignities of the chapter.

The *Chantor* bears the cope and the staff at solemn festivals; and gives tune to the rest at the beginning of psalms and antiphons.

The antients called the *Chantor*, *Primicerius Cantorum*.

To him formerly belonged the direction of the deacons, and other inferior ministers.

CHANTRY, or CHAUNTRY. See the article CHAUNTY.

CHAOLGY, the history or description of the chaos.

Orpheus, in his *Chaology*, sets forth the different alterations, creations, and divers forms which matter went through till it became inhabitable; which amounts to the same with what we otherwise call *Cosmogony*, or the creation of the world.

Dr. Burnet likewise gives us a *Chaology*, in his theory of the earth. He represents the *Chaos*, as it was at first, entire, undivided, and universally rude and deformed; or the tohu bohü: then shews how it came divided into its respective regions; how the homogeneous matter gathered itself apart from all of a contrary principle; and lastly, how it hardened and became a solid habitable globe.

CHAOS, among the antient philosophers, was described a dark, turbulent kind of atmosphere; or a disorderly system, or mixture of all sorts of particles together, without any form or regularity: out of which the world was formed.

Chaos is every-where represented as the first principle, ovum, or seed of nature, and the world. All the ancient sophists, sages, naturalists, philosophers, theologues, and poets, hold that *Chaos* was the eldest and first principle, *το Αρχειον* &c.

The Barbarians, Phœnicians, Egyptians, Persians, &c. all refer the origin of the world to a rude, mixed, confused mass of matter. The Greeks, Orpheus, Hesiod, Menander, Aristophanes, Euripides, and the writers of the cyclic poems, all speak of the first *Chaos*: the Ionic and Platonic philosophers build the world out of it. The Stoics hold, that as the world was first made of a *Chaos*, it shall at last be reduced to a *Chaos*; and that all its periods and revolutions in the mean time, are only transitions from one *Chaos* to another. Lastly, the Latins, as Ennius, Varro, Ovid, Lucretius, Statius, &c. are all of the same opinion. Nor is there any sect or nation whatever, that does not derive their *Διακοσμουσις*, the structure of their world, from a *Chaos*.

The opinion first arose among the Barbarians, whence it spread to the Greeks, and from the Greeks to the Romans and other nations.

Dr. Burnet observes, that besides Aristotle and a few other pseudo-Pythagoreans, no body ever asserted, that our world was always, from eternity, of the same nature, form, and structure as at present: but that it had been the standing opinion of the wise men of all ages, that what we now call the terrestrial globe, was originally an unformed, indigested mass of heterogeneous matter, called *Chaos*; and no more than the rudiments, and materials of the present world.

It does not appear who first broached the notion of a *Chaos*. Moses, the eldest of all writers, derives the origin of his world, from a confusion of matter, dark, void, deep, without form, which he calls *Tohu Bohu*; which is precisely the *Chaos* of the Greek and Barbarian philosophers. And hence, possibly, might those philosophers derive their *Chaos*, with some alteration and interpolation.

Moses goes no further than the *Chaos*; nor tells us whence it took its origin, or whence its confused state; and where Moses stops, there, precisely, do all the rest.

Dr. Burnet endeavours to shew, that as the ancient philosophers, &c. who wrote of the cosmogony, acknowledged a *Chaos* for the principle of their world; so do the divines, or writers of the theogony, derive the origin or generation of their fabled gods from the same principle.

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Mr. Whiston supposes the ancient *Chaos*, the origin of our earth, to have been the atmosphere of a comet; which, though new, yet, all things considered, is not the most improbable assertion. He endeavours to make it out by many arguments, drawn from the agreement which appears to be between them.

So that, according to him, every planet is a comet, formed into a regular and lasting constitution; and placed at a proper distance from the sun, revolving in a nearly circular orbit: and a comet is a planet either beginning to be destroyed, or re-made; that is, a *Chaos* or planet unformed, or in its primæval state, and placed, as yet, in an orbit very eccentrical. See COMET.

CHAP. See CHILBLAIN.

CHAPEAU, in a general sense. See the article HAT.

CHAPEAU, is sometimes also used to denote the cap, or coronet armed with ermin, worn by dukes, &c.

The crest is born on the *Chapeau*; and by the *Chapeau* the crest and coat are separated; it being a rule, that no crest must touch the shield immediately.

CHAPEL*, or CHAPPEL, a kind of little church, served by an incumbent properly under the denomination of a *Chaplain*.

* The word *Chapel*, according to some, comes from the Greek *καπηλειον*, little tents, or booths, set up by traders in fairs to shelter them from the weather. Papias fetches it both from the Greek and Latin, *quasi capiens dæon*, or, *populum vel laudem*: others derive it from the *Chape*, or cope which served to cover the body: others, *à pellibus Caprarum*; because these places were antiently covered with goatskins. Rebuff derives it from *Capp*, St. Martin's cope, which the kings of France carried to war with them as their standard, and preserved very carefully in particular tents, thence called *Chapels*.

There are two kinds of *Chapels*, the one consecrated, and held as benefices: the other secular, being of the nature of oratories.

The first are built apart, and at a distance from the parish-church; being neither parishes, cathedrals, nor priories, but subsisting of themselves.

These are called by the canonists *Sub-Dio*, and by us *Chapels of ease*; as being erected at a distance from the mother-church, where the parish is large and wide, for the ease and conveniency of some of the parishioners who reside far off.

These are served by some inferior pastor, provided either by the rector of the parish, or by those for whose ease and benefit they are intended.

The second kind are frequently built in, or adjoining to a church, as a part thereof; having only a desk, &c. to read prayers in; and, in the Romish churches, an altar, &c. to celebrate mass on: but without any baptistry, or font.

These the canonists call *Sub recto*. They are generally erected by some considerable person, for the use of their own families; *ut ibidem familiaria sepulchra sibi constituant*.

The twenty-first canon of the council of Agda, held in 506, allows private persons the use of *Chapels*; but with prohibition to all clerks to officiate in them without leave from the bishop.

Free CHAPELS, are those *Chapels of ease* which have settled a revenue for perpetual maintenance of a pastor, &c. by charitable donations of lands, or rents bestowed on them; so as not to be any charge either to the rector, or the parishioners.

There are several collegiate churches in France, which they call *Saintes Chapelles*, holy *Chapels*; as those of Paris, Dijon, Bourges, Bourbon, &c. These are so denominated, by reason there are relics in them.

Hence, all those places where relics were preserved came to be called *Chapels*; and the persons who had the care of them, *Chaplains*.

CHAPEL is also a name given to a printer's workhouse; by reason, say some authors, printing was first actually performed in *Chapels*, or churches.

In this sense, they say, the orders, or laws of the *Chapel*, the secrets of the *Chapel*, &c.

Knights of the CHAPEL, was an order of knights instituted by king Henry VIII. in his testament, to the number of thirteen; tho' these have been increased to the number of twenty-six: they are called also *Paor Knights*.

These are not knights of the order of the garter; but are, as it were, their assistants or deputies, serving to discharge all their offices in the funeral services of the kings of England. They are subject to the office of the canons of Windsor, and live on pensions which the order assigns them.

They bear the blue or red cloke, with the arms of St. George on the left shoulder; and the cloke is only cloth, and they wear no sort of garter: which distinguishes them sufficiently from the knights of the garter.

CHAPERON, CHAPERONNE, or CHAPERON, properly signifies a sort of hood, or covering of the head, antiently wore both by men and women, the nobles, and the populace, and afterwards appropriated to the doctors, and licentiates in colleges, &c.

Hence, the name passed to certain little shields, and other funeral devices, placed on the foreheads of the horses that drew the hearses in pompous funerals, and which are still called *Chaperons*.

rooms, or *Shafferoons*; by reason such devices were originally fastened on the *Chaperonnes*, or hoods, wore by those horses with their other coverings of state.

CHAPTERS, in law, were antiently a summary of such matters as were to be inquired of, or presented before justices in eyre, justices of assize, or of the peace, in their sessions.

Chapters are now taken for articles delivered by the mouth of the justice in his charge to the inquest: though it appears from Bracton and Briton, they were formerly written exhortations given by the justices, for the good observation of the laws, and the king's peace; first read in open court, then delivered in writing to the grand inquest: which the grand jury, or inquest, were likewise to answer to upon their oaths, either affirmatively, or negatively.

CHAPLAIN, properly signifies, a person provided of a chapel; or who discharges the duty thereof. See **CHAPEL**.

CHAPLAIN is also used for an ecclesiastical person, in the house of a prince, or a person of quality, who officiates in their chapels, &c.

With us there are forty-eight *Chaplains* to the king, who wait four each month, preach in the chapel, read the service to the family, and to the king in his private oratory, and say grace in the absence of the clerk of the closet.

While in waiting, they have a table and attendance, but no salary.

The first *Chaplains* are said to have been those instituted by the ancient kings of France, for preserving the *Chape*, or *Cape*, with the other relics of St. Martin, which the kings kept in their palace, and carried out with them to the war. The first *Chaplain* is said to have been Gul. de Mefmes, *Chaplain* to S. Louis.

CHAPLAIN in the order of Malta, is used for the second rank, or class, in that order; otherwise called *Diacon*.

The knights make the first class, and the *Chaplains* the second. See **MALTA**.

CHAPLAINS of the Pope, are the auditors, or judges of causes in the sacred palace; so called, because the pope antiently gave audience in his chapel, for the decision of cases sent from the several parts of Christendom.

He is hence summoned as assessors the most known lawyers of his time, and they hence acquired the appellation of *Capellani*, *Chaplains*.

It is from the decrees formerly given by these, that the body of decretals is composed: their number pope Sixtus IV. reduced to twelve.

If it be true, that the word *Chaplain* was first applied to those who preserved St. Martin's Chape, as above, the word must be derived from *Capa*, *Chape*, not from *Capella*, or *Capella*, or *Cassia*, a case, as others imagine.

Some say, the shrines of relics were covered with a kind of Tent, *Cape*, or *Capella*, i. e. little cape; and that hence the priests who had the care of them, were called *Chaplains*. In time, these relics were deposited in a little church, either contiguous to a larger, or separate from it; and the same name, *Capella*, which was given to the cover, was also given to the place where it was lodged; and hence the priest who looked to it came to be called *Chaplain*.

CHAPELET, or **CHAPELET**, a string of beads, used in the Romish church, to keep account of the number of pater-nosters, and ave-marys to be rehearsed in honour of God, and the holy virgin.

Chaplets are otherwise called *Pater-Nosters*: there are *Chaplets* of coral, of diamonds, of callambo, of St. Lucy's wood, &c. A rosary is a *Chaplet* * of fifteen decads of ave-marys. See **ROSARY**.

* *Ménage* derives the word from *Chapeau*, hat: by reason of the resemblance the thing bears to a hatband, or *Chaplet* of roses, *Chapeau de roses*; the modern Latins call it, *Capellina*; the Italians more frequently *Corona*.

Larrey and P. Viret ascribe the first invention of the *Chaplet* to Peter the hermit, well known in the history of the *Crossades*.

There is a *Chaplet* of our Saviour, consisting of thirty-three beads, in honour of his thirty-three years living on earth, instituted by father Michael, the *Camalulian*.

The orientals have a kind of *Chaplet*, which they call *Chains*, and which they use in their prayers, rehearsing one of the perfections of God on each link, or head. The great Mogul is said to have eighteen of these chains, all of precious stones, some diamonds, others rubies, pearls, &c.

The Turks have likewise *Chaplets*, which they bear in the hand, or hang at the girdle: but, father Dandini observes, they differ from those used by the Romanists, in that they are all of the same bigness, and have not that distinction into decads; though they consist of six decads, or sixty beads. He adds, that the muslimen have presently run over the *Chaplet*, the prayers being extremely short, as containing only these words, *Praise to God*; or these, *Glory to God*, for each bead.

Besides the common *Chaplet*, they have likewise a larger one, consisting of one hundred beads, where there is some distinction, as being divided by little threads into three parts, on one of which they repeat thirty times *Soubhan allah*, i. e. *God is worthy to be praised*; on another, *Ellamb allah*, *Glory be to God*;

and on the third, *Alla eber, God is great*. These thrice thirty times making only ninety; to complete the number one hundred, they add other prayers for the beginning of the *Chaplet*. He adds, that the mahometan *Chaplet* appears to have had its rise from the *Mea heracath*, or hundred benedictions; which the Jews are obliged to repeat daily, and which we find in their prayer-books; the Jews and Mahometans having this in common, that they scarce do any thing without pronouncing some laud, or benediction.

CHAPELET, or **CHAPELET**, in architecture, a little moulding cut, or carved into round beads, pearls, olives, or the like.—See **Tab. Archit. fig. 12**.

A *Chaplet*, in effect, is little else but a baguette enriched with sculpture. See **BAGUETTE**.

CHAPPAR *, a courier of the king of Persia, who carries dispatches from court to the provinces, and from the provinces to the court. See **COURIER**.

* The word, in the original Persian, signifies *Courier*.

The posts, M. Tavernier tells us, are not established and regulated in Persia as among us: when the court sends out a *Chappar*, the sophi's master of the horse furnishes him with a single horse, how long soever his journey be, and a man to run after him: when his horse is weary, he takes that of the first horseman he meets with, who dares not make the least refusal, and sends his own home by the man who follows him. As for the master of the new horse he has taken, he must run, or at least fend after the *Chappar* to retake him, when the *Chappar* dismounts some other horseman to change him.

CHAPPE, in heraldry, the partition of an escutcheon, by lines drawn from the center of the upper edge to the three angles below: as represented in **Tab. Herald. fig. 14**, which they blazon *Chappe Or*, and *Vert*.

The sections of the sides are to be of a different colour from the rest. Makenzy calls it, *A chief party per bend dexter, or sinister*, or both.

CHAPPEL, or **CHAPEL**. See the article **CHAPEL**.

CHAPTER, **CAPITULUM**, a community of ecclesiastics belonging to a cathedral, or collegiate church.

The chief, or head of the *Chapter*, is the dean; the body consists of canons, or prebendaries, &c.

The *Chapter* has now no longer any share in the administration of the diocese, during the life of the bishop; but succeeds to the whole episcopal jurisdiction during the vacancy of the see.

The origin of *Chapters* is derived from hence, that antiently the bishops had their clergy residing with them in their cathedrals, to assist them in the performance of sacred offices, and in the government of the church; and even after parochial settlements were made, there were still a body of clerks who continued with the bishop, and were indeed his family, maintained out of his income.

After the monastick life grew into request, many bishops chose monks rather than seculars for their attendants.

These bodies, either of monasticks or seculars, then had the same privilege of choosing the bishop, and being his council, which the whole clergy of the diocese had before: but, by degrees, their dependance on the bishop grew less and less; and then they had distinct parcels of the bishop's estate assigned them for their maintenance; till at last, the bishop had little more left than the power of visiting them.

On the other hand, these capitular bodies by degrees also lost their privileges; particularly that of choosing the bishop, for which the kings of England had a long struggle with the pope: but at last, Henry VIII. got this power vested in the crown; and now the deans and *Chapters* have only the shadow of it.

The same prince likewise expelled the monks from the cathedrals, and placed secular canons in their room; those he thus regulated, are called *Deans* and *Chapters of the new foundation*; such are Canterbury, Winchester, Worcester, Ely, Carlisle, Durham, Rochester, and Norwich: such also are the *Chapters* of the four new sees, of Peterborough, Oxford, Gloucester, and Bristol.

CHAPTER, is also applied to the assemblies held by religious, and military orders, for deliberating on their affairs, and regulating their discipline.

Papias says, they are so called, *quod Capitula ibi legantur*.

The establishment of general *Chapters* of religious orders, is owing to the Cistercians, who held the first in 1116, and were soon followed by the other orders.

CHAPTER is also used for a division of a book; contrived for keeping the matters treated thereon more separate, clear, and distinct.

The antients were unacquainted with the division of books into *Chapters*, and sections: Papias says, the name *Chapter*, *Caput*, arose hence, *quod sit alterius sententia Caput, or quod Caput, totam summam*. S. Augustine compares *Chapters* to inns, inasmuch as they refresh the reader, as those the traveller.

The three **CHAPTERS**, is a phrase famous in ecclesiastical history, signifying a volume published by Theodoret, an adherent of Nestorius, against St. Cyril; consisting of a letter of Ibas priest of Edessa, to Marius a bishop of Persia; of extracts from the works of Diodorus of Tarsus, and Theodore of Mopsuestia, wherein the same doctrines were taught, that were contended for

for by Nestorius: and of two pieces of Theodoret, the one against the council of Ephesus, the other against the anathemas of St. Cyril.

These make the famous three *Chapters*; which have been, since, condemned by various councils and many popes.

CHAPTREL. See the article IMPOST.

CHARACTER*, in a general sense, signifies a mark, or figure drawn on paper, metal, stone, or other matter, with a pen, graver, chisel, or other instrument, to signify, or denote any thing.

* The word is Greek, χαρακτηρ, formed from the verb χαρασσειν, *insculpere*, to engrave, impress, &c.

The various kinds of *Characters* may be reduced to three heads, *viz.* *Literal Characters*, *Numeral Characters*, and *Abbreviations*.

LITERAL CHARACTER, is a letter of the alphabet, serving to indicate some articulate sound, expressive of some idea, or conception of the mind.

These may be divided, with regard to their nature and use, into *Nominal*, *Real*, and *Emblematical*.

NOMINAL CHARACTERS are those we properly call *Letters*; which serve to express the names of things.

REAL CHARACTERS, are those that instead of names, express things, and ideas.

Emblematical, or *symbolical CHARACTERS*, have this in common with real ones, that they express the things themselves; but they also have this further, that they in some measure personate them, and exhibit their form: such are the hieroglyphics of the ancient Egyptians.

LITERAL CHARACTERS may be again divided, with regard to their invention and use, into *Particular* and *General*.

PARTICULAR CHARACTERS, are those peculiar to this, or that nation; or that have been so: Such are the Roman, Italian, Greek, Hebrew, Arabic, Gothic, Chinese, &c. *Characters*.

UNIVERSAL CHARACTERS, are also *real Characters*, and make what some authors call a *Philosophical Language*.

The diversity of *Characters* used by the several nations to express the same idea, is found the chief obstacle to the advancement of learning; to remove this, several authors have taken occasion to propose plans of *Characters* that should be universal, and which each people should read in their own language. The *Character* here is to be real, not nominal: to express things, and notions; not, as the common ones do, letters, or sounds: yet to be mute, like letters, and arbitrary; not emblematical, like hieroglyphics.

Thus, every one should retain their own language, yet every one understand that of each other, without learning it; only by seeing a real or universal *Character*, which should signify the same thing to all people; by what sounds forever each express'd it in his particular idiom. For instance, by seeing the *Character* destined to signify to drink, an Englishman should read to drink; a Frenchman *boire*; a Latin *bibere*; a Greek *πινεν*; a Jew *שׂוּב*; a German *truncken*; and so of the rest: in the same manner as seeing a horse, each people expresses it after their own manner; but all mean the same animal.

This real *Character* is no chimera; the Chinese and Japonese have already something like it. They have a common *Character* which each of those nations understand alike in their several languages; though they pronounce it with such different sounds, that they do not understand a tittle of one another in speaking.

The first, and most considerable attempts for a real *Character*, or philosophical language in Europe, are those of bishop Wilkins, and Dalgarnie: but these, with how much art forever they were contrived, have yet proved ineffectual.

M. Leibnitz had some thoughts the same way; he thinks those great men did not hit the right method. And adds, it was probable, indeed, that by this means, people, who do not understand one another, might easily have a commerce together; but that they have not hit on true, *real Characters*.

According to him, the *Characters* should resemble those used in algebra; which, in effect, are very simple, yet very expressive; without any thing superfluous or equivocal; and contain all the varieties required.

The real *Character* of bishop Wilkins has its just applause: Dr. Hook recommends it on his own knowledge and experience, as a most excellent scheme; and to engage the world to the study thereof, publishes some fine inventions of his own therein.

M. Leibnitz tells us, he had under consideration an *Alphabet of human thoughts*; in order to a new philosophical language, on his own scheme; but his death prevented this from being brought to maturity.

M. Lodwic, in the *Philosophical Transactions*, gives us a plan of an universal *Alphabet*, or *Character* of another kind: this was to contain an enumeration of all such single sounds, or letters, as are used in any language; by means whereof, people should be enabled to pronounce truly and readily any language; to describe the pronunciation of any language that should be pronounced in their hearing; so, as others accustomed to this language, though they had never heard the language pronounced, should at first be able truly to pronounce it: and, lastly, this *Character* to serve as a standard to perpetuate the sounds

of any language.

In the *Journal Litteraire*, an 1720, we have a very ingenious project for an universal *Character*: the author, after obviating the objections that might be made against the feasibility of such schemes in the general, proposes his own: his *Characters* are to be the common Arabic, or numeral figures. The combinations of these nine are sufficient to express distinctly an incredible quantity of numbers, much more than we shall need terms to signify our actions, goods, evils, duties, passions, &c. Thus is all the trouble of framing and learning any new *Characters* at once saved: the Arabic figures having already all the universality required.

The advantages are immense: for 1^o, We have here a stable, faithful interpreter; never to be corrupted or changed, as the popular languages continually are. 2^o, Whereas the difficulty of pronouncing a foreign language, is such as usually gives the learner the greatest trouble, and there are even some sounds which foreigners never attain to; in the *Character* here proposed this difficulty has no place: every nation is to pronounce them according to the particular pronunciation that already obtains among them. All the difficulty is, the accommodating the pen and the eye to affix certain notions to *Characters* that do not, at first sight, exhibit them. But this trouble is no more than we find in the study of any language whatever.

The inflections of words, are here to be expressed by the common letters: for instance, the same *Character* shall express a *Filly*, or a *Colt*, a *Horse*, or a *Mare*, an *old Horse*, or an *old Mare*, as accompanied with this or that distinctive letter, which shall shew the sex, youth, maturity, or old age: a letter is also to express the bigness or size of things; thus, *v. g.* a man with this or that letter, to signify a *great man*, or a *little man*, &c.

The use of these letters belongs to the grammar, which once well understood, would abridge the vocabulary exceedingly. An advantage of this grammar, is, that it would only have one declension and one conjugation: those numerous anomalies of grammarians are exceeding troublesome, and arise hence, that the common languages are governed by the populace, who never reason on what is best: but in the *Character* here proposed, men of sense having the introduction of it, would have a new ground, whereon to build regularly.

The difficulty is not in inventing the most simple, easy and commodious *Character*, but in the engaging the several nations to use it; there being nothing they agree less in, than the understanding and pursuing their common interest.

LITERAL CHARACTERS, again, may be divided with respect to the nations among whom they have been invented and used; into *Greek Characters*, *Roman Characters*, *Hebrew Characters*, &c. The *Character* now ordinarily used throughout Europe, is the *Latin Character* of the antients.

The *Latin Character* was formed from the Greek, and that from the Phœnician, which Cadmus brought into Greece.

The Phœnician *Character*, was the same with that of the antient Hebrew, which subsisted to the time of the Babylonish captivity; after which they used that of the Assyrians, which is the square Hebrew, now in use; the antient being only found on some Hebrew medals, commonly called *Samaritan Medals*. Ptolellus, and others shew, that beside the Phœnician, the Chaldee, Syriac, and Arabic *Characters* were likewise formed from the antient Hebrew.

The French were the first who, with the latin office of St. Gregory, admitted the *Latin Characters*. And in a provincial synod, held in 1091, at Leon in Spain, the use of the Gothic *Characters* invented by Ulfilas, was abolished, and the Latin ones established.

Medallists observe, that the Greek *Character*, consisting only of masculine letters, has preserved its uniformity on all medals, as low as the times of Gallienus; there being no alteration found in the turn of the *Character*, notwithstanding the many considerable ones both in the use and pronunciation. From the time of Gallienus, it appears somewhat weaker and rounder: from the time of Constantine to Michael, the space of five hundred years, we find only *Latin Characters*; and after Michael, the Greek *Characters* re-commence: but from that time they began to alter with the language, which was then a mixture of Greek and Latin. See GREEK.

The *Latin medals* preserve both their *Character* and language, as low as the translation of the seat of the empire to Constantinople. Towards the time of Decius the *Character* began to alter, and to lose of its roundness and beauty: some time after it retrieved itself, and subsisted tolerably till the time of Justin; when it fell into the last barbarity mentioned, under Michael; though it afterwards grew worse, and degenerated into the Gothic: so that the rounder and better formed the *Character* is on a medal, the greater pretence it has to antiquity.

NUMERAL CHARACTERS, are those used to express numbers.

Numeral Characters are either letters; or figures, otherwise called *Digits*.—The *digits* now chiefly in use, are the Common, and the Roman: to which may be added the Greek, and another called the *French Character*; as also the letters of other alphabets which have been made use of to express numbers.

Common Character is that ordinarily called the *Arabic*, as supposed to have been invented by the Arab astronomers; though the Arab

Arabs themselves call it the Indian Character; as if they had borrowed it from the people of India.

The Arabic Characters are ten, viz. 1, 2, 3, 4, 5, 6, 7, 8, 9, 0; the last is called Cipher.

The Arabic Character is used almost throughout Europe, and that on almost all occasions in commerce, in measuring, in astronomical calculations, &c.

Roman Character consists of the majuscule letters of the Roman alphabet; whence probably its name: or, perhaps, from its being used by the ancient Romans on their coins, and in the inscriptions of their public monuments erected in honour of their gods, and great men; on their sepulchres, &c.

The numeral letters that compose the Roman Character are in number seven, viz. I, V, X, L, C, D, M.

The I denotes one, V five, X ten, L fifty, C a hundred, D five hundred, and M a thousand.

The I repeated twice, makes two, II; thrice, three, III; four is expressed thus IV. I before V or X, taking an unit from the number expressed by each of those letters.

To express six, an I is added to a V, VI; for seven, two, VII; and for eight, three, VIII: nine is expressed by an I before X, IX; agreeably to the preceding remark.

The like remark may be made of the X before L or C, except that the diminution is by tens, not units; thus, XL signifies forty, and XC ninety; an L followed with an X, sixty, LX, &c. The C before D or M, diminishes each by a hundred.

Besides the letter D, which expresses five hundred, that number may also be expressed by I before a C inverted, thus IC; and thus, in lieu of the M, which signifies a thousand, is sometimes used an I between two Cs, the one direct, the other inverted, thus, CIO; * agreeable to this, six hundred may be expressed ICIC; and seven hundred, ICOC, &c.

The addition of C and O before, or after, raises CIO by tens, thus, CCICIO, 10000, CCCICIO, 100,000, &c.

This is the common way of notation, formerly used by the Romans; who also expressed any number of thousands by a line drawn over any numeral less than a thousand; e.g. V̄ 5000, IX̄ 60000, so likewise M̄ is 1,000,000; MM̄ is 2,000,000, &c.

Besides which, (I.) certain liberties or variations have been admitted, at least in some modern writers; e.g. IIX, 8; IICIX, 89. (II.) And certain Characters have been used, which seem to have been derived from the letters; e.g. M, by which they express (Mille) 1000, was turned into CXO, or CIO; half of which, viz. IO, stood for 500. (III.) And for the easier writing of these Characters, 1. IO seems to have been altered into D; 2. IC into A, or V; (3.) CIO into ∞ or A; whence 10000, 100000, 20000, V. X.

Greek Numerals. The Greeks had three ways of expressing numbers.

(I.) The most simple was, for every single letter, according to its place in the alphabet, to denote a number from a 1 to α 24; in which manner the books of Homer's Iliad are distinguished.

(II.) Another way was by dividing the alphabet into (1.) 8 units: α 1, β 2, &c. (2.) 8 Tens: ι 10, κ 20, &c. (3.) 8 Hundreds: ρ 100, σ 200, &c. N. B. Thousands they expressed by a point or accent under a letter, e.g. α̇ 1000, β̇ 2000, &c. (III.) A third way was by six capital letters, thus, I [iota] for 1000, Π [pi] for 2000, Δ [delta] for 4000, Η [eta] for 8000, Χ [chi] for 10000, and when the letter Π enclosed any of these, except I, it showed the enclosed letter to be five times its own value, as, [Δ] 50, [Π] 500, [Χ] 5000, [Μ] 50000. N. B. 6, 90, 900, are expressed by Characters.

Hebrew Numerals. The Hebrew alphabet was divided into 9 Units: א 1, ב 2, &c. — 9 Tens: י 10, כ 20, &c. — 9 Hundreds: ק 100, ר 200, &c. — 7 500, ח 600, ט 700, י 800, ק 900. — Thousands (1.) were sometimes expressed by the units prefixed to hundreds, as, קלד 1534, &c. and even to tens, as, קט 1070, &c. (2.) But generally by the word קלף 1000;

□□□□ 2000; □□□□□, with the other numerals prefix'd, to signify the number of thousands: e.g. □□□□□ 23000, &c.

French Character, so called, because invented and chiefly used by the French, is more usually denoted, Character of Account, or Finance.

It consists of six figures; partly taken from the letters of the usual current hand, and partly invented by the contriver; the six Characters are j, b, x, L, C, y. The j consonant standing for one, the b for five, the x for ten, the L for fifty, the C for an hundred, and the last Character y for a thousand.

This Character is only an imitation of the Roman Character; and its use is in most respects the same, particularly in what relates to the combination of certain letters, which placed before or after others, diminish or increase their value. Indeed it has these things peculiar in it, that when several units occur successively, only the last is expressed. 2dly, That ninety, and the following numbers to one hundred, are expressed thus, jiii xxx ninety; jiii xxxxi ninety one; jiii xxxxii, &c.

It is principally used in the chambers of accounts, in the accounts given in by treasurers, receivers, farmers, and other persons concerned in the management of the revenue.

CHARACTERS in printing, denote the letters or types, by the va-

rious arrangement whereof, are composed forms; whence impressions are taken, by means of a press, on paper. For the method of casting these Characters, see Letter-Foundry.

CHARACTER * is also used, in several of the arts, for a symbol, contrived for the more concise, immediate, and artful conveyance of the knowledge of things.

* In this sense of the word, Paulus Diaconus refers the invention of Characters to Ennius; who, he says, contrived the first eleven hundred. To these were many more added by Tyro, Cicero's freedman, and by Philargyrus, Fannius, and Aquila, freedmen of Mecenas.

Lastly, L. Annaeus Seneca made a collection of them, reduced them into order, and increased their number to five thousand. Tyro's notes may be seen at the end of Gruter's inscriptions.

Valerius Probus, a grammarian, in the time of Nero, laboured to good purpose in explaining the notes of the antients. P. Diaconus wrote an ample treatise of the explanation of the Characters in law, under the reign of the emperor Conrad I. and Goltzius another for those of medals.

Characters, or symbols, are now chiefly affected in the several parts of mathematicks; particularly in algebra, geometry, trigonometry, and astronomy: as also in medicine, chymistry, music, &c. The principal of each kind we shall here subjoin.

CHARACTERS used in Arithmetick and Algebra.

a, b, c, and d, the first letters of the alphabet, are the signs or Characters that denote given quantities; and x, y, z, &c. the last letters, are the Characters of quantities sought.

Note, Equal quantities are denoted by the same Character.

m, n, r, s, t, &c. are Characters of indeterminate exponents, both of ratios and powers; thus x^m, yⁿ, z^t, &c. denote indeterminate powers of different kinds; m, x, n, y, r, s, different multiples, or submultiples of the quantities x, y, z, according as m, n, r, are either whole numbers or fractions.

+ Is the sign of real existence, and is called the affirmative or positive sign; importing the quantities to which it is prefixed, to be of a real and positive nature.

It is also the sign of addition, and is read plus, or more; thus 9 + 3, is read 9 plus 3; or 9 more 3; that is, nine added to 3, or the sum of 9 and 3, equal to 12.

— Before a single quantity, is the sign of negation, or negative existence; shewing the quantity to which it is prefixed to be less than nothing.

Between quantities, it is also the sign of subtraction, and is read minus, or less; thus 14 — 2, is read, 14 minus, or abating, 2; that is, the remainder of 14, after 2 has been subtracted, viz. 12.

= Is the sign of equality: thus, 9 + 3 = 14 — 2; signifies, 9 plus 3, to be equal to 14, minus 2.

This Character was first introduced by Harriot: Des Cartes in lieu of it uses ∞. Before Harriot there was no sign of equality at all. Wolfius, and some other authors, use the same Character, = for the identity of ratios; or to denote the terms to be in a geometrical proportion: which most authors express thus: x is the sign of multiplication, denoting the quantities on either side to be multiplied into one another: thus, 4 x 6, is read 4 multiplied by 6; or the factum, or product of 4 and 6 = 24; or the rectangle between 4 and 6.

Ordinarily, however, in algebra, the sign is omitted, and the two quantities put together: thus, b d expresses the product of the two numbers denoted by b and d, which suppose 2 and 4, the product whereof is 8, signified by b d.

Wolfius and others, make the sign of multiplication a dot (.) between the two factors: thus 6.2 signifies the product of 6 and 2 = 12. Where one or both the factors are compounded of several letters, they are distinguished by a line drawn over them: thus, the factum of a + b — c into d, is wrote d $\overline{a + b - c}$. Guido Grandio, and after him Leibnitz, Wolfius, and others, to avoid the perplexity of lines, in lieu thereof distinguish the compound factors, by including them in a parenthesis, thus (a + b — c) d.

÷ Is the Character of division: thus, a ÷ b denotes the quantity a to be divided by b. Indeed, ordinarily in algebra, the quotient is expressed fraction-

wise; thus, $\frac{a}{b}$ denotes the quotient of a divided by b. Wolfius, &c. make the sign of division (:) thus, 8 : 4 denotes the quotient of 8 divided by 4 = 2.

If either the divisor or dividend, or both, be composed of several letters; v. g. a + b, divided by c; instead of writing the quotient fraction-wise thus $\frac{a + b}{c}$ Wolfius, &c. include the compound quantities in a parenthesis; thus, (a + b : c).

⊗ Is the Character of Evolution, or of producing any quantity by multiplying it by itself.

∞ The Character of Evolution, or of extracting the roots out of the several powers; the reverse of ⊗.

7 Is the sign of Majority, or of the excess of one quantity beyond another; some use this 7, or this 7.

∟ Is the sign of Minority: these two Characters were first introduced by Harriot, and have been since used by Wallis and Lamy. Other authors use others; some this, ∟; but the generality none at all.

∞ The sign of Similitude commended in the Miscellanea Bero-

linensia, and used by Leibnitz, Wolfius, and others; though the generality of authors use none. See SIMILITUDE.

The same Character is used in other authors for the difference between two quantities, while it is yet unknown which is the greater.

√ Is the Character of Radicality, and shews that the root of the quantity, to which it is prefixed, is extracted, or to be extracted; thus, √ 25, or √ 25, denotes the square root of 25, viz. 5. and √ 25, the cube root of 25. See ROOT.

This Character sometimes affects several quantities distinguished by a line drawn over them, thus √ b + d, denotes the sum of the square roots of b and d.

Wolfius, &c. in lieu hereof, includes the roots composed of several quantities in a parenthesis, adding its index: thus (a + b - c)² denotes the square of a + b - c, ordinarily written a + b - c.

∴ Is the Character of arithmetical proportion disjunct; thus 7 . 3 : 13 . 9. intimates three to be exceeded by 7, as much as 9 by 13; viz. by 4.

∴∴ This is the Character of identity of ratio, and geometrical proportion disjunct; thus 8 . 4 : 30 : 15. expresses the ratio of 30 to 15, to be the same with that of 8 to 4; or that the four terms are in geometrical proportion, viz. 8 to 4 as 30 to 15.

Wolfius, in lieu hereof, uses the Character of equality =, which he prefers to the former, as more scientific and expressive.

∴∴ The Character of geometrical proportion continued, implying the ratio to be carried on without interruption: thus, 2, 4, 8, 16, 32, ∴∴ are in the same uninterrupted proportion.

CHARACTERS in Geometry and Trigonometry. ∥ is the Character of parallelism; implying two lines or planes to be equi-distant from each other. See PARALLEL.

△ Character of a triangle. See TRIANGLE. □ A square. ∠ Equality of sides. ▭ A rectangle. ∟ An angle. ○ A circle. L A right angle.

∠ Equality of angles. ⊥ A perpendicular. ° A degree; thus 75° implies 75 degrees.

′ A minute, or prime; thus, 50′ implies 50′ minutes. ″ A second, or double prime; thus, 20″ implies 20″ seconds. 6 thirds, 18 fourths, and 20 fifths.

Note, the same Characters are sometimes used, where the progression is by tens, as it is here by sixties.

CHARACTERS used in the arithmetic of Infinites. ∞ The Character of an infinitesimal, or fluxion: thus, x, y, &c. express the fluxions, or differentials of the variable quantities x and y; two, three, or more dots, denote second, third, or higher fluxions.

This method of denoting the fluxions, we owe to Sir Isaac Newton, the inventor of fluxions: it is adhered to by the English; but foreigners generally follow M. Leibnitz, and in lieu of a dot prefix the letter d to the variable quantity; on pretence of avoiding the confusion arising from the multiplication of dots, in the differencing of differentials.

d The Character of a differential of a variable quantity; thus, dx is the differential of x; dy the differential of y.

The Character was first introduced by M. Leibnitz; and is followed by all but the English, who, after Sir Isaac Newton, express the differential by a dot over the quantity. See CALCULUS Differentialis.

CHARACTERS used in astronomy. ♄ Character of Saturn. ♊ Character of Gemini. ♃ Jupiter. ♋ Cancer. ♀ Mars. ♌ Leo. ♁ Venus. ♍ Virgo. ☿ Mercury. ♎ Libra. ☼ The Sun. ♏ Scorpio. ☾ The Moon. ♐ Sagittarius. ☿ The earth. ♑ Capricornus. ♈ Aries. ♒ Aquarius. ♉ Taurus. ♓ Pisces.

CHARACTERS of the aspects, &c. S Conjunction. □ Quartile. SS Semisextile. T d Tridecile. * Sextile. Δ Trine. Q Quintile. Bq Biquintile.

V c Quincunx. ♁ Opposition. ♏ Scorpion's head. ♏ Scorpion's tail.

CHARACTERS of time. A M (ante meridiem) or M. morning. G. or N. noon. P. M. (post meridiem) or A. afternoon.

Rests or Pauses of Time.

CHARACTERS used in music. Characters of the musical notes, with their proportions.

Table of musical note characters and proportions: A Large (8), A long (4), Breve (2), Semibreve (1), Minim (1/2), Crotchet (1/4), Quaver (1/8), Semiquaver (1/16), Demisemiquaver (1/32).

Character of a sharp Note: this Character at the beginning of a line, or space, denotes all the notes in that line or space, to be taken a semitone higher than in the natural series.

When the Character is prefixed to any particular note, it shews that note alone to be a semitone higher than it would be without such Character.

Character of a flat Note: this Character, at the beginning of a line, or space, shews, that all the notes in that line, or space, are to be taken a semitone lower than in the natural series.

Character of a natural Note. Where, in a line or series of artificial notes, marked at the beginning for either sharps or flats, the natural note happens to be required, it is denoted by this Character.

Character of Treble Clef. Mean Clef. Bass Clef.

CHARACTERS of Time. 2, or 2, or 2; Characters of common, or duple Time; signifying the measure of two crotchets to be equal to two notes, whereof four make a semibreve.

Characters that distinguish the movements in common time: the first implying slow; the second brisk; the third very quick.

Characters of the simple triple Time; whose measure is equal either to three semibreves, or to three minims, &c.

Characters of mixed triple time; where the measure is equal to six crotchets, or six quavers, &c.

Characters of compound triple Time. 2, or 2, or 2; or 2, or 2, or 2; Characters of the fourth species of triple Time; called, The measure of twelve Times.

Single bar, Double bar, Repeat, Repeat, Cleft, Tris, Tris, Dires.

Musical staff with various note values and rests, including labels for Demisemiquaver, Semiquaver, Quaver, Crotchet, Breve, Long Rest, and Large Rest.

CHARACTERS used in Medicine, Pharmacy, and Chymistry.

Authors are very redundant, and even fanciful in pharmaceutical Characters: but the most usual are these that follow.

- R Recipe.
- 3, 4, ana, of each alike.
- ⊖ Antimony.
- ℞ Aqua fortis.
- ℞ Aqua regia.
- ℞ Balneum marie.
- ψ Calx viva.
- ⊕ Caput mortuum.
- ⊖ Copper.
- ⊖ Common salt.
- ⊖ Diftil.
- ⊙ Gold.
- CC Harts-horn.
- CCC Harts-horn calcined.
- ♂ Iron.
- aaa. Amalgamate.
- fff. Stratum super stratum.
- ♃ Jupiter, tin.
- ♁ Lead.
- ☿ Mercury.
- ⊖ —Sublimate.
- ⊖ —Precipitate.
- ⊖ Nitre.
- ⊖ Sal armoniac.
- ⊖ Vitriol.
- Δ Sulphur.
- ⊖ Spirit of wine.
- or S, V, R, spirit of wine rectified.
- ⊖ Silver.
- ⊖ Tartar.
- ℔ A pound, or a pint.
- ℥ An ounce.
- ℥ A drachm.
- ⊖ A scruple.
- gr. Grains.
- fs. Half of any thing.
- Cong. Congius, A gallon.
- Cochl. Cochleare, A spoonful.
- M. Manipulus, A handful.
- P. A pugil.
- P. E. Equal quantities.
- S. A. According to art.
- q. f. A sufficient quantity.
- q. pl. Quantum placet, as much as you please.
- P. P. Pulvis patrum, the Jesuit's bark.

The poetical Character, Boffu observes, is not properly any virtue or quality in particular; but 'tis a composition of several, mixed and combined in various degrees, according to the occasions of the fable, and the unity of the action. All the simple qualities that enter this compound, must not have the same rank, nor be equal to each other: since, in that case, one prevailing on one occasion, and another on another, the Character will appear changeable; and the poem, as well as the hero, will seem animated with several souls.

There must, therefore, be one to reign over all the rest; and this must be found in some degree in every part: just as the same hero in several paintings, should have the same lines and features, how different soever his postures and passions may be.

This first quality, in Homer's Achilles, is wrath; in Ulysses, dissimulation; and in Virgil's Æneas, mildness: each of which may, by way of eminence, be called the Character of those heroes.

These are never to go alone, but always are to be accompanied with others, to give them the greater lustre; either by hiding their defects, as in Achilles, whose anger is palliated by a world of courage; or by making them center in some solid virtue, as in Ulysses, whose dissimulation makes a part of his prudence; and Æneas, whose mildness is chiefly employed in a submission to the will of the gods.

These secondary qualities of courage, prudence, and submission, make the goodness of the Characters of those heroes, and even of the poems.

Boffu adds, that the quality of courage must always have a share in the Character of a hero, to serve as a support to the rest: the heroic Character, therefore, he makes a compound of three kinds of qualities. Those of the first kind are necessary and essential to the fable; those of the second are the supplements, or embellishments of the first; and courage, which sustains the other two, make the third.

The first, which is the chief, is to be some universal quality, to have place on all occasions, and to distinguish the hero wherever he is found.

For the unity of Character, we have Horace's expre command, *Sit quodvis simplex dontaxat & unum*. Boffu adds, that the Character is not less the soul of the hero and the whole action, than the fable is of the poem; and of consequence the unity must be as exact in the one as the other: which accordingly we find observed both by Homer and Virgil.

The unity of Character is somewhat different from that of the manners: in the latter, the unity or equality consists in not giving contrary sentiments to the same person; which is not sufficient to the unity of Character, but to this must be added, that the same spirit must always appear on all occasions, whether contrary or otherwise: thus, Æneas, shewing a deal of goodness in the first part of the poem, and a world of valour in the second, but without discovering any of his former piety and gentleness; there had been no offence against the evenness of the manners, but much against the unity of the Character.

So that besides the qualities which have their particular place on different occasions, there must be one to have place throughout, and to reign over all the others. Without this there is no Character: as would be the case, should a poet give his hero the piety of Æneas, and the courage of Achilles, without considering the severity of the one, and the mildness of the other.

A hero, it is true, may be made as brave as Achilles, as mild or pious as Æneas, and, if one will, as prudent as Ulysses; but it would be a mere chimera to imagine a hero with the particular courage of Achilles, the piety of Æneas, and the prudence of Ulysses at the same time.

The unity of Character is not only to be kept in the hero, and the several other persons of the piece; but also in that of the poem itself: that is, all the characters how opposite soever, must center and reunite in that of the hero; and be so swayed by it, as that this alone may seem to govern throughout the whole. Thus Homer makes wrath prevail throughout the whole Iliad; and artifice and dissimulation throughout the Odyssey: the hero's Character is perceived every where, has its full swing, and is favoured by the similitude of the Characters of some of the other persons. Virgil had a great difficulty to grapple with to preserve his unity: in regard of the direct opposition between the humours of his hero, and those of some other of his persons, as Turnus, Mezentius, Dido, &c. He therefore takes care not to carry those opposite Characters to their full length, but moderates and restrains them: and as that moderation could not flow naturally from the persons themselves; it is produced either by some passion, as in Dido, or some dependence, as in Turnus and Mezentius. To this artifice he adds episodes, accommodated to the general Character, by which he interrupts the particular actions which require an opposite Character.

Claudian's conduct, in this respect, is unpardonable; from the horrible Characters of Pluto and the furies, with all the terrors of hell, he passes to the gaiety and pleasures of the graces, gilded palaces, flowery fields, &c. He has as many different prevailing Characters in his three books, as Homer and Virgil in their sixty.

CHARACTERS among the antient Lawyers, and in antient Inscriptions.

- § Paragrapho.
- ℥ Digestis.
- E. Extra.
- S. P. Q. R. Senatus Populique Romanus.
- Scto. Senatusconsulto.
- P. P. Pater Patriæ.
- C. Cede.
- CC. Consulibus.
- T. Titulus, &c.

CHARACTERS on Tomb-stones.

- S. V. Siste Viator, Stay traveller.
- M. S. Memoria Sacra, Sacred to memory.
- D. M. Divi Manibus.
- IHS. Jesus.
- XP. A Character found on antient monuments, about the meaning whereof authors are not agreed. See CATAcombe.

CHARACTERS in Grammar, Rhetoric, Poetry, &c.

- ⊖ Character of a Comma.
- ⊖ Semicolon.
- ⊖ Colon.
- ⊖ Period.
- ! Exclamation.
- ? Interrogation.
- () Parenthesis.
- Hyphen.
- ⊖ Apostrophe.
- L.L.D. Doctor of Laws, or, of the Civil and Canon Law.
- S.S.T.D. Sacro-Sanctæ Theologiæ Doctor, i. e. Doctor in divinity.
- M. D. Doctor in physic.
- V.D.M. Verbi Dei Minister, Minister of the word.
- A.M. Artium Magister, Master of arts.
- A.B. Artium Baccalaureus, Bachelor of arts.
- F.R.S. Fellow of the Royal Society.
- CHARACTERS in Commerce.
- D. Ditto, the same.
- Nº Numero, or number.
- Fº Folio, or page.
- Rº Reclio. } folio.
- Vº Verso. } folio.
- £ Sterling, or its Pound sterling.
- § Shillings.
- ℥ Pence, or Deniers.
- ff Pound weight.
- C. or c hundred weight, or 112 pound.
- q. Quarters.
- ℥ Per, or By. — As ℥ ann. by the year. — ℥ cent. in the hundred, &c.
- Rs. Rixdollar.
- D. Ducat.
- P. S. Poffscript.

For Characters in printing, see CORRECTION.

CHARACTER is also used for a certain manner, air, or assemblage of qualities, resulting from several particular marks, which distinguish a thing from any other, so as it may be known thereby.

Thus, we say, The Character of Achilles; generosity and greatness of mind was the Character of the Romans; Cicero had a Character of politeness, which is wanting in Demosthenes; every passion has its peculiar Character.

The writers of Characters are Theophrastus, whose fragments are still extant; Du Moulin, in his Exemplar Morum; Paschal, in Characteres Virtutum & Vitiarum; M. de la Chambre, in his Characters of the Passions; and de la Bruyere, in his Characters and Manners of the Age.

CHARACTER, in poetry, especially the epopea and drama, is the result of the manners, or that which each person has peculiar and singular in his manners, whereby he is distinguished from others.

CHARACTER is also used for certain visible qualities, which claim respect or reverence to those vested therewith.

The majesty of kings gives them a *Character*, which procures respect from the people. A bishop should sustain his *Character* by learning and solid piety, rather than by worldly lustre, &c. The law of nations secures the *Character* of an ambassador from all insults.

CHARACTER is also used among divines, especially those of the Romish church, for an indelible mark, or impression, which certain sacraments are supposed to leave behind them in those who receive them.

The sacraments that leave this *Character*, are incapable of being repeated. The *Character* is generally supposed to be something physical.

It is the sacraments of baptism, confirmation, and ordination, which leave such indelible *Character*.

CHARACTER of a Plant. See **GENUS, CHARACTERISTIC, &c.**

CHARACTERISTIC, in the general, is that which characterises a thing, or person, *i. e.* constitutes its *Character*, whereby it is distinguished from all others.

CHARACTERISTIC, is peculiarly used in grammar, for the principal letter of a word; which is preserved in most of its tenses, and moods, its derivatives and compounds.

The *Characteristic* frequently shews its etymology; and ought constantly to be retained in its orthography; such is the letter *r* in course, fort, &c.

The *Characteristics* are of great use in the Greek grammar, especially in the formation of the tenses; as being the same in the same tenses of all verbs of the same conjugation, excepting in the present tense, which has several *Characteristics*; and the future, the Aorist primus, the preterfect, and the pluperfect tenses of the fourth conjugation, which have two *Characteristics*.

CHARACTERISTIC of a Logarithm, is its index, or exponent. See **INDEX and LOGARITHM.**

CHARACTERISTIC Triangle of a Curve, in the higher geometry, is a rectilinear right-angled triangle, whose hypotenuse makes a part of the curve, not sensibly different from a right line. It is so called, because curve lines are used to be distinguished hereby.

Suppose, *e. gr.* the semiordinate pm , (Tab. *Analysis*, fig. 7.) infinitely near another PM ; then will Pp be the differential of the abscissa: and letting fall a perpendicular, $MR = Pp$, Rm will be the differential of the semi-ordinate. Draw, therefore, a tangent TM ; and the infinitely small arch Mm , will not differ from a right line: consequently MmR is a rectilinear right-angled triangle; and constitutes the *Characteristic triangle* of that curve.

CHARAG, the tribute which Christians and Jews pay to the grand signior.

It consists of ten, twelve, or fifteen francs *per ann.* according to the estate of the party. Men begin to pay it at nine or at sixteen years old; women are dispensed with, as also priests, rabbins, and religious.

CHARCOAL, a sort of artificial coal, or fuel, consisting of wood half burnt; chiefly used where a clear strong fire, without smoke, is required; the humidity of the wood being here mostly dissipated, and exhaled in the fire wherein it was prepared.

The microscope discovers a surprizing number of pores in *Charcoal*: they are disposed in order, and traverse it length-wise: so that there is no piece of *Charcoal*, how long soever, but may be easily blown through. If a piece be broke pretty short, it may be seen through with a microscope. In a range the 18th part of an inch long, Dr. Hook reckoned one hundred and fifty pores; whence he concludes, that in a *Charcoal* of an inch diameter, there are not less than five millions, seven hundred twenty-four thousand pores.

It is to this prodigious number of pores, that the blackness of *Charcoal* is owing: for the rays of light striking on the *Charcoal*, are received and absorbed in its pores, instead of being reflected; whence the body must of necessity appear black: blackness in a body being no more than a want of reflexion.

Charcoal was antiently used to distinguish the bounds of estates and inheritances; as being supposed incorruptible, when let very deep within the ground. In effect, it preserves itself so long, that there are many pieces found entire in the antient tombs of the northern nations.

M. Dodart says, there is sometimes found *Charcoal* made of corn, probably as old as the days of Cæsar: he adds, that it has kept so well, that the wheat may be still distinguished from the rye; which he looks on as a proof of its incorruptibility.

Method of making CHARCOAL.—The best is that made of oak, cut into lengths of about three foot. The ground whereon the operation is to be performed, is bared of all the turf, and other combustible matter; and is in form circular, a stake being driven in the center. This area is filled up with wood, eight foot high, placed alternately lengthwise, and perpendicularly; then coped atop in the form of a sugarloaf, and all inequalities filled up with small wood, till it lies very close: the whole is then to be covered over moderately thick with turf, and other rubbish.

A moveable skreen being then set up against the wind; the stake is pulled up, and fire set to the pile, by pouring into the cavity some *Charcoal* and other coal fully kindled; the vent, or tunnel at-top, is then covered with turf, and vent-holes are made through the stuff that covers the pile, two or three foot apart, quite round, a foot from the top. The next day a new range of holes is made, a foot and a half below the first; and thus on to the bottom; observing, that as the pile cools, and sinks to the center, it must be continually fed with short wood, that no part remain un-fired; and that if any part chars faster than other, the vent-holes there are to be stopped up.

A parcel is thus burnt in five or six days: as it cools, the smoke grows thinner and bluer. The heap requires two or three days to cool; which is promoted by stopping the vents, and stripping off the covering by degrees, about a yard at a time; at first only taking off the coarsest part and leaving the rest; that the pile may neither cool too fast, nor endanger the reduction of the whole into ashes. Lastly, the coals are taken out from around the bottom, by which means the whole mass, coals and rubbish, sinks down, and extinguishes the fire at once.

Charcoal for powder-mills, is usually made of elder-wood; the process the same, but is finished in two days.

CHARDS, in gardening.—The *Chards* of artichokes, are the leaves of good artichoke plants, tied and wrapped up, all over but the top, in straw, during the autumn and winter; this makes them grow white, and lose some of their bitterness.

CHARDS of Beets, are white beets, covered with dry dung, during the winter season, when they produce large tops, with a downy cotton shoot; which is the true *Chard*, to be used in pottages, intermisses, &c.

CHARGE, in gunnery, the load of a piece; or the quantity of powder and ball, or shot, wherewith it is to be prepared for execution.

The rules for *charging* large pieces in war, are, that the piece be first cleaned or scoured within side; that the proper quantity of gunpowder be next driven in and rammed down; care, however, being taken, that the powder be not bruised in ramming; which too weakens its effect; that a little quantity of paper, hay, or the like, be rammed over it, and that then the ball, or shot be intruded.

If the ball be red-hot, a tampon, or trencher of green wood, is to be driven in before it.

The weight of gunpowder necessary for a *Charge*, is commonly in a subdule proportion to that of the ball. See **CANNON.**

CHARGE, in heraldry, is apply'd to any figure, or thing, bore, or represented in an escutcheon, or coat of arms; whether it be animal, vegetable, or other matter.

Too many *Charges* are not deemed so honourable as fewer. *Charges* peculiar to the art and usage of armory, as the cross, chief, pale fesse, &c. are called *proper Charges*; and frequently *Oyndaries*.

Bloom restrains the term *Charges* to those additions, or rewards of honours frequently placed on escutcheons; as cantons, quarters, girons, flasks, &c.

CHARGE, in the manage, a sort of unguent, made of oil, honey, grease, turpentine, and sometimes of lees of wine, and other matters, apply'd externally to a horse, &c. for the cure of strains, bruises, and swellings.

CHARGE, or rather *Overcharge*, in painting, is an exaggerated representation of any person; wherein the likeness is preserved, but, withal, ridiculed.

Few painters have the genius necessary to succeed in these *Charges*: The method is, to pick out and heighten something already amiss in the face, whether by way of defect, or redundancy: Thus, *v. g.* if nature have given a man a nose a little larger than ordinary, the painter falls in with her, and makes the nose extravagantly long: or if the nose be naturally too short, in the painting it shall be a mere stump; and thus of the other parts.

CHARGE of Lead, is thirty-six pigs. See **LEAD, &c.**

CHARGED, in heraldry. A shield, carrying on it some figure or impress, is said to be *charged* therewith.

So, also, when one bearing, or *charge*, has another figure added upon it, it is properly said to be *charged*.

CHARIENTISMUS, in rhetoric, a figure wherein a taunting expression is softened by a jest.

CHAR. } See **CARR.**
CHARIOT. } See **COACH.**

CHARISTIA*, a family feast celebrated among the Romans, on the 11th of the calends of March; *i. e.* on the 19th of February; in honour of the goddess *Concord*.

* The word comes from the Greek *χαιρς*, grace, favour; *q. d.* a day of reconciliation, or of returning into favour. It was also called *dies charæ cognationis*. Vigenere, on Livy, calls it the *day of good cheer*.

The *Charistia* were instituted to re-establish peace and amity, in families embroiled, or at variance among themselves. It consisted in a great entertainment made in each family, to which no strangers were admitted, but only relations and kindred. The joy and

and freedom inspired by the repaft, was looked upon as a proper means to re-unite divided minds; to which the good offices of fo many friends would greatly contribute.

CHARISTICARY, *Comendatary*, or *Donatary*, a perfon to whom is given the enjoyment of the revenues of a monaftery, hofpital, or benefice.

The *Charifticaries* among the Greeks, were a kind of donataries, or comendataries, who enjoyed all the revenues of hofpitals and monafteries, without giving an account thereof to any perfon.—The original of this abufe is referred to the Iconoclaftae, particularly Conftantine Copronymus, the avowed enemy of the monks, whofe monafteries he gave away to ftangers.

In after times, the emperors and patriarchs gave many to people of quality, not by way of gift, to reap any temporal advantage from them; but to repair, beautify, and patronize them. At length avarice crept in, and thofe in good condition were given, especially fuch as were rich; and at laft they were all given away, rich and poor, thofe of men and of women; and that to laymen and marry'd men.

M. Couteiler, in his *ecclēfiæ Græcæ monumenta*, gives us the form of thefe donations: They were granted for life, and fometimes for two lives. See **ABBOT**.

CHARITATIVE, in the canon law. *A charitable Aid*, or *Subfidy*, is a moderate allowance which a council grants a bifhop upon any urgent occafion; e. g. when his revenues will not bear his expences to a council, &c.

CHARITY, one of the three grand theological virtues, confifting in the love of God, and our neighbour.

Charity is the habit, or difpofition of loving God with all our heart, and our neighbour as ourfelves. It has two material objects, therefore, as the fchool expreffes it, *viz.* God, and our neighbour.

CHARITY is alfo used for the effect of a moral virtue, which confifts in fupplying the neceffities of others, whether with money, counfel, affiftance, or the like.

CHARITY Schools, are fchools erected and maintained in various parifhes, by the voluntary contributions of the inhabitants, for teaching poor children to read, write, and other neceffary parts of education.

In moft *Charity Schools*, the children are likewife clothed and put out to trades, fervices, &c. on the fame charitable foundation.

Charity Schools are but of a few years ftanding: They were began in London; and have fince fpread throughout moft of the confiderable towns of England and Wales. In the year 1710, the account of the *Charity Schools* in and about London flood thus.

Number of fchools 88.	Of boys taught therein 2181.	Of girls 1221.
Boys clothed 1863	In all 2977.	Girls 1114
Girls 1114		
Boys not clothed 373	In all 501.	Girls 128
Girls 128		

Note, Out of the whole, 967 boys, and 407 girls, had been put out apprentices: but the number is, fince that time, vaftly increafed.

In London we had likewife a **CHARITABLE Corporation** for the relief of the induftrious poor, erected under queen Anne; for enabling indigent manufacturers and traders to take up money at common and legal intereft; there being a fum of 30000 *l.* raifed for that end.

Order of CHARITY. There are feveral religious orders which bear this title: one instituted by S. John de Dieu, for the affiftance of the fick: This inftitute was approved of in 1520, by Leo X, and confirmed by Paul V. in 1617. The religious of this order apply themfelves wholly to the fervice of the difeafed.

CHARITY of the holy Virgin, is a religious order eftablifhed in the diocefe of Chalons, by Guy lord Joinville, &c. towards the clofe of the thirteenth century, approved under the rule of St. Auguftine, by the popes Boniface VIII. and Clement VI.

In each parifh of Paris, there is a fociety of women, who apply themfelves to find out and relieve the wants of the poor of the parifh; and on this account called, *Dames de la Charite*, and *Sœurs de la Charite*.

CHARKING, or **CHARRING**, the burning of wood to make charcoal. See **CHARCOAL**.

CHARKS, pit-coal charked or charrd. See **COAL**.

CHARLATAN *, or **CHARLETAN**, an empiric, or quack, who retails his medicines on a publick ftage, and draws the people about him with his buffooneries, feats of activity, &c. See **EMPIRIC**.

* The word, according to Calepine, comes from the Italian *Cerretano*; a town near Spoleto in Italy, where thefe impostors are faid to have firft rifen. Menage derives it from *Charlatano*, and that from *Circulatorius*, or *Circulator*, a quack.

CHARLES'S-WAIN, in aftronomy, feven ftars in the conftellation *Ufa Minor*.

CHARM *, a magic power, or fpell, by which, with the affiftance of the devil, forcerers and witches are fuppofed to do wondrous things, far furpaffing the powers of nature. See **MAGIC**.

* The word comes from the latin *Carmen*, *verfe*.

Philacteries, ligatures, &c. are all kinds of *Charms*. We have the hiftory of a notable *Charm*, wherewith great

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things are pretended to have been done in the way of poffoning, and tormenting; defcribed by a famous forcerer, one Brafs de Forthen, while under fentence of death in France, as follows. It confifts of a new earthen pan, varnifhed, not bought nor bargained for; wherein is put fheep's blood, wool, hair of feveral beafts, with poifonous herbs, mixed together with a great deal of grimace, and fuperftitious ceremonies, uttering certain words, and invoking devils. This pan is put in a fecret place in the neighbourhood where the mifchief is to be done, and fprinkled with vinegar, according to the effect it is to produce. The *Charm* holds a certain time, and cannot be taken away, but either by the party that lodged it, or fome fuperior power which overcomes it; but thefe things are now fufficiently exploded.

CHARNEL, a portico, or gallery, antiently near the church-yard; over which were difpofed the bones of the dead, when the flefh was confumed.

The *Charnels*, or *Charnel-Houfes*, are now ufually contiguous to the church.

CHART, or *Sea-CHART*, a hydrographical map; or a projection of fome part of the fea, in plano; for the ufe of navigation.

The invention of *Sea-charts*, Fournier refers to Henry fon of John king of Portugal. They differ very confiderably from geographical, or land maps, which are of no ufe in navigation. Nor are *Sea-Charts* all of the fame kind; fome being what we call *Plain Charts*, others *Reduced*, or *Mercator's-Charts*, and others *Globular Charts*.

Plain Charts, are thofe wherein the meridians and parallels, are exhibited by right lines, parallel to each other.

Thefe, Ptolemy, in his geography, rejects for the following faults, though their inventor judged them of good ufe; and experience has confirm'd his judgment; efppecially in fhort voyages.

Their defects are, 1. That fince in reality all the meridians meet in the poles; it is abfurd to represent them, efppecially in large *Charts*, by parallel right lines. 2. That *Plain Charts* exhibit the degrees of the feveral parallels, equal to thofe of the equator; and of confequence the diftances of places lying eaft and weft, much larger than they fhould be. And 3. In a *Plain Chart*, while the fame rhumb is kept, the veffel appears to fail in a great circle; which yet is falfe.

But notwithstanding thefe defects in the *Plain Chart*, yet the eafinefs of its application has fo reconciled it to the mariners, that it is ufed almoft alone; in exclusion of the more accurate ones.

Conftitution of a Plain CHART.—1. Draw a right line, as A B, (Tab. *Hydrography*, fig. 9.) and divide it into as many equal parts, as there are degrees of latitude in the portion of the fea to be represented. 2. Add another to it at right angles B C, divided into as many parts, and thofe equal to one another, and to the former, as there are degrees of longitude in the portion of the fea to be represented. 3. Compleat the parallelogram A B C D, and relolve its area into little fquares; then right lines, parallel to A B and C D, will be meridians; and thofe parallel to A D and B C parallels. 4. The coafts, iflands, bays, fands, rocks, &c. infer from a table of longitudes and latitudes, in the fame manner as is laid down under **MAP**.

Hence, 1. the latitude and longitude of a fhip being given, her place is eafily exhibited in the *Chart*. 2. The places F and G, to and from which the fhip fails, being given in a map, the right line F G, drawn from the one to the other, makes, with the meridian A B, an angle A F G, equal to the inclination of the rhumb: And fince the parts F 1, 1 2, 2 G, intercepted between equidiftant parallels, are equal; and the inclination of the right line F G, to all the meridians or right lines parallel to A B, is the fame; the right line F G truly represents the rhumb. After the fame manner it may be fhewn, that this *Chart* exhibits *latus meodynamicum*, or miles of longitude truly.

It follows, that *Plain Charts* may be ufed to very good purpofe in directing a fhip; provided care be taken there efcape no error in the diftance of the places F and G.

Conftitution of a feale to correct the errors of the diftances in Plain

CHARTS.—1 Upon the right line A B, (fig. 10.) from the map transfer five degrees, and divide them into 300 equal parts, or geographical miles. 2. On this defcribe a fmall circle A C B, to be divided into 90 equal parts: If then it be defired to know how many miles make five degrees in the parallel fifty; in the compaffes take the interval fifty, and transfer it on to the diameter A B; the number of miles required will here be fhewn. It follows, that if a fhip fail on an eaftern or weftern rhumb, out of the equator; the miles anfwering to the degrees of longitude will be found as in the preceding article. If it fail on any collateral rhumb, ftill the failing is fuppofed to be an eaftern or weftern rhumb, in an intermediate parallel, between the parallel of the place whence the fhip proceeds, and the parallel of the place at which the arrives.

It is true, this reduction, by an arithmetically mean parallel, is not accurate; yet is it frequently ufed in practice, as being accommodated to the apprehenfions of the generality of mankind. In effect, it does not err any thing confiderable, if the whole courfe be divided into parts, whereof each does not exceed one degree; whence it appears advifable, not to take the diameter of the femicircle A B above one degree, and to divide it at moft into geographical miles.

For the application of the Plain CHART in sailing. See Plain SAILING.

Reduced CHART, or CHART of Reduction, is that wherein the meridians are represented by right lines converging towards the poles; and the parallels by right lines parallel to one another, but unequal. These, therefore, it appears by their construction, must correct the errors of the Plain Charts.

But since the parallels should cut the meridians at right angles; these Charts are defective, inasmuch as they exhibit the parallels inclined to the meridians.

Hence another kind of Reduced Charts has been invented, wherein the meridians are parallel, but the degrees thereof unequal; these are called Mercator's Charts.

Mercator's CHART, is that wherein the meridians and parallels are represented by parallel right lines; but the degrees of the meridians are unequal; still increasing, as they approach the pole, in the same proportion as those of the parallels decrease: By means whereof, the same proportion is preserved between them as on the globe.

This Chart has its name from that of the author who first proposed it for use, and made the first Chart of this projection, *N. Mercator*: But neither was the thought originally his own, as having been hinted by Ptolemy near 2000 years ago: Nor is the perfection of it owing to him; our countryman Mr. Wright being the first who demonstrated it, and shewed a ready way of constructing it, by enlarging the meridian line by the continual addition of secants.

Construction of Mercator's CHART.—I. Draw a right line, and divide it into equal parts, representing degrees of longitude either in the equator, or in the parallel wherein the Chart is to terminate. From the several points of division erect perpendiculars to represent meridians; so as right lines may cut them all under the same angle, and therefore represent rhumbs: Thus far as in the Plain Chart.

That the degrees of the meridians may have their just proportion to those of the parallels, the former are to be increased; in regard the latter continue the same, by reason of the parallelism of the meridians.

With the interval therefore of one degree in the equator CD, (Tab. Hydr. fig. 11.) describe the quadrant CDE, and in D erect a perpendicular DG; make the arch DL equal to the parallel of latitude, and through L draw CG: This CG will be the enlarged degree of the meridian, to be transferred to the meridian of the Chart: The rest as in Plain Charts.

In practice, suppose it required to draw a Mercator's Chart from the fortieth degree of north-latitude to the fiftieth, and from the sixth degree of longitude to the eighteenth. First draw a right line representing the fortieth parallel of the equator; which divide into 12 equal parts, for the 12 degrees of longitude the Chart is to contain. Then take a line of equal parts, on a scale whereof 100 parts are equal to each of these degrees of longitude; and at each extreme of the line raise two perpendiculars, to represent two parallel meridians to be divided by the continual addition of secants, which are proved to increase in the same proportion, as the degrees of longitude should decrease.

Thus, for the distance from forty degrees of latitude, take $131\frac{1}{2}$ equal parts, from the scale which is the secant of forty degrees thirty min. For the distance from forty-one deg. to forty-two deg. take $133\frac{1}{2}$ equal parts, from the scale which is the secant of forty-one deg. thirty min. and so on to the last degree of your Chart, which will be 154 equal parts, viz. the secant of forty-nine deg. thirty min. and will give the distance from forty-nine deg. of latitude to fifty deg. By this means, the degrees of latitude will be augmented, in the same proportion as the degrees of longitude on the globe decrease.

The meridians being divided, add the card, or compass; choosing some convenient place near the middle thereof: from this draw a line parallel to the divided meridians, which will be the north rhumb; and from this the other thirty-one points of the compass are to be set off.

Lastly, lay down the towns, ports, islands, coasts, &c. from a table of longitudes and latitudes; and the Chart is complete. In Mercator's Chart, the scale changes as the latitude is changed: if, then, *v. g.* a ship sails between the fortieth and fiftieth parallels of latitude, the degrees of the meridians between those two parallels, are to be the scale for measuring the ship's way: whence it follows, that though the degrees of longitude be equal in extent on the Chart, yet they must contain unequal numbers of miles, or leagues; and that they will decrease as they approach nearer the pole, because measured by a magnitude continually increasing. This Chart is demonstratively true; though to appearance false: it is found by experience very accurate, and withal very easy of application. In effect, it has all the qualifications required to render it of service in navigation; yet do the generality of mariners decline the use of it, and rather chuse to keep the old erroneous Plain Chart.

For the use of Mercator's CHART in sailing. See Mercator's SAILING.

Globular CHART, is a projection so called, from the conformity it bears to the Globe itself; this has been since the others proposed to the world by Messrs. Senex, Wilson, and Harris; wherein the meridians are inclined; the parallels equidistant

and curvilinear; and the rhumbs real spirals, as on the surface of the globe.

We might be under the protection of his majesty's patent, and with the recommendation of several able navigators, and among others, that of Dr. Halley; and as it has now stood the test of a pretty severe inquisition. We shall only add, that the projection is perfectly agreeable to nature, and therefore easily conceivable; and that it has been found to answer very exactly, even in very large distances; where its failure, if it have any, must needs be most conspicuous.

CHARTS compassed by rhumbs and distances, are those wherein there are no meridians or parallels; but all is effected by the rhumbs, and the scale of miles.

These are chiefly used by the French, and especially in the Mediterranean.

They are patched up, without any great art, from the observations of the mariners; any regular account therefore how to make them would be needless. They are only used in short voyages.

CHARTA primarily signifies a sort of paper made of the plant *Papyrus*, or *Bibulus*. See PAPER.

CHARTA Empirica, in pharmacy, &c. a kind of paper made very soft and porous, and used to filter withal.

CHARTA is also used in our antient customs for a Charter, or deed in writing. See CHARTER.

CHARTA de Foresta. See CHARTER of the Forest.

CHARTA Magna, the great Charter, is an antient instrument, containing several privileges and liberties granted to the church and state, by Edward the confessor, together with others relating to the feudal laws of William the conqueror, granted by Henry I. all confirmed by the succeeding princes about thirty times. See MAGNA CHARTA.

CHARTA Pardonationis se defendendo, is the form of a pardon for killing another man in his own defence.

CHARTA Pardonationis Utlogariae, is the form of pardon of a man who is outlawed.

CHARTA Simplex, is a single deed, or deed-pole. See DEED.

CHARTTEL. See the article CARTEL, COMBAT, DUEL, CHAMPION, &c.

CHARTER *, **CHARTA**, an instrument, or written evidence of a thing under the seal of a prince, lord, church, chapter, or community.

* The word Charter comes from the latin *Carta*, antiently used for a publick or authentick act, a donation, contract, or the like, from the Greek *παρτις*, *thick paper*, or *pasteboard*, whereon publick acts were used to be wrote.

Bracton says, donations are sometimes made in Charters, in *perpetuum rei memoriam*.—He adds, that of Charters some are royal, others of private persons.

Of royal, some are private, some common, some universal. Of private Charters, some are *de puro feoffamento*, others *de conditionali feoffamento*, others of recognition, pure or conditional, others of confirmation, &c.

CHARTER of the Forest, is that wherein the laws of the forest are comprized and established; together with the *Magna Charta*, or *Great Charter*. See FOREST.

Great CHARTER, *Magna Charta*. See MAGNA CHARTA.

CHARTERS of the King, are those whereby a king makes a grant to a person, or community; *v. g.* a Charter of Exemption, that a person should not be impanelled on a jury, &c.

CHARTER of Pardon, is that whereby a person is forgiven a felony, or other offence against the king's crown and dignity. See PARDON.

CHARTER HOUSE. See the article CHARTREUSE.

CHARTER-LAND, in law, is such as a man holds by Charter, that is, by evidence in writing; otherwise called *Freehold*. See FREEHOLD.

This the Saxons called *Bockland*: which Lambard renders, *terra ex scripto*.

It was held on more easy conditions than the Folkland, or *terra sine scripto*, held without writing: the former being *hereditaria libera & immunis*; whereas the latter *consuetum peribat annuum atque officiorum quadam servitute erat obligatus*.

CHARTERPARTY, in commerce, denotes the instrument of freightage; or articles of agreement for the hire of a vessel.

The Charterparty is to be in writing; and is to be signed both by the proprietor, or the master of the ship; and the merchant who freights it.

The Charterparty is to contain the name and the burden of the vessel; those of the master and the freighter; the price or rate of freight; the time of loading and unloading; and the other conditions agreed on.

It is properly a deed, or policy, whereby the master or proprietor of the vessel engages to furnish immediately a tight found vessel, well equipped, caulked and fopped, provided with anchors, sails, cordage, and all other furniture to make the voyage required, as equipage, hands, victuals, and other munitions; in consideration of a certain sum to be paid by the merchant for the freight. Lastly, the ship, with all its furniture, and the cargo, are respectively

ively subjected to the conditions of the *Charterparty*. The *Charterparty* differs from a *bill of lading*, in that the first is for the entire freight, or lading, and that both for going and returning; whereas the latter is only for a part of the freight, or at most only for the voyage one way.

The president Boyer lays, the word comes from hence, that *per medium charta incidebatur, & sic fiebat charta partita*; because in the time when notaries were less common, there was only one instrument made for both parties: they cut in two, and gave each his portion, and joined them together at their return, to know if each had done his part. This he observes to have been practised in his time; agreeable to the method of the Romans, who, in their stipulations, used to break a staff, each party retaining a moiety thereof as a mark.

CHARTIS *Reddendis*, a writ which lies against him that has *Charters* of feoffment intrusted to his keeping, and refuseth to deliver them to the owner.

CHARTOPHYLAX*, an officer in the church of Constantinople, intrusted with the custody of the archives.

* The word is formed from *χαρτα*, and *φυλαξ*, *custodio*; and signifies *Charter keeper*.

Codin calls the *grand Chartophylax* the judge of all causes, and the right arm of the patriarch. He adds, that he was the depository or keeper of all the *Charters* relating to the ecclesiastical rights; and that he presided over matrimonial causes, and was judge of all the *Jergy*. He drew up all sentences and decisions of the patriarch, who signed and sealed them; he presided in the grand council of the patriarch; he took cognizance of all matters and causes ecclesiastical and civil, whether among the clergy, the monks, or the people.

He took place of all the bishops; though himself only a deacon; and, on occasion, discharged the functions of the priests: he had twelve notaries under him.

The *Chartophylax* was much the same at Constantinople with the *Charitulary* at Rome.

There were, in reality, two officers who bore this title; the one for the court, the other for the patriarch; the first was called also *Registrator*, and the latter *Scriniarius*; though the two are usually confounded together. Leunclavius, and others, confound *Chartophylax* with *Charitulary*.

CHARTREUSE, a celebrated monastery of Carthusians; so called from the name of a steep rocky place, in a frightful desert five leagues from Grenoble in France; where S. Bruno retired from the world, and first instituted the order of Carthusians.

The name has since passed to all houses of Carthusians; and that near Grenoble, is now distinguished by the name of the *great Chartreuse*.

That of London, corruptly called *Charter-house*, is now converted into a college, called also from its founder Sutton's *hospital*; first endowed, with 4000 *l. per ann.* since improved to 6000 *l.*

It is to consist of decayed gentlemen, soldiers, and merchants; eighty of whom have a plentiful maintenance of diet, lodgings, clothes, physick, &c. living together in a collegiate manner; and of scholars, or youths, forty-four of whom are taught, and supplied with necessaries, and such of them as are fit for the university sent thither, with an exhibition of 20*l. per ann.* for eight years; the rest are put to trades.

For the superintendency of this hospital there are sixteen governors, generally of the prime quality: vacancies being supplied by the election of the remaining governors. The ordinary officers are, a master, preacher, register, treasurer, school-master, &c.

CHARTREUX, religious of the order of S. Bruno, called also Carthusians. See **CARTHUSIANS**.

CHARTULARY, **CHARTULARIUS**, a title given to an antient officer in the Latin church, who had the care of *Charters* and papers relating to publick affairs.

The *Chartulary* presided in ecclesiastical judgments, in lieu of the pope.

In the Greek church, the *Chartulary* was called *Chartophylax*; but his office was there much more considerable; and some even distinguish the *Chartulary* from the *Chartophylax* in the Greek church. See **CHARTOPHYLAX**.

CHASE, or **CHACE**, in law, is used for a driving of cattle to, or from any place; as to a distress, a forelet, &c.

CHASE, or **CHACE**, is also a place of retreat for deer and wild beasts, of a middle kind, between a forest and a park; being usually less than a forest, and not possessed of so many privileges; but wanting, *v. g.* courts of attachment, *swainmote*, and justice seat.

Yet is it of a larger extent, and stocked both with a greater diversity of wild beasts, or game, and more keepers, than a park. Crompton observes, that a forest cannot be in the hands of a subject, but it forthwith loses its name, and becomes a *Chase*; in regard, all those courts lose their nature when they come into the hands of a subject; and that none but the king can make a lord chief justice in eye of the forest.

Yet the same author adds, that a forest may be granted by the king to a subject, in so ample a manner, as that there may be courts equivalent to a court of attachment, *swainmote*, and justice seat.

CHASE, in the sea language, is to pursue a ship; which is called also *giving Chase*.

Stern CHASE, is when the chaser follows the chased a-stern, directly upon the same point of the compass.

To lie with a ship's fore-foot in a *Chase*, is to sail, and meet with her by the nearest distance, and so to cross her in her way, or to come a-cross her fore-foot.

A ship is said to have a *good Chase*, when she is so built forward on, or a-stern, that she can carry many guns to shoot forwards or backwards; according to which she is said to have a *good forward*, or *good stern Chase*.

CHASE-Guns, are such whose ports are either in the head (and then they are used in chasing of others) or in the stern, which are only useful when they are pursued or chased by any other ship.

CHASE of a Gun, is the whole bore, or length of a piece taken within-side. See **CANNON**.

CHASING, a method of working, or enriching gold, silver, &c. properly called *enchasing*. See **ENCHASING**.

CHASM, *Xaoum*. See the articles **GROTTO** and **HIATUS**.

CHATELET*, antiently signified a little castle, or fortress, where in the *Chatelain*, or governor lodged. See **CASTLE**.

* The word is a diminutive of *chateau*, formed from *castrum*, a diminutive of *castrum*; or from *castrum*, a diminutive of *castrum*, castle.

At present, the term is used for certain courts of justice established in several cities in France: the *grand Chatelet* in Paris, *v. g.* is the place where the prefdial, or ordinary court of justice of the prevot of Paris is kept; consisting of a prefdial, a civil chamber, criminal chamber, and a chamber of policy. The term signifies the same at Montpellier, Orleans, &c.

The little *Chatelet* at Paris, is an antient fort, now serving as a prison.

CHATELS*, **CATALIS**, **CATALLA**, a Norman term, under which were antiently comprehended all moveable goods; those immovable being termed *seign*, or, as we now say, *fee*.

* Spelman defines *Chattels* to be *bona quaecunque mobilia & immobilia; propriè lamen a bonorum pars, que in animalibus consistit, à quorum capitibus res ipsæ, alia capita, alia capitalia diste sunt*.

CHATELS, in the modern sense of the word, are all sorts of goods, moveable or immovable, except such as are in the nature of freehold, or parcel thereof.

Chattels are either *personal*, or *real*.

CHATELS Personal, are such as do either belong immediately to the person of a man, as his horse, sword, &c. or such things as being injuriously withheld from him, a man has no way to recover but by personal action. See **PERSONAL**.

CHATELS Real, are either such as do not appertain immediately to the person, but to some other thing, by way of dependance; as charters of land, apples upon a tree, &c. or such as necessarily issue out of some immovable thing to a person; as a lease, or rent for years.

CHAUNTOR, or **CHAUNTER**. See **CHAUNTOR**.

CHAUNTRY, or **CHAUNTRY**, was antiently a church, or chapel endowed with lands, or other yearly revenue, for the maintenance of one, or more priests, daily saying, or singing mass for the souls of the donors, and such others as they appointed.

Hence **CHAUNTRY-Rents**, are rents paid to the crown by the tenants, or purchasers of *Chauntry-Lands*.

CHAUFFE-WAX. } See } **CHAFF-WAX**.

CHASSE-TRAPE. } See } **CALTROP**, and **CROWSFEET**.

CHAZINZARIANS*, a sect of hereticks, who rose in Armenia in the seventh century.

* The word is formed of the Armenian, *chazus*, cross. In the Greek text of Nicephorus, they are called *Chazintzarians*, *χαζιντζαριαν*.

They are also called *staurolatras*, which, in Greek, signifies the same as *chazintzarians* in Armenian, *viz. adorers of the cross*; they being charged with paying adoration to the cross alone.

In other respects they were Nestorians; and admitted two persons in Jesus Christ. Nicephorus, l. xvii. c. 54. ascribes other singularities to them, particularly their holding an annual feast, in memory of the dog of their false prophet Sergius; which they called *artziartzas*.

CHECK-Roll, a roll, or book containing the names of such as are attendants, and in pay to the king, or other great persons; as their household servants.

It is otherwise called the *chequer-roll*. See **ROLL**.

Clerk of the CHECK, in the king's household, has the *Check* and controulment of the yeomen of the guard, and all the others belonging to the royal family; allowing their absence or defects in attendance, or diminishing their wages for the same, &c.—He also, by himself or deputy, takes the view of those that are to watch in the court, and has the setting of the watch. 33H.8. c. 12.

Clerk of the CHECK, in the king's navy at Plymouth, is also the name of an officer invested with like powers. 19 Car. 2. c. 1.

CHECK, in falconry, is where a hawk forsakes her proper game, to follow rooks, pies, or other birds that cross her in her flight.

CHECKER. See the article **EXCHEQUER**.

CHECKY, in heraldry, is where the shield, or a part thereof, as a bordure, &c. is chequered, or divided into checkers, or squares.—See Tab. *Heraldry*, fig. 15.

Where there is but one row of squares, it is not properly called *checky*, but *countercompmed*.

Checky, according to Colombiere, is one of the most noble and antient figures in all armory; and ought never to be given, but

to persons who have distinguished themselves in war: for it represents a chess-board, which it self is a representation of a field of battle. The pawns and men, placed on both sides, represent the soldiers of the two armies; which move, attack, advance, or retire, according to the will of the two gamesters, who are the generals.

Checks is always composed of metal, and colour. Some authors however would have it ranked among the sorts of furs.

When the whole escutcheon is chequered, it should ordinarily contain six ranges: there is no need of blazoning to express them; only it must be observed, to begin to blazon by the first square in chief on the dexter-side. So that if that be *or*, and the next *gules*, the house or family is said to bear *checks, or, and gules*.

When the whole shield is not chequered, but only the chief, a bend, cross, or the like, the number of ranges should be expressed.

CHEEKS, a general name among mechanics, for almost all those pieces of their machines and instruments, that are double, and perfectly alike.

The *Checks of a printing-press*, are its two principal pieces: they are placed perpendicular, and parallel to each other; serving to sustain the three formers, *viz.* the head, shelves, and winter, and to bear the spindle, and other parts of the machine.

The *Checks of a turner's Lathe*, are two long pieces of wood, between which are placed the *puppets*, which are either pointed; or otherwise; serving to support the work, and the mandrils of the workman. These two pieces are placed parallel to the horizon, separated from one another by the thickness of the tail of the puppets, and joined with tenons to two other pieces of wood, placed perpendicularly; called the *legs of the lathe*.

Checks of the glazier's vice, are two pieces of iron, joined parallel at top and bottom; in which are the axis, or spindles, little wheel, cushions, &c. whereof the machine is composed.

CHEESE, a popular food; being a preparation of milk curdled by means of rennet, and afterwards dried, and hardened.

Cheese is nothing but milk purged of its serum, or whey; and sometimes too of the cream, or butyrous part of the milk.

Cheese, when new, is found to load the stomach, by reason of its moisture and viscosity; and when too old, it heats and inflames it by its salts. The physicians advise it to be eat in small quantities; hence that Latin verse,

Casus ille bonus quem dat avara manus.

Dr. Quincy says, it cannot be too old: it is certain, the more it abounds with salts, the more will it contribute to digestion, and the clearing of the stomach of other food.

Indeed some condemn all use of *cheese*; sheltering themselves under that ancient maxim, *Cosens est nequam quia concoquit omnia squama.*

CHEF. See the article **CHIEF**.

CHEF d'Ouvre. See the article **MASTERPIECE**.

CHELIDONIUS, in natural history, a stone pretended to be found in the stomachs of young swallows; much esteemed by some for the falling sickness.

* The word is formed from the Greek *χελιδων*, a swallow. See Supplement, article **CHELIDONIUS**.

CHELONITES, a stone said to be found in the Indian tortoises, and said to have the faculty of resisting poison.

* The word is formed from the Greek *χελων*, a tortoise.

Some confound the *Chelonites* with the *bunonites*, or *toadstone*. See Supplement, article **CHELONITES**.

CHELSEY-College, or hospital. See **HOSPITAL**.

CHEMISE, in fortification, a wall wherewith a bastion, or ditch is lined, for its greater support and strength.

Fire CHEMISE, is a piece of linen cloth, steeped in a composition of oil of petrol, camphor, and other combustible matters; used at sea, to set fire to an enemy's vessel.

CHEQ, or **CHERIF**, the prince, or high-priest of Mecca; sovereign pontiff of the Mussulmans; and owned as such by all the sects into which they are divided.

The grand signior, soppies, mogols, kans of Tartary, &c. send him yearly presents; especially tapestry, to cover Mahomet's tomb withal, and tents for himself: for the *Cheq* has a tent near the mosque of Mecca, wherein he lives during the seventeen days of devotion in pilgrimage to Mecca. The tapestry and tent are changed each year, and pieces thereof are sent to the princes who furnish new ones.

His revenue is very considerable, consisting of presents made by the Mahometan princes, and pilgrims, to the mosque of Mecca and Medina.

The *Cheq* subsists all the pilgrims during the seventeen days of devotion; on which account, he is every year furnished with a very considerable sum of money from the grand signior: the better to obtain this, he makes him believe, that there are constantly, during this time, seventy thousand pilgrims; and that, should the number fall short, the angels, in form of men, would make it up.

CHERRY-Brandy, a drink made of *Brandy*, with the addition of *Cherries*.

The *Cherries* commonly used therein, are of the black kind; with these, a bottle being half filled, is filled up with *Brandy*, or spirits. The whole is to be shaken up now and then; and in a month's time it becomes fit for use.

To sweeten it, and improve the flavour, some chuse to put in Sugar, with a quantity of raspberries.

CHERSONESUS, in geography, a peninsula; or a continent almost encompassed round with the sea, only joining to the main land by a narrow neck, or isthmus.

* The word is Greek, *χερσονησος*, which signifies the fame.

This term is used by the moderns, in complaisance to the antients, who called all their peninsulas by this name: accordingly, such places as were hereby distinguished among them, retain the name among us; as the *Chersonesus of Peloponnesus*, of *Thrace*, *Chersonesus cimbrica*, *aurea*, &c.

CHERUB, or **CHERUBIN**, a celestial spirit, which, in the hierarchy, is placed next in order to the seraphim. See **HEBRARCHY**.

* The word is formed of the Hebrew *כרוב* *Cherub*; the plural whereof is *Cherubim*.

They are painted red, to signify that they are inflamed with the love of God.

CHERUBIN was also the name of an antient military order in Sweden, otherwise called the order of seraphim. It was instituted by Magnus IV. in 1334; and abolished by Charles IX. It took its denomination from the golden figures of cherubim, whereof the collar of the order was composed.

CHESS, an ingenious game, performed with little round pieces of wood, on a board divided into sixty-four squares; where art and address are so indispensable requisite, that chance seems to have no place; and a person never loses but by his own fault.—On each side there are eight noble men, and as many pawns, which are to be moved and shifted, according to certain rules and laws of the game.

* Sarafin has a precise treatise on the different opinions of the origin of the Latin *Schacchi* whence the French *Echecs*, and our *Chess*, is formed. Menage is also very full on the same head. Leunclavius takes it to come from the Ufoches, famous Turkish robbers: P. Simon from the German *Scacbe*, chess; and that from *Calculus*. He takes *Chess* to be the same with the *Ludus Latruncularum* of the Romans, but mistakenly. This opinion is countenanced by Vossius and Salmastius, who derive the word from *calculus*, as used for *latrunculus*. G. Tolofanus derives it from the Hebrew *Schach*, *vallavit* & *mat movens*; whence *Chess* and *Chess-mate*. Fabricius says, a celebrated Persian astronomer, one Schatrenscha, invented the game of *Chess*; and gave it his own name, which it still bears in that country. Nicod derives it from *sebeque*, or *Xeque*, a moorish word for lord, king, and prince: Bochart adds, that *sech* is originally Persian, and that *schachmat*, in that language, signifies the king is dead.—The opinion of Nicod and Bochart, which is likewise that of Scrivenerius, appears the most probable.

Donatus, on Terence's *Eunuch*, observes, that Pyrrhus, the most knowing and expert prince of his age, ranging a battle, made use of the men at *Chess* to form his designs; and to shew the secrets thereof to others. Vopiscus, in his life of Proculus, informs us, that one of the Roman emperors had the title Augustus given him, because of his gaining ten games at *Chess* successively. Tamerlane is also recorded as a very expert gamester at *Chess*.

Chess is doubtless a most antient and universal game: the common opinion is, that it was invented by Palamedes at the siege of Troy. Others attribute the invention to Diomedes, who lived in the time of Alexander: the romance of the rose ascribes it to one Attalus; but the truth is, the game is so very antient, there is no tracing its author.

In China, it makes a considerable part of the education of their maids, and seems to take the place of dancing among us. In Spain, whole cities challenge each other at *Chess*.

John of Salisbury relates, that in a battle between the French and English, in 1117, an English knight seizing the bride of Louis le Gros, and crying to his comrades, *the king is taken*, that prince struck him to the ground with his sword, saying,

Ne scis tu pasci quaux echecs on ne prend pas le roy? Dost thou not know, that at *Chess* the king is never taken? The reason is, that when the king is reduced to such a pass that there is no way for him to escape, the game ends, without exposing the royal piece to further affront.

Cardinal Cajetan, and other casuists, rank *Chess* in the number of prohibited games; as requiring too much application: and Montaign blames it as too serious for a game.

CHEST, in commerce, a kind of measure, containing an uncertain quantity of several commodities.

A *Chest of Sugar*, *v. g.* contains from ten to fifteen hundred weight: a *Chest of Glass*, from 200 to 300 foot; of *Castle Soap*, from 2½ to three hundred weight; of *Indigo*, from 1½ to two hundred weight; five score to the hundred.

CHEVAGE, or **CHIEFAGE**, according to Bracton, signifies a tribute by the head; or a kind of poll-money antiently paid by such as held lands in villinage, or otherwise, to their lords, in acknowledgment.

* The word is formed of the French *Chef*, head.

The word seems also to have been used for a sum of money yearly given to a man of power, for his patronage and protection, as to a *Chief*, head, or leader.

In the first sense, Coke observes, there is still a kind of *Chevage* subsisting in Wales, called *Analyr*; paid to the prince of Wales for the marriage of his daughters; antiently by all, now only by some. Lambard writes it *Cbyage*.

The Jews, allowed to live in England, long paid *Chevage*, or poll-money; *viz.* three pence per head: it was paid at Easter.

CHEVAL

CHEVAL de Frise *, a large piece of timber pierced, and traversed with wooden spikes, armed or pointed with iron, five or six foot long.—See *Tab. Fortif. Fig. 15.*

* The term is French, and properly signifies a Friesland horse; as having been first invented in that country.—It is also called a *Turnpike*, or *Tourniquet*.

Its use is to defend a passage, stop a breach, or make a retrenchment to stop the cavalry.

It is sometimes also mounted on wheels, with artificial fires, to roll down in an assault.

Errard observes, that the prince of Orange used to inclose his camp with *Chevaux de Frise*, placing them over one another. On a medal of Licinius, is found a kind of *Cheval de Frise*, made with spikes interposed; serving to express a fortified camp.

CHEVALIER *, a French term, ordinarily signifying a knight.

* The word is formed of the French *Cheval*, horse; and that of the Latin *cavallus*.

It is used, in heraldry, to signify any Cavalier, or horseman armed at all points; by the Romans called *cataphractus eques*, now out of use, and only to be seen in coat-armour. See *EQUES*.

CHEVELLE, a term used by the French heralds, to express a head where the hair is of a different colour from the rest of the head.

CHEVIN. See the article *FISHING*.

CHEVRON, or **CHEVERON**, in heraldry, one of the honourable ordinaries of a shield; representing two rafters of a house joined together, without any division.

It descends from the chief towards the extremities of the coat, in form of a pair of compasses half open.—Thus, he bears gules, a *Chevron* argent.—*V. Tab. Herald. fig. 16.*

The *Chevron* is the symbol of protection, fay some; or of constancy according to others: some say it represents the knights spurs; others the head attire of priestesses; others a piece of the list, or the barrier or fence of a park.

When it is alone, it should take up the third part of the coat: when it is accompanied with any other bearings, its breadth must be adjusted thereby.

It is bore divers ways; sometimes in chief, sometimes in base, sometimes enarched, sometimes reversed, &c.

The *Chevron* is sometimes charged with another *Chevron*, $\frac{2}{3}$ of its own height.

Two *Chevrons* are allowed in the same field, but not more; when they exceed that number, they are called *Chevronwise*, or *Chevronals*. There are *Chevrons* of several pieces.

A *Chevron* is said to be *abased*, when its point does not approach the head of the chief, nor reach farther than the middle of the coat; *mutilated*, when it does not touch the extremes of the coat; *clown*, when the upper point is taken off, so that the pieces only touch at one of the angles; *broken*, when one branch is separated into two pieces; *couched*, when the point is turned towards one side of the escutcheon; *divided*, when the branches are of several metals, or when metal is opposed to colour; and *inverted*, when the point is towards the point of the coat, and its branches towards the chief.

A coat is said to be *chevroned*, when it is filled with an equal number of *Chevrons*, of colour and metal.

Counterchevroned, is when it is so divided, as that colour is opposed to metal, and *vice versa*.

Per Chevron, or *party per Chevron*, is when the field is divided by only two single lines, rising from the two base points, and meeting in a point above, as the *Chevron* does.

CHEVRONEL, a diminutive of *Chevron*; and as such only containing half a *Chevron*.

CHEVRONNE, or **CHEVRONNY**, signifies the parting of the shield, several times *Chevronwise*. Gibbon says, *Chevronne* of six.

CHIAOUS *, an officer in the grand seignior's court, doing the business of an usher.

* The word, in the original Turkish, signifies envoy.

He bears arms offensive and defensive; and has the care of prisoners of distinction. His badge is a staff covered with silver, and he is armed with a scimitar, bow, and arrows.

The emperor usually chuses one of this rank to send as ambassador to other princes.

The *Chiaus* are under the direction of the *Chiaus-Baschi*, an officer who sits at the divan, and introduces those who have business there.

CHICANE *, or **CHICANKRY**, in law, an abuse of judiciary proceeding, tending to delay the cause, and deceive or impose on the judge, or the parties.

* Some derive the word from *Cicum*, the skin of a pomegranate; whence the Spaniards formed their *Chies*, little, slender, *Chicans* being conversant about trifles.

The French call sollicitors, attorneys, &c. *Gens de Chicane*.

CHICANE is also applied in the schools, to vain sophisms, distinctions, and subtilties, which immortalize disputes, and obscure the truth; as the *Chicans* of courts does justice.

CHIEF *, a term denoting head, or a principal thing, or person.

* The word is formed of the French *Chief*, head; of the Greek $\chi\epsilon\alpha\sigma\alpha\iota\varsigma$, *caput*, head: though Menage derives it from the Italian, *Capo*, formed of the Latin *Caput*.

We say, the *chief* of a party; the *chief* of a family, &c. Agamemnon was the *chief* of the Greeks who besieged Troy; the Romans sometimes refused triumphs to their victorious generals; by reason the conduct of the *chief* was not answerable to his success. The abbies that are *chiefs* of their order are all regular; and it is there the general chapters are held.

CHIEF-JUSTICE. See the article *JUSTICE*.

CHIEF LORD, denotes the feudal lord, or lord of an honour, on whom others depend. See *LORD*; see also *HONOUR*.

Holding in CHIEF. See *CAPITE*, and *TENURE*.

CHIEF, in heraldry, is the upper part of the escutcheon, reaching quite across, from side to side.

The arms of France are three golden flower de lys's, in a field azure; two in *chief*, and one in point.

CHIEF is more particularly used for one of the honourable ordinaries, placed athwart the top of the coat, and containing one third part of its height.

When the escutcheon is cut in stone, or in relief, the *Chief* stands out prominent beyond the rest; and is supposed to represent the diadem of the ancient kings and prelates; or the casque of the knights.

It is frequently without any ornament; sometimes it is charged with other bearings; sometimes it is of a colour or metal different from that of the coat.

The line that bounds it at the bottom is sometimes straight, sometimes indented, engrailed, embattled, lozenged, &c. Thus, say they, The field is gules, a *chief* argent, &c. again, he bears gules, a *Chief* crenele, or embattled argent.

Sometimes one *Chief* is born on another; expressed by a line drawn along the upper part of the *Chief*; when the line is along the under part, it is called a *Filler*. The first is an addition of honour, the second a diminution.

The *Chief* is said to be *abased*, when it is detached from the upper edge of the coat, by the colour of the field which is over it; and which retrenches from it one third of its height. We also say, a *Chief* is *chevroned*, *paled*, or *banded*, when it has a chevron, pale, or bend contiguous to it, and of the same colour with itself. A *Chief* is said to be *supported*, when the two thirds at top are of the colour of the field, and that at bottom of a different colour.

In CHIEF.—By this is understood any thing born in the *Chief* part, or top of the escutcheon.

CHIEF-PLEDGE, the same as headborough. See *HEADBOROUGH*.

CHIEF-POINT. See the article *POINT*.

CHIEFTAIN, the *Chief*, leader, or general of an army, or the like.

CHILBLAIN *, *Pernio* †, (in medicine) a tumour afflicting the feet and hands; accompany'd with an inflammation, pain, and sometimes an ulcer, or solution of continuity: in which case it takes the denomination of *chaps*, on the hands; and *kibes*, on the heels.

* *Chilblain* is compounded of *chill* and *blain*; *q. d.* a blain or sore contracted by cold.

† *Pernio* is the Latin name adopted by the physicians; and is derived by Vossius from *perna*, a gammon of bacon, on account of some resemblance.

‡ *Chop* alludes to gape, both in found and appearance.

§ *Kiber*, in Welsh *kiber*, may be derived from the German *kerben*, to cut; the skin, when broke, and appearing as if cut.

Chilblains are occasioned by excessive cold stopping the motion of the blood in the capillary arteries.

The tumour, from white, generally inclines to bliueness. For the cure of *Chilblains* it is usual to wash them with warm brine, urine, &c. but petroleum, or warm honygare water, with spirit of wine camphorated, used with a sponge, are much better.

—For chaps and kibes, nothing exceeds the unguentum deficcativum rubrum, or diapompholyx mix'd with a little camphor; and used, for the dressings, with emplastrum e minio, or diachylon simplex, let-down with oil of roses.

CHILD, a term of relation to parent.

We say, natural *Child*, legitimate *Child*, putative *Child*, bastard *Child*, adoptive *Child*, posthumous *Child*, &c. See *NATURAL*, *PUTATIVE*, *BASTARD*, *ADOPTIVE*, *POSTHUMOUS*, &c.

M. Derham computes, that marriages, due with another, produce four *Children*; not only in England, but in other parts also.

In the genealogical history of Tuscany, wrote by Gamarini, mention is made of a nobleman of Sienna, named Pichi, who of three wives had a hundred and fifty *Children*; and that, being sent ambassador to the pope and the emperor, he had forty eight of his sons in his retinue.

In a monument in the church-yard of St. Innocent, at Paris, erected to a woman who died at eighty-eight years of age, it is recorded, that she might have seen 288 *Children* directly issued from her. This greatly exceeds what Hakewell relates of Mrs. Honeywood, a gentlewoman of Kent, born in the year 1527, and married at sixteen to her only husband R. Honeywood, of Charing, Esq; and who died in her ninety third year.

She had sixteen *Children* of her own body; of which three died young, and a fourth had no issue: yet her *Grandchildren* in the second generation, amounted to 114; in the third to 228; tho' in the fourth they fell to 9. The whole number she might have

seen in her life-time being 367. $16 + 114 + 228 + 9 = 367$. So that she could say the same as the distich does of one of the Dalburg's family at Basil.

Mater ait natae dic natae filia natae,
1 2 3 4
5 6

Ut maneat, natae, plangere filiam.

Dr. Harris has an express treatise of the acute diseases of Children, de morbis acutis infantum. He takes them all to arise from the humours in the primae viae growing fowre, and degenerating into acidities: which is confirmed from their fowre belches and dejections. Hence all that is required to cure them, is to combat this acidity; which is to be effected two ways; by disposing it to be evacuated, and by actual evacuation by rhubarb, and other gentle purgatives.

To dispose the peccant acid for evacuation, no sudorifics or cordials are to be used, those remedies being too violent; but crabs eyes and claws, oyster-shells, cuttlefish-bones, egg-shells, chalk, coral, pearls, bezoar, burnt ivory, scrapings of the unicorn's horn, armenian bole, and the confection of hyacinth. But of all these, he prefers old shells that have lain long on the edge of the sea, exposed to the sun, which is better than any chymical furnace.

CHILD-BED. } See the article DELIVERY.
CHILD-BIRTH. }

CHILD-WIT, a power to take a fine of a bond-woman unlawfully gotten with child, that is, without consent of her lord. Every reputed father of a base Child, got within the manor of Writtle in Essex, pays to the lord for a fine 3 s. 4 d. where, it seems, Child-wit extends to free, as well as bond-women.— Quicumque fecerit Child-wit, Archiepiscopus aut totum, aut dimidiam emendationis partem habebit, quatenus esse de Child-wit. Du Cange.

Charity-CHILDREN. See CHARITY-School, and HOSPITAL.

CHILDERMASS-Day, called also Innocents-Days, an anniversary feast of the church, held on the 28th of December, in memory of the Children of Bethlehem, massacred by order of Herod.

CHILIAID *, an assemblage of several things ranged by thousands.

* The word is formed of the Greek χίλιας, mille, a thousand.

CHILIAARCHA *, or CHILIAARCHUS, an officer in the armies of the antients, who had the command of a thousand men.

* The word comes from the Greek χίλιας, thousand, and αρχη, command.

CHILIASTS. See the article MILLENNARY.

CHILMINAR, CHELMINAR, or Tchelminar, the noblest and most beautiful piece of architecture remaining of all antiquity; being the ruins of the famous palace of Persepolis, to which Alexander the great, being drunk, set fire, at the persuasion of the courtisan Thais.

Authors and travellers are exceedingly minute in their descriptions of the Chilminar; particularly Gracias de Silva Figueroa, Pietro de la Valle, Chardin, and Le Brun.

A general idea thereof, may be conceived as follows.

There appear the remains of near fourscore columns; the fragments whereof are at least six foot high: but there are only nineteen that can be called entire; with a twentieth all alone, 150 paces from the rest.

A rock of black hard marble, serves for the foundation of the edifice. The first plan of the building is ascended to by fourscore and fifteen steps cut in the rock. The gate of the palace is twenty foot wide; on one side is the figure of an elephant, and on the other of a rhinoceros, each thirty foot high, and of shining marble. Near these animals are two columns; and not far off the figure of a Pegasus.

After this gate is passed, there are found a great number of columns of white marble; the remains whereof shew the magnificence of the work; the smallest of these columns is fifteen cubits high, the largest eighteen; each has forty flutings, three large inches broad; whence the height of the whole may be guessed at, with the other proportions. Near the gate is an inscription on a square piece of marble, smooth as glass, containing about twelve lines: the characters are of a very extraordinary figure, resembling triangles and pyramids.

These noble ruins are now the shelter of beasts, and birds of prey. Besides the inscription abovementioned, there are others in Arabic, Persian, and Greek. Dr. Hyde observes, that the inscriptions are very rude and unartful; and that some, if not all of them, are in praise of Alexander the great, and therefore are later than that conqueror.

M. Le Brun tells us, that he took his voyage to the East-Indies merely for the sake of viewing the Chilminar.

CHIMERA, or CHIMERA, a fabulous monster, which the poets feign to have the head and breast of a lion, the belly of a goat, and the tail of a dragon; and to have been killed by Bellerophon, mounted on the horse Pegasus.

The foundation of the fable is this; that antiently in Lycia there was a volcano, or burning mountain of this name, the top whereof, which was desert, only inhabited by lions; the middle, having good pastures, was frequented by goats; and the foot, being marshy, by serpents. Thus Ovid:

—Mediis in partibus bircum

Pectus, & ora lea, caudam serpentis habebit.

Bellerophon being the first who caused this mountain to be in-

habited, it was feigned he slew Chimera. Pliny says, the fire thereof would burn in water, and could be extinguished with nothing but earth or dung.

CHIMES of a clock, a kind of periodical musick, produced at certain seasons of the day, by a particular apparatus added to a Clock.

To calculate numbers for the Chimes, and to fit and divide the Chime-barrel, it must be observed, that the barrel must be as long in turning round, as you are in finging the tune it is to play.

As for the Chime-barrel, it may be made up of certain bars which run athwart it, with a convenient number of holes punched in them, to put in the pins that are to draw each hammer: by this means the tune may be changed, without changing the barrel. In this case, the pins, or nuts, which draw the hammers, must hang down from the bar, some more, some less; and some must stand upright in the bar: the reason whereof is, to play the time of the tune rightly: for the distance of each of these bars may be a semibreve; but the usual way, is to have the pins which draw the hammers fixed on the barrel.

For the placing of these pins, you may proceed by the way of changes on bells, viz. 1, 2, 3, 4, &c. or rather, make use of the musical notes: where it must be observed, what is the compass of the tune, or how many notes, or bells, there are from the highest to the lowest; and accordingly, the barrel must be divided from end to end.

Thus, in the following example, each of the tunes are eight notes in compass; and accordingly, the barrel is divided into eight parts. These divisions are struck round the barrel; opposite to which are the hammer-tails.

We speak here as if there were only one hammer to each bell, that it may be more clearly apprehended; but when two notes of the same found come together in a tune, there must be two hammers to the bell to strike it: so that if in all the tunes you intend to chime of eight notes compass, there should happen to be such double notes on every bell; instead of eight, you must have sixteen hammers; and accordingly you must divide the barrel, and strike sixteen strokes round it, opposite to each hammer-tail: then you are to divide it round about, into as many divisions as there are musical bars, semibreves, minims, &c. in the tune.

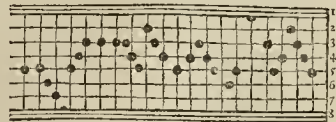
Thus the hundredth psalm-tune has twenty semibreves, and each division of it is a semibreve: the first note of it also is a semibreve; and therefore on the Chime-barrel there must be a whole division, from five to five; as you may understand plainly, if you conceive the surface of a Chime-barrel to be represented by the following tables; as if the cylindrical superficies of the barrel were stretched out at length, or extended on a plane: and then such a table, so divided, if it were to be wrapped round the barrel, would shew the places where all the pins are to stand in the barrel: for the dots running about the table, are the places of the pins that play the tune.

Indeed, if the Chimes are to be compleat, yet ought to have a fit of bells to the gamut notes; so as that each bell having the true sound of sol, la, mi, fa, you may play any tune with its flats and sharps; nay, you may by this means play both the bass and treble with one barrel: and by setting the names of your bells at the head of any tune, that tune may easily be transferred to the Chime-barrel, without any skill in musick: but it must be observed, that each line in the musick is three notes distant; that is, there is a note between each line, as well as upon it.

The notes of the hundredth psalm.



A table for dividing the Chime-barrel of the hundredth psalm.



CHIMIN, or CHEMIN, in law, a road or way. See ROAD. Hence, CHIMINAGE, a toll for wayfarage, or passage through a forest.

The Feudists call it *pedagium*.

CHIMNEY *, in architecture, a part of a house, or lodging, wherein the fire is made.

* The word Chimney comes from the French *Cheminée*; and that from the Latin *Caminata*, a chamber wherein is a Chimney: *Caminato*, again, comes from *Caminus*, and that from the Greek, *καμινος*, a Chimney; of *καμινος*, *αρος*, I burn.

The parts of a *Chimney* are the jambs, or sides; the back or hood; the mantle-tree, resting on the jambs: the tube, or funnel, which conveys away the smoke; the *Chimney-piece*, or moulding, on the fore-side of the jambs over the mantle-tree; and the hearth, or fire-place.

Palladio settles the proportions of a chamber-*Chimney* thus; breadth on the inside, $5\frac{1}{2}$, 6 or 7 foot; height to the mantle-tree, 4, or $4\frac{1}{2}$; depth, 2, or $2\frac{1}{2}$ foot.

According to Wolfius, the breadth of the aperture, at bottom to be to the height, as three to two, to the depth as four to two. In small apartments the breadth is three foot, in larger five; in bed-chambers four; in small banquetting-rooms $5\frac{1}{2}$, in large 6. But the height is never to exceed 2 $\frac{1}{2}$, lest there being too much room for the air and wind, the smoke be driven down into the room. Nor must the height be too little, lest the smoke miss its way, and be checked at first setting out. The same author advises to have an aperture, through which the external air may, on occasion, be let into the flame, to drive up the smoke; which the internal air would otherwise be unable to do.

The mouth of the tube, or that part joined to the *Chimney*-back, Felibien orders to be a little narrower than the rest; that the smoke coming to be repelled downwards, meeting with this obstacle, may be prevented from getting into the room.

Some make the funnel twisted, to prevent the smoke's descending too easily; but the better expedient is to make the funnel narrower at bottom than at top; the fire impelling it upward more easily when contracted at bottom; and in mounting, it finds more space to disengage itself, and therefore has less occasion to return into the chamber.

To prevent smoking CHIMNEYS, M. Lucar advises two holes, or two pipes, one over the other, to be left in each side of the *Chimney*; one sloping upwards, the other downwards: through one of these, says he, the smoke will pass in any position.

De l'Orme orders a brass ball full of water, with one small aperture, to be hung up in the *Chimney*, at a height a little above the greatest flame: here, as the water grows hot, it will rarely and drive through the aperture in a vapoury steam, which will drive up the smoke that would otherwise linger in the funnel. Others place a kind of moveable vane, or weathercock a-top of the *Chimney*: so that what way soever the wind comes, the aperture of the *Chimney* will be skreened, and the smoke have free egress: but in truth the best prevention of a smoking *Chimney*, seems to lie in the proper situation of the doors of the rooms and the apt falling back of the back, and convenient gathering of the wings and breast of the *Chimney*.

It is a rule, in building, that no timber be laid within twelve inches of the fore-side of the *Chimney*-jambs; that all joists on the back of the *Chimney* be laid with a trimmer, at six inches distance from the back; and that no timber be laid within the funnel.

Chimneys are usually supposed a modern invention; the ancients only making use of stoves: but Orazio Ferrari endeavours to prove *Chimneys* in use among the ancients. To this end he cites the authority of Virgil: *Ei jam summa precui villarum culmina fumant.* And that of Appian, who says, 'That of those persons procriber by the Triumvirate, some hid themselves in wells, and cloaca, common-floues; some in the tops of houles, and *Chimneys*:' for so he understands *κατωτες οπυροτας, fumarua sub tecto posita.* Add, that Aristophanes, in one of his comedies, introduces his old man, Polveleon, shut up in a chamber, whence he endeavours to make his escape by the *Chimney*. However, the few instances remaining among the ancients, together with the obscurity of the rules of Vitruvius on this head, make us rather conclude the use of stoves, whereof the ancients had entire apartments, made them neglect this point of building, which the coldness of our climates obliges us to have a principal regard to.

In the year 1713, there appeared a French book, entitled, *La Mécanique du Feu*, or the art of augmenting the effects, and diminishing the expence of fire, by M. Gauger; since published in English, by Dr. Delisle; wherein the author examines what disposition of *Chimneys* is most proper to augment the heat; and proves geometrically, that the disposition of parallel jambs, with the back inclined as in the common *Chimneys*, is less fitted for reflecting heat into the room, than parabolical jambs, with the bottom of the tablette horizontal.

He gives seven several constructions of his new *Chimneys*, and the manner of executing them.

M. Gauger, however, does not appear to be the first inventor of the *Chimney* he describes; the description of a like *Chimney* being found in a German book, printed at Leipzig, in 1699.

CHIMNEY-JAMBS, are the sides of a *Chimney*, usually standing out perpendicularly, sometimes circularly, from the back; on the extremities whereof the mantle-tree rests.

CHIMNEY-MONEY, or *hearth-money*, a tax imposed by statute 24 Car. II. expressing, that every fire-hearth and stove of every dwelling, or other house within England and Wales, except such as pay not to church and poor, shall be chargeable with two shillings *per ann.* payable at Michaelmas and Lady-day, to the king and his heirs.

CHIMNEY-PIECE, in building, a composition of certain mouldings, of wood or stone, standing on the fore-side of the jambs, and coming over the mantle-tree.

CHINA, or CHINA-Ware, a fine sort of earthen ware, properly called *porcelain*. See PORCELAIN.

CHINA-CHINA, a name sometimes given to the Quinquina, or Peruvian Bark. See QUINQUINA.

CHINA-Root, a medicinal root, brought from the East-Indies; and lately also from Peru, and New Spain.

It is of a ruddy brown colour, bordering on black, without-side; and white, or reddish, within. It grows chiefly in fenny places, usually covered with the sea; which, upon its withdrawing, leaves great quantities thereof on the shore: the best is that which is firm, ruddy, and fresh.

It is esteemed a sweetener of the blood; and used as such in decoction, in venereal and scorbutick cases.

CHINESE, or *Chinse Tongue*, the language of the people of China.

F. le Comte observes, that the *Chinse* has no analogy to any other language in the world: it only consists of three hundred and thirty words, which are all monosyllables; at least, they are pronounced so short, that there is no distinguishing above one syllable, or sound, in them. But the same word, as pronounced with a stronger or weaker tone, has different significations: accordingly, when the language is accurately spoke, it makes a sort of music, which has a real melody, that constitutes the essence and distinguishing character of the *Chinse* tongue.

As to *Chinse Characters*, they are as singular as the language: the *Chinse* have not, like us, any alphabet, containing the elements, or as it were the principles of their words: in lieu of an alphabet, they use a kind of hieroglyphicks; whereof they have above eighty thousand.

CHIN-COUGH, a disease which children are chiefly subject to. It consists in a violent and immoderate coughing, to a danger of suffocation. Letting of blood, and balsamicks, are the usual cure.

CHIRAGRA*, in medicine, the gout in the hands.

* The word comes from the Greek *χειρ*, hand; and *αγρα*, *captura*, seizing.

The *Chiragra*, has its seat in the carpus, or extreme part of the hand, or the ligaments and junctures of the fingers.

CHIROGRAPH*, CHIROGRAPHUM, was antiently a deed which requiring a counterpart, was engrossed twice on the same piece of parchment, counterwise; leaving a space between, wherein was wrote *CHIROGRAPH*; through the middle whereof the parchment was cut, sometimes straight, sometimes indentedly; and a moiety given to each of the parties.

* The word is compounded of the Greek *χειρ*, hand; and *γραφα*, *scriptura*, I write: *q. d.* hand-writing.

This was afterwards called *videnda*, and *charte divisée*; and was the same with what we now call *charter-party*. See CHARTER-Party.

The first use of these *Chirographs* with us, was in the time of king Henry III.

According to some, a deed was properly a *Chirograph*, when it was subscribed by the hand-writing of the vendor, or creditor, and delivered to the buyer, or debtor. These authors make the *Chirograph* differ from a *Syngraph*, in this; that in the latter, the word *Syngraph* was wrote in the middle, and cut through, in the manner just observed of *Chirograph*. Those authors, therefore, make the *Syngraph* and the *Chirograph* a different thing.

CHIROGRAPH was also antiently used for a fine: the manner of engrossing the fines, and cutting the parchment in two pieces, is still retained in the office, called the *Chirographer's Office*.

CHIROGRAPHER of Fines, an officer in the common pleas, who engrosses fines acknowledged in that court, into a perpetual record, (after they have been examined, and passed by other officers,) and writes and delivers the indentures thereof to the party.

He makes two indentures, one for the buyer, the other for the seller; and a third indented piece, containing the effect of the fine, and called the *foot of the fine*; and delivers it to the *custos brevium*.

The same officer also, or his deputy, proclaims all fines in court every term, and endorses the proclamations on the backside of the foot; keeping, withal, the writ of covenant, and the note of the fine.

CHIROMANCY*, the art of divining the fate, temperament, and disposition of a person, by the lines, and lineaments of the hand; this is otherwise called *palmaristry*.

* The word comes from the Greek *χειρ*, hand; and *μαντια*, divination.

We have a great number of authors on this vain and trifling art; as Artemidorus, Fludd, and Johannes de Indagine: Taffnerus, and M. de le Chembre have done the best.

This last insists on it, that the inclinations may be known from inspecting the hand; there being a very near correspondence between the parts of the hand, and the internal parts of the body, the heart, liver, &c. whereon the passions and inclinations much depend. He adds, however, that the rules and precepts of *Chiromancy* are not sufficiently warranted, the experiments whereon they stand, not being well verified. He concludes, that there must be a new set of observations, made with justness and exactitude; in order to give *Chiromancy* the form and solidity which an art or science demands.

CHIROTANIA*, the imposition of hands, in conferring any priestly orders. See IMPOSITION.

* The word comes from the Greek *χειροτονια*, the action of stretching out the hands: and because the ancients gave their suffrages by stretching out the hands, they gave the name *Chirotania* to the election of magistrates.

This custom was first established in Greece; as appears from an oration of Demosthenes against Neera, and that of Æschines against Ctesiphon: thence it passed to the Romans. From prophane authors it passed to ecclesiastical ones; and was used by them, not only in speaking of elections, but also of ordinations.

CHIRURGERY*, popularly called *Surgery*, the third branch of medicine; consisting in operations performed by the hand, for the cure of wounds, and other disorders.

* The word *Chirurgery* is formed from the Greek *χειρ*, manus, hand; and *εργον*, *εργα*, operation.

Chirurgery may be defined the art of curing wounds, and various diseases, by the opening of veins, application of topics, and by incisions, and amputations of several parts of the body.

Chirurgery is divided into speculative, and practical; one whereof does that in effect, which the other teaches to do.

All the operations of *Chirurgery* are reduced under four kinds: the first whereof rejoins what has been separated; and is called *synthesis*.

The second divides, with discernment, those parts whose union is prejudicial to health; and is called *diuresis*.

The third extracts with art, foreign bodies; called *exarexis*.

And the fourth, called *præthesis*, adds and applies what is wanting.

The principal things that come under the consideration of *Chirurgery*, are tumors, ulcers, wounds, dislocations, and fractures. *Chirurgery* has the advantage of medicine in the solidity of its foundation, the certainty of its operations, and the sensibility of its effects; inasmuch, that those who deny medicine to be of any signification, yet allow the usefulness of *Chirurgery*.

Chirurgery is very ancient; and even much more so than medicine, whereof it now makes a branch. It was, in effect, the sole medicine of the first ages: they beating themselves to the cure of external disorders, before they came to examine or discover what related to the cure of internal ones.

Apis, king of Egypt, is said to be the first inventor of *Chirurgery*; after him, Æsculapius composed a treatise of wounds and ulcers. He was succeeded by the philosophers of the following ages, in whose hands *Chirurgery* wholly lay; such were Pythagoras, Empedocles, Parmenides, Democritus, Chiron, Pæon, Cleombrotus, who cured king Antiochus, &c.

Pliny tells us, upon the authority of Cassius Hemina, that Arca-gathus was the first of the profession that settled at Rome; that the Romans were wonderfully pleased with this *Vulneyarius*, as they called him, at his first coming, and shewed him some extraordinary marks of their esteem; but that they were disgusted at him afterwards, and nick-named him *Carnifex*, for his cruelty in cutting off limbs. Some pretend, that he was even stoned by them to death in the Campus Martius. But if he really came to such an unlucky end, it is strange Pliny should take no notice of it. Vid. Pliny, Hist. Nat. l. 29. c. 1.

Chirurgery was cultivated with much more earnestness by Hippocrates, than by any of the preceding physicians: It is said to have been perfected in Egypt by Philoxenus, who wrote several volumes on that subject. Among the Greeks, Gorgias, Sofrates, Heron, the two Apollonius's, Ammonius of Alexandria; and at Rome, Trypho the father, Evelpistus, and Mezes, made it flourish, each in their time.

The more modern authors, who have contributed most to the perfection of *Chirurgery*, are Paræus, Fab. ab Aquapendente, Harvey, Wharton, Glisson, Du Laurence, Diemerbroeck, Vieussens, Barbette, Dionis, Charriere, Heister, &c. Scultetus has published a description of all the instruments used in *Chirurgery*, under the title of *armamentarium chirurgicum*; and our countryman, Mr. Wiseman, Serjeant-*Chirurgion* to king Charles II. a folio volume of *Chirurgical* treatises, containing practical observations, both in respect to the internals and externals, of a number of cases in each branch of the art, from his own experience; and under the title of *several chirurgial treatises*. This work has been made use of ever since, by the most knowing of our English *Chirurgions*; and has been the foundation of most *Chirurgial* treatises since its publication, Anno 1676. In England there are two distinct companies now occupying the science or faculty of Surgery; the one company called *Barbers*, the other *Surgeons*, which latter were not till very lately incorporated.—The two were united to face, and be sued, by the name of masters or governors and commonalty of the mystery of Barbers and Surgeons of London. 32 H. 8. c. 42. No person using any Barbery, or shaving, in London, was to occupy any Surgery, letting of blood, or other matter; drawing of teeth only excepted.—And no person using the mystery or craft of Surgery was to occupy or exercise the seal or craft of Barbery, or shaving; neither by himself, nor any other for his use. 32 H. 8. c. 42.

By the same statute, Surgeons were obliged to have signs at their doors.

The French *Chirurgions* being refused to be admitted into the

universities, notwithstanding that their art makes a branch of medicine, one of the four faculties; on pretence of its bordering a little on butchery, or cruelty; associated themselves into a brotherhood, under the protection of S. Cosmus, and S. Damian: on which account, according to the laws of their institution, they are obliged to dress and look to wounds gratis, the first Monday of each month.

They distinguish betwixt a *Chirurgion* of the long robe, and a *Barber Chirurgion*: the first has studied physick, and is allowed to wear a gown.

The skill of the other, beside what relates to the management of the beard, is supposed to be confined to the more simple and easy operations in *Chirurgery*; as bleeding, tooth-drawing, &c. They were formerly distinguished by badges; those of the long gown bore a case of instruments; and the barber a basin.

CHISEL, an instrument much used in sculpture, masonry, joinery, carpentry, &c.

There are *Chissels* of different kinds; though their chief difference lies in their different size and strength, as being all made of steel well sharpened and tempered; but they have different means, according to the different uses to which they are applied.—

The *Chissels* used in carpentry and joinery, are, 1. The *Former*, which is used first of all before the paring-*Chissel*, and just after the work is scribed. 2. The *Paring-Chissel*, which has a fine smooth edge, and is used to pare off, or smooth the irregularities which the former makes. This is not struck with a mallet, as the former is, but is pressed with the shoulder of the workman. 3. *Skew-former*, this is used for cleaning acute angles with the point, or corner of its narrow edge. 4. The *Mortice-Chissel*, which is narrow, but very thick and strong, to endure hard blows; and it is cut to a very broad bass: its use is to cut deep square holes in the wood, for mortices. 5. The *Gauge*, which is a *Chissel* with a round edge; one side whereof serves to prepare the way for an auger, and the other to cut such wood as is to be rounded, hollowed, &c. 6. *Socket-Chissels*, which are chiefly used by carpenters, &c. have their flank made with a hollow socket at top, to receive a strong wooden sprig, fitted into it with a shoulder. These *Chissels* are distinguished, according to the breadth of the blade, into half inch *Chissels*, three quarters of an inch *Chissels*, &c. 7. *Ripping-Chissels*, which is a socket-*Chissel* an inch broad; having a blunt edge, with no bass to it: its use is to rip, or tear two pieces of wood asunder, by forcing in the blunt edge between them.

CHITTING, in gardening.—A feed is said to *chit*, when it first shoots its small roots into the earth.

CHIVALRY, or CHEVALRY, in law, a tenure of land by knight-service; whereby the tenant was antiently bound to perform service in war, to the king, or the mesne lord of whom he held by that tenure.

By a statute of 12 Car. II. all tenures by *chivalry*, in capite, &c. are abolished.

CHIVES, or CHIEVES, in botany, the small knobs growing on the ends of the fine threads, or stamina of flowers: by Ray and others called also *apices*.

Dr. Grew calls the stamina, or threads themselves, on which the apices are fixed, the *Chives*.

CHLAMYS, in antiquity, a military habit, worn by the antients over the tunica.

Chlamys was the same, in time of war, that the *tega* was in time of peace; each belonged to the Patricians. It did not cover the whole body, but chiefly the hind-part; though it also came over the shoulders, and was fastened with a buckle on the breast. There were four or five kinds of *Chlamys*; that of children, that of women, and that of men; which last was divided into that of the people, and that of the emperor.

CHLOROSIS*, in medicine, a feminine disease, vulgarly called the *green-sickness*, *whitè-jamàice*, &c.

* The word *Chlorosis* signifies *greenness*, *verdure*; formed from *χλον*, *grasi*.

Its usual subjects are girls, maids, and widows; or even wives, whose husbands are deficient, &c. It gives a pale, yellow, or greenish tincture to the complexion, with a circle of violet under the eyes. The patient is melancholy and uneasy; has frequently a low wandering fever, with an unequal pulse, vomiting, heaviness, listlessness, drowsiness, difficulty of breathing, longing for absurd foods, &c.

It comes on, commonly, antecedent to, or about the time of the eruption of the menses.—Though the stoppage of the menses is not always the cause of this distemper; for they sometimes, though but seldom, flow regularly, in the progress thereof. According to Etmuller, the suppression of the menses is rather the effect than the cause of this disease.

The cure is chiefly to be attempted by chalybeats and bitters. In the colder constitutions, decoctions of guaiacum are found of use. See Supplement, article CHLOROSIS.

CHOCOLATE, a kind of cake, or confection prepared of certain drugs, the basis, or principal whereof, is the cacao nut.

The name *Chocolate* is also given to a drink, prepared from this cake, of a dusky colour, stiff, and oily; usually drank hot: and esteemed not only an excellent food, as being very nourishing, but also a good medicine; at least a diet, for keeping up the warmth of the stomach, and assisting digestion.

The

The Spaniards were the first who brought *Chocolate* into use in Europe; and that, perhaps, as much out of interest, to have the better market for their cacao nuts, vanilla, and other drugs which their West-Indies furnish, and which enter the composition of *Chocolate*; as out of regard to those extraordinary virtues, which their authors so amply enumerate in it. The qualities abovementioned, are all that the generality of Physicians, and others, allow it.

Original manner of making CHOCOLATE.—The method first used by the Spaniards, was very simple, and the same with that in use among the Indians; they only used cacao nut, maize, and raw sugar, as expressed from the canes, with a little achiot, or rocou, to give it a colour. Of these four drugs, ground between two stones, and mixed together in a certain proportion, those barbarians made a kind of bread, which served them equally for solid food, and for drink; eating it dry when hungry, and steeping it in hot water when thirsty.

This drink the Mexicans called *Chocolate*, from *chocao*, found, and *alte*, or *atte*, water; *q. d.* water that makes a noise: from the noise which the instrument used to mill and prepare the liquor, made in the water.

But the Spaniards, and other nations, afterwards added a great number of other ingredients to the composition of *Chocolate*; all of which, however, vanilla alone excepted, spoil rather than mend it.

Method of making CHOCOLATE, now in use among the Spaniards of Mexico.—The fruit being gathered from the cacao tree, is dried in the sun, and the kernel taken out, and roasted at the fire, in an iron pan pierced full of holes; then pounded in a mortar; then ground on a marble stone, with a grinder of the same matter, till it be brought into the consistence of a paste; mixing with it more or less sugar, as it is to be more or less sweet. In proportion as the paste advances, they add some long pepper, a little achiot, and lastly, vanilla: some add cinnamon, cloves, and anise; and those who love perfumes, musk and ambergris.

There is also a kind of Mexican *Chocolate*, in the composition whereof there enter almonds and filberts; but 'tis rather to spare the cacao, than to render the *Chocolate* better: and accordingly, this is looked on as sophisticated *Chocolate*.

The *CHOCOLATE* made in Spain, differs somewhat from that made in Mexico: for besides the drugs used in this last, they had two or three kinds of flowers, pods of campeche, and generally almonds and hazel nuts. The usual proportion, at Madrid, is to a hundred kernels of cacao, to add two grains of Chilé, or Mexican pepper, or in lieu thereof, Indian pepper; a handful of anise; as many flowers, called by the natives *vinacaxtilides*, or little ears; six white roses in powder; a little mahufia; a pod of campeche; two drachms of cinnamon; a dozen almonds, and as many hazel nuts; with achiot enough to give it a reddish tincture. The sugar and vanilla are mixed at discretion; as also the musk and ambergris. They frequently work their paste with orange-water, which they think gives it a greater consistence and firmness.

The paste is usually made up into cakes, sometimes into large rolls. And sometimes the cakes are made up of pure *Chocolate*, without any admixture; those who use it being to add what quantity they please of sugar, cinnamon, and vanilla, when in the water.

Among us, in England, the *Chocolate* is chiefly made thus simple and unmixed, though (perhaps not unadulterated) of the kernel of the cacao; excepting that sometimes sugar, and sometimes vanilla is added: any other ingredients being scarce known among us.

The newest *Chocolate* is esteemed the best; the drug never keeping well above two years; but usually degenerating much before that time.

It is to be kept in brown paper, put up in a box; and that in another in a dry place.

The manner of preparing the *mas* into a liquor, with the proportions, are various: ordinarily, the *Chocolate* is boiled in water, sometimes in milk; and sometimes, by good economists, in water-gruel: when boiled, it is milled, or agitated with a wooden machine for the purpose, and boiled again, 'till it be of the proper consistence for drinking; then sugared, if the *mas* were pure; then milled afresh, and poured off.

Note, the best *Chocolate* is that which dissolves entirely in the water, leaving no grounds, or sediment at the bottom of the pot.

There is a dispute among the casuists, whether or no *Chocolate* break the fast? the negative is very stiffly asserted by cardinal Brancaccio, who has wrote expressly on the subject: though some have endeavoured to shew, that there is more nutritious juice in an ounce of cacao, than in a pound of beef or mutton.

The quantity of *Chocolate* made in New Spain is such, that there are annually used twelve millions of pounds of sugar in the preparation thereof. The Spaniards esteem it the last misfortune that can befall a man, to be reduced to want *Chocolate*: they are never known to leave it, excepting for some other liquor that will fuddle.

CHOIR *, that part of a church, cathedral, &c. where the clergy and choristers, or singers are placed.

* The word, according to Jâdore, is derived à *coronis circumstantibus*.

tium; because, antiently, the choristers were disposed round the altar to sing: which is still the manner of building altars among the Greeks.

The *Choir* with us is distinguished from the chancel, or sanctuary, where the communion is celebrated: as also from the nave, or body of the church, where the people are placed.

The patron is said to be obliged to repair the *Choir* of a church; and the parishioners the nave.

The *Choir* was not separated from the nave, till the time of Constantine: from that time the *Choir* was railed in with a ballustrade, with curtains drawn over: not to be opened till after the consecration.

In the twelfth century they began to enclose the *Choir* with walls: but the antient ballustrades have been since restored; out of a view to the beauty of the architecture.—The cantor is master of the *Choir*.

In nunneries, the *Choir* is a large hall, adjoining to the body of the church; separated by a grate, where the religious sing the office.

CHOLAGOUE *, *Χολαγογ* Ⓞ, a medicine which purges the bile downward.

* The word comes from *χολη*, *bile*, and *αγω*, to lead, draw.

Of these some are simple, others compound; and both the one and the other are distinguished into three kinds, with regard to their activity; the *benign*, the *moderate*, and the *violent*.

Of the first kind are manna, cassia, roses, tamarinds, &c.

Of the second, are sena, rhubarb, aloes, &c.

Of the third, Jalop, scammony, &c. See each under its article, MANNA, CASSIA, SENA, &c.

CHOLEDOCHUS *, in anatomy, a term applied to a canal, or duct, called also *ductus communis*; formed of the union of the porus biliaris, and ductus cysticus.

* The word comes from the Greek *χολη*, *chole*, and *δωχεμα*, I receive or contain.

The *Choledochus Ductus*, passing obliquely to the lower end of the duodenum, serves to convey the bile from the liver to the intestines. Some have imagined, that it conveyed the bile from the liver to the gall-bladder: but it being observed, that it is the duodenum, not the gall-bladder, that swells upon blowing through this duct; it is evident the bile contained therein, is conveyed no where else but to the duodenum. See BILE, LIVER, GALL-BLADDER, &c.

CHOLER. See the article BILE.

CHOLERA-MORBUS, a sudden overflowing, or eruption, of the bile, or bilious matters, both upwards, and downwards. See BILE.

It is supposed to have its rise from the great abundance of bilious humours, which being very acrimonious, vellate the membranes of the stomach and intestines; and by that means occasion unusual and violent contractions.

It is very dangerous: whence the French antiently called it *Troussé-Galand*.

It has its name, either from the great quantity of *Choler* it evacuates; or because the matter is incessantly expelled at the intestines, which they antiently called *Cholades*.

Dr. Sydenham observes, it generally attacks people about the latter end of summer; and proceeds, not unfrequently, from surfeits: that the cure depends upon large quantities of chicken-broth, drank fo as to excite vomiting plentifully; and that the broth is also to be injected clysterwise: after which, he says, the cure is to be completed by laudanum, given at proper intervals, and in proper doses.

The remedy in the Indies for the *Cholera-morbis*, or *Mandechin*, is to keep the patient from drinking; and to burn the soles of his feet. See Supplement, article CHOLERA MORBUS.

CHONDROGLOSSUM, in anatomy, a very small muscle of the tongue, mentioned by Verheyen, and several other authors, exceedingly short and narrow; arising from the cartilaginous processes of the os hyoides, and meeting in the middle of the basis of the tongue, where 'tis inserted, forming an arch under it. This pair of muscles is not found in all subjects; whence some have questioned its existence: but nature takes so many liberties, in matters even of greater moment than a pair of muscles; that we need not on that score dispute the veracity of so many authors as profess to have seen it.

CHOP-CHURCH, or **CHURCH-CHOPPER**, a name, or rather nick-name, given to parsons, who make a practice of exchanging benefices.

Chop-church, occurs in an antient statute as a lawful trade, or occupation; and some of the judges say it was a good addition. Brook holds, that it was no occupation, but only a thing permissible by law.

CHOPIN, or **CHOPINE**, a French liquid measure; containing half their pint.

The Paris *Chopin* is nearly equal to the English pint. A *Chopin* of common water weighs a Paris pound. See PINT.

CHORD *, or **CORDE**, primarily denotes a slender rope, or cordage.

* The word is formed of the Latin *Chorda*, and that from the Greek *χορδη*, a gut, whereof strings may be made.

CHORDS, or **CORDS**, in musick, denote the strings, or lines, by whose vibrations the sensation of sound is excited; and by whose divisions the several degrees of tune are determined.

They are called *Chords*, or *Chords* from the Greek $\chi\omicron\rho\delta\acute{\alpha}$, a name which the physicians give to the intestines; in regard, the strings of musical instruments are ordinarily made of guts: though others are made of brass or iron wire; as those of spinets, harpicoords, &c.

Chords of gold wire, in harpicoords, yield a sound almost twice as strong as those of brass: *Chords*, or strings of steel, yield a feebler sound than those of brass; as being both less heavy, and less ductile.

Mr. Perrault observes, that of late they have invented a way of changing the *Chords*, to render the sound stronger, without altering the tone.

The sixth *Chord* of bass-viol, and the tenth of large theorbos, consist of fifty threads, or guts: there are some of them too foot long, twisted and polished with equisetum, or horse-tail.

For the division of *CHORDS*, so as to constitute any given interval, the rules are as follow: 1. To assign such a part of a *Chord* A B, as shall constitute any concord, v. g. a fifth, or any other interval, with the whole.

Divide A B into as many parts, as the greatest number of the interval has units; v. g. the fifth being 2 : 3, the line is divided into 3. Of these take as many

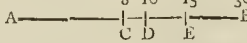


as the lesser number v. g. 2 = AC. Then is AC the part sought: that is, two lines, whose lengths are to each other as A B to A C, make a fifth.

Hence, it is required to find several different sections of the line A B, v. g. such as shall be 8^{ve} 5th and 3d^e. Reduce the given ratios 1 : 2, 2 : 3, and 4 : 5, to one fundamental; the series becomes 30 : 24, 20 : 15. The fundamental is 30; and the sections sought are 24, the third *g*; 20, the fifth; and 15, the octave.

2. To find several sections of a line A B, that from the least, gradually to the whole, shall contain a given series of intervals in any given order; viz. 10 as the least to the next greater contain a third *g*; that to the next greater, a fifth; and that to the whole an octave.

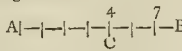
Reduce the three ratios 4 : 5, 2 : 3, 1 : 2, to one series; hence we have 8 : 10 : 15 : 30. Divide the line A B into the number of



parts of the greatest extreme of the series, viz. 30; we have the sections sought at the points of division answering the several numbers of the series, viz. at the points C, D, and E; so as A C to A D is a third, A D to A E a fifth, and A E to A B octave.

3. To divide a line A B into two parts, to contain between them any interval, v. g. a fourth.

Add together the numbers containing the ratio of the interval, v. g. 3 : 4; and the line into as many parts as the sum, v. g. 7; the point of division answering to any of the given numbers, v. g. 4 or C, gives the thing sought.



4. For the harmonical division of *CHORDS*. To find two sections of a line, which with the whole shall be in harmonical proportion, with regard to their quantity.

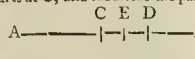
Take any three numbers in harmonical proportion, as 3, 4, 6; and divide the whole line into as many parts as the greatest of these three numbers, v. g. 6; and at the points of division answering the other two numbers, v. g. 3 and 4, you have the sections sought.

5. To find two sections of a line, which together with the whole shall be harmonical, with respect to quality or tune.

Take any three numbers concords with each other, v. g. 2, 3 and 8, and divide the line by the greatest; the points of division answering the other two, give the sections sought.

6. To divide a *CHORD* A B, in the most simple manner, so as to exhibit all the original concords.

Divide the line into two equal parts at C, and subdivide the part C B into equal parts at D; and again, the part C D into two equal parts at E. Here A C to A B is an octave; A C to A D a fifth; A D to A B a fourth; A C to A E a third *g*; A E to A D a third *l*; A E to E B a sixth *g* and A E to A B a sixth *l*.



CHORD is also used in music, for the note or string to be touched, or sounded; in which sense, it is applicable to all the intervals of music.

CHORD, *CHORDA*, in geometry, a right line connecting the two extremes of an arch.

Or, it is a right line, terminated at each extreme in the circumference of a circle, without passing through the center; and dividing the circle into two unequal parts, called *Segments*.—Such is the line A B, Tab. *Geometry*, fig. 6.

CHORD of the complement of an arch, is the *Chord* that subtends the rest of the arch; or so much as makes up the arch a semicircle.

The *Chord* is perpendicular to a line drawn from the center of the circle to the middle of the arch, as C E; and has the same

disposition thereto, as the *Chord*, or string of a bow, has to the arrow: which occasioned the ancient geometricians to call this line the *Chord* of the arch, and the other the *sagitta*, or arrow; the former of which names is still continued, though the latter is diffused. What the antients called *sagitta*, is now termed the *versed Sine*.

Half the *Chord* of the double arch, B o, is what we now call the *right sine*; and the excess of the radii beyond the *Chord*, o E, the *versed sine*.

The *Chord* of an angle, and the *Chord* of its complement to a semicircle, are the same thing. The *Chord* of fifty degrees is also the *Chord* of 130.

It is demonstrated, in geometry, that the radius C E, bisecting the *Chord* B A in D, does also bisect the arch in E, and is perpendicular to the *Chord* A B; and *vice versa*. And again, if the right line N E bisect the *Chord* A B, and be perpendicular thereto; that it passes through the center, and does bisect both the arch A E B, and the circle A N B.

Hence we derive several useful corollaries: as, 1. To divide a given arch A B into two equal parts. Draw a perpendicular to the middle point D of the *Chord* A B; this bisects the given arch A B.

2. To describe a circle, that shall pass through any three points A, B, C, fig. 7. From A and C describe arches intersecting in D and E; and also others, G and H, from C and B; draw the right lines D E and G H. The point of intersection I, is the center of the circle to be described through A, B, and C.

Demonstration. For the points A, B, and C, are in the periphery of some circle; and therefore, the lines A C and C B are *Chords*. But E D is perpendicular to A C, and G H to B C; E D bisects A C, and G H bisects B C; wherefore each passes through the center. Now as D E and G H only intersect in I; I will be the center of a circle, passing through the given points A, C, and B.

Hence, assuming three points in the periphery, or arch of any circle, the center may be found, and the given arch completed. Hence also, if three points of one periphery do agree or coincide with three points of another; the whole peripheries agree, and therefore the circles are equal.

And hence, lastly, every triangle may be inscribed in a circle. The *Chord* of an arch A B, (fig. 6.) and the radius C E being given; to find the *Chord* of the half arch A E. From the square of the Radius C E, subtract the square of half the given *Chord* A D, the remainder is the square of o C; from which, extract the square root = D C: this subtracted from the radius E C, leaves o E. Add the squares of A E and E o; the sum is the square of A E: whence, the rest being extracted, we have the *Chord* of the half arch A E.

Line of *CHORDS*, is one of the Lines of the sector and plain scale. See its description and use under the words *SECTOR* and *PLAIN SCALE*.

CHORD, *CHORDA*, in anatomy, a little nerve extended over the membrana tympani, or drum of the ear. See *TYMPANUM*.

Anatomists are not agreed about the use of the *Chorda Tympani*: some say, it serves to vary and modify the sound of the tympanum, in the same manner as the strings, or braces, stretched over the war-drum. Others will have it to be no more than a branch of the fifth pair.

CHORDAPUSUS *, in medicine, a disease of the intestines, otherwise called *volvulus*, the *slow passion*, and *miserere mei*: though others make it a distinct species of the *miserere*.

* The word comes from the Greek $\chi\omicron\rho\delta\acute{\alpha}$, gut, and $\alpha\pi\tau\omicron$, nels, I knot or tie.

Galen defines it, a tumidity, or inflation of the small intestines, which makes them appear filled, and stretched like a *Chord*. Archigenes makes it a kind of *miserere*; consisting in a tumor in a certain place of the small intestines, which sinks in, and gives way to the hand when pressed: he adds, that 'tis exceeding dangerous, and ordinarily kills in three or four hours, unless it comes to supuration; which, however does not take away all the danger.

It is probable, however, that the *Chordapusus* is in reality nothing else but the *miserere* not well understood. Celsus informs us, that in his time they were esteemed the same thing.

CHORDEE, in medicine, an inflammation and contraction of the frænum, and under part of the penis; so as to render erection painful.

It happens in gonorrhæas, and is generally proportional to the degree of the virus received; so that in virulent gonorrhæas, it is usually a very troublesome symptom.

It proceeds from the acrimony of the matter which runs from the urethra, irritating the under part of the penis; by which it is, as it were, tied or held forcibly downwards in erection, especially its frænum. When the acrimony is considerable, it it sometimes gives rise to unnatural erections, or the symptom called a *priapism*.

If the *Chordee* be violent, or does not decrease proportionally to the other symptoms in gonorrhæas, an emetic of turbit mineral is usually given with success; it causing a revulsion from the part.

CHOREA Janiti viti, in medicine, a distemper which some authors reckon as an hysterical case; or a species of furor uterinus.

It is supposed to proceed from a turgency and repletion of hot juices, especially in the uterine vessels, which raises violent motions; and that only females are affected by it: but Dr. Sydenham more properly observes it to be an universal Convulsion, which sometimes continues several weeks, nay months, without intermission.

Those affected with this disease, are continually in strange motions with their head, legs, and arms; so that they are unfit to feed themselves.—It differs from other convulsions, in that the motions are not painful, nor are any of the extremities or parts forcibly contracted, or extended for any time. Boys and girls are most subject to this disease, and that from ten years of age to puberty: though the latter often than the former.

It sometimes precedes the first eruption of the menfes; in which case, proper cathartics, with calomel and doobruents, are generally used; otherwise evacuations and antiepileptics, as in other nervous distempers.

It takes the name *Chorea sancti viti*, or St. Vitus's dance, from the chapel of S. Vitus; because it was supposed to seize persons about May, which was the time of the year they visited that chapel, and to make them leap and dance about in a strange manner. See Supplement, article VITI CHOREA.

CHOREPISCOPUS*, an episcopal officer in the antient church, about whose function the learned are extremely divided.

* The word comes from the Greek *χορηγος*, a region, or little country, and *επισκοπος*, a bishop, or overseer.

M. de la Roque thinks, that the *Chorepiscopi* were the country bishops, and had the same authority in villages, that the bishops had in cities; but that, by degrees, as the church flourished, the country bishops grew too proud for the country life; and imagined the episcopal honour debased, and rendered contemptible in a rural retreat. Accordingly, the Sardic council prohibited the consecration of bishops in the country, or in little towns; that the episcopal character might always be sustained by the splendor of great cities.

M. du Bois adds, that though the *Chorepiscopi* exercised most of the episcopal functions in country towns, &c. yet they were not ordained like bishops, nor vested with the whole authority of that order, but were only a step above mere priests.

M. le Maitre is of opinion, that the office of a *Chorepiscopus*, which is that now discharged by the rural deans, was to overlook, under the bishops, those parishes that were at a distance from the see in the country. He adds, that they were abolished, by reason they usurped the authority of the bishops.

Others, again, say, the *Chorepiscopi* were properly what we now call bishops in parishes; to whom, in quality of suffragans, were committed the administration of dioceses, during the bishop's absence.

Others rather think, the institution of *Chorepiscopi* gave occasion to that of the *episcopi in partibus*; which last, however, have privileges that the others had not.

Lastly, others take the *Chorepiscopi* to be no more than priests, vested by the bishops with most of their authority, in country places.

The council of Antioch, held in 342, appoints, 'That those in burghs and villages, called *Chorepiscopi*, know the bounds prescribed them; they may ordain readers, subdeacons, and exorcists, but not priests or deacons, without the bishop whereon they depend; and the *Chorepiscopus* shall be ordained by the bishop of the city.'

Pope Leo, in 936, says, the *Chorepiscopi* may not ordain priests, or consecrate churches: yet pope Nicholas, in a letter to Raoul, in the ninth century, declares that the *Chorepiscopi* shall have the episcopal functions; and that the ordinations of priests and deacons performed by them are valid.

The first time we read of *Chorepiscopi* in the east, is in the beginning of the fourth century; and in the west, about the year 439. They ceased, both in the east and west, in the tenth century.

CHOREPISCOPUS* is also the name of a dignity still subsisting in some cathedrals, particularly in Germany; signifying the same with *Chori Episcopus*, or bishop of the choir.

* The word, in this sense, does not come from *χορηγος*, place, but *χορηγος*, choir, &c.

In the church of Cologne, &c. the first chanter is called *Chorepiscopus*.

CHOREUS, *Κορηος*, a foot in the antient poetry, more commonly called *Trochæus*. See TROCHEE.

CHORIAMBUS, in the Latin poetry, a foot compounded of a choreus, or trochæus, and an iambus. See FOOT.

It consists of four syllables; of which the first and last are long, and the two middle ones short: as *Επιβάν*.

CHORION*, the exterior membrane which invests the fœtus in the womb.

* The word comes from the Greek *χορηγος*, capere, to contain.

It is very thick and strong; on the inside, where it joins another membrane, called *Ammios*, very smooth; but rough and uneven without side; interspersed with a great number of vessels, and fastened to the matrix, or womb, by means of the placenta, which adheres very closely to it. This membrane is found in all animals.

The *Chorion*, with the amnios and placenta, make what we call the *Secundine*, or after-birth. See SECUNDINE.

CHORIST, or **CHORISTER**, a chantor, or singer in the choir. **CHOROBATES***, a kind of water level, used among the antients; composed of a double square, in form of a T, described by Vitruvius.

* The word comes from the Greek *χορηβατον*, to over-run a country.

CHOROGRAPHY*, the art of making a map, or description of some country or province.

* The word comes from the Greek *χορηγος*, region, country, place.

Chorography is distinguished from Geography, as the description of a particular country, is from that of the whole earth. See GEOGRAPHY.

From *Topography* it is distinguished, as the description of the same country is from that of a single place, town, or district in it.

CHOROIDES*, or **CHOROÏDES**, in anatomy, a term applied to several parts of the body; bearing some resemblance to the chorion.

* The word is formed from the Greek *χορηγος*, chorion, and *εδως*, image, likeness.

CHOROÏDES is particularly used for the inner membrane which immediately invests the brain; so called as being intermingled with a great number of blood-vessels, like the chorion; but more usually denominated the *pia mater*, or *meninx tenuis*.

Plexus, or **Lacis CHOROÏDES**, is a knot of veins and arteries in the anterior ventricle of the brain, wove out of the branches of the carotid.

CHOROÏDES is also applied to the inner, and posterior tunic of the eye, immediately under the sclerotica.

It is soft, thin, and black; and its inner, or concave surface, is very smooth and polite.—It has its name from its being interperfed with vessels.—Its anterior part is called the *Uvea*.

M. Mariotte maintains, that vision is performed rather in the *Choroïdes* than the retina: in which he agrees with Bar. Torinus, and is seconded by M. Mery; but most other authors are of a different sentiment.

Next under the *Choroïdes* is the retina. Ruysch, indeed, says, he has found another tunic between the *Choroïdes* and retina; and denominates it from himself, *Tunica Ruyschiana*. He adds, that it grows so firmly to the *Choroïdes*, that it is overlooked in the common dissections.

But Verheyen, though he found the *Choroïdes* of a bird divisible into two membranes, could never separate those of the human eyes; and therefore he thinks there needed not any new name.

The *Choroïdes* is black in men; in lions, camels, bears, sheep, cattle, dogs, cats, and most fishes, it is of a shining colour, like the brilliance of silver, or the lustre of oriental pearl; and makes what naturalists call the *Tapis*, or colour of the eye.

CHORUS, in dramatic poetry, one, or more persons, present on the stage during the representation, and supposed to be bystanders thereto, without any particular share or interest in the action.

Tragedy in its origin, M. Dacier observes, was no more than a single *Chorus*, who trod the stage alone, and without any other actors; singing dithyrambics, or hymns in honour of Bacchus. Thespis, to relieve the *Chorus*, added an actor, who rehearsed the adventures of some of their heroes. Æschylus, finding a single person too dry an entertainment, added a second; and at the same time greatly reduced the singing of the *Chorus*, to make more room for the recitation.

Every thing introduced between the four songs of the *Chorus*, they called by the term *Episodæ*; and those four songs made the four intervals, or acts of the piece.

But when once tragedy began to be formed, those recitatives, or episodes, which at first were only intended as accessory parts, to give the *Chorus* a breathing time, became now the principal parts of the performance: and whereas, before, they were taken from various subjects, they were now all drawn from one and the same.

The *Chorus*, by degrees, became inserted and incorporated into the action, to which at first it was only intended as an addition or ornament. Sometimes the *Chorus* was to speak, and then their chief, whom they called *Coryphæus*, spoke in behalf of all the rest: The singing was perform'd by the whole company; so that when the *Coryphæus* struck into a song, the *Chorus* immediately joined him.

Besides the four songs, which made the division of the piece, and which were managed by the *Chorus*, the *Chorus* sometimes, also, joined the actors in the course of the representation, with their complaints and lamentations; on occasion of any unhappy accidents that befel them.

But the proper function of the *Chorus*, when tragedy was formed, and that for which it seemed chiefly retained, was to shew the intervals of the acts: while the actors were behind the scenes, the *Chorus* engaged the spectators; their songs usually turned on what was just exhibited; and were not to contain any thing but what was closely to the subject, and had a natural connection with it: so that the *Chorus* concurred with the actors for advancing the action.

It is a fault observed in Euripides's tragedies, that his *Chorus's* are detached from the action, and not taken from the same subject. There were some other poets, who to save the pains of composing *Chorus's*, and adapting them to the piece, contented themselves with invented songs, which had no relation at all to the action. These foreign *Chorus's* were the less pardonable, as the *Chorus* was esteemed to act a part in the piece; and to represent the spectators, who were looked on as interceded therein; inasmuch that the *Chorus* was not always to be mute, even in the course of the acts. In the modern tragedies, the *Chorus* is laid aside; and the music supplies its place. M. Dacier looks on this retrenchment as of ill consequence; and thinks it robs tragedy of a great part of its lustre. He adds, that it is ridiculous to have a tragic action broke, and interrupted by impertinent flourishes from the music box; and to have the spectators who are supposed to be moved by the representation, become all of a sudden calm and easy, break off at the height of a passion, and amuse themselves peaceably with a foreign entertainment. The re-establishment of the *Chorus* he judges necessary, not only for the embellishment and regularity of the piece; but also, in regard it was one of its principal functions, to redress and correct any extravagancies that might fall from the mouths of the actors, when under any violent passion, by prudent, and virtuous reflections.

That which occasioned the suppression of the *Chorus*, was its being incompatible with certain complots, and secret deliberations of the actors. For it is in no wise probable, that such machinations should be carried on in the eyes of persons interested in the action. As the *Chorus*, therefore, never went off the stage, there seemed a necessity of laying it aside, to give the greater probability to these kind of intrigues, which require secrecy. M. Dacier observes, there was a *Chorus*, or *grego*, also in the ancient comedy; but this too is suppressed in the new: chiefly because it was made use of to reprove vices, by attacking particular persons.

The *Chorus* in comedy was at first no more than a single person, who spoke in the ancient compositions for the stage; the poets, by degrees, added to him another; then two, afterwards three, and at last more: so that the most ancient comedies had nothing but the *Chorus*, and were only for many lectures of virtue.

To give the *Chorus*, among the Greeks, was to purchase a dramatic piece of the poet, and defray the expences of its representation.

The person who did this was called *Choragus*. At Athens, the office of choragus was imposed on the archon; and at Rome on the *Ædiles*.

CHORUS is likewise used in musick, where, at certain periods of a song, the whole company are to join the singer, in repeating certain couplets, verses, or clauses.

CHOSE, *Thing*, this word in law, is used in various circumstances, and with various epithets; as,

CHOSE in *Action*, is not any thing corporeal, but only a right, *q. g.* an annuity, obligation, covenant, &c.

Chose in *Action*, may also be called *Chose* in *Suspence*, as having no real existence, and not being properly in possession.

CHOSE Local, is something annexed to a place, *v. g.* a mill.

CHOSE Transitory, something moveable, and which may be transported from place to place.

CHRISM, *Χρῖσμα*, oil consecrated by the bishop, and used in the Romish, and Greek churches, in the administration of baptism, confirmation, ordination, and extreme unction.

The *Chrism* is prepared on Holy Thursday with a world of ceremony. In Spain, it was antiently the custom for the bishop to take one third of a sol for the *Chrism* distributed to each church; on account of the balsam that entered its composition. Du Cange observes, there are two kinds of *Chrism*; the one prepared of oil and balsam, used in baptism, confirmation, and ordination; the other of oil alone, consecrated by the bishop, used antiently for the catechumens, and still in extreme unction.

The Maronites, before their reconciliation with Rome, besides oil and balsam, used musk, saffron, cinnamon, roses, white frankincense, and several other drugs mentioned by Rynaldus, in 1541, with the doses of each. The jesuit Dandini, who went to mount Libanus in quality of the pope's nuncio, ordained, in a synod held there in 1595, that *Chrism*, for the future should be made only of two ingredients, oil and balsam; the one representing the human nature of Jesus Christ, the other his divine nature. The action of imposing the *Chrism*, is called *Chrismation*: this the generality of the Romish divines hold to be the next matter of the sacrament of confirmation.

The *Chrismation* in baptism, is performed by the priest; that in confirmation by the bishop: that in ordination, &c. is more usually styled *Unction*.

CHRISM Pence, *CHRISMATIS Denarii*, or *CHRISMALES Denarii*, a tribute antiently paid to the bishop by the parish clergy, for their *Chrism*, consecrated at Easter for the ensuing year: this was afterwards condemned as simoniacal.

CHRISOM, *CHRISMALE*, was antiently the face-cloth, or piece of linnen laid over the child's head when it was baptized.

Whence, in our bills of mortality, children who die in the

month are called *Chrifoms*.—The time between the child's birth and baptism, was also called *Chrifoms*.

CHRIST *, an appellation usually added to Jesus: and, together therewith, denominating the *Messiah*, or saviour of the world. See *MESSIAH*.

* The word in the original Greek $\chi\rho\iota\varsigma$, signifies *Anointed*, of $\chi\rho\iota\varsigma$, *Inungo*, I anoint.

Sometimes the word *Christ* is used singly, by way of antonomasia, to denote a person sent from God, an anointed prophet, or priest.

Order of CHRIST, a military order, founded in 1318, by Dionysius I. king of Portugal, to animate his nobles against the Moors.

Pope John confirmed it in 1320, and appointed the knights the rule of St. Bennet. Alexander VI. permitted them to marry. The order became afterwards insensibly reunited to the crown of Portugal; and the king took upon him the administration thereof.

The arms of the order are, gules, a patriarchal cross, charged with another cross argent. They had their residence, at first, at Castromarin; afterwards they removed to the city of Thomar, as being nearer to the Moors of Andalusia, and Estramadura.

CHRIST is also the name of a military order in Livonia, instituted in 1205, by Albert bishop of Riga. The end of their institution was to defend the new christians who were converted every day in Livonia, but were persecuted by the heathens.

They wore on their cloaks a sword with a cross over it; whence they were also denominated *Brothers of the Sword*.

CHRISTENING. See the article *BAPTISM*.

CHRISTIAN, something that relates to Christ. See *CHRIST*. The king of France bears the title, or surname of the *Most Christian King*, *Rex Christianissimus*. The French antiquaries trace the origin of the appellation up to Gregory the great; who writing a letter to Charles Martel, occasionally gave him that title, which his successors have since retained.

Lambecius, in the III^d tome of his catalogue of the emperor's library, holds, that the quality of *Most Christian* was not ascribed to the antient French kings, Louis le Debonair, &c. as kings of France, but as emperors of Germany: but the French historians endeavour to refute this plea.

CHRISTIAN Church. See the article *CHURCH*.

CHRISTIAN Court, *Curia CHRISTIANITATIS*, denotes the ecclesiastical or bishop's Court; in contradistinction to civil courts, which are called *King's Courts*, *Curia Domini regis*.

CHRISTIAN Name, that given at baptism. See *NAME*.

CHRISTIAN Religion, that instituted by Jesus Christ.

CHRISTIAN is peculiarly and absolutely used for a person who believes in Christ, and is baptized in his name.

The name *Christian* was first given at Antioch, to such as believed in Christ, as we read in the acts: till that time they were called *Disciples*.

CHRISTIANS of *St. John*, a corrupt sect of *Christians*, very numerous in Baffora, and the neighbouring towns.

They formerly inhabited along the river Jordan, where St. John baptized; and it was thence they had their name. But after the Mahometans became masters of Palestine, they retired into Mesopotamia and Chaldea.

They hold an anniversary feast of five days; during which, they all go to their bishops, who baptize them with the baptism of St. John: their baptism is always performed in rivers, and that only on sundays.

They have no notion of the third person in the trinity; nor have they any canonical books, but abundance full of charms, &c. Their bishopricks descend by inheritance, as our estates do; though they have the ceremony of an election.

CHRISTIANS of *St. Thomas*, or *San Thome*, a sect of antient *Christians*, found in the East-Indies, when the Europeans touched at the port of Calcut; who pretend to be descended from those St. Thomas converted in the Indies: whence the name.

The natives call them, by way of contempt, *Nazarenes*; their more honourable appellation is *Mappuleymen*. See *THOMEAN*.

Some learned men in Europe say, it was not St. Thomas the apostle that converted that country, but another St. Thomas: others say, it was a Nestorian merchant, called *Thomas*. It is certain they are Nestorians, and have been so a long time; inasmuch, that *Christians* of St. Thomas, now passes for the name of a sect.

They have a patriarch, who resides at Mosul.—The pope has made several attempts to reduce them under his obedience, but to no purpose.

CHRISTMASS, the feast of the nativity of Jesus Christ.

It appears from S. Chrysostom, that in the primitive times, *Christmas* and Epiphany were celebrated at one and the same feast: that father observes, it was but of a little while that *Christmas* had been celebrated at Antioch on the twenty-fifth of December, as a distinct feast; and that the use thereof came from the west. He adds, that the Armenians made but one feast of them, as low as the XIIth century.

CHRISTOLYTI *, a sect of hereticks mentioned by Damascenus ; so called, because they destroyed the humanity of Christ : maintaining, that he descended into hell, body and soul ; and that he left both there ; ascending to heaven with his divinity alone.

* The word comes from the Greek χριστος, Christ, and λωω, I resolve.

CHROMA *, in rhetoric, a colour, or fair pretence.

* The word is Greek, χρομα, which literally denotes Colour.

CHROMA, in musick. See the article CHROMATIC.

CHROMATIC, in the ancient musick, the second of the genera, or kinds, in which the consonant intervals were subdivided into their concinnous parts.

The other two kinds were, the *Enharmonic*, and the *Diatonic*.

The *Chromatic* abounds in semitones : it had its name, either by reason the Greeks marked it with the character of colour, which they call χρομα ; or, as P. Parran suggests, because the *Chromatic* kind is a medium between the other two, as colour is between black and white : or else because the *Chromatic* kind varies and embellishes the diatonic kind, by its semitones ; which have the same effect in musick, with variety of colours in painting. Aristoxenus divides the *Chromatic* genus into three species ; the *Molle*, *Hemisthan*, and *Tonicum* : Ptolemy into *Molle* or *Antiquum*, and *Interfan*.

These species were also called *Chroai*, or colours of the genera : the *molle* expresses a progression by small intervals, the *interfan* by greater.

The *Chromatic* and *enharmonic* kinds, only contain the smallest of the diatonic degrees ; so that they have the same proportion to the diatonic, as fractions have to integers.

Boethius, and after him Zarlino, attribute the invention of the *Chromatic* genus to Timotheus a Milesian, in the time of Alexander the great. The Spartans banished it their city, by reason of its softness.

Mr. Malcolm observes, that we are at a loss what use the ancients could make of these divisions, and subdivisions into genera and species. All acknowledged the diatonic to be the true melody ; the others seem only humorous irregularities, calculated to please the fancy by their novelty and oddness ; and were besides so very difficult, that few, if any, are said to have ever practised them accurately. See Musick.

CHROMATIC is also used, in painting, for the colouring ; which makes the third part of the art of painting.

CHRONIC *, CHRONICAL, in medicine, is applied to a slow disease, which lasts a long time ; at least upwards of forty days : such as are the gout, dropsy, asthma, &c.

* The word comes from the Greek χρονος, Time.

Chronic diseases stand in opposition to acute diseases, which are speedy, and hasten to a crisis ; as fevers, small-pox, &c.

Chronic diseases are usually owing either to some natural defect in the constitution ; or to an irregular manner of living.

Most of the *Chronical* diseases, says Dr. Cheyne, the infirmities of old age, and the short periods of the lives of Englishmen, are owing to repletion : this is evident hence, that evacuation of one kind or another, is nine parts in ten of their remedy.

The sources of *Chronical* distempers, says the same author, are, 1. Viscidity in the juices, or the over-largeness of their constituent particles ; which not being sufficiently broken by the coactive powers, stop, or retard the circulation. Or, 2. Too great abundance of sharp acrimonious salts ; whereby the juices themselves are rendered so corrosive, as to burst or wear out the solids. Or, 3. A relaxation, or want of due force and springiness of the solids themselves.

An excess in the quantity of our meat and drinks begets the first ; the bad condition of the same foods the second ; and both together, with want of due exercise, the third.

CHRONICLE, CHRONICON, denotes a history digested in order of time ; though the term is seldom used but in speaking of our old English histories, as Holinhead's *Chronicle*, Stow's *Chronicle*, &c.

CHRONOGRAM *, a kind of composition whose numeral letters joined together, make up some date, or epocha. See ANAGRAM.

* The word is compounded of χρονος, Time, and γραμμα, Letter.

CHRONOLOGY *, the art of measuring and distinguishing time ; or the doctrine of epochs, &c.

* The word is compounded of the Greek χρονος, Time, and λογος, Discourse.

Sturmius divides *Chronology* into five distinct branches, viz. metaphysical, physical, political, historical, and ecclesiastical ; according to the various relations, or habitudes wherein time is considered, viz. as in itself ; as connected and subjected to the affections, states, and alterations of natural things ; as accommodated to civil uses ; as matched with events that pass in the world ; and particularly, as it relates to the celebration of Easter.

There is more difficulty in *Chronology* than every one is aware

of : It requires not only the knowledge of astronomy and geography, and consequently that of arithmetic, geometry, and trigonometry, both plain and spherical ; but also a world of application to the antient monuments. Its use is very great : it is called one of the eyes of history ; and serves many good purposes in theology.

The more eminent writers on *Chronology*, among the antients, are Julius Africanus in the III^d century ; Dionysius Exiguus, Eusebius, and Cyril.

Among the moderns, Bede, Funccius, Mercator, Lilius, Clavius, Scaliger, Vieta, Petavius, Cassini, Munster, Calvisius, Hardouin, Capellus, Uther, Marsham, Helvicus, I. Vossius, Pagi, &c.

CHRONOMETER *, a general name for any instrument used in the measuring of time. See TIME.

* The word is compounded of χρονος, Time, and μετρον, mensura, measure.

In this sense, clocks, watches, dials, &c. are *Chronometers*.—Though there are some other instruments peculiarly called by the name *Chronometer* ; particularly one described by M. Sauveur, in his *Principles of Acoustics*.

CHRYSALE *, a term used by some modern writers of natural history of insects, in the same sense with nymphæ.

* The word seems to imply a peculiar yellow, or golden colour, usual in the nymphæ of some species of insects : from the Greek χρυσος, gold ; but this is purely accidental, and is not found in all nymphæ.

Some confine the word *Chrysalis* to the nymphæ of butterflies and moths. See Supplement, articles CHRYSALE, AURELIA, and PUPPET.

CHRYSARGYRUM *, a tribute formerly levied on courtiers, and the like persons of evil fame.

* Hoffman says, it was paid in gold and silver ; whence its name, χρυσος, gold, and αργυρος, silver.

Zofimus says, that Constantine first set it on foot ; though there appear some traces of it in the life of Caligula by Suetonius ; and that of Alexander by Lampridius. Evagrius says, Constantine found it established, and had some thoughts of abolishing it. It was paid every four years : some say, all petty traders were liable to it. It was abolished by Anastasius.

M. Godeau thinks, the *Chrysiargyrum* was a general tribute, levied every four years, on persons of all conditions, rich and poor, slaves and freemen : nay, even on all animals, as low as dogs ; for each whereof they paid six oboli.

CHRYSOBERYL, a precious stone ; being a kind of pale beryl, with a tincture of yellow.

CHRYSOCOCCA *, a mineral substance used by the antients in the folding of gold, &c. and frequently also in physic, as an escharotic, resolvent, and dryer. See Plin. Hist. Nat. l. 33. c. 5.

* The term is formed of the Greek, χρυσος, gold, and κοκα, glue.

Chrysoquilla is represented by Pliny as found in mines of gold, silver, copper, and lead : its colour, he says, was various, according to that of the matter in which it is found ; yellow if among gold, white in silver, green in copper, and black in lead.

The Arabs, and inhabitants of Guzarate, call the modern *Chrysoquilla*, which is *Borax*, *Tincars*, or *Tincal*. The best is that found in copper mines ; and the worst, in those of lead. See Supplement, article CHRYSOCOCCA.

CHRYSOCOCCA is also the name of a sort of precious stones, mentioned by Pliny, l. 37. c. 10. who calls it also *Amphibane* : he describes it as of a gold colour, and of a square figure ; adding, that it has the virtue of attracting iron, and even gold.

But this, in all probability, is fabulous ; and the stone he speaks of is apparently no other than the cubick Pyrites.

CHRYSOLITE, with us, a precious stone of a dusky green colour, with a cast of yellow.

The *Chrysolite* of the antients was no other than the topaz of the moderns.

CHRYSOLITE is also a general name which the antients gave to all precious stones, wherein the yellow, or golden was the prevailing colour.

When the stone was green, they called it *Chrysoprasus* : the red and blue too had their particular denominations, which expressed their colour ; the gold being signified by *Chrysis* ; which still began the name.

We know but few of these *Chrysolites* now ; or rather, they are referred to the species of stones which they approach the nearest to : the green to the emerald, the red to the ruby ; and so of the rest. See Supplement, article CHRYSOLITE.

CRYSTAL, CRYSTALLINE, CRYSTALLIZATION. } See { CRYSTAL, CRYSTALLINE, CRYSTALLIZATION, CRYSTAL Mineral, the same as Sal Prunella.

CHUB. See FISHING.

CHUMMESSAHITES *, a sect among the Mahometans, who believe that Jesus Christ is God, and the true Messiah, the redeemer of the world ; but without rendering him any public, or declared worship ;

* The word, in the Turkish language, signifies protector of 120 Christians.

Ricaut says, there are abundance of these *Chummessahites* among

mong the people of fashion in Turkey, and some even in the seraglio.

CHURCH, an assembly of persons united by the profession of the same Christian faith, and the participation of the same sacraments.

Bellarmin, and the Romish divines, to this definition add, *Under the same pope, sovereign pontiff, and vicar of Jesus Christ on earth*: in which circumstance it is that the Romish, and reformed notion of *Church* differ.

Amelotte, and others, make a visible head, or chief, essential to a *Church*: accordingly, among the catholics, the pope; in England the king, are respectively allowed heads of the *Church*. Bishop Hoady sets aside the notion of a visible head: Christ alone, according to him, is head of the church; which position he has maintained with great address, in a celebrated sermon before the late king on those words, *My kingdom is not of this world*; and in the several vindications thereof.

Sometimes, we consider *Church* in a more extensive sense, and divide it into several branches.—The *Church Militant* is the assembly of faithful on earth.—*Church Triumphant*, that of the faithful already in glory.—To which the catholics add the *Church Patient*, which, according to their doctrines, is that of the faithful in purgatory.

The term *ecclesia*, *ἐκκλησία*, synonymous with our *Church*, is used in the Greek and Latin profane authors for any kind of publick assembly; and even for the place where the assembly is held. The sacred and ecclesiastical writers sometimes also use it in the same sense; but ordinarily they restrain the term to the Christians; as the term *synagogue*, which originally signifies nearly the same thing, is in like manner restrained to the Jews.

Thus, in the new testament, the Greek *ἐκκλησία*, signifies almost always, either the place destined for prayer, as 1 Cor. xiv. 34. or the assembly of the faithful diffused over the whole earth, as Ephes. v. 24. or the faithful of a particular city, or province, as 2 Cor. viii. 1, 2. or even of a single family, as Rom. xvi. 1. or the pastors or ministers of a *Church*, as Matt. xviii. 17.

The christian *Church* is frequently divided into Greek and Latin. *Greek, or Eastern Church*, comprehends the *Churches* of all the countries antiently subject to the Greek, or eastern empire; and through which their language was carried; i. e. all the space extended from Greece to Mesopotamia and Persia, and thence into Egypt; which has been divided ever since the time of the emperor Photius, from the Roman *Church*.

Latin, or Western Church, comprehends all the *Churches* of Italy, France, Spain, Africa, the north, and all other countries whither the Romans carried their language.

Great-Britain, part of the Netherlands, of Germany, and of the north, have been separated hence ever since the time of Henry VIII. and constitute what we call the *Reformed Church*, and what the Romanists call the *western schism*; as the Greek *Church* does the eastern one.

The *Reformed Church* is again divided into the *Lutheran Church*, the *Calvinist Church*, the *Church* of England, &c.

CHURCH is also used for a christian temple, built and consecrated to the honour of God; and, antiently, under the invocation of some particular saint, whose name it assumed.

In this sense, *Churches* are variously denominated, according to their rank, degree, discipline, &c. as *Metropolitan Church*, *Patriarchal Church*, *Cathedral Church*, *Parochial Church*, *Cardinal Church*, &c. See each under its proper article, **METROPOLIS**, **PATRIARCH**, **CATHEDRAL**, **PAROCHIAL**, **CARDINAL**, &c.

In ecclesiastical writers, we meet with *Grand Church*, for the chief church of a place; particularly in the Greek liturgy, for the *Church* of S. Sophia at Constantinople, the see of the patriarch, founded by Constantine, and consecrated under Justinian: It was at that time so magnificent, that Justinian is said to have cried out in the consecration thereof, *εὐκλειστὸς Ἱεροσόλυμ, Ἰ have out-done thee, Solomon*. The dome, which is said to have been the first that was built, is 330 foot diameter.

The first *Church* publicly built by the christians, some authors maintain to be that of S. Saviour at Rome; founded by Constantine: others contend, that several *Churches* abroad, called by the name of S. *Peter Vrons*, were built in honour of that apostle during his life-time.

Mother-CHURCH, matrix ecclesia.

CHURCH, with regard to architecture, Daviler defines a large oblong edifice, in form of a ship, with nave, choir, isles, chapel, belfry, &c. See each part under its proper head.

Simple Church, is that which has only a nave and a choir.

Church with Isles, is that which has a row of porticos, in form of vaulted galleries with chapels in its circumference.

Church in a Greek Cross, that where the length of the traverse part is equal to that of the nave; so called, because most of the Greek *Churches* are built in this form.

Church in a Latin Cross, that whose nave is longer than the cross part, as in most of the Gothic *Churches*.

Church in Rotondo, that whose plan is a perfect circle, in imitation of the Pantheon.

For the form of the antient Greek *Churches*, when they had all their parts, it was as follows: first was a porch, or portico,

called the *vaunt-nave*, *πρυμνα*, this was adorned with columns on the outside, and on the inside surrounded with a wall; in the middle whereof was a door, through which they passed into a second portico. The first of these porticos was destined for the Eucergumeni, and penitents in the first stage of their repentance; the second was much longer, destined for penitents of the second class, and the Catechumens, and hence called *ναὸς ἁγῶν, serua*; because those placed in it began to be subject to the discipline of the *Church*. These two porticos took up about one third of the space of the *Church*.

From the second portico, they passed into the *nave*, *ναὸς*, which took up near another third of the *Church*. In the middle, or at one side of the nave, was the ambo, where the deacons and priests read the gospel and preached. The nave was destined for the reception of the people, who here assisted at prayers.

Near the entrance of this was the baptistery, or font. See **BAPTISTERY** and **FONT**.

Beyond the nave was the choir, *χορὸς*, set with seats, and round: the first seat on the right, next the sanctuary, being for the cantor, or choragus.

From the choir, they ascended by steps to the sanctuary, which was entered at three doors. The sanctuary had three apses in its length; a great one in the middle; and under which was the altar, crowned with a baldachin, supported by four columns: See **SANCTUARY**, **BALDACHIN**, &c. Under each of the small apses, was a kind of table, or cupboard, in manner of a buffet.

Though, of the Greek *Churches* now remaining, few have all the parts above described; most of them having been reduced to ruins, or converted into mosques.

M. Frezier, engineer to the French king, and F. Cordemoy, a regular canon, have disputed the form of the antient and modern *Churches*, and the best manner of building them, with a good deal of learning, in the journals de Trevoux.

For the form of the Latin *Churches*, though it be various, yet may all the variety be reduced to two heads; viz. those in form of a ship, and those of a cross.

CHURCH-YARD, a sacred place adjoining to a *Church*, destined for the interment of the deceased. See **COEMETERIUM**.

CHURCH-Government, Discipline, &c. See **ECCLESIASTICAL**, **GOVERNMENT**, **DISCIPLINE**, **POLICY**, &c.

CHURCH-REVES. See the article **CHURCH-WARDENS**.

CHURCH-SCOT, or CHURCHESSET, a payment, or contribution, by the Latin writers frequently called *primitia seminum*; being, at first, a certain measure of wheat, paid to the priest on St. Martin's day, as the first-fruits of harvest.

This was enjoined by the laws of king Malcolm IV. and Canut. c. 10. But after this, *Church-Set* came to signify a reserve of corn-rent paid to the secular priests, or to the religious; and sometimes it was taken in so general a sense as to include poultry, or any other provision that was paid in kind to the religious.

CHURCH-WARDENS, antiently called **CHURCH-REVES**, are officers chosen yearly in easter week, by the parson and his parishioners, according to the custom of the place; to look to the *Church*, *Church-yard*, *Church-revenues*, &c. observe the behaviour of the parishioners with regard to faults that come under the jurisdiction of the ecclesiastical court; prevent scandalous liveries to the bishop; take care none preach without license, &c. The *Church-wardens* are a kind of corporation; and are enabled by law to sue, and be sued for any thing belonging to the *Church*, or the poor of the parish.

CHYLE*, in the animal economy, a whitish juice, into which the food is immediately converted by digestion, or more properly, by that first branch thereof called *Chylification*.

* The word comes from the Greek *χυλῶς, juice*.

The *Chyle*, Dr. Drake observes, is nothing but a mixture of the oily and aqueous parts of the food, incorporated with the saline ones; which, while they yet remain mixed with the grosser parts in the stomach, make a thick, whitish, partly fluid mass, called *Chyme*: which, as soon as it is reduced to a consistence loose enough to be obedient to the pressure and peristaltic motion of the stomach, is gradually thrust out at the pylorus into the duodenum, and then is denominated *Chyle*.

Thus is the *Chyle* begun to be formed in the stomach: It is perfected in the intestines by the mixture of the bile and the pancreatic juice; and is thence received into the lacteal veins, which carry it to the receptaculum chylli, or Pecquet's reservoir: thence it passes into the thoracic duct, which terminates in the left subclavian vein: in this vein, the *Chyle* first begins to mix with the blood; into which it is afterwards converted by the action called *anguification*.

Some of the antients supposed the *Chyle* was changed into blood in the liver; others of them in the heart: but the moderns, with more reason, take the change to be effected by the blood itself, in all the parts of the body.

Some take *Chyle* to be the immediate matter of nutrition; others the blood.

CHY

Dr. Lister is of opinion, that in the digestion of meat in the stomach, there is made a separation, or solution of urinous salts, no otherwise than in the rotting of plants, or animals: that the *Chyle* is highly impregnated with this urinous salt; that it owes its whiteness to the fermentation it acquires from that mixture: that the salt *Chyle* is conveyed into the venal blood, and with it enters the heart; and is thence thrown out *Chyle*, as it comes in, by a continual pulsation, into the arteries: that as oft as it enters the emulgent arteries, it leaves behind part of its saline liquor, or urine, and consequently abates of its colour: and that when sufficiently freed of its salts, it becomes a lymph; which seems to be nothing else but the residue of the *Chyle* not yet converted into blood; as not yet sufficiently deperated of its saline particles. See LYMPHA.

CHYLIFICATION, the formation of the *Chyle*; or the act whereby the food is changed into *Chyle*. See FOOD, and CHYLE.

Chylification is begun by comminuting, or breaking the aliment in the mouth, mixing it with saliva, and chewing it with the teeth.

By such means, the food is reduced into a kind of pulp, which falling through the oesophagus into the warm stomach, there mixes with the juices thereof; and being thus diluted, begins to ferment, or putrify, and assumes a very different form from what it had before; growing either acid or rancid.

Here it mixes with a juice separated from the blood by the glands of that part, whose excretory ducts open into the stomach; as also with the remains of the former aliment: and thus it becomes better macerated, diluted, dissolved, and acquires still a greater likeness to the animal fluids, and is called *Chyme*.

Add to this, that the fleshy membrane of the stomach continually contracting and pressing its contents by its peristaltic motion, occasions a more intimate mixture, and by degrees works the more fluid parts through the pylorus into the duodenum; along the sides whereof, and the rest of the intestina tenuia, the lacteals are planted; into the minute orifices whereof, the finer parts of the mass is received.

The fabric of the stomach being considered, the heat of the circumambient parts, the pulsations of innumerable arteries, the great strokes of the aorta underneath, the constant compression of the diaphragma and abdominal muscles; it must necessarily follow, that the finer parts of the aliment will be first expelled the stomach; and that the grosser will remain; till, by the repeated action of the fluids, and the contraction and pulsation of the solids, they also become fine enough to go off: thus is the stomach left empty; and by means of its muscular coat, reduced to a state of contraction, and appetite is renewed.

Thus will even the fleshy membranes, cartilages, &c. of animals fed on, be squeezed, and be obliged to give out their juices; and thus is a fluid obtained, that shall have in some measure the same properties with those of our bodies.

This juice being got through the pylorus into the intestines, its liquefaction is still promoted by its mixture with two other dissolvents, the pancreatic juice and the bile; which divide and subtilize those parts that were left too gross: and by the peristaltic motion of the guts it is protruded forwards. In the passage through the small intestines, the finer part of the mass, which we call the *Chyle*, enters the orifices of the lacteal veins of the first kind, wherewith the whole mesentery is intermixed; which either alone, or together with the melaric veins, discharge themselves into the glands at the basis of the mesentery.

Then the *Chyle* is taken up by the lacteals of the second kind, and is conveyed into glands between the two tendons of the diaphragma, known heretofore under the name of the *lumbar* glands, now called *Pecquet's* reservoir; whence it is carried to the heart by the thoracic duct and the subclavian vein; wherein it begins to be mixed with the blood, and to circulate, and in time becomes assimilated thereto.

CHYLOSIS, *Χηλωση*, in medicine, the action whereby the aliment is converted into *Chyle*, or *Chyme*, in the stomach, &c. whether it be by a ferment in the stomach, or the contractile force of the stomach, or both.

CHYME, *Χυμος*, an animal juice, which is according to some the same with that commonly called *Chyle*. See CHYLE.

Some, however, distinguish between *Chyme* and *Chyle*; restraining the word *Chyme* to the mass of food, &c. while in the stomach, ere it be sufficiently comminuted and liquified to pass the pylorus into the duodenum, and thence into the lacteals, to be further diluted and impregnated with the pancreatic juice; where it commences *Chyle*.—And others distinguish and denominate them the contrary way.

CHYMISTRY,* or **CHEMISTRY**, the art of separating the several substances whereof mixed bodies are composed, by means of fire; and of composing new bodies in the fire, by the mixture of different substances or ingredients.

CHY

Chymia. Others, making Cham the inventor of *Chymistry*, derive the term from his name; supporting their etymology on the signification of the word *Cham*, which in the Hebrew signifies heat, hot, black; all of them bearing some relation to the operations of *Chymistry*. *Chymistry* is also known under various other names: it is sometimes called the *hermetical art*, from a supposition of its being invented by Hermes Trimegistus. Others call it, the *Egyptian art*, from the people among whom it was first practised; others the *sacred*, or *divine art*; and Poiesis, or the art of making gold, &c. Others call it the *spagyric art*; Paracelsus, the *hyppic art*; and others *pyrotechnia*.

The chief object of *Chymistry*, is to analyse, or decompound natural bodies; reduce them to their first principles; discover their hidden virtues, and demonstrate their inner texture, or the center, as they call it, wherein natural substances concur. In a word, *Chymistry* is the anatomy of natural bodies, by means of fire; which is the definition Hanneman gives us of the art.

Boerhaave defines *Chymistry* more scientifically: 'An art whereby by sensible bodies contained in vessels, or capable of being contained therein, are so changed, by means of certain instruments, and principally of fire, that their several powers and virtues are thereby discovered, with a view to philosophy, medicine, &c.' This definition appears very prolix and circumstantial, and more like a description than a definition; but with all his endeavours, that author assures us, he could not frame a shorter that would express the full scope, object, and instruments of *Chymistry*, so as to distinguish it from every other art: which is a point all the writers of *Chymistry* have stumbled at.

For *Chymistry* cannot justly be called the art of resolving bodies, as Regius, Paracelsus, &c. define it; since mechanics will also do that: nor is the matter mended, by saying, it is the art of analysing bodies by fire; as Helmont has done: nor by salt, as others would have it. These definitions include only a part, instead of the whole. And with as little propriety is it termed, the art of separating the pure from the impure; inasmuch as it compounds as well as separates, and frequently mixes the pure with the impure. *Chymistry*, on this footing, appears a very extensive art: Its object, or the *materia chymica*, is all sensible bodies, capable of being contained in vessels; and is accordingly divided into three kingdoms, *mineral, vegetable, and animal*.

The operations of *Chymistry*, include all the changes produced in bodies by natural agents or instruments, viz. *decoction, infusion, exhalation, calcination, extraction, distillation, crystallization, &c.*

The effects, or productions of *Chymistry*, may be reduced to *magnifieries, extracts, tinctures, elixirs, and chysis*.

The instruments, or agents of *Chymistry*, whereby its operations are performed, are *fire, water, air, earth, menstrua, and instruments properly so called, as alembics, cucurbits, retorts, pelicans, furnaces, and lutes*.

Chymistry is an art of very great antiquity, and is held by some very learned persons to have been practised in the antediluvian world. Cham, the son of Noah, is commonly held to have been its inventor, from whom it is supposed to have taken its name. But others refer the invention to Tubal Cain, whom the scripture records as the inventor of instruments of brass and iron. This is pretty certain, that some of the highest and most difficult things in *Chymistry*, must have been known by him; among which are the separating and purifying of copper and iron, the making of brass, &c.

The first mention we find made of the art, is in Zosimus, the Panopolite, who lived about the year of Christ 400. 'In the sacred writings, says that author, we find certain Genii spoke of, who had commerce with women. Hermes says as much in his books upon nature; and scarce any author but has some footsteps of this tradition. These Genii, intoxicated with the love of women, discovered them all the secrets of nature; and taught them abundance of things unfit for them to know: for which reason they are banished from heaven.' The book wherein their secrets was contained, was called *Chemia*; and hence the name *Chemia*, or *Chymia*.

The text of scripture Zosimus here refers to, is that passage in Moses, *The sons of God saw the daughters of men, and took them to wife*.

This antediluvian origin of *Chymistry* is confirmed by Tertulian: 'The angels that fell, says that father, discovered gold and silver to men, with the arts of working them, of dying wool, &c. for which reason they were banished, as is related by Enoch.'

Borrichius looks on these passages as authentic; but adds, that Enoch was mistaken, for that the angels he speaks of, were not real angels; but the descendants of Seth and Tubal Cain, who degenerating from their fathers, gave themselves up to criminal pleasures with the women descended from Cain; and in the course of their intrigues, divulged the secrets God had trusted them withal.

Be this as it will, *Chymistry*, no doubt, was first practised in Egypt. According to Moses, Tubal Cain should be the first inventor,

* Critics are divided as to the etymology of the name *Chymistry*: it is usually derived from the Greek *χυμος*, juice; or from *χημα*, to melt. Boerhaave, and others, more justly derive it from the Egyptian *Chema*, or *Kema*, black; and write it *Chemia*, not

ventor. Profane authors refer it to Vulcan; and some of the latest and best critics endeavour to shew, that Tubal Cain and Vulcan were the same; and, indeed, there is a great resemblance between their names.

After Tubal Cain, the first *Chymist* we read of is Moses; whose skill in *Chymistry* is incontestable, from his burning and pulverizing the golden calf the Iftaelites had set up, and giving it the people to drink. There being scarce a more difficult operation in all *Chymistry*, than to make gold potable.

Chymistry had the common fate of the other arts, at the declension of the eastern empire: and lay buried and forgot till the time of Roger Bacon, who retrieved it. He was followed by Lully, Ripley, Basil Valentine, Paracelsus, Van Helmont, Glauber, Boyle, Lemery, Homberg, &c. by whom the art has been carried to its present degree of perfection.

The first *Chymists* confined themselves to metals: in these latter ages, the bounds of *Chymistry* have been greatly enlarged; and plants, animals, minerals, &c. have been taken into it.

It is but of late that *Chymistry* has been applied to the preparation of medicines: Basil Valentine, and Arnoldus de Villa Nova, seem to have been the first that attempted it. Paracelsus and Van Helmont carried it to such a length, as to render medicine almost wholly *chymical*.

Chymistry is divided into *metallurgia*, *alchymia*, *chymical pharmacy*, and *chymical philosophy*. See METALLURGY, ALCHEMY, &c. Some authors observe, that Dioclesian, after the taking of Alexandria, ordered all the books of *Chymistry*, antiently wrote by the Egyptians, for making gold and silver, to be sought out and burnt; that they might not have the power of enriching themselves by this art, or of putting themselves, by this means, into a condition of revolting again.

Authors on the subject of *Chymistry* are very numerous: Borel has published a catalogue of most of them, under the title of *bibliotheca chymica*; containing the names of above four thousand. Boerhaave is the latest, fullest, and apparently the best; he has given both the history, theory, and practice, in an orderly, and scientific way. Dr. Friend has reduced *Chymistry* to *Newtonianism*, and accounted for the reasons of the operations on mechanical principles.

CHYMOSIS*, *χυμωσις*, in medicine, the act of making, or preparing *Chyme*. See CHYME.

* The word comes from *χυμω*, *succus*, of *χυμο*, *fundo*, I melt.

Chymosis, according to some, is the second of the concoctions made in the body; being a repeated preparation of the most impure and gross parts of the chyle, which being rejected by the lacteals, is imbibed by the meserales, and thence carried to the liver, to be there elaborated, purified, and subtilized a fresh. It is of this, according to Rogers, that the animal spirits are formed.

CHYMOSIS*, or rather CHEMOSIS, is also used for an inflammation of the eyelids, which turns out their inside to sight.

* In which sense, the word comes from the Greek *χυμωσις*, *bifco*, I gape.

CICATRICULA, in natural history, a little whitish speck, or vesicle, in the coat of the yolk of an egg; wherein the first changes appear towards the formation of the chick. The *Cicatricula* is what is otherwise called the eye of the egg. See EGG.

CICATRISIVE, **CICATRIZANS**, in medicine, is applied to such remedies as are very desiccative; and on that account aid nature to repair the skin, and to form a cicatrix, or eschar. Such are Armenian bole, powder of tutty, and the unguents diaphoreticis, desiccativum rubrum, &c.

Cicatrificæ medicines are otherwise called *escharotics*, *epuloticks*, *incarnatiuus*, *agglutinanti*, &c.

CICATRIX*, in medicine, &c. a little seam, or elevation of callous flesh, rising on the skin, and remaining there after the healing of a wound, &c. ordinarily called a *scar*, or *eschar*.

* Some derive the word from *cicra cutem*: others fetch *cicatrix* from *accicatrix*, the *cicatrix* being only *obductio vulneris*, the covering up, or hiding of the wound: but it is better derived from *cicatrix*, which has the same force; of the verb *ciccare*, to bind.

The *Cicatrix* is the same with regard to the joining of the fleshy parts, as a *callus* is to the bones.

In young infants, these callosities, or scars, sometimes much diminish, and sometimes quite vanish when come to age, as is particularly observed in the pits of the small-pox: and, in growing, they are sometimes observed to change their situation.

CICUTA, a vegetable poison, celebrated as such both among antients and moderns.

The modern *Cicuta* is the plant hemlock; whereof there are two kinds: the *Cicuta*, absolutely so called, or *cicuta major*; and the *cicuta minor*.

The first grows in places a little moist, in the shade, among old ruins, or along roads.—So many unhappy effects have been experienced from it, that its use, internally, is by no means to be recommended: and yet some persons boast of it as a powerful sudorific. Externally it may be applied, to resolve wens, and hardnesses of the spleen and liver. It is the basis of the plaister which bears its name.

Physicians have generally ranked it among the cold poisons; but the later writers, with more justness, regard it as an acrimonious dissolving, or hot poison: and say that it kills by corroding and lacerating the stomach. The reasons they give, as related by Weffer, are, that it bites the tongue; that the effluvia it yields are hot, and arise from a volatile salt, and an impure sulphur; that the madest it occasions, as well as the other symptoms, shew a great activity of parts; and that if the blood be found coagulated by it after death, spirit of wine also does the same. See Mead's Essay on Poisons.

The lesser *Cicuta* is not less dangerous than the greater; it is even supposed more violent, as well as more hafty in its operation.

Several persons have been rendered delirious, by eating porridge wherein this *Cicuta* has been used instead of barley.—According to some, it has much such an enmity to the brain, as *caubarides* have to the bladder, and *lepus marinus* to the lungs.

CICUTA is also used, chiefly among the antients, for a poisonous juice, or liquor, expressed from a plant called *Cicuta aquatica*; being the common poison wherewith the state-criminals at Athens were put to death.

The *Cicuta* of the antients is a secret now scarce possible to be discovered. Weffer, in an express treatise on the subject, will have it the *Oenanthe cicuta facie*, *succo virgato*; which he describes by the name of *cicuta aquatica*; and of the dismal effects of which he gives a very ample relation.—At least the violence of this plant makes it much fitter instrument of hafty death than the common *cicuta* or hemlock, which is by much less malignant.—Though some have suggested, that the poisonous draught to which the Athenians doomed their criminals was an inspissated juice compounded of the juice of *Cicuta* and some other corrosive herbs. Vid. Mead's Essay on Poisons, ap. Bibl. Anal. Med. T. 3. p. 28 r.

Socrates drank the *Cicuta*.—Plato, in his dialogue on the immortality of the soul, observes, that 'The executioner advised Socrates not to talk, for fear of causing the *Cicuta* to operate too slowly.' M. Petit, in his *observations miscellaneæ*, remarks, that this advertisement was not given by the executioner out of humanity, but to save the *Cicuta*: for he was only allowed so much poison *per ann.* which if he exceeded, he was to furnish the rest at his own expence. This construction is confirmed by a passage in Plutarch: the executioner who administered the *Cicuta* to Phocion, not having enough, Phocion gave him money to buy more; observing, by the way, that it was odd enough, that at Athens a man must pay for every thing, even his own death. See Supplement, article *CICUTA* and *ANANTHE*.

CIDER, or **CYDER**, a brisk, tart, cool liquor, prepared from apples.

Manner of making CYDER. The fruit is first ground, or stamped, and the juice squeezed out in a press; then it is strained through a sieve, or other str, and turned up; the vessel is not to be full. For two or three days it is to be stopped loosely, then quite closed with clay. Henceforward, a small quantity is to be drawn out every day for some weeks, till such time as it be supposed pretty clear: then it is pierced, to see how fine it is; the summer fruit after a month; the gennet-moil, after the first frosts; the redstreak not till after January; and the other winter fruits about the same time.

If it be not now found fine enough, it stands a month longer; and if after this it be defective, it is racked off like wine, so as to keep out the air.

Some, instead of racking, fine it with *ising-glass*, steeped in white wine, and dissolved over the fire; this they boil in a quantity of the liquor to be fined, and then mix it with the rest: and others, instead of dissolving the *ising-glass* over the fire, let it steep in the white wine for about a month, in which time it dissolves into a gelly of itself: a quantity of this is mixed with some of the liquor, and the whole beat to a froth; then mingled, together with some broom, with the rest. The liquor once fine, it is drawn out, or bottled off, as occasion requires.

It is observed, that a mixture of fruits is a great advantage to *Cider*; the worst apples, mixed together, making as good *Cider* as the best make alone: always observing, however, that they be of equal ripeness.

The best mixture, according to Mr. Worlidge, is that of redstreaks with golden-reenets: bitter apples spoil the *Cider*, but the juice of them, and of crabs, yield as good spirits, as the best apples, when fermented: neither the four nor the bitter taste arising with the spirit upon distillation.

If the apples be pounded in a stone mortar, which is the custom of some, the kernels and stalks are bruised with them, which gives the liquor an ill favour.

CIDERKIN, or **PURGE**, is a liquor made of the muck, or gross matter remaining after the *Cider* is pressed out.

For this purpose, the muck is put up in a large fat, with a proper quantity of boiled water, which has stood till it be cold again: if half the quantity of water be used that there was of *Cider*, it will be good; if the quantities be equal, the *Ciderkin* will be small. The whole is left to infuse forty-eight hours, and then well pressed: what is squeezed out by the press, is immediately tunned up and stopped; it is fit to drink in a few days.

It clarifies of itself, and serves in families instead of small beer. It will keep, if boiled after pressure, with a convenient quantity of hops.

CILIA, in anatomy, the hairs wherewith the palpebræ, or eyelids are fringed; especially the upper, which are larger and stiffer than those of the under.

Their use seems to be, to break the too fierce impression of the rays of light; as also to keep out flies and moats, and other things floating in the air, which might annoy the eye.

These *Cilia* spring from a small row of glands, which cover a thin tender cartilage, edging each eyelid, and serving as a kind of rod, or ring to stretch them upon.

CILIARE, in anatomy, an epithet given to a part of the eye, called *ligamentum ciliare*; because of its relation to the *cilia*, or hair of the eyelids.

The *ligamentum ciliare*, called also *processus ciliaris*, consists of a range of black fibres disposed circularly; having their rise in the inner part of the uvea, and terminating in the prominent part of the crystalline, which they encompass round.

Anatomists generally imagine their use to be to suspend the crystalline in the globe of the eye, to lengthen or shorten its figure, and bring it nearer to or further from the uvea; and even to open or contract the pupil as occasion requires, *i. e.* as near or remote objects, obscure or bright objects, are to be viewed.

The motion of the pupil, some say, is effected by the circular and frait fibres of the uvea; others attribute it to the *Ciliary* ligament: yet, there is no great doubt, but they both concur in the same action; and that the *ligamentum ciliare* doth, at the same time the pupil opens or shuts, dilate or compress the crystalline, and bring it nearer, or carry it farther off the retina. Derham *phys. theol.*

M. Mariotte denies the *ligamentum ciliare* to have any connection with the crystalline, or to serve for any purposes thereof.

CILIARIS, in anatomy, a muscle, otherwise called *orbicularis palpebrarum*. See **ORBICULARIS**.

CIMA, or **SIMA**, in architecture, a member or moulding, called also *gee*, and *cymatium*.—See *Tab. Archit. fig. 8.*

CIMIER, in the French heraldry. See **CREST**.

CINCURE *, or **CINTURE**, in architecture, a ring, or list, at the top and bottom of the shaft of a column; separating the shaft, at one end, from the base; and at the other from the capital. See *Tab. Archit. fig. 28. and 24. lit. q. s.*

* The word in its original French signifies *girde*, of the Latin, *cingo*, I gird.—

That at bottom is peculiarly called *apophyse*; as if the pillar took its flight hence: and that at top, *calarim*, or collar.

The *Cincture* is supposed to be an imitation of the girths, or ferils, antiently used to strengthen and preserve the primitive wooden columns. See **ORDER**.

CINERATION, in chymistry, the reduction of wood, or any other combustible matter into ashes, by means of fire.—This, others call *cinifaction*.

CINERES. See the article **ASHES**.

CINERES Cleavellati, among chymists, are the ashes of tartar, or lees of wine, burnt.

CINERITIOUS, a term applied to things resembling ashes; particularly in point of colour, and consistence.

Thus, the cortical part of the brain, is also called the *cineritious* part.

CINNABAR *, in natural history, a mineral substance, red, heavy, and brilliant; found chiefly in the quicksilver mines, and being one of the ores of that mineral.

* The word comes from the Greek *κινναβη*, the smell of goats; by reason, says Matthiolus, in digging one kind of mineral *Cinnabar*, it yields a strong a scent, that the diggers are obliged to stop their nostrils.

Some have wildly imagined *Cinnabar* to be dragon's-blood, gathered, as Pliny and Solinus have it, when the dragon and elephant fight together: this fable is refuted by Dioscorides, and Scaliger. See **DRAGON'S BLOOD**.

Cinnabar is either *native*, or *factitious*.

Native, or *Mineral CINNABAR*, which is that abovementioned, is found in most places where there are quicksilver mines.

It may be esteemed as an ore of quicksilver, or rather, as quicksilver petrified and fixed, by means of sulphur, and a subterraneous heat: chymistry being found to reduce it without much trouble or loss, to the nature of mercury. Each pound of good *Cinnabar* yields fourteen ounces of mercury. Accordingly, the principal property and use of this mineral, is to yield a most excellent mercury; and that which the alchymists maintain to be the best disposed for attaining to the transmutation of gold.

The best mineral *Cinnabar* is of a high colour, brilliant, and free from stony matter.—It is used by physicians in venereal cases, and others occasioned by sharp ferocities. It is also esteemed a good cephalic, and accounted of service in epilepsies, and other

nervous distempers: add, that it is reckoned of efficacy in cutaneous cases, as the feurvy.

Factitious, or artificial **CINNABAR**, is formed of a mixture of mercury, and sulphur, sublimed, and thus reduced into a kind of fine red glebe.—The best is of a high colour, and full of fibres, like needles.

The method of preparing *factitious CINNABAR*, is thus, — They take sulphur, one part, melt it in a pipkin; and then put it, by a little at a time, three parts of quicksilver, stirring them together till no mercury appears: then letting them cool, they grind the mixture, put it in a bolt-head, bake it, and place it over a naked fire, which they augment by degrees; a coloured fume arises first to the top of the subliming vessel, which, in the further progress of the heat, becomes, at length, of a red, crimson hue. Taking it off the fire, the *Cinnabar* is found at top.

This serves for the same medicinal purposes with the *native Cinnabar*: besides which, it is likewise used by the farriers, to make pills for their horses; and by painters, as a colour: it being a very vivid red; but drying with some difficulty.

This *Cinnabar*, called also by the painters, *vermillion*, is rendered more beautiful by grinding it with gum-water, and a little saffron: this preventing its growing black. See **VERMILION**.

There is likewise a *blue Cinnabar*, made by mixing two parts of sulphur with three of quicksilver, and one of fal ammoniac: these being sublimed produce a beautiful blue substance; whereas quicksilver and sulphur alone produce a red. See *Supplement, article CINNABAR*.

The chymists prepare other kinds of artificial *Cinnabar*; as, **CINNABAR of Antimony**, a composition of mercury, common sulphur, and crude antimony, sublimed.

It is held a diaphoretic, and alterative; and is used in scrophulous and other chronic cases.

CINNAMON, an agreeable aromatic spice, brought from the East-Indies.

Cinnamon is allowed to be the bark of a tree, growing in the island of Ceylon, and, as some say, also in Java, and in Malabar.

The *Cinnamon*-tree, grows in woods, like other trees. It never rises high: its leaves resemble those of the laurel, both as to substance, and colour *. The flowers, when they first begin to open, are red as scarlet; and if rubbed between the hands, they yield an odour more like that of cloves than of *Cinnamon*. Seba says he found them blue, and of the bigness of the Italian bean flowers. The fruit resembles an acorn, or olive; and has neither the smell nor taste of the bark. When boiled in water, it yields an oil, which, as it cools and hardens, becomes as firm and white as tallow; and is called by the Dutch *Cinnamon wax*. Its smell is agreeable, and they make candles of it, which are only allowed to be burnt in the king's palace. It is also used in physic, as a balsamic and healer.

* The leaves of the *Cinnamon* tree are called *folia Malabatris*, and yield a bitterish aromatic oil, called *oleum Malabatris*, reputed excellent against cephalalgia, &c.

The chief virtue of the *Cinnamon* tree is in its bark; which, when green, appears to be double: its exterior surface being brownish, and the inner of the common *Cinnamon* colour.

It is then divisible into two barks of different colours; but these drying together become inseparable, and pass for the same bark; the brownish colour changing in proportion as it dries. When the *Cinnamon* is fresh taken from the tree, it is flat, and has little taste, smell, or colour; but it twists, or convolves, as it dries, in form of a stick, or cane: whence the French call it *canelle*.

By thus exhaling its superfluous humidity, it acquires a sweet brisk smell, and a sharp pungent taste. It is said, that after the tree has been stripped of its bark, in three years it forms a new one, which is as good as the first: but this is not very probable. The Ceylons cut down their *Cinnamon* trees as soon as they are stripped, close to the root: and from the stump there spring up new ones, which, in 5 or 6 years time, become trees fit for barking.—A sort of pigeons which feed on the fruit of the *Cinnamon* tree, are the chief agents in propagating it. In carrying the fruit to a distance to their young, they drop it in various places, where it takes root. *Vid. Phil. Trans. N^o 409. p. 104. seq.*

Some hold, that the small branches of the same tree make the *Cassa*; but that is a great mistake. See **CASSIA**.

The natives draw from the roots of the tree a liquor, which, as it hardens, in all respects resembles camphor; and which in reality is a true camphor.

Cinnamon, to be good, must have a brisk, agreeable taste, and a bright brown colour. Its qualities are, to heat and dry; to promote the menes, to fortify the spirits, and to help digestion: but its chief use, in medicine, is an astringent; with which intention it is prescribed in diarrheas, and weaknesses of the stomach.

The *Cinnamon* of the antients was different from that of the moderns; they distinguished five kinds of *Cinnamon*: the *myrsitic*; *Cinnamon of the mountain*; black and branched *Cinnamon*;

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mon; another white and spongy; and a fifth of less value, reddish, and of a strong smell: as also a *bastard Cinnamon*, called *zimziber*: this last species was antiently in very high esteem, but is now no longer known.

They extract an oil from *Cinnamon*, called its *essence*, or *quintessence*, which is an excellent cardiac: it is drawn by distillation, like the oils of other vegetables. Indeed, being heavier than most other essential oils, it requires a greater heat to raise it. And for the same reason it sinks to the bottom of the water that comes over with it into the receiver, whereas others swim a-top, the essential oils of cloves, saffras, guaiacum, and box, excepted. The Dutch are said to have a method of preparing, or rather, adulterating oil of *Cinnamon*, which is kept a secret among themselves. And the common *Cinnamon* is often adulterated with that out of which this essence has been extracted.

Cinnamon, by means of fire, furnishes, beside its oil, waters, extracts, and salts; out of which are compounded syrups, and pills, called *oleo-sacchara*; together with an essence, that serves to turn all manner of wines, white and red, into hypocras.

CINNAMON-WATER, is made by distilling the bark, (first infused for some days) in spirit of wine, brandy, or white-wine.

All the *Cinnamon* consumed in Europe, comes from the Dutch; who have got the whole commerce thereof in their own hands, by becoming masters of the Isle of Ceylon, and destroying all the other *Cinnamon* trees about the kingdom of Cochin.

Clove CINNAMON, is also the bark of a tree growing in Brazil and Madagascar; where it is known under the name of *rauwenslara*. The Portuguese call it *cravo de marenham*.

This bark, pulverized, is sometimes substituted for real cloves, though far short of them in respect of flavour.

Saffras, is sometimes also called *Cinnamon-wood*. See *SASSAFRAS*.

White CINNAMON, which some call *costus corticus*, or *corticus*, or *cortex Winteri*, *Winter's bark*, from the person's name who first brought it into England; is the bark of a tree resembling the olive tree, frequent in the islands of S. Domingo, Guadalupe, and Madagascar; called by the natives *simpli*.

This bark, which dries like that of *Cinnamon*, is at first brownish, of a sharp biting taste, like pepper; and a smell like musk: as it dries it whitens.—Some use it in lieu of nutmeg: and in medicine, it is used as a stomachic, and sometimes as an antiscorbutic.

The same tree also yields a gum, called *alouch*, sometimes *delidium*, which is no disagreeable perfume. See *Supplement, article CINNAMOMUM*, and *WINTERANUS CORTEX*.

CINQUE-PORTS, *Quinque ports*, five havens that lie on the east part of England, towards France; thus called, by way of eminence, on account of their superior importance; as having been thought by our kings to merit a particular regard, for their preservation against invasions.

Hence, they have a particular policy, and are governed by a keeper, with the title of *Lord-warden of the Cinque ports*.

They have various privileges granted them, as a particular jurisdiction; their warden having the authority of an admiral among them, and sending out writs in his own name.

Camden tells us, that William the conqueror first appointed a warden of the *Cinque-ports*; but King John first granted them their privileges; and that upon condition they should provide eighty ships at their own charge for forty days, as often as the king should have occasion in the wars: he being then straitened for a navy to recover Normandy.

These five ports are Hastings, Romney, Hythe, Dover, and Sandwich.—Thorn tells us, that Hastings provided twenty-one vessels; and in each vessel twenty-one men. To this port belong Seaford, Pevensey, Hedney, Winchelsea, Rye, Hamine, Wakesbourn, Creneth, and Forthelipe.—Romney provided five ships, and in each twenty-four men. To this belong Bromhal, Lyde, Owarthone, Dangemares, and Romenhall.—Hythe furnished five ships, and in each twenty-one seamen. To this belongs Westmeath.—Dover the same number as Hastings. To this belong Folkston, Feverham, and Marge.—Laffly, Sandwich furnished the same with Hythe. To this belong Fordwic, Reclver, Serre, and Deal.

CION, or *CYON*, in gardening, a young shoot, sprout, or sprig, put forth by a tree.

Grafting is performed by the application of the *Cion* of one plant upon the stock of another.

To produce a stock of *Cions* for grafting, planting, &c. the gardeners sometimes cut off the bodies of trees, a little above the ground, and only leave a stump or root standing; in this case the redundant sap will not fail next spring to put forth a great number of shoots.

In dressing dwarf-trees, a great many *Cions* are to be cut off. See *DWARF*; see also *PRUNING*.

CION, in anatomy, is sometimes used for the uvula. See *UVULA*. *CIPHER**, or *CYPHER*, one of the numeral characters, or figures; formed thus, 0.

* The word *Cipher*, comes from the Hebrew *Sifre*, number, enumeration.

The *Cipher* of itself implies a privation of value; but when

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disposed with other characters on the left thereof, in the common arithmetic, it serves to augment each of their values by ten; and in decimal arithmetic, to lessen the value of each figure to the right thereof, in the same proportion.

CIPHER, denotes also a kind of enigmatic character, composed of several letters interwoven; which are ordinarily the initial letters of the persons names, for whom the *Cipher* is intended.

These are frequently used on seals, coaches, and other moveables.—Antiently, merchants and tradesmen were not allowed to bear arms: in lieu thereof, they bore their *Ciphers*, or the initial letters of their names, artfully interwove about a cross; of which we have divers instances on tombs, &c.

CIPHER is also applied to certain secret characters, disguised and varied; used for the writing of letters that contain secrets not to be understood by any but those between whom the *Cipher* is agreed on. This is now reduced into a separate art, called, *Cryptographia*, *Polygraphia*, and *Steganographia*; but it appears to have been little known to the antients.

De la Guilletiere, in his *Lacedaemon antient and modern*, endeavours to make the antient Spartans the inventors of the art of writing in *Cipher*.

Their scytala, according to him, was the first sketch of this mysterious art: these scytala were two rollers of wood, of equal length and thickness; one of them kept by the ephory; the other by the general of the army sent on any expedition against the enemy.

Whenever those magistrates would send any secret orders to the general, they took a slip of parchment, and rolled it very justly about the scytala which they had reserved; and in this state wrote their intentions, which appeared perfect and consistent while the parchment continued on the roller: when taken off, the writing was maimed, and without connection; but it was easily retrieved by the general, upon his applying it to his scytala. Polybius says, that Aeneas Tacticus, 2000 years ago, collected together twenty different manners of writing so as not to be understood by any but those in the secret; part whereof were invented by himself, and part used before his time.—Trithemius, Bap. Porta, Vigenere, and P. Niceron, have wrote expressly on the subject of *Ciphers*.

As the writing in *Cipher* is become an art; so is the reading, or unravelling thereof, which is called *deciphering*. See *DECIPHERING*.

CIPHER with a single Key, is that wherein the same character is constantly used to express the same word, or letter: this is easily deciphered with a little application.

CIPHER with a double Key, is that wherein the alphabet, or key is changed in each line, or in each word; and wherein are inserted many characters of no significancy, to amuse and perplex the meaning.

CIPHERING, or *CYPHERING*, is popularly used for the art of accounting; properly called *arithmetica*.

CIPPUS, among antiquaries, a little, low column, erected in roads, or other places, with an inscription thereon; either to shew the way to travellers, to serve as a boundary, or preserve the memory of something remarkable, and particularly the grave of a defunct.

The *Cippi* placed in the highway, for the convenience of travellers, were more properly called *military columns*. See *MILITARY Column*.

Hottinger has an express treatise of the *Cippi* of the Jews, *de cippiis hebraeorum*; wherein he takes *Cippus* for the tomb-stone of a defunct.

CIPPUS was also used in antiquity, for a wooden instrument, wherewith criminals and slaves were punished; being a kind of clog, or stocks for the feet.

CIRCELLIONES. See *AGONISTIC*.

CIRCENSES Ludi, *CIRCENSIAN Games*, or *Games of the Circus*, a general term, under which were comprehended all combats exhibited in the Roman *Circus*, of what kind soever; whether on foot, on horseback, or in a car; wrestling, or boxing; with swords, pikes, darts, or arrows; against men, or against beasts; on the ground, or aboard vessels.

There were few except slaves that gave the people this cruel pleasure: it was an exercise that would have disgraced people of any account. See *GLADIATOR*.

Some say, the *Circensian Games* were so called from the Latin *Circumfess*; because they were held in a place incircumfess round with naked swords, that the combatants might not have an opportunity of escaping.

At first they are said to have been exhibited on the brink of the river Tyber, and the ground incircumfess, to the landward, with naked swords.

Most of the feasts of the Romans were accompanied with *Circensian Games*; and the magistrates, or other officers of the republic, frequently presented the people with them on other occasions.—The grand ones were held for five days, commencing on the 15th of September.

CIRCLE, *CIRCULUS*, in geometry, a plane figure, comprehended under one single line, which returns into itself; having a point in the middle, from which all the lines drawn to its circumference are equal.

Properly speaking, it is the space included within the circumference,

rence, or periphery, that is the *Circle*: tho' in the popular use of the word, *Circle* is frequently used for the periphery alone. Every *Circle* is supposed to be divided into 360 degrees.

The area of a *Circle*, is found by multiplying the periphery by the fourth part of the diameter; or half the periphery by half the diameter.—The area is also had by finding a fourth proportional to 1000,785, and the square of the diameter: or, to 452, 355, and the square of the diameter.

Circles, and similar figures inscribed in them, are always as the squares of the diameters: so that they are in a duplicate ratio of their diameters; and therefore of their radii.

A *Circle* is equal to a triangle whose base is equal to the periphery, and its altitude to the radius. *Circles*, therefore, are in a ratio compounded of the peripheries and the radii.

To find the proportion of the diameter of a *CIRCLE* to its periphery.—

Find, by continual bisection, the sides of the inscribed polygons, till you arrive at a side subtending any arch, howsoever small: this found, find likewise the side of a similar circumscribed polygon; multiply each by the number of sides of the polygon; by which you will have the perimeter of each polygon. The ratio of the diameter to the periphery of the circle, will be greater than that of the same diameter to the perimeter of the circumscribed polygon; but less than that of the inscribed polygon.

The difference of the two being known, the ratio of the diameter to the periphery, is easily had in numbers very nearly true; though not justly so.

Thus, Welfius finds it as 100000000000000 to 3141592-6535897932. Archimedes fixed the proportion as 7 to 22. Ludolphus a Ceulen carries it to a much greater accuracy; finding, that putting the diameter for 1, the periphery is greater than 3.14159: 5358979323846264338387950; but, less than the same, number with the last cypher changed into an unite.

Metius gives us the following proportion, which is the best that is expressed by small numbers: if the diameter be 113, the periphery (113.31415): 10000; that is, 355, nearly.

To circumscribe a *CIRCLE*, about a given regular polygon: bisect two of the angles of the polygon E and D, (Tab. *Geometry*, fig. 28.) by the lines EF and DF; and on the point of concurrence F, as on a center, with the radius EF, describe a *Circle*. See *CIRCUMSCRIBING*.

To inscribe any given regular polygon in a *CIRCLE*: divide 360 by the number of sides, to find the quantity of the angle EFD; which being made, in the center apply the chord ED to the periphery, as often as it will go: thus is the figure inscribed in the *Circle*.

Through three given points, not in a right line, A, B, C, fig. 7. to describe a *CIRCLE*. On A and C strike arches intersecting in D and E; and others, G and H; from C and B draw the right lines DE and HG: the point of intersection, I, is the center of the *Circle*. Hence, if, by assuming three points in the periphery, or the arch of any *Circle*, the center may be found, and the given arch be perfected.

zdy, If three points of any periphery agree, or coincide with three points of another; the whole peripheries agree, and the *Circles* are equal.

Every triangle may be inscribed in a *Circle*.

In optics, it is shewn, that a *Circle* never appears truly such, unless either the eye be directed perpendicularly to its center; or the distance of the eye from the center, when directed obliquely, be equal to the semidiameter of the *Circle*: in every other case, the *Circle* appears oblong; and to make a *Circle* that shall appear such, it must be oblong.

Parallel, or concentric *CIRCLES*, are such as are equally distant from each other in every point of their peripheries; or are described from the same center: as, on the contrary, those struck from different centers, are said to be *eccentric*.

The *Quadrature* of the *CIRCLE*, or the manner of making a square, whose surface is perfectly and geometrically equal to that of a *Circle*, is a problem that has employed the geometers of all ages. See *QUADRATURE*.

Many maintain it to be impossible; Des Cartes, in particular, insists on it, that a right line, and a *Circle*, being of different natures, there can be no strict proportion between them: and, in effect, we are likewise at a loss for the just proportion between the diameter and circumference of a *Circle*.

Archimedes is the person who has come the nearest to the quadrature of the *Circle*: all the rest have made paralogisms.—Charles V. offered a reward of 100000 crowns to the person who should solve this celebrated problem; and the states of Holland have also proposed a reward for the same.

CIRCLES of the higher kinds, are curves wherein $A P^m : P M^n :: P M^m : P B^n$. Or, $A P^m : A P^m :: P M^m : P M^m$. Tab. *Analysit*, fig. 8. Cor. I. Suppose $A P = x$, $P M = y$, $A B = a$: then will $P B = a - x$. And consequently $x^m : y^m :: y^m : a - x$. Hence we have an equation that defines infinite *Circles*, viz. $ym + 1 = ax^m - x m + 1$; and another defining infinite other *Circles*, viz. $ym + n = (a - x) n x^m$.

Cor. II. If $m = 1$, then will $y^2 = ax - x^2$; and therefore a *Circle* of the first order is contained under this equation alone. If $m = 2$, $y^2 = ax^2 - x^3$, which equation defines a *Circle* of

the second order.

CIRCLES of the *Sphere*, are such as cut the mundane sphere, and have their periphery either on its moveable surface, or in another immoveable, conterminous, and equidistant surface.

Hence arise two kinds of *Circles*, *moveable*, and *immoveable*.

The first, are those whose peripheries are in the moveable surface, and which therefore revolve with its diurnal motion; as, the *meridians*, &c.

The latter, having their periphery in the immoveable surface, do not revolve; as the *ecliptic*, *equator*, and its *parallels*, &c.

If a sphere be cut in any manner, the plane of the section will be a *Circle*, whose center is in the diameter of the sphere.

Hence the diameter of a *Circle* passing through the center, being equal to that of the *Circle* which generated the sphere; and that of a *Circle* which does not pass through the center, being only equal to some chord of the generating *Circle*; the diameter being the greatest of all chords, there hence arises another division of the *Circles* of the sphere, viz. into *great* and *lesser*.

Great CIRCLE of the *Sphere*, is that which divides it into two equal parts, or hemispheres; having its center in the center thereof.

Hence, all *great circles* are equal, and cut each other into equal portions, or femicircles.

The *great Circles* are the *horizon*, *meridian*, *equator*, *ecliptic*, the *colures*, and the *aximuths*; which see in their places.

Lesser CIRCLE of a *Sphere*, is that which divides the sphere into two unequal parts, and has its center in the axis of the sphere, but not in the center thereof.

These are usually denominated from the *great Circles* they are parallel to; as, *parallels* of the *equator*, &c.

CIRCLES of *Altitude*, otherwise called *altimantars*, are *Circles* parallel to the horizon, having their common pole in the zenith, and still diminishing as they approach the zenith.

They have their names from their use; which is to shew the altitude of a star above the horizon.

CIRCLES of *Declination*, are *great Circles* intersecting each other in the poles of the world.

Diurnal CIRCLES, are immoveable *Circles*, supposed to be described by the several stars, and other points of the heavens, in their diurnal rotation round the earth; or rather, in the rotation of the earth round its axis.

The *Diurnal Circles* are all unequal: the equator is the greatest.

CIRCLE *Equant*, in the Ptolemaick astronomy, is a *Circle* described on the center of the equant.

Its chief use is, to find the variation of the first inequality.

CIRCLES of *Excursion*, are *Circles* parallel to the ecliptic, and at such a distance from it, as that the excursions of the planets towards the poles of the ecliptic, may be included within them; usually fixed at 10 degrees.

It may be here added, that all the *Circles* of the sphere above described, are transferred from the heavens to the earth; and thence come to have a place in geography, as well as in astronomy: all the points of each *Circle* being conceived to be let fall perpendicularly on the surface of the terrestrial globe, and so to trace out *Circles* perfectly similar to them.

Thus, the terrestrial equator is a line, conceived precisely under the equinoctial line, which is in the heavens; and so of the rest.

Horary CIRCLES, in dialling, are the lines which shew the hours on dials; though these be not drawn circular, but nearly so.

CIRCLES of *Latitude*, or *Secondaries* of the *Ecliptic*, are *great Circles* parallel to the plane of the ecliptic, passing through the poles thereof, and through every star and planet.

They are so called, because they serve to measure the latitude of the stars, which is nothing but an arch of one of these *Circles*, intercepted between the star and the ecliptic.

CIRCLES of *Longitude*, are several lesser *Circles*, parallel to the ecliptic; still diminishing, in proportion as they recede from it.

On the arches of these *Circles*, the longitude of the stars is reckoned.

CIRCLE of *perpetual Apparition*, one of the lesser *Circles*, parallel to the equator; described by any point of the sphere touching the northern point of the horizon; and carried about with the diurnal motion.

All the stars included within this *Circle* never set, but are ever visible above the horizon.

CIRCLE of *perpetual Occultation*, is another *Circle* at a like distance from the equator; and contains all those stars which never appear in our hemisphere.

The stars situate between these *Circles*, alternately rise and set at certain times.

Polar CIRCLES, are immoveable *Circles*, parallel to the equator, and at a distance from the poles equal to the greatest declination of the ecliptic.

That next the northern pole is called the *arctic*; and that next the southern one the *antarctic*.

CIRCLES of *Position*, are *Circles* passing through the common intersections of the horizon and meridian, and through any degree of the ecliptic, or the center of any star, or other point in the heavens; used for finding out the situation or position of any star.

They are usually made six in number; and cut the equator into twelve equal parts, which the astrologers call the *celestial houses*. Hence some call them *circles of the celestial houses*.

Antarctic CIRCLE. See the article ANTARCTIC.

Arch of a Circle. See the article ARCH.

Arctic CIRCLE. See the article ARCTIC.

Axis of a CIRCLE. See the article AXIS.

Center of a CIRCLE. See the article CENTER.

Eccentric CIRCLE. See the article ECCENTRIC.

Equal CIRCLE. See the article EQUAL.

Fairy CIRCLE. See the article FAIRY.

Right CIRCLE. See the article RIGHT.

Secondary CIRCLES. See the article SECONDARY.

Segment of a CIRCLE. See the article SEGMENT.

Vertical CIRCLES, or azimuths. See VERTICAL, and AZIMUTH.

CIRCLE, CIRCULUS, is understood among the schoolmen, of a vicissitude of generations, arising one out of another.

Thus, good concoction causes a good habit of body; a good habit of body produces strength and vigour; these occasion frequent exercises; and these a good concoction.

It is a celebrated dogma of the Scotists, 'There is no *Circle* in causes of the same order, or kind.'

CIRCLE, in logick, that fault of an argument that supposes the principle it should prove, and afterwards proves the principle by the thing it seemed to have proved.

Or, a *Circle* in logick, called also *sylogistic Circle*, is when the fame terms are proved, *in orbem*, by the same terms; and the parts of the syllogism, alternately by each other, both directly and indirectly.

There are two kinds of *Circles*; the one *material*, the other *formal*.

The *formal* is that which in two reciprocal syllogisms begs the medium, which is the next cause of the greater extreme. This kind is by no means to be admitted: otherwise, the same thing becomes both prior and posterior; the cause and effect of itself; which is absurd.

The *material Circle*, called also *regressus*, consists of two syllogisms, the former whereof proves the cause by the effect; and the latter the effect by the cause: this may be admitted.

CIRCLES of the Empire, are such provinces, and principalities of the empire, as have a right to be present at diets.

The division of the empire into six *Circles*, was established by Maximilian I. in 1500, at Augsbourg: twelve years afterwards he divided it afresh, into ten *Circles*; which partition was confirmed by Charles V. at the diet of Nuremberg, in 1522.

Though the order of these *Circles* has never been well regulated; yet, in the imperial matricula, it is as follows: the *Circle* of Austria, that of Burgundy, of the Lower Rhine, of Bavaria, Upper Saxony, Franconia, Suabia, Upper Rhine, Westphalia, and the Lower Saxony. See DIET.

CIRCUIT, or CIRCUITY, in law; a longer course of proceeding to recover the thing sued for, than is needful.

Thus, if a man grant a rent-charge of 10*l.* out of his manor, and after, the grantee disseizeth the grantor of the same manor, who brings an assise, and recovers the land, and 20*l.* damages; which being paid, the grantee brings his action for 10*l.* of his rent, due during the time of the disseisin, and which he must have had, if no disseisin had been: this is called *Circuit of Action*; because, whereas the grantor was to receive 20*l.* damages, and to pay 10*l.* rent, he might have received but 10*l.* for damages, and the grantee have kept the other.

CIRCUIT, is also the journey, or progress the judges take, twice every year, through the several counties of England and Wales, to hold courts, and administer justice, where recourse cannot so well be had to the king's courts at Westminster. See JUDGE, and ASSISE.

England is divided into six *circuits*; viz. the Home-circuit, Norfolk Circuit, Midland Circuit, Oxford Circuit, Western Circuit, and Northern Circuit.

CIRCUITORES. See AGONISTIC.

CIRCULAR, any thing that is described, or moved in a round; as the circumference of a circle, or the surface of a globe. See CIRCLE.

The *circular* form is of all others the best disposed for motion; and the most capacious.

The modern astronomers shew, that the heavenly bodies do not move in *circular*, but in elliptic orbits. See ORBIT, PLANET, &c.

CIRCULAR Arches. See the article ARCH.

CIRCULAR Letter, a letter directed to several persons, who have the same interest in some common affair; as, in the convocation of assemblies, &c.

CIRCULAR Lines, an appellation given by some to such straight lines as are divided from the divisions made in the arch of a circle.—Such are sines, tangents, secants, &c. See SINE, and TANGENT.

CIRCULAR Numbers, are such whose powers end in the roots themselves; whose square is 25, and cube 125. See NUMBER.

CIRCULAR Sailing, is that performed in the arch of a great circle.

Circular sailing, of all others, goes the nearest or shortest way; and yet there are such advantages in sailing by rhumbs, that this latter is generally preferred. See SAILING.

CIRCULAR winding Stairs. See the article STAIRS.

Resistance of a CIRCULAR Segment. See RESISTANCE.

CIRCULAR Velocity, a term in astronomy, signifying that velocity of a planet, or revolving body, which is measured by the arch of a circle: as suppose by *A b*, (Tab. *Astronomy*, fig. 10.) described on the center of attraction *S*.

The *Circular velocity* of a body moving from *B* to *C*, is measured by the arch *B C*.

CIRCULATION, the act of moving round, or in a *Circle*.

We say, the *Circulation* of the blood; and the *Circulation* of the sap; of the spirits, &c.

As in the great world we find a perpetual and orderly *Circulation* of waters, conveyed from the sea by subterraneous passages, springs, &c. and returned thither again by rivers, &c. so in the little world, man, a like circuit is observed; the blood being continually driven from the heart, by the arteries, to all parts of the body; and brought back again to the heart by the veins.

CIRCULATION of the blood, denotes a natural motion of the blood in every living animal; whereby that humour is alternately conveyed from the heart to all the parts of the body, by the arteries, and returned from the same parts to the heart by the veins.

The heart, we have elsewhere shewn, is a muscle, into the ventricles or cavities whereof, all the veins discharge themselves, and from which all the arteries arise; having withal, a reciprocal action of dilatation, or diastole; and contraction, or systole. Now, the necessary effect of such alternate action, is, that the heart, by turns, both receives and expels the blood. The blood expelled out of the right ventricle, must be carried through the pulmonary artery (which arises thence) into the lungs; from which it must be returned, by the pulmonary vein, to the left ventricle, (in which that vein terminates). From the left ventricle, the blood thus imported, is by the contraction of that part, again expelled into the aorta, and by it distributed all over the rest of the body; and thence is returned again to the right ventricle by the cava, which compleats the *Circulation*.

The *Circulation* of the blood, has been generally allowed to have been first discovered in England, in the year 1628, by Harvey, a physician of our own country; though there are several authors who dispute it with him.

Janston ab Almeloveen, in a treatise of *new inventions*, printed in 1684, quotes several passages from Hippocrates, to prove that the *Circulation* was known to him. Wallaeus, *ep. ad Barthol.* pretends, it was known not only to Hippocrates, but also to Plato and Aristotle.—It is added, that the Chinese physicians taught it 400 years, before it was spoke of in Europe.

Some go back as far as Solomon, and imagine they see some traces of it in Ecclesiastes, chap. xii.—Bern. Geneva, in an Italian treatise of anatomy, quotes several passages from Realdus Columbus, and And. Caelapinus, whereby he endeavours to prove that they admitted a *Circulation*, long enough before Harvey.

He adds, that Fra. Paolo Sarpi, the famous Venetian, from a consideration of the structure of the valves of the veins, and other experiments, concluded a *Circulation*.

Leonicens adds, that F. Paolo durst not make known his discovery, for fear of the inquisition; that he therefore only communicated the secret to Fab. ab Aquapendente; who, after his death, deposited the book he had composed on it in the library of S. Mark; where it lay hid a long time, till Aquapendente discovered the secret to Harvey, who then studied under him at Padua; and who, upon his return to England, a country of liberty, published it as his own.—But much of this is fable. Sir Geo. Ent has shewn that Father Paul received the first notice of the circulation of the blood from Harvey's book on the subject, which was carried to Venice by the ambassador of the republic at the court of England, who shewed it to F. Paul, by whom some extracts were made from it, which coming afterwards into the hands of his heirs, gave rise to an opinion in several persons that he was the author of the papers and the invention. See Douglas's Biblioth. Anat. Spec. p. 227. Edit. 1734.

The *Circulation* of the blood is evinced, from the following considerations.—1. All the blood of a living animal, upon wounding any one of the larger arteries, is, in a little time, evacuated; and that with a considerable force: as appears from the operations of butchers, &c.

Hence, it follows, that the blood has a passage from every part of the animal body into every artery; and if the whole mass of blood be found to move on this occasion, it is evident it must have moved before.

2. The great quantity of blood driven out of the heart into the arteries at every pulse, makes a *Circulation* necessary; since, without it, an infinitely greater stock of blood must be supposed

in the body of a man, than any observation, or experiment will allow of.

For though the antients, who knew not this *Circulation*, imagined that only a drop or two was expelled at each systole; which they were necessitated to suppose, to avoid the too great distension of the arteries, from a more considerable influx: yet it is certain, and even demonstrable, that there must needs be an ounce, or more, driven into them at each time; and yet some compute that there are five or six thousand pulsations in an hour.

3. Any of the arteries, being tied with a thread, swell, and beat, between the bandage and the heart; but they grow flaccid between the bandage and the extremities of the body.

If now the artery be cut between the bandage and the heart, blood streams out, even to death: if it be cut between the bandage and the extremities of the body, the quantity of blood it yields is very small.

The vital blood, therefore, flows through the arteries; and its course is from the heart towards the extremities of the body: and this it does in every point of the body, internal and external; fill out of a wider part into a narrower; out of the trunk into the branches. And it is on this principle alone, that all the blood may be derived into any artery, and evacuated at it.

4. Any one of the larger veins being bound up with a thread, swells between the extremities of the body and the bandage; but without beating: and between the bandage and the heart it becomes flaccid.

If opened in the former part, it bleeds largely; if in the latter, it scarce bleeds at all. The blood, therefore, flows briskly from every part of the body into this vein; and its course is from the extremities of the body towards the heart; from the narrower parts of the vein towards the wider parts; from the branches to the trunk.

From the whole, it is evident, that all the arteries of the body are continually bringing the blood from the left part of the heart, through the trunks of the arteries, into the branches; and from those to all parts of the body, internal and external: and on the contrary, that all the veins, excepting the porta, are perpetually bringing back the blood from the extreme parts into the smaller branches; from those it passes into the larger, at length into the trunks, and thence into the cava; and thro' the sinus venosus, or trunk of that vein (which ends in the cavity of the right auricle) into the heart.

The blood being arrived here, its motion, or *Circulation*, is continued as follows.

The auricles of the heart being large hollow muscles, furnished with a double series of strong fibres proceeding with a contrary direction to two opposite tendons, the one adhering to the right ventricle, the other to the sinus venosus; as also with innumerable veins and arteries; by the contractile force of these auricles, the blood will be vigorously expressed, and drove into the right ventricle; which, upon this contraction, is rendered flaccid, empty, and disposed to admit it.

If now the right ventricle, thus full of blood, by the contraction of its fibres press the blood towards the aperture again; the venous blood at the same time pouring in, will drive it back again into the cavity, and mix it more intimately; till rising up against the parietes, it raise the valvula tricuspidæ, which are so connected to the fleshy columns extended on the opposite side, as that when laid quite down they cannot close the parietes of the right ventricle: these it thrusts towards the right auricle, till being there joined, they stop the passage very closely, and prevent any return.

By the same means, the same blood rises up into the three femoral valves, placed in the extremity of the other mouth, and lying open to the pulmonary artery: these it shuts close against the sides of the artery, and leaves a passage into the artery alone.

The venous blood therefore, that is, the blood of the whole body continually moves out of the sinus, or trunk of the vena cava, through the right auricle, and right ventricle, into the pulmonary artery, and that in a continued and forcible stream.

The blood carried by this artery into the lungs, and distributed by its branches through the whole substance thereof, is first admitted into the extremities of the pulmonary vein, called *arteria vasa*; whence passing into four large vessels, which unite together, it is brought to the left sinus venosus, or trunk of the pulmonary vein; by the force of whose muscular structure it is driven into the left ventricle, which, on this occasion, is relaxed, and by that means prepared to receive it.

Hence, as before, it is driven into the left ventricle, which is relaxed by the same means; and the valvula mitralis opening, admit it into the left ventricle, and hinder its reflux into the pulmonary vein.

From hence it is forced into the aorta; at whose orifice there are three femoral valves, which also prevent a reflux by closing the same.

And thus is *Circulation* effected; all the blood sent into the lungs, and received into the arteria venosa, sinus venosus, left auricle and ventricle, being here continually propelled into the aorta; whose ramifications are spread throughout all the rest of the body, with a violent motion.

This motion, in living animals, is attended with the following phenomena.

1. Both the venous sinus's are filled, and grow turgid at the

same time. 2. Both auricles grow flaccid at the same time; and both are filled at the same time, with blood impelled by the contractile force of its correspondent muscular venous sinus.

3. Each ventricle contracts, and empties itself of blood at the same time; and the two great arteries are filled and dilated at the same time. 4. As soon as the blood, by this contraction, is expelled, both ventricles being empty, the heart grows longer and broader; and consequently more flaccid and capacious.

5. Upon which, the muscular fibres of both venous sinus's contract, and express the blood contained in them into the ventricles of the heart. 6. In the mean time, the venous sinus's are again filled, as before; and the auricles, &c. return into their former habitude.

7. And this alternation continues till the animal begins to languish, under the approach of death; at which time the auricles and venous sinus's make several palpitations, for one contraction of the ventricle.

Thus is all the blood, in its return from every point of the body, internal and external, and from every point of the heart and its auricles, impelled into the right ventricle; out of that into the lungs; thence into the left ventricle; and thence through the whole extent of the body; and thence again is brought back to the heart.

As to the manner of the blood's passing out of the arteries into the veins, in order to its being returned to the heart; there are two opinions.

In the first, the veins and arteries are supposed to open into each other, or to be continued from each other, by anastomoses, or inoculations of their extremities.

In the latter, the extreme capillary arteries are supposed to let out their blood into the pores of the substance of the parts; on whose nutrition part is spent, and the rest is received in at the mouths of the capillary veins.

Each of these manners must be allowed to have its reason: For without the first, it were difficult to account for so quick a return of the blood to the heart, as in effect we find; besides, that in some of the larger vessels, there is a confessed anastomosis, *v. g.* in the splenic artery with the splenic vein, &c. whence authors conclude the same contrivance to hold in the lesser vessels; even in the smallest twigs in the extreme parts of the body, though not discovered by the eye; nature being ordinarily found very uniform, and consistent with herself.

Riolanus, however, who will allow of no *Circulation* but by anastomoses; allows of none, neither, but by the larger vessels.

The reason of the latter opinion is deduced hence, that if part of the arterial blood did not ooze out into the substance of the parts, they could not be nourished thereby: for the blood, while contained in the vessels, may indeed convey warmth thereto, but no nutriment; the very vessels themselves being not nourished by the fluid running in their cavity, but by capillaries passing their coats.

If then the blood be driven out of the vessels in a greater quantity than is required for nutrition; the redundancy must be imbibed by the capillary veins.

M. Leewenhoek seemed to have put this matter out of doubt by his microscopes, with which he discovered the inoculations, or continuations of the extremities of the veins and arteries in fishes, frogs, &c. But some still doubt whether there be such continuations in the extremities of the veins and arteries in human bodies and quadrupeds: those animals it has been hitherto observed in, being either fish, or some of the amphibious kind, which have but one ventricle in the heart, and their blood actually cold: to which it may be added, that the blood in these creatures does not circulate with that rapidity as in those whose hearts have two ventricles.

This difference in the principal organs of *Circulation*, occasioned Mr. Cowper to make experiments on other animals, whose parts have the same structure with those of man. In the omentum of a cat, he saw the blood move briskly through the inoculations; the same also he found of the omentum, and much clearer in the mesentery, of a dog. He adds, that the extremity of the vessels are not equally lessened, in the inoculations, in different animals.

In the tail of the tadpole, he frequently observed several communications between the veins and the arteries; through each of which two globules of blood might pass abreast. In young fish, particularly grigs, the communicant branch is so small, that one globule of blood can scarce pass in the space of three seconds.

In a fœtus, the apparatus for the *Circulation* is somewhat different from that above described.—The septum, which separates the two auricles of the heart, is pierced through with an aperture, called the *foramen ovale*; and the trunk of the pulmonary artery, a little after it has left the heart, sends out a tube in the descending aorta, called the *communicating canal*.

The fœtus being born, the foramen ovale closes, by degrees, and the canal of communication dries up, and becomes a simple ligament.

This mechanism once known, it was easy to perceive its use.—For while the fœtus is inclosed in the uterus, it receives no air, but that little furnished it by the umbilical vein; its lungs, therefore, cannot swell and subside as they do after the birth, and after the free admission of the air. They continue almost at rest,

and without any motion; their vessels are as if they were full of themselves, and do not allow the blood to circulate, either in abundance, or with ease.

Nature, therefore, has excused the lungs from the passage of the greatest part of the blood; and has contrived the foramen ovale, by which part of the blood of the vena cava, received into the right auricle, passes into the left auricle, as the mouth of the pulmonary veins; and by this means is found as far in its journey as if it had passed the lungs.

But this is not all, for the blood of the cava, which, missing the foramen ovale, passes from the right auricle into the right ventricle; being still in too great quantity to pass by the lungs, whither it is driven through the pulmonary artery; the communicant canal intercepts part of it in the way, and pours it immediately into the descending aorta.

This is the doctrine of Harvey, Lower, and most other anatomists; but M. Mery, of the royal academy, has made an innovation in it.

He assigns another use for the foramen ovale; and maintains, that the whole mass of blood brought from the cava to the right ventricle, passes, as in adults, into the pulmonary artery, whence part of it is conveyed by the communicant canal into the aorta; and the rest brought from the lungs by the pulmonary vein into the left auricle, where it is divided into two parts; the one passing through the foramen ovale into the right ventricle, without circulating through the aorta, and the rest of the body; the other part pushed, as in adults, by the contraction of the left ventricle, into the aorta, and the whole body of the fetus.

The whole question then turns upon this, *viz.* whether the blood pass through the foramen ovale from the right to the left ventricle, or from the left to the right?

M. du Verney asserts the antient opinion, against M. Mery, and maintains that the foramen ovale, has a valve so disposed as to be opened by the blood driving into the right ventricle, but shut the more firmly by its pushing towards the left. But M. Mery denies the existence of any such valve.

Again, in an adult, the aorta being to receive all the blood of the pulmonary artery, is found of the same bigness. In a fetus, the two arteries are to receive unequal quantities, which of the two systems never be followed.

According to the common opinion, the aorta receiving more blood than the pulmonary, should be bigger: according to the opinion of M. Mery, the pulmonary artery should be the bigger, as being esteemed to receive a greater quantity of blood.

To judge of the two systems therefore; it should seem there needed nothing but to determine which of the two vessels were biggest in a fetus.

M. Mery always found the pulmonary artery half as big again as the aorta; and, on the other hand, Mr. Tauvry, who followed M. du Verney, produces cases where the pulmonary is less than the aorta: the facts on both sides being examined by the French royal academy.

M. Tauvry adds, that though the pulmonary artery should be greater than the aorta, yet this does not prove that more blood passes the first than the second; since it may be accounted for from the blood's pressing more slowly towards the lungs, which it finds some difficulty to penetrate, and accordingly swells, and is driven back.

M. Littre, upon dissecting an adult, in whom the foramen ovale was still open, and measuring the capacities of the vessels on each side, declares for M. Mery.

For the source of the *Circulation* in the fetus, anatomists are again divided.—The popular opinion is, that during gestation, the arteries of the uterus convey their blood into the placenta, which is nourished by it, and the surplus conveyed into the roots of the umbilical vein, which makes part of the navel-string: thence it is carried to the liver of the fetus, where it enters the vena cava, and is thence conveyed to the right ventricle of the heart, and distributed as before.

Again, the blood brought from the iliac arteries of the fetus, enters the navel-string by the umbilical arteries; then passes into the placenta, where it is resumed by the veins of the uterus, which carry it back again to the mother; and perhaps also by the roots of the umbilical vein, which mix it afresh with the blood of the mother.

According to this system therefore, it is the blood of the mother that supplies the child; which is here only regarded as a distinct member, or part of her frame.

The beating of her heart sends it a portion of her blood; and so much of the impulse is preserved, as suffices to maintain that languid *Circulation* which a fetus enjoys; and, in all probability, gives that feeble pulsation observed in the heart.

Other anatomists maintain, that the fetus is only supplied with chyle from the glands of the uterus; which is further elaborated, and turned into blood in the vessels of the fetus; and circulates therein, without any further communication with the mother.—These allow of no reciprocal *Circulation*, excepting between the placenta and the fetus.

But the former opinion seems best supported: For the placenta being separated from the uterus, during the time of gestation, neither yields any chyle, nor any other thing but blood. Besides,

M. Mery has shewn, that the uterus has no glands to furnish any chyle.

Two other observations of the same author, confirm the popular system: the inner surface of the uterus is lined with veins; and the outer surface of the placenta is not lined with any membrane. Now as it is by these two surfaces that the two feces in some measure glued together; it looks as if they were only left without membranes, for an immediate communication between their blood-vessels.

Add to these a fact whereof M. Mery was an eye-witness: a woman big with child was killed by a fall; in the cavity of her belly were found seven or eight pints of blood; all the blood-vessels being emptied: the child too was found dead; but without the least appearance of any wound or contusion: all its blood-vessels being empty of blood, like those of the mother.

The body of the placenta still adhered to the whole inner surface of the uterus; nor was there any extravasated blood there.

Now the blood here had no other way to discharge itself, but by the veins of the uterus: whence it follows, that those veins bring back to the mother the blood of the fetus; which alone establishes the whole system. If the *Circulation* were only from the fetus to the placenta, and not also to the mother; the dead child would have had all its blood.

Upon the whole, the blood in the lungs of the fetus has none of the advantages of air or respiration; which yet being necessary, nature, it is supposed, takes care that it receives a portion of air, mixed together with its mother's blood, and transmitted to it by the umbilical vessels, to be diffused through the body.

This is confirmed hence, that by constricting the navel-string very tight, the child dies like a man strangled: which appears to be owing to nothing but the want of air. Add to this, that as soon as the mother ceases to respire, the fetus expires.

As to the velocity of the circulating blood, and the time wherein a *Circulation* is completed; several computations have been made.—By Dr. Keil's account, the blood is driven out of the heart into the aorta, with a velocity which would carry it 52 feet in a minute. But this velocity is continually abated in the progress of the blood through the numerous sections, or branches of the arteries: so that before it arrive at the extremities of the body, its motion is infinitely diminished.

The same author, upon a moderate ratio of the branches of the arteries to the trunks, shews, that the greatest velocity of the blood is to the least, in a greater proportion than of 10000,00000,00000,00000,00000,00000,00000,00000, to 1.

The space of time wherein the whole mass of blood may ordinarily circulate, is variously determined.—Some of the latest writers state it thus: supposing the heart to make 2000 pulses in an hour, and that at every pulse there is expelled an ounce of blood; as the whole mass is not ordinarily computed to exceed 24 pounds, it must be circulated seven or eight times over in the space of an hour.

CIRCULATION of the spirits, or nervous juice. That the spirits circulate, is evinced in the same manner as some authors chuse to prove the *Circulation* of the blood, *viz.* That as the heart drives out every hour three or four thousand ounces of blood, whereas, ordinarily, there is not above two thousand in the whole body; there is a necessity for the blood driven out, to return to the heart, in order to supply a fund to be expelled.

In like manner it is shewn, that there is formed each hour a large quantity of spirits, which are nothing but the more subtil parts of this blood driven out from the heart; whence it is inferred, that these two must circulate.

The course they are supposed to take, is this.—The most subtil parts of the arterial blood being carried from the heart to the brain by the carotid arteries, are thrown violently into the fine net-work wherewith the bottom of the ventricles of the brain is lined; whence the more delicate parts are driven into the mouths of the choroid arteries, where they continue their rapid motion, and discharge themselves at the pores where those vessels terminate around the pineal gland.

Hence they enter that gland, and there form a constant spring of spirits; which being here purified, enter the cavities of the brain, and insinuating into the pores of its substance, flow into the lymphatics; whence they are carried to the heart by two ways. Those from the upper parts by the subclavian veins, and the adjacent vessels: those from the lower, being discharged into Pecquet's reservoir, proceed by the thoracic duct, and at last by the descending veins to the heart. Whence they begin their course afresh.

CIRCULATION of the Sap, is a natural motion of the nutritious juice of plants, from the root to the extreme parts, and thence back again to the root.

The experiments of modern naturalists, and gardeners, seem to prove a *Circulation* in the body of plants, by veins and arteries, analogous to that in animals.

M. Perrault started the *Circulation* of the sap in France, and proposed it, in 1667, to the royal academy: though M. Major, a physician of Hambourg, had published it unknown to M. Perrault, two years before. A year and half afterwards, M. Mariote proposed the same to the academy, as a new

a new thing; not knowing that M. Perrault had been beforehand with him: and the great Malpighi appears to have entertained the same thought about the same time.

The opinion, however, was not universally received: some of the ablest botanists, and particularly M. Dodart, protesting openly against it.

That author allows of a juice mounting from the root to the extremities of the branches; and of another descending from those extremities to the root: the first imbibed from the soil, and digested in the root, for the nourishment of the plant: the second received from the moist parts of the air, in at the extremities of the branches. The rising and descending juices, therefore, according to him, are not the same; or, that which rises, never descends, and reciprocally; i. e. there is no *Circulation*.

Dr. Tong, in the *Philosophical Transactions*, maintains, that the sap always rises, and never properly descends; having only a subsiding, or recidivation, which he can by no means call a *Circulation*.

M. Switzer owns himself at a loss for the method wherein a *Circulation* should be effected; as well as for the parity of reason commonly urged for a *Circulation* of the sap, and of the blood. In animals, he observes, the degree of growth, or extension, is but very small: so that the blood, not being employed in any other service, may be easily supposed to circulate: but trees, growing to an unlimited tallness, it is probable the great effort of nature is employed in extending them that way; and that the nutritious juice only ascends. He adds, that as to the swelling or extension of trees in bulk, it evidently arises from the effusion of the sap from the heart of the tree through the pores, which dilates the whole insensibly, by accumulating circle on circle; which are annual gradations easily observed upon cutting a branch, or trunk across.

But still, the arguments for a *Circulation* seem of more weight than any thing here urged against it.—The same experiments of ligation, and incision, which evince a *Circulation* in animals, have been made in plants; particularly in such as abound in sap, as the spurge, &c. and with the same success; the part between the ligation and the root swelling very considerably, and the other much less.

The ligatures are to be made with metalline rings. Dr. Lifter gives us an instance in the catapua minor, where the ligation being only a silken thread, tied as hard as possible without breaking the skin, no greater swelling arose on one side the ligation than on the other.

Mr. Lawrence gives us a demonstration of the *Circulation* of the sap, from an experiment on the yellow striped jessamine.—Upon a branch of a plain jessamine, whose stem spreads itself in two or three branches, inoculate a bud of the yellow striped jessamine, in autumn: as the tree comes to shoot, the following summer, some of the leaves will be found tinged here and there with yellow; and this even on the branches not inoculated; till, by degrees, the whole tree, even the very wood of the young branches, will be all variegated, or striped with green and yellow.

Mr. Fairchild confirms this experiment by a similar one of his own: Having inoculated a yellow spotted jessamine tree, into another jessamine tree; he found, that though the bough did not take, yet, in a fortnight's time, yellow spots began to appear on a shoot which came out of the ground from another part of the plant.

As to the manner of the *Circulation*; it is not difficult to conceive. Malpighi, Grew, &c. by means of microscopes, have discovered, that the wood of plants consists of fine capillary tubes, which run parallel from the root, through the trunk, and may be looked on as arteries; and on the outside of these, betwixt the wood and the inner bark, are other large tubes, to do the office of veins.

Now, the root having imbibed a stock of juice from the earth, that juice will be put in motion by the heat; that is, it will be rarefied, and made to ascend in form of a steam or vapour. Meeting, therefore, with the open mouths of the arterial vessels, it will pass through the same to the top and extreme parts of the tree, with a force answerable to the heat by which it is put in motion: when it is there arrived, meeting with the cold of the external air, it is condensed into a liquor; and in that form returns, by its own weight, towards the root of the venal vessels above-mentioned.

CIRCULATION, in chymistry, is an operation whereby the same vapour, raised by fire, falls back; to be returned and distilled several times, and thus reduced into its most subtil parts.

Circulation is performed by disposing the liquor in a single vessel, stopped at top, called a *pelican*; or in a double vessel, consisting of two pieces, luted on each other; the lower to contain the liquor and its vapours.

It is performed either by the heat of a lamp, or that of ashes, or of sand moderately hot, or in dung, or by the sun. It usually demands a continued heat of several days, sometimes of several weeks, or even several months.—By *Circulation*, the finest part of the fluid mounts to the top of the vessel; and finding no issue there, falls back again, and rejoins the matter left behind at the bottom, whence it arose: and thus, by continu-

ing to rise, and fall alternately in the vessel, there is effected a kind of *Circulation*, or remixture of the spirituous parts with the gross ones; whereby the former are rendered finer, and more subtil, and are better disposed to exert their activity when separated from the latter.

CIRCULATORY, **CIRCULATORIUM**, in chymistry, the vessel wherein a fluid is put, to undergo the process of *Circulation*. See **CIRCULATION**.

There are two kinds of *Circulatories*, the *diata*, or double vessel; and the *pelican*. See **DOUBLE VESSEL**, and **PELICAN**.

CIRCULUS, in geometry, logick, &c. See **CIRCLE**.

CIRCULUS, among chymists, is a round iron instrument, used in cutting off the necks of glass vessels: which they effect thus.

The instrument being heated, is applied to the glass vessel, and there kept till the latter grow hot: then, by a few drops of cold water, or a cold blast thereof, it flies evenly and regularly off.—Thus they cut off the necks of retorts, or cucurbits.

There is another method of doing the same, viz. by tying a thread, first dipped in oil of turpentine, round the place where the section is to be; and then setting fire to the thread.

This done, some cold water being sprinkled on the place, the glass will be cracked through precisely where the thread was tied.

CIRCUMAGENTES *Mysali*, in anatomy. See **OBLIQU**.

CIRCUMAMBIENT, an epithet denoting a thing to invest, or encompass another around.

We say the ambient, or *circumambient* air, &c.

CIRCUMCISION, the act of cutting off the prepuce; or, a ceremony in the Jewish and Mahometan religions, wherein they cut away the fore-skin of the males who are to profess the one, or the other law.

Circumcision commenced in the time of Abraham; and was, as it were, the seal of a covenant stipulated between God and him: It was in the year of the world 2178, that Abraham, by divine appointment, circumcised himself, and all the males of his family; from which time it became an hereditary practice among his descendants.

The ceremony, however, was not confined to the Jews: Herodotus and Philo Judeus observe, that it obtained also among the Egyptians and Ethiopians. Herodotus says, that the custom was very ancient among each people; so that there was no determining which of them borrowed it from the other. The same historian relates, that the inhabitants of Colchis also used *Circumcision*; whence he concludes, that they were originally Egyptians. He adds, that the Phœnicians and Syrians were likewise circumcised; but that they borrowed the practice from the Egyptians. And lastly, that a little before the time when he wrote, *Circumcision* had passed from Colchis, to the people inhabiting near Thermodou and Parthenius.

Marham is of opinion, that the Hebrews borrowed *Circumcision* from the Egyptians; and that God was not the first author thereof: citing Diodorus Siculus, and Herodotus, as evidences on his side. This latter proposition seems directly contrary to the testimony of Moses, who assures, Gen. xvii. that Abraham, though 99 years of age, was not circumcised till he had the express command of God for it. But as to the former position of Marham, it will admit of more debate. The arguments on both sides may be seen in one view in Spencer de Legibus Hebræor. l. 2. c. 4.

Be this as it will, it is certain, the practice of *Circumcision* among the Hebrews, differed very considerably from that of the Egyptians.—Among the first, it was a ceremony of religion, and was performed on the eighth day after the birth of the child. Among the latter, it was a point of mere decency and cleanliness; and, as some will have it, of physical necessity: and was not performed till the thirteenth year; and then on girls as well as boys.

Among the Jews, *Circumcision* was performed with a knife of stone.—They set aside the practice of *Circumcision*, during the forty years of their passage through the wilderness; in regard, *Circumcision* being intended as a mark of distinction between the Jews and the Gentiles, it was unnecessary to make any mark at all, in a place wherein there was nobody to mix with them. M. Fleury observes, that the Jews were not unanimous as to the necessity of *Circumcision*; some holding it an essential, others only as a circumstance.

The Turks, before the operation of *Circumcision*, squeeze the skin with little pinchers, to deaden the sensation: they then cut it off with a razor, and apply a certain powder, which heals the wound, and takes off the pain. They never circumcise till the seventh or eighth year; as having no notion of its being necessary to salvation.

The Persians circumcise their boys at thirteen years; and their girls from nine to fifteen.—Those of Madagascar cut off the flesh at three several times: and the most zealous of the relations present, catches hold of the preputium and swallows it. Herrera tells us, there is a kind of *Circumcision* among the Mexicans, though they are very far both from Judaism and Mahometanism: they cut off the foreskin of the virile member and the ears, as soon as the child is born, with a world of ceremony.

Circumcision is also practised on women, by cutting off the foreskin of the clitoris, which bears a near resemblance, and analogy to the preputium of the male penis. Strabo says, the Egyptian women were circumcised; Belon says the same of the Coptæ; and P. Jovius and Munster of the subjects of Prester John.

Among the Jews, the father is obliged to have his son circumcised on the eighth day; it may not be sooner: but the child's weakness may allow of its being deferred longer. There is a godfather to hold the child, and a godmother to carry it from the house to the synagogue, and to present it there. He who circumcises is called in Hebrew, *Mohel*: Any person is chosen for the purpose, indifferently; provided he be but capable of the function; which, among the Jews, is a title of great merit.

The manner of the ceremony, as related by Leo de Modena, is as follows.—Two seats are prepared, in the morning, with silken cushions; the one for the godfather who holds the child, the other, as they say, for the prophet Elias, whom they suppose to assist invisibly. The person who is to circumcise, brings the necessary utensils, the razor, styptic, linen, fillet, and oil of roses; to which some add a shell full of sand to put the preputium in. A palm is sung till the godmother brings the child, attended with a crowd of women, and delivers it to the godfather; none of them entering the door. The godfather being seated, sets the child on his lap: then the circumciser taking the razor, and preparing the child for the operation, says, *Blessed be thou, O Lord, who hast enjoined us Circumcision*; and in so saying, cuts off the thick skin of the preputium, and with his finger nails tears off another finer skin remaining; sucking the blood two or three times as it breaks out, and spitting it out into a glass full of wine: then he lays dragons-blood on the wound, with powder of coral, and other things to staunch the blood; and lastly, a compress of oil of roses; and thus binds up the whole. This done, he takes a glass of wine, and blessing it, adds another benediction for the child, and imposes the name.

The manner of circumcising among the Turks, differs from that of the Jews: for the former, after they have cut off the skin, meddle no further; but the last, tear off the edge of the remaining skin in several places with their thumb-nails; which is the reason why the circumcised Jews are cured much sooner than the Turks.

Those among the Jews who perform the operation of *Circumcisions*, are distinguished by the length of their thumb-nails.

CIRCUMCISION is also the name of a feast celebrated on the first of January, in commemoration of the *Circumcision* of our Saviour.

This day was antiently kept a fast; in opposition to the Pagan superstitions, who feasted on it in honour of the god Janus.

CIRCUMFERENCE *, in geometry, the curve line that incloses a circle, or circular space; called also the *Periphery*. See **CIRCLE**, and **PERIPHERY**.

* The word is formed from the Latin *Circum*, about; and *fero*, I carry.

All lines drawn from the center of a circle to the *Circumference*, called *radii*, are equal.

Any part of the *Circumference* is called an *arch*; and a right line drawn from one extreme of the arch to the other, a *chord*. The *Circumference* of every circle is supposed to be divided into 360 equal parts, which are called *degrees*.

The angle at the *Circumference* is double that at the center. Every circle is equal to a triangle, whose base is equal to the *Circumference*, and its height to the radius.

Hence, the *Circumferences* of circles are to each other as their radii.

Hence, again, since the *Circumference* of one circle is to its radius, as that of any other circle to its radius; the ratio of the *Circumference* to the radius is the same in all circles.

The ratio of the diameter of a circle to its *Circumference*, Archimedes makes as seven to twenty-two; others, who bring it nearer the truth, as 100000000000000 to 31415926535897932. For use, the proportion of 100 to 314 in smaller circles; and of 10000 to 31415 in larger circles, is commended by Vieta, Huygens, &c. Though the justest proportion for small numbers, is that of Metius, who makes it as 113 to 355.

The diameter of a circle therefore being given, its *Circumference* is had; and that multiplied by one fourth part of the diameter, gives the area of the circle.

CIRCUMFERENTOR, an instrument used in surveying, to take angles by.

The *Circumferentor* is very simple, yet expeditious in the practice: It consists of a brass circle and an index, all of a piece.—See its figure in *Tab. Surveying*, fig. 19.

On the circle is a card, or compass, divided into 360 degrees; the meridian line whereof answers to the middle of the breadth of the index. On the limb, or circumference of the circle, is soldered a brass ring; which, with another fitted with a glass, make a kind of box for the needle, which is suspended on a pivot in the center of the circle. To each extreme of the index is fitted a sight.

The whole is mounted on a staff; with a ball and socket for the conveniency of its motion.

To take an angle by the **CIRCUMFERENTOR**. Suppose the angle required E K G, (*Tab. Surveying*, fig. 20.) place the instrument, *v. g.* at K, with the Flower-de-luce in the card towards you. Then direct the sights, till through them you spy E; and observe what degree is pointed at by the fourth end of the needle, which suppose 296: then turn the instrument about, the Flower-de-luce still towards you, and direct the sights to G; noting the degree at which the fourth end of the needle points, which suppose 182.

This done, subtracting the lesser number 182, from the greater 296, the remainder 114, is the number of degrees of the angle E K G.

If the remainder chance to be more than 180 degrees, it must be again subtracted from 360 degrees; the last remainder is the quantity of the angle sought.

To take the *plot of a field, wood, park, &c.* by the **CIRCUMFERENTOR**.—Suppose ABCDEFGK, (fig. 21.) an inclosure to be surveyed with the *Circumferentor*.

1. Placing the instrument at A, the Flower-de-luce towards you, direct the sights to B; where, suppose the fourth-end of the needle to cut 191°; and the ditch, wall, or hedge, measured with the chain, to contain 10 chains, 75 links; which enter down. See **CHAIN**.

2. Placing the instrument at B, direct the sights as before to C; the fourth-end of the needle, *v. g.* will cut 279°; and the line BC will contain 6 chains, 83 links, to be noted as before. Then move the instrument to C; turn the sights to D, and measure CD as before.

In the same manner, proceed to D, E, F, G, H, and lastly to K; still noting down the degrees of every bearing, or angle, and the distances of every side.

Having thus gone round the field, you will have a table in the following form.

Stations.	Degrees.	Min.	Chains.	Links.
A	191.	00	10.	75
B	279.	00	6.	83
C	210.	30	7.	82

By this table, the field is to be plotted, or protracted; for the manner whereof, see **PLOTTING**, and **PROTRACTOR**.

Note, where security is to be consulted rather than dispatch, it may be convenient to take back-sights; *i. e.* to place the instrument so, at each station, as that looking backwards through the sights to the last station, the north-end of the needle may point to the same degree as the fourth-end did, in looking forwards from the last station to this: both which instruments are used, on occasion, as *Circumferentors*.

CIRCUMFLEX, in grammar, an accent, serving to note, or distinguish a syllable of an intermediate sound between acute and grave; and generally some what long.

The Greeks had three accents, the *acute*, the *grave*, and the *Circumflex*, formed thus, *´*, *`*, *ˆ*. In Latin, English, French, &c. the *Circumflex* is made thus *ˆ*.

The acute raises the voice, and the grave falls, or lowers it: the *Circumflex* is a kind of undulation, or wavering of the voice, between the two.

It is seldom used among the moderns, unless to shew the omission of a letter which made the syllable long and open; a thing much more frequent in the French than among us: thus they write *pâte*, for *paste*; *tête*, for *teste*; *fômes*, for *fismes*; &c. They also use the *Circumflex* in the participles; some of their authors writing *conues*, *peus*, others *comis*, *pâ*, &c. Father Buffier is at a loss for the reason of the *Circumflex* on this occasion.

The form of the Greek *Circumflex* was antiently the same with that of ours, *viz.* being a composition of the other two accents, *´* in one.—But the copyists changing the form of the characters, and introducing the running-hand, changed also the form of the *Circumflex* accent; and instead of making a just angle, rounded it off, adding a dash through too much haste; and thus formed an *s*, laid horizontally, which produced this figure *ˆ*, instead of this *ˆ*.

CIRCUMINCESSION, in theology, a term whereby the schoolmen use to express the existence of three divine persons in one another, in the mystery of the trinity. See **PERSON**.

The school divines are not the first authors of this term; Damascenus, in the eighth century, having used the word *πρεσβυτηριον*, which signifies the same thing, in his explication of that text, *I am in my father, and my father is in me*.

CIRCUMLOCUTION *, an ambages, or tour of words, used either when a proper term is not at hand, to express a thing naturally and immediately by; or when one chooses not to do it, out of respect; or for some other reason.

* The word comes from the Latin *circumloquor*, I speak about.

CIRCUMLOCUTION, in oratory, is the avoiding of something disagreeable, or inconvenient to be expressed in direct terms; by intimating the sense thereof in a kind of paraphrase, so conceived as to soften, or break the force thereof.

Thus Cicero, unable to deny that Clodius was slain by Milo, owns it, with this *Circumlocution*, *Milo's servants being prevented from assisting their master, who was reported to be killed by Clodius; they, in his absence, and without his privity, or consent,*

content, did what every body would expect from their own fervants on such an occasion.

CIRCUM-POLAR Stars, are such stars as being pretty near our north-pole, move round it; and in our latitude, never set, or go below the horizon.

CIRCUMSCRIBING, in geometry, denotes the describing a polygonous figure about a circle, in such manner, as that all its sides are tangents to the circumference.

The term is sometimes also used for the describing of a circle about a polygon; so, as that each side is a chord. But in this case, we more usually say, the polygon is inscribed, than the circle circumscribed.

Any regular figure ABCDE, (Tab. Geometry, fig. 29.) inscribed in a circle, is resolved into equal and similar triangles, by radii drawn from the center of the circumscribing circle F, to the several angles of the figure; and its area is equal to a rect-angled triangle, whose base is equal to the circumference of the whole polygon; and its height a perpendicular let fall from the center F to one side AB.

The same may be said of the area of the circumscribing circle abcde, (fig. 28.) excepting that the height is to be the radius. The area of every polygon that can be inscribed in a circle is less; and that of every polygon that can be circumscribed, greater than that of the circle: in like manner, the perimeter of the first is less, and that of the second is greater than the circumference of the circle.

On this principle Archimedes attempted the quadrature of the circle; which is nothing else, in effect, but the measuring of the area, or capacity of a circle.

The side of a hexagon is equal to the radius of a circumscribed circle.

To circumscribe a circle about any given regular polygon, ABC; (fig. 28.) and vice versa. Bisect two of the angles, v. g. A and B; and on the point F, where the two lines of bisection intersect, as on a center, describe a circle with the radius FA.

To circumscribe a Square about a Circle. Draw two diameters, AB and DE, (fig. 31.) intersecting each other in the center C, at right angles. From AEBD, with the interval of the radius, make intersections in F, G, H, I. Draw the right lines FG, GH, IH, and IF. Then is FGH I a square circumscribed about the circle.

To circumscribe any regular polygon, v. g. a pentagon, about a circle. Bisect the chord AE, (fig. 28.) by the perpendicular FG, which continue till it cut the arch in g. Through A and E, draw the radii AF and EF; and through g, draw a line parallel to AE, meeting the radii continued on each side in a and e: then is a e one side of the circumscribed polygon. Produce the radius FB to b, till Fb = Fa; and draw ab: this is another side of the polygon; and in the same manner may the rest of the sides be drawn.

To inscribe any regular polygon in a circle. Divide 360 by the number of sides, in order to find the quantity of the angle EFD; which make at the center, and apply the chord to the periphery as often as it will go. Thus will the desired figure be inscribed in the circle.

CIRCUMSTANCES, the incidents of an event, or the particularities that accompany an action.

Divines say, the conversion of a sinner depends on a certain assemblage, and a certain management of external Circumstances in the midst whereof he is placed; which arrangement of Circumstances, depends on the providence of God: whence conversion also depends on him.

The Circumstances of the actions of men, are expressed in this Latin verse.

Quis, quid, ubi, quibus auxiliis, cur, quomodo, quando.

Quis, who, denotes the quality, state, age, &c. of the person. Quid, what, the greatness, smallness, multitude, fewness, &c. of the thing. Ubi, where, the place. Quibus auxiliis, with what assistances, the instruments, means, &c. Cur, why, on what account, with what view. Quomodo, how, the quality of the action, as to intention or remissness, designedness, or casualty, secrecy, or openness. Quando, when, the time; as on a holiday, at the hour of prayer, &c.

CIRCUMSTANTIBUS, in law, is used for the supplying, and making up the number of jurors, (in case any impanelled appear not; or appearing, be challenged by either party) by adding to them so many of the persons present, or standing by, as will serve the turn.

CIRCUMVALLATION*, in fortification, a line or trench, with a parapet, thrown up by the besiegers, encompassing all their camp to defend it against any army that may attempt to relieve the place.

* The word is formed from the Latin circum, about, and vallum, wall, or mound.

This line is to be cannon-shot distant from the place, ordinarily, about 12 foot broad, and seven deep. It is bordered with a breast-work, and flanked with redoubts, or little forts, erected from space to space. It serves both to prevent any success from being sent into the place, to keep in deserters, and to prevent incursions of the enemy's garison.

Care must be taken that the line of Circumvallation never pass

by the foot of an eminence; left the enemy seizing on the eminence, lodge his cannon, and command the line.

CIRCUMVOLUTIONS*, in architecture, the turns of the spiral line of the Ionic volute.

* The word comes from the Latin circumvolvere, to turn around; and is also applied to the turns of a wreathed, or twisted column. See COLUMN.

CIRCUS*, in antiquity, a large building, either round, or oval; used for the exhibiting of shows to the people.

* Some derive the word from Circe, to whom Tertullian attributes the invention. Cassiodorus says, Circus comes à circuitu—The Romans, Servius observes, at first, had no other Circus, but that made by the Tiber, on one side, and a passade of naked swords on the other. Hence, according to Isidore, came the term ludi circenses, quasi circum-enses. But Scaliger laughs at that etymology.

The Roman Circus, was a large oblong edifice, arched at one end; encompassed with porticos, and furnished with rows of seats, placed ascending over each other.

In the middle was a kind of foot-bank, or eminence, with obelisks, statues, and posts at each end. This served them for the courses of their bigae and quadrigae.

There were no less than ten Circus's at Rome: the largest was that built by the elder Tarquin, called Circus Maximus; between the Aventine and Palatine mounts. Pliny says, it was enlarged by J. Cæsar, so as to take in no less than three stadia in length, and one in width.

The most magnificent Circus's were those of Augustus and Nero. There are still some remains of the Circus's, both at Rome, at Nismes, and other places.

The Romans were exceedingly fond of the games exhibited in the Circus, witness that verse in Juvenal,

Atque duas tantum res anxius optat,

Panem & Circenses—

The Games of the CIRCUS, which some call CIRCENSIAN Games, were combats celebrated in the Circus, in honour of Consius the god of councils; and thence also called Consualia.

They were also called Roman Games, Ludi Romani, either on account of their antiquity, as being coeval with the Roman people, or because established by the Romans: and the games held here, the great games, ludi magni, because celebrated with more expense and magnificence than any others; and because held in honour of the great god Neptune, who was their Consius.

Those who say they were instituted in honour of the sun, confound the pompa circensis, or procession of the Circus, with the games.

The games of the Circus were instituted by Evander, and established by Romulus: the pomp, or procession, was only a part of the games, making the prelude thereof; and consisting of a simple cavalcade of chariots.

Till the time of the elder Tarquin, they were held in an island of the Tiber; and were called Roman Games: after that prince had built the Circus, they took their name therefrom; as being constantly held there.

There were six kinds of exercises in the Circus: the first was wrestling, and fighting with swords, with staves, and with pikes: the second was racing: the third saltatio, dancing; the fourth disci, quoits, arrows, and cestus; all which were on foot: the fifth was horsecourring: the sixth courses of chariots, whether with two horses, or with four.

In this last exercise, the combatants were at first divided into two squadrons or quadrils; then into four; each bearing the names of the colours they wore; scilicet alba, ruffa, &c.

At first there was only white and red; then green was added, and blue. Domitian added two more colours, but they did not hold.

It was Oenomaus who first invented this method of distinguishing the quadrils by colours. The green was for those who represented the earth; the blue for the sea, &c.

CIRRI, in botany, a term used for those fine fringes, or hairs, by which some plants fasten themselves to walls, &c. for their support; as ivy, and the like.

CIRSOCELE*, in medicine, a multitude of varices in the testicles, which prodigiously increase their bulk, and hinder the due preparation of the seed: so as sometimes even to render castration necessary. This disorder is otherwise called hernia varicosa.

* The word comes from the Greek κίρσος, varix, vein, and κηλη, hernia, See VARIX.

CISALPINE*, any thing on this side the Alps.

* The word is formed from the preposition cis, on this side, and Alpes; which, though properly confined to the mountains separating Italy and France, yet is used by authors for any very high mountains.—Thus, Aufonius speaks of the Alps of the Pyreneans, the Alps of the Apennines, &c.

The Romans divided Gaul, and the country now called Lombardy, into Cisalpine and Transalpine.

That which was Cisalpine with regard to the Romans, is Transalpine with regard to us.

CISSOID, in geometry, an algebraic curve, first invented by Diocles; whence it is peculiarly called the Cisoid of Diocles. See CURVE.

CIT

The geneſis of the *Ciſſoid* may be thus conceived : To the diameter A B, (Tab. *Analysis*, fig. 9.) of the femicircle A O B, draw an indefinite line, at right angles, B C : then, draw the right line A H, and make A M = I H ; or in the other quadrangle, L C = A N. Thus will the points M and L be in a curve line, A M O L ; which is the *Ciſſoid* of Diocles.

Properties of the Cissoïd.—From the geneſis it follows, 1. That drawing the right lines P M and K I, perpendicular to A B ; we ſhall have A P : K B :: A M : I H. But A M = I H ; confequently, A P = A B. And therefore, A K = P B ; and P N = I K.

2. After the ſame manner, it appears, that the *Ciſſoid* A M O biſects the femicircle A O B.

3. Again, A K : K I :: K I : K B. That is, A K : P N :: P N : A P. And again, A K : P N :: A P : P M ; therefore, P N : A P :: A P : P M. Conſequentially, A K, P N, A P, and P M, are four lines in continual proportion. And if P N = v, A P = x, P M = y, x = v y. And after the ſame manner it may be ſhewn, that A P, P N, A K, and K I, are in continual proportion.

4. In the *Ciſſoid*, the cube of the abſciſſe A P, is equal to a ſolid ariſing from the ſquare of the ſemiordinate P M, multiplied into the complement of the diameter of the generating circle P B.

Hence, when the point P falls on B, then x = a, and B C = y ; confequently, y = a ³ / x. Wherefore, o : I :: a : y ².

that is, the value of y becomes infinite : and therefore the *Ciſſoid* A M O L, though it continually approach B C, yet they will never meet.

5. B C, therefore, is an asymptote of the *Ciſſoid*. The ancients made uſe both of the conchoid and *Ciſſoid*, for the finding of two mean continual proportionals between two given right lines.

For the quadrature, ſubnormal, and ſubtangent of the *Cissoïd* : ſee QUADRATURE, SUBTANGENT, &c.

Cissoïd Angle. See the article ANGLE.

CISTERCIANS, an order of religious, reformed from the Benedictines, conſiſting of an hundred monaſteries, and near as many nunneries.

The order took its riſe in 1075, from twenty-one zealous monks in the monaſtery of Moleſme in Burgundy ; who, with their abbot Robert, complaining that the rule of S. Benedict was not ſtrictly enough obſerved ; obtained permiſſion of Hugh archbiſhop of Lyons, and legate of the holy ſee, to settle in a place called *Ciſteaux*, five miles from Dijon.

Here, Eudes duke of Burgundy erected them a houſe, into which they were admitted in 1098 ; endowing it with a conſiderable revenue. The biſhop of Chalons gave Robert the paſtoral ſtaff, in quality of abbot ; and erected the new monaſtery into an abbey.

Such was the beginning of the *Ciſteſians*, ſo famous in after-times, and now fo extended throughout all Europe.

CISTERNS*, is properly uſed for a ſubterraneous reſervoir of rain-water.

* The word, according to ſome, comes from *cis*, and *terram*, i. e. *inter terram* ; others derive it from *cista*, a duct, &c.

Earthen *Ciſterns* muſt be made with good cement, to retain the water. And the bottom ſhould be covered with ſand, to ſweeten and preſerve it.

Authors mention a *Ciſtern* at Conſtantinople, the vaults whereof are ſupported by two rows of pillars, 212 in each row ; each pillar being two foot in diameter. They are planted circularly, and in radii tending to that in the center.

CISTIC } See } CYSTIC.
 CIST-*Hepatic*. } See } Cyst-*Hepatic*.
 CISTIS. See the articles CYSTIS, and HYPOCISTIS.
 CISTRUM. See the article SISTRUM.
 CISTULA *Cataptric*. See the article CATOPTRICT.

CITADEL*, or CITADEL, a fort, or place fortified with four, five, or ſix baſtions ; built ſometimes in the moſt eminent part of a city, and ſometimes only near the city.

* The word is a diminutive of the Italian *citta*, city, *g. d.* little city.

In the firſt caſe, the *Citadel* ſerves to defend the city againſt enemies.

In the latter, it ſerves to command it, and to keep the inhabitants in their obedience : for which purpoſe the city is left unfortified on the part toward the *Citadel*, but the *Citadel* is fortified toward the city.

The moſt uſual form for *Citadels*, is that of a pentagon : a ſquare being too weak, and a hexagon too large.

There is always a large eſplanade between the city and *Citadel*. See EſPLANADE.

CITATION*, in the eccleſiaſtical courts, a ſummons to appear before an eccleſiaſtical judge, on ſome affair relating to the church.

* The word comes from *cito*, of *cito*, I ſtir up.

CIT

In the civil and ordinary courts, it is called *ſummoning*. CITATION is alſo uſed in ſpeaking of military and monaſtick, as well as eccleſiaſtical courts. Such a heretick was *cited* to Rome ; to a general council, &c.

Knights are *cited* to the general chapters of their order. King Edward I. of England, was *cited*, by order of Philip IV. of France, to a court of his peers : The *Citation* was publiſhed by the Seigneur d'Arbray, Seneſchal of Perigord and Querci ; and was pat'd up, by his order, on the gates of the city Li-bourne, which then belonged to king Henry. And for default in not appearing, all his domains, and effects in France were confiscated. F. Daniel.

CITATION is alſo an allegation, or quotation of ſome law, authority, or paſſage.

CITHARA, an antient muſical inſtrument, by ſome ſuppoſed the ſame with the lyra ; or at leaſt, a particular ſpecies of the lyra ; by others different : though its precise ſtructure does not appear to be known.

The antients deſcribe it as triangular, in form of a Greek Delta, Δ : the poets aſcribe the invention of it to Apollo.

CITIZEN*, or CITTIZEN, a native or inhabitant of a city, veſted with the freedom and rights thereof.

* The word comes from the Latin *civis* ; which authors derive from *citer*, by reaſon the *Citizens* live together ; or rather from *citer*, I call together.

Augustus, upon numbering the Roman *Citizens*, found they amounted to upwards of four millions.

To make a good Roman *Citizen*, there were three things required : that he were an inhabitant of Rome ; that he were enrolled in one of the 35 tribes ; and that he were capable of dignities.—Thoſe ſtrangers to whom were granted the rights and privileges of Roman *Citizens*, were properly only *honorary Citizens*.

The ſeventh law, *de inclini*, makes a great deal of difference between a *Citizen* and a mere inhabitant. Birth, alone, made a *Citizen* ; and entitl'd to all the privileges of Burgeſy : time could not acquire it ; but the emperor could beſtow it.

CITRON, an agreeable fruit, in colour, taſte, ſmell, &c. reſembling a lemon ; and ſerving, like that, to cool, and quench thirſt : being produced by a tree of the ſame name, much reſembling the lemon-tree.

The *Citron* is diſtinguiſhed from the lemon, in that it is bigger, and its pulp firmer ; its ſmell brisker, and colour higher. It is held excellent againſt poiſons ; and Athenæus relates an inſtance of two perſons ſaid to be preſerved ſafe from the moſt dangerous aſpics, by only eating a *Citron*.

The diſtillers, perfumers, confectioners, &c. procure divers things from *Citrons* ; as eſſences, oils, confections, waters, &c.

CITRON-WATER. See the article CITRON-WATER.

CITRON-SANTAL. See the article SANTAL.

CITY, or CITY, *Urbs*, a large town incloſed with a wall. It is hard to give any juſt definition of a *City* ; in regard, cuſtom has reſerv'd the appellation of towns, to many places which ſeem to have every thing requiſite to conſtitute *Cities*.

Formerly, *City* was only underſtood of ſuch towns as were biſhops ſees : which diſtinction ſeems ſtill to hold in England ; though no where elſe. See BISHOP, and DIOCESE. The term *City* had its riſe among us, ſince the conqueſt ; for in the time of the Saxons there were no *Cities*, but all great towns were called *Burghs*.—Thus, London was called *Lunden Burgh*. See BURGH.

And for a long time after the conqueſt, *City* and *Burgh* were uſed promiſcuouſly.—Thus, in the charter of Leicester, that place is called both *civitas* and *burgus* ; which ſhews a miſtake in my lord Coke, where he tells us, that every *City* was, or is a biſhop's ſee. Nor had Glouceſter any biſhop then ; though it is called a *City* in Dome's-day. The like may be obſerved of Cambridge ; to which it may be added, that Crompton, reckoning up our *Cities*, leaves out Ely, though it had a biſhop and a cathedral.

Yet Chaffaneus de *Conſuetud. Burgund.* ſays, France has within its territories 104 *Cities* ; and gives his reaſon, becauſe it has ſo many archbiſhops, and biſhops.

City is particularly uſed to expreſs the heart of the place. At Paris they have the *City*, and the *Univerſity* ; at London we have the *City* and the *Suburbs*.

- | | | |
|----------------------|---------------------|-----------|
| Advocate of a CITY. | } See the article } | ADVOCATE. |
| Capital CITY. | | CAPITAL. |
| College of CITIES. | | COLLEGE. |
| Foreſt CITIES. | | FOREST. |
| Freedom of a CITY. | | FREEDOM. |
| Honours of the CITY. | | HONOURS. |
| Imperial CITIES. | | IMPERIAL. |
| Municipal CITIES. | MUNICIPAL. | |
| Provost of the CITY. | PROVOST. | |

CITY, CIVITAS, in ſpeaking of antiquity, ſignifies a ſtate, or people, with all its dependencies, conſtituting a particular republick.—Such as are, ſtill, ſeveral *Cities* of the empire, and the Swiſs cantons.

Though

Though the ancient Gauls were, in effect, only one nation; they were yet divided into several peoples, which formed as many different states: or, to speak with Cæsar, as many different *Civitates, Cities*. Besides that each *City* had its particular assemblies, it sent deputies, too, from time to time, to the general assemblies held on affairs relating to their common interest.

CIVET*, a kind of perfume, bearing the name of the animal whence it is taken.

* The word comes from the Arabic *Zibet*, or *Zebed*, scum, froth.

The *Civet*, or *Civet-cat**, is a little animal, not unlike our cat; excepting that its snout is more pointed, its claws less sharp, and its cry different.

* Some naturalists will have it the same with the hyena of Aristotle, and call it *hyena odorifera*. Others suppose it the panther of the ancients, while the generality take it for a kind of wild cat, and call it *felis zibetica* on account of the perfume it yields, which the Arabs call *zibet*. It is a native of Africa, the Indies, Peru, Brazil, Guinea, &c.

The perfume this animal produces, is formed like a kind of grease, or thick cum, in a receptacle, or bag, under its tail, between the anus and pudendum of the creature*.

* An ample description of the *Civet bag*, its glands, the reservoirs of the perfume, &c. is given by M. Morand in Mem. Acad. R. Scienc. An. 1728. p. 568. § 99.

It is gathered from time to time; and still abounds, in proportion as the animal is fed.

There is a very considerable traffic of *Civet*, from Bassora, Calicut, and other places, where the animal that produces it is bred. Though great part of the *Civet* among us is furnished us by the Dutch; who bring up a considerable number of the animals. Before any of these animals were seen in Europe, or it had been observed how the perfume had been gathered, the common opinion, founded on the relations of travellers, was, that it was the sweat of that animal, when irritated and provoked into rage. To this effect, it was said, that the animal was inclosed in an iron cage; and after having been a long time beaten with rods, they gathered with a spoon, through the bars of the cage, and between the thighs of the animal, the sweat or foam, which the rage and agitation had produced: and that without this precaution, the animal would yield no perfume at all.

But experience has taught us better; and we now know, that the perfume *Civet*, is only a thick unctuous humour, secreted by certain glands between the two tunics of the bag wherein it is amassed, under the creature's tail, beneath the anus.

Civet must be chosen new, of a good consistence, a palish colour, and a strong smell.

Besides the Indian and Dutch *Civet*, there is also a *Civet* from Brazil, or Guinea, like that of India; and an *occidental Civet*, which bears no resemblance to it: this being only a term used to express the human excrements.

Civet is little used in medicine, except in a thickness of hearings, from cold; where a grain or two being put in a little cotton, or wool, and the ears stopped therewith, is sometimes of service. It is much used among perfumers and confectioners. See Supplement, article ZIBETHICUM Animal.

CIVIC, CIVICUS, an epithet applied to a kind of crown, made of oak leaves; antiently bestowed by the Romans, on those who saved the life of a fellow-citizen in a battle, or an assault. The *Civic* crown was exceedingly esteemed; and was even given as an honour, to Augustus; who on this occasion struck coins with this device, *OB CIVIS SERVATOS*.—It was also granted to Cicero; after his discovery of Catiline's conspiracy.

CIVIL, CIVILIS, in its general sense, denotes something that regards the policy, public good, or peace of the citizens, or subjects of a state.

In this sense, we say, *Civil government; Civil law; Civil rights; Civil war*, &c.

CIVIL, in a legal sense, is also applied to the ordinary procedure in an action relating to some pecuniary matter, or interest.—In which sense it is opposed to criminal.

CIVIL Action. See the article ACTION.

CIVIL Architecture. See the article ARCHITECTURE.

CIVIL Day. See the article DAY.

CIVIL Death, any thing that retrenches, or cuts off a man from *Civil* society; as, a condemnation to the galleys, perpetual banishment, condemnation to death, outlawry, and excommunication; all which make a man cease to be looked on as a citizen.

The term is likewise applied to those who are no longer capable of acting in temporal concerns: as, those who renounce the world, who retire and make vows in a monastery, &c.

CIVIL Fruits. See the article FRUITS.

CIVIL History. See the article HISTORY.

CIVIL Law, Lex CIVILIS, is defined, in the institutes, to be the laws peculiar to each city, or each people.—But in the modern use, it properly implies the Roman law, contained in the institutes, the digest, and the code; otherwise called, *lex scripta*, or the *written law*.

The Roman law, at its commencement, was very inconsiderable. Under the kings, the people were governed by certain laws, prepared by the senate, passed by the kings, and confirmed in an assembly of the people.

Papirius was the first who made a collection of the regal laws; which took its name from its author, and was called *jus papirianum*.

The Republic, after abolishing the regal government, still retained the royal laws: to these they added the law of the twelve tables, drawn by the Decemviri, from the laws of twelve of the principal cities of Greece; and the more equitable among the laws hitherto practised at Rome.

The law of the twelve tables was at length found so severe, and conceived in such obscure terms; that it was judged proper to moderate, refrain, and ascertain it, by other laws, proposed to the senate by the consuls, and passed at general assemblies of the people; according to the practice that had obtained under the kings themselves.

In the year of Rome 731, the Republic expired; and the whole power of the people was transferred to Augustus, who was contented to publish his new laws in the assembly of the people; to keep up some image of the Republic by this formality. Tiberius abolished these occasional assemblies, on pretence of their being too numerous; and in lieu thereof offered his laws to the senate, who never failed to confirm them: inasmuch that the laws of Tiberius, and his successors, who kept the same measures with the senate, were esteemed *senatus consulta*. Thus arose two kinds of Roman law, with regard to the changes in the legislative authority: the laws established by the people, *Plébiscita*; and the laws of the emperors, or *imperial laws*.

During the time of the republic, and even under the emperors, there were juris-consulti; who making publick profession of the study of the law, interpreted, were consulted on the different senses of the laws, and gave answers to the questions proposed to them hereon; which were called *responsa prudentum*.

Papirius was the first of these juris-consulti, after the expulsion of the kings; and Modestinus was the last. See JURIS-CONSULTUS.

After him, viz. in 240, these oracles of the Roman jurisprudence ceasing, out of their writings, which made no less than 2000 volumes, a body of the Roman law was afterwards compiled, by order of Justinian.

The magistrates, on their side, in administering justice, interpreted the laws with more freedom than even the juris-consulti, and were, as it were, the living voice of the law.

The emperors too, to render the interpretation of the magistrates less free and frequent, appointed, that they themselves should be consulted; and their answers expected, as to questions in law: as may be observed from Pliny's epistles to Trajan.

In proportion as new laws were made at Rome, care was taken to collect and reduce them into bodies. Papirius, as before observed, in the time of Tarquinius Superbus, made a collection of the regal laws. And no sooner was the republic established, than the body of laws of the twelve tables was compiled.

In the time of Julius Cæsar, Offilius, a lawyer, began a collection of the edicts of the prætors; but this was not finished till the time of Adrian, by another lawyer, Julianus.

In the time of Constantine, or his children, two juris-consulti compiled two codes; from their authors called the *Gregorian*, and *Hermogenian Code*. See CODE.

Lastly, Justinian, finding the authority of the Roman law almost abolished in the west, by the declension of the empire, resolved to make a general collection, of the whole Roman jurisprudence; and committed the care thereof to his chancellor Tribonianus.

That minister executed his commission with a great deal of diligence, not to say precipitation: a new code was finished in 529, and a digest in 533.

The same year he published an abridgment thereof, containing the first principles and elements of law, under the title of *institutes*.

In the course of this reign, Justinian made 168 constitutions, and 13 edicts; which made a considerable alteration in the antient law, and were called *novels*.

All these together, make the *corpus juris civilis*, or body of the *civil law*, as reduced, by order of Justinian.

For the space of 300 years, this system of law obtained without any innovation. But the new constitutions made by the emperors from time to time, at length occasioning some alterations; the emperor Basil, and Leo his son, composed a new body of the Roman law, chiefly from the Justinian, in the Greek language; dividing it into seven volumes, and 60 books; under the title of *Basilica*. From which time, Justinian's body had but little credit in the east; the Basilica taking place of it.

In the west, the *Civil Law* had a different fortune: it is ordinarily supposed not to have been there known till the year 600; when Lotharius II. finding the book at the taking of Melphi, a town in Naples, made a present of it to the city of Pisa: though we find it quoted in several Latin works long before Lotharius. It is true, however, it was never taught publicly till the twelfth century; when Irnerius first made profession of it at Bologna, in 1128; whence it was carried by his disciples into other countries; and in a little time was taught in all the universities.

It is allowed that the *Civil* law contains all the principles of natural equity; and that nothing can be better calculated to form good sense, and sound judgment. Hence, though in several countries it has no other authority but that of reason, and justice; it is every where referred to for authority, and is that alone taught in the Universities.

It is not received at this day in any nation without some alterations: sometimes the feudal law is mixed with it, or general and particular customs; and often, ordinances and statutes cut off a great part of it.

In Turkey, the *Basliks* are only used. In Italy, the canon law, and customs, have excluded a good part of it. In Venice custom hath almost an absolute government. In the Milanese, the feudal law, and particular customs, bear sway. In Naples and Sicily, the constitutions and laws of the Lombards are said to prevail. In Germany and Holland, the *Civil Law* is esteemed to be the municipal law: but yet many parts of it are there grown obsolete; and others are altered, either by the canon laws, or a different usage.

In Friesland, it is observed with more strictness: but in the northern parts of Germany, the *jus Saxonicum*, *Lubeckense*, or *Culmense*, is preferred before it. In Denmark and Sweden it hath scarce any authority at all. In France only a part of it is received; and that part is in some places as a customary law; and in those provinces nearest to Italy, it is received as a municipal written law. In criminal causes, the *Civil Law* is more regarded in France; but the manner of trial is regulated by ordinances and edicts.

The *Civil* law, in Spain and Portugal, is connected with the *jus regium* and custom. In Scotland, the statutes of the *Sederunt*, part of the *regie majestatis*, and their customs, controul the *Civil* law.

In England, it is used in the ecclesiastical courts; in the courts of the admiralty; and in the two universities; yet in all these it is restrained and directed by the common law. See *LAW*, *COMMON-LAW*, &c.

CIVIL-Month. See the article *MONTH*.

CIVIL-Obligation. See the article *OBLIGATION*.

CIVIL-War, is a war between people of the same state, or the citizens of the same city.

CIVIL-Year, is the legal year, or annual account of time, which every government appoints to be used within its own dominions. See *TIME*.

It is thus called, in contradistinction to the natural year; which is measured exactly by the revolution of the heavenly bodies.

CIVILIANS College. See the article *COLLEGE*.

CIVILISATION, a law, or judgment, which renders a criminal process, civil. See *CIVIL*, &c.

Civilisation is performed by turning the information into an inquiry, or *vice versa*.

CLAIM, in law, a challenge of interest in any thing that is in possession of another; at least of a man's own. See *CHALLENGE*, *POSSESSION*, &c. See also *NON-CLAIM*.

There are divers kinds of *Claims*: as *Claim by charter*, *by descent*, *by acquisition*, &c.

Continual CLAIM, a *Claim* made from time to time, within every year and day, to land, or other thing, which on some accounts, cannot be attained without danger.

Thus, if I am dispossessed of land, into which, though I have a right, I do not enter for fear of being beaten; I am to hold on my right of entry at my best opportunity; by approaching as near as I can, once every year, as long as I live: and thus I leave the right of entry to my heir.

Falſe CLAIM. See the article *FALSE*.

Quit CLAIM. See the article *QUIT*.

CLAIR-OBSCURE, or *CHIARO-SCURO*, in painting, the art of distributing to advantage, the lights and shadows of a piece; both with regard to the easing of the eye, and heightening the effect of the whole composition.

Thus, when a painter gives his figures a strong relief, loosens them from the ground, and sets them free from each other, by the management of his lights and shadows; he is said to understand the *Clair-obscur*.

The *Clair-obscur* makes one of the great divisions, or branches of painting; the whole of a picture being resolvable into light and shadow.

The doctrine of the *Clair-obscur*, will come under the following rules.—Light may either be considered with regard to itself; to its effects; the place wherein it is diffused; or its use. For the 1st, light is either *natural*, or *artificial*.

Natural, either comes immediately from the sun, which is brisk, and its colour various, according to the time of the day; or it is that of a clear air through which light is spread, and whose colour is a little bluish; or of a cloudy air, which is darker, yet represents objects in their genuine colours with more ease to the eye.

Artificial light, proceeds from fire, or flame, and tinges the object with its own colour: but the light it projects, is very narrow and confined.

For the 2^d, the effects of light are either *principal*, as when the rays fall perpendicularly on the top of a body, without

any interruption; or *glancing*, as when it slides along bodies: or *secondary*, which is for things at a distance.

3. For the place, it is either the open campaign, which makes objects appear with great softness; or an inclosed place where the brightness is more vivid, its diminution more hasty, and its extremes more abrupt.

4. For the use, or application: the light of the sun is always to be supposed without, and over-against the picture; that it may heighten the foremost figures; the luminaries themselves never appearing, in regard the best colours cannot express them. The chief light is to meet on the chief group, and as much as possible on the chief figure of the subject. The light is to be purified over the great parts, without being crossed, or interrupted with little shadows. The full force of the principal light is to be only in one part of the piece: taking care never to make two contrary lights. Not to be scrupulously confined to one universal light; but to suppose other accessory ones, as the opening of clouds, &c. to loosen some things, and produce other agreeable effects. Lastly, the light to be different, according to the quality of the things whence it proceeds, and the nature of the subjects which receive it. For shadows; they are distinguished, 1^o, into those formed on the bodies themselves, by their proper reliefs. 2^o, Those made by adjacent bodies: those that make parts of any whole; and the different effects, according to the difference of places.

For the first, since the different effects of lights only appear by shadows, their degrees must be well managed. The place which admits no light, and where the colours are lost, must be darker than any part that has relief, and disposed in the front. The reflex, or return of the light, brings with it a colour borrowed from the subject that reflects it; and flies off at a greater or less angle, according to the situation of the reflecting body, with regard to the luminous one: hence, its effect must be different in colour, and in force; according to the dispositions of bodies. Deepenings, which admit not of any light, or reflex, must never meet on the relieve of any member of any great elevated part; but in the cavities or joints of bodies, the folds of draperies, &c. And to find occasions for introducing great shadows to serve for the repose of the sight, and the loosening of things; instead of many little shadows, which have a pitiful effect.

For the 2^d, the shadows made by bodies, are either in plain and smooth places, or on the earth; wherein they are deeper than the bodies that occasion them, as receiving less reflex light; yet still diminish as they depart further from their cause; or they are on the neighbouring bodies, where they are to follow the form of the said bodies, according to their magnitude and position, with regard to the light.

For the 3^d, in shadows that have parts, the painter must observe to take for a light in a shadowed place, the teint, or lustre of the light part; and, on the contrary, for the shadow in the lightened part, the teint, or lustre in the shadow: to make an agreeable assemblage of colour, shadow, and reflex in the shadowed part; but without interrupting the great masses of shadow: to avoid forming little things in the shadow, as not being perceived, unless closely looked at; and to work, as it were, in the general, and at one light: never to set the strong shadows against the lights, without softening the harsh contrast by the help of some intermediate colour: though the mass of light may be placed either before or behind that of the shadow; yet ought it to be so disposed, as to illumine the principal parts of the subject.

For the 4th, The effect of shadows are different, as the place is either wide and spacious; as in those coming immediately from the sun, which are very sensible, and their extremes pretty abrupt; from the serene air, which are fainter and more sweet; from the dark air, which appear more diffused, and almost imperceptible; and those from an artificial light, which makes the shadows deep, and their edges very abrupt: or as it is more narrow and confined, where the lights coming from the same place make the shadow more strong, and the reflex less sensible.

CLAIR-OBSCURE, *CHIARO-SCURO*, is also used for a design consisting only of two colours; ordinarily black and white, sometimes black and yellow.

Or, it is a design only washed with one colour; the shadows being of a dusky brown colour, and the lights heightened up with white.

The word is also applied to prints of two colours, taken off at twice; whereof there are volumes in the cabinets of the curious in prints.

The word *Clair-obscur* is a compound of two others. *Clair* is used among the French for those parts of a painting which reflect the most light; and comprehends not only the lights themselves, but also those colours that are luminous. By *obscur*, is meant not only all the shades, but also all the colours that are dusky.

CLAMEA admittenda in itinere per atturmatum, is a writ whereby the king commands the justice in eyre to admit a person's *Claim* by an attorney, who being employed in the king's service, cannot come in person.

CLAMOR, or **CLAMEUR de Hara**, a popular term in the French laws, importing a complaint, or cry, whereby any one implores the assistance of justice against the oppression of another.

CLAMP, in a ship, a piece of timber applied to a mast, or yard, to strengthen it, and prevent the wood from bursting.

CLAMP, also denotes a little piece of wood, in form of a wheel; used instead of a pulley in a mortice.

CLAMPING, in joinery, &c.—When a piece of board is fitted with the grain, to the end of another piece of board cross the grain; the first board is said to be *clamped*.—Thus the ends of large old tables were commonly *clamped*, to preserve them from warping.

CLAMP-NAILS, are such nails as are used to fasten on *Clamps*, in building and repairing of ships.

CLANCULARII, a sect of Anabaptists, who denied the necessity of making an open profession of the faith; and taught that a private one would be sufficient.

These were also called *Hortulani*, and *Gardners*, from the places they chose to assemble in, instead of churches.

CLANDESTINE *, any thing done secretly, and without the knowledge of some of the parties interested in it; or without the proper solemnities.

* The word comes from the preposition *clan*, of κλειον, *claudo*, I shut, or κλειμα, *furtum*, theft.

Thus, a marriage is said to be *Clandestine*, when performed without the publication of banns, the content of parents, or the knowledge of the ordinary.—The council of Trent, and the French ordinances annul all *clandestine* marriages.

CLAP, in medicine, the first stage, or state of the venereal disease; called also a *Gonorrhoea*.

Dr. Cockburn, and others after him, will have the *Clap* to consist in an ulceration of the mouths of the glands of the urethra in men, and of the glandular lacunae in women; occasioned by the insinuation of an acrimonious, purulent matter, contracted from an infected person in actu coitus.

From these glands, issues or gleans a sharp corrosive matter, accompanied with heat of urine, chordee, &c. which makes what is usually termed the first stage of the distemper.

A *Clap* appears sometimes sooner, and other times later, though generally in about three or four days after the infection is received; and discovers itself by the running, &c. of the penis, with inflammation of the glans, or nut of the yard.

If the person be affected with a phimosis, or paraphimosis; if the running be of a thin consistence, a yellow or green colour, and in great quantity, and the testicles swelled, it is usually termed a *gonorrhoea virulenta*; and the *Clap* supposed to be in its second stage.

Some authors think, that in this degree, or stage, the infection has reached the mass of blood, and the vesiculae feminales; others insist, that these symptoms may be accounted for from the running, or virus, being more corrosive; and by that means irritating and inflaming the adjacent parts.

The cure of a *Clap* consists in proper evacuations, as calomel-purgatives, refrigerant emulsions, powders, &c. turbitih-emeticks, and lastly, proper tercbintins, &c. to which some add decoctions of the lignum vitæ. As to externals, they are generally comprehended under the form of fomentations, cataplasms, liniments, and lotions.

Late authors, and especially Dr. Cockburn, have insisted on the cure of a *Clap* by a particular injection, without the use of any other medicine.—This has given a handle to quacks, who, by affecting to do the same by their injections, generally check the running, and make a confirmed pox.

Turbith-mineral, calomel, &c. given in small doses, and continued for some time, so as to take effect by way of alteratives, have been lately much commended as to success. Mercurial unguents, used in small quantities, so as not to raise a salivation, are said to cure all the stages of the venereal disease: this practice is usual at Montpellier.

Mr. Becket, in the *Philosophical Transactions*, attempts to shew, that the disease we now call a *Clap*, is the same with that our forefathers called a *burning*, or *branning*; under which name it was known several hundred years before the commonly supposed origin of the venereal disease; and that the appellation *branning*, &c. was only discontinued as that of *Clap* commenced.

In a MS. as old as Henry IV. Arden, chirurgeon to that prince, defines *branning* to be a certain inward heat and excoriation of the urethra; which, Mr. Becket observes, gives us a perfect idea of what we now call a *Clap*. For frequent dissections of such as have laboured under that disease, have made it evident, that the urethra is excoriated by the virulency of the matter they receive from the infected woman: which excoriation, or ulceration, he adds, is not confined to the ostioli, or mouths of the mucous glands of the urethra, as has been lately imagined; but may equally attack any part of the urethra.

The heat, or burning which such persons feel in making water, is a consequence of this excoriation of the urethra; the salts

contained in the urine pricking and irritating the nervous fibrillæ of the urethra, thus divested of its natural membrane. See *Supplement, article GONORRHEA*.

CLARENCIEUX, the second king at arms; thus called from the duke of Clarence, to whom he first belonged.

Lionel, third son of Edward III. having by his wife the honour of Clare in the county of Thromond, was hereupon created duke of Clarence; which dukedom afterwards escheating to Edward IV. he made this herald, who properly belonged to the duke, a king at arms; naming him *Clarencieux* in French, and *Clarencius* in Latin.

His office is to marshal, and dispose of the funerals of all the lower nobility; as baronets, knights, esquires, and gentlemen on the south-side of Trent: whence he is also called *surveys*, or *southroy*, in contradistinction to *norroy*. See NORROY.

CLARET *, or **CLAIRET**, *pale red*, a name which the French give to such of their red wines as are not of a deep, or high colour. See WINE.

* The word is a diminutive of *clair*, clear, bright, transparent.

CLARET, **CLARETUM**, in the antient pharmacy, was a kind of wine sweetened with sugar, and impregnated with aromatics; sometimes also called *hippocras*, or *vinum hippocraticum*; because supposed to have been first prescribed by Hippocrates.

It has its name *Claret*, from its being clarified by percolation through a flannel bag, called *manica hippocratis*.

CLARICORD, or *Manicord*, a musical instrument, in form of a spinett.

It has 49 or 50 keys, and 70 strings, which bear on five bridges; the first whereof is the highest, the rest diminishing in proportion. Some of the strings are in unison; their number being greater than that of the stops.

There are several little mortises for passing the jacks, armed with little brass hooks, which stop and raise the chords in lieu of the feather used in virginals and spinetts. But what distinguishes it most, is, that the strings are covered with pieces of cloth; which render the sound the sweeter; and deaden it so, as that it cannot be heard to any considerable distance.

Hence some call it the *dumb spinett*; whence it comes to be particularly in use among the nuns, who learn to play, and are unwilling to disturb the silence of the dormitory.

The *Claricord* is more antient than either the spinett or harp-ficord; as is observed by Scaliger, who, however, only gives it 35 strings.

CLARIFICATION, in chymistry, the act of clearing, or fining of liquors from their grosser parts.

Clarification is performed by ebullition, despumation, and colature, or filtration.

The term is chiefly applied to juices, decoctions, and syrups, which are *clarified* by filtration, or by passing them through a strainer, after having beat them up into a froth with the whites of eggs; the viscous parts of the eggs entangling the thick gross particles of the liquor, retain them in the strainer. Sometimes the mixture is boiled; by which means, the eggs entangle the grosser parts, and carry them up to the top in a tough scum; which is either taken off with a spoon, or separated by a flannel bag, as before, called *Hippocrates's sieve*. Another method is, by letting the liquor stand in a convenient vessel, till the grosser particles settle.

In distilled waters, &c. which have a milky hue, or are turbid, this is generally effected with fine sugar, mixed with a small quantity of allum; which will bear down the oily parts, and leave the rest clear.

Many liquors are clarified by passing them through a thick brown paper; among others, hippocras, hydromel, &c. The antients clarified their wines by pouring them from off the lees, into another barrel, through a tin strainer. Fine and delicate wines are usually clarified with ichthyocolla, or fish-glue: the thicker wines with omelette, or whites of eggs diluted in water. Sometimes with pouring them through a heap of little chips.

It is an error to suppose that either insinglafs, or omelette, can be prejudicial to the health; since both the one and the other fall down with the lees, without producing any ill effect.

That which makes wines unwholesome, is not the *clarifying* by these innocent means, but the mixtures and sophistications of the vintners, to make them brisk, and bring them to life again after the fret; which is done with aqua vitæ, spices, pigeons dung, &c.

Sugar is *clarified* with the whites of eggs and sugar beat together.

For malt liquors, particularly beer, there are various methods of clearing; the best is by casting into it fixed nitre: some add the quintessence of malt and wine; whites of eggs made into balls with a little flower and insinglafs: oil and quintessence of barley have the same effect. It is exceedingly cleared and strengthened, by adding to it, during the time of its fermentation, some ardent spirit. See MALT LIQUOR.

CLARIGATIO, or **CLARIGATION**, in the law of nations, a loud, clear call, or summons made to an enemy, to demand satisfaction

satisfaction for some injury received; in defect whereof, recourse will be had to reprisals.

Clarigatio amounts to much the same with what the Greeks call *καταβολή*.—Though Naude uses the word in a somewhat different manner. * Reprisals, says he, signify the same as *pignoratones Budae, aut clarigationes Hermolae*: for, as to the Greek word *androlephia*, it is equivalent to the Latin *pignorandi potestas*.

CLARION *, a kind of trumpet, whose tube is narrower, and its tone acuter and shriller than the common trumpet.

* Menage derives the word from the Italian *Clarino*, of the Latin *Clarus*, by reason of the clearness of its sound.

Nicod says, the *Clarion*, as now used among the Moors, and the Portuguese, who borrowed it from the Moors, served anciently for a treble to several trumpets, which sounded tenor and bass. He adds, that it was only used among the cavalry and the marines.

CLARION, in heraldry, is a bearing represented in Tab. *Heraldry*, fig. 36.—He bears ruby, three *Clarions* topaz; being the arms of the earl of Bath, by the name of Granville.

Guillim takes these *Clarions* to be a kind of old-fashioned trumpets; but others rather think, they represent the rudder of a ship; and others a rest for a lance.

CLARO-OBSCURO. See **CLAIR-OBSCUR**.

CLARY WATER. See the article **WATER**.

CLASP NAILS. See the article **NAILS**.

CLASPERS, in botany, are tendrils, threads, or ligaments of a middle nature between that of a root, and trunk; whereby shrubs, and other lesser plants, take hold of trees, or other things near them, for their support, &c.

The wisdom of the creator is very conspicuous, in this provision for some species of plants, which need it; as ivy, vines, bryony, &c.

The contrivance is various in various subjects. Malpighi observes, that the *Claspers* of ivy are roundish, and covered with hair; and what is very remarkable, they yield a glutinous terribine humour, by means whereof, they adhere closely to stones, &c. Nature, he adds, uses no less artifice in the *vitis canadensis*.

Claspers serve sometimes for support only; as those of the vine, bryony, &c. whose branches being long, slender, and brittle, would be weighed down by their own load, and that of their fruit, but for these *Claspers*, which by a natural spire, or circumvolution, catch hold of any adjacent body.

Claspers sometimes also serve for a supply of juice; as in the trunk-roots of ivy, which being a tall plant, and of a compact substance, the sap would not be sufficiently furnished to the upper sprouts, without this expedient.

Claspers also sometimes serve for stabiliment, as those of cucumbers; for propagation, as those of camomile; and for shade, stabiliment, and propagation altogether, as those of strawberries.

CLASS *, **CLASSIS**, a distribution of persons, or things, ranged according to their merit, value, or nature. See **RANK**, &c.

* The word comes from the Latin *Classis*, derived by some from the Greek *κλάσει*, *congrego, convoco*; a *Classis* being nothing but a multitude, assembled apart.

CLASS is particularly used for a distinction among scholars; who are distributed into several *Classes*, or forms, according to their capacities, and attainments.

Quintilian uses the word *Classis* in this sense, in the first book of his *institutions*.

CLASSIC, **CLASSICAL**, a term chiefly applied to authors read in the *Classes*, at schools, and who are in great authority there. In this sense, Aquinas, and the master of the sentences are *classic* authors in the school divinity; Aristotle, in philosophy; Cicero and Virgil in the humanities.—Aulus Gellius ranks among *Classic* authors, Cicero, Caesar, Sallust, Virgil, Horace, &c.

The term *Classic* seems properly applicable only to authors who lived in the time of the Roman republic, and the Augustan age, when the Latin was in its perfection.

It appears to have taken its rise hence, that an estimate of every person's estate being appointed by Servius Tullus, he divided the Roman people into six bands, which he called *Classes*.

—The estate of those of the first *Classis* was not to be under 200 pounds: and these, by way of eminence, were called *Classici*, *Classici*.

Hence, also, authors of the first rank, came to be called *Classici*: all the rest were said to be *infra classis*.

The first *Classis*, again, was subdivided into centuries; making fourscore centuries of footmen, and eighteen of horsemen.

Each *Classis* consisted, one half of the younger sort, who were to make war abroad; and the other of old men, who staid at home for the defence of the city.

CLAUDENDA Curia. See the article **CURIA**.

CLAVELLATI Cineres, Potashes. See the article **CINERES**.

CLAVICULÆ, collar bones, in anatomy, two small bones, situate at the basis of the neck, and top of the breast.—See Tab. *Anatomy, (Of the)* fig. 3. n. 3, 3.

They are about half a foot long, of the thickness of a finger, and a little bent at each end, and that different ways, somewhat like the letter S; and are thus called, as being the keys, *clavus*, of the thorax.

Their inner substance is spongy; whence they are brittle, easily broke, and easily coalescing again.—They are joined to the acromion of the scapula per synchondrosin; and on the fore-part, per arthrodiom, to a sinus on each side of the upper part of the sternum.

Their use is, to fix the scapulae with the sternum and the arms, and to prevent them from slipping too forward upon the thorax.

CLAVIS, a Latin word, sometimes used in English writers for a key.

CLAUSE, an article, or particular stipulation in a contract; a charge, or condition in a testament, &c.

We say, a *derogatory clause*, *penal clause*, *saving clause*, *coadjutory clause*, &c. See **DEROGATORY**, &c.

CLAUSIT extremum diem. See the article **DIEM**.

CLAUSTRAL Prior. See the article **PRIOR**.

CLAUSUM Fregit, an action of trespass; thus called, by reason the writ demands the person summoned to answer to *quare clausum fregit*, of the plaintiff, why he committed such a trespass?

CLAVUS, in antiquity, a band, or fillet of purple, worn on the breast by the Roman senators and knights, more or less broad, according to the dignity of the person; from the proportions of which arose the difference of *tunica augusti-clavata*, and *laticlavata*. See **LATICLAVIA**, &c.

This ornament, according to some, was called *Clavus*, nail, as being studded with little round plates of gold, or silver; like the heads of nails. Cælius maintains, that the *Clavus* consisted of a kind of purple flowers, sewed upon the stuff.

CLAVUS, in medicine, a name physicians give to a shooting pain in the head, commonly situate a little above the eyes, *viz.* on the sinus frontalis; and supposed to resemble a boring of the head through with an augre; whence the name. In some it is only in one, and in others in both sides.

It is generally allowed to be a species of an ague, or an intermitting fever; its periods of coming or going, being usually regular or stated. In some it is quotidian, in others tertian.

The cure consists in giving an emetic a little before the fit, and after, confirming it with a proper quantity of the cortex, &c. as in intermitting fevers; though bleeding and diaphoretics sometimes effect a cure without other assistants.

A pain like to this, on the top of the head, sometimes attacks hysterical persons; which by Dr. Sydenham is termed *Clavus Hystericus*.

CLAVUS is also used in medicine, for a callus formed on the toes; popularly called a *corn*.

Clavi arise from a too great compression of the cutis; which by this means hardens, and forms itself into a knot. The cure is by first softening them, as with emplast. de ranis cum mercurio, or with galban. crecat. with sal ammoniac; and then pulling them up. A piece of raw beef, applied in manner of a plaster, and frequently shifted, is often found to dissipate them in a little time.

CLAWS.—*Elks*: **CLAWS**. See the article **ELK**.

CLAY, in natural history, a soft viscid earth, found in various places, and used for various purposes; of several kinds and properties.

Dr. Lister, in the *Philosophical Transactions*, gives us a table of twenty-two several *Clays* found in the several counties of England; five whereof he calls

Pure, i. e. such as are soft, like butter, to the teeth, with little or no grittiness in them, *viz.* 1. Fullers earth, which he distinguishes by its colour into yellowish, brown, and white: See **FULLERS Earth**. 2. Boles. See **BOLE**. 3. Pale yellow *Clay*.

4. Cowshot *Clay*. 5. Dark blue *Clay*, or marle. See **MARLE**.

—The other seventeen,

Impure; whereof eight are harsh and dusty when dry; as, 1. Creta, chalk, or milk-white *Clay*. 2. Potters pale yellow *Clay*. 3. Blue potters *Clay*. 4. Blue *Clay*, wherein is found the astroites. 5. Yellow *Clay*. 6. Fine red *Clay*. 7. Soft chalky blue *Clay*. 8. Soft chalky red *Clay*.

Three are stony when dry, *viz.* 1. A red stony *Clay*. 2. A blue stony *Clay*. 3. A white stony *Clay*.

Three are mixed with sand, or pebbles, *viz.* 1. A yellow loam. 2. A red sandy *Clay*. 3. A second species of the same kind.

Lastly, three are mixed with flat or thin sand, glittering with mica: *viz.* 1. Crouch white *Clay*. 2. Grey or bluish tobacco-pipe *Clay*. 3. A red *Clay*. But this is a very unartful disposition. See **Supplement**, article **ARGILLA**.

CLAYES, in fortification, are wattles made with stakes, interwove with ozers, &c. to cover lodgments.

CLAYING of Land. See **MANURING**.

CLEAR, in building, is sometimes used among the workmen for the inside work of a house, &c.

CLEAR Idea, or Notion. See the articles **NOTION**, and **IDEA**.

CLEARING of Lignans. See **CLARIFICATION**.

CLECHE *, or **CLECHY**, in heraldry, is explained by Guillim as an ordinary open to the light, or pierced through with another inner one of the same figure; *e. gr.* when a cross appears as if charged with another cross of the same colour with the field; or as if the field appeared through the apertures thereof.

* The word is French, supposed to be formed of *clef*, key; the ends of the cross being thought to bear some resemblance to the bows of the ancient keys.

but Colombiere, and some other writers, will have this piercing to be only a circumstance of the cross *Cleché*, and call it by the name *vuide*, voided. The thing that denominates it *Cleché*, is its spreading from the centre towards the extremities, which are very wide, and end in an angle in the middle; as in the figure represented Tab. *Herald*, fig. 37.

CLEDONISM, CLEDONISMS, a kind of divination in use among the ancients.

The word is formed from the Greek *κλῆδονισμῶν*, which signifies two things, *numus*, a report, and *avis*, a bird: In the first sense, *Cledonism* should denote a kind of divination drawn from words occasionally uttered.—Cicero observes, that the Pythagoreans made observation not only of the words of the Gods, but of those of men; and accordingly believed the pronouncing of certain words, *v. gr.* *incendium*, at a meal, very unhappy.—Thus, instead of prison, they used the word *domicilium*; and to avoid *erimias*, said *eumenides*.

In the second sense, *CLEDONISM* should seem a divination drawn from birds; the same with ornithomania.

CLEF, or CLIEF, in music, a mark at the beginning of the lines of a song, which shews the tone, or key in which the piece is to begin.—Or, it is a letter marked on any line, which explains and gives the name to all the rest.

Antiently, every line had a letter marked for a *Clef*: now a letter on one line suffices; since by this all the rest are known; reckoning up and down in the order of the letters.

It is called the *Clef*, *q. d.* key, because hereby we know the names of all the other lines and spaces; and consequently the quantity of every degree, or interval.

But because every note in the octave is called a *key*, though in another sense, this letter marked, is called in a particular manner the *signed Clef*, because being written on any line, it not only signs and marks that one, but it also explains all the rest. By *Clef*, therefore, for distinction-sake, we mean that letter signed on a line, which explains the rest; and by *key* the principal note of a song, in which the melody closes.

There are three of these *signed Clefs*, *c, f, g*. The *Clef* of the highest part in a song, called *treble*, or *alto*, is *f* set on the second line counting upwards. The *Clef* of the bass, or the lowest part, is *f* on the fourth line upwards; for all the other mean parts, the *Clef* is *c*, sometimes on one, sometimes on another line. Indeed, some that are really mean parts, are sometimes set with the *g Clef*.

It must, however, be observed, that the ordinary signature of *Clefs* bear little resemblance to those letters. Mr. Malcolm thinks it would be well if we used the letters themselves. Kepler takes a world of pains, to shew that the common signatures are only corruptions of the letters they represent. See their figure among the other **CHARACTERS of music**.

The *Clefs* are always taken fifth to one another: that is, the *Clef* is lowest, *c* a fifth above it, and *g* a fifth above *c*.

When the place of the *Clef* is changed, which is not frequent in the *mean Clef*, it is with design to make the system comprehend as many notes of the song as possible, and so to have the fewer notes above or below it. If then there be many lines above the *Clef*, and few below it, this purpose is answered by placing the *Clef* in the first or second line: if there be many notes below the *Clef*, it is placed lower in the system. In effect, according to the relation of the other notes to the *Clef* note, the particular system is taken differently in the scale, the *Clef* line making one in all the variety.

But still, in whatever line of the particular system any *Clef* is found, it must be understood to belong to the same of the general system, and to be the same individual note or found in the scale. By this constant relation of *Clefs*, we learn how to compare the several particular systems of the several parts; and know how they communicate in the scale, *i. e.* which lines are unison, and which not: for it is not to be supposed that each part has certain bounds, within which another must never come. Some notes of the treble, *v. gr.* may be lower than some of the mean parts, or even of the bass. To put together therefore in one system all the parts of a composition written separately, the notes of each part must be placed at the same distances above and below the proper *Clef*, as they stand in the separate system; and because all the notes that are consonant, (or heard together) must stand perpendicularly over each other, that the notes belonging to each part may be distinctly known, they may be made with such differences as shall not confound or alter their significations with respect to time, but only shew that they belong to this or that part. Thus shall we see how the parts change and pass through one another; and which, in every note is highest, lowest, or unison. The use of particular *signed Clefs* then, is an improvement with respect to the parts of any composition; for unless some one key in the particular systems were distinguished from the rest, and referred invariably to one place in the scale, the relations could not be distinctly marked.

It must here be observed, that for the performance of any single piece, the *Clef* only serves for explaining the intervals in the lines and spaces: so that we need not regard what part of any greater system it is; but the first note may be taken as high or

as low as we please. For as the proper use of the scale is not to limit the absolute degree of tone; so the proper use of the *signed Clef*, is not to limit the pitch at which the first note of any part is to be taken; but to determine the tune of the rest, with relation to the first: and considering all the parts together, to determine the relations of their several notes by the relations of their *Clefs* in the scale: thus, their pitch of tune being determined in a certain note of one part; the other notes of that part are determined by the constant relations of the letters of the scale, and the notes of the other parts by the relations of their *Clefs*.

In effect, for performing any single part, the *Clef* note may be taken in any octave, *i. e.* at any note of the same name, provided we do not go too high or too low for finding the rest of the notes of a song. But in a concert of several parts, all the *Clefs* must be taken, not only in the relations, but also in the places of the system abovementioned; that every part may be comprehended in it.

The difference of *Clefs* in particular systems, makes the practice of music much more difficult and perplexed than it would otherwise be; both with respect to instruments, and to the voice. This occasioned Mr. Salmon to propose a method of reducing all music to one *Clef*; whereby the same writing of any piece of music, should equally serve to direct the voice, and all instruments; which he calls an *universal character*.

The natural and artificial note expressed by the same letter, as *c* and *c* \times , are both set on the same line or space. When there

is no character of flat or sharp at the beginning with the *Clef*, all the notes are natural: and if in any particular place the artificial note be required, it is signified by the sign of a flat or sharp set on the line a space before that note.

If a sharp or flat be set at the beginning in any line or space with the *Clef*, all the notes on that line or space are artificial ones; *i. e.* are to be taken a semitone higher or lower than they would be without such sign. And the same affects all their octaves above and below, though they be not marked so. In the course of the song, if the natural note be sometimes required, it is signified by this character.

The marking of the system thus by flats and sharps, Mr. Malcolm calls the *signature of the Clefs*.

CLEFT, in grafting. See the article **ENGRAFTING**.

CLEMENTINE*, a term in use among the Augustines, who apply it to a person, who after having been nine years a superior, ceases to be so, and becomes a private monk, under the command of a superior.

* The word has its rise hence, that pope Clement, by a bull, prohibited any superior among the Augustines from continuing above nine years in his office.

CLEMENTINES, in the canon law, are the constitutions of pope Clement V. and the canons of the council of Vienne. See **CANON**.

CLENCH-NAILS. See the article **NAILS**.

CLEPSYDRA*, a kind of water-clock, or an hour-glass serving to measure time by the fall of a certain quantity of water.

* The word comes from *κλεψύδρα*, *condo*, and *ὕδωρ*, *agua*, *water*.

There have likewise been *Clepsydræ* made with mercury. The Egyptians, by this machine, measured the course of the sun; Tycho Brahe, in our days, made use of it to measure the motion of the stars, &c. and Dudley used the same contrivance in making all his maritime observations.

The use of *Clepsydræ* is very antient: they were invented in Egypt under the Ptolemys; as were also sun-dials. Their use was chiefly in the winter; sun-dials served in the summer. They had two great defects; the one, that the water run out with a greater or less facility, as the air was more or less dense: the other, that the water run out more readily at the beginning, than towards the conclusion.

M. Amontons has invented a *Clepsydra* free from both these inconveniences, and which has the three grand advantages, of serving the ordinary purpose of clocks; of serving in navigation for the discovery of the longitude; and of measuring the motion of the arteries.

Construction of a CLEPSYDRA.—To divide any cylindric vessel into parts to be emptied in each division of time; the time wherein the whole, and that wherein any part is to be evacuated, being given.

Suppose, *v. gr.* a cylindric vessel, whose charge of water flows out in twelve hours, were required to be divided into parts to be evacuated each hour. 1. As the part of time 1 is to the whole time 12, so is the same time 12 to a fourth proportional, 144. 2. Divide the altitude of the vessel into 144 equal parts: here, the last will fall to the last hour; the three next above to the last part but one; the five next to the tenth hour, &c. Lastly, the 23 last to the first hour.

For, since the times increase in the series of the natural numbers 1 2 3 4 5, &c. and the altitudes, if the numeration be in retrograde order from the twelfth hour, increase in the series of the unequal numbers 1 3 5 7 9, &c. the altitudes computed from the twelfth hour, will be as the squares of the times 1 4 9 16

25, &c. Therefore the square of the whole time 144, comprehends all the parts of the altitude of the vessel to be evacuated. But a third proportional to 1 and 12 is the square of 12; and consequently it is the number of equal parts into which the altitude is to be divided, to be distributed according to the series of the unequal numbers, through the equal intervals of hours. Since, in lieu of parts of the same vessel, other less vessels equal thereto may be substituted; the altitude of a vessel emptied in a given space of time being given, the altitude of another vessel to be emptied in a given time may be found; viz. by making the altitudes as the squares of the times.

Hence we see the method of constructing the *Clepsydræ* used by the antients.

CLEPSYDRA is also used for an hour-glass of sand. See HOUR-GLASS.

CLERGY, CLERUS, KΛΗΡΟΣ, the assembly or body of clerks, or ecclesiastics. See CLERK.

In the Romish church there are two kinds of *Clergy*: the one regular, comprehending all the religious of both sexes; the other secular, comprehending all the ecclesiastics that do not make the monastic vows.

Among the reformed, there are none but secular *Clergy*.—The Roman *Clergy* forms a monarchical church, under the pope, who is the head thereof.

The *Clergy* was antiently divided into three orders, viz. priests, deacons, and inferior clerks; and each order had its chief: the arch-priest was the head of the first order, the archdeacon of the second, and the dean of the third.

Under the name of *Clergy*, were also formerly comprised all the officers of justice; as being supposed to be men of letters. See CLERK.

Though the *Clergy* formerly claimed an exemption from all secular jurisdiction, yet Matt. Paris tells us, William the conqueror subjected the bishops and abbots who held per Baroniam, and who, till then, had been exempt from all secular service; and ordered they should be no longer free from mortuary services. To this purpose he prescribed arbitrarily what number of soldiers every abbey and bishoprick should provide, to serve him and his successors in war, and laid up these registers of ecclesiastical servitude in his treasury.

But, in effect, the *Clergy* were not exempt from all secular service till then; as being bound by the laws of king Edgar to obey the secular magistrate in some things, viz. upon an expedition to the wars, and in contributing to the building, and repairing of bridges, &c. See TRINODA NECESSITAS.

The *Privileges of the English Clergy*, by the antient statutes, are very considerable: their goods are to pay no toll in fairs or markets; they are exempt from all offices, but their own; from the king's carriages, posts, &c. from appearing at sheriff's tours or frank-pledges; and are not to be fined or amerced, according to their spiritual, but their temporal means.

A *Clergyman* acknowledging a statute, his body is not to be imprisoned: if he be convicted of a crime, for which the benefit of *Clergy* is allowed, he shall not be burnt in the hand: and he shall have the benefit of the *Clergy* in infinitum, which no layman can have but once.

The *Clergy*, by common law, are not to be burdened in the general charges with the laity; nor to be troubled or incumbered, unless expressly named, and charged by the statute; for general words do not affect them. Thus, if a hundred be sued for a robbery, the minister shall not contribute; though the words are, *gentes demorantes*: neither are they assised to the highway, to the watch, &c.

The *Revenues of the Clergy*, were antiently more considerable than at present: Ethelwolph, in 855, gave them the tythe of all goods, and the tenth of all the lands in England; free from all secular services, taxes, &c.

The charter whereby this was given them, was confirmed by several of his successors, Edmund, Edgar, Ethelred, Alfred, and William the conqueror; which last, finding the bishopricks so rich, erected them all into baronies; each barony containing thirteen knights fees, at least.—But since the reformation the bishopricks are much impaired. See BISHOP.

The revenues of the inferior *Clergy*, in the general, are small; a third part of the best benefices being antiently, by the pope's grant appropriated to monasteries; upon the dissolution whereof they became lay-fees.

Indeed an addition was made 2° Annæ; the whole revenue of first-fruits and tenths being then granted, to raise a fund for the augmentation of the maintenance of the poor *Clergy*: pursuant to which, a corporation was formed, by the name of the governors of the bounty of queen Anne, for the augmentation of the maintenance of the poor *Clergy*; to whom the said revenues were conveyed in trust, &c. See FIRST-FRUITS.

Articles of the CLERGY. See ARTICLES.

Proctors of the CLERGY. See the article PROCTORS.

CLERGY is also used for an antient liberty of the church, confirmed by several acts of parliament; consisting in this, that when a priest, or one in orders, is arraigned of felony before a secular judge, he may pray his *Clergy*, i. e. he may pray to be delivered

ed to his ordinary, to purge himself of the crime objected against him.—This was formerly admitted, even in cases of murder.—But the antient course of the law is now much altered on this head.—By the statute 18 Eliz. cap. 7. clerks are no more committed to their ordinaries to be purged; but every man to whom the benefit of *Clergy* is granted, though not in orders, is put to read at the bar, after he is found guilty, and convicted of such felony; and so, burnt in the hand, and set free for the first time, if the ordinary's commissioner, or deputy standing by, do say, *legit ut clericus*; otherwise he suffers death.

CLERICAL Crown. See the article CROWN.

CLERICAL Title. See the article TITLE.

CLERICI non elegantur in officio. See QUOD CLERICI.

Non-residentia pro CLERICIS Regis. See Non RESIDENTIA.

CLERICO admittendo, a writ directed to the bishop, for the admitting a clerk to a benefice upon a re admittas tried, and found for the party who procured the writ. See the article ADMITTENDO.

CLERICO capto per statuto mercatorum, is a writ for the delivery of a clerk out of prison, who is imprisoned upon the breach of statute-merchant.

CLERICO convicto commissio gaole in defectu ordinarii deliberando, is a writ for the delivery of a clerk to his ordinary, that was formerly convicted of felony; by reason his ordinary did not challenge him according to the privilege of clerks.

CLERICO intra sacros ordines constituto non eligendo in officium, is a writ directed to the bailiffs, &c. that have thrust a bailiwick or headship upon one in holy orders; charging them to release him.

CLERK*, CLERICUS, a word formerly used to signify a learned man, or man of letters.

* The word comes from the Greek κληρος, used for *clergy*, but more properly signifying *lot*, or *heritage*: in regard the lot, and portion of *Clerks* or ecclesiastics is to serve God.—Accordingly, *clerus* was at first used to signify those, who had a particular Attachment to the service of God.—The origin of the expression is derived from the old testament, where the tribe of Levi is called the *lot*, *heritage*, κληρος; and God is reciprocally called their portion; by reason that tribe was consecrated to the service of God, and lived on the offerings made to God, without any other settled provision as the rest had,

Thus, Pasquier observes, the officers of the counts, (*comites*) were antiently created under the title of *Clerks of Accounts*; and secretaries of state were called *Clerks of the Secret*. So, *Clericus domini regis*, in the time of Edward I. was Englished, the *king's secretary*, or *Clerk of his council*.

The term was applied indifferently to all who made any profession of learning; or who knew how to manage the pen: though, originally it was appropriated to ecclesiastics.

As the nobility and gentry were usually brought up to the exercise of arms; there was none but the clergy left to cultivate the sciences: hence, as it was the clergy alone who made any profession of letters, a very learned man came to be called a *great Clerk*, and a stupid ignorant man, a *bad clerk*.

Ronsard, in his old language, uses the word femininely, *clergesse*, for a learned woman. "Mais trop plus est à craindre une femme *clergesse*."

CLERK (in the general) is used for all those of the ecclesiastical state, or who are in holy orders, of any degree, or kind; from the deacon, to the prelate.

Yet, in its utmost latitude, the word *Clerk* also includes *chantors*, *acolyths*, *exorcists*, and *ostiaris*. See CHANTOR, ACOLYTHI, EXORCIST, &c.

The canons excommunicate all those who lay hands on a *Clerk*. A council held in Africa prohibited the appointing any *Clerk* to be a tutor, guardian, or curator, by testament.—The council of Elvira enjoins continence on all clerks, bishops, priests, or deacons, on pain of being stripped of their clericature.

Accephalus CLERK, in the sixth century, was a name given to those *Clerks* who separated from the bishop, and chose not to live any longer in community with him; in contradistinction to *Canonic CLERKS*, who continued to live with the bishop, according to the canons.

CLERK, is also a title given to several officers in the royal palace, the courts of justice, revenue, army, navy, &c.—The principal of these are as follow.

CLERK of the Acts, is an officer of the navy, who receives and enters the commissions and warrants of the lord admiral; and registers the acts and ordinances of the commissioners of the navy.

CLERK of Assize, is he that writeth all things judicially done by the justices of assize, in their circuits.

CLERK of the Check, is an officer in the court, so called, because he hath the check and controulment of the yeomen of the guard, and all other ordinary yeomen, or officers, belonging either to the king, queen, or prince; giving leave, or allowing their absence, or defects in attendance; or diminishing their wages for the same.

CLERK of the Closet, is a divine, otherwise called *confessor* to his majesty; whose office is to attend at the king's right hand during divine

divine service, to resolve all doubts concerning spiritual matters, to wait on the king in his private oratory, &c.

CLERK of the Crown, or Crown-Office, in the King's-bench court, an officer whose business is to read, frame, and record all indictments against traitors, felons, and other offenders there arraigned upon any publick crime.

CLERK of the Crown, in Chancery, is an officer, who by himself, or deputy, is continually to attend the lord chancellor, or lord keeper, for special matters of state, by commission, or the like, either immediately from his majesty, or by order of his council; as well ordinary as extraordinary.—All general pardons, upon grants of them at the king's coronation, or in parliament; the writs of parliament, with the names of the knights, citizens, and burgeses, are also returned into his office: besides which; he has the making of special pardons, and writs of execution upon bonds of statute (scape forfeited).

CLERK of the Deliveries, is an officer in the Tower, who takes indentures for all fores issued thence.

CLERK of the Enrollments of Pines and Recoveries, in the court of Common-pleas, is an officer under the three elder judges of that court, and removable at their pleasure. See **ENROLLMENT.**

CLERK of the Errors, in the Court of Common-pleas, transcribes and certifies into the king's-bench the tenor of the records of the cause, or action, upon which the writ of error, made by the curitor, is brought there to be determined.

CLERK of the Errors, in the King's-bench, transcribes and certifies the records of such causes in that court into the exchequer; if the cause, or action, is by bill.

CLERK of the Errors, in the Exchequer, transcribes the records certified thither out of the king's-bench; and prepares them for judgment in the court of exchequer, to be given by the justices of the common-pleas, and barons, there.

CLERK of the Effoins, in the court of common-pleas, keeps the effoin-roll, or enters effoins. He also provides parchment, cuts it into rolls, marks the number on them; delivers out all the rolls to every officer, and receives them again when written. See **ESSOIN.**

CLERK of the Effraits, belongs to the exchequer; and, every term, receives the effraits out of the lord treasurer's remembrancer's office, and writeth them out to be levied for the king. He also maketh schedules of such sums effraited as are to be discharged. See **ESTREAT.**

CLERKS of the Green Cloth. See **GREEN-CLOTH.**

CLERK of the Hammer, or Hammer, is an officer in chancery, whose business is to receive all money due to the king for the seals of charters, patents, commissions, and writs: as also fees due to the officers for enrolling and examining the same. He is obliged to attend on the lord chancellor, or lord keeper, daily in term-time; and at all times of sealing.

CLERK of the juries, or curata writs, is an officer belonging to the court of common-pleas, who makes out the writs called *habeas corpus*, and *distingas*, for the appearance of juries, either in court or at the assizes; after the panel is returned upon the venire facias. See **JURY.**

CLERK Comptroller of the King's House, an officer of the court, who has place and seat in the compting-house; with authority to allow or disallow the charges and demands of purveyants, and messengers of the green cloth, purveyors, &c. He has also the oversight of all defaults and mismanagements of inferior officers; and sits in the compting-house with the superior officers, viz. the lord steward, treasurer, comptroller, and cofferer, for the correcting and redreting things out of order.

CLERK of the King's great Wardrobe, keeps an account or inventory in writing, of all things belonging to the king's wardrobe. See **WARDROBE.**

CLERK of the King's Silver, is an officer belonging to the common-pleas; to whom every fine is brought, after it has been with the custos breviu; and by whom the effect of the writ of covenant is entered into a paper-book; and according to that note, all the fines of that term are also recorded in the rolls of the court. See **QUEEN GOLD.**

CLERK of the Market, is an officer of the king's house, whose duty is to take charge of the king's measures, and to keep the standards of them, that is, examples of all the measures that ought to be used through the land.

CLERK Marshal of the king's house, seems to be an officer who attends the marshal in his court, and records all his proceedings. See **MARSHAL.**

CLERK of a Ship, is an officer appointed to take care that nothing be squandered, or spent needlessly. He is obliged to keep a register, or journal, containing an exact inventory of every thing in the loading of the vessel; as the rigging, apparel, arms, provision, munition, merchandises: as also the names of the passengers, if there be any; the freight agreed on; a list of the crew, their age, quality, wages; the bargains, purchases, sales, or exchanges the ship makes from its departure; the consumption of provision; and, in short, every thing relating to the expence of the voyage. He also registers the consultations of the captains, pilots, &c.—He also does the office of a register in all criminal process; and of a notary, to make and

keep the wills of those who die in the voyage; takes inventories of their effects, &c. The Clerk is not allowed to quit the vessel during the voyage, on forfeiture of all his wages, &c.—In small vessels, the master, or pilot, does the office of Clerk.

CLERK of the Nichils, or Nichils, is an officer in the exchequer, who makes a roll of all such sums as are nichilled by the sheriff's upon their estreats of green wax; and delivers the same into the lord treasurer's remembrancer's office, to have execution done upon them for the king. See **NIHIL.**

CLERK of the Ordinance, is an officer in the Tower, who registers all orders relating to the king's ordnance. See **ORDNANCE.**

CLERK of the Outlawries, is an officer belonging to the court of common-pleas; being a deputy to the king's attorney-general, for making out the writs of *capias utlagatum*, after outlawry; and the king's attorney's name is to every one of those writs.

CLERK of the Paper-Office, is an officer of the king's-bench. See **PAPER-OFFICE.**

CLERK of the Parcels, an officer of the exchequer. See **PARCEL-MAKERS.**

CLERK of the Parliament, is an officer who records all things done in parliament; and engrosses them fairly into parchment rolls, for their better keeping to posterity.—Of these there are two: one of the higher, or house of lords; and the other of the lower, or house of commons.

CLERK of the Patents, or letters patent under the great seal. See **PATENT.**

CLERK of the Peace, is an officer belonging to the session of the peace, whose duty is at the session to read the indictments, to enroll the acts, and draw the process; to enroll proclamations of rates for servants wages; to enroll the discharge of apprentices; to keep the counterpart of the indenture of armour, &c. Also to certify in the king's-bench transcripts of indictments, outlawries, attainders, and convictions, had before the justices of the peace within the time limited by statute.

CLERK of the Pells, belongs to the exchequer: his business is, to enter the teller's bills into a parchment roll, called *pellis recepturam*; and also to make another roll of payment, called *pellis exituum*, wherein he sets down by what warrant the money was paid. 22 and 23 Car. 2.

CLERK of the Petty Bag, is an officer in chancery, whereof there are three; the master of the rolls being their chief.—Their office is to record the return of all inquisitions out of every county, all liveries granted in the court of wards, all other leases; to make all patents of customers, gaugers, comptrollers, and aulgagers; to conge d'elles for the creations of bishops; summons of the nobility, clergy, and burgeses to parliament; commissions directed to knights and others, of every shire, for raising of subsidies; writs for nomination of collectors for the fifteenths; and all traverses upon any office, bill, or otherwise; and to receive the money due, to the king for the same.

CLERK of the Pipe, belongs to the exchequer; who having all accounts and debts due to the king delivered and drawn out of the remembrancer's office, chargeth them down into the great roll: he also writes summons to the sheriff, to levy the said debts upon the goods and chattels of the said debtors; and if there be no goods, he draws them down to the lord treasurer's remembrancer, to write estreats against their lands.

CLERK of the Pleas, is an officer in the exchequer, in whose office the officers of the court, upon special privileges belonging to them, ought to sue, and be sued upon any action.

CLERKS of the Privy Seal, are four officers, who attend the lord keeper of the privy-seal, or, if there be none such, the principal secretary; and write, or make out all things sent by warrant from the signet to the privy-seal, and to be passed to the great-seal: as also to make out privy-seals upon any special occasion of the king's affairs; as for loan of money, or the like.

CLERK of the Sewers, is an officer belonging to the commissioners of the sewers, who writes down all things they do by virtue of their commission, and the authority given them by 13 El. c. 9.

CLERK of the Signet, is an officer continually attending on the king's principal secretary; who has custody of the privy-signet, as well for sealing the king's private letters, as for such grants as pass his majesty's hand by bills signed. Of these there are four, who attend in their turn, and have their diet at the secretary's table.

CLERK of the Superfedeas, is an officer of the court of common-pleas, who makes out writs of *Superfedeas* (upon the defendant's appearing to the exigent on an outlawry) whereby the sheriff is forbid to return the exigent.

CLERK of the Treasury, an officer of the common-pleas, who has charge of the records of the nisi prius, the fees due for all searches, and the certifying of all records into the king's-bench, when a writ of error is brought.—He also makes out all writs of *superfedeas de non molestanda*, which are granted for the defendants while the writ of error hangeth; and all exemptions of records, being in the treasury.

CLERK of the Warrants, is an officer likewise belonging to the court of common-pleas, who enters all warrants of attorney for

plaintiff and defendant; and enrolls all deeds of indentures of bargain and sale, which are acknowledged in the court, or before any judges out of the court, And it is his office to estreat into the exchequer all issues, fines, and ameracements, which grow due to the king in that court, for which he has a standing fee or allowance.

Misprison of CLERKS. See the article MISPRISON. Riding CLERK. See the article RIDING.

Six CLERKS. See the article SIX.

CLEROMANCY *, a kind of divination performed by the throwing of dice, or little bones; and observing the points, or marks turned up.

* The word comes from the Greek κληρο, lot, and μαντεια, divination.

At Bura, a city of Achaia, was a temple, and a celebrated oracle of Hercules; where such as consulted the oracle, after praying to the idol, threw four dies, the points whereof being well scanned by the priest, he was supposed to draw an answer from them.

CLERUS. See CLERK.

CLIENT, CLIENTS, among the Romans, a citizen who put himself under the protection of some great man, who in that relation was called his patron, patronus.

The patron assisted his Client with his protection, interest and estate; and the Client gave his vote for his patron, when he sought any office for himself, or his friends. Clients owed respect to their patrons, as these reciprocally owed them their protection.

This right of patronage was appointed by Romulus, to unite the rich and poor together, in such manner, as that one might live without contempt, and the other without envy. But the condition of a Client, in course of time, became little else but a moderate kind of slavery.

By degrees, the custom extended itself beyond Rome; and not only families, but cities, and entire provinces, even out of Italy, followed the example. Thus Sicily, v. gr. put itself under the clientela, or protection of Marcellus.

Lazius and Budæus, refer the origin of fiefs, and tenures, to the patrons and Clients of ancient Rome: but the difference is pretty considerable between the relation of vassals and their lords, and that of Clients and their patrons. See VASSAL.

The Clients, beside the respect they bore their patrons, and the vote they gave them, were obliged to assist them in all affairs; and even to pay their ransom, if they should be taken prisoners in war, in case they were not able to do it themselves.

CLIENT, is now used for a party in a law-suit, who has turned over his cause into the hands of a counsellor, or solicitor.

CLIMACTERIC*, Annus CLIMACTERICUS, a critical year, or period in a man's age, wherein, according to astrologers, there is some very notable alteration in the body to arise; and a person stands in great danger of death.

* The word comes from the Greek κλιμακτηρ, or κλιμακτηριχ, of κλιμαξ, κλιμακ, scilicet; q. d. by a scale, or ladder.

The first Climacteric is the seventh year of a man's life; the rest are multiples of the first, as 21, 49, 56, 63, and 84; which two last are called the Grand Climacterics, and the dangers here are supposed more imminent.

The opinion has a great deal of antiquity on its side. Aulus Gellius says, it was borrowed from the Chaldeans; who might probably receive it from Pythagoras, whose philosophy turned much on numbers; and who imagined an extraordinary virtue in the number 7.

Marc. Ficinus gives us the foundation of the opinion: he tells us, there is a year assigned for each planet to rule over the body of man, each in his turn: now Saturn being the most malignant planet of all, every seventh year, which falls to his lot, becomes very dangerous; especially those of 63 and 84, when the person is already advanced in years.

Some hold, according to this doctrine, every seventh year an established Climacteric; but others only allow the title to those produced by the multiplication of the climacterical space by an

odd number, 3, 5, 7, 9, &c.—Others observe every ninth year as a Climacteric.

Hevelius has a volume under the title of annus climactericus, describing the loss he sustained in the burning of his observatory, &c. which it seems happened in his first Grand Climacteric.

Suetonius says, Augustus congratulated his nephew upon his having passed his first Grand Climacteric, whereof he was very apprehensive.

Some pretend that the Climacteric years are also fatal to political bodies; which perhaps may be granted, when it is proved that they are so to natural ones.

Authors on this subject, are Plato, Cicero, Macrobius, Aulus Gellius, among the ancients; Argol, Magirus, and Salmatius, among the moderns. And St. Augustin, St. Ambrose, Bede, and Boetius countenance the opinion.

CLIMATE*, CLIMA, or CLIME, in geography, a part of the Surface of the earth, bounded by two circles parallel to the equator, and of such a breadth, as that the longest day in the parallel nearer the pole, exceeds the longest day in that next the equator by some certain space; viz. half an hour.

* The word comes from the Greek κλιμα, inclinamentum, an inclination.

The Beginning of the CLIMATE, is the parallel circle wherein the day is the shortest.

The End of the CLIMATE, is that wherein the day is the longest.

The Climates therefore are reckoned from the equator to the pole; and are so many bands, or zones terminated by lines parallel to the equator: though, in strictness, there are several Climates in the breadth of one zone.

Each Climate only differs from its contiguous ones, in that the longest day in summer is longer or shorter by half an hour in the one place than in the other.

As the Climates commence from the equator, the first Climate, at its beginning, has its longest day precisely twelve hours long; at its end, twelve hours and an half: the second, which begins where the first ends, viz. at twelve hours and an half, ends at thirteen hours; and so of the rest, as far as the polar circles, where, what the geographers call Hour-Climates terminate, and Month-Climates commence.

As an Hour-Climature is a space comprized between two parallels of the equator, in the first of which, the longest day exceeds that in the latter by half an hour; so the Month-Climature is a space terminated between two circles parallel to the polar circles, whose longest day is longer or shorter than that of its contiguous one by a month, or thirty days.

The ancients, who confined the Climates to what they imagined the habitable parts of the earth, only allowed of seven. The first they made to pass through Meroc; the second through Sienna; the third through Alexandria; the fourth through Rhodes; the fifth through Rome; the sixth through Pontus; and the seventh through the mouth of the Borythenes.

The moderns, who have sailed further toward the poles; make thirty Climates on each side: and in regard the obliquity of the sphere makes a little difference in the length of the longest day; instead of half an hour, some of them only make the difference of Climates a quarter.

In fixing the Climates, there ordinarily is no regard had to the refraction.

Vulgarly, the term CLIMATE is bestowed on any country or region differing from another, either in respect of the seasons, the quality of the soil, or even the manners of the inhabitants: without any regard to the length of the longest day.

Abulfeda, an Arabic author, distinguishes the first kind of Climates by the term real Climates; and the latter by that of apparent Climates.

Varenius gives us a table of thirty Climates; but without any regard to the refraction. Ricciolus furnishes a more accurate one, wherein the refractions are allowed for: an abstract of which follows.

A Table of CLIMATES.

Middle of Clim.	Longest Day.	Latit.	Climates.	Longest Day.	Latit.	Middle of Clim.	Latit.	Cont. Light.	North Night.	Cont. Light.	South Night.
I	12 ^h 30'	7° 18'	VIII	16 ^h 0'	48° 15'	XV	66° 53'	31 ^h	27 ^h	30 ^h	28 ^h
II	13 0'	15 36'	IX	17 0'	53 46'	XVI	69 30'	62	58	60	59
III	13 30'	23 8'	X	18 0'	57 44'	XVII	73 0'	93	87	89	88
IV	14 0'	29 49'	XI	19 0'	60 39'	XVIII	78 6'	124	117	120	118
V	14 30'	35 35'	XII	20 0'	62 44'	XIX	84 0'	156	148	150	149
VI	15 0'	40 32'	XIII	22 0'	65 10'	XX	90 0'	188	180	178	177
VII	15 30'	44 42'	XIV	24 0'	65 54'						

CLIMAX, Κλιμαξ, or Gradation, in rhetoric, a figure, whereby the discourse ascends, or descends, as it were by degrees. Such is that of Cicero to Cataline, Nihil agis, nihil moliris, nihil cogitas; quod ego non audiam, quod etiam non videam, planeque sentiam: thou dost nothing, movest nothing, thinkest nothing; but I hear it, may see it, and perfectly understand it. Thus, the same Cl-

cero to Atticus; Si dormis, expurgare; si stas, ingredi; si ingredere, curare; si curris, advolare. So, Tertullian de Spect. * Who ever found the truth without God? Who ever found * God without Christ? Who Christ without the Holy Spirit? * Who the Holy Spirit without Faith?

CLINIC, CLINICUS *, a term applied by some church-historians to those among the antients, who received baptism on their death-bed.

* The word is Greek, κλινικός, formed from κλινω, a bed.

It was the doctrine of many of the fathers, that baptism absolutely washed away all previous sins, and that there was no atonement for sins committed after baptism. On this account, many deferred that sacrament till they were at the last stage of life, and were pretty safe from the danger of sinning any more, and such were called *Clinici*.

Magnus, in the third century, made a doubt whether or no *Clinici* were truly baptized, in regard the ceremony was only performed by aspersion, instead of immersion! he consulted St. Chrysostom on the point, who made him answer, that the sacrament does not wash away sin after the manner of a corporal bath; and shews from scripture that aspersion is sufficient.

CLINIC is also used in antiquity for a patient, or person merely sick, even without keeping his bed.—As appears from the life of Charlemaign, in Canisius.

CLINICUS is also used for a physician.—In regard, physicians are much conversant about the beds of the sick.

It was, however, principally the physicians of emperors that were called by this title.

CLINIC is now seldom used but for a quack; or rather for an empirical nurse, who pretends to have learned the art of curing diseases by attending on the sick.

Medicina CLINICA, was particularly used for the method of visiting, and treating sick persons in bed, for the more exact discovery of all the symptoms of their disease.

Le Clerc observes, that Esculapius was the first who exercised the *Clinic medicine*.

CLINOIDES *, in anatomy, an epithet given to three internal apophyses of the os sphenoides, one of the bones of the cranium; so called, say some, from their resembling the feet of a bed. See **SPHENOIDES**.

* The word is formed of the Greek κλινω, a bed, and εἶδος, form; either from the resemblance which the three bones bear to the feet of a bed; or from the cavity they form, which resembles a bed itself.

Two of these are anterior, or before; the third posterior, behind: the three together form a little cavity, from its shape called *fella turcia*, or *equina*; wherein is placed the pituitary gland.

CLITORIDIS Musculi, in anatomy. See **RECTOR Clitoridis**.

CLITORIS, κλειτορίς, in anatomy, a long round body in the fore-part of the vulva, or natural parts of a woman; being one of the organs of generation in that sex.—See *Tab. Anat. (Splanch.) fig. 9. lit. a. p. fig. 11. lit. m. fig. 13. lit. a.*

Its figure represents that of a gland: ordinary it is pretty small, but in some women thick, and long.—In many respects, it represents the penis of a man; whence some call it *mentula*, or *penis muliebris*, the woman's yard.

In effect, it is composed of the same parts; it has, like it, two cavernous or spongy bodies; and a gland at the extremity, covered with a præputium; but it is not pierced through like the penis.

It has two muscles which erect it in coition; on which occasion it swells, and grows hard. Some anatomists pretend too, that it has two muscular ejaculators.—See *Tab. Anat. (Splanch.) fig. 13. lit. f. f.*

Its sensation is exquisite; and it is found the chief seat of pleasure; so that some call it *osfrum veneris*. And hence it is said, some women are apt to abuse it. See **POLLUTION**.

The extremity of this part is sometimes cut off; as in circumcision, and where it advances out too far. It is sometimes so large and proreptent, that it bears a full resemblance to the virile member; whence the persons in whom it is so found, frequently pass for hermaphrodites.

The spongy bodies of the *Clitoris*, arise distinctly from the lower parts of the os pubis; and approaching one another, unite, and form the body of the *Clitoris*. Before their union they are called the *crura clitoridis*; and are twice as long as the body of the *Clitoris*.

Its muscles arise from the protuberance of the ischium, and are inserted into its spongy bodies. It has veins and arteries from the hæmorrhoidal vessels, and pudenda; and nerves from the intercostals.

CLOACA *, among the antients, was a subterraneous aqueduct, or common-floure, for the reception and discharge of the filth of a city, or house.

* The word is formed from the Greek κλωακή, I wash away. Tarquinius Priscus is said to have been the first who contrived *Cloacæ* in antient Rome; to which end, a canal was first dug through the mountains whereon the city stood, and divided into three branches, called the *great Cloaca*.

The care and inspection of the *Cloacæ* belonged to the censors, till the time of Augustus, who appointed curatores *Cloacarum* on purpose.—The Romans had also their *Cloacina*, or goddess, who presided over the *Cloacæ*.

CLOATHS, or **CLOTHERS**. See the article **HABIT**.

CLOCK, a kind of movement, or machine, serving to measure, and strike time.

The usual chronometers are watches, and *clocks*: the former, in strictness, are such as shew the parts of time; the latter, such as publish it by striking: though the name watch is ordinarily appropriated to pocket-*Clocks*; and that of *Clocks* to larger machines, whether they strike or no.

The parts common to both kinds of movements, see under the article **MOVEMENT**.—Those peculiar to watches and *Clocks*, see under **WATCH-WORK**, and **CLOCK-WORK**.

The invention of *Clocks* with wheels, is referred to Pacificus arch-deacon of Verona, who lived in the time of Lotharius, son of Louis the Debonnair; on the credit of an epitaph quoted by Ughelli, and borrowed by him from Panvinus.

They were at first called *natural dials*; to distinguish them from sun-dials, which shewed the hour by the sun's shadow.—Others ascribe the invention to Boethius, about the year 510.

Mr. Derham makes *Clock-work* of a much older standing; and ranks Archimedes's sphere, mentioned by Claudian, and that of Pseudoionus, mentioned by Cicero, among the machines of this kind; not that either their form or use were the same with those of ours: but that they had their motion from some hidden weights, or springs, with wheels, or pulleys, or some such *Clock-work* principle. Thus he understands the *Inclusus variis famularatur spiritibus astris*, & *oritur certis motibus urget opus*.

But be this as it will, it is certain the art of making *Clocks*, such as are now in use, was either first invented, or at least retrieved, in Germany about 200 years ago.

The water-*Clocks*, or clepsydræ, and sun-dials, have both a much better claim to antiquity.

—The French annals mention one of the former kind, sent by Aaron king of Persia to Charlemaign, about the year 807, which seemed to bear some resemblance to the modern *Clocks*: It was of brass, and shewed the hours by twelve little balls of the same metal, which fell at the end of each hour, and in falling, struck a bell, and made it sound. There were also figures of twelve cavaliers, which at the end of each hour came forth at certain apertures, or windows in the side of the *Clock*, and shut them again, &c.

Among the modern *Clocks*, the most eminent for their furniture, and the variety of their motions and figures, are those of Strasbourg, and of Lyons. In the first, a cock claps his wings, and proclaims the hour; the angel opens a door, and salutes the virgin; and the holy spirit descends on her, &c. In the second, two horsemen encounter, and beat the hour on each other; a door opens, and there appears on the theatre the virgin with Jesus Christ in her arms; the magi, with their retinue, marching in order, and presenting their gifts; two trumpeters sounding all the while to proclaim the procession. See Scottus; see also Salmastius on Solinus, Mafius de *Tivinatibus*, and Kircher in his *Museum Romanum*, and *Oedip. Egypt.*

The invention of pendulum *Clocks* is owing to the happy industry of the last age: the honour of it is disputed between Huygens and Galileo. The former, who has a volume on the subject, declares it was first put in practice in the year 1657, and the description thereof printed in 1658. Becher, *de nova temporis dimetiendi theoria*, anno 1680, speaks for Galileo; and relates, though at second hand, the whole history of the invention: adding, that one Treffer, clock-maker to the father of the then grand duke of Tuscany, made the first pendulum *Clock* at Florence, by direction of Galileo Galilei; a pattern of which was brought into Holland.

The academy del Cimento say expressly, that the application of the pendulum to the movement of a *Clock* was first proposed by Galileo, and first put in practice by his son Vincenzo Galilei, in 1649.

Be the inventor who he will, it is certain the invention never flourished till it came into Huygens's hands, who insists on it, that if ever Galileo thought of such a thing, he never brought it to any degree of perfection.

The first pendulum *Clock* made in England, was in the year 1622, by M. Fromantil a Dutchman. See **PENDULUM**.

Pendulum *CLOCK*. } See the articles } **PENDULUM Clock**.
Pocket *CLOCK*. }
Repeating *CLOCK*. } **WATCH**.

CLOCK-WORK, is that part of the movement which strikes the hour, &c. on a bell.

The wheels it consists of are the great, or first wheel; which is that the weight or spring first drives: in sixteen or twenty hour-*Clocks*, this has usually pins, and is called the *pin-wheel*; in eight-day pieces, the second wheel is commonly the pin-wheel, or striking-wheel. Next the striking-wheel, is the detent-wheel, or hoop-wheel, having a hoop almost round it, wherein is a vacancy at which the *Clock* locks. The next is the third, or fourth wheel, according to its distance from the first. The last is the flying pinion, with a fly, or fan to gather air, and so bridle the rapidity of the *Clock's* motion. To these must be added the pinion of report; which drives round the locking-wheel, called also the *count-wheel*; ordinarily with eleven notches in it, unequally distant, to make the *Clock* strike the hours. See **WHEEL**.

Besides the wheels, to the *Clock*-part belongs the rafh, or ratch; a kind of wheel with twelve large fangs, running concentric to the dial-wheel, and ferving to lift up the detents every hour, and make the *Clock* ftrike: the detents, or flops, which being lifted up, and let fall, lock and unlock the *Clock* in ftriking: the hammers which ftrike the bell: the hammer-tails, by which the ftriking pins draw back the hammers: latches, whereby the work is lifted up and unlocked; and lifting-pieces, which lift up and unlock the dents.

Theory and Calculation of Clock-Work.—The method of calculating the numbers of a piece of *Clock-work*, having fomething in it very pretty, and at the fame time very eafy and ufeful, we fhall give the readers the rules relating thereto: referring, for the general rules that obtain in the calculation of all movements, of watch as well as *Clock-work*, to the article MOVEMENT; and for the particular rules of watch-work, to the article WATCH-*Work*.

For the ftrict calculation itfelf, it bears that affinity to the calculation of watch-work, that to avoid the repetitions we fhall refer to that head: what *Clock-work* has peculiar to itfelf, will be conceived from what follows.

Rules for calculating the ftriking part of a Clock.—Firft then, Obferve that regard, here, needs only be had to the count-wheel, ftriking-wheel, and detent-wheel, which move round in this proportion: the count-wheel commonly goes round once in 12 or 24 hours: the detent-wheel moves round every froke the *Clock* ftrikes, or fometimes but once in two frokes; wherefore, it follows, that,

Secondly, as many pins as are in the pin-wheel, fo many turns hath the detent-wheel in one turn of the pin-wheel; (or, which is the fame) the pins of the pin-wheel are the quotients of that wheel, divided by the pinion of the detent-wheel. But if the detent-wheel move but once round in two frokes of the *Clock*, then the faid quotient is but half the number of pins.

Thirdly, As many turns of the pin-wheel as are required to perform the frokes of 12 hours, (which are 78) fo many turns muft the pinion of report have, to turn round the count-wheel once: or thus, the quotient of 78, divided by the number of ftriking pins, fhall be the quotient for the pinion of report and the count-wheel; and this is in cafe the pinion of report be fixed to the arbor of the pin-wheel, which is commonly done.

An example will make all plain: the locking wheel being 48, the

- pinion of report 8, the pin-wheel 78, the ftriking-pins are 13, and fo of the refl. Note alfo, that 78 divided by 13 gives 6, the quotient of the pinion of report. As for the warning-wheel, and flying-wheel, it matters little what numbers they have; their ufe being only to bridle the rapidity of the motion of the other wheels.

1. To find how many frokes a *Clock* ftrikes in one turn of the fuffy, or barrel. As the turns of the great wheel, or fuffy, are to the days of the *Clock*'s continuance; fo is the number of frokes in 24 hours, viz. 156, to the frokes of one turn of the fuffy.

2. To find how many days the *Clock* will go. As the frokes in 24 hours are to thofe in one turn of the fuffy; fo are the turns of the fuffy to the days of the *Clock*'s going.

3. To find the number of turns of the fuffy, or barrel. As the frokes in one turn of the fuffy, are to thofe of 24 hours; fo is the *Clock*'s continuance, to the turns of the fuffy, or great wheel.

4. To fix the pin of report on the fpindle of the great wheel. As the number of frokes in the *Clock*'s continuance is to the turns of the fuffy; fo are the frokes in 12 hours, viz. 78, to the quotient of the pinion of report, fixed on the arbor of the great wheel.

5. To find the frokes in the *Clock*'s continuance. As 12 is to 78, fo are the hours of the *Clock*'s continuance to the number of frokes in that time.

To add Chimes to a piece of *CLOCK-work*. See the article CHIMES.

Balance of a *CLOCK*. See the article BALANCE.

Clock-Makers Compaffes. See the article COMPASSES.

CLOISTER, CLAUSTRUM, a habitation furrounded with walls, and inhabited by canons, or religious.

In a more general fenfe, *Cloifter* is ufed for a monaffery of religious of either fex.

In a more reftained fenfe, *Cloifter* is ufed for the principal part of a regular monaffery, confifting of a fquare built around; ordinarily, between the church, the chapter-houfe, and the refectory; and over which is the dormitory. See DORMITORY, &c.

The *Cloifters* ferved for feveral purpofes in the antient monafferies. Petrus Blefenfis obferves, that it was here the monks held their lectures: the lecture of morality at the north-fide, next the church; the fchool on the weft, and the chapter on the eaft; fpiritual meditation, &c. being referved for the church.

Du Cange concludes, that all thefe different exercifes were performed in the *Cloifter* itfelf; but by miftake. The church, the chapter-houfe, and the fchool were not parts of the *Cloifter*, but buildings adjoining to it.

Lanfranc obferves, that the proper ufe of the *Cloifter* was for

the monks to meet in, and converse together, at certain hours of the day.

The form of the *Cloifter* was fquare; and it had its name *claustrum*, from *claudere*, I fhut or clofe, as being inclofed on its four fides with buildings.

Hence, in architecture, a building is ftill faid to be in form of a *Cloifter*, when there are buildings on each of the four fides of the court.

CLOISTERED Monks. See the article MONK.

CLOSE, in heraldry. When any bird, addicted to flight, is drawn in a coat of arms, in a ftanding pofture; with its wings clofe down about it, and not either flying or difplayed, they blazon it by the word *Clofe*.

In which fenfe *Clofe* ftands oppofed to *Volant*. See VOLANT. It is alfo applied to the peacock, dunhill-cock, &c. in regard that it is their ordinary pofture.

The term *Clofe* is likewife ufed for the barnacles, or bits of a bridle, when not extended, as they are ufually born.

It is alfo applied to the bearing of a helmet, with the vizor down:

A barnacle *Clofe*, helmet *Clofe*, &c.

CLOSE, in mulick. See the article CADENCE.

CLOSE Field. See the article FIELD.

CLOSE Fights, a-board a fhip, are bulk-heads put up fore and aft in the fhip, for the men to ftand behind in a clofe engagement, and fire on the enemy; or if the fhips be boarded, to fcour the decks.

CLOSE Fire. See FIRE, and REVERBERATION.

Pound CLOSE. See the article POUND.

CLOSET, in heraldry, fignifies the half of a bar. See BAR.

Clerk of the CLOSET. See the article CLERK.

CLOTH, in commerce, in its general fenfe, includes all kinds of ftuffs wove or manufactured on the loom, whether their threads be of wool, hemp, or flax.

CLOTH, is more peculiarly applied to a web, or tiffue of woollen threads, interwoven; whereof fome, called the *warp*, are extended lengthwife, from one end of the piece to the other; the refl, called the *woof*, are difpofed a-crofs the firft, or breadthwife of the piece.

Cloths are woven on the looms as well as linens, druggets, ferges, camblets, &c. They are of various qualities, fine, coarfe, strong, &c. fome are made of wool, and this of different colours; the wool being dyed and drefed, are firft spun, then wove: others are wrought white, deftined to be died in fcarlet, black, blue, green, yellow, &c.—Their breadths and lengths are various, according to the places where they are manufactured.

The goodnefs of CLOTH confifts 1^o. In the wool's being fine, and well drefed. See WOOL.—2^o, in its being spun equally; always obferving, however, that the thread of the warp be finer and better twifted than that of the woof.

3^o, In the *Cloths* being well wrought and beaten on the loom, fo as to be every where equally clofe and compact.—4^o, In the wool's not being finer and better at one end of the piece than in the refl.—5^o, In the lifts being fufficiently strong, and of the fame length with the ftuff; and that they confift of good matter, as wool, hair, or ottrich feathers, or the hair of Danifh dogs; which laft is the beft.—6^o, In the *Cloths*' being well cleared of the knots, and other imperfections.—7^o, In its being firft well fcoured with good fullers-earth, then filled with the beft white foap, and washed out in clear water. See FUL-LING.—8^o, In the hair or nap's being well drawn out with the teazle, or thifle, on the pole, without being too much opened. See TEAZLE.—9^o, In its being thorn clofe; yet without laying the ground or thread bare. See SHEERRING.—10^o, In its being well dyed.—11^o, In its not being ftretched, or pulled farther than is neceffary to fet it fquare, and bring it to its juft length and breadth. See TENTER.—12^o, In its only being preffed cold; hot-pretting being an utter enemy to *Cloth*.

Manufacturing of white CLOTHS for dying.—The beft wools for the purpofe are thofe of England and Spain; efppecially thofe of Lincolnfhire, and Segovia.

To ufe them to the beft advantage; when taken out of the bales, they muft be fcoured; by putting them in a liquor fome-what more than luke-warm, compofed of three parts of fair water, and one of urine. After the wool has continued long enough in the liquor to difolve and loofen the greafe, it is taken out, drained, and washed in a running water: It is known to be well fcoured, when it feels dry to the touch, and has no fmell but the natural fmell of the fheep.

In this ftate it is hung out to dry in the fhade; the heat of the fun being apt to make it harfh, and untractable. When dry, it is beat with rods on hurdles of wood, or on ropes, to clear out the duft and groffer filth: the more it is thus beat and cleaned, the more foft it becomes, and the better it spins.—After beating, it is well pickled, to clear the refl of the filth, that had efaped the rods.

It is now in a ftate to be oiled, and carded on large iron cards, placed a-flope. The beft oil for the purpofe is oil of olives; one fifth of which, at leaft, fhould be ufed for the wool deftined for the woof, and a ninth for that of the warp.

It is now given out to the spinners; who first card it on the knee, with small fine cards; then spin it on the wheel: observing to make the thread of the warp smaller by one third than that of the woof, and much clofer twisted; in order to this, the latter must be spun with the band, or string open, and the former with it crossed.

The thread being thus spun, reeled and made into skeins; that destined for the woof is wound on spools, *i. e.* on little tubes, or pieces of paper, or ruffles, so disposed as that they may be easily put in the eye of the shuttle. That for the warp is wound on a kind of rochets, or large wooden bobbins, to dispose it for warping.

When warped, it is stiffen'd with size; whereof, that made of shreds of parchment is the best; and when dry is given to the weavers, who mount it on the loom.

The warp being on the loom, the weavers, who are two to each loom, one on each side, tread at the same time, alternately, on the same treadle; *i. e.* now on the right step, and now on the left, which raises and lowers the threads of the warp equally; between which they throw, transversely, the shuttle from the one to the other. And each time that the shuttle is thrown, and so a thread of the woof inserted within the warp, they strike it conjointly with the same frame wherein is fastened the comb, or reed, between whose teeth the threads of the warp are passed; repeating the stroke as often as is necessary; in some Cloths no less than twelve or thirteen times, *viz.* six with the warp open, and seven shut.

It may be observed, that the more the threads of the woof are struck against each other, the clofer the Cloth is: and hence it becomes enabled to sustain the violence of the fulling-mill, as well as of the teazel, or fulling-thistle, without fretting or opening.

The weavers having continued their work till the whole warp is filled with woof, the Cloth is finished: It is taken off the loom by unrolling it from the beam whereon it had been rolled in proportion as it was wove; and is now given to be cleared of the knots, ends of thread, straws, and other filth; which is done with little iron nippers.

In this condition it is carried to the fullery, to be scoured with urine, or a kind of potters clay well cleansed and steeped in water, put along with the Cloth in the trough, wherein it is filled. See FULLING.

The Cloth being again cleared from the earth, or urine, by washing it in water, is returned to the former hands, to have the lesser filth, small straws, and almost imperceptible knots taken off as before: then it is returned to the fuller, to be beat and filled with hot water, wherein five or six pounds of soap have been dissolved. The soap most esteemed is the white, especially that of Genoa. After fulling an hour and a half, it is taken out to be smoothed, *i. e.* to be pulled by the lifts lengthwise, to take out the wrinkles and creases occasioned by the force of the mallets, or pestles falling on the Cloth when in the troughs.

The smoothing is repeated every two hours, till the fulling be finished, and the Cloth brought to its proper breadth: after which, it is washed in clear water, to purge it of the soap, and given, all wet, to the carders, to raise the hair, or nap, on the right side, with the thistle or weed; wherewith they give it two rubs or courses, the first against the grain, the second with the grain. The Cloth being dried after this preparation, the cloth-worker takes it, and gives it its first cut, or sheering.—This done, the carders resume it, and after wetting it, give it as many more rubs or courses with the teazel as the quality of the stuff requires: always observing to begin against the hair, and to end with it; and to begin with a smoother thistle, proceeding still to a sharper and sharper, as far as the sixth degree.

After this, the Cloth being dried, is returned to the cloth-worker, who sheers it a second time, and returns it to the carder; who wetting it again, gives it as many courses as he thinks fit, dries it, and gives it back again to the cloth-worker; who after sheering it the third and last time, returns it to the carders, who repeat their operation as before, till the hair, or nap, be well ranged on the surface of the Cloth, from one end of the piece to the other.

It must be observed, that it is indispensibly necessary the Cloth be wet, while in the carders hands; in order to which, it is sprinkled from time to time with water.

The nap being finished, and the Cloth dried, the cloth-worker gives it as many cuts as he thinks requisite for the perfection of the stuff. It must also be observed, that all the sheerings must be on the right side, except the two last, which must be on the other; and that the Cloth cannot be too dry for sheering.

The Cloth thus wove, scowred, napped, and shorn, is sent to the dyer.—When dyed, it is washed in fair water, and the cloth-worker takes it again, wet as it is, lays the hair, or nap, with a brush on a table, and hangs it on the tenters; where it is stretched both in length and breadth, enough to smooth it, set it square, and bring it to its proper dimensions, without straining it too much; observing to brush it afresh, the way of the hair, while yet a little moist on the tenter.

When quite dry, the Cloth is taken off from the tenter, and brushed again on the table, to finish the laying of the nap: it is then folded, and laid cold under a press, to make it perfectly smooth and even, and to give it a little gloss.

The gloss is given by laying a leaf of vellum, or cap-paper in each plait of the piece; and over the whole a square plank of wood: on which, by means of a lever, the screw of a press is brought down, with the degree of force judged necessary, with regard to the quality of the Cloth.—In France, none but scarlets, greens, blues, &c. receive this last preparation; blacks being judged better without it.

Lastly, the Cloth being taken out of the press, and the papers removed; it is in a condition for sale, or use.

For the manufacture of mixed Cloths, or those wherein the wools are first dyed, then mixed, spun, and wove of the colours intended; the process, except in what relates to the colour, is mostly the same with that just spoke of.

The method of adjusting the mixture, is by first making a felt or flock of the colours of the intended Cloth, as a specimen: the wool of each colour is weighed, and when the specimen is to the manufacturer's mind, he mixes, for use, a quantity in the same proportion; estimating each grain of the specimen at twenty pounds weight of the same wool in the Cloth to be made.

Thus, if he would mix three colours, *v. gr.* coffee-colour, feuille-mort, and pale blue, the first to be the prevailing colour; he weighs a quantity of each: for instance, 70 grains of the first, 25 of the second, and 20 of the third; then multiplies each by 20 pounds of wool; and thus gains 1400 pounds for the coffee wool; 500 pounds for the feuille-mort, and 400 for the pale blue.

The wools of the specimen thus weighed, are mixed, oiled, carded, moistened with clear water, rubbed with black soap, and in this state wrought a long time in the hands; till they are reduced into a piece of felt, like that used by haters.

It is then rinsed in water, to purge out the oil and soap; and when dry, the hair, or nap, is carded out with the teazel; then shorn carefully, till the ground appear, and the several colours be discoverable.

Lastly, wetting it a little, and pressing it, he examines it well, and if he be not contented with it, makes another felt; if he be, he proceeds to mix his wools: when mixed, it is beat on hurdles, cleaned, oiled, carded, spun, wove, &c. as in white Cloth.

Castings of Lead on CLOTH. See the article CASTING.

Cocking CLOTH. See the article COCKING CLOTH.

Frizing of CLOTH. See the article FRIZING.

Green CLOTH. See the article GREEN.

House-wife's CLOTH. See the article HOUSE-WIFE.

Incombustible CLOTH. See ASBESTOS, ASBESTINE, and LINUM INCOMBUSTIBILE.

Painting on CLOTH. See the article PAINTING.

Sear-CLOTH. See the article SEAR-CLOTH.

CLOUD, in physiology, a collection of condensed vapour, suspended in the atmosphere. See VAPOUR.

A Cloud is a congeries of watery particles, or vesicles raised from the waters, or watery parts of the earth, by the solar, or subterraneous heat, or both; which at their first rise from our globe, are too minute to be perceived; but as they mount, meeting with a greater degree of cold, are condensed, and rendered opaque by the reunion of their parts; so as to reflect light, and become visible.

The manner wherein vapours are raised into Clouds may be conceived thus.—Fire being of a light, agile nature, easily breaks loose from bodies wherein it is detained: For the manner whereof, see BOILING.

Now, by reason of the exceeding smallness of the particles of fire, their attractive force must be exceedingly great; hence, in their ascent through fluid bodies, part of the fluid will cling around them, and mount up together with them, in form of vesicles of water replete with particles of fire; and these vesicles are what we call Vapour.

Further, these vapours being specifically lighter than air, mount in it, till having reached such a region of the atmosphere as is of the same specific gravity with themselves, they will be suspended; till the watery vesicles, which were at first too thin to be perceived, being now condensed by the cold of the superior regions; and their included igneous particles extinct, or at least driven into a less compass, and consequently the parts fit closer together; their density is first augmented so as to render them opaque enough to reflect the sun's light, and become visible; and their specific gravity increased, so as to make them descend: in the former state they are called Clouds; and in the latter, when they arrive at us, rain.

Clouds, beside their use when they descend in showers, are of service while suspended in the atmosphere; as they help to mitigate the excessive heat of the torrid zone, and screen it from the beams of the sun, especially when in his zenith.

CLOVE*, an aromatic fruit, bore on a tree of the same name; by the Latins also called *Caryophyllus*.

* The fruit is somewhat in form of a nail; whence the term Clove from the French *Clou*, nail.

The Clove-tree was antiently very common in the Molucco-islands; where all the European nations, who traffic in spices to the Indies, furnished themselves with what quantity of Cloves they required. At present there are scarce any found but in the island of Ternate: the Dutch, in order to render themselves masters of that merchandize, having dug up the Clove-trees of the

Moluccos, and transplanted them to Ternate; so that there are none now to be had but through their hands.

The tree is very large; its bark resembles that of the olive-tree, and its leaves those of the laurel: its fruit falling, takes root, and thus it multiplies itself without any culture. It is said, it will not allow any other herb, or tree, to grow near it; its excessive heat drawing to it all the humidity of the soil.

When the *Clove* first begins to appear, it is of a greenish white colour; as it ripens it grows brown. Nor is there any preparation necessary in order to render it such as it comes to us, but to dry it in the sun; whatever some authors talk of first steeping it in sea-water, to preserve it from worms.

Towards the head, it separates into four; and the four quarters being shaped angle-wise, their apices meeting at the top, form a kind of crown, somewhat in the antique manner.

Cloves must be chosen dry, brittle, harsh to the touch, well grown, of a dusky reddish colour, a hot aromatic taste, an agreeable smell, and, if possible, with the stalk on.

Their properties are, to warm and dry, to correct a fetid breath, to sharpen the sight, dissipate films in the eyes, fortify the stomach and liver, and stop vomiting. They are used in apoplexies, palsies, lethargies, and other diseases of the brain.

Such of the fruit as escape the gatherers, grow and swell on the tree, and become full of a gum; these are sometimes used in medicine, and are called *Mother of Cloves*.

There is also an oil drawn from *Cloves* by distillation; which, when new, is of a pale yellow colour, but reddens as it grows old: it is used in medicine as a sovereign remedy for the tooth-ach, and in compositions with the same view as the fruit. It is also much used among the perfumers.

The natives call the *Clove-tree* *chamque*, the Persians and Arabs *karumfel*, and the Turks *kalafour*. They make several preparations both of the flowers, and the fruit.

CLOYE-CINNAMON. See the article CINNAMON.

CLOYE-WATER. See the article WATER.

CLOUGH, or Draught, in commerce, an allowance of two pounds in every hundred weight for the turn of the scale; that the commodity may hold out weight when sold out by retail.

CLOUT-NAILS. See the article NAIL.

CLUNY, or CLUGNY, a celebrated abbey of Benedictin monks, in a city of that name; being the head, or chief of a congregation denominated from them.

It is situate in the Maçonnois, a little province of France, on the river Grône; and was founded by William duke of Berry and Aquitain; or, as others say, by the abbot Bernon, supported by that duke, in the year 910.

This abbey was antiently so very spacious and magnificent, that in 1245, after the holding of the first council of Lyons, pope Innocent IV. went to *Cluny*, accompanied with the two patriarchs of Antioch and Constantinople, twelve cardinals, three archbishops, fifteen bishops, and a great number of abbots; who were all entertained, without one of the monks being put out of their place: though S. Louis, Q. Blanche his mother, the duke of Artois his brother, and his sister, the emperor of Constantinople, the sons of the kings of Arragon and Castile, the duke of Burgundy, six counts, and a great number of lords, with all their retinue, were there at the same time.

Cluny, at its first erection, was put under the immediate protection of the apostolick see; with express prohibition to all secular and ecclesiastick powers, to disturb the monks in the possession of their effects, or the election of their abbot. By this they pretended to be exempted from the jurisdiction of bishops; which, at length, gave the hint to other abbies to insist on the same.

Cluny is the head of a very numerous and extensive congregation: in effect, it was the first congregation of divers monasteries united under one chief, so as only to constitute one body, or, as they call it, one order, that ever arose.

CLYPEUS, or CLYPEUM, Buckler; a piece of defensive armour, which the antients used to carry upon the arm, to secure them from the blows of their enemies.

The figure of it was either round, oval, or sexangular: in the middle was a boss of iron, or of some other metal, with a sharp point. See SHIELD.

CLYSSUS, a chymical production, consisting of the most efficacious principles of any body, extracted, purified, and then re-mixed.

A *Clyssus* is when the several species, or ingredients of a body, are prepared and purified separately, and then combined again.—Thus, salt, sulphur, oil, spirit, and mercury, reassembled into one body, by long digestion, &c. make a *Clyssus*.

Clyssus of *Antimony*, is an agreeable acid spirit, drawn by distillation from antimony, nitre, and sulphur mixed together.

There is also a *Clyssus* of vitriol, which is a spirit drawn by distillation from vitriol dissolved in vinegar.—This is used by physicians in various diseases, and to extract the tinctures of several vegetables.

Clyssus is also used among some authors for a kind of sapa, or extract, made with eight parts of the juice of a plant, and one of sugar, seethed together into the consistence of honey.

CLYSTER, *κλύστρον*, in medicine, a liquid remedy, or injection,

introduced into the intestines by the fundament; in order to refresh them, loosen the belly, moisten and soften the faeces, dissipate wind, &c.

* The word comes from the Greek *κλύω*, *lavo*, *ablus*, I wash. *Clysters* are sometimes made of bran-water, and milk, but more usually of decoctions of certain herbs; to which are added honey, brown sugar, and sometimes lenitive electuary, and other drugs. *Clysters* are either emollient, carminative, lenitive, astringent, laxative, aodyne, uterine, antifebrile, nourishing, &c.

Nourishing CLYSTERS, are those applied with design to nourish persons who cannot take in any aliment at the mouth. Hildanus tells us, that Aubery, a physician, fed a woman of quality six weeks with *Clysters* composed of capons flesh, and other fowls, boiled to a pulp, with yolks of eggs, applied twice a day.

It is difficult, however, to conceive how *Clysters* should nourish; and the case is briskly controverted in the memoirs of the French royal academy, between M. Litre, who maintains the negative, and M. Lemery.

The arguments urged by the first, are, that the materials of the *Clyster*, for want of the ordinary passage, want the preparation necessary to be converted into nourishment; and beside that, are out of the road for getting into the blood: for in the first of the large intestines, called the *cæcum*, is a valve called *valvula Bauhini*, to oppose the passage of any food into the small intestines: and there are no lacteal veins in the large intestines, but abundance in the small ones. But the lacteals are the only canals that can carry the chyle into its receptacle, and the chyle is the only substance that can nourish.

To this, M. Lemery objects, that very great anatomists have found lacteals in the large intestines, though but in small number: but though there were none, adds he, the mesaraic veins are indisputably distributed to these intestines; and may easily be supposed to pump up the most subtil part of a broth, and carry it into the blood. M. Mery has passed a liquor immediately from the large intestines into these veins; besides, that the animal machine is so porous throughout, that nature seems to have intended an extraordinary way of conveying fluids into the blood, to be ready on extraordinary occasions.

This notion will appear inconceivable, if M. Morin's theory of the passage of the urine be admitted.

Herodotus says, the Egyptians were the first who invented *Clysters*; or rather, who applied them to use. Galen and Pliny add, that they took the hint from a bird of their country, called *Ibis*, which they frequently observed to make this kind of injection with its beak, and afterwards to discharge itself several times. Others say, that the ciconia, or stork, first taught men the application of *Clysters*.

Uterine CLYSTERS, are injections into the uterus, or womb.

Catholicon for **CLYSTERS.** See the article CATHOLICON.

CNEMODACTYLÆUS, in anatomy, a muscle, otherwise called *extensor tertii internodii digitorum*. See **EXTENSOR tertii internodii**, &c.

COACERVATUM vacuum. See the article VACUUM.

COACH, a vehicle for commodious travelling, suspended on leathers, and moved on wheels.

In England, and throughout Europe, the *Coaches* are drawn by horses, except in Spain, where they use mules. In a part of the east, especially the dominions of the great Mogul, their *Coaches* are drawn by oxen. In Denmark they sometimes yoke rein deer in their *Coaches*; though this is rather for curiosity than use.

The *Coachman* is ordinarily placed on a seat raised before the body of the *Coach*. But the Spanish policy has displaced him in that country by a royal ordinance; on occasion of the duke d'Olivares, who found that a very important secret whereon he had conferred in his *Coach*, had been overheard, and revealed by his coachman: since that time, the place of the Spanish coachman, is the same with that of the French stage-coachman, and our postillion, *viz.* on the first horse on the left.

The invention of *Coaches* is owing to the French: yet are not *Coaches* of any great antiquity, even in France; scarce reaching beyond the reign of their Francis I.

Their use, at their first rise, was only for the country: and authors observe, as a thing very singular, that there were at first no more than two *Coaches* in Paris; the one that of the queen, and the other that of Diana, natural daughter of Henry II. The first courtier who had one, was Jean de Laval de Bois Dauphin; whose enormous bulk disabled him from travelling on horseback.

One may hence judge how much vanity, luxury, and idleness have grown upon our hands in later days; there being now computed in that city no less than 15000 *Coaches*.

Coaches have had the fate of all other inventions to be brought by steps and degrees to their perfection; at present they seem to want nothing, either with regard to ease or magnificence. Louis XIV. of France, made several sumptuary laws for restraining the excessive richness of *Coaches*, prohibiting the use of gold, silver, &c. therein; but they have had the fate to be neglected.

Coaches may be divided into two kinds; those that have iron bows, or necks, and those that have not: both the one and the other have two principal parts, the body, and the train, or carriage.

The *body* is that part where the passengers are disposed; and the *carriage* is that which sustains the body, and to which the wheels are fastened, that give motion to the whole machine. *Coaches* are distinguished, with regard to their structure, into *Coaches*, properly so called, *Chariots*, *Calashes*, and *Berlins*.—With regard to the circumstances of their use, &c. we distinguish *Stage-Coaches*, *Hackney-Coaches*, &c.

Chariots, or *Half-Coachs*, is a kind of *Coach* that has only a seat behind; with a stool, at most, before.—When these are very gay, richly garnished, and have five glasses, they are called *Calashes*.

Calash is also a kind of light small *Coach*, with very low wheels, richly adorned, used on occasions of pleasure, and open on all sides, to take the air, and enjoy the prospect. There are of these *Calashes* with one, two, and three seats; where the persons do not sit facing one another, as in the common *Coaches*, but all forwards, each seat having its back.

Hackney-Coaches, those exposed to hire, in the streets of London, and some other great cities, at rates fixed by authority. Those in London are under the direction of commissioners, who take cognizance of all causes and disputes arising thereupon.—They are distinguished by numbers affixed to the *Coach-doors*; and the fares, or rates, are fixed by a statute 14 Car. II. and confirmed by another in the fifth and sixth of king William III.

For a whole day of twelve hours the fare is 10 s. for a single hour 1 s. 6 d. for every hour after the first, &c.—At these rates, they are obliged to carry passengers any where within ten miles of London.

Stage-Coaches, are those appointed for the conveyance of travellers from one city or town to another.

COADJUTOR, *Fellow-Helper*, is properly used for a prelate joined to another, to assist him in the discharge of the functions of his prelature; and even, in virtue thereof, to succeed him.

The *Coadjutor* has the same privileges with the bishop himself.—*Coadjutors* were formerly appointed by kings, for archbishops and bishops grown old, or absent, and not able to administer their dioceses. But the right of appointing *Coadjutors*, in Romish countries, is now reserved to the pope alone.

Coadjutors are also called bishops in *paribus infidelium*; in regard it is necessary the *Coadjutor* of a bishop should be a bishop himself; without which, he cannot discharge the office.

The use of *Coadjutors* in the church, is borrowed from the Roman empire. Symmachus speaks of assistants, or *Coadjutors*, given to magistrates; and calls them *adjuvatores publici officii*.

The popes, formerly, made a shameful abuse of the *Coadjutories*: some they granted to children, and young people, with this clause, *donec ingressus fuerit*; 'Till they were capable of entering upon the administration of the office.' Others they granted to persons not in orders, with this clause, *donec accesserit*: and others to persons at a great distance, with this clause, *cum regressus*: but the council of Trent tied down the pope's hands, by adding abundance of restrictions on the article of *Coadjutors*. In nunneries they have *Coadjutores*; who are religious, nominated to succeed the abbess, under pretence of aiding her in the discharge of her office. See **ABBESS**.

COAGMENTATION, is used among chymists, for the act of melting down a matter, by casting in certain powders, and afterwards reducing the whole into a concrete, or solid.

COAGULATION, the condensing, or thickening of a fluid matter, without its losing any of the sensible parts which occasioned its fluidity; as we frequently see in blood, milk, &c. We distinguish between that kind of thickening which is effected by the evaporation of the fluid parts of a body, as in clay, which condenses in the sun, properly called *hardening*; and that effected without any loss of its substance, called *coagulating*. Thus, we say, that cold *coagulates* blood, &c.

There is one general term, *viz. concretion*, which includes both *Coagulation*, condensation, and hardening.

Coagulation chiefly depends on the admixture of salts of different natures; as when spirit of vitriol is poured on oil of tartar; or when oils are mixed in a mortar with saline, or aqueous liquors, as in the unguentum nutritum.

By injecting an acid into the vein of an animal, the blood coagulates; which stops its circulation, and brings immediate death.—Several poisons have their effect by inducing a *Coagulation*.

COAL, a black, sulphurous, inflammable matter, dug out of the earth; serving in many countries as the common fuel.

This we sometimes call *Pit-Coal*, *Fossil-Coal*, *Earth-Coal*, and *Natural-Coal*; to distinguish it from an artificial fuel made in imitation hereof, by half burning the branches and roots of trees; properly called *Charcoal*, and *Small-Coal*: in places, whither *Coal* is brought by sea, it is called *Sea-Coal*.

Canal, or *Canale-Coal*, is a sort of fossil coal found in divers of the northern counties; very hard, glossy and light; apt to cleave into thin flakes; and when kindled, it yields a continual blaze till it be burnt out.—Camden suspects this to be the lapis Obfidianus of the ancients.

Pit-Coal is ranked among the number of minerals, and the places

it is dug out of are called *Coal-Mines*, or *Coal-Pits*. It is common in most countries of Europe: though the English *Coal* is of most repute, even in foreign countries; notwithstanding some pretend that of the Fosse in Auvergne is not any thing inferior to it.

The goodness of *Coal* is found by its being as free as possible from sulphur, in its heating iron well, and in its burning a long time in the smith's forge. The English *Coal* has this peculiar to it; that it never lights so perfectly, as when water is thrown on it.

The commerce of *Coal* is very considerable in England; great quantities are exported to France, &c. by way of Rouen. The measure whereby it is sold is the chaldron, containing thirty-six bushels.

In the memoirs of the French royal academy, we have an account of two experiments on the common *Pit-Coal*, made by M. Des Landes while in England, and which he thinks have escaped the English philosophers.

1st, Pounding some *Coal*, and putting half an ounce of it in a vial of water, the mixture became quite black: but leaving it exposed to the air in a window, during a cold winter night, in the morning it was found frozen, and turned to a reddish colour. The reason of the change must be, that the frost had disengaged the sulphurs of the *Coal*: though one would little expect such an effect from it.

2^{dly}, From an infusion of cinders in brandy, mixed with iron filings, arises a black tincture, which brightens in proportion as it is heated; when arrived at the heat of boiling, the colour becomes perfectly fine and soft, and gives a dye to cloth, which no workman can imitate.

The strata, or veins of *Coals* in coalpits are numerous, and their order, quality, &c. are very different in different places.

In those at Dudley in Staffordshire, the strata, below the turf, are two or three clays, a grey stone, and a hard grey rock, then they are expressed in the *Philosophical Transactions* to be, 1^o, *Coal*, called *Bench-Coal*; 2^o, *Slipper-Coal*, less black and shining than the former; 3^o, *Spin-Coal*, more black and shining; 4^o, *Stone-Coal*, much like *Canal-Coal*.

These strata have between each of them a bat, or bed, of a peculiar sort of matter, about the thickness of a crown-piece. Below these are divers metalline strata; as a black substance called the *Dun-row bat*; a grey iron ore, called the *Dun-row iron-stone*; a bluish bat, called *White-row*; a blackish iron ore, called *White-row grains*, or *Iron-stone*; a grey iron ore, called *Mid-row grains*; a black fossil substance, called the *Gubbin-bat*; a black iron ore, called *Gubbin iron-stone*; a dark grey iron ore, called *Rubble iron-stone*; and lastly, the *table bat*.

Then 5^o, comes a coarse sort of *Coal*, called *Foot Coal*; a black brittle bat: 6^o, The *Heather-Coal*; 7^o, A substance like coarse *Coal*, though called a *Bat*, because it does not burn well: And 8^o, *Bench-Coal*. See Supplement, articles LITHANTHRAK, and LAPIS AMPELITES.

Small-Coal is a sort of charcoal, prepared from the spray, and brush-wood, stripped off from the branches of coppice wood, sometimes bound in bays for that purpose, and sometimes prepared without binding.

The wood they dispose on a level floor, and setting a portion of it on fire, they throw on more and more, as fast as it kindles; whence arises a sudden blaze, till all be burnt that was near the place. As soon as all the wood is thrown on, they cast water on the heap, from a large dish, or scoop; and thus keep plying the heap of glowing *Coals*, which stops the fury of the fire, while with a rake they spread it open, and turn it with shovels till no more fire appears. When cold, the coals are put up into sacks for use.

Char-Coal. See its preparation under **CHARCOAL**.

COALITION, the re-union, or growing together of parts before separated. See **CONGLUTINATION**, &c.

COAST, a sea-shore, or the country adjoining to the edge of the sea. See **SEA**, &c.

COASTING, that part of navigation, wherein the places sailed to, and from, are not far distant; so that a ship may sail in sight of the land, or within sounding, between them.

Such are the voyages on the narrow, or British seas, between England, Holland, and France; also those about the British seas, and in the Mediterranean, &c.

For in the performance hereof, there is only required good knowledge of the land, and the use of the compass, and of the lead, or sounding line.

COASTING, in agriculture, &c. denotes the transplanting of a tree, and placing it in the same situation, with respect to east, west, north, &c. as it stood in before.

COAT of Arms, in heraldry, a cloak, or habit, worn by the ancient knights over their arms, both in war, and at tournaments; and still worn by the heralds at arms.

It was a kind of furcoat, reaching only as low as the navel; open at the sides, with short sleeves; sometimes furred with ermins and vair; whereon were applied the armories of the knight, embroidered in gold and silver, and enamelled with beaten tin, coloured black, green, red, and blue: whence the rule, never to apply colour on colour, nor metal on metal.

The *Coats of Arms* were frequently open, and diversified with bands

bands and fillets of several colours, alternately placed, as we still see cloths scarletted, watered, &c. hence they were also called *Divizes*, or *Divises*, as being divided, or composed of several pieces, sewed together; whence the words, *seffe*, *pale*, *chevron*, *band*, *crofs*, *salteer*, *lozange*, &c. which have since become honourable pieces, or ordinaries of the shield. See each in its place, *FESSE*, *BEND*, *CROSS*, &c.

Coats of Arms, and *Banners*, were never allowed to be wore by any but knights, and ancient nobles.

COAT of Mail, *jacque de mail*, a kind of armour made in form of a shirt; consisting of iron rings wove together net-wise. See *MAIL*.

COAT, in anatomy. See the article *TUNIC*, and *EYE*.

COBALT, in natural history, a kind of marcasite, supposed to be the cadmia of the antients; out of which is drawn arsenic, and smalt.

Cobalt usually contains a little silver, some copper, but much arsenic. There are various mines of *Cobalt*, especially in Saxony; and some in France, and England. See *Supplement*, article *COBALT*.

COBWEB. See the articles *WEB*, and *SILK*.

COCCIFEROUS, in botany, such plants, or trees, as bear berries. **COCCULUS Indicus**, a poisonous narcotick berry, known mostly now to poachers, who have got a trick of intoxicating fish therewith, so as to take them out of the water with their hands; for which reason these berries are called *bacca piscicoria*, fishers-berries. See *Supplement*, article *COCCULUS INDICUS*.

COCCYGHIS os, in anatomy, a bone joined to the extremity of the os sacrum; composed of three or four bones, whereof the lower is still less than the upper, till the last ends in a small cartilage.—See *Tab. Anat. (Osteol.) fig. 7. n. 21*. It resembles a little tail turned inwards; or rather, as some imagine, the beak of a cuckow; whence the name. Its use is to sustain the frait gut: it yields to the pressure of the foetus in women in travel; and midwives use to thrust it backwards; but sometimes too rudely and violently, which is the occasion of great pain, and several bad effects.

COCHINEAL, or *COCHENEEL*, a drug used by the dyers, &c. for giving red colours, especially crimsons, and scarlets; and likewise in medicine as a cardiac and alexipharmic. It is brought from the West-Indies: but authors have been divided as to its nature; some taking it to be a kind of worm, and others for the berry of a tree. F. Plumier, a celebrated botanist, has maintained the former opinion, and Pomet very absurdly the latter. That author is very wide of the truth in the description he has given of *Cochineal*. Dampier tells us, there are two sorts; one an insect, and the other a feed, and gives a precise description of each kind as follows:

The *COCHINEAL Worm*, is an insect ingendered in a fruit resembling a pear: the plant which bears it is five or six foot high. Atop of the fruit grows a red flower, which, when mature, falls on the fruit; and that opening, discovers a cleft two or three inches in diameter. The fruit then appears full of little, red insects, having wings of a surprizing smallness, and which would continue and die, and rot there, if not taken out. The Indians, therefore, spreading a cloth under the tree, shake it with poles, till the insects are forced to quit their lodgings, and fly about the tree; which they cannot do many moments, but tumble down dead into the cloth; where they are left till they be entirely dry: when the insect flies it is red; when it is fallen, black; and when first dried it is greyish; though it afterwards changes colour. See *Tab. Nat. Hist. fig. 24*. There are whole plantations of the *Cochineal* plant, or *tonna*, as the natives call it, about Guatimala, Chepe, and Guexaca, in the kingdom of Mexico.

The *COCHINEAL Grain*, or, as Dampier calls it, *Sylvestris*, is a red berry, growing in America, found in a fruit resembling that of the *Cochineal* plant, or *tonna*. The first shoots produce a yellow flower; then comes the fruit, which is long, and when ripe opens with a cleft of three or four inches. The fruit is full of kernels, or grains, which fall on the least agitation, and which the Indians take care to gather. Eight or ten of these fruits may yield about an ounce of grain. See *fig. 24. n. 2*. This berry yields a dye almost as beautiful as that of the insect; and a person may be easily deceived in them; though the other is much the most esteemed. Dampier is mistaken in supposing this last a feed. It is an animal of the same kind with the other. The true account of this drug, see in the *Supplement*, article, *COCHINEAL*.

COCHLEA*, in mechanicks, one of the five mechanical powers; otherwise called the *Screw*. See *SCREW*.

* It is thus denominated, from the resemblance a few bears to the spiral shell of a snail, which the Latins call *Cochlea*.

COCHLEA, in anatomy, the third part of the labyrinth, or inner cavity of the ear. See *EAR*.

The *Cochlea* lies directly opposite to the semicircular canals, and is properly so called from the resemblance it has to the shell that snails lie in: through its parietes a small branch of the auditory nerve passes.

Its canal is divided by a septum composed of two substances, one almost cartilaginous, the other membranous.

The two canals that are divided by the septum, are called *scala*; whereof the one, looking towards the tympanum, by the se-

nefra rotunda, is called *scala tympani*; the other having a communication with the vestibulum, by the fenestra ovalis, is called the *scala vestibuli*; the first lies uppermost, and is the largest; the last lowermost, and is the least.

COCK of a dial, the pin, style, or gnomon. See *GNOMON*.

COCK bearing high. See the article *HIGH-bearing*.

Bloody-beel'd COCK. See the article *HEELER*.

Grubbing a COCK. See the article *GRUBBING*.

Pea-COCK. See the article *PEACOCK*.

Weather-COCK. See the article *WEATHER-COCK*.

COCKET, or *COCKET*, a seal belonging to the king's custom-house. See *SEAL*.

COCKET, or *COCKET*, is also a scroll of parchment, sealed and delivered by the officers of the custom-house to the merchants, upon entering their goods; certifying that the goods were custom'd.

The same word is also used in the statute of bread and ale, 15 Hen. III. where there is mentioned, *Cocket-bread*, among several other kinds. It seems to have been hard sea biscuit, which perhaps had then some *Cocket*, mark, or seal; or else was so called from its being designed for the use of the cockswains, or seamen.

COCKING Cloth, a device for the catching of pheasants withal. It consists of a piece of coarse canvas, about an ell square, dipped in a tan-pit to colour it; and kept stretched by two sticks, placed from corner to corner, diagonal-wise: a hole being left to peep through. The sportsman then, being provided of a short gun; carries the cloth before him at arms-end; under cover of which, he may approach his game as near as he pleases: when near enough, he puts the nose of his gun thro' the hole, and shoots.

COCKLE-Stairs. See the article *STAIRS*.

COCKPIT, a sort of theatre, whereon game-cocks fight their battles.—The *Cock-Pit* is usually a house, or hovel covered over: they fight on the clod, or green sod; which is generally marked out round, and incompass'd with seats, one above another.

The *Cock-Pit Laws*, are principally these: when cocks are set, none are to be on the sod but the two setters. When the cocks are set beak to beak in the middle of the clod, and there left by the setters, if the set cock do not strike in counting twenty, and six times ten, and twenty after all, the battle is lost: but if he do strike, the batel is to begin again, and they must count again. If any offer a mark to a goat, or forty to one, and the wager be taken, the cock must be set, and they are to fight it out. Done, and done, is a sufficient bet; or wager, when the cocks are cast on the clod.

Cock-Pit, in a man of war, is a place on the lower floor, or deck, abast the main capstan, lying between the platform and the steward's room; where are subdivisions, or partitions, for the purser, the surgeon, and his mates.—See *Tab. Ship, fig. 2. lit. Z*.

COCK-ROAD, a contrivance for the taking of woodcocks.—This bird lies close by day, under some hedge, or near the root of an old tree, to peck for worms under dry leaves, and will scarce stir out, unless disturb'd; as not seeing his way so well in the morning; toward the evening he takes wing, to seek for water; flying generally low, and when he finds any thoroughfare in a wood, he ventures through it. To take them, therefore, they plant nets in such places; or, for want of such places ready to their hands, they cut roads through woods, thickets, groves, &c.

These roads they usually make thirty-five or forty foot broad, perfectly straight and clear; and to two opposite trees they tie the net, which has a stone fastened to each corner. Then, having a stand, or place to lie concealed in, at a proper distance, with a stake near the same, to fasten the lines of the net to; when they perceive the game flying up the road, they unwind the lines from off the stake; upon which, the stones drawing it down, the birds are entangled in the fame.

COCK-SWAIN, or *COCKSON*, an officer on board a man of war, who hath the care of the boat, or sloop, and all things belonging to it. He is to be always ready with his boat's gang, or crew, and to man the boat on all occasions.—He sits in the stern of the boat, and steers; and hath a whistle to call and encourage his men.

COCOA, or more properly *CACAO*, the nut whose kernel yields the chocolate. See *CACAO*.

COCOS, or *COCO*, is also used for a nut, whose shell is much used by turners, carvers, &c. for divers works.

The *Coco-tree*, which the Malabarians call *tonga*, grows straight, without any branches, and ordinarily is thirty or forty foot high: its wood is too spongy to be used in carpentry. At the top it bears twelve leaves, ten foot long, and half a foot broad, used in the covering of houses, making mats, &c. Above the leaves grows a large excrescence, in form of a cabbage, excellent to eat; but the taking this off, is mortal to the tree.

Between the leaves and the top arise several shoots, of the thickness of the arm; which, when cut, distil a white, sweet, agreeable liquor, serving as a wine, and as intoxicating; it becomes acid if kept a few hours; and at the end of 24 hours is converted into a strong vinegar; but it may be prepared into brandy. While this liquor distills, the tree yields no fruit; but when the

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fuckers are let grow, it puts forth a large cluster or bunch, where- in the *Coco-nuts* are fastened, to the number of ten or twelve. While they are yet new, and the bark tender, they yield each about half a pint of a clear cooling water: which in a little time becomes first a white, soft pulp, and at length condens- ed, and assumes the taste of the nut.

The tree yields fruit thrice a-year, and those sometimes as big as a man's head. Many travellers aver, from the size, and the many useful products of this tree, that from a single *Coco- tree*, and its fruit, a ship might be built, equipped, and laden with merchandize and provision.

The *Cocos* of the Antilles, are not so large as those of the East- Indies, Africa, and Arabia: the trees seldom exceed 25 foot in height; and the fruits are in proportion: it is these which are used among us.

In the kingdom of Siam, the *Cocos* fruit, dried and emptied of its pulp, serves as a measure, both for things liquid and dry. As these shells are not all of the same capacity, but are some larger, others less; their content is first measured with cauris, those little Maldives shells, which serve as small money in fev- eral states of the Indies. Some *Cocos* contain 1000 cauris, others 500, &c.

COCTION, a general name for all alterations made in bodies, by the application of fire, or heat.

There are various species of *Coction*; as *maturatio*, *frictio*, *elixatio*, *affusio*, *torrefactio*, and *assio*; which fee in their places, ASSATI- ON, TORREFACTI- ON, FRICTI- ON, &c. fee also CONCOCTI- ON, and DECOCTI- ON.

CODE-FISHERY. See the article COD-FISHERY.

CODE*, CODEX, a collection of the laws, and constitutions of the Roman emperors; made by order of Justinian.

* The word comes from the Latin *Codex*, a paper-book; so cal- led a *codicibus*, or *codicibus arborum*, the trunks of trees; the bark whereof being stripped off, served the antients to write their books on.

The *Code* is comprized in twelve books, and make the second part of the civil, or Roman law.

There were several other *Codes* before the time of Justinian; all of them collections, or abridgments of the Roman laws. Gregorius and Hermogenes, two lawyers, made each a col- lection of this kind, called from their names the *Gregorian Code*, and *Hermogenian Code*. These included the constitutions of the emperors from Adrian, to Dioclesian and Maximine, A. D. 306. We have nothing remaining of them but a few fragments; the compilations themselves falling to the ground, for want of authority to put them in execution.

Theodosius the younger was the first emperor who made a *Code*, which was comprized in sixteen books, formed out of the constitutions of the emperors from Constantine the Great to his own time; abrogating all other laws not included in it: and this is what we call the *Theodosian Code*; which was pub- lished in the year 438, and received and observed, till annul- led by the *Code* of Justinian.

The *Theodosian Code* has been a long time lost in the west: Cujas took a great deal of pains to retrieve it, and to publish it in a better condition than ever. Gothofred has given us a comment on the *Theodosian Code*; a work which cost him thirty years.

In 506, Alaric, king of the Goths, made a new collection of the Roman laws, taken from the three former *Codes*, the *Gregorian*, *Hermogenian*, and *Theodosian*, which he likewise published under the title of the *Theodosian Code*.—This *Code* of Alaric continued a long time in force; and was all the Roman law received into France.

Lastly, the emperor Justinian, finding the authority of the Roman law exceedingly weakened in the west, upon the de- cline of the empire, resolved to make a general collection of the whole Roman jurisprudence. The management hereof he committed to his chancellor Tribonian; who chose out the most excellent constitutions of the emperors, from Adrian to his own time; and published his work in 528, under the title of the *New Code*.

But because Justinian had made several new decisions, which made some alteration in the antient jurisprudence; he retrench- ed some of the constitutions inserted by Tribonianus, and ad- ded his own in their place: on which account, he published a new edition of the *Code* in 534, and abrogated the former.

This *Code* of Justinian, as well as the rest of the Roman law, was a long time lost in the west, till the time of Lotharius II. who found it at the taking of Melphi, and gave it to the city of Pisa. This was first re-published by Irnerius, in 1128.

The emperor Frederic, at the request of the universities, ap- pointed it to be taught in the schools; and commanded all his people to observe it. Accordingly, it obtained in Italy and Germany; and still obtains in a part of France, particularly in the southern provinces.

There have been various other later *Codes*, particularly of the antient Gothic, and since of the French kings; as the *Code* of Euridic, the *Code* Michault, *Code* Louis, *Code* Neron, *Code* Henry, *Code* Marchand, *Code* des Eaux, &c. See CIVIL LAW.

CODE of Cannis, CODEX Canonum. See CANON.

V O L. I.

CODIA, in botany, is used for the top, or head of any plant; but, by way of eminence, for that of the white poppy: whence the syrup made therewith is called *diacodium*.

CODICIL, a schedule, or supplement to a will, or other writing.

It is used as an addition to a testament, when any thing is o- mitted which the testator would add, explain, alter, or re- tract; and is of the same nature as a testament, except that it is without an heir, or executor.

So that a *Codicil* is a less solemn will, of one that dies either testate or intestate, without the appointment of an heir: testate, when he that hath made his *Codicil*, hath either before or afterwards made his testament, on which that *Codicil* de- pends, or to which it refers. Intestate, when one leaves be- hind him only a *Codicil* without a testament, wherein he gives legacies only to be paid by the heir at law, and not by any heir instituted by will, or testament.

A *Codicil*, as well as a will, may be either *written* or *nuncupative*. Some authors call a testament, a *great will*; and a *Cod- icil*, a *little one*; and compare the testament to a ship, and the *Codicil* to the boat tied to it.

But there is this further difference between a *Codicil* and a testa- ment, that a *Codicil* cannot contain the institution of an heir; and that in a *Codicil*, a man is not obliged to observe strictly all the formalities prescribed by law for solemn testaments.

In customary countries, testaments, properly speaking, are no more than *Codicils*; in regard, custom itself names the heir, and does not allow of testamentary inheritors.

Codicils were first brought into use in the time of Augustus by L. Lentulus; they were originally intended to follow the testa- ment; which was, as it were, their basis. In process of time, *Codicils* came to have their effect, even though made before the testament; provided there was nothing in the testament contrary to the *Codicil*.—People were also allowed to make *Codicils* without testaments.

Raym. Lully has a book which he calls *The Codicil*; wherein he pretends to have left his readers the secret of the philoso- pher's stone; provided they do but understand it.

COECUM, in anatomy, the *blind gut*; the first of the thick intes- tines; so called, because made like a sack, having but one aperture, which serves it both for entrance and exit.

It is situate on the right side, below the kidney. In children new born, and in quadrupeds, it is found full of excrements; but in adults, &c. it frequently disappears, or only hangs like a worm.

Its use in adults is very obscure: in a foetus, or infant newly born, it appears to serve as a receptacle of the feces during such time as the animal does not discharge by stool.

Dr. Glisson imagines it may likewise serve in such animals as have it large, as dogs, conies, rats, &c. for a kind of second ventricle, or bag, wherein the prepared aliment may be re- tained, while a richer, and more nutritious juice is drawn from it.

Others will have it contain a ferment, and others, the status of the intestines: others fancy it may separate a humour, by some glands placed therein, wherewith to harden the excre- ments as they pass through the colon.

Dr. Lister assigns the use of the *Caecum* to be, to keep the ex- crements which pass into its cavity, (as most of those of found animals he thinks do) till they are sufficiently drained, baked, and hardened, to receive the figure to be given them by the colon and rectum. He adds, to confirm this, that wherever there are regularly figured excrements of the first kind, there is a capacious *Caecum*, and *vice versa*. This indeed is true, that some animals, which are naturally loose, have either no *Cae- cum* at all, or very little; as the talpa, echinus terrestris, gula, &c. Nature's end, in thus providing for the figuratio- n of the excrements, he takes to be, first, to prevent diarrheas; secondly, to make the creature abide hunger the better; (thus it is that snails, in winter, rest with full intestines;) and lastly, to heighten the digestion and fermentation in the stom- ach and small guts.

Dr. Musgrave gives us an account, in the *Philosophical Tran- sactions*, of the *Caecum* of a dog being cut out, without any prejudice to the animal. M. Giles gives us another, of the *Caecum* of a lady being distended so as to form a tumor, that held almost three chopines of thin, greyish, and almost liquid substance, whereof she died. And Mr. Knowles, a third, of a boy's *Caecum* being vastly extended and stuffed with chery- stones, which likewise proved mortal.

Some say, the name, *Caecum*, is mistaken; not allowing this to be the *Caecum* of the antients, which they imagine to be the thick globous part of the colon, immediately appended to the ileum; and therefore give this part the name of *appendicula vermiformis*.

CO-EFFICIENTS, in algebra, are numbers, or given quantities, prefixed to letters, or unknown quantities, into which they are supposed to be multiplied; and therefore, with such letters, or with the quantities represented by them, make a rectangle or product, *co-efficient productum*; whence the name.

Thus, in $3a$, or bx , or Cxx : 3 is the *Co-efficient* of $3a$; b , of bx ; and C of Cxx . If a letter have no number prefixed, it is

is always supposed to have the *Co-efficient*; because every thing is once itself. Thus, *a*, or *b*, import as much as *1 a*, or *1 b*.

The *Co-efficient* in a biquadratic equation, is according to its sign, either the sum, or the difference of the two roots.

In an equation of an higher nature, the *Co-efficient* of the second term, is always the aggregate of all the roots retaining their proper signs: so that if all the negatives be equal to all the affirmatives, the second term will vanish; and where the second term is thus wanting, it is a sign that the quantities under contrary signs were thus equal.

The *Co-efficient* of the third term is the aggregate of all the rectangles arising by the multiplication of every two of the roots, how many ways soever those combinations of two's can be had; as three times in a cubic, six in a biquadratic equation, &c.

The *Co-efficient* of the fourth term is the aggregate of all the solids made by the continual multiplication of every three of the roots, how often soever such a ternary can be had; as there may be four in a biquadratic, five in an equation of five dimensions, &c. And thus it will go on infinitely.

COELESTIAL Observations, are observations of the phenomena of the heavenly bodies, made with a proper apparatus of astronomical instruments, in order to the determining their places, motions, phases, &c.

The instruments chiefly used in *Caelestial Observations*, are the astronomical gnomon, quadrant, micrometer, and telescope; each of which see under its proper head.

Observations in the day-time are easy; in regard the cross hairs in the focus of the object-glass of the telescope are then distinctly perceivable: in the night, those cross hairs are to be illuminated to make them visible.

This illumination is either performed by a candle, placed obliquely near them, so as the smoke do not intercept the rays; or where this is inconvenient, by making an aperture in the tube of the telescope, near the focus of the object-glass, thro' which a candle is applied to illumine the cross hairs.

M. de la Hire has made an improvement on the first method, which renders it of very good use; and it is by covering that end of the tube next the object-glass with a piece of gauze, or fine white silken crape. For in such case, a link, placed at a good distance from the tube, so enlightens the gauze, as to render the cross hairs very perceivable.

Observations of the sun, are not to be made without placing a glass, smoked in the flame of a lamp or candle, between the telescope and the eye; to take off from its lustre, which would otherwise damage the eye, were not a good part of its beams intercepted.

Note, when any of the heavenly bodies are observed through a telescope of only two glasses, they appear inverted.

Caelestial Observations are chiefly of two kinds; the one when the objects are in the meridian. See **MERIDIAN**.

The other, when they are in vertical circles. See **VERTICAL COELESTIAL Globe**. See the article **GLOBE**.

COELIAC Artery, the first artery detached from the descending trunk of the aorta into the abdomen.

It divides into two branches, the one on the right side, the other on the left; of which the first gives the gastrica dextra, which goes to the stomach; the cystica, which goes to the gall-bladder; the epipolis dextra to the omentum; the intestinalis to the duodenum, and to a part of the jejunum; and the gastro-epipolis to the stomach, to the omentum, and some branches to the liver, which enter the capsula communis, to accompany the branches of the vena porta.

The left branch of the *Coeliaca* gives the gastrica dextra, which is also spread upon the stomach; the epipolis sinistra which goes to the omentum; and the splenica to the substance of the spleen. See each branch described in its place.

COELIAC Passion, is a sort of diarrhoea, or flux of the belly; wherein the aliment comes away either crude or chylified, in lieu of excrements.

Authors frequently confound the *Coeliac* passion with the lenteria, but they are different.

There is also a **COELIAC Diabetes**, called *Coeliaca Urinatis*, wherein the chyle passes off along with, or instead of urine. See **DIABETES**.

COELIAC Vein, is that which runs through the intestinum rectum. See **RECTUM**.

COELUM. See the article **HEAVEN**.

COELI Fundus. See the article **FUNDUS**.

COELUM is also used by some anatomists for the cavity of the eye towards the angles, or canthi. See **EYE**, **CANTHUS**, &c.

COEMETERIUM *, **CEMETERY**, *Koimnnesor*, a dormitory, or sacred place set a-part for the burial of the dead.

* Choiser observes, that under *Coemeterium*, *Koimnnesor*, anti-ently was comprehended, not only the strict dormitory, or place where the dead were disposed; but all the lands which encompassed the parish churches, and were contiguous to the real churches.—Perhaps it might be added, that all the church domains were comprized under *Coemeterium*. This will best account for that consecration of the *Coemeteries*, charged on Valerian.

In the primitive times, the christians held their meetings in *Coemeteria*; as we are informed by Eusebius, Lib. vii. and by Tertullian, who also calls those *Coemeteria*, where the people used to meet to pray, *areas*. Eusebius adds, that Valerian having confiscated the *Coemeteria*, and places destined for the worship of God, Gallienus restored them by a public rescript, rehearsed by the same author. From these passages it seems as if *Coemeteria*, and places of worship, were used indifferently for the same thing.

The heathen writers frequently upbraid the primitive christians for their meetings in *Coemeteries*; as if they served other purposes besides those of religion. The council of Elvira prohibits the keeping of tapers lighted in *Coemeteria*, during the day-time; and by another canon, the women from passing the night watching in *Coemeteria*.

The custom of blessing *Coemeteries*, is of an old standing: the method was, for the bishop to go round it with his crozier, or pastoral staff, and to sprinkle it with some consecrated fluid. Lobineau says, the holy water-pot was carried before him. Antiently, all were buried in *Coemeteries*; none in churches. From the bodies of martyrs, &c. being deposited here, the christians chose particularly to build their churches in them, when Constantine gave them the liberty: and hence Tillemont derives that custom which still obtains in the Romish church, never to consecrate any altar, without depositing in it the relics of some martyr.

COENA Domini, *Bull*. See the article **BULL**.

COENOBITE *, a religious who lives in a convent, or in community, under a certain rule; in opposition to Anachoret, or Hermit, who lives in solitude. See **HERMIT**, &c.

* The word comes from the Greek *κοινος*, *communis*; and *βίος*, *vita*, *life*.

Cassian makes this difference between a *convent* and a *monastery*, that the latter may be applied to the residence of a single religious, or recluse; whereas the *convent* implies *Coenobites*, or numbers of religious living in common.

Fleury speaks of three kinds of monks in Egypt; *Anachorets*, who live in solitude; *Coenobites*, who continue to live in community; and *Sarabaites*, who are a kind of monks-errant, that stroll from place to place.

He refers the institution of *Coenobites* to the times of the apostles, and makes it a kind of imitation of the ordinary lives of the faithful at Jerusalem. Though St. Pachomius is ordinarily owned the initiator of the *Coenobite* life; as being the first who gave a rule to any community.

CO-EQUALITY, a term expressing the relation of equality between two things. See **EQUALITY**.

The retainers to S. Athanasius's doctrine of the trinity, hold the Son and Holy Spirit *co-equal* with the Father. The Arians, &c. deny the *Coequality*. See **TRINITY**, and **ARIAN**.

CO-ETERNITY, is used among divines, to denote the eternity of one being, equal to that of another.

The orthodox hold the second and third persons in the trinity *co-eternal* with the first.

COEUR, in heraldry, — *Party en COEUR*, signifies a short line of partition in pale, in the centre of the escutcheon, which extends but a little way, much short of top and bottom; being met by other lines, which form an irregular partition of the escutcheon, as represented in Tab. *Herald.* fig. 43.

CO-EXISTENCE, a term of relation, denoting two, or more things to exist together, at the same time, &c. See **EXISTENCE**.

COFFEE, in natural history, a seed, or berry, brought from Arabia felix; used for the making a drink of the same name. See **DRINK**.

That from the Levant is most esteemed, being greener, heavier, and appearing riper and plumper than that from Mocha; which is larger, lighter, and whiter.

For *Coffee-berries*, some substitute peas, beans, rye, and barley, which roasted, yield an oily matter, resembling in flavour, but less agreeable, as well as much less strong than *Coffee*.

COFFEE also denotes a kind of drink, prepared from these berries; very familiar in Europe for these eighty years, and among the Turks for an hundred and fifty.

Its original is not well known; some ascribe it to the prior of a monastery, who being informed by a goat-herd, that his cattle sometimes browsing on the tree, would wake and caper all night; became curious to prove its virtue: accordingly, he first tried it on his monks, to prevent their sleeping at mattins. Others, from Schehabeddin, refer the invention of *Coffee* to the Persians; from whom, they say, it was learned in the fifteenth century by Gemaaliddin, musti of Aden, a city near the mouth of the red sea; and who having tried its virtues himself, and found that it dissipated the fumes which oppressed the head, inspired joy, opened the bowels, and prevented sleep, without being incommoded by it; recommended it first to his servants; with whom he used to spend the night in prayer.

Their example brought *Coffee* into vogue at Aden; the professors of the law, for study, artificers to work, travellers to walk in the night, in fine, every body at Aden drank *Coffee*.—Hence it passed to Mecca, where first the devotees, then the rest of the people took it. From Arabia felix it passed to Cairo.

In 1511. Khaib Beg prohibited it, from a persuasion that it inebriated, and that it inclined to things forbidden. But Sultan Caufou immediately after took off the prohibition, and *Coffee* advanced from Egypt to Syria and Constantinople.

The devils declaimed against it from the Alcoran, which declares that coal is not of the number of things created by God for food. Accordingly, the mufti ordered the *Coffee-houses* to be shut up; but his successor, declaring *Coffee* not to be coal, they were opened again.

During the war in Candia, the assemblies of news-mongers making too free with state-affairs, the grand vizier Cuproli suppressed the *Coffee-houses* at Constantinople; which suppression, though still on foot, does not prevent the publick use of the liquor there. Thevenot, the traveller, was the first who brought it into France; and a Greek servant, called *Pafqua*, brought into England by Mr. Dan. Edwards, a Turkey merchant, in 1652. to make his *Coffee*, first set up the profession of *Coffee-Man*, and introduced the drink among us. Though some say Dr. Harvey had used it before.

The word *Coffee* is originally Arabic: the Turks pronounce it *Cabueh*, and the Arabs *Calnab*; which some authors maintain to be a general name for any thing that takes away the appetite; others, for any thing that promotes appetite; and others, again, for any thing that gives strength and vigour.

The Mahometans, it is observed, distinguish three kinds of *Cabueh*; the first is wine, or any liquor that inebriates; the second is made of the pods that contain the *Coffee-Berry*; this they call the *Sultana's Coffee*, from their having first introduced it, on account of its heating less than the berry, as well as its keeping the bowels open: the third is that made with the berry itself, which alone is used in Europe, the pods being found improper for transportation. Some Europeans who imported the pods, called them the *Flower of the Coffee-Tree*.

The deep brown colour of the liquor, occasioned its being first called *Syrup of the Indian Mulberry*; under which specious name it first gained ground in Europe.

The preparation of *Coffee* consists in roasting, or giving it a just degree of torrefaction, on an earthen, or metalline plate, till it have acquired a brownish hue, equally deep on all sides: It is then ground in a mill, as much of it as serves the present occasion. A proper quantity of water is next boiled, and the ground *Coffee* put in it. After it has just boiled, it is taken from the fire; and the decoction having stood a while to settle, and fine, they pour, or decant it into dishes.

The custom is to drink *Coffee* as hot as possible, with sugar; Though the Turks do not trouble themselves to take off its bitterness with any sugar: their grandees add to each dish a drop of essence of ambergrease; others boil with it a couple of cloves; others a little Indian anise; others cacouche, or the grain of the cardamom minus.—*Coffee* is one of the necessaries which the Turks are obliged to furnish their wives.

The ordinary method of roasting *Coffee* among us, is in a tin cylindrical box, full of holes; through the middle whereof runs a pipe: under this is a semicircular hearth, wherein is a large charcoal fire: by help of a jack, the spit turns swift, and so roasts the berries; being now and then taken up to be shaken. When the oil rises, and it is grown of a dark brown colour, it is emptied into two receivers, made with large hoops, whose bottoms are iron plates, these shut into: there the *Coffee* is shaken, and left till almost cold; and if it look bright and oily, it is a sign it is well done.

Coffee is taken with very different, nay, frequently with directly opposite, intentions; some use it to prevent fevers, others to promote digestion, &c.—Its more real virtues, owned by the physicians, consist in this; that being an excellent drier, it carries off humors and disorders of the head arising from too much moisture, dissipates megrims, and absorbs acrimonies of the stomach, whence its use after a debauch of strong liquors; and hence also its use in promoting watching, bracing the fibres, and rendering them too tense for the relaxation required in sleep.

It likewise promotes circulation, but that best with people of a pretty corpulent habit; being found hurtful to those who are thin, lean, dry, and of a bilious temperament; as it dries up the nerves, and inclines them to tremors: it is said to be prejudicial likewise to those who digest too fast, where the circulation is too quick, or where there is a spitting of blood arising from the mouths of any of the veins and arteries being too open, or the blood too thin and sharp.

The oily matter that separates from the *Coffee*, and appears on its surface when roasted, and its particular smell which distinguishes it from peas, beans, rye, &c. which some substitute in lieu of *Coffee*, are to be the real indications of its effects. If considered with regard to the oil drawn by the retort, this, as well as that, contains volatile principles, both saline and sulphureous. It is to the dissolution of its salts, and the mixture of its sulphurs in the blood, that its chief faculty of promoting watchfulness is to be attributed: hence also its property of promoting digestion, of precipitating foods, of preventing eruptions, and of correcting acrimonies of the stomach, when taken after meals.

Hence also that fermentation in the blood, serviceable to corpulent people: hence also its diuretick virtue. By experience it is found of service to drink a glass of water before *Coffee*, to ren-

der it laxative; and to mix it with milk, or cream, to extinguish its sulphurs, embarras its saline principles, and render it nourishing.

S. Pauli, a Danish physician, maintains, that it enervates men, and renders them incapable of generation; and it is certain the Turks attribute the same effects to it; and from the immoderate use hereof, account for that thinness of inhabitants found in their provinces formerly the best peopled. But this opinion is refuted by Du Four.—F. Malebranche gave the royal academy of sciences an account of a person cured of an apoplexy, by means of several clysters of *Coffee*.

The tree that produces the *Coffee*, is a kind of Arabic jessamin: the berry, when ripe, is found as hard as horn; which gave occasion to an opinion, that the people of the kingdom of Yemen in Arabia felix, where it is cultivated, steeped in boiling water, or baked in a furnace all the *Coffee* they sold abroad, to prevent its growing any where else.

It is said, it yields a revenue of upwards of five millions *per annum*. Nor will that appear any wonder, when we consider that in London alone, besides the consumption in private houses, some have computed more than three thousand *Coffee-Houses*. In the three kingdoms are yearly expended one hundred tun of *Coffee-Berries*; in England alone seventy; which at 300 *l.* per ton, a moderate price, amounts to 21000 *l.* sterling.

COFFER, *Coffra*, in architecture, a square depression, or sinking, in each interval between the modillions of the Corinthian cornice; ordinarily filled up with a rose, sometimes with a pomegranate, or other enrichment.

These sinkings, called also *panels*, are of different figures in the compartments of vaults and soffits.

COFFER, in fortification, denotes a hollow lodgment, athwart a dry moat, from six to seven foot deep, and from sixteen to eighteen foot broad; the upper part made of pieces of timber raised two foot above the level of the moat; which little elevation has hurdles laden with earth for its covering; and serves as a parapet, with embrasures.

The *Coffer* is nearly the same with the caponiere, abating that this last is sometimes made beyond the counterescarp on the glacis, and the *Coffer* always in the moat, taking up its whole breadth, which the caponiere does not.

It differs from the traverse, and gallery, in that these latter are made by the besiegers, and the *Coffer* by the besieged.

The besieged generally make use of *Coffers* to repulse the besiegers, when they endeavour to pass the ditch.—To save themselves from the fire of these *Coffers*, the besiegers throw up the earth on that side towards the *Coffer*.

COFFERER of the King's Household, a principal officer in the court, next under the comptroller; who, in the compting-house, and elsewhere at other times, has a special charge and oversight of other officers of the house, for their good demeanor and carriage in their offices: to all whom he pays the wages. See HOUSEHOLD.

COGGESHALL'S Sliding-Rule, an instrument used in gauging, so called from its inventor: see the description and use under SLIDING-RULE.

COGITATION, the act or operation of thinking. See THINKING.

COGNATION, in the civil law, the bond of relation between all the descendants from the same stock, both males and females,—by which it is distinguished from *agnation*, which only comprehends the descendants of the male sex.

In France, for the succession to the crown they follow *agnation*; in England, Spain, &c. *Cognition*, women coming to the succession, according to the degree of proximity, in default of males, or their descendants from branch to branch.

In the Roman law, the words *Cognatio* and *COGNATI* are also taken in a more limited sense; *agnatio* signifying only the bond of relation between the descendants from the same stock by women; and *cognati*, those between whom there was such a bond of relation subsisting.

COGNIZANCE, or COGNISANCE, in heraldry. See CREST. COGNIZANCE, or CONUSANCE, in law, is the acknowledgement of a fine; or the concession of a thing done.—In which sense, we say, *cognoscens latro*, a thief that confesses.

COGNIZANCE is also used for a power, or jurisdiction.—Thus, *Cognizance of pleas*, denotes an ability to call a plea out of another court; which no one but the king can do, unless he can shew a particular charter for it.

COGNIZANCE is sometimes also used for an audience, or hearing of a matter judicially.—In which sense, we say, *to take Cognizance*, &c.

COGNIZANCE, again, is used for a badge on a waterman's, or serving-man's sleeve, which is commonly the giver's crest, whereby he is discerned to belong to this or that nobleman, or gentleman.

COGNISOR, or CONUSOR, is he that passeth, or acknowledgeth a fine of lands and tenements to another. See FINE, and COGNIZANCE.

CO-HABITATION, implies a concubinage, or a copulation, or carnal knowledge between two persons: It is rarely used, except in a criminal sense.

CO-HEIR, a person who shares an inheritance or estate with another. See **HEIR**.

COHERENCE, a school-term, applied to propositions, discourses, &c. which have a connection, or dependance on one another. See **CONNECTION**, &c.

COHESION, or **COHÆSION**, in physics, the action whereby the particles, or primary corpuscles whereof natural bodies consist, are connected, or bound together, so as to form particles; and those, again, kept together, so as to form sensible masses, or bodies.

The cause of this *Cohesion*, or *nexus materie*, has extremely perplexed the philosophers of all ages. In all the systems of physics, matter is supposed originally to be in minute, indivisible atoms.

How, and by what principle these several and distinct corpuscles should come first joined and combined into little systems; and how they should come to persevere in that state of union; is a point of the most difficulty, and even of the most importance of any in physics!

The most popular opinion, is that so strenuously defended by J. Bernoulli de *gravitate Ætheris*; who accounts for the *Cohesion* of the parts of matter, from the uniform pressure of the atmosphere: confirming this doctrine from the known experiment of two polished marble planes, which cohere very strongly in the open air, but easily drop asunder in an exhausted receiver.

But though this theory might serve tolerably well to explain the *Cohesion* of compositions, or greater collections of matter; yet it falls short of accounting for that first *Cohesion* of the atoms, or primitive corpuscles, whereof the corpuscles of hard bodies are composed.

Sir Isaac Newton delivers his doctrine of *Cohesion* thus: 'The particles of all hard, homogeneous bodies which touch one another, *cohere* with a great force; to account for which, some philosophers have recourse to a kind of hooked atoms, which, in effect, is nothing else but to beg the thing in question. Others imagine, that the particles of bodies are connected by rest, *i. e.* in effect, by nothing at all; and others by conspiring motions, *i. e.* by a relative rest among themselves. For myself, it rather appears to me, that the particles of bodies *cohere* by an attractive force, whereby they tend mutually toward each other: which force, in the very point of contact, is very great; at little distances is less; and at a little farther distance is quite insensible.

Now, if compound bodies be so hard, as by experience we find some of them to be, and yet have a great many hidden pores within them, and consist of parts only laid together; no doubt those simple particles which have no pores within them, and which were never divided into parts, must be vastly harder. For such hard particles gathered into a mass, cannot possibly touch in more than a few points: and therefore much less force is required to sever them, than to break a solid particle whose parts touch throughout all their surfaces, without any intermediate pores or interstices. But how such hard particles, only laid together, and touching only in a few points, should come to *cohere* so firmly as in fact we find they do, is inconceivable; unless there be some cause, whereby they are attracted and pressed together.

Now, the smallest particles of matter may *cohere* by the strongest attractions, and constitute larger, whose attractive force is feebler: and, again, many of these larger particles *cohering*, may constitute others still larger, whose attractive force is still weaker; and so on for several successions, till the progression end in the biggest particles, on which the operations in chymistry, and the colours of natural bodies do depend; and which by *cohering* compose bodies of a sensible magnitude.'

The different degrees of *Cohesion*, constitute bodies of different forms and properties.—Thus, the same great author observes, the particles of fluids which do not *cohere* too strongly, and are small enough to render them susceptible of those agitations which keep liquors in a flux, are most easily separated and rarefied into vapour, and make what the chymists call *volatile bodies*; rarefying with an easy heat, and again condensing with a moderate cold.

Those whose particles are grosser, and so are less susceptible of agitation, or *cohere* by a stronger attraction, are not separable without a greater degree of heat; and some of them not without fermentation: and these make what the chymists call *fixed bodies*.

COHOBATION, in chymistry, a repeated distillation of the same matter, with the liquor drawn from it; that liquor being again and again returned upon the matter left at the bottom.

The design of this operation is to open the pores, and separate, and volatilize the spirituous part.

Cohobation is a kind of circulation; only differing from it in this, that the liquor is drawn off in *Cohobation* as in common distillation, and thrown back again; whereas in circulation it rises and falls in the same vessel, without ever being carried out. See **CIRCULATION**.

COHORT, **COHORS**, among the Romans, a body of infantry,

consisting of five or six hundred men; answering in most respects to our battalion. See **BATTALION**.

The *Cohort* was divided into three maniples, or companies; the manipule into two centuries; and the century into an hundred men.

The first century in the first *Cohort* was called *primipilus*; and had the charge of the eagle, or standard of the legion.—A legion consisted of ten *Cohorts*.

When the army was ranged in order of battel, the *Cohorts* were disposed in the following manner: the first *Cohort* took up the right of the first line, as the companies of grenadiers do in our regiments; the rest followed in their natural order; so that the third was in the center of the first line of the legion, and the fifth on the left: the second between the first and third; and the fourth between the third and fifth. The five remaining *Cohorts* formed a second line in their natural order: thus the sixth was behind the first, and so of the rest.

The first, third, and fifth *Cohorts* were esteemed the best; at least it appears so from the posts they took up, which were looked on by the Romans as the most important.

Marius is by some said to have been the first who divided the Roman forces into *Cohorts*: which opinion seems confirmed by Rosinus; *Non enim in tota Livii historia cohortium sit mentio. Ideoque datii viri sentiant a C. Mario primum cohortes esse institutas.* Rosin. Corp. Antiq. l. 10. c. 5. But yet this is a great mistake; for the *Cohorts* are often mentioned in Livy, and particularly l. 27. c. 13. *Marcellus—Cohortibus que signa amiserant bordeum dari jussit: Centurionibusq; manipularum quorum signa amissa fuerant distribuit gladiis distinctos destituit.*—This happened A. U. C. 543. and consequently, several years before Marius was born.

COIF, the badge of a serjeant at law; who is hence also called *serjeant of the COIF*. See **SERGEANT**.

The *Coif* is of lawn, and is worn on the head, under the cap, when they are created, and ever after.

The use of the *Coif* was to cover the *tonsura clericalis*, or clerical crown; because the crown of the head was originally close shaved, and only a border of hair left around the lower part, which gave it the appearance of a crown. See **CROWN**, **TONSURE**, &c.

COIN, *Matrice*, in the manufacture of money, medals, and counters, is a piece of steel well tempered, four or five inches deep, square at bottom, and round a-top; whereon are engraved, dent-wise, with punchions and other instruments, the several figures, marks, &c. to be struck on the monies, &c.

For the manner of engraving COINS. See **ENGRAVING on steel**.

COIN is more generally used for a piece of metal, converted into money, by the impressing of certain marks or figures thereon.

Coin may be defined, a species of money, struck either with a hammer, or mill.

Hence, *Coin* differs from money, as the species does from the genus. Money is any matter, whether metal, wood, leather, glass, horn, paper, fruits, shells, or kernels, which have course as a medium in commerce.

Coins are a particular branch of monies, *viz.* such as are made of metal, gold, silver, or copper, and struck according to a certain process, called *coining*.

It is observed, under the article **MONEY**, that the precise epocha of the invention of money is not known; it is too antient for our annals: and if we might argue from the necessity and obviouness of the thing, it must be nearly coeval with the world.

Whether *Coins* be of equal antiquity, may admit of some doubt; especially as the mention of the ancient writers are so frequent and express in their mention of leathern-monies, paper-monies, wooden monies, &c. Some, however, notwithstanding all this, are of opinion that the first monies were of metal: the reasons they give, are the firmness, neatness, cleanliness, durableness, and universality of metals; which, however, do rather conclude, that they ought to have been so, than they actually were so.

In effect, the very commodities themselves were the first monies, *i. e.* they were current for one another by way of exchange; and it was the difficulty of cutting, or dividing certain commodities, and the impossibility of doing it without great loss, that first put men on the expedient of a general medium.

Indeed, thus much may be said in behalf of *Coins*, that, on this view, it was natural for men to have their first recourse to metals; as being almost the only things whose goodness, and as it were integrity, is not diminished by partition; besides the advantages above expressed, and the conveniencies of melting, and returning them again into a mass of any size or weight.

It was probably, then, this property of metals which first accoutented people, who trafficked together, to account them in lieu of quantities of other merchandises in their exchanges; and at length to substitute them wholly in their stead: and thus arose money: as it was their other property to preserve any mark or impression a long time, which confirmed them in the right; and thus was the first rise of *Coins*.

In the first ages, each person cut his metal into pieces of different sizes and forms, according to the quantity to be given for any merchandize, or according to the demand of the seller, or the quantity stipulated between them: to this end they went to market, laden with metal, in proportion to the purchase to be made, and furnished with instruments for portioning it, and with scales for dealing it out, according as occasion required.

By degrees it was found more commodious to have pieces ready weighed; and as there were different weights required, according to the value of the different wares, all those of the same weight began to be distinguished with the same mark, or figure: thus were *Coins* carried one step further.

At length, the growing commerce of money beginning to be disturbed with frauds, both in the weights and the matter, the publick authority interposed; and hence arose the first stamps or impressions of money; to which succeeded the names of the monies; and at length the effigy of the prince, the date, legend, and other precautions to prevent the alterations of the species: and thus were *Coins* completed.

On the foot whereon money now stands, it is divided into real, or effective money; and imaginary money, or money of account.

Modern Coins, or Species current in Europe, Asia, Africa, and America.—All the current species in the four quarters of the earth, at this day, are either made of metals, or they are shells, and fruits.

The metals are gold, silver, copper, tin, and lead; to which may be added billon, a mixture of silver and copper in a certain proportion.

In Europe none are used beside gold, silver, copper, and billon. In some parts of the East-Indies, they likewise use tin and lead: as to shells and fruits, they are the small money of several nations in Asia, Africa, and America.

British Coins.—In England, the current species of gold, are the guinea, half-guinea, jacobus, laureat, angel, and rose-noble: the four last of which are now seldom met with, having been most of them converted into guineas, chiefly during the reign of Charles II. and James II.

The silver *Coins* are the crown, half-crown, shilling, and sixpence. The Copper *Coins* are the half-penny and farthing.

Value and Proportions of the English COINS,

Farthing.

2	Halfpenny.
48	24 Shilling.
120	60 21 Half Crown.
240	120 5 2 Crown.
960	180 20 8 4 Pound Ac.
1008	504 21 8 4 1/2 1/4 Guinea, or piece.
The Jacobus	25 10 5 1 1/2
The Carolus } or Laureat }	23 9 1/2 4 1/2 & 1/4

In Scotland, by the articles of the union, it is appointed, that all the *Coins* be reduced to the English, and the same accounts observed throughout. Till then the Scots had their pounds, shillings, and pence, as in England; but their pound was but twenty pence English, and the others were in proportion: accordingly, their mark was 13 1/3 s. Scotch, current in England at 13 1/4 d. their noble in proportion.

Beside these, they had their Turnorer pence, and half-pence; their penny, 1/2 of that of England: besides base money of Achifons, Babees, and Placks. The Bodle, 1/2 of the penny, 1/2 of the Achifon, 1/2 of the Babe, and 1/2 of the Plack.

In Ireland, the *Coins* are as in England, viz. shillings, pence, &c. with this difference, that their shillings, or harper, is but equal to nine pence sterling; whence their pound is only 1/3 of ours, or 15 s.

French Coins.—The only gold *Coin* now current in France, is the lewidore, or Louis d'Or, with its divisions, which are 1/2 and 1/4; and its multiples, which are the double and quadruple Louis.—Till the year 1700, they had gold lys, and ecus, or crowns, but they are now no more.

The silver *Coins* are the ecus, crown, or white louis's, with their diminutions, viz. 1/2 and 1/4; and pieces of ten sols, and of fix. See SOL, and CROWN.

The Billon *Coins* are of two kinds, each called *sols*; some of 15 deniers, other of 21. To these may be added the deniers current in the Lioinois, Provence, Dauphine, and other parts. Lastly, the copper *Coin* is the liard, equal to three deniers; and is ordinarily called the *double*.

Value and Proportion of the French COINS.

Dernier, equal to 1/4 of a Farthing sterling.

2	Double		
3	1 1/2 Liard.		
12	6 4	Sol Paris, is equal to	l. s. d.
240	120 8 20	Livre, Acc.	0 : 0 : 0 : 1/2
720	360 240 60 3	Ecu, Crown.	0 : 2 : 7 : 1/2

The louis d'or, or French pistole, was first struck at 10 livres; but has since risen as high as 30. With us it is valued at 16 s. sterling.

Spanish COINS.—In Spain, and the states depending thereon, the gold *Coin* is the pistole; above which is the double pistole, and piece of four pistoles; and under it the half pistole: to which must be added the castillans of gold.

The silver money are the piastra, or piece of eight rials, and its diminutions; as also the simple rial, with its diminution. See RIAL.

The copper *Coins* are the ochavos, or ochavos, which are of two kinds, the one equal to four maravedis, and ordinarily called *quarta*; the other double this, and called *double quarta*: lastly, the maravedis. See MARAVEDIS.

It must be observed, that in Spain they have new money and old. The old, current in Sevil, Cadix, Andalusia, and some other places, is worth 25 per Cent. more than the new, current at Madrid, Bilbao, St. Sebastian, &c. i. e. 100 pounds old, is equal to 125 pounds new. This difference is owing to their king Charles II. who in 1688, to prevent the export of money abroad, raised it 25 per Cent. which, however he was only able to effect in part; several provinces still retaining the antient rate.

Value and Proportion of the Spanish COINS.

Maravedis old, nearly equal to half a farthing sterling.

4	Quarta.		
8	2 Octavo, or double Quarta.		
64	3 1/2 4 1/2	Real, old plata, equal to	l. s. d.
512	68 34 8	Pieces of Eight, or Piastra	0 : 0 : 6 1/2
2048	272 136 32 4	Pistole,	0 : 4 : 6
			0 : 17 : 6

Portuguese COINS.—Those of gold are the milleray, or St. Stephen, and the moeda d'oro, or, as we call it, the moire; which is properly their pistole; above this are doppio moedas, or double pistoles; and quadruple species equal to five pistoles. See MOIRE, DOUBLOON, &c.

Their silver *Coins* are the cruzada, pataca, or piece of eight; and the vintem, whereof they have two forts, the one silver, and the other billon.

The ree is of copper, which serves them in accounts, as the maravedis does the Spaniards.

Res, or Rez, equal to 1/2 of a farthing sterling.

20	Vintem		
400	20 Cruzada.		
1000	50 2 1/2	Mi-moeda, or half pistole, equals	l. s. d.
2000	100 5 2	Moeda d'oro, or pistole,	0 : 13 : 6
4000	200 10 4 2	Doppio moeda, or double pist.	1 : 7 : 0
10000	500 25 10 6 2 1/2	Ducat of fine gold,	2 : 14 : 0
			6 : 15 : 0

Dutch COINS.—Those of silver are crowns, or dollars, ducatoons, florins, and shillings, each whereof has its diminution. The silver, or common shilling, is of billon, the duy, and penny, of copper.

Penny.

1	Duyt.		
6	4 Gros:		
12	8 2	Stuyver, or shilling common	l. s. d.
72	48 12 6	Scalin, or shilling gros,	0 : 0 : 1 1/2
236	160 40 20 3 1/2	Florin or gilder,	0 : 0 : 7
708	480 120 60 30 1 1/2	Dollar, or ducatoon,	0 : 2 : 0
			0 : 6 : 0

COIN

Flemish COINS.—Those of gold are imperials, rides, or philips, alberts, and crowns.

Those of silver are philips, rixdollars, patagons, sealines, and gulden: and those of copper, patars.

Pataid, or penny.	8	Groat.	l. s. d.
16	2	Single fiver, equal to	0 : 0 : 1½
96	6	Shilling,	0 : 0 : 7½
288	18	20	3 Gulden,
720	90	50	2 Rixdollar, dollar, patag.
2104	17	2½	Imperial.

Note, The rixdollar, dollar, and patagon, are nearly on the same foot with the crown, or piece of eight.

German COINS.—Those of gold are ducats, which are of various kinds; oboli of the Rhine, and florins: of this last kind there are some likewise of silver; beside rixdollars and izelottes, which are all of that metal.

Those of copper, are the creux, or kreutzer, and fenin.

Fenin, equal to ⅓ of a farthing sterling.	8	Creux, or kreutzer.	l. s. d.
102	24	Dollar.	0 : 2 : 9
348	43	18	Obolus.
432	54	18	1 izelotte.
480	60	24	1½ Gulden, or florin.
600	100	24	1 Rixdol. or dollar.
1068	133	24	1 Ducat.

Italian COINS.—In Italy, the several states have several current monies: though there are some common to them all; such as the pistole of gold, and the ducatoon and florin of silver; which being of various weights, fineness, and value; see under the articles PISTOLE, DUCATOON, &c.

Those peculiar to Rome, are the julios of silver, the pignatelle of billon; and the bayoco, demi-bayocos, and quadrine of copper.—Venice has its seqoins of gold; its justins, or ducatoons, and derlingues of silver.—Naples its carlins.—Mourgues its monacos, or crowns, and its louis's of six sols.—Genoa its croifats. Savoy and Piedmont, its lys; all silver. This last state has likewise papiroles, and cauales of billon.

Julio, equal to	0 : 6 7/8	8 1/2 make a French crown.
Bayoco, 1/2 of the julio	0 : 0 1/2	penny and 1/2.
Pignatelle, 1/3 of the julio	0 : 0 1/3	of 2/3 of a penny, or near 1/2 a farthing sterling.
Justine	4 : 9	
Derlingue, 1/2 of the justine	1 : 2 1/2	
Carlin	0 : 6	
Monaco	4 : 4	
Sequin	9 : 2	
Croifatt	4 : 4	

Swiss COINS, are ratzes, and blazes; of Billon.—The ratze, equal to 1/4 and 1/5 of a penny sterling.—Blaze of Bern, nearly on the same footing with the ratze.

Polish COINS.—Beside the rixdollars struck here, which are common to other countries; the Poles strike silver roubles, abras, and groats.

Roup	0 : 4 1/2
Abra	1 : 0 1/2
Groch	0 : 0 1/2 and 1/3

Danish COINS, are the horse, the marc lub, and the scheldal of silver.

Horse	1 : 1 1/2
Marc lub	1 : 6
Scheldal, two marcs, or lub	0 : 3

Swedish COINS.—Those of silver are the christines, carolines, and cavaliers. Those of copper the roustique, alleuvre, mark and money.

Christine	1 : 1 1/2
Caroline	1 : 5 1/2
Mark	0 : 2 1/2
Roustique, 1/3 of the mark	0 : 0 1/2 and 1/3 of 1/2
Alleuvre, 1/2 of the roustique	0 : 0 1/2 and 1/3 of 1/2

The Swedish money, properly so called, is a kind of copper, very soft and malleable, cut in little square pieces, or plates, about the thickness of three English crowns, and weighing five pounds and a half; stamped at the four corners with the Swedish arms; and current in Sweden for a rixdollar, or piece of eight.

COI

Muscovite COINS.—There are two kinds of copecs in Muscovy, the one of gold, the other of silver; the last called also denaring, or pence. Their

Copec, or kapeke of gold, worth 1 : 6 1/2 Sterl. but current in the Czar's territories for	1 : 9
Copec of silver, or denaring of an oval form, worth	0 : 1 1/2 Sterl. but current for somewhat more.
Polusk, 1/2 of the copec	0 : 0 1/2
Mosstofske, 1/4 of the copec	0 : 0 1/4

Turkish COINS.—The only gold species struck in the grand seignior's territories, is the sultanin, called also the scheriff, or sequin. Their small monies are the para, parafi, called also parat, and the meidin, and the afre, both of silver. s. d. Sultanin scheriff, or sequin, equal to the ducat of gold, or } 9 : 0
Para parat, or parafi } 0 : 1 1/2
Shake of Aleppo and Scanderoun } 0 : 3 1/2
Afre } 0 : 0 1/2 but ordinarily, by reason of the base alloy, no more than 1/2

COINS of the coasts of Barbary.—The current Coins struck here are rubies, medians, ziams, and metecals; these are all of gold: the last of which are struck at Morocco, the rest at Fez, Algiers, and Tunis; which beside have doublas of silver, and burbas of copper.—Tunis, has its nafaras of silver, its blanquilles likewise of silver, and its felours of copper.

Other Coins of Africa, are the merigal of gold, current in Sofala, and the kingdom of Monopotapa; and the pardo of silver, current in Mosambica.

Rubie, equal to 35 afres, or	1 : 9
Menian, 50 afres, or	2 : 7
Ziam, zian, or dian, two menians, or	5 : 2

Metecal a kind of ducat of different fineness, consequently of different value; whence very considerable difficulties in commerce. The difference arises hence, that there is no mint fixed, or regular coiners at Morocco, but every Jew and goldsmith strikes ducats after his own manner in open shop.

Double, equal to 80 afres, or	4 : 6
Burba, 1/2 of an afre, or	0 : 0 1/2
Blanquille, 1/3 of the burba	0 : 2 1/3
Felours, 1/2 of the blanquille, or	0 : 0 1/2 and 1/3
Merigal, worth about	18 : 0
Pardo, worth about	1 : 3

Persian COINS.—These are either silver, or copper; gold they have none: of the first kind are the abassi, mamoudi, shabee, and bishi: of the second the kabefqui, and half kabefqui; the tela, or cherafis indeed is gold; but it is less a money than a medal, though it has some course in commerce. d. Sterl.

Abassi, equal to	1 : 4 1/2
Mamodi, 1/2 the abassi	0 : 8 1/2
Shabee, 1/3 the mamodi,	0 : 4 and 1/3

Bishi, some relations make a Coin worth about one penny half-penny; but others only a term of account, signifying 10 dimars, or 1/3 part of a toman. See TOMAN.

Casbequi, or casbequi, equals 1/2 of a penny sterling.—Tela, or cherafis, usually struck at the accession of a new king, and at the beginning of each new year; its weight and worth various.

Chinese COINS.—Throughout the kingdom of China and Tonquin, there are not properly any Coins struck; instead of these, they cut their gold and silver into little pieces of different weights: those of gold, the Dutch, from their figure, which resembles a boat, call *golchuts*: those of silver, the natives call *leam*; the Portuguese, *taels*.—Their small money is of copper; ten of these pieces make their shilling, and ten of those their crown, or leam. Beside these, they have a small money of lead, mixed with the scum of copper, having holes in the middle to string them on for the ease of numbering; this species is called *caxa*, *cas*, and *pitis*; and the string, which usually holds 200, is called *fant*. They are so very brittle, that they never fall without breaking into a great number of pieces; and if left all night in salt water, they stick so close together that they cannot be separated.

There are two kinds of golchuts, great and small.—Golchut, an ingot, which at 3 l. 3 s. per ounce, usually amounts to 101 l. 5 s. sterling.—Other golchuts only weigh half as much; their value is in proportion.

Tael, or leam, equal to 6 s. 8 d. sterling. Copper money 1/3 part of the tael, or somewhat more than 1/3 of a farthing.

Caxa, cas, or pitis, 1/3 of a farthing sterling, 30000 of these are near equal to 56 Dutch livres.

Caxa lang, 1/3 part of a piastre, or piece of eight. **COINS of Japan.**—The Japonese strike coupants, both of gold and silver, and copper pieces with holes in the middle, like those of China; six hundred of these make the tael. Their other monies, or quasi monies, are ingots, which they cut like the Chinese of

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of different weights, chiefly three; the largest of the weight of six rials, viz. forty-eight tael, the tael equivalent to seventy-five Dutch flyers. The second equal to six taels and an half; and the third to $\frac{1}{2}$ of a rial, or one tael $\frac{1}{2}$.

Beside these, they have a small silver money, in form of round beads, of no determinate weight, but usually weighed by maifes; the common payment being by ten maifes, which make one tael.

Coupant of gold, weighing one ounce six drachms; its figure a long oval, the longest diameter about four inches, and the shortest half an inch.	} 6 : 12 : 6
Other coupants of gold, near $\frac{1}{2}$ of the former, amounting to about	
Coupant of silver, current at	0 : 4 : 2
Copper money,	$\frac{1}{7}$ of a farthing.

COINS of Siam.—In the dominions of Siam are struck gold pieces five or six grains heavier than the half pistole of Spain; but these are rather pieces of curiosity, than of use in commerce. Their silver *Coin* is the tical, or baat; the diminutions whereof are the mayon, or seling, foang, and fompayc. These pieces are all strangely struck; in form they resemble nuts, a little flattened at the extremities; and are some of them cloven like horse-shoes: on two of the sides there are some Siamese letters.—Their copper money, called bia, is round and thick: beneath this is the cauris.

Gold species of Siam,	7 : 0
Tayl,	6 : 11 $\frac{1}{2}$
Mayam, or maif $\frac{1}{2}$ of the tayl,	0 : 5 $\frac{1}{2}$ and $\frac{1}{4}$
Foang, $\frac{1}{2}$ the mayam,	0 : 2 $\frac{1}{2}$
Sompayc, $\frac{1}{2}$ the foang,	0 : 1 $\frac{1}{2}$ and $\frac{1}{4}$
Copper <i>Coin</i> , or farthing of Siam,	0 : 0 $\frac{1}{4}$

COINS of the Coasts and Islands of the Indies.—The principal, and those most generally current, are pagodos, rupees, larins, fanos, or fanons, and coupans, each whereof are struck both of gold and silver.

Beside these general *Coins*, there also are particular ones, viz. at Goa, S. Thomas's of gold.—Along the Persian gulf, about Mecca, and throughout Arabia, the larin.—Along the coasts of Malabar, and at Goa, the pardao and xeraphin of silver.—At Bantam, the fardos; at Malabar, the tare; at Siam the tayl, with its diminutions the mayam, foang, fompayc, and demi-foang: all of silver.—At Surate, Agra, and the rest of Indofan, the pecha, or pella, and doudous, all of copper.—The barufucos and chedas, of tin.

Pagodo, gold, denominated from its impression, an Indian idol,	} 0 : 5 : 0
Pagodo, silver, its value very different; the smallest eight tangas, and the tanga ninety barufucos; equal to	
Rupee, gold,	1 : 11 : 6
Rupee, silver, its fineness and value various: there are three kinds current, viz. the rupees Siccas, the rupees of Surat, and rupees of Madras.	

Rupees Siccas, worth at Bengal	2 : 11
of Surat	2 : 3
of Madras	2 : 5 $\frac{1}{2}$

Note. This is to be understood of the new rupees; for as to the old ones, of each kind, their value is less: those of Madras, *v. gr.* are but equal to 11 *d.* sterling, those of Surat 2 *s.* and the Siccas 2 *s.* 4 *d.*

Larin, in form of a round wire, or cylinder, equal to the barrel of a pen; bent in two, and a little flattened at each end, to receive the impression of some Arabic, or Persian characters.

Fanos, or fanon, gold, is of different fineness, weight, and value; the largest worth

The smallest	0 : 2 $\frac{1}{2}$
Fanos, silver,	0 : 1 $\frac{1}{2}$

Coupant, see **COINS of Japan.**

S. Thomas, equal to	9 : 0
Xeraphin	2 : 1
Fardos	2 : 8 $\frac{1}{2}$
Tare	0 : 0 $\frac{1}{2}$

Ticil, see **COINS of Siam.**

Pecha, or pella,	0 : 0 $\frac{1}{2}$
Doudou, $\frac{1}{2}$ of fanos, or somewhat less than Barufuco or Budgerook, $\frac{1}{2}$ of a farthing.	0 : 0 $\frac{1}{2}$
Cheda is of two kinds, the one octagonal current at	0 : 1 $\frac{1}{2}$
The other round	0 : 0 $\frac{1}{2}$

Mogul COINS.—In the dominions of the great Mogul, are roupies, mamoudas, and pechas; the first both of gold and silver; the second of silver alone, and the third of copper.

There are others struck by the princes tributary to him, and the powers bordering on him, but these are scarce current beyond their respective territories: particularly a small silver *Coin* struck by the king of Matoucha, whose territories lie to the north of Agra, of the value of the pecha of Mogul, but half as heavy a-

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gain.—The Raja of Parta-jajamoula, to the north of Patua, likewise strikes some little pieces, both of silver and copper, of small value.—The Raja of Ogden, who commands between Brampour, Seronge, and Amadabath, a small silver *Coin*, equal to sixpence sterling; and another of copper, equal to an half-penny sterling.—The king of Cheda and Pera, a tin-money called *cheda*.—The king of Achem, little flight gold pieces, worth about fifteen pence sterling.—And tin pieces, eighty of which are equal to the English penny, current in the isles of Sumatra.—The gold *Coin* of the king of Macassar and Celebes, is taken by the Dutch for a florin.—The kings of Cambaya strikes only pieces of silver and copper: his gold, wherein he abounds, is negotiated by weight.—The king of Java and Bantam, in the same island, and those of the Molucca islands, strike only copper *Coins*: they allow foreign silver species to be current in their territories, but they coin none.

Roupia, see **COINS of the Coasts, &c. of India.**
Mamouda, or mamotha, its value is not fixed: in the kingdom of Mazarate, the great mamouda is equal to

The small, half the great one	0 : 11
Pecha, see COINS of the Isles, &c. of India.	0 : 5 $\frac{1}{2}$
Silver piece of Matoucha	0 : 0 $\frac{1}{2}$
Silver piece of the king of Ogden,	0 : 6
Copper piece of the same	0 : 0 $\frac{1}{2}$
Cheda, see COINS of the Isles, &c. of India.	
Gold piece of the king of Achem,	1 : 3
Tin piece of the same	0 : 0 $\frac{1}{2}$
Gold piece of the king of Macassar, taken by the Dutch for a guildler,	1 : 10 $\frac{1}{2}$

To the number of current *Coins* which have distinct names to specify them, may be added many more, both in Europe and Asia, only denominated and known from their value: such are those called simply *pieces*, with the addition of their price; as in Spain, the piece of eight rials, in England the piece of twenty-one shillings, or guinea; in France the piece of four francs, piece of ten sols, or shillings; piece of four sols; piece of two sols; of six francs, of 30, 15, 6, 4, &c. deniers, or pence. See **PIECE.**

Shells current for COINS.—These serve in many places for money; and are brought from the Maldives, and called in the Indies *cowries*: on the coasts of Africa they change their name, and are called *banzes*.

In America they take a third name, viz. *porcelains*. Indeed these last do not come from the Maldives; there being shells found in the West-Indies much like those of the East.

In the kingdom of Congo there is another kind of shells, called *zimbi*; though some will have them the same with the cowries. Cowrie, coris, or bouges, are white shells, current particularly in the states of the great Mogul; sixty-five are usually reckoned equivalent to the pence, a small copper *Coin*, worth about an half-penny sterling; which brings each cowry to $\frac{1}{3}$ of a penny sterling.

Porcelains are nearly on the same footing with the cowries. See **PORCELAIN.**

Zimbi, current particularly in the kingdoms of Angola and Congo. Two thousand zimbis make what the negroes call a *maciute* or *macoute*; which is no real money, whereof there is none in this part of Africa, but only a manner of reckoning: thus, two Flemish knives they esteem a *macoute*; a copper bason, two pound weight, and twelve inches diameter, three *macoutes*; a fify ten, &c.

Fruits current for COINS.—There are three kinds of fruits used for *Coins*; two in America, particularly among the Mexicans; which are the cacao and maife: the other in the East-Indies, viz. almonds; brought thither from Lar, and growing in the deserts of Arabia.

Cacao, fifteen of these are esteemed equivalent to a Spanish rial, or seven pence sterling. See **CACAO.**

Maife has ceased to be a common money since the discovery of America by the Europeans.

Almonds are chiefly used where the cauris are not current. As the year proves more or less favourable to this fruit, the value of the money is higher or lower: in a common year, forty almonds are set against a pecha, or half-penny sterling; which brings each almond to $\frac{1}{4}$ of a farthing.

Antient COINS are those chiefly which have been current among the Greeks, Jews and Romans.

For Jewish COINS, their Values and Proportion stand thus:

Gerah	100	00	00	1 $\frac{1}{2}$ $\frac{1}{2}$	sterl.
10 Bekah	00	01	1 $\frac{1}{2}$ $\frac{1}{2}$		
20	2	00	02	3 $\frac{1}{2}$	
1200	120	50	Maneh	} 05 : 14 : 0 $\frac{1}{2}$	
			Mina hebraica		
60000	6000	3000	60 Talent	342 : 03 : 9	
Solidus aureus, or sextula, worth				00 : 12 : 0 $\frac{1}{2}$	
Siclus aureus, worth				1 : 16 : 6	
A talent of gold, worth				5475 : 00 : 0	Value

Value and Proportion of the antient Grecian COINS.

				s.	d.	grs.	Sterl.					
Lepton	—	—	—	0	0	0	$\frac{1}{12}$					
7	Chalcus	—	—	0	0	0	$\frac{1}{12}$					
14	2	Dichalcus	—	0	0	1	$\frac{1}{6}$					
28	4	2	Hemibolium	0	0	2	$\frac{1}{3}$					
56	8	4	2	Obolus	0	1	$\frac{1}{2}$					
112	16	8	4	2	Diobolus	0	2					
224	32	16	8	4	2	Tetrobolus	$0 : 5 : 0 \frac{1}{2}$					
336	48	24	12	6	3	1	Drachma	0 : 7 : 3				
662	96	48	24	12	6	3	2	Didrachm	1 : 3 : 2			
1324	192	96	48	24	12	6	4	2	Tetradrach. flater	2 : 7 : 0		
1660	240	120	60	30	15	7	5	2	1	1	Pentadrachm.	3 : 2 : 3

Note, Of these the drachma, didrachm, &c. were of silver, the rest for the most part of brass. The other parts, as tri-drachm, triobolus, &c. were sometimes coined.

Note also, the drachma is here, with the generality of authors, supposed equal to the denarius: though there's reason to believe, the drachma was somewhat the weightier. See DRACHMA, and DENARIUS.

The Grecian gold Coin was the stater aureus, weighing two attick drachms, or half of the stater argenteus; and exchanging usually for 25 attick drachms of silver; in our money

According to our proportion of gold to silver } 1 : 16 : 1 3/4

There were likewise the stater cyzicenus, exchanging for 28 attick drachms, or Stater philippicus, and stater alexandrinus of the same value. } 1 : 18 : 1

Stater darcicus, according to Josephus, worth 50 attick drachms, or } 1 : 12 : 3 1/2

Stater cræsius, of the same value.

Value and Proportion of the Roman COINS.

				s.	d.	grs.	Sterl.
Teruncius	—	—	—	0	0	0	$\frac{1}{12}$
2	Semilibella	—	—	0	0	1	$\frac{1}{6}$
4	2	Libella	As	0	0	3	$\frac{1}{2}$
10	5	2 1/2	Sestertius	0	1	3	$\frac{1}{2}$
20	10	5	2	Quinarius	0	3	$\frac{1}{2}$
40	20	10	4	2	Denarius	0	7 : 3

Note, Of these the denarius, victoriatius, sestertius, and sometimes the as, were of silver, the rest of brass.

There were sometimes also coined of brass the triens, sextans, uncia, sextula, and dupondius.

The Roman gold Coin was the aureus, which weighed generally double the denarius; the value of which, according to the first proportion of coinage, mentioned by Pliny, was

According to the proportion that obtains now amongst us, worth } 1 : 4 : 3 1/4

According to the decuple proportion, mentioned by Livy and Julius Pollux, worth } 1 : 12 : 11

According to the proportion mentioned by Tacitus, and which afterwards obtained, whereby the aureus exchanged for 25 denarii, its value } 1 : 16 : 1 3/4

COIN, in architecture, a kind of dye, cut diagonal-wise, after the manner of the flight of a staircase; serving at bottom to support columns in a level; and at top to correct the inclination of an entablature, supporting a vault.

These COINS have also the same effect with round balusters, which are not inclined according to any flight.

COIN is also used for a solid angle, composed of two surfaces inclined towards each other; whether that angle be exterior, as the Coin of a wall, a tree, &c. or interior, as the Coin of a chamber, or chimney: from the word *cuneus*, wedge. See QUOIN.

COINAGE, or COINING, the art, or act of making money. *Coining*, is either performed by the hammer or the mill.—The first method is now little used in Europe, especially in England, France, &c. though the only one known till the year 1553, when a new machine, or *coining mill*, was invented by an engraver, one Antoine Brucher, was first tried in the French

king's palace at Paris, for the *coining* of counters. Though some attribute the invention of the mill to Varin, a famous engraver, who, in reality, was no more than an improver of it; and others to Aubry Olivier, who had only the inspection of it.

The mill has met with various fate since its first invention; being now used, and again laid by, and the hammer reformed: but it has at length got that footing, by the neatness and perfection of the species struck with it, that there appears no great probability of its ever being again disused. See MILL.

In either kind of *coining*, the pieces of metal are stamped, or struck with a kind of punchions or dyes, wherein are engraven the prince's effigies, with the arms, legend, &c. The manner of preparing and cutting of which, see under ENGRAVING.

The first operations in *Coining* are the mixing, and melting of the metal.—For the first, it is to be observed, that there are no species coined of pure gold or silver, but always a quantity of alloy of copper is mixed with them; the reasons are partly the scarcity of those two metals, partly the necessity of making them harder by some foreign admixture; and partly to defray the expences of *Coining*.

Now there are two kinds of alloying, or mixing: the first where the gold or silver has not been used for money before; and the other, where several kinds of species, or ingots of different standards and values, are to be melted down into a new money. The proportioning of the alloy with the fine metal is easy in the first case, in the other it is more difficult: the arithmeticians make a long doctrine of it, which see under ALLIGATION.

Yet it is readily effected by the following method, taken from the anonymous author of the treatise at the end of that of Mr. Boisard, *viz.*

Write down the several matters to be melted, their quality, weight, and fineness, in two distinct articles; the one containing those above the standard, the other those under it: by calling up the first, you shall have the excess, by the latter, the defect. Then comparing the two sums, you will find, by subtraction, how much alloy must be added to bring the several matters to the fineness required.

For the melting, if the metal be gold, it is done in earthen crucibles; if silver or copper, in pots or crucibles of iron.

There are two kinds of furnaces proper for the melting of the metals; those with only a draught of wind, and those with bellows. See each explained under the article FURNACE. When the gold or silver are in balneo, *i. e.* are entirely melted, they are to be stirred and brewed together; the silver and copper with an iron stirrer, the gold with one of lead earth. In this state they are poured into moulds, or frames, for casting them into long flat bars: the method of doing which, is exactly the same with that used by the founders, in sand; both with regard to the frames, the manner of working the earth, and that of ranging the models or patterns.

The models are flat plates of copper, about fifteen inches long, and nearly of the thickness of the species to be struck. In each mould are placed eight of these to make bars or plates for guineas, ten for half guineas, five for crowns, &c. and in proportion for copper. All the difference between casting the bars of gold, and those of the other metals consisting in this; that the latter are taken out of the crucibles with ladles, and poured into the aperture of the mould; and that for gold, the pot or crucible is taken off the fire with a kind of tongs, and thence poured into the mould.

Thus far the process is the same, in *coining* either with the mill or the hammer: when the bars are taken out of the moulds, the difference commences; so that here the article of *Coining* divides into two branches.

COINING by the Mill, or milled Money.—The bars or plates being taken out of the moulds, and scraped, and brushed, are passed several times through a mill, to flatten them further, and bring them to the just thickness of the species to be coined; with this difference, however, that the plates of gold are heated again in a furnace, and quenched in water, before they undergo the mill; which softens, and renders them more ductile: whereas those of silver pass the mill just as they are, without any heating; and when afterwards they are heated, they are left to cool again of themselves, without water.

The plates, whether gold, silver, or copper, thus reduced as near as possible to their thickness, are cut into round pieces, called *blanks* or *plancheets*, near the size of the intended species, with a cutting instrument fastened to the lower extremity of an arbor, whose upper end is formed into a screw; which being turned by an iron handle, turns the arbor, and lets the steel, well sharpened, in form of a punch-cutter, fall on the plates; and thus is a piece punched out.—See the cutting instrument represented in Tab. *Miscellany*, fig. 3.

These pieces are now given to be adjusted, and brought by filing, or rasping, to the weight of the standard whereby they are to be regulated; and what remains of the plate between the circles is melted again, under the denomination of *Sisel*.

The pieces are adjusted in a fine balance; and those which prove too light, are separated from those too heavy; the first to be melted

melted again, and the second to be filed down. For it may be observed, that the mill through which the plates are passed, can never be so just, but there will be some inequality, whence will arise a difference in the blanks. And this inequality, indeed, may be owing to the quality of the matter, as well as of the machine; some parts being more porous than others. When the blanks are adjusted, they are carried to the blanching, or whitening house, *i. e.* the place where the gold blanks have their colour given them, and the silver ones are whitened; which is done by heating them in the furnace, and when taken out and cooled, boiling them successively in two copper vessels, with water, common salt, and tartar; and after that scouring them well with sand, and washing them with common water, drying them over a wood fire, in a copper sieve, wherein they are put when taken out of the boilers.

The whitening, or blanching, was formerly performed very differently from what it now is: and as the antient method is still in use among goldsmiths, and other workmen who use gold and silver, we have made a distinct article of it. See **BLANCHING**. Formerly, the planchets, as soon as blanching, were carried to the press, to be struck and receive their impressions; but now they are first marked with letters or grainings, on the edges, to prevent the clipping and paring of the species; which is one of the ways wherein the antient money used to be damaged. The machine used to mark the edges, is very simple, yet ingenious; it consists of two plates of steel, in form of rulers, about the thickness of a line, on which the legend or edging is engraven, half on the one, and half on the other. One of these plates is immovable, and strongly bound with screws to a copper plate; and that again to a strong board, or table: the other is moveable, and slides on the copper plate, by means of a handle, and a wheel, or pinion of iron, the teeth whereof catch in a kind of other teeth, on the surface of the sliding plate. Now, the planchet being placed horizontally between these two plates, is carried along by the motion of the moveable one; so, as by that time it has made half a turn, it is found marked all round. This machine is so easy, that a single man is able to mark twenty thousand planchets in a day: Savary pretends it was invented by the sieur Castagn, engineer to the French king, and first used in 1685. But it is certain, we had the art of lettering the edges in England long before that time; witness the crowns and half-crowns of Oliver Cromwell struck in 1658, which for beauty and perfection far exceed any French *Coins* we have ever seen. Lastly, the planchets being thus edged, are to be stamped, *i. e.* their impression is to be given them in a sort of mill, or press, by the French called a *Balancier*, invented towards the latter end of the sixteenth century: See its figure in *Tab. Metallurg. fig. 4.*

Its chief parts are a beam, screw, arbor, &c. all contained in the body of the machine, except the first, which is a long iron bar, with a heavy ball of lead at each end, and rings, to which are fastened cords which give it motion: this is placed horizontally over the body of the machine. In the middle of the beam is fastened a screw, which by turning the beam, serves to press the arbor underneath it; to the lower extremity of which arbor, placed perpendicularly, is fastened the dye or matrice, of the reverse, or arm side, in a kind of box, or case, wherein it is retained by screws: and under this is a box, or case containing the dye of the image-side, firmly fastened to the lower part of the engine. See **MATRICE**.

Now when a planchet is to be stamped, it is laid on the image-matrice, upon which two men draw, each on his side, one of the ropes of the beam, and turn the screw fastened in it; which by this motion lowers the arbor, to which the dye of the arms is fastened: by which means, the metal being in the middle, at once receives an impression on each side, from either dye. As to the press, formerly used, it has all the essential parts of a balancier, except the beam, which is here, as it were, divided, and only drawn one way.

The blanks having now all their marks and impressions, both on the edges and faces, become money; but they have not currency till they have been weighed and examined.

For the COINING of Medals, the process is the same, in effect, with that of money: the principal difference consists in this, that money having but a small relieve, receives its impression at a single stroke of the engine; whereas, for medals, the height of their relieve makes it necessary that the stroke be repeated several times: to this end, the piece is taken out from between the dyes, heated, and returned again; which process, in medallions, and large medals, is sometimes repeated fifteen or twenty times, before the full impression be given; care being taken every time the planchet is removed, to take off the superfluous metal stretched beyond the circumference, with a file.

Add to this, that medallions, and medals of high relieve, for reason of the difficulty of stamping them in the balancier, or press, are usually first cast or moulded in sand, like other works of that kind, and are only put in the press to perfect them; by reason the sand does not leave them clean, smooth, and accurate enough. Medals, therefore, receive their form and impression by degrees; money all at once.

The rule whereby they judge the medal to be sufficiently stamped; is, when feeling it with the hand, it is found firm, and

not to be shaken, as filling the dye equally every where.

COINING with the hammer, or hammered money.—In this method of making money, the bars or plates of gold, silver, or copper being taken out of the moulds, or frames, as above, are heated and stretched by beating them on the anvil: when sufficiently beaten, they are cut into pieces; which being again heated, flattened, and further stretched with the hammer, are adjusted by cutting off the angles with sheers: thus, by cutting and rounding them, they are reduced to the weight of the standard; and their roundness finished with another hammer, which beats down all the points and angles still remaining on the edges. In this manner they are brought to the size of the species to be coined.

In this state the pieces become blanks or planchets, and are carried to the blanching-house; where they undergo the same preparation as the milled money already described, and are given to the minter to stamp them with the hammer.

For this last operation, which finishes the money, they use two punches, or matrices; the one called the *pile*, and the other the *trufs*, or *quiver*; each engraven dent-wife. The pile bearing the arms, and the trufs the image, or cross; both their legend, date, &c.

The pile, which is about eight inches high, has a kind of talon, or heel in the middle, and ends in a point: which figure it had, for the sake of being more easily sunk, and more firmly fastened to the block whereon the money is struck.

The minter, then, laying the planchet horizontally on the pile, and covering it with the trufs, which he holds steadily in his left hand, gives several smart blows on the trufs with an iron mallet held in the right; more or less, as the graving of the dyes is more or less deep. If after these first strokes, the planchet be not sufficiently stamped, it is returned again between the matrices, exactly in its former position, and the strokes are repeated till the impression be perfect.

Thus is the *Coinage* finished, and the planchets converted into money; which, after they have been examined as to their weight, become current.

English COINAGE.—Since the invention of milling money (the author whereof is not agreed on, nor even the country, where it took its rise, though the French lay claim to both) it has been imitated by several other nations; but by none with success equal to that of the English, who carried it to the utmost perfection; both by the beauty of their graving, and by their inventing the impressions on the edges, that admirable expedient for preventing the alteration of the species, above-mentioned.

Till the time of K. Charles II. the English money was generally struck with the hammer, as that of other nations; and, in effect, it is but very late, *viz.* in the reign of king William III. that the hammered species ceased to be current. Ere they were put down, the English money was in a woful condition; having been filed and clipped by natives as well as foreigners, especially the Dutch, so as to be scarce left of half the value: the retrieving this distressed state of the English money, is looked on as one of the glories of king William's reign; for which we are owing, in good measure, to the happy conduct of the late earl of Halifax.

The *Coinage* of England is now performed wholly in the Tower of London; where there is a corporation for it under the title of the *mint*.

Formerly there were here, as they are still in other countries, what we call the *rights of seignorage and brassage*; but since the eighteenth year of king Charles II. there is nothing taken, either for the king, or for the expences of *Coining*; it having been settled by act of parliament, that all money should be struck at the publick expence; so that weight is returned for weight, to all persons who carry their gold and silver to the Tower.

The species coined in England are esteemed contraband goods, and not to be exported: all foreign species are allowed by act of parliament, made in 1673, to be sent out of the realm; as well as gold and silver in bars, ingots, dust, &c. Indeed, in the session of parliament in 1718, endeavours were made to put a stop to this license, which drains England of its richest metals; but in vain; the parliament having laid aside the bill, without coming to any resolution.

The Spanish COINAGE is esteemed one of the least perfect in Europe: it is settled at Sevil and Segovia, the only cities where gold and silver are struck. It is true, there are brought from Mexico, Peru, and other provinces of the Spanish America, such vast quantities of pieces of eight, and other species, both of gold and silver, that, in this respect, it must be owned, there is no state in the world where so much money is coined, as in that of the king of Spain.

Muscovite COINAGE.—The Czar strikes no money but silver, and that only in the cities of Moscow, Novogrod, Twer, and Plekou; to which may be now added Petersburg, the favourite city of her Czarian majesty. The *Coinage* of each of these cities is let out to farm, and makes part of the royal revenue.

Persian COINAGE.—All the money made in Persia is struck with the hammer: and the same may be understood of the rest of Asia and America, and the coasts of Africa, and even Muscovy.

vy; the invention of the mill not being yet gone out of Europe, nor even established in every part of it. The king's duty, in Persia, is seven and a half *per cent.* for all the monies coined; which are now reduced to silver and copper: there being no gold coined there, except a kind of medals at the accession of a new sopher.

The *COINAGE of Pers and Tunis*, is not under any discipline; each goldsmith, jew, and even every private person, undertaking it at pleasure: which renders their money exceedingly bad, and their commerce very unsafe.

COITION, the intercourse between male and female in the act of generation.

It is observed that frogs are forty days in the act of *Coition*. Bartholine, &c. relate, that butterflies make 130 vibrations of the wings in one act of *Coition*.

COITION is also sometimes used for that mutual attraction, or tendency toward each other, which is found between iron and the magnet.

COLARBASIANS, or **COLORASIANS**, a sect of hereticks in the second century; so called from their leader Colarbasus, a disciple of Valentinus; who, with Marcus, another disciple of the same master, maintained the whole plenitude, and perfection of truth and religion, to be contained in the Greek alphabet; and that it was upon this account that Jesus Christ was called the *alpha and omega*.

COLARIN, in architecture, the little frise of the capital of the Doric column; placed between the astragal, and the annulets: called by Vitruvius, *Hypotrachelium*; by the French also *Gorgerin*. See *FRIZE*, *HYPATRACHELION*, &c.

COLARIN is also used for the orlo, or ring, a-top of the shaft of the column, next the capital; called also the *cincture*.

COLATURE. See the article *FILTRATION*.

COLCHESTER PLOUGH. See the article *PLOUGH*.

COLCOTHAR, in natural history, &c.—There are two kinds of *Colcothar*, *natural*, and *facitios*.

Natural COLCOTHAR, otherwise called *chalitis*, is a red vitriol, brought from Germany; formed from the common green vitriol, calcined naturally by some subterraneous fire.

Artificial COLCOTHAR is a green vitriol, calcined a long time by an intense fire; and by that means reduced to the redness of blood.

Common sulphur being mixed with iron filings, and exposed to the air, the two unite, and form a *Colcothar* perfectly like that produced by calcination from vitriol. *Vid.* Hist. Acad. R. Scienc. an. 1730. p. 71.

COLCOTHAR Vitrioli, is also used for the caput mortuum, or remains left at the bottom of the vessel, after the distillation of vitriol.

COLD, something devoid of heat, or which contains in it no particles of fire.

This definition is agreeable to the sentiments of most of the modern philosophers, who make *Cold* a mere negative term; and suppose the thing to consist in a privation, or diminution of heat. Others define *Cold*, much on the same principle, to be that state of the minute parts of a body, wherein they are more slowly and faintly agitated than those of the organs of feeling.—In which sense, *Cold* is a mere term of relation; and hence the same body becomes liable to be perceived hot or cold, as its particles are in a greater or less degree of motion than those of the sensible organs.

Heat is supposed to consist in a particular motion of the parts of the hot body; and hence the nature of *Cold*, which is its opposite, is easily deducible: for *Cold*, we find extinguishes, or rather abates heat; whence it seems to follow, that those bodies are *cold*, which check and restrain the motion of the particles wherein heat consists.

Now, there are three kinds of bodies which may do this, *viz.* either those whose particles are perfectly at rest; or those whose particles are indeed agitated, but that less violently than those of the hot body to which they are applied: or, lastly, those whose particles have a motion proper for exciting the sensation of heat, but which move with a different determination; so as to retain and change the motion of the particles of the organ.

Hence, there arise three different kinds of *Cold*, or cold bodies: the first is, that *Cold* common to all hard bodies, which consists in the rest of their parts. The second is that which arises on plunging any part of our body in water; which consists in this, that the parts of our præcordia being more briskly agitated than those of the fluid, communicate part of their motion to it. The third, the *Cold* felt on collecting even warm air with a fan, or in blowing hot breath out of our mouth, with the lips close shut; which consists in this, that the direct motion of the particles of air, do, in some measure, change and rebate the motion and determination of the parts of the body: and hence it is, that a *cold* body cannot cool another without heating itself. Hence also it is, that the more parts of a frigid body are at rest, the more must the particles of a warm body applied to heat them, lose of their motion, and by consequence of their heat. Thus a marble having more quiet parts than wood, which is full of pores and interstices, is felt colder than wood. Hence also we see why air, near marble and other dense bodies, feels somewhat colder than in other places.

On this principle, the two latter kinds of *Cold* appear somewhat more than privations: the particles inducing the *Cold*, may be esteemed real frigorific corpuscles; and the coldness be deemed a real quality as well as hotness.

These particles do not only check the agitation of those continually diffused from the inner parts of the animal to the outer; but, having an elastic power, they bend and hang about the filaments of the body, pinch and squeeze them; and hence that acute pungent sensation called *Cold*.

That *Cold* is more than a mere relation, or comparison, is evident from its having real and positive effects; such as freezing, congelation, condensation, rarefaction, bursting, &c. See *FREEZING*, &c.

Dr. Clarke takes *Cold* to be owing to certain nitrous, and other saline particles, endued with particular figures proper to produce such effects. Hence, sal ammoniac, salt petre, or salt of urine, and many other volatile and alkalizate salts, mixed with water, increase its degree of *Cold* very sensibly. Hence also that popular observation, that *Cold* prevents corruption; which, however, must not be admitted without an exception: since, if a hard, porous body have its interstices filled with water, and this be too much dilated by freezing, the including body will be burst. And thus it is, that *Cold* proves destructive to the parts of some plants.

Potential COLD. See the article *POTENTIAL*.

COLD Baths. See the article *BATHS*.

COLD Diamargaritum. See the article *DIAMARGARITON*.

COLD Diatrageanth. See the article *DIATRAGEANTH*.

COLD Diffillations. See the article *DISTILLATION*.

COLIC, in medicine, a severe gnawing pain, felt in the lower venter; so called, because the ordinary seat of the disorder was antiently supposed to be in the intestine colon.

Physicians usually distinguish three kinds of *Colic*, the *bilious*, *windy*, and *nephritic*.—The *bilious COLIC* has its rise from certain sharp, bilious, stimulating humours, which being diffused through the intestines, vellate their fibres, and occasion a sensation of pain. Though Willis takes the part here principally affected to be the mesentery.

Dr. Sydenham observes, that the *bilious Colic* usually attacks people about the beginning of summer; that it is generally attended with a vomiting of bilious green liquor; that the patient complains of excessive heat, great gripings, faintness, &c. and that if it be not soon remedied, it is apt to turn into the iliac passion.

Baglivi notes, that if the patient sweat much, and be much enfeebled; the disease is apt to degenerate into a palsy. The cure, he says, depends on bleeding, gentle cathartics, and clysters; and if it arise from a crapsula, an emetic is to proceed: after which, the cure is to be completed with proper anodynes.

Wind COLIC, is a vague pain, never staying in any fixed place; being produced by windy vapours, which swell and distend the intestines they are included in.

Nephritic COLIC is that felt particularly in the reins, whence it has its name.

It usually has its rise from some stone, or gravel detached from the kidneys, and fallen into the pelvis. The *parcira brava* is said to be a specific for *nephritic Cases*.

S. Manouchi, a Venetian physician at the court of the great Mogul, gives the following remedy as infallible in *nephritic cases*: an iron ring, about an inch and half in diameter, and thick in proportion, is to be heated red-hot; then, laying the patient on his back, the red-hot ring is to be applied to his navel, so as that the navel be in the center of the ring; the patient will presently feel the pain, which will occasion him to shrink back very suddenly; and the sudden revulsion thus occasioned in the lower venter, will, in a little time, dissipate all his pains. The same author adds, that he can warrant the success of this odd remedy.

In *Colics* arising from flatulencies, carminative waters, oils, aromatics, &c. are always to be added to the compositions: and in *nephritic Colics*, besides emollient clysters, solutions of manna, cremor tartari, &c. in whey, &c. and proper oleaginous mixtures are to be exhibited to relax the fibres; after which, proper anodynes take place.

Some, particularly Sydenham, mention a *nervous Colic*, mostly incident to hysterical and hypochondriac persons; but this appears only a species of the *windy Colic*.

Baglivi recommends camomile as an antidote against the *Colic*, from what cause severer it arise. Where the disease is obstinate, much riding has been found of especial service. See *Supplement*, article *COLIC*.

COLIR, an officer in China, who has an eye over what passes in every court, or tribunal in the empire; and though himself not of the number, yet is assisting at all assemblies, the proceedings whereof are communicated to him.

He is properly what we may call an *inspector*: he gives secret intelligences to the court; and even, on occasion, accuses the mandarins of their faults openly; and that not only of faults in their public offices, but even in private life. To keep him impartial, he is kept independent; by having the post for life. These *Colirs* make even the princes of the blood tremble.

COLISEUM*, or **COLISEUM**, in the ancient architecture, an oval amphitheater, built at Rome by Vespasian, in the place where stood the palace of Nero's gilded house.

* The word is formed from *Coliseum*, on account of the colossus of Nero, that stood near it; or, according to Nardini, from the Italian *coliseo*.

In this were placed statues, representing all the provinces of the empire; in the middle whereof stood that of Rome, holding a golden apple in her hand.—The same term, *Coliseum*, is also given to another amphitheater of the emperor Severus.

In these *Colisea* were represented games, and combats of men and wild beasts; but there is now little remaining of either of them; time and war having reduced them to ruins.

COLLAR, an ornament, worn by the knights of several military orders, hanging over their shoulder, on the mantle; and its figure drawn around their armories.

The *Collar* ordinarily consists of a chain of gold, enamelled; frequently set with cyphers, or other devices, and having the badge of the order suspended at bottom.

The *Collar* of the order of the garter, consists of SS, with roses enamelled red, within a garter enamelled blue, the George at the bottom.

Maximilian is said to have been the first of the emperors who put the *Collar* of an order around his arms, upon his being made chief of that of the golden fleece.

Knights of the COLLAR, a military order in the republic of Venice; called also the *order of St. Mark*, or the *medal*.

It is the doge and the senate that confer this order: the knights bear no particular habit, only the *Collar*, or chain, which the doge puts around the neck; with a medal, whereon is represented the winged lion of the republic.

COLLATERAL*, in geography, any thing, place, country, &c. situate by the side of another.

* The word is a compound of *con*, with, and *latus*, side.

COLLATERAL Points, in cosmography, the intermediate points; or those between the cardinal points. The *Collateral Points* are either *primary*, which are those removed by an equal angle on each side from two cardinal points: or *secondary*; which, again, are either those of the first, or second order.—The first are those equally distant from a cardinal and first primary; the latter equally distant from some cardinal or primary, and first secondary.

COLLATERAL Winds, are those blowing from *Collateral* points. See **WIND**.

Such are the north-east, south-east, north-west, south-west, &c. with their subdivisions.

COLLATERAL, in matters of genealogy, is understood of those relations which proceed from the same stock, but not in the same line of ascendants, or descendants; but being, as it were, aside of each other.

Thus, uncles, aunts, nephews, nieces, and cousins, are *Collaterals*, or in the *Collateral* line. Those in a higher degree, and nearer the common root, represent a kind of paternity with regard to those more remote; but there is a kind of equality between *Collaterals* in the same degree.

Collateral descent stands in opposition to *direct descent* to posterity; the former passing to brothers children, but the latter only from father to son.

COLLATERAL Assurance, in law, is a bond, made over, and beyond the deed itself, for the performance of covenants between man and man; thus called, as being external, and without the nature and essence of the covenant.

Crompton says, that to be subject to the feeding of the king's deer, is *Collateral* to the soil within the forest. It may be added, that liberty to pitch booths in a fair, or another man's ground, is *collateral* to the ground.

COLLATERAL Condition. See the article **CONDITION**.

COLLATERALIS Penis, in anatomy, a muscle, otherwise called *erigens*, or *erector penis*. See **ERECTOR**.

COLLATION, in the canon law, the conferring, or bestowing of a benefice by a bishop, who has it in his own gift, or patronage.

Collation differs from *institution*, in that the latter is performed by the bishop, at the motion or presentation of another: And the former on his own motion.

Collation also differs from *presentation*, in that the latter is properly the act of a patron, offering his clerk to the bishop, to be instituted into a benefice; whereas the former is the act of the bishop himself. The *Collator* can never confer a benefice on himself.

In the Romish church, the pope is the collator of all benefices, even elective ones, by prevention; setting aside consistorial benefices, and those in the nomination of lay-patrons. Prelates and bishops are called *ordinaries*, or ordinary collators.

If the ordinary collator neglect to exercise his right for six months, the superior collator may collate by devolution. Thus, if the bishop neglect, the metropolitan may confer; then the primate; and so on from degree to degree.

In France, the king is the collator of all the benefices whereof he is patron, excepting consistorial ones, to which he has also the nomination, and the pope by virtue of the concordat, is

obliged to confer on whomsoever the king nominates. For the rest, he is direct and absolute collator; and may confer them, by virtue of a kind of priesthood annexed to the royalty.

Other lay-patrons have seldom more than a mere presentation; the *Collation* properly belonging to the bishop: yet there are some abbots who have the full right of *Collation*.

The canonists reckon two kinds of *Collation*; the one free, and voluntary, the other necessary. The first depending on the mere will of the collator, who may chuse whom he pleases to fill the vacancy. In the latter, the collator is not at his liberty: which is the case where a benefice has been resigned, or changed, and that resignation or permutation allowed of by the superior; for here the collator is obliged to grant the provision to the resignatory, or compermutant.

It is a maxim in the new canon law, *collationes sunt in fructibus*; 'Those who have the fruits of a benefice, have the *Collation*.' But in that case, the word *Collation* is used for presentation.

COLLATION, in common law, is the comparison, or presentation of a copy to its original, to see whether or no it be conformable: or the report, or act of the officer who made the comparison.

A collated act is equivalent to an original; provided all the parties concerned were present at the *Collation*.

COLLATION is also used among the Romanists for the meal or repast made on a fast-day, in lieu of a supper.

Only fruits are allowed in a *Collation*: F. Lobineau observes, that antiently there was not allowed, even, bread in the *Collations* in lent; nor any thing beside a few comfits and dried herbs, and fruits: which custom, heads, obtained till the year 1513.

Cardinal Humbert observes further, that in the middle of the eleventh century, there were no *Collations* at all allowed in the Latin church in the time of lent; and that the custom of *Collations* was borrowed from the Greeks; who themselves did not take it up till about the eleventh century.

COLLATION is also popularly used for a repast between dinner and supper.

The word *Collation*, in this sense, Du Cange derives from *collocatio*, conference; and maintains, that originally, *Collation* was only a conference, or conversation on subjects of piety, held on fast-days in monasteries; but that, by degrees, the custom was introduced of bringing in a few refreshments: and that by the excesses to which those sober repasts were at length carried, the name of the abuse was retained, but that of the thing lost.

COLLATIONIS forma. See the article **CONTRA**.

COLLEAGUE, a companion, partner, or associate in the same office, or magistrature. See **ADJUNCT**, and **ASSOCIATE**.

The word is particularly used in speaking of the Roman consuls, and emperors.

COLLECT, **COLLECTION**, a voluntary gathering of money, for some pious, or charitable purpose.

Some say, the name *Collect*, or *Collection*, was used, by reason those gatherings were antiently made on the days of *Collects*, and in *Collects*, i. e. in assemblies of christians; but, it was more probably, *quia colligebatur pecunia*.

COLLECT is sometimes also used for a tax, or imposition, raised by a prince for any pious design.—Thus, histories say, that in 1166, the king of England, coming into Normandy, appointed a *Collect* for the relief of the holy land, at the desire, and after the example of the king of France.

COLLECT, in the liturgy of the church of England, and the mass of the Romanists, denotes a prayer accommodated to any particular day, occasion, or the like.

In the general, all the prayers in each office are called *Collects*; either because the priest speaks in the name of the whole assembly, whose sentiments and desires he sums up by the word *oramus*, let us pray, as is observed by pope Innocent III. or, because those prayers are offered when the people are assembled together; which is the opinion of Pamelius on Tertullian.

The congregation itself is in some ancient authors called *Collect*. The popes Gelasius and Gregory are said to have been the first who established *Collects*. Despenfe, a doctor of the faculty of Paris, has an express treatise on *Collects*, their origin, antiquity, authors, &c.

COLLECTIVE, in grammar, a term applied to a word that expresses a multitude; though itself be singular.

Thus, troop, company, and army, are nouns *Collective*.

COLLECTOR, a person nominated by the commissioners of any duty, the inhabitants of a parish, or the like, to raise or gather any tax, &c.

COLLEGATARY, in the civil law, a person to whom is left a legacy in common with one or more other persons.

If the thing be bequeathed in *solido*, the portion of a deceased *Collegatary* accrues to the rest.

COLLEGE, an assemblage of several bodies, or societies; or, even of several persons into one society.

College, *collegium*, among the Romans, was used for an assemblage of several persons employed in the same functions, and as it were bound together to act, or serve in concert. It served indifferently for those employed in the offices of religion, of government, the liberal arts, and even mechanical arts, or trades: so that

the word properly signified what we call a *corporation*, or *company*.

In the Roman empire, there were not only the *College of augurs*, and the *College of capitulini*, i. e. of those who had the superintendance of the capitoline games; but also *Colleges* of artificers, *collegia artificum*; *College* of carpenters, *fabricorum*, or *fabrorum*; *signariorum*; of potters, *figularum*; of founders, *cruriorum*; the *College* of locksmiths, *fabrorum ferrariorum*; of engineers, for the army, *signariorum*; of butchers, *laniorum*; of dendrophori, *dendrophorum*; of centonaries, *centonariorum*; of makers of military cafaques, *sagariorum*; of tent-makers, *tabernaculariorum*; of bakers, *pisforum*; of musicians, *tibicinum*, &c.

Flutarch observes, that it was Numa who first divided the people into *Colleges*; which he did, to the end that each consulting the interests of their *College*, whereby they were divided from the citizens of the other *Colleges*, they might not enter into any general conspiracy against the publick repose.

Colleges were distinguished from other societies not formed into *Colleges* by publick authority, in this, that those who composed a *College* were qualified to treat of the common interests of their *College*, which was, as it were, a member of the state, and had a common parlie, an agent to negotiate their affairs, sent deputies to the magistrats when they wanted to treat with them; might make statutes and by-laws for the administration of their *College*, &c.

There are various *Colleges* on foot among the moderns, built on the model of those of the antients; as the *three Colleges of the empire*, viz. the *College of electors*, *College of princes*, and *College of cities*, &c.

COLLEGE of Electors, is the body of electors, or their deputies, assembled in the diet at Ratisbon. See ELECTOR.

Antiently, the king of Bohemia had no deputy in this *College*; at present he has.

COLLEGE of Princes, is the body of princes, or their deputies, at the diet of Ratisbon.

COLLEGE of Cities, is, in like manner, the body of deputies which the several imperial cities send to the diet.

COLLEGE of Cardinals, or the *sanct* COLLEGE, is a body composed of the three orders of cardinals, viz. cardinal-bishops, cardinal-priests, and cardinal deacons.

Each order has its dean, or chief. The dean of the cardinal-bishops is always the bishop of Ostia. See CARDINAL.

COLLEGE is also used for a publick place, endowed with certain revenues, where the several parts of learning, both divine and human, are taught, in schools, halls, or classes, appointed for that purpose.

An assemblage of several of these *Colleges* constitute an university.

The university of Oxford consists of nineteen *Colleges*, and six halls; that of Cambridge of twelve *Colleges*, and four halls; and that of Paris of fifty-four *Colleges*, such as they are. In reality, there are but ten where there is *full exercise*, as it is called; for the rest, the author of a late description of Paris says it is needless to recite their names, since there is no teaching in them.

The erection of *Colleges* is part of the royal prerogative, and is not to be done without the king's consent.

Among the Greeks, the lyceum and academy were celebrated *Colleges*; the latter of which has given its name to our universities, which in Latin are called *academia*. With them, the house, or apartment of each philosopher, or rhetor, might be esteemed a kind of *College* of itself.

The Romans came late into the institution of such *Colleges*: they had, however, several, founded by their emperors; especially in Gaul; the chief whereof were those of Marfeilles, Lions, Besançon, and Bourdeaux.

The Jews, and Egyptians too, have had their *Colleges*; the chief of the first were those of Jerusalem, Tiberias, Nardea, Poppodita, Sura, and Babylon: this last is said to have been instituted by Ezekiel, and to have subsisted in the time of Mahomet.

Colleges of this kind have been generally in the hands of those consecrated to the offices of religion: the Magi in Persia, the Gymnosophists in the Indies, and the Druids in Gaul and Britain, had the care of educating youth in the sciences.

After christianity became established, there were almost as many *Colleges* as monasteries; Charlemain, in his capitulars, enjoining the monks to instruct youth in musick, grammar, and arithmetick: but, this, calling the monks from their solitude, and taking up too much of their time, the care of the *Colleges* was at length put into the hands of those who had nothing else to do.

In the canon law, it is said, three persons make a *College*, *tres collegium faciunt*.—The *Colleges* in London, are,

STON-COLLEGE, or the *College* of the London clergy; which has been a religious house time out of mind, sometimes under the denomination of a priory, sometimes under that of a spittal, or hospital: at its dissolution under 31 Hen. VIII. it was called *Ellyn's Spittle*, from the name of its founder, a mercer, in 1320.

At present, it is a composition of both, viz. a *College* for the clergy of London, who were incorporated in 1631, at the request of Dr. White, under the name of the *President and Fellows of STON-COLLEGE*; and an hospital for ten poor men, and as many women.

The officers of the corporation are the president, two deans, and four assistants; who are annually chosen from among the rectors and vicars of London; and are subject to the visitation of the bishop. They have a good library, built and stocked by Mr. Simson, chiefly for the clergy of the city, without excluding other students on certain terms; and a hall, with chambers for students, generally filled with the ministers of the neighbouring parishes.

COLLEGE of Civilians, commonly called *Doctors-Commons*; a *College* founded by Dr. Harvey, dean of the arches, for the professors of the civil law residing in this city; where usually, likewise, reside the judge of the arches court of Canterbury, judge of the admiralty, of the prerogative court, &c. with other *Civilians*; who all live, as to diet and lodging, in a collegiate manner, commoning together: whence the appellation of *Doctors Commons*. Their house being consumed in the great fire, they all resided at Exeter-house in the Strand, till 1672; when their former house was rebuilt, at their own expence, in a very splendid manner. To this *College* belong 34 proctors; who make themselves parties for their clients, manage their causes, &c.

COLLEGE of Physicians, a corporation of physicians, in London; who, by several charters, and acts of parliament of Henry VIII. and his successors, have certain privileges, whereby no man, though a graduate in physick of any university, may, without license under the said *College-seal*, practise physick, in, or within seven miles of London; with power to administer oaths, fine and imprison offenders, in that and several other particulars: to search the apothecaries shop, &c. in and about London, to see if their drugs, &c. be wholesome, and their compositions according to the form prescribed by the said *College* in their dispensatory.

By the said charter they are also freed from all troublesome offices; as to serve on juries, be constable, keep watch, provide arms, &c.

This society had antiently a *College* in Knight-riders-street, the gift of Dr. Linacre, physician to king Henry VIII. Since that, they have had a house built them by the famous Dr. Harvey, in 1652, at the end of Amen-street, which he endowed with his whole inheritance in his life-time; but this being burnt in the great fire in 1666, a new one was erected at the expence of the fellows, in Warwick-Lane; with a noble library, given partly by the marquis of Dorchester, and partly by Sir Theodore Mayerne.

Of this *College* there are a president, four censors, and twelve electors: the censors have, by charter, power to survey, govern, and arrest all physicians, or others practising physick, in, or within seven miles of London; and to fine, amerce, and imprison them at discretion.

The number of fellows was antiently thirty, till king Charles II. increased their number to forty; and king James II. giving them a new charter, allowed the number of fellows to be enlarged, so as not to exceed forty; reserving to himself and successors, the power of placing and displacing any of them for the future.

The *College* are not very rigorous in asserting their privileges; there being a great number of physicians, some of very good abilities, who practise in London, &c. without their license, and are connived at by the *College*: yet, by law, if any person, not expressly allowed to practise, take on him the cure of any disease, and the patient die under his hand, it is deemed felony in the practitioner.

In 1696, the *College* made a subscription, to the number of forty two of their members, to set on foot a dispensary for the relief of the sick poor: since that, they have erected two other dispensaries.

GRESHAM-COLLEGE, or *COLLEGE of Philosophy*; a *College* founded by Sir Thomas Gresham, and endowed with the revenue of the Royal-Exchange: one moiety of this endowment the founder bequeathed to the mayor, and aldermen of London, and their successors, in trust, that they should find four able persons to read within the *College*, divinity, geometry, astronomy, and musick; and to allow each, besides lodging, fifty pounds per ann. The other moiety he left to the company of mercers, to find three more able persons, to read civil law, physick, and rhetoric, on the same terms; with this limitation, that the several lecturers should read in term-time, every day in the week, except Sundays; in the morning in Latin, in the afternoon the same in English: but that in musick to be only read in English. In this *College* formerly met the royal society, that noble academy, instituted by king Charles II. and celebrated throughout the world, for their improvements in natural knowledge. See their history and policy, under SOCIETY.

COLLEGE of Heralds, or *COLLEGE of Arms*, a corporation founded by charter of king Richard III. who granted them several privileges; as, to be free from subsidies, tolls, offices, &c. See HERALD.

They had a second charter from king Edward VI. and a house built near Doctors-Commons, by the earl of Derby, in the reign of king Henry VII. was given them by the duke of Norfolk, in the reign of queen Mary; which house is now rebuilt.

Of this collegiate society, are three officers styled *kings of arms*,

reges armum anglicorum. See KING at arm. Six Herald. See HERALD. And four Pursuivants. See PURSUIVANT.
COLLEGES of *Common Law.* See INNS of COURT, and CHANCERY.
COLLEGES for disabled Soldiers, Seamen, &c. See HOSPITALS.
COLLEGIAT. See the article COLLEGIATE.

COLLEGIANS, COLLEGIANS, a religious sect, formed among the Arminians and Anabaptists in Holland; so called, because of their *Colleges*, or meetings the first Sunday in each month; where every one has the same liberty of expounding the scripture, praying, &c.

They are said to be either Arians, or Socinians: they never communicate in the *Colleges*, but meet twice a-year from all parts of Holland at Rinsborough, a village two miles from Leyden, where they communicate together; admitting every one that presents himself, without regard to his sect or opinion. They have no particular ministers, but each officiates as he is disposed. They never baptize without dipping.

COLLEGIATE, or COLLEGIAL Churches, are those which have no bishop's see, yet have the antient retinue of the bishop, the canons, and prebends.

Such are, among us, Westminster, Rippon, Windsor, &c. governed by deans and chapters. See DEAN and CHAPTER.
Of these *Collegiate* churches, there are two kinds; some of royal foundation, others of ecclesiastical foundation: each of them, in matters of divine service, are regulated in the same manner as the cathedrals.

There are even some *Collegiate* churches which have the episcopal rights. Some of these churches were antiently abbies; which, in time, were secularized.

The church of St. Peter's, Westminster, was antiently a cathedral; but the revenues of the monastery being by act of parliament 1st Eliz. vested in the dean and chapter, it commenced a *Collegiate* church.—In several causes, the titling it *Cathedral*, instead of *Collegiate Church* of Westminster, has occasioned error in the pleadings.

COLLEGIATE Auditors. See the article auditor.

Vergers of COLLEGIATE Churches. See VERGER.

COLLETIC^s, COLLETICA, in medicine, such remedies as join, and glue together the separated parts, or lips of a wound, or ulcer; and thus re-establish them in their natural union. See AGGLUTINANT.

* The word comes from the Greek *καλλωτιν*, something that has the virtue of gluing together: of *καλλω*, *gluten*.

Colletics are more delicate than farotics; but less so than epulotics. See SARCOtics, and EPULOTICS.—Among *Colletics* are ranked litharge, aloes, myrrh, &c.

COLLINS's Quadrant. See the article QUADRANT.

COLLIQUATION, in pharmacy, the action of melting together two, or more solid substances; or rendering them liquid by fusion, or dissolution; as wax, mucilages, &c. by heat; gums, &c. by moisture.

COLLIQUATION is also used to express such a temperament, and disposition of the animal fluids, as proceeds from a too lax compage; whereby they flow off through the several glands, and particularly through those of the skin, faster than they ought; which occasions fluxes of many kinds, but mostly, profuse, greasy, clammy sweats.

If this *Colliquation* continue, it generally terminates in an hectic fever, and is usually a concomitant of one.

The curative intention in this case, is the giving a better consistence to the juices by balsamicks and agglutinants; and the hardening of the solids by subastringents. Hence,

COLLIQUATIVE Fever, is a fever attended with a diarrhæa; or profuse sweats, from too loose a texture of the fluids.

COLLISEUM. See the article COLISEUM.

COLLISION, the friction, or percussion of two bodies moving violently with different directions, and dashing against each other. See PERCUSSION.

COLLUSION, a secret understanding between two parties, who plead, or proceed fraudulently against each other, to the prejudice of a third.

In the canon law, *Collusio*, in matters of benefices, vacates the benefice, and incapacitates the person from holding any benefice at all.

COLLUM, in anatomy. See NECK, and CERVIX.

COLLI interspinales. See the article INTERSPINALES.

COLLI intertransversales. See INTERTRANSVERSALES.

COLLI transversales. See the article TRANSVERSALIS.

COLLUTHIANS, a religious sect, who rose about the beginning of the fourth century; on occasion of the indulgence shewn to Arius, by Alexander patriarch of Alexandria.

Several people being scandalized at so much condescension; and among the rest, Colluthus, a priest of the same city; he hence took a pretence for holding separate assemblies, and by degrees proceeded to the ordination of priests; as if he had been a bishop: pretending a necessity for this authority, in order to oppose Arius. To his schism he added heresy; teaching, that God did not create the wicked; that he was not author of the evils that befall men, &c.—He was condemned in a council held at Alexandria by Osius, in the year 335.

COLLYRIANS, antient hereticks, condescended from a little

cake, called by the Greeks *Collyrida*, which they offered to the virgin Mary.

This sect, it seems, consisted chiefly of Arabian women, who, out of an extravagance of devotion to the virgin, met on a certain day in the year, to celebrate a solemn feast, and to render divine honours to Mary as to a goddess; eating the cake which they offered in her name.—St. Epiphanius, who relates the history of this superstitious ceremony, laughs at it.

COLLYRIUM^s, in medicine, an external remedy, appropriated to diseases of the eyes.

* The word comes from the Greek *καλλωριον*; and that, according to Martinius, from *καλλω τον ρυτι*; because it glues up, and prevents deflections.

There are two kinds of *Collyriums*; the one *liquid*, the other *dry*.—*Liquid Collyriums*, *υγροκαλλωρια*, are composed of ophthalmic powders in waters; as rose-water, plantain-water, that of fennel, eyebright, &c. wherein they dissolve tully, white vitriol, or some other proper powder.

The *dry Collyria*, *ξηροκαλλωρια*, are troches of rhafis, sugar-candy, iris, tully prepared, &c. blown into the eye with a little pipe.

COLLYRIUM is also a name given to unguents used for the same purpose; as unguent of tully, and several others.

COLLYRIUM is also a denomination given, though improperly, to some liquid medicines used against venereal ulcers.

COLOCYNTHIS. See the article COLOQUINTIDA.

COLON, in grammar, a point, or character formed thus [:] serving to mark a pause, and to divide the members of a period.

See POINTING; see also PERIOD, COMMA, and SEMICOLON. Grammarians generally assign the use of a *Colon* to be to mark the middle of a period; or to conclude a sense less perfect than the dot, or period—but, a sense less perfect than the period, is an expression extremely vague and indeterminate.

Others say, a *Colon* is to be used when the sense is over-clear, but the sentence not concluded—but neither is this perfect-clear and express. Add to this, that in practice our best writers confound the *Colon* with the semicolon.

F. Buffer attempts to fix the use of the *Colon*; but he does not much distinguish it from the semicolon: he prescribes the use of either, indifferently; and calls them by a common name, *intermediate pointings*; as being mediums between the comma, and fullpoint or period. Their use, according to this author, is to distinguish the supernumerary members of a period.

By supernumerary members, are meant, such as the precedent ones do not raise any expectation of; i. e. such parts, as have indeed a dependence on what goes before, even though what goes before has a complete sense, independent hereon: v. gr. *The Augustan age was so eminent for good poets, that they have served as models to all others: yet did it not yield any good tragic poets.* Where the supernumerary member, and the use of the *Colon* are obvious. The most obvious and sensible use of the *Colon*, he adds, is when the supernumerary member is distinguished by some conjunction; as, *notwithstanding, however, but, except that, unless, inasmuch as, yet, since, the rather as, provided that, &c.*

Some, indeed, use the *Colon* in the middle of long periods, without any regard to supernumerary members: which custom was probably introduced, to mark that the breath is here to be taken almost as much as in a common period, in the place where the supernumerary period commences. But this, at best, is arbitrary; and the intermediate pointings may always be omitted in a period, if there be no supernumerary member; i. e. if there be no subsequent member, but what is expected from the precedent.

As to the occasions where the *Colon* is to be used, rather than the semicolon, there is nothing precise to be said of it; except that the *Colon* shews the supernumerary member more detached, and sets it at a greater distance from the rest; and therefore marks a longer pause than the semicolon.

Accordingly, it seems preferable to the semicolon before conjunctions adverbative, restrictive, conditional, &c. as, *nevertheless, but, excepting that, however, otherwise, provided that.* Again, where the supernumerary phrases not only suppose the precedent, but depend on them for their regimen, and are, as it were, new parts thereof; there the semicolon seems preferable to the *Colon*. v. gr. *You are regardless of the goodness of God, who first chose you; a God who is only jealous of your heart for your own happiness; a God who could be equally glorious in destroying you by his justice, as in saving you by his mercy.* Or thus: *The discourse consisted of two parts; in the first was shewn the necessity of fighting; in the second, the advantages that would redound from it.*

But this difference, it must be owned, has a dependence on something that influences all the points, and sways the whole doctrine of punctuation; viz. the length, or shortness of the members and periods: for when the phrases are long, we point higher than when short.

A later author, in an ingenious discourse, *de ratione interpunctionis*, marks the office of the *Colon*, and wherein it differs from the semicolon, &c. more precisely: a *Colon*, on his principles, serves to distinguish those conjunct members of a sentence, which are capable of being divided into other members; whereof one, at least, is conjunct.

Thus, in the sentence, *as we cannot discern the shadow moving along the dial-plate, so the advances we make in knowledge are only*

perceived by the distance gone over; the two members being both simple, are only separated by a comma: in this, as we perceive the shadow to have moved, but did not perceive it moving; so our advances in understanding, in that they consist of such minute steps, are only perceivable by the distance; the sentence being divided into two equal parts, and those conjunct ones, since they include others; we separate the former by a femicolon, and the latter by commas: but in this, as we perceive the shadow to have moved along the dial, but did not perceive it moving; and it appears the grass has grown, though no body ever saw it grow: so the advances we make in knowledge, as they consist of such minute steps, are only perceivable by the distance. The advancement in knowledge is compared to the motion of a shadow, and the growth of grass; which comparison divides the sentence into two principal parts: but since what is said of the movement of the shadow, and likewise of the growth of grass, contains two simple members, they are to be separated by a femicolon; consequently, a higher pointing is required to separate them from the other part of the sentence, which they are opposed to: and this is a *Colon*.

COLON*, in anatomy, denotes the second of the thick intestines.

* Some derive the word from *καθουε*, to retard; in regard it is in the folds of this intestine that the excrements are stopped and formed. Others fetch it from *καλον*, on account of its capacity: Others again from *κολαεσθαι*, to be tormented; in regard of the grievous pain it frequently undergoes.—It is from this part that the colic takes its name.

The *Colon* is placed between the ilion and rectum, and is wider than either of them: in length it is eight or nine hands.—It begins where the ilion ends, *viz.* in the cavity of the os ilium, on the right side; whence, ascending by the kidney on the same side, it passes under the concave side of the liver, to which it is sometimes tied, as likewise to the gall-bladder, which tinges it yellow in that place: then it runs under the bottom of the stomach to the spleen in the left side, to which it is also knit; from thence it turns down to the left kidney; and thence passing in form of an S, it ends at the upper part of the os sacrum in the rectum.

At the beginning of this gut, there is a valve formed by the production of the inmost coat of the intestines in this place; which hinders the excrements, when once fallen into the *Colon*, from returning again to the ilium.

It has a strong ligament, which running along its upper side, from the ilium to the rectum, strengthens it against the weight of the excrements, and draws it together into cells; which, with the valvula conniventes, retard the passages of the excrements, that we may not be continually obliged to be going to stool. The fleshy fibres of its second coat are greater and stronger than those of the other intestines; because a greater strength is requisite to cause the excrements to ascend.

The chief design of the *Colon's* surrounding the abdomen, and with the rectum, touching all the parts contained in it, seems to be, that by immediate fomentation with clysters, they might be eased of their maladies.

MESO-COLON. See the article **MESO-COLON**.

COLONEL*, an officer in the army, who has the command in chief of a regiment, either of horse, foot, or dragoons.

* Skinner derives the word from *colony*; being of opinion, the chiefs of colonies called *coloniales*, might give the name to chiefs of forces.

In the French and Spanish armies, *Colonel* is confined to the infantry and dragoons: the commanding officer of a regiment of horse, they usually call *meistre de camp*.

COLONEL-LIEUTENANT, is he who commands a regiment of guards, whereof the king, prince, or other person of the first eminence is *Colonel*.

These *Colonels Lieutenants* have always a *Colonel's* commission, and are usually general officers.

LIEUTENANT-COLONEL, is the second officer in the regiment; who is at the head of the captains, and commands in the absence of the *Colonel*.

Lieutenant-Colonel of horse, or dragoons, is the first captain of the regiment. See **CAPTAIN**.

COLONADE, a peristyle of a circular figure; or a series of columns disposed in a circle, and insulated within-side. See **PERISTYLE**.

Such is that of the little park at Versailles, which consisted of 32 Ionic columns; all of solid marble, and without incrustation.

A **Peristyle COLONADE**, is that whose number of columns is too great to be taken in by the eye at a single view. Such is the *Colonnade* of the place of St. Peter at Rome; which consists of 284 columns of the Doric order, each above four foot and an half in diameter; all of Tiburtine marble.

COLONY*, **COLONIA**, a company of people, of all sexes and conditions, transported into a remote province, in order to cultivate, and inhabit it.

* Originally, the word *Colony*, signified no more than a farm; *i. e.* the habitation of a peasant, *colonus*, with the quantity of land sufficient for the support of his family: *quantum colonus unus arare poterat*.

We may distinguish three kinds of *Colonies*: those serving to ease, or discharge the inhabitants of a country; where the people are become too numerous, so that they cannot any longer conveniently subsist.

The second are those established by victorious princes and people, in the middle of vanquished nations, to keep them in awe and obedience.

The third may be called *Colonies of commerce*; because, in effect, it is trade that is the sole occasion and object thereof.

It was by means of the first kind of *Colonies*, that some ages after the deluge, the east, first, and successively all the other parts of the earth became inhabited: and without mentioning any thing of the Phœnician and Grecian *Colonies*, so famous in ancient history, it is notorious that it was for the establishment of such *Colonies*, that during the declension of the empire, those torrents of barbarous nations, issuing, for the generality, out of the north, over-ran the Gauls, Italy, and the other northern parts of Europe; and after several bloody battels, divided it with the antient inhabitants.

For the second kind of *Colonies*, the Romans used them more than any other people; and that to secure the conquests they had made from the west to the east. Every one knows how many cities in Gaul, Germany, Spain, and even in England, value themselves on their having been of the number of Roman *Colonies*.

Lastly, the *Colonies of commerce*, are those established by the English, French, Spaniards, Portuguese, and other nations within these two last centuries, and which they continue still to establish, in several parts of Asia, Africa, and America; either to keep up a regular commerce with the natives, or to cultivate the ground, by planting sugar-canes, indigo, tobacco, and other commodities.

The principal of this kind of *Colonies*, are in the one and the other America, northern and southern; particularly Peru, Mexico, Canada, Virginia, New-England, Carolina, la Louisiane, l'Acadia, Hudson's Bay, the Antilles Islands, Jamaica, Domingo, and the other islands.—In Africa, Madagascar, Cape of Good Hope, Cape Verd, and its islands, and all those vast coasts, extended thence as far as to the red sea.—Lastly, in Asia, the famous Batavia of the Dutch; Goa, Diu of the Portuguese; and some other less considerable places of the English, French, and Danes.

There were two kinds of *Colonies* among the Romans; those sent by the senate; and the military ones, consisting of old soldiers, broken and disabled with the fatigues of war, who were thus provided with lands, as the reward of their services.

The *Colonies* sent by the senate, were either Roman, or Latin; *i. e.* they were composed either of Roman citizens, or Latin.—The *Colonies* of Roman citizens had the right of suffrages; but had no part in the offices or honours of the republic. The inhabitants of Latin *Colonies*, had no right of suffrages without an express permission.

According to Ulpian (*l. 1. D. de Cens.*) there were other *Colonies*, which had little more than the name; only enjoying what they called *jus italicum*, *i. e.* they were free from the tributes and taxes paid by the provinces.—Such were the *Colonies* of Tyre, Berytus, Heliopolis, Palmyra, &c.

M. Vaillant has filled a volume in folio with medals struck by the several *Colonies*, in honour of the emperors who founded them. The ordinary symbol they engraved on their medals, was, either an eagle; as when the Veteran legions were distributed in the *Colonies*: or a labourer, holding a plough drawn by a pair of oxen; as when the *Colony* consisted of ordinary inhabitants. On all the medals are seen the names of the decemviri, who held the same rank, and had the same authority there, as the consuls had at Rome.

COLOPHONY, a resinous substance prepared of turpentine by boiling it in water, till when cold it becomes of a hard consistence.

The chief use of this drug is in the cure of venereal ailments, seminal weaknesses, the whites in women, &c. The apothecaries make it into pills, which they roll in liquorice-powder, or cover over with gold-leaf, and call them *turpentine pills*.

It is also used by musicians, to rub the hairs of their bow withal; the effect whereof is, that the gum cleaving to the hairs, and communicating to them a tenacious quality, prevents their sliding too easily over the strings; and promotes that trembling which forms the sound.

The common black *Colophony*, or black rosin, is said to be procured from the turpentine of the mountain pine. The oil being extracted from this by distillation, what remains in the still is the *Colophony*.

To be good, it must be shining and odoriferous; and when thrown on the fire, render a smoke like that of frankincense. Pliny says, *Colophony* took its name from *Colophon*, a city of Ionia, whence it was first brought.—It is now frequently called *Spanish wax*, or *Grecian resin*, as it is brought from the one or the other of those countries. It is found to warm, dry, soften, and agglutinate, and usually enters the composition of plaisters and unguents.

COLOQUINTIDA*, or **COLOCYNTHIS**, usually called *bitter apple*; the fruit of a plant of the same name, brought from the Levant; and about the bigness of a large orange.

* This word comes from the Greek *κολοκυνθις*, a name which was given it, in regard it *κολωναι κινει*, moves the belly.

Its colour is a sort of golden brown: its infuse is full of kernels, which are to be taken out before the *Colocynth* be used. The pulp is intolerably bitter.

Coloquintida is of considerable use in medicine, but mostly in official compositions; the violence of its operation rendering it unsafe to be given inwardly in extemporaneous prescriptions, except with great caution.

It enters, as an ingredient, in the confectio hamec, and most of the purging pills; and in such cases as require brisk purging, is attended with great success. But it requires proper management, as it is one of the most violent purgative drugs known; inasmuch that it excoriates the passages to that degree, as sometimes to bring away blood, and induce a superpurgation. Sometimes it is taken boiled in water, or small beer, in obstructions of the menes; which, in strong constitutions, is often attended with success. Some women have got a trick of taking it, in the same manner, in the beginning of pregnancy, to procure abortion; which it often effects by the violence of its operation. The powder of *Coloquintida* is sometimes used externally, with aloe, &c. in unguents, emplasters, &c. with remarkable success against worms; and some, for the same purpose, recommend decoctions of the pulp, given clyster-wise. In the iliac passion, clysters of *Coloquintida* have been found of service, after most other medicines have failed.

Troches made of *Colocynth* are called *troches of albandal*: they are prepared by cutting the *Coloquintida* very small, and reducing it to a fine powder in a mortar, rubbed with oil of sweet almonds; adding gum tragacanth, and mastic afterwards.

COLORBASIANS. See the article **COLORASIANS**.

COLORISATION, or COLORATION, in pharmacy, a term applied to the several changes of colour which bodies undergo in the various operations of nature, or art; as by fermentations, lotions, coctions, calcinations, &c.

COLOSSAL Column. See the article **COLUMN**.

COLOSSUS, a statue of enormous, or gigantic size.

The most eminent of this kind was the *Colossus* of Rhodes, a statue of Apollo, so high, that ships passed with full sails beneath its legs. It was the workmanship of Chares, a disciple of Lyfippus; who spent twelve years in making it; it was at length overthrown by an earthquake, after having stood 1360 years. Its height was sixscore and six foot: there were few people who could fathom its thumb, &c.

Some critics observe, that the *Colossus* of Rhodes gave its own name to the people among whom it stood; and that many, at least among the ancient poets, call the Rhodians, *Colossians*; hence they advance an opinion, that the Colossians in scripture, to whom St Paul directs his epistle, are, in reality, the inhabitants of Rhodes. Of this sentiment are Suidas, Calpene, Munster, &c.

When the Saracens became possessed of the island, the statue was found prostrate on the ground: they sold it to a Jew, who loaded 900 camels with the brass.

The basis that supported it was of a triangular figure, its extremities were sustained with sixty pillars of marble. There was a winding-stair-case to go up to the top of it; from whence one might discover Syria, and the ships that went into Egypt, in a great looking-glass, that was hung about the neck of the statue. Among the antiquities of Rome, there are seven famous *Colossus's*: two of Jupiter, as many of Apollo, one of Nero, one of Domitian, and one of the Sun.

COLOSTRUM, or COLOSTRA, in medicine, the first milk in womens breasts after delivery. See **MILK**.

The name is also given to a disease which this thick coagulated milk sometimes occasions.

COLOUR, COLOR, in philosophy, a property inherent in light, whereby, according to the different sizes, or magnitudes of its parts, it excites different vibrations in the fibres of the optic nerve; which propagated to the sensorium, affect the mind with different sensations.

Or, *Colour* may be defined a sensation of the soul, excited by the application of light to the retina of the eye; and different, as that light differs in the degree of its refrangibility, and the magnitude of its component parts.

In the former view, therefore, light is the subject of *Colour*; in the latter it is the agent. See its properties under the article **LIGHT**.

Various are the opinions of ancient and modern authors, and of the several sects of philosophers, with regard to the nature and origin of the phenomenon *Colour*: the most popular opinion, was long that of the Aristotelians; who maintain *Colour* to be a quality residing in the coloured body; and to exist, independently of light.

The Cartesians come nearer the matter: they own, that as the coloured body is not immediately applied to the organ, to occasion the sensation; and that as no body can affect the sense but by immediate contact; the coloured body does not excite the sensation of itself, or contribute any thing to it, otherwise than by moving some interposed medium, and by that the organ of sight.

They add, that, as we find that bodies do not affect the sense in the dark, light only occasions the sense of *Colour*, by moving the organ; and that coloured bodies are no further concerned

in this, than as they reflect the light with a certain modification: the differences in their *Colours* arising from a difference in the texture of their parts, whereby they are disposed to reflect the light with this or that modification.

But it is to Sir Isaac Newton alone we are to refer for a solid and consistent theory of *Colours*; built on sure experiments, and solving all the phenomena thereof: his doctrine is as follows.

It is found by experience, that rays, or beams of light, are composed of particles very heterogeneous, or dissimilar to each other: *i. e.* some of them, as it is highly probable, are larger, and others less. For a ray of light, as FE, (Tab. *Opticks*, fig. 5.) being received on a refracting surface, as AD, in a dark place, is not wholly refracted to L; but it is split, as it were, and diffused into several radioli, or little rays, some whereof are refracted to L, and others to the other intermediate points between L and G; *i. e.* those particles of the light which are the most minute, are of all others the most easily and most considerably diverted, by the action of the refracting surface, out of their rectilinear course towards L: and the rest, as each exceeds another in magnitude, so is it with more difficulty, and less considerably turned out of its right line to the points between L and G.

Now, each ray of light, as it differs from another in its degree of refrangibility, so does it differ from it in *Colour*: this is warranted by numerous experiments. Those particles, *v. gr.* which are most refracted, are found to constitute a ray of a violet *Colour*, *i. e.* in all probability, the most minute particles of light, thus separately impelled, excite the shortest vibrations in the retina; which are thence propagated by the solid fibres of the optic nerves into the brain, there to excite the sensation of violet *Colour*; as being the most dusky and languid of all *Colours*.

Again, those particles which are the least refracted, constitute a radiolus, or ray of a red *Colour*; *i. e.* the largest particles of light excite the longest vibrations in the retina; so as to excite the sensation of red *Colour*, the brightest and most vivid of all others.

The other particles being in like manner separated, according to their respective magnitudes, into little rays, excite the intermediate vibrations, and thus occasion the sensations of the intermediate *Colours*; much in the same manner as the several vibrations of the air, according to their respective magnitudes, excite the sensations of different sounds.

To this it may be added, that not only the more distinct and notable *Colours* of red, yellow, blue, &c. have thus their rise from the different magnitude and refrangibility of the rays; but also the intermediate degrees or shades of the same *Colour*; as of yellow up to green, or red down to yellow, &c.

Further, the *Colours* of these little rays, not being any adventitious modifications thereof, but connate, primitive, and necessary properties; as consisting, in all probability, in the magnitudes of their parts, must be perpetual and immutable; *i. e.* they cannot be changed by any future refraction or reflection, or any modification whatsoever.

This is confirmed by abundance of experiments; all endeavours having been used, after separating a coloured ray from those of other kinds, to change it into some other *Colour*, by repeated refractions, but to no effect. Apparent transmutations of *Colours*, indeed, may be effected; *viz.* where there is an assemblage, or mixture of rays of different kinds; the component *Colours* never appearing in their natural hue in such mixtures, but always allayed and tempered with each other: whence results a middling kind of *Colour*, which, by refraction, may be separated into the component ones; and those after separation, being remixed, return to their former *Colour*. Hence, the transmutations of *Colours*, by mixing those of different kinds, are not real; but mere appearances or deceptions of the sight; for the rays being again severed, exhibit the same *Colours* as at first. Thus, blue and yellow powders, well mixed, appear to the naked eye green; yet, without having passed any alteration, for when viewed through a microscope, the blue and yellow particles still appear distinct.

Hence there arise two kind of *Colours*, the one *original*, and *simple*, produced by homogeneous light; or by rays that have the same degree of refrangibility, and the same magnitude of their parts: such as red, yellow, green, blue, violet purple, orange, and indigo; with all their intermediate tints and gradations. The other kind of *Colour* is *secondary*, or *heterogeneous*; compounded of the primary ones, or of a mixture of rays differently refrangible, &c.

There may also be secondary *Colours* produced by composition, like the primary ones, or those consisting of homogeneous light, as to the species or appearance of the *Colour*; but not as to the permanency, or immutability thereof. Thus, yellow and blue make green; red and yellow, orange; orange and yellow with green, yellow: and in the general, if any two *Colours* be mixed, which in the series of those generated by the prism, are not too far apart, from their mixture there results that *Colour*, which in the said series is found in the mid-way between them: but those situated at too great a distance do not so. Indeed, the more any *Colour* is compounded, the less perfect and vivid it is; by too much composition they may be diluted and

and weakened till they cease. By composition there may likewise be produced *Colours* not like any of those of homogeneal light. The most extraordinary composition is that of whiteness; for to this, all the primary *Colours* abovementioned are required; and these to be mixed in a certain degree. Hence it is that white is the ordinary *Colour* of light; light being nothing else but a confused assemblage of rays of all *Colours*.

If the rays of different *Colours* do thus begin to be separated by one refraction of one single surface; that separation is much promoted, so as even to become sensible to the eye by a double refraction. This is observed in the two surfaces of any glass; provided those surfaces be not parallel: but, of all others, it is most sensible in the two faces of a triangular prism; the phenomena whereof, as they are the touchstone of all theories of *Colours*; and as they contain the foundation of that here delivered, we shall lay down as follows.

1°. The rays of the sun, transmitted through a triangular prism, exhibit an image of various *Colours*, (the chief whereof are red, yellow, green, blue, and violet) on the opposite wall.

The reason is, that the differently coloured rays are separated by refraction: for the blue rays, *v. gr.* marked with the dotted line, (Tab. *Optics*, fig. 6.) which begin to be separated from the rest by the first refraction in *dd*, of the side *ca* of the prism *abc*, (as also in the first surface of the globe of water *abc*, fig. 7.) are still further separated in the other side of the prism *bc*, (as also in their egress out of the globe *abc*) by a second refraction in *cc*, in the same direction as the former: whereas, on the contrary, in the plain glass *abcf*, fig. 9. (as also in the prism *gls*, fig. 8. now placed in another situation) those blue rays which begin to be separated from the rest in the first surface, in *dd*, by a second refraction, the contrary way, pass out parallel, *i. e.* remixed with all the *Colours* of the other rays.

2°. This image is not round, but oblong; its length, when the prism is an angle of 60 or 65 degrees, being five times its breadth. The reason is, that some of the rays are refracted more than others; and by that means, they exhibit several images of the sun, extended lengthwise, instead of one.

3°. Those rays which exhibit yellow, are turned further from the rectilinear course, than those which exhibit red; those which exhibit green, farther than those which exhibit yellow: but of all others, those which exhibit violet the most: Accordingly, if the prism through which the light is transmitted be turned about its axis, so as the red, yellow, green, &c. rays be projected, in order, through a narrow aperture into another prism, placed at the distance of about 12 feet; the yellow, green, &c. rays, though falling through the same aperture, in the same manner, and on the same point of the second prism, will not be refracted to the same place as the red, but to a point at some distance from it; on that side to which the rotation is made.

This is what Sir Isaac Newton calls the *experimentum crucis*: being that which led him out of the difficulties into which the first phenomenon, &c. had thrown him; and plainly shewed a different degree of refrangibility, and a different *Colour* corresponding thereto in the rays of light: and that yellow rays, *v. gr.* are more refracted than red ones, green ones more than yellow ones, and blue and violet ones most of all.

4°. The *Colours* of coloured rays, well separated by the prism, are not at all changed or destroyed by passing an illuminated medium, nor by their mutual decussation, their bordering on a deep shadow, nor their being reflected from any natural body, or refracted through any one, in a place howsoever obscure.

The reason is, that *Colours* are not modifications arising from refraction, or reflection, but immutable properties; and such as belong to the nature of the rays.

5°. An assemblage of all the kinds of coloured rays, collected either by several prisms, by a convex lens, or a concave mirror, or in any other manner, form what we call *whiteness*; yet each of these, after decussation, becoming separated, again exhibits its proper *Colour*: for, as the ray was white before its parts were separated by refraction; so, the parts being remixed, it becomes white again: and coloured rays, when they meet together, do not destroy one another, but are only interperfed.

Hence, a red, green, yellow, blue, and violet *Colour*, being mixed in a certain proportion, appear whitish, *i. e.* they are of such a *Colour* as arises from white and black mixed together: and if there were not some rays absorbed and lost, they would be plainly white. In like manner, if a paper cut into a circle, be stained with each of those *Colours*, separately, and in a certain proportion; then swiftly turned round its centre, so as the species of *Colours* be mixed together in the eye, by the briskness of the motion; the several *Colours* will disappear, and the whole paper appear of one continued *Colour*; which will be a mean between white and black.

6°. If the rays of the sun fall very obliquely on the inner surface of a prism, those that are reflected will be violet; those transmitted, red.

For, the rays were coloured before any separation; and by how much they are the more refrangible, by so much they are the more easily reflected; and by that means are separated.

7°. If two hollow prisms, the one filled with a blue fluid, the other with a red one, be joined together, they will be opaque; though each, apart, be transparent.

For, the one transmitting none but blue rays, and the other none but red ones; the two together will transmit none at all.

8°. All natural bodies, especially white ones, viewed through a prism held to the eye, appear fimbriated, or bordered, on one side with red and yellow, and on the other with blue and violet. For, those fimbriae are the extremes of entire images, which the rays of any kind, as they are more or less refracted, would exhibit, nearer, or at a greater distance from the real place of the object.

9°. If two prisms be so placed, as that the red of the one, and the purple of the other meet together, in a paper fit for the purpose, uncompacted with darkness; the image will appear pale: and if viewed through a third prism, held to the eye at a proper distance, it will appear double; the one red, the other purple.

In like manner, if two powders, the one perfectly red, the other blue, be mixed; any little body covered pretty deeply with this mixture, and viewed through a prism held to the eye, will exhibit a double image, the one red, and the other blue: in regard, the red and purple of blue rays are separated by their unequal refraction.

10°. If the rays transmitted through a convex lens, be received on a paper before they meet in a focus; the confines or boundary of light and shadow will appear tinged with a red *Colour*: but if they be received beyond the focus, with a blue one.

Because, in the first case, the red rays, being somewhat more refracted, are the higher; but, in the second, after decussation in the focus, the blue ones.

11°. If the rays about to pass through either side of the pupilla, be intercepted by the interposition of any opaque body near the eye; the extremes of bodies, placed as if viewed through a prism, will appear tinged with *Colours*; though those not very vivid.

For then, the rays transmitted through the rest of the pupil, will be separated by refraction into *Colours*; without being diluted with the admixture of the intercepted rays, which would be refracted in a different manner.—And hence it is, that a body viewed through a paper pierced with two holes, appears double, and also tinged with *Colours*.

Colours of thin laminae, or plates.—As rays of different *Colours* are separated by the refraction of prisms, and other thick bodies; so are they separated, though in a different manner, in the thin lamellae, or plates of any pellucid matter, *v. gr.* in the bubbles raised in water, thickened by soap, &c. For all lamellae, under a determinate thickness, transmit rays of all *Colours*, without reflecting any at all: but, as they increase in thickness, in arithmetical proportion, they begin to reflect, first, blue rays; then, in order, green, yellow and red, all pure: then, again, blue, green, yellow, red, more and more mixed and diluted; till, at length, arriving at a certain thickness, they reflect rays of all *Colours* perfectly intermixed, *viz.* white. But, in whatsoever part a slender lamella reflects any one *Colour*; *v. gr.* blue; in that part it always transmits the opposite *Colour*, *v. gr.* red, or yellow.

It is found, by experiment, that the difference of *Colour* of a plate does not depend on the medium that it compasses it; but the degree of vividness does: *ceteris paribus*, the *Colour* will be more vivid, if the denser medium be compassed with the rarer. A plate, *ceteris paribus*, reflects more light as it is thinner; as far as a certain degree of thinness, beyond which it reflects no light at all.

In plates whose thicknesses increase in the arithmetical proportion of the natural numbers 1, 2, 3, 4, 5, &c. If the first, or thinnest, reflect any homogeneal ray, the second will transmit it; the third, again, will reflect it: and thus is the same ray alternately reflected and transmitted; *i. e.* the plates corresponding to the odd numbers, 1, 3, 5, 7, &c. will reflect the same rays that those corresponding to the even ones, 2, 4, 6, 8, &c. transmit. Hence, an homogeneous *Colour* in a plate is said to be of the first order, if the plate reflect all the rays of that *Colour*. In a plate whose thinness is triple the first, it is said to be of the second order: in another, whose thinness is five times that of the first, it is said to be of the third order, &c.

A *Colour* of the first order is the most vivid of any; and, successively, the vividness of the *Colour* increases, as the quantity of the order increases: the more the thickness of the plate is increased, the more *Colours* it reflects; and those of more different orders. In some plates, the *Colour* will vary as the position of the eye varies; in others it is permanent.

Colours of natural bodies. Bodies only appear of different *Colours*, as their surfaces are disposed to reflect rays of this or that *Colour* alone; or of this or that *Colour* more abundantly than any other: hence bodies appear of that *Colour* which arises from the mixture of the reflected rays. See *BODY*.

All natural bodies consist of very thin, transparent lamellae; which, if they be so disposed, with regard to each other, as that there happen no reflections or refractions in their interstices, those bodies become pellucid, or transparent: but if their intervals be so large, and those filled with such matter; or, so empty, (with regard to the density of the parts themselves) as that there happen a number of reflections and refractions within the body; the body, in that case, becomes opaque.

The rays which are not reflected from an opaque body, penetrate into

into it; and there, suffering innumerable reflections and refractions, at length unite themselves to the particles of the body itself.

Hence, an opaque body grows hot the sooner, as it reflects light less copiously: whence, we see why a white body, which reflects almost all the rays that strike upon it, heats much more slowly than a black one, which reflects scarce any.

To determine that constitution of the surface of bodies whereon their Colour depends; it must be observed, that the smallest corpuscles, or first particles whereof surfaces are made up, are most thin and transparent, and separated by a medium of a different density from the particles themselves. In the surface, then, of every coloured body, are innumerable smaller thin plates, corresponding to those of bubbles: wherefore, what has been observed of those, may be understood of these.

Hence we gather, that the Colour of any body depends on the density and thickness of the parts of the body, between the pores of the surface: that the Colour is more vivid and homogeneous, as the parts are thinner; that *cæteris paribus*, the said parts are the thickest when the body is red; and the thinnest when violet: that the parts of bodies are usually much denser, than the medium contained in their interstices; but that in the tails of peacocks, in some silks, and generally, in all bodies whose Colour varies according to the situation of the eye, it is less: and that the Colour of a body is less vivid to the eye, as it has a denser medium within its pores:

Now, of the several opaque bodies, those consisting of the thinnest lamellæ are black; those consisting either of the thickest lamellæ, or of lamellæ very different from each other in thickness, and on that account fitted to reflect all Colours, as the froth of water, &c. are white: those, again, consisting of lamellæ, most of which are of some intermediate thickness, are blue, green, yellow, or red; inasmuch as they reflect the rays of that particular Colour, much more copiously than that of any other Colour; most of which last they either absorb and extinguish, by intercepting them, or else transmit. Hence it is, that some liquors, *v. gr.* an infusion of lignum nephriticum, will appear red, or yellow, if viewed by reflected light; and blue by transmitted light: and gold leaves yellow in the former circumstances, but green or blue in the latter.

To this may be added, that some of the powders used by painters, have their Colour changed by being very finely ground; which must be occasioned by the comminution or breaking of their small parts into others still smaller; just as a lamella has its Colour altered, by altering its thickness.

In fine, those old phenomena arising from the mixture of liquors of different Colours, can no way be better accounted for, than from the various actions of the saline, &c. corpuscles of one liquor, with the coloured corpuscles of another: if they unite, the mass will either swell or shrink, and thereby its density will be altered; if they ferment, the size of the particles may be diminished, and thereby coloured liquors may become transparent: if they coagulate, an opaque liquor may be produced out of two transparent ones.

Hence, it is easy to see, why a coloured liquid, in a glass of a conical figure, placed between the eye and the light, appears of a different Colour in different parts of the vessel; there being more and more rays intercepted, as they pass through a longer or a shorter section of the vessel: till, at the base, they are all intercepted; and none seen but those reflected.

From the various Colours of natural bodies, Sir Isaac Newton observes, the signels of their component parts may be estimated: for that the parts of bodies do properly exhibit the same Colour with a lamella of equal thickness, provided the density in both be the same.

For the distinct properties, &c. of the several Colours. See BLACK, WHITE, BLUE, &c. see also RAINBOW, &c.

COLOUR, in painting, is applied both to the drugs, and to the tints produced by those drugs, variously mixed and applied.

The principal Colours; used by painters, are red, and white lead or cerus; yellow okers; several kinds of earth, as umber, &c. besides orpiment, black lead, cinnabar, gamboge, lake, bice, verdeter, indigo, vermilion, verdegrease, ivory black bistre, lampblack, smalt, ultramarine, and carmine; each of which, with the manner of preparing them, their uses, &c. see under their respective heads.

Of these Colours, some are used ground in oil, others only in fresco, other in water, and others only for miniature.

Dark and light Colours. Under these two classes, the painters reduce all the Colours they use: under light Colours are comprehended white, and all those which approach nearest it; and under dark Colours, black, and all those which are obscure and earthy, as umber, bistre, &c.

Simple and mineral Colours. is another division among the painters: under simple Colours, they range all those used by limners, illuminers, &c. extracted from vegetables; and which will not bear the fire: as the yellow made of saffron, of French berries, &c. lacca, and other tinctures extracted from flowers. The rest are mineral, drawn from metals, &c. and able to bear the fire: these alone are used in enamelling.

Changeable and permanent Colours, is another division of Co-

lours: by changeable, are meant those which depend on the situation of objects with regard to the eye; as that of taffetas, of a pigeon's neck, &c. The last, however, being attentively viewed with a microscope, each fibre of the feathers appears composed of several little squares, alternately red and green; so that they are really fixed Colours.

Kircher tells us, that the changeable Colours observed in the necks of pigeons, peacocks, &c. arise from the feathers being transparent, and of a figure resembling a prism; and consequently the light's being differently refracted from them. On the contrary, the fixed and permanent Colours, are not exhibited by refraction, but reflection.

M. Mariotte observes, that there are two different gradations, or series's of Colours, from white to black; the one white, yellow, red, and black; the other, white, blue, violet, and black.

Local Colours. See the article LOCAL.

Water Colours. See the article WATER.

COLOUR, in dying.—There are five simple, primary, or mother Colours, used by the dyers; from the mixture whereof all the other Colours are formed: these are blue, red, yellow, brown, and black; each of which see under their proper head, BLUE, RED, &c.

Of these Colours, variously mixed and combined, they form the following Colours; *panfy, blue, red:* from the mixture of blue and scarlet, are formed *amaranth, violet, and panfy:* from the same mixture of blue and crimson red, are formed the *columnbine, or dove-colour, purple, crimson, amaranth, panfy, and crimson-violet.* It may be observed, that they give the name *crimson,* to all Colours made with cochineal. See CRIMSON, COCHINEAL, &c.

Of blue, and red madder, they likewise make a good *purple, a pepper-colour, tan-colour, and dry rose.* The same blue, with red half in grain, makes *amaranth, tan colour, and dry rose.* Blue, and half red crimson, compose *amaranth, tan-colour, dry rose, a brown panfy, and subrun.*

Blue and yellow. These two Colours, mixed together, compose a *yellow green, spring green, grass green, laurel green, brown green, dark green;* as well as *sea green, parrot green, and cabbage green, &c.* These three last Colours are to be less boiled than the first.

Note, with regard to yellow, there is no simple ingredient or drug in nature that will dye it; but the stuffs are dyed twice, first in blue, then in yellow.

Blue and brown. These two Colours are never mixed alone; but with the addition of red, either of madder or cochineal, they form several Colours.

Red and yellow. All the shades composed of these two Colours, as *gold-yellow, aurora, marigold, orange, naccarat, granat-flower, flame-colour, &c.* are made with yellow, and red of madder; scarlet being less proper, as well as too dear.

Red and brown. Of these two Colours are formed *cinnamon-colour, chefnut, musk, bears-hair,* and even *purple;* if the red be that of madder.

Yellow and brown. The Colours formed from these two are all the shades of *feuille-mort, and hair-colours.*

It may be observed, that though we say, there are no Colours, or shades, made from such and such mixtures; it is not that none can be made; but only that they are more easily formed from the mixture of other Colours.

COLOUR Wine. See the article WINE.

COLOUR, in heraldry.—The Colours generally used in heraldry, are red, blue, black, green, and purple; which, by the learned in that science are called *gules, azure, sable, vert, or sinople, and purpure.* *Tenne, or tawny, and sanguin,* are not so common. See each Colour under its proper article GULES, AZURE, VERT, SINOPLE, &c.

As to yellow and white, called or and argent, they are metals, not Colours.

These Colours and metals are sometimes also expressed in blazon by the names of precious stones; and sometimes by those of planets, or stars.—Thus, or is called *sol, and topaz;* argent, *luna, and pearl;* gules, *mars, and ruby;* azure, *jupiter, and sapphire;* sable, *saturn, and diamond;* vert, *venus, and emerald;* purpure, *mercury, and amethyst;* tenne, the *dragon's-head,* and *hyacinth;* and sanguin, the *dragon's-tail, and jargonix.*

It is a general and fundamental rule in blazon, not to place Colour upon Colour, nor metal upon metal. That is, if the field be of a Colour, the bearing must be of a metal: though this rule, on some occasions, and in some circumstances, is dispensed withal; as in the diminutions and differences which distinguish the younger from the elder branches of families; and in the extremities of animals tongues, claws, horns, &c. In which cases Colour may be on Colour, and metal on metal, without false heraldry.

Oenomaus is said to have first invented the distinction of Colours, to distinguish the quadrille of combatants at the Circensian games: the green for those who represented the earth; and the blue for those who represented the sea.

Hence the ancient cavaliers took occasion to distinguish themselves in their tournaments, by habits, plumes, and ribbands

of different *Colours*; which were ordinarily those of their mistresses, and were the symbol of some passion, or quality.—Hence also the origin of *Colours* in liveries.

COLOURS, in the military art, include the banners, flags, ensigns, &c. of all kinds, bore in an army, a fleet, or the like. See **FLAG**, and **STANDARD**.

FIELD-COLOURS. See the article **FIELD**.

COLOURS, are also used both in the Latin and Greek churches, to distinguish several mysteries and feasts celebrated therein.

In the Latin church are only regularly admitted five *Colours*, *viz.* white, red, green, violet, and black: the white is for the mysteries of our Saviour, the feasts of the virgin, those of the angels, saints, and confessors; the red for the mysteries and solemnities of the holy sacrament, the feasts of the apostles and martyrs; the green for the time between pentecost and advent, and from epiphany to septuagesima; violet in advent, christmas, in vigils, rogations, and in votive masses in time of war: lastly, black for the dead, and the ceremonies thereto belonging. Cloths of gold and silver, and embroideries, serve indifferently for all solemnities.

In the Greek church, the use of *Colours* is almost obliterated, as well as among us: red, among them, was the *Colour* for christmases and the dead; as black is still for the last among us.

COLOUR, in law, is a probable, or plausible plea; though in reality false at bottom; and only calculated to draw the trial of the cause from the jury to the judge.

Thus, *e. gr.* in an action of trespass for taking away the plaintiff's beasts, the defendant urges, that before the plaintiff had any interest in them, he himself was possessed of them, as his proper goods; and delivered them to A. B. to deliver to him again, when, &c. and A. B. gave them to the plaintiff: and the plaintiff, supposing the property to be in A. B. at the time of the gift, took them; and the defendant took them again from the plaintiff; whereupon the plaintiff brings his action.

—This is a good *Colour*, and even a good plea. Doct. and Stud.

COLOUR of office, is when some unjust action is done, under countenance of office, or authority.

To **COLOUR strangers goods**, is when a freeman allows a foreigner to enter goods at the custom-house in his name.

COLOURABLE Title. See the article **TITLE**.

COLOURING, in painting, the manner of applying, and conducting the colours of a picture; or the mixture of lights and shadows, formed by the various colours, employed in a painting.

The *Colouring* is one of the principal branches in painting. M. Felibien divides the painter's art into three parts; the design, the composition, and the *Colouring*. The *Colouring* strikes the most; but among masters it always gives place to exactness of design.

De Piles observes, that the word *Colouring*, in its confined sense, is chiefly applicable to a history-piece; scarce at all to a landscape. He adds, that the term *Colouring* relates more immediately to the carnations than any thing else.

The *Colouring*, in its general sense, takes in whatever relates to the nature and union of *Colours*; their agreement, or antipathy; as also how to use them to advantage in light and shadow, so as to shew a relievè in the figures, and a sinking of the ground: what relates to the aerial perspective, *i. e.* the diminution of colours by means of the interposition of air; the various accidents and circumstances of the luminary and the medium; the different lights, both of the bodies illuminating and illuminated; their reflections, shadows, different views, with regard either to the position of the eye, or the object: what produces strength, boldness, sweetness, &c. in paintings well coloured; the various manners of *Colouring*, both in figures, landscapes, &c.

Doctrine of COLOURING. *Colours* are considered, either in respect of their use, or their economy and disposition.

1st. With regard to their use. They are either in oil, or water: those in oil, again, may either be considered with a view to their preparation, or application.

In the preparation of oil colours, care must be taken that they be ground fine; that in putting them on the pallet, those which will not dry of themselves, be mixed with drying oil, or other dryers; and that the tinged colours be mixed in as small quantities as possible.

For their application, it is considered either with regard to the kinds of painting, whether in works of various colours, or in those of one single colour.

For the first: in the larger pieces, the colours are either laid on full, so as they may be impacted, or incorporated together, which makes them hold the more firmly.

Or else they mix those more agreeable ones, which dry too hard, and too hastily, with a little colour, and the clearest of the oil: but, in both cases, the colours are to be laid on strong at first; it being easy to weaken those that are to be thrust back, and to heighten the others: the touches to be bold, by the conduct of a free and steady pencil; that the work may appear the most finished at a proper distance, and the figures animated with life and spirit.

For glazed colours, particular care must be taken that the under-colour be painted strong, and that it be a body-colour, and laid smooth.

In finished works, which are to be viewed near at hand, they proceed, either by applying each colour in its place; preferring their purity, without fretting or tormenting them, but sweetly softening off their extremities: or by filling up all the great parts with one single colour; and laying the other colours, which are to form the little things, upon it: which is the more expeditious way, but is more apt to decay.

For the second: the kinds of pictures in one colour are two, *viz.* *camieux*, where the degradations of colours of objects afar off, are usually managed by lights, as with crayons; and *bas-relievè*, which is an imitation of sculpture, of whatsoever matter and colour: in both these, the colours are wrought dry.

For water colours, they are wrought various ways; *viz.* in distemper, as the painters express it, where the colours are prepared in size; which method is used on all kinds of matter: in fresco, or painting on fresh mortar; where the colouring must be quick, that the matter dry not; and with much care and neatness, laying each colour in its place, and intermingling them by parcels: in *aguache*, where the colours are mixed with gum, and the pencil dragged; as in paint and washings: in miniature, for small and delicate works; where the colours are to be very fine and clean, mixed with gums, and wrought in dots or points.

But in all the kinds of painting, both in oil and distemper, especially the latter, proper care must be taken that the design be fixed, and all the parts marked out, ere any colours be applied.

For the 2^d part of *colouring*, or the economy and disposing thereof in paintings; regard is either had, first, to the qualities of the colours, to appropriate them according to their value and agreement: or, secondly, to their effect, in the union and economy of the work.

For the qualities, it must be observed, that white represents light, and gives the briskness and heightening: black, on the contrary, like darkness, obscures and effaces the objects; again, black sets off the light parts; and by that they serve each other to loosen the objects. A proper choice to be made of colours, and the too much charged manner to be avoided; both in carnations, where red colours are not to be affected, as rather resembling the flesh when dead than the skin; and all bright glowing colours: the skin, how delicate soever, being always of a down colour. In the drapery, where the painter has his whole stock of colours to chuse out of, to procure a good effect; and in the landscape, to dispose those colours near one another, which mutually assist and raise each other's force and briskness; as red and green, yellow and blue.

To manage them so, as that they be accommodated to the effects of the great parts of light and colour: that the strong colours lead to the soft ones, and make them more looked at; bringing them forwards, or keeping them back, according to the situation, and the degree of force required.

For the effects of colours, they either regard the union, or the economy: with respect to the first, care must be taken that they be laid so as to be sweetly united, under the briskness of some principal one; that they participate of the prevailing light of the piece; and that they partake of each other by the communication of light, and the help of reflection.

For the economy in managing their degrees, regard is to be had to the contrast, or opposition intervening in the union of the colours, that by a sweet interruption, the briskness, which otherwise fades and palls, may be raised: to the harmony, which makes the variety of colours agree; supplying and sustaining the weakness of some by the strength of others; neglecting some places, on purpose to serve as a basis or repose to the sight, and to enhance those which are to prevail through the piece: to the degradation, where, the better to proportion the colours that fall behind some of the same kind are to be preserved in their purity, as a standard, for those carried afar off to be compared by, in order to justify the diminution: regard being always had to the quality of the air, which, when loaded with vapours, weakens the colours more than when clear: to the situation of the colours, where care must be taken that the purest and the strongest be placed before, or in the front of the piece; and that by their force, the compound ones, which are to appear at a distance, be kept back; particularly, the glazed colours to be used in the first rank: lastly, to the expression of the subject, and the nature of the matters, or stuffs, whether shining or dull, opaque or transparent, polished or rough.

COLOURING and NON-COLOURING drugs: thus the dyers distinguish their materials; the first are applicative, and communicate their colours to the matters boiled in them, or passed through them; as woad, scarlet, green, cochineel, indigo, madder, turmeric, &c.

The second serve to prepare and dispose the stuffs, and other matters; and to extract the colour out of the *colouring* ingredients; as alum, salt, or crystal of tartar, arsenic, realgar, salt-petre, common salt, sal armoniac, sal gemme, agaric, spirit of wine, bran, pease-flour, wheat, starch, lime, and ashes.

COLUMBINE, a kind of violet-colour, called also *deve-colour*. See **COLOUR**, and **DYING**.

COLUMBUS.—*Congregation of St. COLUMBUS* is the name of a congregation of regular canons, formerly of great extent; having under it an hundred abbies, or monasteries, in the British islands. See **CONGREGATION**, and **CANON**. The

The principal monastery, or chief of the order, according to fame, was at Armagh; according to others, at Londonderry: others will have it in the island of Hui, or Hi, or Iona, now called Ycolmkil, to the north of Ireland, not far from Scotland. There is a rule in Irish verse, supposed to have been dictated by S. Columbus to his canons.

COLUMN, in architecture, a round pillar, made to support, or adorn, a building.

The *column* is the principal, or reigning part of an architectural order.

The principal laws and properties of this eminent member of architecture are thus deduced.—Every fulcrum or support, is so much the more perfect as it is the firmer, or carries the greater appearance of firmness: and hence all *columns*, or pillars, ought to have their base, or foot, broader than themselves. See **BASE**. Again, as a cylinder and a quadrangular prism are more easily removed out of their place than a truncated cone, or a pyramid, on the same base, and of the same altitude: the figure of *columns* ought not to be cylindrical; nor, that of a pilaster, pyramidal; but both the one and the other to be contracted or diminished, *i. e.* to grow less and less, like a truncated cone, and a truncated pyramid.

For the same reason, the lowest parts of *columns* ought to be cylindrical, that of pilasters pyramidal: hence, again, as *columns* are more firm, if their diameter bears a greater proportion to their height, than if it bore a less: the greater ratio is to be chosen, where a large weight is to be sustained; and less where a lesser. Further, as the design of a *column* is to support a weight, it must never be supposed without an entablature: though a *column* raised on an eminent place; so as to leave no room to fear its being thrust out of its place, needs no pedestal.

The entire *column*, in each order, is composed of three principal parts, the *base*, the *shaft*, and the *capital*. See the proportions of each under its respective head, **CAPITAL**, &c.

Each of these parts, again, is subdivided into a great number of lesser, called *members*, or *mouldings*: some whereof are essential, and found in all *columns*; others are only accidental, and found in particular orders.

Columns are different, according to the several orders they are used in; and likewise, not only with regard to their order, but also to their matter, construction, form, disposition, and use.—With regard to order we have the

Tuscan COLUMN, the shortest, and most simple of all the *columns*.

Its height, according to Vitruvius, Palladio, and Vignola, is seven diameters, or fourteen modules; according to Scamozzi, it is fifteen modules; to De Lorme, twelve; to Trajan's *column*, sixteen.—Its diminution, according to Vitruvius, is one fourth of the diameter; according to Vignola, a fifth; and according to Trajan's *column*, a ninth.—Its several parts, mouldings, &c. see under their proper heads. And the entire figure, see represented in Tab. *Architecture*, fig. 24.

Doric COLUMN, is somewhat more delicate: its shaft is adorned with flutings: its height, according to Vitruvius, is from fourteen to fifteen modules: to Scamozzi, seventeen; to Vignola, sixteen; in the Coliseum, nineteen; in the theatre of Marcellus, fifteen two thirds.—Its diminution, according to the theatre of Marcellus, twelve minutes; to the Coliseum, four minutes and a half. See Tab. *Architecture*, fig. 28.

Ionic COLUMN, is more delicate still: it is distinguished from the rest by the volute in its capital; and by its base. See **VOLUTE**.

Its height, according to Palladio, is seventeen modules one third: according to Vignola, eighteen.—Its diminution, in the temple of concord, ten minutes and a half; of fortuna virilis, seven and a half; coliseum ten minutes. See Tab. *Architecture*, fig. 32.

Corinthian COLUMN, is the richest and most delicate of all the *columns*.—Its capital is adorned with two rows of leaves, and with caulicoles; whence spring out little volutes.

Its height, according to Vitruvius, and many remains of antique porticos, temples, &c. is nineteen modules; according to Serlio, eighteen; to the coliseum, 17.07; to the three *columns* in the campo vaccino, twenty; the basilica of Antoninus, twenty.—Its diminution, according to the temple of peace, is six minutes and a half; the pantheon, six one eighth; temples of Sibyl and Faustina, eight; Constantine's arch, seven; portico of Septimius, seven and a half. See Tab. *Architecture*, fig. 26.

Composite COLUMN, has two rows of leaves in its capital, like the Corinthian; and angular volutes, like the Ionic. See **COMPOSITE**.

Its height, according to Vignola, and the arch of Titus, is twenty modules; to Scamozzi, and the temple of Bacchus, nineteen and a half; the arch of Septimius, 19.09.—Its diminution, according to Titus's and Septimius's arches, seven minutes; baths of Diocletian, eleven minutes one third; temple of Bacchus, six and a half. See Tab. *Architecture*, fig. 30.

It may be here observed, that there seems more of caprice than reason in that diversity found in the heights of *columns* of the same order, in different authors; each of whom frequently takes the liberty of dispensing with his own rules.—Vitruvius, for instance, makes the Doric *columns* of temples, shorter than those of porticos behind theatres; Palladio gives a greater height to *columns* standing on pedestals, than to those which have none; and Serlio makes his *column* a third shorter, when insulate, or

detached, than when contiguous to a wall.

But notwithstanding the diversity of height in *columns* of the same order in different authors, they still bear a like proportion in the several orders compared with each other; by which they go increasing, as the orders are less massive.

But this augmentation is greater in some ordonnances than in others; for in the antique it is but of five modules, or semidiameters, for the five orders: the shortest *column*, that is, the Tuscan, being fifteen modules; and the longest, the Composite, twenty. In Vitruvius, this increase is also of five modules; but commences from fourteen modules, and ends at nineteen. The moderns usually make it greater: Scamozzi makes it five modules and a half; Palladio and Serlio, six.

From the several proportions of *columns* assigned by several authors, M. Perrault has drawn a new one; which is a mean, between the extremes of the rest.—Thus, he makes the Tuscan *column* fourteen modules two thirds; which is a kind of mean between the Tuscan of Vitruvius, fourteen, and that of Trajan's *column*, eighteen: he makes the Doric *column* he makes fifteen modules; which is a mean between the fourteen of Vitruvius, and the nineteen of the coliseum: the Ionic he makes seventeen modules one third; which is a mean between the sixteen of Serlio, and the nineteen of coliseum: the Corinthian *column* he makes eighteen modules two thirds; as being a medium between the sixteen modules six minutes of the temple of the Sibyl, and the twenty modules six minutes of the three *columns* of the Roman forum: lastly, the Composite *column*, by the same rule, he makes twenty modules; that height being a mean between the arch of Titus, and the temple of Bacchus.

Indeed, the rule he proceeds by seems very reasonable; *viz.* that the progression of each *column* in the different orders is to be equal: so that having settled the whole progression, from the Tuscan to the Composite, at five modules ten minutes; this being a mean between the five modules of the antique, and the five and a half of the moderns; he divides this sum, which is 160 minutes, into four equal parts, giving forty minutes to the progression of each order: this makes the Tuscan *column* fourteen modules twenty minutes; the Doric becomes sixteen, the Ionic seventeen ten minutes, the Corinthian eighteen twenty minutes, and the Composite twenty modules.

For the distinguishing characters of each order of *columns*, see **ORDER**.—For the matter of *columns*, see **STONE**, **MARBLE**, &c.—For their use and application; see **BUILDING**.—For the ranging of *columns*, and the spaces to be observed between each; see **INTERCOLUMNATION**.

COLUMNS, different with regard to their matter.

Fusible COLUMN. Under this term are comprehended, not only *Columns* of various metals, and other fusible matters, as glass, &c. but also those of stone, said to have been cast; the secret of which, some will have us believe to have been known to the ancients.

Hydraulic COLUMN, is that whose shaft appears to be of crystal, being formed by a number of little threads of water, falling from holes made in a girt of metal, at equal distances, by means of a pipe mounting through the middle thereof. As in the gardens at Versailles.

Hydraulic COLUMN, also denotes a column from whose top proceeds a jet d'eau, to which the capital serves as a basin; whence the water descends by a little pipe, which turns spirally around the shaft.—Such are the Ionic *columns* of the cascade of the Belvidera at Fiescati; and those of the vineyard Matthei at Rome.

Moulded COLUMN, is that made by impaffation, of gravel and rints of divers colours, which are bound together with a cement, which grows perfectly hard, and receives a polish like Marble.

The secret of making these, it appears the ancients were masters of, by the *columns* lately discovered near Algiers; which are doubtless the ruins of the ancient Julia Caesarea: on all these is found the very same inscription in antique characters, the contours, accents, and even faults, being repeated in every shaft: an incontestable proof of their being moulded.

Transparent COLUMN, any *column* made of transparent matter; as were those of crystal in the theatre of Scaurus, mentioned by Pliny; and those of transparent alabaster, in the church of St. Mark, at Venice.

Water-COLUMN, is a sort whose shaft is formed of a large jet d'eau; which spouting out water violently from the base, drives it within the tambour of the capital, which is made hollow; whence falling down again, it has the effect of a liquid crystal *column*. See **FOUNTAIN**.—An instance of this we have at Quinta d'Aveiro near Lisbon.

COLUMN of bands, or tambours, that whose shaft is formed of several courses of stone, or blocks of marble, less high than the diameter of the *column*: this is what Ulpian means by *columna struclilis*, or *adpaeta*; which is opposite to the *columna solida*, or *integra*, *i. e.* of one piece.

COLUMNS with regard to their construction.—**COLUMN of joinery**, is that made of strong timber boards, joined, glued, and pinned together; it is hollow, turned in the lathe, and usually fluted. Such are the *columns* in most altar-pieces.

COLUMN of masonry, is made of rough stone, well laid and covered with

with plaster; or of bricks moulded triangular-wise, and covered with stucco.

COLUMNS in truncheons, or pieces, consists of three, four, or five pieces of stone, or metal; differing from the tambours, as being higher than the diameter of the column.

Geminated COLUMNS, that whose shaft is formed of three similar and equal sides, or ribs of stone, fitted within one another; and fastened at bottom with iron pins, and a-top with cramp-irons. This is to be fluted, that the joints may be the less discernible.

Incrustated COLUMN, is made of several ribs, or thin shells of fine marble, or some other rare stone, cemented upon a mould of stone, brick, or the like. This is done with design both to save the precious matter, as oriental jasper, lapis lazuli, agat, &c. or to represent pieces of such stones of an extraordinary size, by the neatness and closeness of the incrustation, which renders the joints imperceptible.

Cabled, or rudented COLUMN, is a column having projections in form of cables, or canes, in the naked of the shaft; each cable having an effect opposite to that of a fluting; and accompanied with a little list on each side.

Corollitic COLUMN, that adorned with foliages, or leaves and branches turned spirally around the shaft; or in form of crowns and festoons.

These were used by the antients for erecting statues on; which hence took the denomination of *corollitic*.—They are very suitable in triumphal arches, and decorations of theatres.

Colossal COLUMN, a column of enormous size, too large to enter any ordonnance of architecture; to be placed solitary, in the middle of a square, &c.

Such is the Trajan column, whose proportions are Doric, and its profile Tuscan; 12 feet and $\frac{1}{2}$ in diameter, and 100 in height, including the base and the capital: the pedestal of this column has 18 feet, and the crowning 16 and an half. It supports a brazen statue of St. Peter, 13 foot high: the whole making 147 antient Roman feet.—It was built by Apollodorus; and consists of 34 tambours, or blocks, or pieces of white marble, taking in the crowning.

The Antonine column, which is also of white marble, is inferior to the Trajan in beauty of sculpture, but exceeds it in height; being 168 feet to the capital, besides 7 feet of the pedestal under ground. Lastly, the London column, or monument, is of stone, 15 foot in diameter, and 202 high; taking in the pedestal and crowning.

Cylindrical COLUMN, is that which has neither swelling nor diminution.

Diminished COLUMN, is that which has no swelling, but begins to taper, or diminish, from the base; in imitation of trees.

Such are most of the antique columns of granite; particularly the Corinthian ones in the porch of the pætheon.

COLUMNS, denominated from their form.—**Fluted COLUMN**, called also channelled, and striated column; that whose shaft is adorned with flutes, or channellings; either from top to bottom, or only two thirds of its height.

Fluted and cabled COLUMN, is that whose flutes are filled up with cables, reeds, or staves; beginning from the bottom of the shaft, and reaching one third of its height.

Fluted COLUMN enriched, is that whose flutings are filled up with ornaments of foliages, rinds, ribbons, &c. instead of cables.

Gettick COLUMN, a round pillar, either too short for its bulk, or too slender for its height; as having, sometimes, 20 diameters; and this without either diminution, or swelling: yet, its ornaments, and the characters of its work, being as far from those of the antique as its proportions.

Hermetic COLUMN, a kind of pilaster, in manner of a terme; having the head of a man, in lieu of a capital. It had its name from a custom among the antients, of placing Mercury's head, whom the Greeks call *Hermes*, a-top of columns.

Massive COLUMNS, are those too short for the order whose capital they bear; as the pillars in Gothic churches usually are. See **MASSIVE**.

Under the term *massive*, are, likewise, frequently comprehended *rustic* and *tuscan* columns.

Oval COLUMN, that whose shaft has a flatness; its plan being made oval, to reduce the projection.

Pastoral COLUMN, that whose shaft is formed in imitation of the trunk of a tree, with bark and knots.

This kind of column, in the Tuscan proportion, may be used in the gates of parks and gardens; and in the decoration of pastoral scenes, &c.

Polygonous COLUMN, has several sides, or faces: the most regular of these have eight faces.

This with the oval and cylindrical columns, Daviler regards as abuses in architecture.

Serpentine COLUMN, a column formed of three serpents, twisted together; the heads whereof serve as a capital.

An instance of this is at Constantinople, in the square called *Atmeidan*, antiently the Hippodrome. P. Gyllius calls this the *Delphic column*; as imagining it antiently served for the tripod of Apollo, in the temple at Delphos. It is now ordinarily called the *talisman*, or *enbathed column*.

Swelled COLUMNS, are those which have a bulging, or swelling, in proportion to the height of the shaft.

Authors are much divided on the subject of this swelling: Sir H.

Wotton treats it as a most ridiculous abuse: yet the practice obtains among the modern architects; who generally make their columns a little bigger at one third of their height, than at the base; i. e. they diminish the column near the base; which makes the upper part appear big, and occasions a swelling at about one third of the height.

This swelling appears to have been unknown to the antients. M. le Clerc observes, it ought not to exceed one minute and a half at most. He thinks it ought never to be used, excepting where there is a particular occasion for it; as where columns are to be placed over one another.

Twisted COLUMN, is that whose shaft is twisted round, in manner of a screw, with six circumvolutions; being, ordinarily of the Corinthian order: Vignola first found a method of drawing it by rule.

Twisted fluted COLUMN, is that whose flutes follow the contour of the shaft, in a spiral line throughout the whole length; whereof there are some antique ones of porphyry, and hard marble.

COLUMNS twisted and enriched, is that, one third of whose shaft is fluted, and the rest adorned with foliages and other enrichments: and which being all of marble, is enriched with sculpture from bottom to top.

Sometimes, again, the *twisted column* is formed of two or three slender shafts, twisted round, so as to leave a cavity in the middle. Sometimes the flutings are spiral, yet the shaft straight; which succeeds very well in the more delicate orders.

COLUMNS, denominated from their disposition.—**COLUMN inserted**, or *backed*, is that let into a wall, a third or fourth part of its diameter.

COLUMN niched, is that whose shaft enters, with half its diameter, into a wall, which is hollowed for its reception; with its plane parallel to the projection of the tore.

Such is that in the portal of St. Peter at Rome.

Angular COLUMN, is an insulated column, placed in the coin, or corner of a portico; or inserted into the corner of a building; or, even a column that flanks an angle, either acute or obtuse, of a figure of many sides.

Attic COLUMN, according to Pliny, is a pilaster insulated; having four equal faces, or sides; and of the highest proportion, *v. gr.* Corinthian.

Cartoned COLUMNS, are those engaged in the four corners of a square pillar, to support four springs of an arch.

Coupled COLUMNS, are those disposed by two and two, so as almost to touch each other at their bases, and capitals.

Doubled COLUMN, is an assemblage of two columns, joined in such a manner, as that the two shafts penetrate each other with a third of their diameter. Such are those of the four angles in the court of the Louvre.

Flanked COLUMN, according to M. Blondel, is a column engaged with one half, or at least one third of its diameter, between two demi-pilasters.

Grouped COLUMNS, are those placed on the same pedestal, or socle; either by three and three, or by four and four.

Insulated COLUMN, is that standing free, and detached on all sides, from any other body.

Median COLUMNS. Vitruvius gives the name *columnæ medianæ*, to the two columns in the middle of a porch, which have their intercolumniation larger than the rest: that if these last, for instance, be *pycnostyle*; the *Medianæ* are *anastyle*.

The term may also be applied to the middle row of columns, in a frontispiece adorned with three orders.

COLUMNS, denominated from their use.—**Astronomical COLUMN**, is a kind of observatory, in form of a very high tower; built hollow, and with a spiral ascent to an armillary sphere placed a-top, for observing the motions of the heavenly bodies.

Such is that, of the Doric order, erected at the Hotel de Soissons at Paris, by Catherine de Medicis, for the observations of Orontius Fineus, a celebrated astronomer of that time.

Chronological COLUMN, that which bears some historical inscription, digested according to the order of time; as by lustres, olympiads, fasti, epochas, annals, &c.—At Athens there were columns of this kind, whereon were inscribed the whole history of Greece, digested into olympiads.

Funeral COLUMN, is that which bears an urn, wherein are supposed to be inclosed the ashes of some deceased hero; and whose shaft is sometimes overspread with tears, or flames; which are symbols of grief, and of immortality.

Gnomonic COLUMN, is a cylinder, whereon the hour of the day is represented by the shadow of a style.

Of these there are two kinds: in the one, the style is fixed, and the hour-lines are no more than the projection of a vertical dial on a cylindrical surface.

In the other, the style is moveable; and the hour-lines are drawn to the different heights of the sun, in the different seasons of the year.

Historical COLUMN, is that whose shaft is adorned with a basio-relievo, running in a spiral line its whole length; and containing the history of some great personage. Such are the *Trajan* and *Antonine columns*, at Rome.

Historical columns may likewise be divided by bands, or tambours, into separate basio-relievos, containing distinct subjects; by which means, the same columns may likewise be made to answer the end

end of chronological ones.—This manner Vignola prefers to the former; which, he thinks, appears too much confused.

Hollow COLUMN, that which has a spiral stair-case within-side, for the convenience of ascending to the top.—As the Trajan *Column*, the stair-case whereof consists of 185 steps, and is illumined by 43 little windows. See Trajan.—The Antonine *column* has 195 steps, with 56 windows; each of these is divided by tambours of white marble. The monument or *fire-column*, at London, has also a stair-case; but it does not reach to the top.—These kind of *Columns* are called also *columnæ cochleæ*, or *cochleæ*.

Indicative COLUMN, that which serves to shew the tides, &c. along the sea-coasts. Of this kind, there is one at Grand Cairo, of marble, whereon the overflowings of the Nile are expressed: by this they form a judgment of the succeeding season: when the water, for instance, ascends to 23 foot, it is a sign of great fertility in Egypt.

Instructive COLUMN, that raised, according to Josephus, lib. I. cap. 3, by the sons of Adam, whereon were engraven the principles of arts and sciences.

Baudelot tells us, that the son of Pisistratus raised another of this kind, of stone, containing the rules and precepts of agriculture.

Itinerary COLUMN, a *Column* with several faces, placed in the cross-ways in large roads; serving to shew the different routs, by the inscriptions thereupon.

Lactary COLUMN, at Rome, according to Festus, was a *Column* erected in the herb-market, which is now the place *Montanara*; which had a cavity in its pedestal, wherein young children, abandoned by their parents, out of poverty or inhumanity, were exposed, to be brought up at the publick expence.

Legal COLUMN. Among the Lacedæmonians, there were *Columns* raised in publick places, whereon were engraven the fundamental laws of the state.

Limitrophous, or boundary COLUMN, is that which shews the limits of a kingdom, or country conquered.—Such was that, which Pliny says, Alexander the Great erected at the extremities of the Indies.

As to those of Hercules, ordinarily called his *Columns*, or *pillars*; they are only two very steep mountains in the straits of Gades, now Gibraltar.

Luminous COLUMN, is a sort of *Column* formed on a cylindrical frame, mounted and covered over with oiled paper, or gawze; so that lights being disposed in ranks within, over each other, the whole appears as on fire.

This sort of *Column* is likewise made with rows of lamps, or torches running round its shaft; either in horizontal belts, or bands; or in a spiral line, over a continued session of flowers.

Mamibary COLUMN, from the Latin *mambias*, spoils of the enemy; a *Column* adorned with trophies, built in imitation of trees, whereon the spoils of enemies were antiently hung.

Memorial COLUMN, that raised on occasion of any remarkable event; as the monument in London, built to perpetuate the memory of the burning of that city, in 1666.

It is of the Doric order, fluted, hollow, with a winding stair-case; and terminated a-top with waving flames.

There is, also, another of the like kind, in form of an obelisk, on the banks of the Rhine in the Palatinate, in memory of the famous passage of that river, by the great Gustavus Adolphus and his army.

Menian COLUMN, any *Column* which supports a balcony, or meniana.—The origin of this kind of *Column*, Suetonius and Africanus refer to one Menias; who having sold his house to Cato and Flaccus, consuls, to be converted into a public edifice; reserved to himself the right of raising a *Column* without side, to bear a balcony; whence he might see the shews.

Military COLUMN, was a *column* of marble, raised by order of Augustus, in the middle of the Roman forum; from whence, as a centre, the distances of the several cities, &c. of the empire were reckoned; by other *military Columns* disposed at equal distances, on all the grand roads.

This *Column* was of white marble; the same with that which is now seen on the balustrade of the perron of the Capitol at Rome. Its proportion is massive; being a short cylinder, supporting a symbol of the globe of the earth.

It was called *millitarium aureum*, as having been gilt, at least the ball, by order of Augustus. It was restored by the emperors Vespasian and Adrian; as appears by the inscriptions.

Military COLUMN, among the Romans, a *Column* whereon was engraven a list of the forces in the Roman army, ranged by legions, in their proper order; with design to preserve the memory of the number of soldiers, and of the order preserved in any military expedition.

The Romans had another kind of *military Column*, which they called *columna bellica*, standing before the temple of Janus; at the foot whereof the consul declared war, by throwing a javelin towards the enemies countries.

Phosphorical COLUMN, a *light-house*; or a hollow *Column*, built on a rock, or the tip of a mole, or other eminence, to serve as a lantern to a port.

Raftral COLUMN, that adorned with the beaks or prows of ships, and galleys, with anchors and grapples; erected, either in me-

mony of a naval victory; as the Tufcan *column*, in the Capitol; or, in honour of some admiral; as the Doric ones, at the entrance of the castle de Richlieu.

Sepulchral COLUMN, antiently, was a *Column* erected on a tomb or sepulchre; with an inscription on its base. See *TOMB*, &c.

Those over the tombs of persons of distinction were very large; those for the common people small: these last are called *stelæ* and *cippi*.

Statuary COLUMN, that which supports a statue. Such was that erected by pope Paul V. on a pedestal before the church of St. Maria major at Rome; to support a statue of the virgin, which is of gilt brass. See *STATUE*.

This *Column* was dug up in the temple of peace; its shaft is a single block of white marble 49 foot and an half high, and five foot eight inches diameter; of the Corinthian order, fluted.

The term *statuary Column*, may likewise be applied to Caryatides, Perlians, Termini, and other human figures, which do the office of *Columns*; and which Vitruvius calls *telamones*, and *atlantes*.

Symbolical COLUMN, is a *column* representing some particular country, by the attributes proper thereto: as that of the French order, set with Flower de Luces, in the frontispiece of the jesuits church at Rouen: or some memorable action; as the *corvinian Column*, on which was a crow; erected to Valerius Maximus, surnamed Corvinus, in memory of his defeat of a giant in the army of the Gauls, by the assistance of a crow.

Under the title of *symbolic Columns*, may also be comprehended those which serve for symbols. Such is that on a medal of Nero, which expresses the stability of the Roman empire. See *SYMBOL*.

Triumphal COLUMN, a *Column* erected among the antients in honour of an hero; the joints of the stones, or courses whereof, were covered with as many crowns, as he had made different military expeditions.

Each crown had its particular name; as *vallaric*, which was beset with spikes, in memory of having forced a palisade. *Muralis*, adorned with little turrets, or battlements; for having mounted an assault. *Navalis*, of prows and beaks of vessels; for having overcome at sea. *Obdionalis*, or *Graminalis*, of grags; for having raised a siege. *OVans*, of myrtle, which expressed an ovation or little triumph: and *Triumphalis*, of laurel; for a grand triumph.

Procopius tells us of a *Column* of this kind, erected in the place called Augusteum, before the imperial palace of Constantinople, supporting an Equestrian statue of the emperor Justinian.

Zoophoric COLUMN, a kind of *statuary Column*, whereon is placed a figure of some animal. Such is one of the two *Columns* of the great gate of Venice; whereon is the lion of St. Mark, and the arms of the republic: or that at Sienna, which bears the Wolf that suckled Romulus and Remus.

Scenography of a COLUMN. See the article *SCENOGRAPHY*.

COLUMN, in war, denotes a deep file, or row of troops: or division of an army, which marches at the same time, and towards the same place, at intervals large enough to avoid confusion.

An army marches in one, two, three, or more *Columns*; according as the ground will allow, and the general fees expedient. The word is sometimes also used in speaking of vessels at sea, following each other in the same line.—It is difficult to form *Columns* at sea, unless the wind be in stern.

COLUMN, among printers, is half a page, when the page is divided into two parts, from top to bottom. See *PRINTING*.

COLUMNA nafi, is used by some writers of anatomy, for the fleshy end of the nose, jutting out over the upper lip. See *NOSE*.

COLUMNA oris, is sometimes used for the uvula. See *UVULA*.

COLUMNÆ carnae; in anatomy, called also *laevituli*, and *columnæ cordis*; are several small muscles in the ventricles of the heart; derived, and, as it were, detached from the parietes of those ventricles, and connected by tendinous extremities to the valves of the heart.

These little *Columns*, or pillars, being fastened to the parietes of the heart on one side, and the tricuspid and mitral valves on the other; do by their contraction in the systole of the heart, draw out the valves; and by that means, not only shut the orifices of the veins, but more exactly close their ventricles in their systole.

COLUMNATED winding stairs. See the article *STAIRS*.

COLURES*, in geography and astronomy, are two great circles, imagined to intersect each other at right angles, in the poles of the world.

* The word is derived from the Greek *κόρυς*, *mutilus*, or *truncatus*, and *αγος*, *tail*; *q. d.* appearing with the tail cut off; because never seen entire above the horizon.

The *Colures* pass, one of them through the solstitial, and the other through the equinoctial point of the ecliptic: whence the first is denominated the *solstitial*, and the second the *equinoctial Colure*.

The equinoctial *Colure* determines the equinoxes; and the solstitial, the solstices.

By thus dividing the ecliptic into four equal parts, they also mark the four seasons of the year.

COLYBA, or **COLYBUS**, a term in the Greek liturgy, signify-

ing an offering of corn and boiled pulse, made in honour of the faints, and for the sake of the dead.
 Balsamon, P. Goar, Leo Allatius, and others, have wrote on the subject of *colybae*; the substance of what they have said, is as follows.
 The Greeks boil a quantity of wheat, and lay it in little heaps on a plate; adding beaten peas, nuts cut small, and grape-stones, which they divide into several compartments, separated from each other by leaves of parsley. A little heap of wheat thus seasoned, they call *κολυβα*.
 They have a particular formula for the benediction of the *colybae*; wherein, praying that the children of Babylon may be fed with pulse, and that they may be in better condition than other people, they desire God to bless those fruits, and those who eat them, because offered to his glory, to the honour of such a faint, and in memory of the faithful deceased.—Balsamon refers the institution of this ceremony to S. Athanasius; but the Greek Synaxary to the time of Julian the apostate.
 Many of the Latin divines having spoke injuriously of this ceremony, Gabriel archbishop of Philadelphia, has wrote a discourse in its vindication: wherein he endeavours to shew, that the design of it *Colyba* is only to represent the resurrection of the dead, and to confirm the antient in the belief thereof.—The *Colybae*, he says, are symbols of a general resurrection; and the several ingredients added to the wheat, signify so many different virtues.

COMA, in medicine, a sort of sleepy disease, otherwise called *cataplasia*; always bringing on a violent propensity to sleep, whether sleep ensue, or not.

If sleep do ensue, the disease is called *coma somnolentum*, wherein the patient continues in a profound sleep; and when awaked, immediately relapses, without being able to keep open his eyes. If he do not sleep, but is continually awaked with frightful dreams, it is called *coma vigil*: in this case also his eyes are shut, and he appears asleep.

The cause of the *coma somnolentum* may be any thing that prevents the course of the spirits; as a cold humid temperature of the brain; hot putrid vapours ascending into the head, and stopping the canals of the animal spirits; narcotic vapours, &c.

The *coma vigil* is supposed to arise from the conflict, or jarring mixture of bile with pituita; the one urging to sleep, the other to waking. Hence the patient sleeps either not at all, or, at most, but for a moment; is uneasy, starts, rises up, and sometimes throws himself on the persons near him; his eyes continuing all the time fast closed.

The remedies for a *coma*, are those which occasion great evacuations, as violent clysters, or vomitives; medicines that purge, and dry the brain; and those which occasion revulsion of humours; as vesicatories, cauteries, &c. to which may be added volatile spirits, salts, and moist cephalics. See SUPPLEMENT, article COMA.

COMA BERENICES, *Berenice's hair*, in astronomy, a modern constellation of the northern hemisphere; composed of uninformed stars near the Lions-tail.

The stars in the constellation *coma berenices*, in Ptolemy's catalogue are three; in Tycho's thirteen; in the Britannic catalogue forty. The order, names, longitudes, latitudes, magnitudes, &c. whereof, are as follow.

Names and Situation of the Stars.	Sign.	Longitude.	Latitude.	Magn.
		° ' "	° ' "	
	♌	16 53 24	20 21 46	7
	♌	17 44 9	20 2 11	6
	♌	21 14 30	16 27 0	6
	♌	17 21 15	24 45 23	6
	♌	19 56 6	19 59 7	6
First of all in the circle of the hair, to the south.	♌	23 16 44	15 13 55	5
	♌	19 18 19	23 28 33	4 5
	♌	20 24 1	22 50 57	7
	♌	17 56 28	27 34 35	6
	♌	17 50 59	27 51 56	6
3d of the prec. from the cusp, or point 2d of the preced.	♌	23 5 51	18 17 53	4 5
	♌	19 45 29	25 57 32	5
	♌	20 2 23	26 11 47	5
That preced. in the cusp.	♌	19 55 40	27 26 54	5
In the cusp towards the north	♌	19 32 24	28 24 2	4 5
That under this	♌	20 16 55	27 6 50	5
	♌	21 10 29	26 29 11	6
That following this	♌	22 10 56	24 55 18	6
First of 5 contiguous ones behind this	♌	23 43 26	22 2 38	6
Middle of the contiguous ones	♌	22 18 15	25 29 10	4 5
Subseq. and less	♌	23 1 59	25 29 11	7
	♌	24 7 14	7 9	4
	♌	26 7 23	20 17 57	5
That preced. several under the hair	♌	27 6 49	19 12 6	6
	♌	25 48 38	23 8 10	5
25	♌	29 34 59	19 48 42	5
	♌	1 16 5	17 12 57	6
	♌	1 10 30	17 48 0	5
Preced. in the hair	♌	24 57 52	29 58 24	6
	♌	25 30 24	30 12 24	5

Names and Situations of the Stars.	Sign.	Longitude.	Latitude.	Magn.
		° ' "	° ' "	
30 More south in the hair	♌	0 39 2	20 48 10	7
	♌	28 59 44	24 42 42	4 5
	♌	2 3 55	21 46 50	5
	♌	25 43 4	33 56 36	5 6
	♌	2 42 23	41 45 14	6
35 Former of 2 in extrem. of the hair	♌	2 5 7	25 55 56	5 6
	♌	1 22 51	27 14 39	5
40 Posterior in the extremity of the hair	♌	29 1 29	31 49 22	5
	♌	4 38 33	22 59 12	4 5
	♌	0 6 31	32 28 33	4

All these stars Ptolemy ranks among the *inferiores* of Leo; and the cluster of little stars, in form of a nebulous one, between the lion and bear, he calls simply *πλωγιστιον*; as resembling an ivy leaf; the pointed part whereof is turned towards the north, and the sides bounded by the 7th and 22d stars. Bayer, instead of hair, gives a sheaf of corn.

COMBAT, in a general sense, denotes an engagement; or a difference decided by way of arms.

Authors sometimes distinguish in an army, between a *combat* and a *battel*; the latter expressing the general action of the whole army: the former only a particular skirmish, or engagement of a single part: so that the *combat* is properly a part of a *battel*.

COMBAT, in law, or, *single Combat*, denotes a formal trial, between two champions, of some doubtful cause or quarrel, by the sword, or battons.

This form of proceeding was antiently very frequent; and obtained not only in criminal, but also in civil causes: being built on a presumption, that God would never grant the victory, but to him who had the best right.

We find the *combat* as early as the time of Otho: the last admitted in England, was 6 Car. I. between Donald Lord Rhee, or Rey, and David Ramsey, Esq; in the painted chamber.

The form and ceremony of the *combat*, is described in the grand Coutumier of Normandy: the accuser, first, swore to the truth of his accusation; the accused gave him the lye, upon which, each threw down a gage, or pledge of *battel*; and the parties were committed prisoners to the day of *combat*. See CHAMPION. Historians tell us, that Alphonfus king of Castile, desiring to abolish the Mofarabic liturgy, and to introduce the Roman office: the people opposing it, it was agreed to terminate the difference by *combat*; and to leave the cause to the decision of heaven.

COMBAT is also used for the solemn games of the antient Greeks and Romans, performed in honour of their Gods; as the Olympic games, Pythian, Isthmian, and Nemean games; the Ludi Actiæ, Circenses, &c. which see in their places, OLYMPIC, ISTHMIAN, &c.

The *Combats* here celebrated, were *running*, *wrestling*, *boxing*, *cutting*, &c.—The combatants, who were called *athletæ*, prepared themselves for it from their youth, by constant exercise, and a very rigid regimen: they only eat certain things, and at certain hours; drank no wine, had no commerce with women; and both their labour and their rest were regulated.

COMBATANT, in heralds word for two beasts, as lions, or boars, born in a coat of arms in a fighting posture, erect on their hinder feet and affronted, or with their faces toward each other.

COMBINATION, is properly understood of an assemblage of several things by two and two: but is more particularly used in mathematicks to denote the variation, or alternation of any number of quantities, letters, sounds, or the like, in all the different manners possible.

P. Merfenne gives us the *combinations* of all the notes and sounds in musick, as far as 64; the sum whereof amounts to 90 figures, or places.

The number of possible *combinations* of the 24 letters of the alphabet, taken first two by two, then three by three, &c. according to Mr. Prestet's calculation amount to 13917242888872-52999425128493402200.

The words in the following verse may be combined a thousand twenty-two several ways.

Tot tibi sunt dotæ, virgo, quot sidera cælo.

F. Truchet, in the memoirs of the French academy, shews, that two square pieces, each divided diagonally into two colours, may be arranged and combined 64 different ways, so as to form 64 many different kinds of chequer-work; which appears surprising enough, when one considers that two letters, or figures, can only be combined twice.

This note may be of use to masons, paviours, &c. See PAVEMENT.

Doctrine of COMBINATION.—Any number of quantities being given, together with the number in each combination; to find the number of combinations.

One quantity, we observe, admits of no combination; two, *a* and *b*, of one; of three, *a b c*, there are three combinations, viz. *a b*, *a c*, *b c*; of four, six, *a b*, *a c*, *b c*, *a d*, *b d*, *c d*; of five, ten, *a b*, *a c*, *b c*, *a d*, *b d*, *c d*, *a e*, *b e*, *c e*, *d e*.

Whence it appears, that the numbers of combinations proceed as 1, 3, 6, 10, &c. *i. e.* are triangular numbers, whose side differs by

by unity from the number of given quantities. if that *v. gr.* be *g*, the side of the number of combinations will be $g-1$; and therefore the number of combinations $\frac{g-1}{1} \cdot \frac{g+0}{2}$.

If three quantities are to be combined, and the number in each combination be three, there will only be one combination, *abc*; if a fourth be added, the combinations will be found *abc, abd, bcd, acd*; if a fifth, ten, *abc, abd, bcd, acd, abc, bde, bce, ace, ade*; if a sixth, twenty, &c. The numbers of combinations, therefore, proceed as 1, 4, 10, 20, i. e. they are the first pyramidal triangular numbers, whose sides differ by two units from the number of given quantities. See PYRAMIDAL number. Hence, if the number of given quantities be *g*, the side will be $g-2$; and therefore, the number of combinations $\frac{g-2}{1} \cdot \frac{g-1}{2} \cdot \frac{g+0}{3}$.

Hence is easily deduced a general rule of determining the number of combinations in any case: for, suppose the number of quantities to be combined, *g*, the exponent of the combination will be the number of combinations $\frac{g-n+1}{1} \cdot \frac{g-n+2}{2} \cdot \frac{g-n+3}{3} \cdot \frac{g-n+4}{4}$ $\frac{g-n+5}{5}$ &c. till the number to be added be equal to *n*.

Suppose *v. gr.* the number of quantities to be combined $\equiv 6$; the exponent of the combination 4; the number of combinations will be $\frac{6-4+1}{1} \cdot \frac{6-4+2}{2} \cdot \frac{6-4+3}{3} \cdot \frac{6-4+4}{4} = \frac{6}{1} \cdot \frac{6-2}{2} \cdot \frac{6-1}{3} = \frac{6+0}{4} = 15$.

Coroll. If it be desired to have all the possible combinations of the given quantities beginning with the combinations of the several twos, proceeding to threes, &c. there must be added $\frac{g-1}{1} \cdot \frac{g+0}{2} \cdot \frac{g-1}{2} \cdot \frac{g+0}{3} \cdot \frac{g-1}{3} \cdot \frac{g-2}{4} \cdot \frac{g-1}{4} \cdot \frac{g+0}{5}$, &c.

Whence the number of combinations possible will be $\frac{g \cdot g-1}{1 \cdot 2} + \frac{g \cdot g-1 \cdot g-2}{1 \cdot 2 \cdot 3} + \frac{g \cdot g-1 \cdot g-2 \cdot g-3}{1 \cdot 2 \cdot 3 \cdot 4} + \frac{g \cdot g-1 \cdot g-2 \cdot g-3 \cdot g-4}{1 \cdot 2 \cdot 3 \cdot 4 \cdot 5}$ which is the sum of the uncies of the binomial, raised to the power *g*, and abridged of the exponent of the power increased by unity, $g+1$. Wherefore, since those uncies come out $1+1$, by being raised to the power *g*; and since $1+1=2$; 2^g-1 is the number of all the possible combinations. *V. gr.* If the number of quantities be 5, the number of possible combinations will be $2^5-1=32-1=31$.

Any number of quantities being given, to find the number of changes and alternations, which those quantities, combined in all the manners possible, can undergo.

Suppose two quantities, *a* and *b*: their variations will be 2; consequently, as each of those may be combined, even with itself, to these there must be added two variations. The whole number, therefore, will be $2+2=4$. If there were three quantities, and the exponent of the variation were 2; the combination will be 3, and the changes 9; to which, if the three combinations of each quantity with itself *aaa, bbb, ccc*, be added, we shall have the number of changes, $3+3+3=9$.

In like manner, it is evident, if the given quantities were 4, and the exponent 2, the number of changes would be 16; if 5, 25, &c. and, in general, if *n*.

Suppose the quantities 3, and the exponent of variation 3; the number of changes is found $27=3^3$; viz. *aaa, aab, aba, baa, abb, aac, aca, caa, abc, bac, bca, acb, cab, cba, acc, cac, cca, bba, bab, bbb, bbb, cbb, bcb, bec, cbc, ccb, ccc*. After the same manner, it will appear, if the quantities were 4, and the exponent 3, the number of changes would be $64=4^3$; and, in general, if the number of quantities be *n*, and the exponent 3, the number of changes will be n^3 . By thus proceeding, it will be found, that if the number of quantities be *n*, and the exponent *n*, the number of changes will be n^n : wherefore, if all the antecedents be added, where the exponent is less, the number of possible changes will be found $n^1+n^2+n^3+\dots+n^{n-1}$.

Till at length, the number subtracted from *n*, leaves 1; because the beginning is from single quantities taken once.

Since then the number of possible changes is in a geometrical progression, whose first or smallest term is *n*, the greatest n^n , and the denominator *n*; it will be $\frac{n^n-n}{n-1}$.

Suppose *v. gr.* $n=4$. the number of possible changes $(4^4-4) : (4-1) = 1020 : 3 = 340$. Suppose, again, $n=24$, the number of possible changes will be $(24^{24}-24) : (24-1) = 32096586444068189867795348272600 : 23 = 139172428888725299942512849340200$. In so many various manners, therefore, may the 24 letters of the alphabet be varied and combined among themselves.

COMBINING of wool, in commerce, the drawing, or passing wool across the teeth of a kind of card, called a comb, to dispose it for spinning.

COMBS of bees. See the article HONEY-COMB.

COMBURENDO heretico. See the article HERETICO.

COMBUS F, in astronomy. When a planet is in conjunction with the sun, or not distant from it above half their disk; it is said to be *combust*, or in *combustion*.

According to Argol, a planet is *combust*, or in *combustion*, when not above eight degrees and thirty minutes distant from the sun, either before or after him.

COME.—The small fibres or tails of malt, upon its first shooting forth, is thus called.

COMEDY, in its proper sense, a dramatic piece, representing some agreeable and diverting transaction: or an allegorical representation of something in private life; for the amusement and instruction of the spectators.

In this sense, *comedy* is opposed to *tragedy*, the subjects whereof are grave, and violent; and the persons of the first rank.

Scaliger defines *comedy*, a dramatic poem, very busy, pleasant in the conclusion, and written in a popular style.—Aristotle calls it an imitation of the worst, or, rather, of the lowest class of persons, by way of ridicule: his definition Corneille finds fault with, and maintains, that the actions of kings themselves may enter *comedy*; provided they be such as are not very momentous, nor attended with any considerable danger. He adds, that a poem wherein the greatest peril is the loss of a mistress, has no right to any higher appellation than that of *comedy*: but then he makes a distinction in *comedies*, and dignifies those where great personages are introduced, with the epithet of *heroic comedies*, to distinguish them from the ordinary ones.

Mr. Congreve seems pretty much of the same sentiment: he understands Aristotle's definition as meant of the worst men; on which bottom, it is sufficient to constitute a *comedy*, that the action represented be that of some ill man brought on the stage to be exposed.

M. Dacier is of a contrary opinion: he maintains, that *comedy* allows of nothing grave, or serious, unless it be turned to ridicule; and that raillery and ridicule are its only proper and genuine characteristics: in which opinion he is warmly seconded by Mr. Dennis.

Thus different are critics and comic authors on the nature of *comedy*: some distinguish it from tragedy by the lowness of the subject; others by the ridiculous light it is set in.

The accurate F. Boffu fixes the notion of *comedy* much better: according to that critic, *comedy* differs from tragedy in this, that the comic writer invents both the names of his persons, and the action which he presents, whereas the tragic writer only invents the latter; the former they are to take from history. See ACTION. Upon the whole, *comedy* may be defined an image, or representation of the ordinary life of men: it exhibits their common actions and passions; exposes, and ridicules their failings, to preserve the spectators from them, or to correct them. Cicero defines it in the imitation of life, the mirror of custom, and the image of truth.

There is a dispute among critics, whether *comedy* be a poem, or a mere conversation? They who maintain the latter, do it on the foot of this general opinion, that a poem is a discourse in verse: F. Boffu insists on the former, and shews, that as *comedy* has the fable, or allegory, it has every thing essential to poetry.

Comedy and tragedy were originally one, and the same thing: their common origin see under TRAGEDY.—M. Boileau says, *comedy* took its rise at Athens, from the happy issues or conclusions of tragedies. On this principle, the catastrophe should have been the proper criterion, or distinguishing mark between tragedy and *comedy*; and all other differences only accidental.

Des succès fortunez du spectacle tragique
Dans Athens naquit la comédie antique.

After the grave and serious became separated from the ridiculous, and tragedy and *comedy* were become two distinct arts; people applied themselves to cultivate the former, and neglected the latter: so that *comedy* continued in its infancy, with little improvements, while tragedy grew up to a perfect art: this once arrived at its height, they began to think of cultivating *comedy*. With regard to the various changes and revolutions *comedy* has undergone, it is commonly distinguished into three kinds, viz. the *antient*, wherein there was nothing feigned; the *middle*, where the subject was real, but the names fictitious; the *new*, where both names and things are fictitious.

The *antient* was that first in use, when the supreme power was in the hands of the people; and when, on that account, the poets were at their full liberty to say what they pleased, and of whom they pleased; by name to rail at people in authority, and openly to charge magistrates with crimes; sparing no age, sex, or quality.

This is very observable in the frogs, and the clouds of Aristophanes; where it is to be noted, that though the railing part was occasionally distributed among all the actors, yet the chief of it was laid on the chorus.

When the Athenian liberties became sunk up in the tyranny of a few, it was no longer safe for the poets to use their old license; men of office being now to be screened from reproach. The chorus, therefore, became useless, and was therefore dropped; and thus commenced what we call *comœdia media, pœna*, or the *middle comedy*. See CHORUS.

Under this, the poets were not allowed to name the persons; and therefore names were to be invented; but then the persons were so well pointed out, that it was no difficult matter to know them.

At length, however, they were obliged to repress even this licence: and this reform gave occasion to the *new comedy*; which only brought upon the stage feigned adventures, and imaginary names.

This last kind alone was received among the Romans; who yet made a new subdivision thereof, into *antient*, *middle*, and *new*; according to the various periods of the commonwealth. Among the antient comedies were ranked those of Livius Andronicus; among the middle, those of Pacuvius; and among the *new* ones those of Terence.

Comedy, as well as tragedy, has its essential, and its integrant parts.—Its essential parts, in the language of the antients, are the *protasis*, *epitasis*, *catasiasis*, and *catastrophæ*.

The *protasis* is the beginning, or opening; where the subject is just entered upon, the character of the persons shewn, and the interest, or part each has in the action signified.

In the *epitasis*, the intrigues begin: they are carried on, and heightened in the *catasiasis*; and unravelled in the *catastrophæ*.

The integrant parts are the five acts into which the *comedy* is divided, agreeable to that precept of Horace;

Neve minor quinto neu sit productior actus.

The acts are divided into scenes: the number whereof is not fixed, either by reason or experience, but depends on the business to be done in each act, and the number of persons to be employed. See ACT, SCENE, &c. see also MANNERS, HUMOUR, &c.

Among the antient Romans, *comedies* were distinguished according to the quality of the persons represented, and the dress they wore, into *togatæ*, *pretextæ*, *trabeatæ*, and *tabinariæ*; which last were those where the scene lay in colleges, or among people of the lowest rank, agreeing pretty nearly with our farces.

In the representation, *comedy* was distinguished from tragedy by the *sock* worn in the former, and the *buskin* in the latter.

Among us, *comedy* is distinguished from *farce*, in that the former represents nature as she is; the other distorts or overcharges her. They both paint from the life, but with different views: the one to make nature known, the other to make her ridiculous.

COMET, a heavenly body, in the planetary region, appearing suddenly, and again disappearing, and during the time of its appearance moving in its proper, though very excentric orbit, like a planet.

Comets, properly called *blazing stars*, have this to distinguish them from the other stars, that they are usually attended with a long train, or tail of light, always opposite to the sun, and which is of a fainter lustre, the further it is from the body. Hence arises a popular division of *comets* into three kinds, *viz.* *bearded*, *tailed*, and *hairy comets*; though in effect, this division rather relates to the several circumstances of the same *comet*, than to the phenomena of several.

Thus, when the *comet* is eastward of the sun, and moves from it, the *comet* is said to be *bearded*, *barbatus*; because the light marches before it, in manner of a beard. See BEARD.

When the light is westward of the sun, and sets after it, the *comet* is said to be *tailed*, *caudatus*; because the train follows it, in manner of a tail. See TAIL.

Lastly, when the *comet* and the sun are diametrically opposite, (the earth between them) the train is hid behind the body of the *comet*, excepting a little that appears around it, in form of a border of hair, hence called *crinitus*.

Nature of COMETS.—As to the nature of *comets*, the infrequency of their appearing, together with the seeming irregularities of their phenomena, have left philosophers much in the dark: those who lived before Aristotle, accounted for them by supposing the heavenly spaces full of an infinite number of stars; and many of these too remote, or too small to have ever come under the notice of astronomers: these invisible stars, they further supposed to move by their own proper motion every way; finishing their courses in very unequal times. Now, a *comet*, according to them, was a vast heap or assemblage of these little stars meeting together, by reason of the inequality of their motions, and uniting into a visible mass; which must again disappear, as those stars separated, and each proceeded in its course.

But how these stars should thus meet, coalesce and form a body, which in all positions of the sun should resemble a tail, and again separate, is a mystery!

This opinion therefore, Aristotle easily overturned; substituting another in its stead: according to him, *comets* were only a kind of transient fires, or meteors, consisting of exhalations raised to the upper region of the air, and there set on fire; far below the moon's course.

But neither is this hypothesis more just than the other: for on this principle, the light of the *comet* being independent of the sun, would be dispersed every way alike, without any appearance of a train, or tail, which is contrary to the phenomena. Besides that the modern astronomers, who have measured the distance between the *comets* and the earth, find that the *comets* have no sensible parallax; which could not be, were they not much more remote than the moon, whose parallax is sensible. See PARALLAX.

Hévelius, from a great number of observations, proposes it as his

opinion, that the *comets*, like the solar maculæ or spots, which they pretty much resemble, are formed and condensed out of the groffer exhalations of his body. In which notion he agrees nearly with Kepler, who maintains, that *comets* are generated in the æther in vast numbers, like fishes in the ocean; though they do not all become visible, either because of their smallness, or because they lay a long time under the horizon.

But Sir Isaac Newton has shewn the fallacy of this hypothesis, by proving that the *comet* of 1680, in its passage through the neighbourhood of the sun, would have been dissipated, had it consisted of exhalations of the sun and planets: for the heat of the sun, it is allowed, is as the density of his rays, *i. e.* reciprocally as the squares of the distances of places from the sun: wherefore, since the distance of that *comet* in its perihelion, December the 8th, was observed to be to the distance of the earth from the sun, nearly as 6 to 1000; the sun's heat in the *comet*, at that time, was to his heat with us at midsummer, as 1000000 to 36, or 28000 to 1.

And again, finding by experiment, that the heat of boiling water is little more than three times the heat of our dry earth, when exposed to the midsummer's sun; and assuming the heat of red-hot iron to be about three or four times as great as that of boiling water; he thence concludes, that the heat of the dried earth, or body of the *comet* in its perihelion, must be near 2000 times as great as that of red-hot iron.

Such an immense heat once acquired in its perihelion, the *comet* must be a long time in cooling again. The same author computes, that a globe of red-hot iron, of the dimensions of our earth, would scarce be cool in 50000 years. If then the *comet* be supposed to cool 100 times as fast as red-hot iron; yet since its heat was 2000 times greater, supposing it of the bigness of the earth, it would not be cool in a million of years.

James Bernoulli, in his *systema cometarum*, supposes some primary planet, revolving round the sun in the space of four years and 157 days; and at the distance, from his body, of 2583 semi-diameters of the magnus orbis: this planet, he concludes, either from its vast distance, or smallness, to be invisible to us; but, however, to have at various distances from him, several satellites moving round him, and sometimes descending as low as the orbit of Saturn; and that these becoming visible to us, when in their perigeum, are what we call *comets*.

Des Cartes advances another opinion: he conjectures that *comets* are only stars, formerly fixed, like the rest, in the heavens; but which, becoming by degrees covered with maculæ, or spots, and at length wholly robbed of their light, cannot keep their place, but are carried off by the vortices of the circumjacent stars; and, in proportion to their magnitude and solidity, moved in such manner, as to be brought nearer the orb of Saturn; and thus coming within reach of the sun's light, rendered visible.

But the vanity of all these hypotheses abundantly appears from the phenomena of *comets*; the chief of which we shall enumerate: as being the test by which all theories are to be tried.

First, then, those *comets* which move according to the order of the signs, do all, a little before they disappear, either advance slower than usual, or else go retrograde, if the earth be between them and the sun; and more swiftly, if the earth be situate in a contrary part: on the contrary, those which proceed contrary to the order of the signs, proceed more swiftly than usual, if the earth be between them and the sun; and more slowly, or go retrograde, when the earth is in a contrary part. 2°. So long as their velocity is increased, they move, nearly, in great circles; but towards the end of their course, they deviate from those circles; and as often as the earth proceeds one way, they go the contrary way.

3°. They move in ellipsis, having one of their foci in the center of the sun; and by radii drawn to the sun, describe areas proportionable to the times.

4°. The light of their bodies, or nuclei, increases in their recess from the earth towards the sun; and on the contrary, decreases in their recess from the sun towards the earth.

5°. Their tails appear the largest and brightest, immediately after their transit through the region of the sun.

6°. The tails always decline from a just opposition to the sun towards those parts which the bodies, or nuclei pass over, in their progress through their orbits.

7°. This declination, *cæteris paribus*, is the smallest, when the heads, or nuclei, approach nearest the sun: and is less, still, near the nucleus of the *comet* than towards the extremity of the tail.

8°. The tails are somewhat brighter, and more distinctly defined in their convex than in their concave part.

9°. The tails always appear broader at their upper extreme than near the center of the *comet*.

10°. The tails are always transparent, and the smallest stars appear through them.

These are the chief phenomena of *comets*; which, how ill they consist with the wild notions of the antients, and the weak conjectures of most of the moderns, is pretty evident. Indeed, there were some, Pliny tells us, among the antients, who 'had a juster notions, who took these stars to be perpetual, and believed they moved in their proper orbs; but were never seen unless

‘ unless when left by the sun.’ and more fully Seneca, *quæst. nat. lib. 7.* ‘ I am not of the common opinion, nor do I take a comet to be a sudden fire, but esteem it among the eternal works of nature.—*Quid autem miramur cometas, tam rarum mundi spectaculum nonnulli teneri legibus certis, nec initia illorum fingere immiserere, quorum ex ingentibus intervallis recursum est?—Venit tempus quo ista quo nunc latent, in lucem dies extrahat & longioris ævi diligentiâ. Venit tempus quo posteri nostri tam aperta nos nescisse mirantur.—Erit qui demonstret aliquando, in quibus cometæ partibus erant; cur tam solutis a cæteris eant, quibus qualisque sint.—*

This prediction we have seen accomplished in our days, by the great Sir Isaac Newton; whose doctrine is as follows.

The comets, he says, are compact, solid, fixed, and durable bodies; in one word, a kind of planets; which move in very oblique orbits, every way with the greatest freedom; perverting in their motions, even against the course and direction of the planets; and their tail is a very thin, slender vapour, emitted by the head, or nucleus of the comet, ignited or heated by the sun.

This at once solves all the phenomena: for 1^o. ‘ It is evident, that those which proceed according to the order of the signs, a little before they disappear, must move more slowly, or appear retrograde, if the earth be betwixt them and the sun, and swifter, if the earth be in a contrary part; on the contrary, those proceeding against the order of the signs, &c.’—For since this course is not among the fixed stars, but among the planets; as the motion of the earth either conspires with them, or goes against them; their appearance, with regard to the earth, must be changed; and, like the planets, they must sometimes appear swifter, sometimes slower, and sometimes retrograde.

2^o. ‘ When the comets move the swiftest, they must proceed in straight lines, but in the end of their course decline, &c.’—Because in the end of their course, when they recede almost directly from the sun, that part of the apparent motion which arises from the parallax, must bear a greater proportion to the whole apparent motion.

3^o. ‘ The comets must move in ellipses, having one of their foci in the centre of the sun.’—Because they do not wander precariously from one fictitious vortex to another; but, making a part of the solar system, return perpetually, and run a constant round.

Hence, their elliptic orbits being very long and excentric, they become invisible, when in that part most remote from the sun.

From considering the curvity of the paths of comets, Sir Isaac concludes, that when they disappear, they are much beyond the orb of Jupiter; and that in their perihelion they frequently descend below the orbits of Mars and the inferior planets.

4^o. ‘ The light of their nuclei must increase in their recess from the sun, and vice versa.’—Because, as they are in the regions of the planets, their access toward the sun bears a considerable proportion to their whole distance.

From observations of the comet of 1680, Sir Isaac Newton found that the vapour in the extremity of the tail, Jan. 25, began to ascend from the head before December the 11th; and had therefore spent more than 45 days in its ascent: but that all the tail which appeared December 10, ascended in the space of those two days, then just past since its perihelion. The vapour, therefore, at the beginning, when the comet was near the sun, ascended prodigiously swift; and afterwards continued to ascend with a motion retarded by the gravity of its particles; and by that ascent increased the length of the tail: but the tail, notwithstanding its length, consisted almost wholly of vapours, which had ascended from the time of the perihelion; and the vapour which ascended first, and composed the extreme of the tail, did not vanish, till it was too far from the sun to be illumined by him, and off us to be visible. Hence, also, the tails of comets that are shorter, do not ascend with a quick and continual motion from the head, and then presently disappear; but are permanent columns of vapours and exhalations, gathered from the head by a very gentle motion, and in a great space of time; which yet, by participating of that motion of their heads they had at the beginning, continue easily to move along with their heads through the celestial regions: whence also the vacuity of those regions is argued. See VACUUM.

5^o. ‘ Their tails must appear the largest and brightest immediately after their transit through the region of the sun.’—because, then, their heads being the most heated, will emit the most vapours.

From the light of the nucleus, or apparent star, we infer their vicinity to the earth, and that they are by no means in the region of the fixed stars, as some have imagined; since in that case, their heads would be no more illumined by the sun, than the planets are by the fixed stars.

6^o. ‘ The tails must still decline from a strict opposition to the sun, towards those parts which the heads pass over, in their progress through their orbits.’—because, all smoke, or vapour emitted from a body in motion, tends upwards obliquely, still receding from that part towards which the smothering body proceeds.

7^o. ‘ That declination will be still the least near the nucleus of the comet; and when the comet is nearest the sun:—because the vapour ascends more swiftly near the head of the comet, than in

the higher extremity of its tail; and when the comet is at a less distance from the sun, than when at a greater.

8^o. ‘ The tail is brighter, and better defined in its convex part, than in its concave:—because the vapour in the convex part, which goes first, being somewhat nearer and denser, reflects the light more copiously.

9^o. ‘ The tail must appear broader towards the higher extremity of the comet, than towards the head:—because, the vapour in a free space perpetually rarifies and dilates.

10^o. ‘ The tails must be transparent:—because consisting of infinitely thin vapour, &c.

Thus accurately does the hypothesis tally to the phenomena.

Phases of COMETS.—The nuclei, which we also occasionally call the heads and bodies of comets, viewed through a telescope, show a very different face from those of the fixed stars, or planets. Sturmius tells us, that observing the comet of 1680, with a telescope, it appeared like a coal dimly glowing, or a rude mass of matter illumined with a dusky fuming light, less sensible at the extremes than in the middle; rather than as a star, which appears with a round disk, and a vivid light.

Hevelius observed of the comet of 1661, that its body was of a yellowish colour, very bright and conspicuous, but without any glittering light: in the middle was a dense ruddy nucleus, almost equal to Jupiter, unaccompanied with a much fainter thinner matter. Feb. 5. its head was somewhat bigger and brighter, of a gold colour; but its light more dusky than the rest of the stars: here, the nucleus appeared divided into several parts. Feb. 6. the disk was lessened; the nuclei still existed, though less than before: one of them, on the lower part of the disk, on the left, much denser and brighter than the rest; its body round, and representing a very lucid little star: the nuclei still unaccompanied with another kind of matter. Feb. 10. the head somewhat more obscure, and the nuclei more confused, but brighter at top than bottom. Feb. 12. the head diminished much, both in magnitude and brightness. March 2. its roundness a little impaired, its edges lacerated, &c. March 28. very pale and exceeding thin; its matter much dispersed; and no distinct nucleus at all appearing.

Weigelus, who saw the comet of 1664, the moon, and a little cloud illumined by the sun at the same time; observed, that the moon, through the telescope, appeared of a continued luminous surface; but the comet very different; being perfectly like the little cloud in the horizon, illumined by the sun. From these observations it was, that Hevelius concluded comets to be like maculae, or spots formed out of the solar exhalations.

The length of the tails of comets is various: that of 1680, according to Sturmius, about the 20 of November, was but small, at most not exceeding 20 degrees in length: in a little time it grew to a length of 60 degrees, after which it dwindled very sensibly.

Formation of the tails of COMETS.—Sir Isaac Newton shews, that the atmospheres of comets will furnish vapour sufficient to form their tails: this he argues from that wonderful rarefaction observed in our air, at a distance from the earth: a cubic inch of common air, at the distance of half the earths diameter, or 4000 miles, would necessarily expand itself so as to fill a space larger than the whole region of the stars. Since then the coma, or atmosphere of a comet is ten times higher than the surface of the nucleus, counting from the center thereof; the tail, ascending much higher, must needs be immensely rare: so that it is no wonder the stars should be visible through it.

Now, the ascent of vapours into the tail of the comet, he supposes occasioned by the rarefaction of the matter of the atmosphere at the time of the perihelion. Smoke, it is observed, ascends the chimney by the impulse of the air wherein it floats; and air, rarefied by heat, ascends by the diminution of its specific gravity, taking up the smoke along with it: why then should not the tail of a comet be supposed to be raised after the same manner by the sun? for the sun-beams do not act on the mediums they pass through, any otherwise than by reflection and refraction.

The reflecting particles, then, being warmed by the action, will again warm the æther wherewith they are compounded; and this, rarefied by the heat, will have its specific gravity, whereby it before tended to descend, diminished by the rarefaction; so as to ascend, and to carry along with it those reflecting particles, whereof the tail of the comet is composed.

This ascent of the vapours will be promoted by their circular motion round the sun; by means whereof, they will endeavour to recede from the sun, while the sun's atmosphere, and the other matters in the celestial spaces, are either at rest, or nearly so; as having no motion but what they receive from the sun's circumrotation.

Thus are the vapours raised into the tails of comets in the neighbourhood of the sun, where the orbits are most curve; and where the comets being within the denser atmosphere of the sun, have their tails of the greatest length.

The tails thus produced, by preserving that motion, and at the same time gravitating towards the sun, will move round his body in ellipses, in like manner as their heads; and by this means, will ever accompany, and freely adhere to their head. In effect, The gravitation of the vapours towards the sun, will no more

occasion the tails of the *comets* to forsake their heads, and fall down towards the sun, than the gravitation of their heads will occasion them to fall off from their tails: but by their common gravitation, they will either fall down together to the sun, or be together suspended, or retarded. This gravitation, therefore, does not at all hinder, but that the heads and tails of *comets* may receive and retain any position towards each other, which either the above-mentioned causes, or any other, may occasion. The tails, therefore, thus produced in the perihelion of *comets*, will go off along with their head into remote regions; and either return thence, together with the *comets*, after a long series of years; or, rather, be there lost, and vanish by little and little, and the *comet* be left bare; till at its return, descending towards the sun, some little short tails be gradually and slowly produced from the heads; which afterwards, in the perihelion, descending down into the sun's atmosphere, will be immensely increased.

The vapours, when they are thus dilated, rarefied, and diffused through all the celestial regions, the same author observes, may probably, by little and little, by means of their own gravity, be attracted down to the planets, and become intermingled with their atmospheres.

He adds, that for the conservation of the water, and moisture of the planets, *comets* seem absolutely requisite; from whose condensed vapours and exhalations, all that moisture which is spent in vegetations and putrefactions, and turned into dry earth, &c. may be resupplied and recruited. For all vegetables grow, and increase wholly from fluids; and, again, as to their greatest part, turn, by putrefaction, into earth again; an earthy slime being perpetually precipitated to the bottom of putrefying liquors. Hence, the quantity of dry earth must continually increase, and the moisture of the globe decrease, and at last be quite evaporated; if it have not a continual supply from some part or other of the universe. And I suspect, adds our great author, that the spirit, which makes the finest, subtlest, and best part of our air, and which is absolutely requisite for the life and being of all things, comes principally from the *comets*.

On this principle, there seems to be some foundation for the popular opinion of presages from *comets*: since the tail of a *comet* thus intermingled with our atmosphere, may produce changes very sensible in animal and vegetable bodies. See SPIRIT and MEDIUM.

M. Facio has suggested, that some of the *comets* having their nodes so very near the annual orbit of the earth; should the earth happen to be found in that part next the node, at the time of a *comet's* passing by; as the apparent motion of the *comet* will be incredibly swift, so its parallax will become very sensible; and the proportion thereof to that of the sun will be given: whence, such transits of *comets* will afford the best means of determining the distance of the earth and sun.

The *comet* of 1472, *v. gr.* had a parallax above twenty times greater than the sun's: and if that of 1618 had come down in the beginning of March to its descending node, it would have been much nearer the earth, and its parallax much more notable. But, hitherto, none has threatened the earth with a nearer approach than that of 1680: for, by calculation, Dr. Halley finds, that November 11, 1 H. 6 Min. P. M. that *comet* was not above one femidiameter of the earth, to the northwards of the way of the earth; at which time, had the earth been in that part of its orbit, the *comet* would have had a parallax equal to that of the moon: what might have been the consequence of so near an approach, a contact, or lastly, a shock of the celestial bodies?—A deluge Mr. Whiston says! See DELUGE.

Motion of COMETS.—If the paths of *comets* be supposed directly parabolical, as some have imagined, it would follow, that being impelled towards the sun by a centripetal force, they descend as from spaces infinitely distant; and by their falls acquire such a velocity, as that they may again run off into the remotest regions; still moving upwards, with such a perpetual tendency as never to return.—But the frequency of their appearance, and their degree of velocity, which does not exceed what they might acquire by their gravity towards the sun, seem to put it past doubt that they move, planet-like, in elliptic orbits, though those exceedingly excentric; and so return again, though after very long periods. See ELLIPTIC.

Apollonius Myndius declar'd that he took *comets* for regular stars; and ventured to foretel, that one day the periods and laws of their motion would be discovered.

Astronomers, however, are still divided on that head: Newton, Flamsteed, Halley, and the English astronomers, &c. seem satisfied of the return of *comets*: Cassini, and others of the French, think it highly probable; but de la Hire, and others, oppose it.

Those on the affirmative side, suppose the *comets* to describe circles prodigiously excentric, inasmuch as we can only see them in a very small part of their revolution: out of this, they are lost in the immense spaces; hid not only from our eyes, but our telescopes. That little part of their circle next us, M. Cassini, &c. have found to pass between the orbits of Venus and Mars.

For the reasons of the return of COMETS, M. Cassini gives these that follow.—1. In considering the course of the *comets*, with regard

to the fixed stars, they are found to keep a considerable time in the arch of a great circle, *i. e.* a circle whose plane passes thro' the center of the earth: indeed, they deviate a little from it, chiefly towards the end of their appearance; but this deviation is common to them with the planets.

2. *Comets*, as well as planets, appear to move so much the faster as they are nearer the earth; and when they are at equal distances from their perigee, their velocities are nearly the same.

By subtracting from their motion the apparent inequality of velocity occasioned by their different distance from the earth, their equal motion might be found; but we should not be certain this motion were their true one: in regard they might have considerable inequalities, not distinguishable in that small part of their orbit visible to us. It is, indeed, probable, their real motion, as well as that of the planets, is unequal in itself; and hence we have a reason why the observations made during the appearance of a *comet* cannot give the just period of their revolution. See PERIOD.

3. There are no two different planets whose orbits cut the ecliptic in the same angle, whose nodes are in the same points of the ecliptic, and whose apparent velocity in their perigee is the same: of consequence, two *comets* seen at different times, yet agreeing in all those three circumstances, can only be one and the same *comet*.

And this were the *comets* of 1577 and 1680 observed to do; and those of 1652, and 1698: not that this exact agreement in these circumstances is absolutely necessary to determine them the same *comet*. M. Cassini finds the moon herself irregular in them all: accordingly, he is of opinion, there are several which disagree herein, and yet may be accounted the same.

The great objections against the return of COMETS, are, the rarity of their appearance, with regard to the number of revolutions assigned to them.

In 1702 there was a *comet* or rather the tail of one, seen at Rome, which M. Cassini takes to be the same with that observed by Aristotle, and that since seen in 1668; which would imply its period to be 34 years. Now, it may seem strange, that a star which has so short a revolution, and of consequence such frequent returns, should be so seldom seen.—Again, in April of the same year, 1702, a *comet* was observed by Mess. Bianchini and Maraldi, supposed by the latter to be the same with that of 1664, both by reason of its motion, velocity, and direction. M. de la Hire took it to have some relation to another he had observed in 1698; which M. Cassini refers to that of 1652: on this supposition its period appears to be 43 months, and the number of revolutions between 1652, and 1698, fourteen: but it is hard to suppose, that in this age, wherein the heavens are so narrowly watched, a star should make 14 appearances unperceived: especially such a star as this, which might appear above a month together; and of consequence be frequently disengaged from the crepuscula.

For this reason M. Cassini is very reserved in maintaining the hypothesis of the return of *comets*, and only proposes those for planets, where the motions are easy and simple, and are solved without straining, or allowing many irregularities.

M. de la Hire proposes one general difficulty against the whole system of the return of *comets*, which would seem to hinder any *comet* from being a planet: and it is this: that by the disposition necessarily given to their courses, they ought to appear as small at first as at last; and always increase, till they arrive at their greatest proximity to the earth: or, if they should chance not to be observed as soon as they become visible, for want of attention thereto; at least, it is impossible but they must frequently then themselves ere they have arrived at their full magnitude and brightness: but he adds, that none were ever yet observed till they had arrived at it.

But the appearance of a *comet* in the month of October, 1723, while at a great distance, so as to be too small and dim to be viewed without a telescope, may serve to remove this obstacle, and set the *comets*, still, on the same footing with the planets.

Sir Isaac Newton supposes, that as those planets which are nearest the sun, and revolve in the least orbits, are the smallest; so among the *comets*, such as in their perihelion come nearest the sun, are the smallest, and revolve in lesser orbits.

Dr. Halley has given us a table of the astronomical elements of all the *comets* that have been yet observed with due care; whereby, whenever a new *comet* shall appear, it may be determined, by comparing it therewith, whether it be any of those which have yet appeared; and consequently its period, and the axis of its orbit be determined, and its return foretold.

There are many things in the *comet* of 1532, observed by Peter Apian, which intimate its being the same with that of 1607, observed by Kepler and Longomontanus; and which Dr. Halley himself again observed in 1682. All the elements agree, and there is nothing contradicts the opinion, but that inequality in the periodic revolution; which, however, he thinks, is no more than may be accounted for from physical causes: no more, in effect, than is observed in Saturn; the motion of which planet is so disturbed by the rest, especially Jupiter, that its period is uncertain for several days together; to what errors then may

not a comet be liable, which rises to almost four times the height of Saturn; and whose velocity, if but a little increased, would change its elliptic orb into a parabolic one?

What further confirms the identity, is the appearance of another comet in the summer of 1456; which, though observed by none with accuracy, yet by its period, and the manner of its transit, he concludes to be the same; and thence ventures to foretell its return in the year 1758. See Whiston's *Solar System*, where the orbits of the several Comets are delineated, and their periods, so many of them as are known, expressed.

To determine the Place and Course of a COMET.—Observe the distance of the comet from two fixed stars, whose longitudes and latitudes are known: from the distances thus found, calculate the place of the comet by trigonometry, after the manner delivered under PLANET.—By repeating the observations and operations for several days successively, the course of the comet will be had.

To determine the Course of a COMET mechanically, and without any apparatus of instruments.—The following ingenious method, by a thread, we owe to Longomontanus: observe four stars round the comet, such, as that the comet may be in the intersection of the right lines that join the two opposite stars; which is easily found by means of a thread placed before the eye, and extended over-against the stars and comet.

Suppose, *v. gr.* the comet's place in the heavens A, (Tab. *Astronomy*, fig. 23.) between the four stars, B, C, D, E; where the line joining the stars B and D, passing through the body of the comet; and the like does the line passing through C and E: On a globe, whereon these four stars are found, extend a thread through B and D, and another through C and E; the point of intersection will give the place of the comet. This practice being repeated for several days, the comet's course will be had on the globe; which course will be found to be a great circle: from any two points whereof, it will be easy to find its inclination to the ecliptic, and the place of the nodes; only by observing where a thread stretched through the two points cuts the ecliptic.

To determine the Parallax of a COMET. See PARALLAX.

Trajectory of a COMET. See TRAJECTORY.

COMITATUS *Passus*. See the article POSSE.

COMITIA *, an assembly of the Roman people, either in the *comitium*, or *campus martius*; meeting for the election of magistrates, or for consulting on the important affairs of the republic. See FIELD of Mars, &c.

* The word comes from the verb *com*, or *comis*, to go together.

There were certain days fixed for these assemblies, called *dies comitiales*, marked with a c in the calendar of Julius Cæsar. *Comitial* assemblies held for the election of consuls, were called *consular comitia*: in like manner, the other *comitia* took names from the officer to be created; whether a tribune, a pontiff, ædile, or the like.

There were three kinds of these *comitia*, *viz.* *curiata*, *centuriata*, and *tribunita*; so distinguished, from the manner wherein the people voted, and gave their suffrages, *viz.* by curie or parishes, tribes, or centuries.

Authors make the difference between *comitia*, and *concilia*, to consist in this; that in the former the whole people were called together, in the latter only a part.

The *comitium*, or the place where the *comitia* were ordinarily held, was a large hall in the Roman Forum: it was a long time open at top; on which account, the assemblies were often interrupted by the ill weather: it was first covered over in the time of the second Punic war. See FORUM.

Rofinus observes, that the consuls and tribunes were not created in the *comitium*, but in the *campus martius*.

COMITIALIS *Morbus*, an ancient term for the epilepsy, or falling-sickness; so called, because if any person was seized with it in the Roman *comitia*, the assembly was immediately dissolved; this being esteemed an unlucky omen: or rather because those liable to it were chiefly seized in the *comitia*, or great assemblies. See EPILEPSY.

COMMA *, *Κομμα*, in grammar, a point, or character formed thus [,]; serving to mark a short stop, or pause; and to divide the members of a period.

* The word is Greek, formed of *κομω*, *see*, I cut.

It is very difficult to fix the precise use of the comma; different authors define, and use it differently: the ordinary doctrine is, that the comma serves to distinguish nouns, verbs, adverbs, and the several parts of a period that are not necessarily joined together. But this conveys no clear, precise idea; for what is it to distinguish the parts of a period not necessarily joined together? F. Buffier has carried the doctrine of the comma further: according to him, the comma serves to distinguish those members of a period, in each whereof is a verb, and the nominative case of the verb. Thus, *That so many people are pleased with trifles, is owing to a weakness of mind, which makes them love things easy to be comprehended.*

Besides this, the comma is used to distinguish, in the same member of a period, several nouns substantives, or nouns adjectives, or verbs not united by a conjunction. Thus, *Virtue, wit, knowledge, are the chief advantages of a man: or, a man never becomes learned without studying constantly, methodically, with a goal, application, &c.*

If those words be united in the same phrase by a conjunction, the comma is omitted: thus, *The imagination and the judgment do not always agree.* The comma may also be omitted between two phrases that are very short, especially if they depend on the same regimen, and are united by a conjunction: thus, *Alexander conquered Asia and established the monarchy of the Greeks.*

The ingenious author of the tract *de ratione interpurgendi*, printed with Vossius's *Element. Rhetor.* Lond. 1724. lays down the use of a comma to be, to distinguish the simple members of a period, or sentence; *i. e.* such as only consist of one subject, and one definite verb.—Thus Cicero, *Venio nunc ad voluptates agriculturalium, quibus ego incredibiliter delector, quæ nec ulla impediuntur senectute, & mihi ad sapientis vitam proxime accedere videntur.* See SENTENCE.

But this rule does not go throughout; the same author instantiating many particular cases, not included herein, where yet the comma is advisable.

Sometimes, *v. gr.* a proposition includes another, which may be called *partitive*, as being only a part of the entire phrase; in which case, the two are to be divided from each other by commas. Thus, *He always says, as he tells us, the finest things in the world.* The points, or pauses in discourse, it is observed, are in a kind of musical proportion: the comma stops the reader's voice while he may privately tell one; the semicolon, two; the colon, three; and the period or full-stop, four.

The ancients only made use of two kinds of points, or pauses in a period; the larger they called *members*, the Greeks *cola*, marked thus [:] the smaller *meisa*, the Greeks *commata*, thus [,].

The moderns, refining on their predecessors, have subdivided the first into a colon and semicolon; some say, without any good foundation in nature; though others stand up for the usefulness of the division.

As the member, or colon, divides the period into two parts, each containing a sense, though that imperfect; thus, *Antequam de republica, patres conscripti, dicam ea quæ dicenda hoc tempore arbitror*; where the sense does not rest, nor is the period or sentence perfect, without the addition of, *exponam vobis breviter & profectissimis & reversionis meæ: the comma subdivides each member into intermediate divisions, which, of themselves, have no precise meaning at all; v. gr. Nihil est, mihi crede, virtute formosius, nihil pulchrius, nihil amabilius.*

Frequent commas, as on other occasions they promote perspicuity and distinctness, and ease the reader, both in the rehearsal and comprehension of his author; so, in oratory, are they of especial use and effect; particularly where an adversary is to be closely and pointedly attacked, unbraided, reprehended, wounded, &c. witness that of Cicero against Verres; *Non enim nas color iste servituti, non pilosæ genæ, non dentes putridi deceperunt: oculi, supercilium, frons, vultus denique totus, qui sermo quidam tacitus mentis est, hic in fraudem, homines impulsi: hic, eos, quibus erat ignotus, decepit, fessellit, in fraudem induxit: pauci tua ipsa ludentia vitia novimus; pauci tarditatem ingenii, stuporem, debilitatemque lingue, &c.*

COMMA, in musick, is the smallest of all the sensible intervals of tune.

The comma is about the tenth part of a tone: or it is the interval whereby a perfect semitone surpasses an imperfect one; or a perfect tone, an imperfect one. See TONE.

Mr. Sauveur says, a comma is the difference between a tone major and minor. It is seldom in use, except in the theory of musick, to shew the justness of the concords; for in the practice, the division is drowned and lost. Each lesser tone ordinarily contains ten commas.

Lancelot only divides his tone into nine parts, or commas; so that according to him, a comma is the ninth part of a tone.

The proportion of the greater comma in number, is as 80 to 81; that of the smaller, as 2025 to 2048.

COMMANDING Ground, in fortification, an eminence or rising ground which overlooks any post, or strong place.

Of this they reckon three sorts: 1°. *A front commanding ground*; which is an height opposite to the face of the post, which plays upon its front.

2°. *A reverse commanding ground*, which is an eminence that can play upon the back of any place or post.

3°. *An enfilade commanding ground*, or *curtain commanding ground*; which is an high place, that can with its shot scour all the length of a straight line.

COMMANDMENT, in a legal sense, has various uses; as, *Commandment of the king*, when, on his own mere motion, and from his own mouth, he casts a man into prison.

Commandment of the justices, is either *absolute*, or *ordinary*; *absolute*, as when on their own authority, and their own discretion, they commit a man to prison for punishment.

Ordinary, as when they commit him rather for safe custody than punishment.—A man committed to an ordinary *Commandment* is releasable.

COMMANDMENT is also used for the offence of him who directs or wills another to transgress the law; as by murder, theft, and the like.

COMMANDDRY, a kind of benefice, or fixed revenue belonging to a military order, and conferred on ancient knights who had done considerable services to the order.

There are *strict*, or regular *Commendaries*, obtained in order, and by merit: there are others of *grace* or *favours*, conferred at the pleasure of the grand master.

There are also *Commendaries* for the religious in the orders of S. Bernard and S. Anthony.—The kings of France have converted several of the hospitals for lepers into *Commendaries* of the order of S. Lazarus.

Commendaries may be compared to conventual priories; which, at first, were no more than administrations of the revenue of certain places at a distance from the principal monastery: as there was a necessity for having monks disposed in these houses to take care of the effects; so there was the like necessity for sending knights into those places where the order had lands.

The *Commendaries* of Malta are of different kinds; for as the order consists of knights, chaplains, and brothers servants, there are peculiar *Commendaries* or revenues attached to each.

The knight to whom one of these benefices or *Commendaries* is given, is called *Commander*: which agrees pretty nearly with the *prepositus* set over the monks in places at a distance from the monastery, whose administration was called *obediencia*; because depending entirely on the abbot who gave him his commission. Thus it is with the simple *Commanders* of Malta, who are rather farmers of the order, than beneficiaries; paying a certain tribute or rent, called *responsio*, to the common treasure of the order.

COMMEMORATION, the remembrance of any one; or something done in honour of a person's memory.

Among the Romanists, it is a practice for dying persons to leave a legacy to the church, for the rehearsing so many masses in *Commemoration* of them.

The eucharist is a *Commemoration* of the sufferings of Jesus Christ; and is not, therefore, Jesus Christ himself.

COMMEMORATION is also the name of a religious feast, otherwise called *All-saints*, held on the first of November, in memory of all the faithful deceased; instituted in the XIIIth century, by Odilo abbot of Cluny. See FEAST.

The occasion of its institution is variously related; the most plausible account is this: a religious knight returning from a pilgrimage to the holy land, and losing his road, met a hermit; who hearing that he was a Franc, asked him if he knew the monastery of Cluny, and the abbot Odilo; the pilgrim professing his knowledge of both, the hermit told him, that God had discovered to him, that he was to have the credit of delivering souls from the pains they suffer in the other life; charging him, at his return, to exhort Odilo, and those of his community, to continue their prayers and alms for the dead. See CLUNY.

COMMENDAM, in the canon law, expresses the charge, trust, and administration of the revenues of a benefice, given to a layman to enjoy, by way of depositum, for the space of six months; in order to its being repaired, &c. or to another bishop, or ecclesiastic, to perform the pastoral offices thereof, till such time as the benefice is provided of a regular incumbent. See BENEFICE.

Antiently, the administration of vacant bishopricks belonged to the nearest neighbouring bishop; which is still practised between the archbishoprick of Lyons, and the bishoprick of Autun: on this account they were called *commendatory bishops*.

This custom appears to be very antient: S. Athanasius says of himself, according to Nicephorus, that there had been given him in *commendam*, i. e. in administration, another church besides that of Alexandria whereof he was stated bishop.

The care of churches, it seems, which had no pastor, was committed to a bishop, till they were provided of an ordinary: the register of pope Gregory I. is full of these commissions, or *Commendams*, granted during the absence or sickness of a bishop, or the vacancy of the see.

Some say, that pope Leo IV. first set the modern *Commendams* on foot, in favour of ecclesiastics who had been expelled their benefices by the Saracens; to whom the administration of the vacant churches was committed for a time, in expectation of their being restored: though S. Gregory is said also to have used the same, while the Lombards desolated Italy.

In a little time, the practice of *Commendams* became exceedingly abused; and the revenues of monasteries were given to laymen for their subsistence. The bishops also procured several benefices, or even bishopricks in *commendam*, which served as a pretext for holding them all without directly violating the canons. Part of the abuse has been retrenched; but the use of *Commendams* is still retained; as an expedient to take off the incompatibility of the person, by the nature of the benefice. When a parson is made bishop, his parsonage becomes vacant; but if the king give him power, he may still hold it in *commendam*.

COMMENDAM, in Romish countries, is a real title of a regular benefice; as an abby, or priory given by the pope to a secular clerk, or even to a layman, with power to dispose of the fruits thereof during his life.

No benefice that has a cure of souls, i. e. no parsonage, or bishopric can be given in *commendam*. This practice being entirely contrary to the canons, none but the pope, who has a power of dispensing with the canons, can confer it.

When the *Commendam* becomes vacant by the death of the *commendatory*, it is not esteemed vacant by his death, but as it

was before the *Commendam* was granted; that making no alteration in the thing: yet the pope gives the same benefice in *commendam* again, by a privilege which he still continues.

By the pope's bulls, a *commendatory* abbot has the full authority of the regular abbot to whom he is substituted: this is expressed in plain terms, *curam monasterii ac regimen & administrationem tibi in spiritualibus & temporalibus plane committendo*. For this reason, the bulls expressly require, that he be a priest; or, that if he have not yet attained the age of a priesthood, he shall take orders as soon as he has. But this is a mere formality, or matter of style; the thing is never executed.

Indeed, the spiritual direction of the abby, while it is in *Commendam*, is lodged wholly in the claustral prior. The *commendatory* abbots have not any authority over the religious in *spiritualibus*: they even cannot either appoint or set aside the claustral priors, who are nominated in the bulls the administrators of the spiritualities; in which, however, this restriction is added, *viz.* till the abbot arrive at the age of 25 years, to assume the priesthood. The bull given the prince of Neubourg for the abby of Fescamp, runs thus: *Et ne ob defectum aetatis primo-dictum monasterium aliquod in spiritualibus patiar detrimendum; priorem-claustralem pro tempore existentem, primo-dicti monasterii in spiritualibus, donec tu 25 tue aetatis annum pervereris, duntaxat constitutimus ac deputamus*. The words *administration in spiritualibus*, are understood principally of the monastic rule, or discipline; from which the *commendatory* abbots are excluded, when they are promoted to the priesthood, unless they become regulars.

The pope grants benefices in *commendam*, not only to clerks, by dispensing with their age, and other qualifications required; but they also dispense with the clericate even in children yet in the cradle, till they become of age to take the tonsure: it being sufficient to obtain a bull, that it be represented at Rome, that the child is destined for the ecclesiastical state.

In this case there is an economist, or steward, appointed to take care of the temporal concerns. See OECONOMUS.

COMMENDATI. See AFFIDATUS.

COMMENSURABLE quantities, in geometry, are such as have some common aliquot part, or which may be measured by some common measure, so as to leave no remainder in either.

Thus, a foot and a yard are *commensurable*; there being a third quantity which will measure each, *viz.* an inch; which taken 12 times makes a foot, and 36 times a yard.

Commensurables are to each other, either as unites to a rational whole number; or as one rational whole number to another. In *incommensurables* it is otherwise. The ratio of *Commensurables* therefore is rational; that of *incommensurables* irrational: hence, also, the exponent of the ratio of *Commensurables* is a rational number.

COMMENSURABLE numbers, whether integers or fractions, are such as have some other number which will measure or divide them without any remainder.

Thus, 6 and 8, $\frac{2}{3}$, and $\frac{4}{5}$, are respectively *commensurable* numbers.

COMMENSURABLE in power. Right lines are said to be *commensurable in power*, when their squares are measured by one and the same space, or superficies.

COMMENSURABLE surds, are such surds as being reduced to their least terms, become true figurative quantities of their kind; and are therefore as a rational quantity to a rational.

COMMENTARY, or COMMENT, a gloss, or interpretation, affixed to some antient, obscure, or difficult author, to render him more intelligible, or to supply what he has left undone.

Sir Henry Savil has wrote a *Commentary* of 300 pages in quarto, to explain the first eight propositions in Euclid.—S. Evermond observes, that commentators commonly spend a great part of their time in finding out beauties the author never dreamt of, and in enriching him with their own thoughts.

COMMENTARY is also used for a sort of history, written by a person who had a chief hand in the transactions related.

Such are the *Commentaries* of Caesar, of Sledan, of Montluc, &c. The word is also used for certain books written on some particular subject: Kepler has an excellent book of *Commentaries on Mars*, containing observations on the motion of that planet.

COMMERCE, the exchange of commodities; or, the buying, selling, or trafficking of merchandize, money, or even paper; in order to profit by the same.

There is no doubt but *Commerce* is nearly as antient as the world itself: necessity set it on foot, the desire of convenience improved it, and vanity, luxury, and avarice, have brought it to its present pitch. At first it only consisted in the exchange of things necessary for life: the plowman gave his corn and his pulse to the shepherd, and received milk and wool in exchange; which method of *Commerce* by exchange subsists still in many places; as about the coasts of Siberia, and the Danish, and Muscovite Lapland; among several nations on the coasts of Africa; among most of those of America, and many of Asia. See EXCHANGE.

It is not precisely known when the *Commerce* by buying and selling first began; nor when coins, and the several species of gold, silver, and copper, had their rise. The first monies were wood, leather, and iron; and even at this day, it is the custom in some places

places of both Indies, to give a certain value in sea-shells and coco-nuts, for merchandises, drugs, &c. See MONEY, and COIN. The first instance of this kind of *Commerce* in the sacred writing, is in the time of the patriarch Abraham. For prophane authors, they usually fix its epocha to the reign of Saturn and Janus in Italy; and the ancient authors, according to Caesar, attribute its invention to the god Mercury.

The Egyptians, Phœnicians, and Carthaginians, who were a Tyrian colony, were the first, the most daring and expert traders of all antiquity: at least, it is evident they were the first who run the hazard of long voyages; and who set on foot a traffick by sea between coasts very remote.

Among the antients, *Commerce* did not appear unworthy the application of persons of the first rank: Solomon, we are told, frequently joined his merchant-fleets with those of the king of Tyre, for their Voyage to Ophir; and by this means rendered himself, though in a little kingdom, the richest king of his time in the universe. Under the Asiatic and Grecian empires, antient history gives us from time to time the traces of a *Commerce* cultivated by several nations: but it flourished more considerably under the dominion of the Romans; as appears from that vast number of colleges and companies of merchants in the several cities mentioned in historians and antient inscriptions.

The destruction of the Roman empire by the irruptions of the Barbarians, brought that of *Commerce* along with it; or at least suspended its ordinary operation for some time: by degrees it began to recover itself, and made a new progress; especially in Italy. Hence, the Pisans, Florentines, Genoese, and Venetians, who abounding in shipping, took occasion to spread themselves through all the ports of the Levant and Egypt; bringing thence silk, spices, and other merchandises; and furnishing the greatest part of Europe therewith. And thus was the modern *Commerce* founded on the ruins of that of the antient Greeks and Romans to the same places: and thus did those famous republics acquire their lustre and power.

The Germans, however, had a long time carried on a separate *Commerce*; which was not borrowed from the Romans, nor did it fall with theirs. Towards the end of the twelfth century, the German cities situate on the coast of the Baltic, and the rivers that run into it, got into a considerable traffick with the neighbouring states.

As their *Commerce* was much interrupted by pyrates, 72 of them united together for their mutual defence; and were thence called *hanseatic*, or *hans towns*. See HANS TOWN.

Thus they flourished till the beginning of the sixteenth or the end of the fifteenth century; when a division arising among them, and about the same time a new passage to the Indies, by the Cape of Good Hope, being discovered by the Portuguese; and settlements made on the coast of Africa, Arabia, and the Indies: the antient Italian and Hanseatic *Commerce* sunk; and the chief trade came into the hands of the Portuguese.

The Portuguese had not possessed those different trades above 100 years, when, about the beginning of the seventeenth century, the Dutch began to share it with them; and in a little time dispossessed them of almost the whole. The English, French, Danes, and Hamburgers, excited by their success, have likewise made settlements in the Indies, and on the coasts of Africa; though much less considerable ones, excepting those of the English.

Lastly, America, discovered by the Spaniards soon after the Portuguese had discovered the new way to the Indies, likewise became the object of a new, vast, and most important *Commerce*, for all the nations of Europe; whereof Cadiz and Sevil were made the center.

It is true, the first conquerors of this new world still possess the greatest and richest part of it; and preserve the *Commerce* thereof to themselves with a world of jealousy: yet, besides that the English, French, Portuguese, and Dutch, have several rich and flourishing colonies, both in the islands and the continent; it is certain, that it is as much for other nations as themselves that the Spaniards every year send their flota's for the treasures of Peru and Mexico.

The trade of Europe was no sufferer by this new one of America; the north and south have still the same mutual occasion for each other as before.

The navigation from the Baltick to the Mediterranean was tedious and difficult: the situation of Flanders, and the manufactures which there flourished from the tenth century, together with the free fairs of that country, engaged the merchants, both of the north and south, to establish their magazines first in Bruges, and then in Antwerp.

The establishment of the republic of Holland, the favourable reception it gave to strangers, and the refuge it afforded to religionaries, drew store of manufacturers to it, as well as manufactures; and soon sunk the *Commerce* of Antwerp.

And the same reasons, the convenience and multitude of the ports of England, the good of the wools, and the industry of the workmen, have brought thither a considerable part of the *Commerce* of Europe.

In France, the nobles are allowed to exercise *Commerce* with-

out derogating from their nobility: by an ordonnance of Louis XIII. merchants are allowed to take on them the quality of nobles; and by another of Louis XIV. they are declared capable of being secretaries of state, without laying aside their *Commerce*. It may be added, for the honour of trade, that some of the Italian princes, looking on themselves as the chief merchants of their states, do not disdain to make their own palaces serve as magazines: and there are several kings in Asia, as well as most of those on the coasts of Africa and Guinea, who negotiate with the Europeans by their factors, and frequently in person.

Commerce, on the foot it now stands, is divided into *Commerce* by land, and by sea; that by long voyages, and by short; inland or domestic, and foreign; and by wholesale and retail.

A great part of the foreign *Commerce* of England is now carried on by collective companies: some incorporated by the king's charters, with an exclusive privilege, as the East-India and South-Sea companies; others only private associations, as the Turkey and Hamburg companies. See COMPANY.

Chambers of *COMMERCE*. See the article CHAMBER.

Characters in *COMMERCE*. See the article CHARACTER.

COMMUNATORY, a clause inserted in a law, edict, patent, &c. importing a punishment wherewith delinquents are menaced; which, however, is not to be executed in its rigor.

Thus, in France, when an exile is enjoined not to return on pain of death, it is deemed a *Communatory* penalty; since, if he do return, it is not strictly executed; but a second injunction is then laid on him, which is more than *Communatory*, and from the day of the date thereof, imports death without remedy.

COMMUNITION, the act of grinding, or breaking any matter into smaller particles.—The effect of chewing, or masticating our food, is the *Communion* thereof.

COMMISSARY, an officer of the bishop, who exercises ecclesiastical jurisdiction in those parts of the diocese which are so far remote from the see, that the chancellor cannot call the subjects thereof to the bishop's principal consistory, without their too great molestation.

This officer, called by the canonists *Commissarius*, or *officialis foraneus*, is appointed to supply the bishop's office in the out-parts of the diocese, and in such parishes as are peculiar to the bishop, and exempted from the jurisdiction of the archdeacon: for where the archdeacons have jurisdiction, as in most places they have, either by prescription or composition, the *Commissary* is superfluous, and frequently vexatious.

COMMISSARY, in an army.—There are two sorts of *Commissaries*:

COMMISSARY-GENERAL of the musters, or muster-master general, takes an account of the strength of every regiment, reviews them, sees that the horse be well mounted, and all the men well armed and accoutred.

COMMISSARY-GENERAL of provisions, has the charge of furnishing the army with all things of that kind.

COMMISSION, in common law, is the same with *delegation* among the Civilians; and is taken for the warrant, or patent which any man exercising jurisdiction, either ordinary or extraordinary, hath to authorize him to hear, or determine any cause or action.

The term, however, is sometimes extended further than to matters of judgment; as in the *Commission* of purveyors, which seems to be null by the statute for taking away purveyance, 12 Car. II. and the high *Commission-court*, which was founded on the statute 1 Eliz. and is also abolished by act of parliament 17 Car. I. The persons charged with a *Commission* are hence called *Commissioners*; sometimes *Committees*.

COMMISSION of anticipation, was antiently a *Commission* given under the great seal, to collect a subsidy before the day. See ANTICIPATION.

COMMISSION of association, is a *Commission* under the great seal, to associate two, or more learned persons, with the several justices in the several circuits and counties in Wales.

COMMISSION of bankruptcy, a *Commission* under the great seal, directed to five or more commissioners, to inquire into the particulars of a man's circumstances, who hath failed, or broke; and to act according to certain statutes made in that behalf.

COMMISSION of peace. See JUSTICE of peace.

COMMISSION of rebellion, or writ of rebellion, is issued out when a man, after proclamation issued out of the chancery, or the exchequer, and made by the sheriff, to present himself, under pain of his allegiance, to the court by a certain day; does not appear. See REBELLION.

This *Commission* is directed, by way of command, to certain persons; three, two, or one of them, to apprehend, or cause to be apprehended, the party as a rebel; and to bring him to the court on a day assigned.

COMMISSION-Officers. See the article OFFICER.

Book of COMMISSIONS. See the article BOOK.

COMMISSION, in commerce. See FACTORAGE.

COMMISSIONER, he who has a *commission*, e. gr. a patent, or other legal warrant, to execute any publick office. See COMMISSION, WARRANT, &c.

Such are, *Commissioners of hawkers and pedlars, Commissioners of alienation, Commissioners of the stamps, &c.*

COMMISSIONERS of the Customs. } See } CUSTOMS.

COMMISSIONERS of Excise. } See } EXCISE.

COMMISSIONERS of the Navy. See the article NAVY.

Lords COMMISSIONERS of the Treasury. See TREASURY, and EXCHEQUER.

COMMISSURE *Fidei*. See the article FIDEI.

COMMISSURE*, COMMISSURA, a term used by some authors, for the junctures, or for the small meat's, or interstices of bodies; or the little clefts between the particles; especially when those particles are broadish and flat, and lie contiguous to one another, like thin plates, or lamellæ. See PORE.

* The word literally signifies a joining, or connecting of one thing to another.

COMMISSURE, in architecture, &c. denotes the joint of two stones; or, the application of the surface of the one to that of the other.

Among anatomists, *Commissure* is sometimes also used for a suture of the cranium, or skull.

COMMITTEE, in law, one or more persons, to whom the consideration of any matter is referred, either by a court, or by consent of the parties concerned.

COMMITTEE of Parliament, is a board consisting of a certain number of members, appointed by the whole house, for the examining of a bill, or making report of an inquiry, or process of the house, &c.

Sometimes, the whole house is resolved into a committee; on which occasion each person has a right to speak, and reply as much, and as often as he pleases: an expedient they usually have recourse to in extraordinary cases, and where any thing is to be thoroughly canvassed.—When the house is not in a Committee, each gives his opinion regularly, and is only allowed to speak once.

COMMITTEE of the King, is used for a widow of one of the king's tenants; it is thus called, as being by the antient law of the realm committed to the king's care and protection. See WIDOW.

COMMODATE, COMMODATUM, in the civil jurisprudence, the loan, or free concession of any thing moveable or immoveable, for a certain time, on condition of restoring again the same individual after a certain term.

The *Commodate* is a kind of loan: there is this difference, however, between a loan and a *Commodate*, that the latter is gratis, and does not transfer the property: the thing must be returned in essence, and without impairment: so that things which consume by use, or time, cannot be objects of a *Commodate*, but of a loan; in regard they may be returned in kind, though not in identity.

COMMODITIES *Staple*. See the article STAPLE.

COMMODORE, in the navy, an under-admiral, or person commissioned by an admiral to command a squadron of ships in chief. See ADMIRAL, and SQUADRON.

COMMON, COMMUNIS, something that belongs to all alike; is owned, or allowed by all; and is not confined to this more than that. See COMMUNIS.

In which sense, *Common* stands opposed to *proper, peculiar, &c.* Thus, the earth is said to be our *Common* mother; in the first, or golden age, all things were in *Common*, as well as the sun and elements: the name animal is *Common* to man and beast; that of substance to body and spirit.

Philosophers dispute whether there be any such thing as *common* notions, innate, or impressed on the mind by nature herself; or whether our ideas are all adventitious.

COMMON Bench. See the article COMMON PLEAS.

COMMON Council. See the article COMMON COUNCIL.

COMMON Duct, in anatomy. See DUCTUS COMMUNIS.

COMMON Fine, in law, a certain sum of money which the tenants within the liberty of some leets pay to the lord thereof; called, in some places, *head-silver*; in others *cert-money*, or *certum letæ*, and *head-pence*.

It was first granted to the lord towards the charge of his purchase of the court-leet; whereby the tenants have now the convenience of doing their suit-royal near home, without being compelled to go to the sheriff's turn.

COMMON Hunt, the chief huntsman belonging to the lord-mayor and aldermen of London.

COMMON Intendment, in law, the *common* understanding, meaning, or construction of any thing; without referring it to any foreign, remote, or particular sense.

Bar to COMMON Intendment, is an ordinary or general bar, which commonly disables the declaration of the plaintiff. See BAR, and INTENDMENT.

COMMON Law, that body of rules generally received, and held as law in this nation, before any statute, or written law, was made to alter the same.

After the decay of the Roman empire, Britain became invaded by three kinds of German people, *viz.* the Saxons, Angles, and Jutes. From the Jutes descended the men of Kent, and those of the Isle of Wight; from the Saxons came the people called the East, South, and West-Saxons; and from the Angles came

the East-Angles, Mercians, and Northumbrians.

Now, as each people had its peculiar customs, so each inclined to different laws; whereof, those of the West-Saxons, and Mercians, who inhabited the midland countries, were upon the dissolution of the heptarchy, and establishment of a monarchy, preferred to the rest, and acquired the common appellation of *Jus Anglorum*. Their particular names were *Wigt Saxonlage*, and *Mercenlage*.

By these laws the nation was governed for several ages, till being at length subdued by the Danes, the customs of those people were introduced, and incorporated with the rest; and thus a new form of *Common* law arose, called *Danelage*.

The Danes being afterwards, in their turn, overcome by the Normans; the conqueror, on a review of the several laws and customs that then obtained, abrogated some, and abolished others; adding some of his own country laws: and the system, or assemblage of these, is what we call the *Common* law.

The *Common* law of England, is properly, the common customs of this kingdom; which, by length of time, have obtained the force of laws.

It is called *lex non scripta*, the *unwritten* law: not but that we have most of it written in the old Norman dialect, but because it cannot be made by charter, or parliament: for those are always matters of record; whereas customs are only matter of fact, and subsist no where but in the memory of the people.

From the common reason of things, therefore, *Common* law should appear the best, most beneficial, and easy to the people; in regard it consists of such rules and practices as they themselves spontaneously, and as it were by the impulse and direction of their own interests, were led to: whereas, the written laws, made in England by the king and parliament, are imposed on the subject at once, and without any trial, or foreknowledge how they shall answer; and whether or no they are like to prove beneficial to the nation, and agreeable to the nature of the people: excepting such as are first made temporary; and for their approved utility, afterwards perpetuated.

The first Saxon laws published in England, were those of king Ethelbert in the VIth century. 300 years after, king Alfred, whom our historians call *magnus juris anglicani conditor*, having united the heptarchy, and rendered himself master of the whole nation, made a collection from among the several laws of the several provinces of his domains; and commanded them to be observed throughout his kingdom. This collection was denominated *folk-right*, and soon after, the *Common* law; as being *common* to the whole nation.

Beside the *Common* law of England in general; there are in divers parts of the nation particular customs, and common usages, which have the force of *Common* law among those people who have retained them: such as the Borough-English, Gavelkind, &c.—Where the *Common* law is silent, there the statute law speaks. See STATUTE.

All trials at *Common* law are by a jury of twelve men. See JURY, TRIAL, &c.

COMMON Month. } See the article } MONTH.

COMMON Motion. } See the article } MOTION.

COMMON Object. } See the article } OBJECT.

COMMON-PLACE Book, *Adversaria*, among the learned, denotes a register, or orderly collection of what things occur worthy to be noted, and retained in the course of a man's reading, or study; so disposed, as that among a multiplicity of heads, and things of all kinds, any one may be easily found, and turned to at pleasure.

Common-place-books are things of great service: they are a kind of promiscuaries or storehouses, wherein to deposit the choicest and most valuable parts of authors, to be ready at hand when wanted. Several persons have their several methods of ordering them: but that which comes best recommended, and which many learned men have now given into, is the method of that great master of order Mr. Locke. He has thought fit to publish it in a letter to M. Toynard; determined thereto, by the great convenience and advantage he had found from it in 20 years experience; as well as by the recommendations and intreaties of many of his friends, who had likewise proved it.

The substance of this method we shall here give the reader; whereby he will be easily enabled to execute it himself.

The first page of the book you intend to take down their *Common-places* in, is to serve as a kind of index to the whole; and to contain references to every place or matter therein: in the commodious contrivance of which index, so as it may admit of a sufficient copia, or variety of materials, without any confusion; all the secret of the method consists.

In order to this, the first page, as already mentioned, or, for more room, the two first pages that front each other, are to be divided, by parallel lines, into 25 equal parts; whereof, every fifth line is to be distinguished, by its colour or some other circumstance. These lines are to be cut perpendicularly by others, drawn from top to bottom; and in the several spaces thereof, the several letters of the alphabet, both capital and minuscule, are to be duly wrote.

The form of the lines and divisions, both horizontal and perpen-

dicular

dicular, with the manner of writing the letters therein, will be conceived from the following specimen; wherein what is to

be done in the book for all the letters of the alphabet, is here shewn in the first four, *A, B, C, and D.*

a
e
i
o
u
a
e 2. 3
i
o
u

a
e
C i
o
u
a
e
D i
o
u

The index of the *common-place* book thus formed, matters are ready for the taking down any thing therein.

In order to this, consider to what head, the thing you would enter is most naturally referred; and under which, one would be led to look for such a thing: in this head, or word, regard is had to the initial letter, and the first vowel that follows it; which are the characteristic letters whereon all the use of the index depends.

Suppose, *e. gr.* I would enter down a passage that refers to the head *beauty*; *B*, I consider, is the initial letter, and *e* the first vowel: then, looking upon the index for the partition *B*, and therein the line *e*, (which is the place for all words whose first letter is *B*, and first vowel *e*; as *Beauty, Beneficence, Bread, Bleeding, Blemishes, &c.*) and finding no numbers already down to direct me to any page of the book where words of this characteristic have been enter'd, I turn forward to the first blank page I find, which in a fresh book as this is supposed to be, will be page 2, and here I now write what I have occasion for on the head *beauty*; beginning the head in the margin, and indenting all the other subservient lines that the head may stand out and show itself: this done, I enter the page where it is wrote, *viz.* 2, in the index, in the space *Be*; from which time, the class *Be* becomes wholly in possession of the 2d and 3d pages, which are assigned to letters of this characteristic.

Had I found any page or number already entered in the space *Be*, I must have turned to the page, and have wrote my matter in that room was left therein: so, if after entering the passage on *beauty*, I should have occasion for *benevolence*, or the like, finding the number 2 already possessed of the space of this characteristic, I begin the passage on *benevolence* in the remainder of the page, which not containing the whole, I carry it on to page 3, which is also for *Be*; and add the number 3 in the index.

An example will make the method of writing down the heads obvious.

BEAUTY. 'The power of perceiving the ideas of *beauty* is justly called a *sense*, because of its affinity to the other senses in this, that the pleasure does not arise from any knowledge of principles, proportions, causes, or of the usefulness of the object; but strikes us at first with the idea of *beauty*: nor does the most accurate knowledge increase this pleasure of *beauty*; however, it may superadd a distinct rational pleasure from prospects of advantage, or from the increase of knowledge. And further, the ideas of *beauty*, like other sensible ideas, are necessarily pleasant to us, as well as immediately so; neither can any resolution of our own, nor any prospect of advantage or disadvantage, vary the *beauty* or deformity of an object: for as in the external sensations, no view of interest will make an object grateful; nor detriment, distinct from immediate pain in the perception, make it disagreeable to the sense; so, propose the world as a reward, or threaten the greatest evil, to make us approve a deformed object, or disapprove a beautiful one; dissimulation may be procured by rewards, or threatenings; or we may in external conduct abstain from any pursuit of the beautiful, and pursue the deformed; but our sentiments of the forms, and our perceptions would continue invariably the same. Hence, it plainly appears, that some objects are immediately the occasions of this pleasure of *beauty*; and that we have senses fitted for perceiving it; and that it is distinct from that joy which arises from self-love, upon prospect of advantage. Nay, do not we often see convenience and use neglected to obtain *beauty*, without any other prospect of advantage in the beautiful form, than suggesting the pleasant ideas of *beauty*? Now this shews us, that however we may pursue beautiful objects from self-love, with a view to obtain the pleasures of *beauty*; as in architecture, gardening, &c. yet there must be a sense of *beauty* antecedent to prospects of even

'this advantage: without which sense, these objects would not be thus advantageous; nor excite in us this pleasure which constitutes them advantageous. Our sense of *beauty*, from objects by which they are constituted good to us, is very distinct from our desire of them, when they are thus constituted: our desire of *beauty* may be counterbalanced by rewards and punishments, but never our sense of it. Had we no such sense of *beauty*, houses, gardens, dress, equipage, might be recommended to us as convenient, fruitful, warm, easy; but never as beautiful: and in faces, I see nothing that could please us, but liveliness of colour, and smoothness of surface.—*Inquiry into the Original of our Ideas of Beauty, &c.* 8vo. Lond. 1725. p. 10, 11, 12.

BENEVOLENCE. 'The true spring of all actions called *virtuous*, is some determination of our nature to study the good of others; or some instinct, antecedent to all reason from interest, which influences us to the love of others:—The same cause which determines us to pursue happiness for ourselves, determines us to esteem and *benevolence* for others: even the very frame of our nature, or a generous instinct.—This universal *benevolence* towards all men, we may compare to that principle of gravitation, which extends to all bodies in the universe, but like the love of *benevolence*, increases as the distance is diminished; and is strongest when bodies come to touch each other, *Id. ib.* p. 131, 143. 199.—As all men have self-love, as well as *benevolence*; those two principles may jointly excite a man to the same action: and then they are to be considered as two forces impelling the same body to motion: sometimes they conspire; sometimes are indifferent to each other; and sometimes are opposite. Thus, if a man has such strong *benevolence* as would have produced an action without any views to self interest; that such a man has also in view private advantage, does no way diminish the *benevolence* of the action. When he would not have produced so much public good, had it not been for prospect of self-interest; then the effect of self-love is to be deducted; and his *benevolence* is proportioned to the remainder of good, which pure *benevolence* would have produced. When a man's *benevolence* is hurtful to himself, then self-love is opposite to *benevolence*; and the *benevolence* is proportioned to the sum of the good produced, and the resistance of the self-love surmounted thereby.—The morality of any person, or the quantity of public good produced by him, is in a compound ratio of his *benevolence* and abilities: or, (by substituting the initial letters for the words, as $M = \text{moment of good}$, and $\mu = \text{moment of evil}$) $M = B + A$. *Idem. ib.* p. 130, 131, 143, 199.'

When the two pages defined for one class are full, look forwards for the next backside that is blank; if it be that which immediately follows, write at the bottom of the margin of the page filled, the letter *v.* for *verte*, turn over; and the same at the top of the next page; and continue from this new page as before. If the pages immediately following be already filled with other classes; then write at the bottom of the page last filled the letter *v.* with the number of the next blank page; and at the top of that page, the number of the page last filled: then entering that head in this new page, proceed as before. By these two numbers of reference, the one at the top, and the other at the bottom of the page, the discontinued matters are again connected. It may not be amiss, too, every time you put a number at the bottom of a page, to put it likewise in the index. Note, if the head be a monosyllable beginning with a vowel, the vowel is at the same time both the initial letter and the characteristic vowel: thus, the word *art* is to be wrote in *Aa*. Mr. Locke omits three letters of the alphabet in his index, *viz.* *K, Y, and W*; which are supplied by *C, F, U*, equivalent to them; and as for *Q*, since it is always followed by an *u*, he puts it in the fifth place of *Z*; and so has no *Zu*, which is a characteristic

characteristic very rarely occurs. By thus making Q the last in the index, its regularity is preserved, without diminishing its extent. Others chuse to retain the class Z u, and assign a place for Q n below the index.

If any imagines that those hundred classes are not sufficient to comprehend all kinds of subjects without confusion, he may follow the same method, and yet augment the number to 500, by taking in one more characteristic to them.

But the inventor assures us, that in all his collections, for a long series of years, he never found any deficiency in the index, as above laid down.

COMMON PLEAS, *Communia placita*, or *Bancus communis*, one of the king's courts, now constantly held in Westminster-hall; but antiently moveable.

Gwyn observes, that till the granting of *magna charta* there were but two courts called the king's courts, *viz.* the exchequer, and the king's-bench; and that upon the grant of that charter the court of *common-pleas* was erected, and fixed to a place certain, *viz.* Westminster-hall: whence the writs which before ran *coram me vel iudicariis meis*, simply; were now changed, and run *coram iudicariis meis apud Westmon.*

All civil causes, both real, personal, and mixed, are tried in this court, according to the strict law of the realm: Fortescue represents it as the only court for real causes.

The chief-justice hereof is called the *lord chief-justice of the common pleas*; who is accompanied with three or four his associates, created by letters patent, and as it were judges installed or placed on the *common bench* by the lord chancellor, and the lord chief-justice of the court.

The rest of the officers belonging to this court, are the *custos breviarum*; three *prothonotaries*, or pronotaries: See **PROTHONOTARY**. A *chirographer*; fourteen *filazers*; four *exigenters*; clerk of the warrants; clerk of the juries, or *jurata writis*; clerk of the treasury; clerk of the king's silver; clerk of the effoigns; clerk of the outlawries; clerk of the errors; whose several functions see in their places, **CUSTOS BREVIUM**, **CHIROGRAPHER**, **EXIGENTER**, **CLERK**, &c.

COMMON RAY. See the article **RAY**.

COMMON, in grammar, denotes the gender of nouns which is equally applicable to both sexes, male and female.

Such is that of *parens* parent; which is either masculine, or feminine, as it is used to signify either father, or mother.

The Latin grammarians, besides this, which they call the *common of two*, do also make a *common of three*; which extends to masculine, feminine, and neuter.

COMMON, in geometry, is applied to an angle, line or the like, which belongs equally to two figures, or makes a necessary part of both.

COMMON CENTER of Gravity. See **CENTER of Gravity**.

COMMON DIVISOR, is a quantity, or number, which exactly divides two, or more other quantities, or numbers, without leaving any remainder.

COMMON, in law, that soil, the use whereof lies open or common to the several inhabitants, or holders of a particular town, or lordship.

In which sense, we say, *common of pasture*, *common of fishing*, *common of turbary*, *common of cistovers*, &c.

Common of pasture, is divided into *common in gross*, *common appendant*, *common appurtenant*, and *common by way of neighbour-hood*.

COMMON in gross, is a liberty to have *common* alone, that is, without any land or tenement in another man's land, granted either to a person for life, or to him and his heirs. This is commonly passed by deed, or specialty.

COMMON appendant, and **COMMON appurtenant**, are usually confounded; both being defined to be a liberty of *common* appertaining to, or depending on such, or such a freehold; which *common* must be taken with beasts *commonable*; as horses, oxen, &c. being accounted fittest for the plowman; and not with goats, geese, and hogs.

Others distinguish between the two, thus; *common appurtenant* may be severed from the land whereto it appertains; but not *common appendant*, which, according to my lord Coke, had its original in the following manner:

1. When a lord enclosed another in arable lands to hold of him in socage; the scoffee, to maintain the service of his plow, had at first, by courtesy of his landlord, *common* in his wastes, for necessary beasts, to ear and compost his lands: and that for two causes; 1^o. because it was tacitly implied in the scoffment; by reason the scoffee could not till, or compost his pasture; by consequence, therefore, the scoffee had, as a thing necessary, or incident, *common* in the wastes, or lands of the lord. 2^o. For the maintenance and advancement of tillage.

COMMON per Cause de Vicinage, i. e. by reason of neighbour-hood; is a liberty that the tenants of one lord in one town, have to *common* with the tenants of another lord in another town.

But it is to be observed, that those who claim this kind of *common* (which is usually called *intercommoning*) may not put their cattle into the *common* of the other two, for then they are distainable; but, turning them into their own fields, if they

stray into their neighbours *common*, they must be suffered. See **INTERCOMMONING**.

Tenants in COMMON. See the article **TENANT**.

COMMON receptacle. } See { **RECEPTACLE**.

COMMON sensory. } See { **SENSORY**.

COMMON time. See the article **TIME**.

COMMON year. See the article **YEAR**.

COMMONER, is used for a student in some universities, entered in a particular rank.

The word is also applied to a member of the house of *commons*; in contradistinction to a *peer*.

COMMONS, in parliament, are the lower house, consisting of knights elected by the counties, and of citizens and burgesies by the cities and borough-towns.

In these elections, antiently, all the people had votes; but king Henry VI. to avoid tumults, first appointed, that none should vote for knights but such as were freeholders, did reside in the county, and had 40 s. yearly revenue: the persons elected for counties to be *milites notabiles*, at least esquires, or gentlemen fit for knight-hood; native Englishmen, at least naturalized; and 21 years of age: no judge, sheriff, or ecclesiastical person, to sit in the house for county, city, or borough.

All members of either house, with their menial servants, and necessary goods brought with them, are privileged from all attachments and imprisonments; except for treason, felony, or breach of peace, all the time of the session, and till they arrive at home, *eundo, morando, ad propria redeundo*.

The *commons* sit in their house promiscuously; only the *speaker* has a chair, or feat, fixed towards the upper end; and the clerk, with his assistant, sits near him.

The members have no robes, as the lords ever had; excepting the *speaker* and clerks; and sometimes the professors of law in term-time, and the members of the city of London.

On the first day of the new parliament, before any affair is meddled with, all the members take the oaths; usually, before the lord steward, and in the court of wards. They then proceed to the choice of a *speaker*. And after the election of a *speaker*, they take the oaths a second time. See **SPEAKER**.

Privileges of the COMMONS. All bills for levying money on the subject, begin in the house of *commons*; in regard, it is from them the greatest part of the monies arise: nor will they allow the lords to make any alteration in a money-bill.

They have the privilege to propose laws, and are, in effect, the grand inquest of the realm; present publick grievances; impeach publick delinquents, even the highest officers of the kingdom; and prosecute them before the house of lords, who are a court of judicature, though the *commons* are not.

The *commons* are allowed their expences during parliament-time, *rationabiles expensas*, as the words of the writ are; i. e. such allowance as the king, considering the prices of things, shall think proper to impose on the people they represent. In 17 Edward II. the allowance was ten groats for knights, and five for burgesies, *per day*; afterwards it was raised to four shillings a day for dubbed knights, and two shillings for all the rest: but all allowance is now grown into disuse; and the course of the money turned the other way.

COMMONS is also used in opposition to *nobles*, or *peers*, *viz.* for all sorts of persons under the degree of a baron; including the orders of knights, esquires, gentlemen, the sons of the nobility, and yeomen. See each under its proper article **ESQUIRE**, **GENTLEMAN**, **YEOMAN**, &c.

Dollors COMMONS. See **COLLEGE of Civilians**.

PROCTOR of the COMMONS. See **PROCTOR**.

COMMONS is also used for the stated and ordinary diet, or eating, of a college, inns of court, or other society. See **INN**, &c.

COMMONWEALTH. See **REPUBLICK**, and **ROMAN**.

COMMOTE, an antient term in Wales, denoting half a cantred, or hundred; containing 50 villages. See **HUNDRED**.

Wales was antiently divided into three provinces; each of these subdivided into cantreds; and every cantred into two *commotes* or half hundreds.

Silvester Girald, however, tells us in his *itinerary*, that a *commote* is but a quarter of a hundred.

COMMOTION, an intestine motion, or luctation in the parts of any thing.

In medicine, the term is chiefly used for a blow, or shake of the brain. A convulsion is a *commotion* of the fine medullary fibres of the brain. A fall occasions a *commotion*, whence frequently arises a counterstroke on the opposite part; which occasions sometimes a contrainflure, and at other times a rupture of the vessels, and an apothume, by shaking the whole mass of the brain.

COMMUNAM appropriare. See the article **APPROPRIARE**.

COMMUNE rectum. See the article **RECTUM**.

COMMUNIBUS locis, a Latin term, in frequent use among philosophical, &c. writers; implying some medium, or mean relation between several places.

Dr. Keil supposes the ocean to be one quarter of a mile deep, *communibus locis*, q. d. at a medium, or taking one place with another.

COMMUNIBUS annis, has the same import with regard to years, that *communibus locis* has with regard to places.

Mr. Derham observes, that the depth of rain, *communibus annis*, i. e. one year with another, were it to stagnate on the earth, would amount to, at Townly in Lancashire, 42 $\frac{1}{2}$ inches; at Upminster in Essex 19 $\frac{1}{2}$; at Zurich 32 $\frac{1}{2}$; at Pisa 43 $\frac{1}{2}$; and at Paris 19 inches.

COMMUNICATING, in theology, the act of receiving the sacrament of the eucharist. See EUCHARIST.

Those of the reformed, and of the Greek churches, *communicate* under both kinds; those of the Romish only under one.

From the second book of Tertullian to his wife, it appears, that antiently they *communicated* fasting. S. Augustin says expressly, that in some churches, in his time, they *communicated* every day. Among the Greeks, M. Fleury observes, the laity still *communicate* every Sunday; and that those who omit it three Sundays together are excommunicated.

The oriental communicants receive the species of wine by a spoon; and antiently they sucked it through a pipe, as has been observed by Beat. Rhenanus on Tertullian.

COMMUNICATION, the act of imparting a thing to another, or making him a sharer with us therein.

Thus, God is said to *communicate* his grace to us, by means of his sacraments. The use of speech is for the *communicating* of our ideas and sentiments to each other.

Philosophers are at a loss as to the manner of the *Communication*, or intercourse between soul and body. See SOUL, CAUSE, &c.

COMMUNICATION is also used for the connection of one thing with another; or the passage from one place to another.

Antiently, it was frequent to have subterraneous *Communications* between one place and another. Such a gallery makes a *Communication* between such two apartments.

BRIDGE OF COMMUNICATION. See the article BRIDGE.

LINES OF COMMUNICATION, in war, called also simply *lines*; are trenches six or seven foot deep, and twelve broad, made between one fort, or work, and another; in order for a safe passage between one quarter and another; especially in sieges.—See Tab. Fortification, fig. 21, 22, &c.

COMMUNICATION of idioms, in theology, the act of imparting the attributes of one of the natures in Jesus Christ, to the other.

The *Communication of idioms*, is founded on the union of two natures in the person of Christ: by this *Communications of idioms* it is, that we say, God suffered, died, &c. which is strictly understood of the human nature; and signifies, that God suffered in his humanity, that he died as to his human nature, &c.

For the denominations which signify natures, or properties of nature, the schoolmen tell us, are denominations of *suppositum*, or persons, and are to be attributed to them: thus, the two natures only subsisting in Jesus Christ by the sole person of the Word, to this person must be attributed the denominations of both natures, and of their properties. But we may not by *Communication of idioms* attribute to Jesus Christ what would suppose him not to be God; since that would destroy the hypostatical union, which is the foundation of the *Communication of idioms*. Thus, we may not say that Jesus Christ is mere man; that he is fallible, &c.

The Lutherans carry the *Communication of idioms* so far, as to say, that Jesus Christ is not only in his divine nature, and by reason of his divine person, but also really and properly in his humanity, immortal, impassible, &c.

COMMUNICATION of motion, that act of a moving body, whereby another body at rest is put by it in motion, or a body already in motion is accelerated.

F. Malebranch looks on the *Communication of motion* as something metaphysical; i. e. as not necessarily arising from any physical principles, or any properties of bodies, but flowing from the immediate agency of God: there being, according to him, no more connection, or dependance between the motion or rest of one body, and that of another, than between the form, colour, magnitude, &c. of one body and those of another. The motion of one body, therefore, on his principle, is not any physical cause of that of another. See CAUSE.

LAWs OF THE COMMUNICATION of motion.—Action, and reaction, Sir Isaac Newton demonstrates, are equal and opposite; so that one body striking against another, and thereby occasioning a change in its motion, does itself undergo the very same change in its own motion, the contrary way. See MOTION.

Hence, a moving body striking directly against another at rest, the one loses just as much of its motion as it *communicates* to the other; and they will proceed with the same velocity as if united into one mass.

If, therefore, the body in motion be triple that at rest against which it strikes, it will lose a fourth part of its motion; and whereas, before, it would have run over (v. gr.) a line of 20 feet, in a given time, it will now only run over 15; i. e. it will lose a fourth part of its velocity.

If the moving body strike on another already in motion, the first will augment the velocity of the latter; but will lose less of its own motion, than had the latter been absolutely at rest. Thus, v. gr. if a body in motion be triple of another at rest, and strike against it with 32 degrees of motion; it will *communicate* eight degrees of its motion to the other, and retain 24 to itself. If the other body had already four degrees of

motion, the first would only *communicate* five, and retain 27; since those five were sufficient, in regard of the inequality of the bodies, to make them proceed with equal velocity.

After the same manner may the other laws of *Communication* of motion in bodies perfectly hard, and void of all elasticity, be determined. But all hard bodies that we know of have an elastic power; and in elastic bodies, the laws are different, and much more intricate. See ELASTICITY; and the laws of percussion in elastic bodies, see under PERCUSSION.

If a body, when moved by another, happen to decline out of the way, so as to leave a free passage to the body whereby it was moved; yet, that will only proceed with the velocity which it had after its *Communication* to the other, not with that it had before: it being a rule, that every thing endeavours to persevere, not in the state wherein it was formerly, but in that wherein it is at that juncture: therefore, a body which has already lost part of its motion, by its meeting with another; may lose still more by a second and a third, so as at length to become perfectly quiescent.

Hence, 1st, if two unequal homogeneous bodies move in a right line with the same velocity, the greater must persevere in motion longer than the smaller: for the motions of both bodies are as their masses; but each *communicates* of its motion to the circumjacent bodies which touch its surface, in proportion to the magnitude of its surface; the larger body, therefore, though it has more surface than the smaller, yet having less, in proportion to its mass or quantity of matter than the smaller, will lose a less portion of its motion every moment than the smaller. Suppose, e. gr. a cube, A, to be two foot every way, and another B, one foot: the surfaces here will be as four to one, but their masses as eight to one. If therefore those bodies move with the same velocity, the cube A will have eight times as much motion as the cube B (the quantity of motion being ever as the quantity of matter.) That each of them, therefore, may become quiescent at the same time, the cube A must lose eight times as much motion every moment as the cube B: but that is impossible, because as their surfaces are to each other as four to one; the bodies against which they strike, will only be as four to one: therefore, when the cube B is become perfectly quiescent, A will have half its motion.

Hence, 2dly, we see the reason why any long body, as a dart, thrown lengthwise, continues its motion longer than when thrown transversely: it meeting fewer bodies in the way to *communicate* its motion to in the one case than in the other. Hence also, 3dly, if a body be moved almost wholly within itself, so as to *communicate* little of its motion to the ambient bodies, it must continue its motion a long time. Thus, a smooth brass ball of half a foot diameter, supported on a slender smooth axis, with a very weak impulse, is found to revolve, for the space of three or four hours.

COMMUNION, in theology, an uniform belief in several persons; whereby they are united under one head, in one church. See UNITY, UNIFORMITY, CHURCH, &c.

In this sense, the Lutherans, Calvinists, &c. are said to have been cut off from the Romish *Communion*.

This is the primitive use of the word *Communion*, as appears from the canons of the council of Elvira.

COMMUNION is also used for the act of *communicating* in, or participating of, the sacrament of the eucharist.

The fourth council of Lateran, decrees, that every believer shall receive the *Communion*, at least, at Easter; which seem to import a tacit desire that they should do it oftner; as, in effect, they did do it much oftner in the primitive days. Gratian, and the master of the sentences, prescribe it as a rule for the laity, to *communicate* three times a year, at Easter, Whitson-tide, and Christmas. But in the thirteenth century, the practice was got on foot, never to approach the eucharist except at Easter; and the council thought fit to enjoin it then by a law, lest their coldness and remissness should go farther still.

COMMUNION under both kinds.—In the eleventh century, the *Communion* was still received by the laity in both kinds; or, rather, the species of bread was dipped in the wine, as is owned by the Romanists themselves. *Acta SS. Benedicti. Sæc. III.*

M. de Marca observes, that they received it at first in their hands, *Hist. de Béarn*. and believes the *Communion* under one kind alone, to have had its rise in the West under pope Urban II. in 1096, at the time of the conquest of the holy land. The twenty-eighth canon of the council of Clermont, enjoins the *Communion* to be received under both kinds, distinctly: adding, however, two exceptions; one of necessity, the other of caution, *nisi per necessitatem, & cautelam*; the first in favour of the sick, the second of the abtemperous, or those who had an averfion for wine.

It was formerly a kind of canonical punishment, for clerks guilty of any crime, to be reduced to lay *Communion*, i. e. only to receive it as the laity did, *viz.* under one kind.

They had another punishment of the same nature, tho' under a different name, called *foreign Communion*; to which the canons frequently condemned their bishops and other clerks. This punishment was not any excommunication, or deposition; but a kind of suspension from the function of the order, and a degradation from the rank they held in the church.

It had its name, because the *Communio* was only granted to the criminal on the foot of a foreign clerk, *i. e.* being reduced to the lowest of his order, he took place after all those of his rank, as all clerks, &c. did in the churches to which they did not belong. The second council of Agda, orders every clerk that absents himself from the church, to be reduced to foreign *Communio*.

COMMUNIS *capsula*.

COMMUNIS *ductus choledochus*.

COMMUNIS *digitorum manus extensor*.

COMMUNIS *labiorum depressor*.

COMMUNIS *labiorum elevator*.

COMMUNIS *misericordia*.

COMMUNITY, a society or body of men united together under certain common laws, agreed on among themselves, or imposed by a superior.

The Romans, who seem to have given the first hint of *Communities* to the several nations into which their empire was divided, doubtless borrowed it from some rules of their neighbours: they called them *colleges*; which term, among them, had nearly the same signification with *Community* among us.

Communities are of two kinds, *ecclesiastick* and *laick*: the first are either *secular*, as chapters of cathedral and collegiate churches; or *regular*, as convents, monasteries, &c.

Lay Communities are of various kinds; some contracted by a fixed abode of a year and a day in the same place; others formed by the discharge of the same office, the profession of the same art, or attending the same place of worship; as those of parishes, fraternities, &c.

Accordingly, the word is commonly understood of pious foundations for the support of several persons, either in a secular or regular life; as *colleges*, *abbies*, *convents*, *priories*, *seminaries*, *hospitals*, *inns*, &c.

COMMUNITY is more particularly used in the French law, for the joint property in goods between the husband and the wife: the result of which is, that during marriage they are equally intitled to all effects, and liable to all debts, contracted either before or under marriage.

Community, is a species of succession, and the acceptance of *Community* resembles an *aditio hereditatis*.

Community was set on foot in favour of the wives, to enter them as sharers in their husband's effects.

In countries where the civil law obtains, this *Community* has no place; nor even in several customary countries; as being reputed a burden on the man.

Antiently, the woman's share in the *Community* was only one third: and this appears still the sense of the law among us; the widow, at the decease of her husband, being only intitled to one third part of the moveables.

COMMUNITY *continued*, in the French law, is that which subsists between the survivor of two persons joined in marriage, and the minor children of that marriage; when the survivor has not made an inventory of the effects in possession during marriage. The widow may either renounce *Community* with her children, or continue it.

COMMUNITY *tacti*, is a *Community* contracted between a man and woman, by the mere mingling of their effects; provided they have lived together the space of a year and a day: this *Community* being odious, is now abolished.

COMMUTATION, in law, a change of a penalty, or punishment, *viz.* of a greater for a less, &c. as when death is commuted for, by banishment or perpetual imprisonment, &c. Some doubt whether the word be properly applied to any change but that of punishment: others will have it indifferently serve for the exchanging, or trucking of any thing.

COMMUTATION, in astronomy. *Angle of COMMUTATION*, is the distance between the sun's true place seen from the earth, and the place of a planet reduced to the ecliptic. See PLACE.

Thus the angle ESR, (Tab. *Astronomy*, fig. 25.) subtended between the sun's true place E, viewed from the earth at S; and that of a planet reduced to the ecliptic, R, is the *angle of Commutation*.

The *angle of Commutation*, therefore, is found by subtracting the sun's true place E, from the heliocentric place of the planet R; or contrarily.

COMPACT, in physics, denotes a body to be close, dense, and heavy; having few pores, and those small ones.

The heaviest metals, as gold and silver, are the most *compact*. See GRAVITY.

COMPACT, in a legal sense, signifies an agreement, or a contract stipulated between several parties. See CONTRACT.

COMPACT is also the name of a celebrated bull, confirmed by pope Paul IV. relating to the cardinals.

In virtue of the bull of *Compacts*, cardinals can only confer benefices in their natural state; *i. e.* regular benefices on regulars.

COMPANY *, a collective term, understood of several persons assembled together in the same place, or with the same design. See SOCIETY.

* The word is formed of the French *compagnie*, and that of *companto*, or *companies*, which, Chifflet observes, are found in the *Salle* law, Tit. 66. and are properly military words, understood

of soldiers, who, according to the modern phrase, are comrades, or mess-mates, *i. e.* lodge together, eat together, &c. of the Latin *cum*, with, and *panis*, bread. It may be added, that in some Greek authors under the Western empire, the word *κωμματα* occurs in the sense of *society*: but it is more probable, that the Greeks borrowed it from the French or Italians.

COMPANY, in commerce, is an association of several merchants, or others, who unite in one common interest, and contribute by their stock, their counsel, and study, to the setting on foot, or supporting of some lucrative establishment.

Though *Company*, and society, or fellowship, be in effect, the same thing, yet custom has made a difference between them: society, or partnership, being understood of two, or three dealers, or not many more; and *Company* usually of a greater number. See SOCIETY.

A second difference between *Companies* and societies, is, that the first, especially when they have exclusive privileges, cannot be established without the concession of the prince; and need letters patent, charters, &c.

Whereas, for the latter, it is sufficient to have the consent of the members, fixed, and certified by acts and contracts, and authorized by by-laws.

Lastly, the word *Company* seems more peculiarly appropriated to those grand associations, set on foot for the commerce of the remote parts of the world; as the English and Dutch East-India *Company*, South-sea *Company*, Mississippi *Company*, &c. The rise and establishment whereof, we shall here set before the reader.

English COMPANIES. — East-India COMPANY, was formed towards the latter end of the reign of queen Elizabeth; their charter being dated in 1599.

Their first fleet, sent out in 1600, brought back so rich a cargo, that in a few years they numbered 20 ships. King James I. to shew how much he had its interest at heart, sent several embassies to the great Mogul, the kings of Persia, Japan, and other princes, to make treaties of commerce in his name, and that of the *Company*; some of which subsist still: the king of Persia, in particular, granted the *Company* several extraordinary favours, in recompence for the service the English had done him, in assisting him to expel the Portuguese from Ormus; who, by means of their lodgment there, usurped the whole commerce of the Persian gulf.

But its chief favours the *Company* received at the hands of king Charles II. who, by a charter in 1669, granted them the port and island of Bombay, with all the rights thereof, as surrendered to him by the Portuguese: only reserving to himself the sovereignty and homage thereof, with a yearly acknowledgment of 10 *l. per ann.* in gold. — By another charter in 1674, he also granted them, in like manner, the island of St. Helena, belonging to him by right of conquest, from the Dutch, who had before taken it from the English. — By a third charter, he granted them a power to erect a court of judicature, composed of a lawyer, and two merchants, in all their places, settlements, factories, &c. to judge of seizures, and all marine disputes; as also about bargains, exchange, &c. and even of all crimes committed on the high seas, or in the countries and territories of the *Company*, in Asia, Africa, and America; the whole, however, agreeable to the usages and customs of merchants, and the laws of England.

In 1662, the same prince granted the *Company* a charter, which contained a confirmation of the antient ones of king James I. and queen Elizabeth; or rather, a new charter, granting them abundance of privileges which they had not before enjoyed: this charter is properly the basis of the *Company*, and that whereon are founded all the rights, and the policy of the *new Company*, afterwards established in 1698. It consists of twenty-eight articles: In the first, the king erects the *Company* into a corporation, or body politic, under the name of the *governor and Company of merchants trading to the East-Indies*. The third grants them a common seal: the fourth a governor, and twenty-four directors, or assistants, chose out of the proprietors, or stockholders; the sixth, seventh, eighth, and ninth, regulate the order and policy of the *Company*, settle the officers, manner of election, authority, general meetings, &c. The tenth fixes the term the grant; permits all those of the *Company*, their children of 21 years of age, and their apprentices, factors, and domesticks, to trade to the Indies, and any part of Asia, Africa, and America, beyond the Cape of Good Hope, and the Straits of Magellan. The eleventh grants them power to make by-laws to be observed by the officers, factors, &c. and to enjoin penalties; provided those laws be not contrary to the standing laws of England. By the twelfth, the payment of the duties, customs, &c. of goods imported or exported is delayed; one half of it for half a year, the other half a whole one: providing, withal, that if the goods thus imported, be exported again in the space of thirteen months, no duties shall be paid for such export, provided it be done aboard English vessels. The thirteenth article grants them a power of exporting foreign gold for their service abroad, and even English gold coined in the Tower; provided the sum do not exceed 50000 pounds sterling at a voyage. By the fourteenth and fifteenth, they are allowed six large ships, and six pinks, to pass freely through all the limits of their grant, without the king's being able to lay any imbrago

inbargo on them on any occasion. The sixteenth grants them an exclusive privilege; to have the sole right of dealing to the Indies: ordering the seizure and confiscation of all vessels, &c. which shall interfere. The nineteenth obliges them to bring, at least, as much gold and silver into the kingdom, as they carry out each voyage. The twenty-first fixes the sum in the capital stock necessary to have a vote in the meetings, at 500 l. sterling: allowing, however, several of those who have less, to join several together to form a voice. Lastly, the twenty-sixth allows them to send vessels of war, and even to make peace and war with all the nations not christian, in the extent of their grant.

All these four charters of king Charles II. were confirmed by king James II. especially the last, which was enforced with new fashions; particularly the article of exclusion; which, in the time of king Charles, had been but little regarded, but was now enforced with such rigorous prohibitions, that all interlopers seemed for ever excluded.

The shares, or subscriptions of the *Company*, were originally only of fifty pounds sterling: but the directors having a considerable dividend to make in 1676, it was agreed to join the profit to the original, instead of withdrawing it; and thus the shares were doubled, and became of 100 l. sterling.

The first capital was only 369891 l. sterling, and 5 s. which being thus doubled, amounted to 739782 l. sterling, and 10 s. to which, if the profits of the *Company* to the year 1685, viz. 963639 l. sterling be added, the whole stock will be 1703422 l. sterling.

The *Company* had from time to time undergone great losses; first, in 1680, by the loss of Bantam, out of which they were driven, and had their magazines plundered by the Dutch; under pretence of assisting sultan Agui against sultan Agom, his father. Secondly, in 1682, when the great numbers of interlopers, to whom king Charles II. too easily granted permissions, lowered their shares *cent. per cent.* Thirdly, by the war which the *Company* maintained in the Indies against the great Mogul; wherein it was obliged to abandon the factory of Surat, and to retire to Bombay. But still she repaired her stock, and supported the reputation of her commerce, till the revolution which happened soon after: when the war, and the incredible losses the *Company* sustained by the French privateers, &c. put it into so desperate a condition, that appearing scarce possible to be supported, a new one was erected.

The charter of the new East-India *Company* was of the year 1698, its stock was so considerable, and the subscriptions so very ready, that in two years time, the *Company* had 40 vessels equipped in its service; which was double of what the old one ever had: and sent to the Indies (*communibus annis*) at least a million sterling in silver: whereas the former had never sent above 500000 l. After the two *Companies* had subsisted a few years in a separate state, means were contrived to unite them, which was effected in 1702, when a new charter of union was granted them, under the name of the united *Company of merchants of England trading to the East-Indies*: which being since expired, another charter with new powers was granted them in 1730.

The cargo which the *Company* sends to the East-Indies, is chiefly silver, bullion, and pieces of eight; with cloth, either scarlet or blue: they also send some iron, and lead. The returns from the Indies are chiefly silks, both raw and manufactured, cottons, calicoes, muslins, drugs, tea, coffee, china-ware, rice, sugar, red wood, salt-petre, pepper, Carmania wool, indigo, &c.

For the economy and policy of the united *Company*; all persons, without exception, are admitted members of it, natives and foreigners, men and women; with this circumstance, that 500 l. in the stock of the *Company* gives the owner a vote in the general courts, and 2000 l. qualifies him to be chosen a director. The directors are twenty-four in number, including the chairman and deputy-chairman, but may be re-elected for four years successively. They have a salary of 150 l. *per ann.* and the chairman of 200 l.—The meetings, or courts of directors, are to be held at least once a week, but are commonly oftner, and they are summoned as occasions require.

Out of the body of directors are chosen divers committees, who have the peculiar inspection of certain particular branches of the *Company's* business: as, the committee of correspondence, committee of buying, committee of treasury, committee of warehouses, committee of shipping, committee of accounts, committee of private trade, committee of house, and committee to prevent the growth of private trade.

Other officers of the *Company* are—a secretary, and assistant with six clerks: two cashiers, with five clerks: a chief accountant, with three assistants, and twenty-two clerks: a head accountant of the freight-accounts, with three clerks: a pay-master, with two assistants, and one clerk: to which may be added a surveyor of ships, and two assistants; a ships husband for receiving the *Company's* goods at the water-side, with an assistant, and three elders; a solicitor for law affairs; besides warehouse-keepers, elders, and labourers employed in the several warehouses.

The warehouses, or magazines of the *Company*, are—that for Bengall goods, which is managed by a warehouse-keeper, and his assistant, with three elders; under whom are a number of porters, employed at daily wages.—St. Helens warehouse for coast

and Surat goods, in which are two warehouse-keepers, and four elders, besides labourers.—The drug warehouse, for drugs and china-ware.—Pepper-warehouse.—Lastly, the private trade warehouse, all officer'd much like the first.—The *Company* has no ships of its own, except a few small craft used in the Indies. The rest, whereby their commerce is carried on, belong to other persons, who build and let them out on freight to the *Company* for each voyage, according to the terms of a charter-party agreed on.—By the by-laws of the *Company*, no vessel is to be hired, wherein any director is concerned directly or indirectly, either as owner, or part-owner: a regulation which it is said, is not over-strictly observed.

No persons are allowed to have any private trade, except the *Company's* officers, and seamen sent to India on board their ships; who are regularly licensed to carry out and bring back commodities to a certain value, greater or less, according to their rank. But at their return, their cargoes are to be consigned to the *Company*, and sold by them at their next sale. The Jews also and others dealing in diamonds, are allowed to trade for themselves by the *Company's* ships, on allowing so much *per cent.* to the *Company* for freight.

The *Company* has three principal settlements, viz. Fort-William in Bengall; Fort St. George on the coast of Coromandell; and the island of Bombay: each of which has several subordinate factories.

The factories dependent on Fort-William, are Cassimbuzar, Patna, Dacca, Ballafore, and Jugdea.—Those on Fort St. George, are Fort-Marborough, Fort St. David, Vizagapatam, Ingeram, and Madipollam.—Those on the island of Bombay are Gombroon, Surat, Anjingo, and Tellicherry.

Royal African *Company*, established for the commerce of the coasts of Guinea, is governed much like that of the East-Indies. Its privilege is exclusive: it sends out yearly, ten or a dozen ships, of about 150 ton, laden with old and new draperies, and with iron-works, scissars, knives, muskets, cottons, and other less considerable merchandises.

The returns are in gold-dust, elephants teeth, wax, and leathers: but the best article of its commerce is the negroes, which it sends to Jamaica, Barbadoes, and other English isles in America; frequently, even to the ports of New Spain. See NEGRO, ASSIENTO, &c.

The first establishment of this *Company*, was by a charter granted 1661, in favour of the duke of York; securing to him the commerce of all the country, coasts, islands, &c. belonging to the crown of England, or not possessed by any other christian prince; from Cape Blanc in 20° nor. lat. to the Cape of Good Hope in 34° 30' sou. lat. The charter was soon after returned into the king's hands by the duke, and revoked, by consent of the parties associated with him in the enterprise; and a new charter was granted in 1663, with ampler privileges than the former. The principal adventurers here, were queen Katherine of Portugal, queen Mary of France, the duke of York, Henrietta Maria duchess of Orleans, prince Rupert; in brief, the whole court came into it. The other adventurers, i. e. those who were to be charged with the management of affairs, were chosen from among the wealthiest and ablest merchants; especially those who had already dealt to those countries. By this charter the grant was enlarged, and the *Company* put in possession of all the countries, &c. between the port of Sally in S. Barbary to the Cape of Good Hope, for a thousand years; only reserving to the crown the homage thereof, with the acknowledgment of two elephants to be presented the king, or his successors, every time any of them should set foot within the countries and colonies within their grant.

The privileges granted by the charter, are, first, that the *Company* shall be a corporation, or body politic; shall have a common seal, bearing on one side an elephant, supported by two negroes; on the other, the king's portrait. That the governor, with his deputy, and seven of the twenty-four assistants, be authorized to take on them the direction of affairs: that they may hold courts, make laws, inflict punishments, &c. provided, still, they be equitable, and consistent with the laws of England. That the adventurers may transfer their stock at pleasure; provided the transfer be made in open court, and be registered. That they may equip and send out what vessels they please, for commerce or war; but that they pay the duties and customs. That no vessels but those of the *Company*, and those authorized by it, shall traffick within the limits of its grant, on pain of confiscation. That the *Company* may make war, in defence of its colonies, against invaders, &c. That it have the benefit of all the mines in its territory; the king only reserving to himself two thirds of the gold mines, upon bearing two thirds of the expence. Lastly, that the king reserves for himself and his successors, the right of intervening, and being admitted at any time a sharer in the stock, upon contributing a proportionable sum to the rest.

This charter was confirmed by new letters patent in 1673; followed by a proclamation, enforcing the observance of the article of exclusion: but neither charter nor proclamation being able to secure them from interlopers, they had recourse to the protection of king James II. who had been twice among the number of merchant adventurers; of whom they obtained a most severe declaration on their behalf, in the year 1685.

On this foot the *Company* has stood ever since, till the year

1720; when a *new African Company* being formed by the duke of Chandos, and others; and a charter purchased at the expence of 250000 *l.* sterling; the two *companies* soon became united.

Hamburgh Company, is the oldest trading establishment in the kingdom; though not always known by that name, nor restrained to those narrow bounds under which it is now confined. It was first called, the *Company of merchants trading to Calais, Holland, Zealand, Brabant, and Flanders*: then it acquired the general title of *merchant-adventurers of England*; as being composed of all the English merchants who traded to the Low-Countries, the Baltic, and the German ocean. Lastly, it was called the *Company of merchant-adventurers of England trading to Hamburgh*.

This *Company*, as well as some others in England built on its model, is very different from those abovementioned; and differs widely from the ordinary plan and system of such societies. In effect, this is not a society of dealers, each furnishing a part of the sum to constitute the capital stock of the *company*; but a mere association, or body of merchant, who have nothing in common but the grant and privilege of trading to Hamburgh, and some other cities of Germany; each managing his own commerce, and trading on his own bottom: only observing a certain discipline, and some regulations, which none but the *Company* can establish or change.

The first charter whereby the *Hamburgh Company* was established, was in 1406, under the reign of king Henry IV. It was afterwards confirmed, and augmented with divers privileges by many of his successors; among the rest, by Henry V. in 1413; Henry VI. in 1422, Henry VII. in 1493, 1505, and 1506; Henry VIII. in 1509, 1517, and 1536; Edward VI. in 1547; queen Mary in 1553, Elizabeth in 1564, and 1586; James I. in 1605, and Charles II. in 1661.

But of all these charters, there are, properly, none but those of Henry IV. Henry VII. Elizabeth, James, and Charles, that are of any importance, or that give the *Company* any thing new; the rest being only simple confirmations.

Before the charter of Henry IV. all the English merchants who trafficked out of the realm, were left to their own discretion; and managed their affairs with foreigners, as might be most for their respective interests; without any regard to the general commerce of the nation.

Henry, observing this disorder, endeavoured to remedy it, by uniting all the merchants in his dominions into one body; wherein, without losing the liberty of trading each for himself, they might be governed by a *Company* still subsisting; and be subject to regulations, which should secure the general interest of the national commerce, without prejudice to the interest of particulars. With this view, he granted all the merchants of his states, particularly those of Calais, then in his hands, a power of associating themselves into a body politic, with directors and governors, both in England and abroad; to hold assemblies, both for the direction of business, and the deciding of controveries among merchants; make laws; punish delinquents; and impose moderate duties and taxes on merchandizes, and merchants, to be employed in the service of the corporation.

These few articles of the charter of Henry IV. were afterwards much augmented by Henry VII. who first gave them the title of *merchant-adventurers to Calais, Holland, &c.* gave them a power of proclaiming and continuing free fairs at Calais; and ordered, that to be reputed a member of the society, each person pay twenty marks sterling; and that the several members should attend the general meetings or courts appointed by the directors, whether at London, Calais, or elsewhere.

The inexecution of this last article, and contempt of some of the rest, occasioning great inconveniencies to the *company's* affairs, another charter was procured; whereby, the pain of imprisonment was menaced, for those who should absent themselves from the meetings without lawful cause, or should disobey the laws.

A petition being made to queen Elizabeth, in 1564, for an explanation of certain articles in the charter of Henry VII. and a confirmation of the rest granted by other kings; that princess, by a charter of the same year, declares, that to end all disputes, they shall be incorporated anew, under the title of the *Company of merchant-adventurers of England*; that all who were members of the former *Company*, should, if they desired it, be admitted members of this; that they should have a common seal; that they should admit into their society what other persons, and on what terms they pleased; and expel them again on misbehaviour: that the city of Hamburgh, and neighbouring cities, should be reputed within their grant, together with those of the Low-Countries, &c. in that of the former *company*. That no member should marry out of the kingdom; nor purchase lands, &c. in any city beyond sea: and that those who do, shall be, *ipso facto*, excluded for ever.

Twenty-two years after this first charter, queen Elizabeth granted them a second; confirming the former, and further, granting them a privilege of exclusion; with a power of erecting in each city within their grant a standing council.

The woollen manufacture being the principal object of their application; they met with great opposition therein first from the Hanke, who forced them frequently to change their mart or staple; and afterwards under king James I. who having erected a corporation in 1616, in favour of some private persons, who of-

ferred to set up a manufacture for dying and pressing cloths, &c. under pretence whereof, the *Company* of merchant-adventurers were prohibited dealing therein. But that project not succeeding, and the charter being revoked two years afterwards, the merchant-adventurers, whose *Company* had been dissolved two years before, were restored in 1617, to their antient privileges, and a new charter was given them, confirming their exclusive right; and allowing them to have officers in the several custom-houses, to have an eye that they were not prejudiced in their woollens, under pretence of the like merchandizes, which others were allowed to send to other parts. This charter of king James, is the last of those confirmed by Charles II. in the grand charter of 1661.

The revolutions which had happened in the Low-Countries towards the end of the sixteenth century, and which laid the foundation of the republick of Holland, having hindered the *Company* from continuing their commerce with their antient freedom; it was obliged to turn it almost wholly to the side of Hamburgh, and the cities on the German ocean: from which change, some people took occasion to change its name to that of the *Hamburgh Company*; though the antient title of *merchant-adventurers* is still retained in all their writings.

Russia Company, this was first projected towards the end of the reign of king Edward VI. executed in the first and second years of Philip and Mary; but had not its perfection, till its charter was confirmed by act of parliament under queen Elizabeth, in 1566. It had its rise from certain adventures, who were sent in three vessels on the discovery of new countries; and to find out a north-east passage to China: these falling into the white sea, and making up to the port of archangel, were exceedingly well received by the Muscovites, and at their return, solicited letters patent to secure to themselves the commerce of Russia, for which they had formed an association.

The charter was promised them by Edward VI. but he dying, was first dispatched by queen Mary, in 1555. By this charter, the association was declared a body politic, under the name of the *Company of merchant-adventurers of England, for the discovery of lands, territories, islands, &c. unknown, or undiscovered*. Their privileges were, to have a governor, four consuls, and twenty-four assistants, for their commerce; for their policy, to make laws, inflict penalties, send out ships to make discoveries, take possession of them in the king's name, set up the banner royal of England, plant them; and, lastly, the exclusive privilege of trading to Archangel, and other ports of Muscovy, nor yet frequented by the English.

This charter, not being sufficiently guarded, was confirmed by parliament in the eighth year of queen Elizabeth; wherein it was enacted, that in regard the former name was too long, they should now be called the *Company of English merchants for discovering new trades*; under which name, they should be capable of acquiring and holding all kinds of lands, manors, rents, &c. not exceeding 100 marks *per ann.* and not held of her majesty. That no part of the continent, island, harbour, &c. not known or frequented before the first enterprise of the merchants of their *company*, situate to the north, or north-west, or north-east of London; nor any part of the continent, islands, &c. under the obedience of the emperor of Russia, or in the countries of Armenia, Media, Hircania, Persia, or the Caspian sea; should be visited by any subjects of England, to exercise any commerce, without the consent of the said *Company*, on pain of confiscation.

The said *Company* shall use no ships in her new commerce, but those of the nation; nor transport any cloths, ferges, or other woollen stuffs, till they have been dyed and pressed. That in case the *Company* discontinue of itself to unload commodities in the road of the abbey of S. Nicholas in Russia, or some other port on the north coasts of Russia, for the space of three years; the other subjects of England shall be allowed to traffick to Narva, while the said *Company* discontinues its commerce into Russia; only using English vessels.

This *Company* subsisted with reputation almost a whole century; till the time of the civil wars. It is said, the Czar then reigning, hearing of the murder of king Charles I. ordered all the English in his states to be expelled; which the Dutch taking the advantage of, settled in their room. After the restoration, the remains of the *Company* re-established part of their commerce at Archangel, but never with the same success as before; the Russians being now well accustomed to the Dutch merchants, and merchandize.

This *Company* subsists still, nearly on the foot of that of Hamburgh, and the northern, and Turkey *Companies*, i. e. each member thereof trafficks for himself, and on his own bottom; only paying an acknowledgment of 12 or 13 *l.* sterling, besides some other dues imposed from time to time for the occasions of the *Company* and the commerce in general.

North Sea Company, or, as some, more agreeably to its charter, call it, *eastland company*, is established on the foot of that of Hamburgh; from whence it appears to have been dismembered.

Its charter is dated in the year 1579. By the first article the *Company* is erected into a body politic, under the title of the *Company of merchants of the east*; to consist of Englishmen, all real merchants, who have exercised the business thereof, and trafficked through the Sound, before the year 1568, into Norway, Sweden, Poland, Livonia, Prussia, Pomerania, &c. as also Revel, Coningsberg, Dantzick, Copenhagen, &c. excepting Narva, Muscovy, and its dependencies. Most of the following articles grant them

them the usual prerogatives of such *Companies*; as a seal, governor, courts, laws, &c.

The privileges peculiar to this *Company*, are, that none shall be admitted a member, who is already a member of any other *Company*; nor any retail-dealer at all. That no merchant qualified, be admitted without paying six pounds, thirteen shillings, and six-pence. That a member of another *Company*, desiring to renounce the privileges thereof, and to be received into that of the East, shall be admitted gratis; provided he procures the same favour for a merchant of the East, willing to fill his place. That the merchant-adventurers who never dealt in the East, in the places expressed in the charter, may be received as members of the *Company* on paying forty marks: that notwithstanding this union of the *adventurers* of England, with the *company of the East*, each shall retain its rights and privileges. That they shall export no cloths but what are dyed and pressed; except 100 pieces *per ann.* which are allowed them gratis.

This charter was confirmed by Charles II. in 1661, with this addition; that no person of what quality soever, living in London, should be admitted a member, unless he were free of the city.

TURKISH COMPANY, or LEVANT COMPANY. This *Company* is established on foot of the *Hamburgh Company*, i. e. there is no common fund, wherein the *adventurers* deposit their stock, to make one single commerce; but the commerce thither is free, each member trafficking for himself; but observing, withal, the rules and orders of the *Company*; and all contributing, occasionally, towards the common expences.

This flourishing body had its rise under queen Elizabeth: James I. confirmed its charter in 1606; adding new privileges. During the civil wars, there happened some innovations in the government of the *Company*; many persons having been admitted members, not qualified by the charters of queen Elizabeth and king James, or that did not conform to the regulations prescribed: Charles II. upon his restoration, endeavoured to set it upon its ancient basis; to which end, he gave them a charter, containing not only a confirmation of their old one, but also several new articles of reformation.

By this, the *Company* is erected into a body polittick, capable of making laws, &c. under the title of the *company of merchants of England trading to the seas of the Levant*. The number of members is not limited, but is ordinarily about three hundred. The principal qualification required, is, that the candidate be a free-man of London, and a wholesale merchant, either by family, or by serving an apprenticeship of seven years. Those under 25 years of age, pay 15 *l.* sterl. at their admission; those above, twice as much. Each makes oath, at his entrance, not to send any merchandises to the Levant, but on his own account; and not to consign them to any but the *Companies* agents, or factors.

The *Company* has a court, or board at London, which is composed of a governor, deputy-governor, and twelve directors, or assistants; who are all actually to live in London, or the suburbs. They have also a deputy-governor in every city, and port, where there are any members of the *Company*. The assembly at London sends out the vessels, regulates the tariff for the price at which the European merchandizes sent to the Levant are to be sold; and for the quality of those returned. It raises taxes on merchandises, to defray impositions, and the common expences of the *Company*; presents the ambassador which the king is to keep at the port, elects two consuls for Smyrna and Constantinople, &c.

One of the best regulations of the *Company*, is, not to leave the consuls, or even ambassador, to fix the imposition on vessels for defraying the common expences; (a thing fatal to the *Companies* of most other nations) but to allow a pension to the ambassador, and consuls, and even to the chief officers; as secretary, chaplain, interpreters, and janizaries; that there may not be any pretence for their raising any sum at all of the merchants or merchandises.

In extraordinary cases, the consuls, and even ambassador himself, have recourse to two deputies of the *Company*, residing in the Levant: or, if the affair be very important, they assemble the whole body. Here are regulated the presents to be given, the voyages to be made, and every thing to be deliberated: and on the resolutions here taken, the deputies appoint the treasurer to furnish the monies, &c. required.

It is true, the ambassador and consul may act alone on these occasions; but the pension being allowed them on condition of declining them, they chuse rather to sit still.

The ordinary commerce of this *Company*, employs from 20 to 25 vessels, from 25 to 30 pieces of cannon.

The merchandises exported thither are cloths of all kinds and colours, pewter, lead, pepper, cochineal, and a great deal of silver, which they take up at Cadiz: the returns are in raw silk, galls, camlets, wools, cottons, Morocco leather, ashes for making glass and soap, and several gums and medicinal drugs.

The commerce of this *Company* to Smyrna, Constantinople, and Scanderoon, is not esteemed much less considerable than that of the East-India *Company*; but is, doubtless, more advantageous to England; in regard, it takes off much more of the English manufactures than the other, which is chiefly carried on in money.

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The places reserved for the commerce of this *Company*, are all the states of Venice, in the gulph of Venice; the state of Ragusa; all the states of the grand seignior, and the ports of the Levant and Mediterranean; excepting Carthagen, Alicant, Barcelona, Valencia, Marseilles, Toulon, Genoa, Leghorn, Civita Vecchia, Palermo, Messina, Malta, Majorca, Minorca, and Corfica; and other places on the coasts of France, Spain, and Italy.

South-Sea COMPANY. Many take this *Company*, established towards the close of the XVIIth century, to have been originally intended, rather as a political contrivance for raising a fund of money, to serve in the pressing occasions of the state, than as a real establishment for the sake of commerce. For the nation being exhausted of money by the long wars with France, it is no wonder the phantom of a new *Company* should be raised, to bring in the subscriptions of the monied men; as the only expedient to be supplied with money, without dissatisfying the people, already wore out with subsidies, &c.

Be this as it will, it is certain the ministry never thought seriously, during the whole course of the war, about making any settlement on the coasts of South America; which was the thing wherewith the people were first flattered: besides, that the fund having been apparently perverted to defray the expences of the war, its value was so lowered, that it must in all probability have sunk outright, but for the unexpected help it met with in 1713.

By the treaty of Utrecht, the business of the French *Assienta Company*, which was to furnish the Spanish West-Indies with negroes, was resigned to the English, in favour of the *South-Sea Company*; which by this turn relieved itself from its languishing condition, and became in a condition to vie with the most flourishing *Companies* of commerce in England.

The treaty of this *Company* with the Spaniards, commences from May 1713; and was to hold 30 years; during which time, the *Company* was to furnish the Spanish America with 144000 negroes, of both sexes, between fifteen and twenty-five years of age, found, &c. at the rate of 4800 *per annum*; and for all that they furnish besides, only to pay half the dues to the king of Spain, for the first 25 years of the term, or assienta. It may be added, that in consideration of 200000 piasters, paid in advance to the king of Spain, to be reimbursed as the dues rise during the first ten years, the *Company* is only to pay dues for 4000: the king's due is 33 piasters $\frac{1}{2}$ *per head*. See ASSIENTA.

The chief establishment of the French *Assienta Company* was at Buenos Ayres, a town of considerable trade on the coast of South America. The *South-Sea Company*, who without changing their name, took on them the *Assienta*, or farm of negroes, preserves the same establishment; and it is here their vessels disembark their negroes, which they had purchased through all the coasts of Africa within their grant.

The *Company*, it is certain, set out with good success; and there was room to hope still better; since, besides that the value of their stock the first five years, rose faster, in proportion, than that of any other *Company*; his majesty, after purchasing 10000 *l.* sterling therein, was pleased to condescend to be their governor, or first director. For what remains of the history of this *Company*, with that fatal train of romantic *Companies* it drew after it, we chuse to refer to the article BUBBLE.

HARBOROUGH COMPANY. This *Company*, anno 1722, was in embryo: its design was to set on foot an immediate commerce between the subjects of England, and those of his majesty's German territories. The first scheme was laid in 1717; a charter was obtained some time after.

WEST-INDIA COMPANIES, or those of the English colonies in North America, are of a lower class than those above mentioned; and too numerous to be here described.

Their names are, the *Hudson's Bay Company*, *Virginia Company*, *New England*, *New York*, *Pensylvania*, *New Scotland*, *Massachusetts*, *Connecticut*, *Bernudat*, *Tobago*, and *Carolina Companies*.

SCOTCH DARIEN COMPANY. This was established with good prospect at Edinburgh in 1699, for the commerce of S. America. They sent an armament and a colony, which they endeavoured to establish in the isthmus of Darien, which parts N. and S. America: but the English ministry not thinking proper to avow and support the first successes of the *Company*, which had alarmed Spain, ever jealous of this part of her territories, the Scotch colony was dispersed by the Spaniards in 1700: and thus vanished the best project that ever was formed, for disputing with that nation the possession of those countries, from which she pretends to exclude all other nations.

Dutch East-India COMPANY, had its rise in the midst of the struggle which that people had for their liberty: for the Spaniards having forbid all commerce with them, and shut up all their ports; necessity inspired some Zealanders to seek a new north-east passage to China.

This enterprize proving unsuccessful to three several armaments in 1594, 1595 and 1596; a second *Company* was formed, under the name of the *Company of remote parts*; which, in 1595, took the ordinary rout of the Portoguese to the Indies, and returned in two year and a half's time, with little gain, but good hopes.

This *Company*, and a new one just established at Amsterdam, being united, equipped other fleets; and these occasioned other *Companies* at Amsterdam, Rotterdam, in Zealand, &c. inasmuch that the states soon began to apprehend they might be prejudicial to each other: under this concern, they called all the directors of the several *Companies* together, who all consented to an union, the treaty whereof was confirmed by the states in 1602: a very remarkable epocha, as being that of the most solid and celebrated establishment of commerce that ever was in the world.

Its first capital was six millions six hundred thousand florins. It has 60 directors divided into several chambers; 20 in that of Amsterdam, 12 in that of Zealand, 14 in that of Delph and Rotterdam, and a like number in those at Stays and Horn. As each grant expires, the *Company* is obliged to procure a new one, which it has already done four times since the first; viz. one in 1622, for 21 years, like the first; another for 21 years, commencing in 1647; and a third in 1665, for 25 years; a fourth in advance, commencing in 1698, to end in 1740. Each grant costs the *Company* a considerable sum; that of 1647 cost 1600000 livres, and the two following ones more. The last of 1698 was confirmed by a placard of the states general, granting them an exclusive privilege.

Their factories, residences, &c. in the East-Indies, are almost infinite; reaching from the Persian gulph to the coast of China: the principal is that of Batavia, the center of their commerce; here resides their general, with the state and splendor of a sovereign prince; making war and peace with the eastern kings and emperors at pleasure.

The other more considerable factories, are Taioum on the coast of China, Nangfac in Japan, Malaca, Surat, Amboyna, Banda, Siam, Moluccos, &c. Several on the coast of Coromandel, and at Ispahan, Cape of good Hope, &c. In all, they number 40 factories and 25 fortresses. They have the whole trade of the spicery in their own hands.

Dutch West-India COMPANY, established in 1621, with an exclusive privilege to trade 24 years along the coasts of Africa, between the tropic of Capricorn, and the Cape of Good Hope; and in America, from the fourth point of Newfoundland, thro' the freights of Magellan, that of le Maire, or others, to the freights of Anian, both in the north and south sea.

The directors are divided into five chambers, (as in the East-India *Company*) out of which, 19 are chosen for the general direction of affairs. In 1647 the *Company* renewed its grant for 25 years, but it was scarce able to hold out the term; by reason of its great losses, and expences in taking the bay of Todos los Santos, Fernambuc, and the greatest part of Brasil from the Portuguese. The weakness of this *Company*, which had several times in vain attempted to be joined to that of the East-Indies, occasioned its dissolution at the expiration of its grant. In 1674, a new *Company*, composed of the antient proprietors and their creditors, was settled in the same rights and establishment with the former; and still subsists with honour: their first capital was about six millions of florins. Its principal establishments, are, one at Cape Verd, another on the gold coast of Africa, at Tabago, Curassao, &c. in America.

Dutch North COMPANY has no exclusive privilege; the advantages of its patent being of another kind, and very inconsiderable.

There are also in Holland, *Companies* for the Baltic sea, the fishery of Nova Zembla, Davis's Streights, and Greenland: yet, none of their fisheries are interdicted to private traders; all the difference between these and the *Companies* consisting in this; that the former may not go ashore to cut their fish in pieces, and melt their lard; but must bring their luggage to Holland.

Dutch Levant COMPANY. In strictness, there is no Levant *Company* in Holland: but the commerce of the private traders is so considerable, that the state has taken the regulation thereof on itself.

To this end, they have established a chamber of direction at Amsterdam, composed of six deputies and a register; who, under the burgomasters, take care of every thing relating to the commerce of the Mediterranean: especially that of Smyrna and Constantinople.

This *Company* names the consuls, appoints the number and strength of convoys, terminates differences among the traders; and has also a right, on occasion, to add new regulations to the old ones; though those be of no force, till confirmed by the states-general.

French East-India COMPANY, was established in 1664, with an exclusive privilege, to trade for 30 years in all the seas of the East-Indies and South-Sea: no adventurer to be admitted without 1000 livres in stock; and foreigners who have 20000 livres in stock, to be reputed Regnicoles.

The patent grants them the island of Madagascar; and the king to be at one fifth of the expence of the three first armaments, without interest; the principal to be refunded in ten years; or, if the *Company* find it loses on the whole, the loss to fall on the king's side.

The capital fund of the *Company*, which was mostly furnished by the king, was seven or eight millions of livres, but was to have been 15 millions.

In effect, though no means were wanting to support the *Company*, yet it still drooped, and still struggled; till having subsisted ten years without any change in its form, and being no longer able to discharge its engagements, there were new regulations concerted; but to little purpose. At length, things not being disposed for a new East-India *Company*, nor much good to be expected from the old one; in 1708, the ministry allowed the directors to treat with the rich traders of S. Malo, and resign to them their privilege under certain conditions. In the hands of these last, the *Company* began to flourish.

Its chief factory is at Pondichery, or Pondichery, on the coast of Coromandel: this is the residence of the director-general; the other factories are inconsiderable. The merchandises which the *Company* brings into France, are silks, cottons, spices, coffee, rice, salt-petre; several kinds of gums and drugs, woods, wax, printed callicos, mullins, &c.

French West-India COMPANY, was established in 1664: their charter gave them the property and seignory of Canada, Acadia, the Antilles Islands, Isle of Cayenne, and the Terra firma of America, from the river of the Amazons to that of Oroonoko; with an exclusive privilege for the commerce of those places, as also of Senegal and the coasts of Guinea, for forty years, only paying half the duties.

The stock of the *Company* was so considerable, that in less than six months, 45 vessels were equipped; wherewith they took possession of all the places in their grant, and settled a commerce: yet this only subsisted nine years. In 1674 the grant was revoked, and the countries above reunited to the king's dominions, as before; the king reimbursing the actions of the adventurers. This revocation was owing partly to the poverty of the *Company*, occasioned by its losses in the wars with England, which had necessitated it to borrow above a million; and even to alienate its exclusive privilege for the coasts of Guinea: but also to its having in good measure answered its end; which was to recover the commerce of the West-Indies from the Dutch, who had tore it from them: for the French merchants being now accustomed to traffic to the Antilles, by permission of the *Company*, were so attached to it, that it was not doubted they would support the commerce after the dissolution of the *Company*.

French Mississippi was first established in 1684, in favour of the chevalier de la Salle; who having projected it in 1660, and being appointed governor of the fort of Frontignac, at the mouth of that river, travelled over the country in the year 1683, and returned to France to solicit the establishment. This obtained, he set sail for his new colony, with four vessels laden with inhabitants, &c. but entering the gulph of Mexico, he did not, it seems, know the river that had cost him so much fatigue; but settled on another river, unknown; where his colony perished by degrees: so that in 1685, there were not 100 persons remaining. Making several expeditions to find the Mississippi, he was killed in one of them by a party who mutinied against him: whereupon the colony was dispersed and lost. M. Hibernville afterwards succeeded better; he found the Mississippi, built a fort, and settled a French colony there: but he being poisoned, it is said, by the intrigues of the Spaniards, who feared such a neighbourhood; in 1712, M. Crozat had the whole property of trading to the French territories, called Louisiane, granted him for 15 years.

COMPANY of the West. In 1717, the sieur Crozat surrendered his grant; and in the same year a new *Company* was erected, under the title of *Company of the west*: to which, besides every thing granted to the former *Company*, was added the commerce of castor, enjoyed by the Canada *Company* from the year 1706, but expiring in 1717. In this establishment, an equal view was had to the finances, and the commerce of the nation: and accordingly, part of the conditions of its establishment regarded the settling a colony, a trade, &c. the other the venting part of the bills, called *bills of state*; which could no longer subsist on their present footing. The former are no more than are usual in such establishments: for the latter, the actions are fixed at five hundred livres; each payable in bills of state: the actions to be esteemed as merchandise; and in that quality to be bought, sold, and trafficked. The bills of state, which make the fund of the actions, to be converted into yearly revenue. To put the finishing hand to the *Company*, in 1717 its fund was fixed at an hundred millions of livres: which being filled, the cash was shut up.

India COMPANY. The junction of the former *Company* with that of Canada, was immediately followed by its union with that of Senegal; both in the year 1718, by an arret of council, which at the same time granted the new *Company* the commerce of castor, and made it mistress of the negro, or Guinea trade, to the French colonies in America.

Nothing was now wanting to its perfection, but an union with the East-India *Company*, and with those of China and S. Domingo, which was effected; with the two first in 1719, and with the third in 1720. This union of the East-India and China *Company* with the *Company* of the west, occasioned an alteration of the name, and it was henceforth called the *India Company*.

The reasons of the union, were the inability of the two former

to carry on their commerce, the immense debts they had contracted in the Indies, especially the East *Company*; complaints whereof had been sent to court by the Indians, which discredited the *Company* so, that they durst not appear any longer at Surat: lastly, the little care they took to discharge their engagements; and their having transferred their privilege to the private traders of S. Malo, in consideration of a tenth in the profits of the returns of their ships.

The ancient actions of the *Company* of the west, which were not at par when this engratment was projected, ere it was completed, were risen to 300 per cent, which unexpected success gave occasion to conclude the new actions of the united *Companies* would not bear less credit. The concourse of subscribers was so great, that in a month's time there were above fifty millions subscribed for: the first twenty-five million actions which were granted to the India *Company*, beyond the 100 millions of stock allowed the *Company* of the west, being filled as soon as the books were opened; to satisfy the earnestness of the subscribers, the stock was increased by several arrears to three hundred millions. Credit still increasing, the new actions rose to 1200 per cent, and those of the ancient *Company* of the west to 1900 per cent, an exorbitant price, to which no other *Company* ever rose.

Its condition was now so flourishing, that in 1719 it offered the king to take a lease of all his farms for nine years, at the rate of three millions five hundred thousand livres *per annum* more than had been given before; and also to lend his majesty twelve hundred millions to pay the debts of the state: these offers were accepted: and the king, in consideration hereof, granted them all the privileges of the several grants of the *Companies* united to that *Company*, to the year 1770: on condition, however, of discharging all the debts of the old East-India *Company*, without any deduction at all. The loan of twelve hundred millions not being sufficient for the occasions of the state, was augmented, three months afterwards, with three hundred millions more; which, with the former loan, and another of one hundred millions before, made sixteen hundred millions: for which the king was to pay interest at the rate of three per cent.

The duke of Orleans, in February 1720, did the *Company* the honour to preside in their assembly, where he made several proposals to them on the part of the king: the principal of these was, that they should take on them the charge and administration of the royal bank. This was accepted of, and Mr. Law, comptroller-general of the finances, was named by the king, *Inspector-General of the India Company and Bank united*.

This union, which, it was proposed, should have been a mutual help to both those famous establishments, proved the fatal point from whence the fall of both commenced: from this time, both the bank-bills and the actions of the *Company* began to fall: in effect, the first perished absolutely, and the other had been drawn along with it, but for the prudent precautions taken for its support.

The first precaution was the revoking the office of inspector-general, and the obliging Mr. Law to quit the kingdom: the ancient directors were discarded, and new ones substituted; and, to find the bottom of the *Company's* affairs, it was ordered, they should give an account of what they had received, and disbursed, both on the account of the *Company*, and of the bank, which they had had the management of near a year. Another precaution to come at the state of the *Company*, was by endeavouring to distinguish the lawful actionaries from the Mississippian extortioners; whose immense riches, as well as their criminal address in realising their actions, either into species or merchandise, were become so fatal to the state; in order, if possible, to secure the honest adventurers their stock. To this end, an inquisition was made into their books, &c. by persons appointed by the king: and the new directors, or, as they were called, *Regisseurs*, began seriously to look about for their commerce abroad.

The French have had several other *Companies*; some whereof have fallen of themselves, the rest upon the expiration of their grants: as, the

Bastion Company of France, which was, at first, only a simple association of two merchants at Marseilles, in the XVth century, for fishing of coral in the gulph of Stora-Courcoury on the coast of Barbary, on the frontiers of Algiers and Tunis. Having obtained leave of the sultan Solyman II. to make an establishment, and having likewise treated with the moorish princes of the country; in 1561 they built a little fort, called the *Bastion of France*, whence the *Company* took its name.

The first undertakers not being successful, a new grant was obtained of Mahomet III. in 1604, to new undertakers: in 1628 it began to flourish, and the colony consisted of 800 people: but the death of their governor in 1633, gave them a blow they never recovered.

Several of the *Companies* have since endeavoured to set the fishing of coral on its ancient foot, but hitherto in vain.

Guinea Company, was established in 1685: its grant expired in 1705, but it continued its trade of negroes, by the king's permission, under the name of *Affiento Company*, to the year 1713; when, by the treaty of Utrecht, that trade was surrendered to the English South-Sea *Company*; which see.

Affiento Company. See *Guinea Company*, and *ASSIENTO*.

Cape Verd Company, the same with that of *Senegal*, under another name: it was established in 1664, before the *Company* of the west; but the coasts of Africa being included in the grant of this last, we hear no more of the *Cape Verd Company* till the year 1673, when it rose afresh under the title of *Company of Senegal*.

French South-Sea Company, is the same with the *Affiento Company*. See *ASSIENTO*.

Canada Company, established in 1628, for the commerce of castor-skins, &c. Its grant expiring in 1717, it was united to the *Company* of the west; which see.

Acadie Company, established in 1683. Its grant expiring in 1703, and the war, &c. preventing a new one, the colony was neglected; and was taken by the English 1710, and confirmed to them by the treaty of Utrecht.

French Levant Company, established in 1670; but its privilege revoked in 1684.

French North Company, established in 1669, and expiring with its grant in 1690.

S. Domingo Company, established in 1698, for fifty years; carried on with honour to the year 1720, and then united to the *India Company*.

Danish North Company, was established at Copenhagen, in 1647: its establishments are very considerable in Norway; besides which, it sends vessels to Waranger, whence they convey their merchandises by land into the Danish Lapland; and by sledges drawn by rein-deer, into the Muscovite Lapland. It also sends others for Borandai and Siberia; where its agents take them up, and convey them, in like manner, on sledges to Panigorod, the capital of this part of the Muscovite empire.

The commodities it sends thither are rixdollars, tobacco, and linnens; it returns nothing but furs and skins.

Danish Iceland Company, established in the same year with the north *Company*: its chief factory is Kirkebar, a large town in that island.

Danish East-India Company, established in the middle of the XVIIth century; their chief factory is at Tranquebar, whither they send two or three vessels every year.

Levant Company of the Genoese, established in 1664, and confirmed by the Porte; notwithstanding the opposition of the French.

Its chief commerce was to be in pieces of 5 sols, which the Genoese had before furnished the Turks withal, though in the French name, and under their banner; they were now to do it under their own banner; and accordingly, while the humour of these pieces lasted, as they served not only for money, but were likewise used by the Greek and Turkish women of the islands, as ornaments in their head-dress, at the bottom of their vests, or petticoats, which were covered with them; the *Company* succeeded well enough: but that money being afterwards decried in 1670, the *Company* has languished ever since; and can now scarce support a miserable commerce.

Company of Ships, is used for a fleet of merchant-vessels, who make a kind of charter-party among themselves; whereby, under several clauses and conditions tending to their common safety, they engage not to quit one another, but to defend each other reciprocally, during their voyage.

These associates, in the mediterranean, are called *conserves*. The chief conditions of the charter-party, are, that such and such shall be owned admiral, vice-admiral, and rear-admiral. That those which bear no guns, shall pay so much per cent. of their cargo, for the expences of the admiral, &c. that such and such signals shall be observed; that if they be attacked, the damages shall be reimbursed by the *Company* in general, &c.

Rule of Company, or *Fellowship*, in arithmetic, is a rule whereby we discover, or ascertain the share of the profits, or losses, belonging to the several partners, or associates in any enterprize, in proportion to the stock each contributed thereto, and the time that stock was in bank.

Company, in war, denotes a little body of infantry, commanded by a captain.

The French use the word indifferently for the horse, or foot; but the English appropriate the term troop to a *Company* of horse. See *TROOP*.

The number of men in a *Company* is uncertain; in the ordinary regiments it is 50 centinels, besides 3 sergeants, 3 corporals and 2 drums, &c.—A *Company* in the guards is 80 private men. See *REGIMENT*, and *GUARDS*.—In the French guards the *Company* is 120, in the Swiss guards 200.

Companies not imbodyed into regiments, are called *independent Companies*.—The French also have their *free Companies*, who never enter the body of any regiment; and *Companies of ordonnance*, who in like manner never enter the body of a regiment; but consist of the gendarmes and light-horse. They were instituted by Charles VII. who chose out fifteen captains, under each of whom was to be 100 lances, or men at arms, each man at arms to receive pay for six persons, himself among the number; the rest to be three archers on horseback, a cutler, and a servant.

Artillery Company. See the article *ARTILLERY*.

COMPARATES, *COMPARATA*, in logic, the terms or subjects of a comparison; or the two things compared to each other. See *COMPARISON*.

COMPARATIONE—*Punctum ex* COMPARATIONE. See PUNCTUM.

COMPARATIONIS *Homogeneousum*. See the article HOMOGENEUM.

COMPARATIVE *Anatomy*, is that branch of anatomy which considers the same parts of different animals, with relation to the particular structure, and formation which is best suited to their several manners of living, and the necessities of every creature.

Thus, in the *Comparative anatomy* of stomachs, for instance, it is remarkable, that those creatures which have the opportunities of frequent feeding, have their stomachs very small, in comparison to some creatures of prey, which, probably, may be under a necessity of fasting a long time; and therefore have stomachs large enough to hold food sufficient for such a time.

However, in the common use of the term, *Comparative anatomy* is understood of any anatomy of brutes; whether with an immediate reference of their structure to that of other animals, or not.

COMPARATIVE *Degree*, in grammar, is an inflexion between the positive and superlative degrees; whose effect is, to set a thing above or beneath the level of another.

The Latins expressed their *Comparative degree* by a particular termination of their adjectives, and participles; wherein they are followed by the English, though by few other of the modern languages.

The French form most of their *Comparatives*, by adding the participles *plus, moins, and aussi*; the Italians by *piu, meno, &c.* as the thing is to be raised, lowered, or equalled to another.

COMPARISON, the relation of two persons or things, considered as opposed, or set against each other, in order to find wherein they agree or differ; or wherein one has the advantage of the other.

COMPARISON of *Ideas*, an act of the mind, whereby it compares its ideas one with another, in respect of extent, degree, time, place, or any other circumstances. See IDEA.

This operation of the mind is the ground of relations. See RELATION.

Brutes seem not to have this faculty in any great degree: they have, probably, several ideas distinct enough; but cannot compare them farther than as to some sensible circumstances annexed to the objects themselves: the power of comparing general ideas, which we observe in men, we may probably conjecture they have not at all.

COMPARISON, in rhetoric, is a figure, or rather place, in speech, whereby two things are considered with regard to some third, which is common to them both. See FIGURE, and PLACE.

Thus, Cicero. *Cato licuit sequi bellum civile, igitur & Cicero mi licuit. It was allowed Cato to engage in the civil wars, therefore it may be allowed Cicero: where, to engage in the civil wars is common to both.*

There are three kinds of *Comparison*: the first *à majori*, i. e. from the major to the minor, as that of Cicero against Anthony, *Quid feceris domi tuæ, cum alienæ tam sis inflexus?* Or that of Terence; *Quem feret, si parentem non ferri juan?* From the same place, Ovid endeavours to appease Cæsar.

*Cur ego posse negem leniri Cæsaris iram,
Cum videam vires hostibus esse Deos?*

The second *à minori*, i. e. from the minor to the major: thus Cicero, *maiores nostri sæpe mercatoribus, ac navicularibus injuriosius tractatis, bella gesserunt; vos tot civium Romanorum militibus uno nuntio atque uno tempore necatis, quo tandem animo esse debetis?*

The third *à pari*; as when we contend that what obtains in one thing, ought to obtain in another of the same kind: thus, *It was a law, that he who killed his father should be sewed up in a sack and thrown into a river; therefore, he who killed his mother deserves the same punishment.*

*Cæpto tuam, pudet heu, sed cæpto, Maxime, cænam
Tu capis alterius; jam sumus ergo pares.
Mane salutatam venio, tu diceris isti,
Ante salutatam: jam sumus ergo pares, &c.*

Mart. Lib. II.

COMPARTIMENT, or COMPARTMENT, a design composed of several different figures, disposed with symmetry; to adorn a parterre, a ceiling, panel of joinery, or the like.

A *COMPARTIMENT of Tiles*, is an arrangement of white and red tiles varnished, for the decoration of the covering of a roof.

The term *Compartment* is also used in painting. The Turkish and Moorish paintings are only *Compartiments*: the fine bindings of books are in *Compartiments*, &c.

ALLEY of COMPARTIMENT. See the article ALLEY.

COMPARTIMENT, in heraldry. See the article PARTITION.

COMPARITION, in architecture, the useful and graceful distribution of the whole ground-plot of an edifice, into rooms of office, and of reception, or entertainment.

Compartition makes one of the great divisions of the art of building. See BUILDING.

COMPASS. The mariner's, or nautical *Compass*, is an instru-

ment used by pilots, to direct the course of their ships.

It consists of a box, which includes a magnetical needle, that always turns to the north; excepting for a little declination, which is various in various places, and even at various times, in the same place.

In the middle of the box is fixed a perpendicular pivot, which bears a card, or pastboard, on whose upper surface are described several concentric circles; the outmost of which is divided into 360 degrees; the other into 32 points, answering to the 32 winds.

In the center of this card is fitted a brass cone, or cap, a little concave, which plays at liberty on the pivot; and along, in the thickness of the card, is fitted the needle, which is covered over with a glass, that its motions may be observed: the whole is inclosed in another box; where it is sustained by brass hoops, to keep the needle horizontal. See it represented, *Tab. Navigation*, fig. 1. The needle, which is, as it were, the soul of the *Compass*, is made of a thin plate of steel in form of a lozenge: the middle being cut out, so as to leave nothing but the extremities and an axis in the middle, to which the cap is fitted. To animate, or touch it, it must be rubbed on a good loadstone: that end intended for the north point on the north pole of the stone, and that for the south point on the south pole. In rubbing it, care must be taken to begin first in the middle of the lozenge, drawing it gently to the acute angle of the lozenge intended for the north; never suffering it to stay at the end when arrived there, nor drawing it back again from the end to the middle, but rubbing it a second, and even a third time, in the same manner as the first, only beginning a little further and further from the north point: some say, the stone and needle should be so disposed as that the line of the rub be in the direction of the meridian.

The invention of the COMPASS is usually ascribed to Flavio de Melis, or Flavio Gioia a Neapolitan, about the year 1302: and hence it is, that the territory of Principato, which makes a part of the kingdom of Naples, where he was born, bears a *Compass* for its arms.

Others say, that Marcus Paulus a Venetian, making a journey to China, brought back the invention with him in 1260: what confirms this conjecture, is, that at first they used the *Compass* in the same manner as the Chinese still do; i. e. they let it float on a little piece of cork, instead of suspending it on a pivot. It is added, that their emperor Chiningus, a celebrated astrologer, had the knowledge of it 1120 years before Christ. The Chinese only divide their *Compass* into twenty-four points.

Faucher relates some verses of Guyot de Provence, who lived in France about the year 1200, which seem to make mention of the *Compass* under the name of *marinette*, or *mariner's stone*; which shews it to have been used in France near 100 years before either the Melphite or Venetian. The French even lay claim to the invention, from the flower de lis, wherewith all nations still distinguish the north point of the card.

With as much reason Dr. Wallis ascribes it to the English, from its name *Compass*, whereby most nations call it; and which he observes, is used in many parts of England to signify a circle.

The use of the Sea-Compass is obvious. For, the course a ship is to sail in, being known by the chart; and the *Compass* so placed, as that the two parallel sides of the square box be disposed according to the length of the ship, i. e. parallel to a line drawn from the head to the stern; the rudder is to be directed accordingly; *v. gr.* if the course be found on the chart between the south-west and south-south-west, i. e. south-west; to the south; turn the stern so as that a line from the south-west, $\frac{1}{2}$ south, exactly answer the mark on the middle of the side of the box. This is all that is required.

COMPASS is also an instrument of considerable use in surveying land, dialing, &c. See SURVEYING.

Its structure, in the main, is the same with that of the *mariner's Compass*; consisting, like that, of a box and needle: the principal difference consists in this, that instead of the needle's being fitted into the card, and playing with it on a pivot, it here plays alone; the card being drawn on the bottom of the box, and a circle divided in 360 degrees on the limb. See *Tab. Surveying*, fig. 15. This instrument is of obvious use to travellers, to direct them in their road; and to miners, to shew them what way to dig, &c. but it has other uses, though less easy, yet more considerable.

1. To take the declination of a wall by the COMPASS. Apply that side of the *Compass* whereon the north is marked along the side of the wall; the number of degrees over which the north end of the needle fixes, will be the declination of the wall, and on that side: *v. gr.* if the north point of the needle tends towards the north; that wall may be shone on by the sun at noon; if it fix over fifty degrees, counting from the north towards the east, the declination is so many degrees from north towards east. But since the needle itself declines from the north towards the west, with us, 13°; it must be noted, that to retrieve the irregularity, 13° are always to be added to the degrees shewn by the needle, when the declination of the wall is towards the east: on the contrary, when the declination is towards the west, the declination of the needle to be subtracted.

2. To take an angle with the COMPASS. Suppose the angle required be DAE, (Tab. Surveying, fig. 11.) apply that side of the compass whereon the north is marked to one of the lines, A D; when the needle rests, observe the degrees at which its north point stands, which suppose 80: so many degrees does the line decline from the meridian.

In the same manner take the declination of the line A E, which suppose 215°; subtract 80° from 215, the remainder is 135; which subtracted from 180, there will remain 45°; the quantity of the angle required.

But if the difference between the declination of the two lines exceed 180°; in that case, 180° must be subtracted from that difference: the remainder then is the angle required.

For the method of laying this down on paper; see PLOTTING. Note, In measuring angles by the compass, there needs not any regard be had to the variation; that being supposed the same in all the lines of the angles.

3. To take the plot of a field by the COMPASS. Suppose the field A, B, C, D, E, (fig. 12.) for the greater accuracy let there be two sights fitted to the meridian line of the compass, place it horizontal, and through the sights look along the side A B, or a line parallel to it; applying the eye to the sight at the fourth point of the compass. Draw a rough sketch of the field by the eye, and on the corresponding line enter down the degree to which the needle points, which suppose 90; measure the length of the side, and enter that too, which suppose 10 chains.

In this manner proceed with all the rest of the sides and angles of the field; the sides which suppose 70, 65, 70, 50, 94 chains; and the angles which suppose 30, 100, 130, 240, 300 degrees. To protract the field, set down the several angles observed, one after another, and subtract the lesser from the next greater: thus will you have the quantity of the several angles, and the length of the lines that include them. For the rest, see PLOTTING, and PROTRACTING.

Note, All the angles of the figure taken together, must make twice as many right angles, abating two; if no mistake have been committed.

The Azimuth COMPASS, differs from the common sea compass in this; that there is fastened, on the round box wherein the card is, a broad circle A B, (Tab. Navigation, fig. 2.) one half whereof is divided into 90 degrees, and those subdivided diagonally into minutes: *b c* is an index movable on *b*, having a sight, *b a*, erected thereon, and moving on a hinge. From the upper part of the sight, to the middle of the index, is fastened a fine hypotenusal luteffring *a e*, to give a shadow on a line in the middle of the index. The circle A B is crossed at right angles with two threads, from the extremities whereof are drawn four lines on the inside of the round box: there are also four lines drawn at right angles to each other on the card. The round box fitted with its card, graduated circle, and index, is hung in the brass hoops B B, and those hoops fastened to the square box C C.

The use of the azimuth COMPASS, is for finding the sun's magnetical azimuth, or amplitude; and thence the variation of the compass. If the observation be for an amplitude at sun-rising, or for an azimuth before noon; apply the center of the index *b e* on the west point of the card, within the box; so that the four lines on the edge of the card, and those on the inside of the box may meet. If the observation be for the sun's amplitude setting, or an azimuth in the afternoon, turn the center of the index right against the east point of the card, and make the lines within the box concur with those on the card: the instrument thus fitted for observation, turn the index *b e* towards the sun, till the shadow of the thread *a e* fall directly on the slit of the sight, and on the line that is along the middle of the index; then will the inner edge of the index cut the degree and minute of the sun's magnetical azimuth from the north or south. But note, that if, when the compass is thus placed, the azimuth is less than 45° from the south, and the index *b e* turned towards the sun, it will pass off the divisions of the limb: the instrument, therefore, in this case, must be turned just a quarter of the compass, *i. e.* the centre of the index must be placed on the north or south point of the card, according as the sun is from you; and then the edge will cut the degree of the magnetic azimuth, or the sun's azimuth from the north, as before. See AMPLITUDE.

The sun's magnetical amplitude thus found, the variation of the needle is thus determined.

Being out at sea the 15th of May, 1715, in 45° nor. lat. the tables give me the sun's latitude 19° north, and his east amplitude 27° 25' north: by the azimuth compass, I find the sun's magnetical amplitude at his rising and setting; and find he rises, *v. gr.* between the 62d and 63d degree, reckoning from the north towards the east point of the compass, *i. e.* between the 27th and 28th degrees, reckoning from the east. The magnetical amplitude, therefore, being here equal to the true one, the needle has no variation: but if the sun at his rising should have appeared between the 52d and 53d degree, from the north towards the east; his magnetical amplitude would then have been between 37 and 38 degrees, *i. e.* about 10 degrees greater than the true amplitude: therefore, the needle would vary about 10 degrees north-easterly.

V O L I.

If the magnetical east amplitude found by the instrument, should be less than the true amplitude, their difference would shew the variation of the needle easterly.

If the true east-amplitude be southward, as also the magnetical amplitude, and this last be the greater; the variation of the needle will be north-west: and *vice versa*.

What has been said of north-east amplitudes, holds also of south-west amplitudes. And what of south-east amplitudes, holds of north-west amplitudes.

Lastly, If amplitudes be found of different denominations, *v. gr.* if the true amplitude be six degrees north, and the magnetical amplitude five degrees south; the variation, which in this case is north-west, will be equal to the sum of the magnetical and true amplitudes: understand the same for west amplitudes.

The variation may likewise be found from the azimuth: but in that case, the sun's declination, latitude of the place, and his altitude must be given, that his true azimuth may be found.

COMPASS of preparation. See the articles SECTOR, and PROPORTION.

COMPASS dials, are small dials, fitted in boxes, for the pocket; to shew the hour of the day by direction of the needle; which indicates how to place them right by turning the dial about, till the cock or style stand directly over the needle, and point to the northward; but these can never be very exact, because of the variation of the needle itself. See DIAL.

COMPASS saw. See the article SAW.

COMPASSES, or pair of COMPASSES, a mathematical instrument, used for the describing of circles, measuring lines, &c. The common compasses consist of two branches, or legs, of iron, brass, or other metal, pointed at bottom; and a-top joined by a rivet, whereon they move, as on a centre.

The invention of compasses is ascribed to Talaus, nephew of Dædalus by his sister, whom the poets say, Dædalus killed out of envy. We have compasses now of various kinds and contrivances, accommodated to the various uses they are intended for: as,

COMPASSES of three legs. Their structure is like that of the common compasses, setting aside the excess of a leg: their use is to take three points at once; and so to form triangles; to lay down three positions of a map to be copied at once, &c.

Beam COMPASSES, consist of a long branch, or beam, carrying two brass cursors; the one fixed at one end, the other sliding along the beam, with a screw to fasten it, on occasion. To the cursors may be screwed points of any kind; whether steel, for pencils, or the like. It is used to draw large circles, to take great extents, &c.

Caliber COMPASSES. See the article CALIBER.

Clock-makers COMPASSES are very substantial, serving to cut past-board, brass, &c. jointed like the common compasses with a quadrant, or bow, as the spring compasses, only its use different; as serving here, to keep the instrument firm at any opening.

Cylindrical and spherical COMPASSES, used in taking the diameter, thickness, or caliber of round, or cylindrical bodies; such as, cannons, pipes, &c. They consist of four branches joined in a center; two of them circular, and two flat, a little bent at the ends.

To use them, one of the flat points is put within the cannon, the other without: the two opposite points shew the thickness. See CALIBER-compasses.

There are also spherical compasses, differing in nothing from the common ones, but that their legs are arched; serving to take the diameters of round bodies, &c.

ELLIPTICK COMPASSES. Their use is to draw ellipses, or ovals of any kind: they consist of a beam A B, (Tab. Geometry, fig. 2.) about a foot long, bearing three cursors; to one of which may be screwed points of any kind: to the bottom of the other two are riveted two sliding dove-tails, adjusted in grooves made in the cross branches of the beam. The dove-tails having a motion every way, by turning about the long branch, go backwards and forwards along the cross; so that when the beam has gone half way about, one of these will have moved the whole length of one of the branches; and when the beam has got quite round, the same dove-tail has got back the whole length of the branch. Understand the same of the other dove-tail.

Note, the distance between the two sliding dove-tails, is the distance between the two foci of the ellipsis; so that by changing that distance, the ellipsis will be rounder or slenderer. Under the ends of the branches of the cross, are placed four steel points to keep it fast.

The use of this compass is easy; by turning round the long branch, the ink, pencil, or other point, will draw the ellipsis required. Its figure shews both its use and construction.

German COMPASSES, whose legs are a little bent outwards towards the top; so that when shut, only the points meet.

Hair-COMPASSES, so contrived within-side, as to take an extent to a hair's-breadth.

Lapidary's COMPASSES, a piece of wood in form of the shaft of a plane, cleft a-top, as far as half its length; wherewith they measure the angles, &c. of the precious stones, as they cut them. In the cleft is a little brass rule, fastened there, at one end, by a pin; but so that it may be moved in manner of a bevel: with this kind of square they take the angles

of the stones, laying them on the shaft as they cut them.

Proportional COMPASSES, consist of two branches, (Tab. *Geometry*, fig. 3.) each pointed at either end with steel; the length of the branches is cut through, for a cursor to slide up and down; in the middle of which cursor is a screw, serving to join the branches, and to fix them at any point required.

On the one leg are divisions, serving to divide lines into any number of equal parts, for reducing of figures, &c. On the other are numbers, for the inscribing any regular polygon in a circle proposed.

The use of the first is easy: Suppose, *v. gr.* a right line required to be divided into three equal parts; push the cursor till the screw be just on the figure 3; where fixing it, take the length of the given line between the longest parts of the legs: the distance between the two shortest, will be one third of the given line. In the same manner may the line be divided into any other number of parts.

For the use of the line of polygons: Suppose, *v. gr.* a pentagon required to be inscribed in a circle; push the cursor till the middle of the screw be against 5, the number of sides in a pentagon; between the shortest parts of the legs take the semidiameter of the circle: the legs thus opened, the distance between the points of the longest parts, will be the side of the pentagon to be inscribed in the circle. And thus for a figure of any other number of sides.

Proportional COMPASSES with the sector lines. The structure of these is so like that of the common *proportional compasses*, only a little nicer, that it needs no particular description. See Tab. *Geometry*, fig. 4.

The lines on the first face, are the line of lines, marked *lines*: it is divided into 100 unequal parts, every tenth numbered: and the line of chord, which goes to 60°, and is marked *chords*.

On the other face are a line of sines to 90°, and a line of tangents to 45°. On the first side are the tangents from 45° to 71° 34'; on the other secants from 0° to 70° 30'.

For the use of these compasses. 1. To divide a line into any number of equal parts, less than 100: divide 100 by the number of parts required; slip the cursor till the line on the sliding dove-tail be against the quotient on the line of lines: then, the whole line being taken between the points of the *compasses* most remote from the centre; and the aperture of the other will shew the division required. 2. A right line given, supposed to be divided into 100 parts, to take any number of those parts: slip the line on the sliding dove-tail to the number of parts required: the whole line being taken between the points furthest from the centre, the aperture of the other two will include the number of divisions required. 3. The radius being given, to find the chord of any arch under 60°: slip the line on the sliding dove-tail to the degrees required on the line of chords: the radius being taken between the points furthest from the centre of the cursor; the aperture of the other line will be the chord required, provided the number of degrees be greater than 29: if it be less, the aperture taken from the radius will leave the chord required. 4. If the chord of an arch under 60° be given, and the radius required, slip the line on the dove-tail to the degrees given on the line of chords: the given chord being taken between the two points next the cursor, the aperture of the other will be the radius required. 5. The radius being given, to find the sine of any number of degrees. Slip the line on the dove-tail to the degree on the line of sines whose sine is required: the radius taken between the points furthest from the cursor; the aperture of the other will give the sine of the angle required. But if the sine sought be less than 30°, the difference of the apertures of the opposite points, will be the sine required. 6. The radius being given, to find the tangent of any number of degrees under 71: if the tangent required be under 26° 30', then slip the line on the dove-tail to the degree proposed on the tangent-line: the radius taken between the points furthest from the cursor; the aperture of the others, will be the tangent of the degrees required: if the tangent required be above 26° 30', but under 45°; the line on the cursor must be slipped to the degrees given on the tangent-line: then the radius being taken between the points furthest from the cursor; the aperture of the others will be the tangent. If the tangent required be greater than 45°, but less than 56° 20'; slip the notch on the tangent-side of the turned cheek to the degree 0 in the tangent-line on the side of the *compasses*: the radius taken between the points furthest from the cursor; the difference between the aperture of the other, and these, added together, will be the tangent required. Thus, for the tangents of other degrees under 71.—After the like manner may the secant of any number of degrees under 71 be found. See **PROPORTIONAL**.

Spring COMPASSES, or *dividers*, made of hardened steel, the head arched; which, by its spring, opens the *compasses*; the opening being directed by a circular screw, fastened to one leg, and let through the other, worked with a nut.

Triangular COMPASSES. See the article **TRIANGULAR**.

Triflexing COMPASSES, the invention of M. Tartagon, for the triflexion of angles, geometrically.

The instrument consists of two central rules, and an arch of a circle of 120 degrees, immovable, with its radius: the radius is fastened with one of the central rules, like the two legs of a sector, that the central rule may be carried through all the points of the circumference of the arch. The radius and rule to be as

thin as possible, and the rule fastened to the radius hammered cold, to acquire an elasticity: the breadth of the other central rule, to be triple the breadth of the radius. In this rule to be a groove, with a dove-tail, to be fastened on it, for its motion: In the center of each rule must likewise be a hole. See the *Journ. des Savans*, Sept. 1688.

Turn-up COMPASSES, a late contrivance to save the trouble of changing the points: the body is like the common *compasses*; towards the bottom of the legs, without-side, are added two other points, besides the usual ones; the one carrying a drawing pen-point, the other a port craion; both adjusted so as to turn round, and so be in the way of use, or out of it, as occasion requires.

The points of small *compasses* are tempered by a lamp and blow-pipe, heating them red hot; when cold they are hard: the larger are tempered by a charcoal-fire and a blow-pipe, heating them to a cherry-colour, then plunging them in water.

COMPATIBLE, something that may suit, or consist with another. See **INCOMPATIBLE**.

COMPENDIUM, an abstract, epitome, or reduction of a large matter into a little compass. See **EPITOME**.

COMPENSATION, an action whereby any thing is admitted as an equivalent to another.

COMPENSATION, in the civil law, is a kind of right, whereby a debtor pursued by his creditor, for the payment of a debt, demands that the debt may be *compensated* with what is owing him by the creditor.—*Compensation* is equivalent to payment.

COMPETENCE, or **COMPETENCY**, in law, the authority, or right, of a judge for taking cognizance of any matter. See **JURISDICTION**.

COMPITALIA *, or **COMPITALITIA**, feasts held among the antients in honour of the *lares*.

* The word comes from the Latin *compitum*, a cross-way; by reason the feast was held in the meeting of several roads.

The *compitalia* are more antient than the building of Rome. Dionysius Halicarnassus, and Pliny, indeed, say, that they were instituted by Servius Tullius; but this only signifies that they were then introduced into Rome.

Notwithstanding what Dion relates, that the *compitalia* were celebrated a little after the Saturnalia; and that the Roman calendar fixes them on the 12th of January; it appears that they had not any fixed day: at least, not in the time of Varro, as is observed by Casaubon.

The feast being thus moveable, the day whereon it was to be observed, was proclaimed every year. It was ordinarily held on the 4th of the nones of February, *i. e.* on the second of that month. Macrobius observes, that they were held not only in honour of the *lares*, but also of *mania*, madnes. The priests who officiated at them were slaves and liberti; and the sacrifice was a sow. They were re-established, after a long neglect, by Tarquin the proud, on occasion of an answer of the oracle, *that they should sacrifice heads for heads*, *i. e.* that for the health and prosperity of each family, children were to be sacrificed: but Brutus, after expelling the kings, in lieu of those barbarous victims, substituted the heads of garlic and poppy; thus satisfying the oracle which had enjoined *capita*, heads, at an easier rate.

During the celebration of this feast, each family placed at the door of their house, the statue of the goddess *mania*: they also hung up at their doors figures of wool, representing men and women; accompanying them with supplications that the *lares* and *mania* would be contented with those figures, and spare the people of the house.

As for slaves, in lieu of the figures of men, they offered balls, or fleeces of wool. Servius Tullius ordered, that the slaves who assisted at the *compitalia*, should be free during the whole time of the feast. Augustus ordered the statues of the *lares*, placed in the cross-ways, to be adorned with flowers twice a-year.

COMPLAINANT, in law, a plaintiff, or one who prefers a complaint against another, to be relieved by justice, or equity. See **PLAINTIFF**.

COMPLEMENT, in geometry, is what remains of a quadrant of a circle, or of ninety degrees, after any certain arch has been retrenched from it.

Thus, if an arch or an angle be 30 degrees, we say its complement is 60 degrees, since $60 + 30 = 90$.

The arch and its complement are relatives; and are only used with regard to each other.

The sine of the complement of an arch, is called the *co-sine*; of a tangent, the *co-tangent*, &c.

We sometimes also say, the complement of an angle; meaning so much as it wants of a right angle, or of 90 degrees.

COMPLEMENT of the course, in navigation, is the number of points the course wants of 90 degrees, or eight points, *viz.* of a quarter of the compass.

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

COMPLEMENT of the curtain, in fortification, that part of the interior side thereof which makes the demigorge. See **CURTAIN**, and **DEMIGORGE**.

COMPLEMENT of the line of defence, is the remainder of the line of defence, after you have taken away the angle of the flank. See **DEFENCE**, and **ANGLE**.

COMPLEMENTS of a *Parallelogram*, are the two lesser parallelograms, made by drawing two right lines parallel to each side of a parallelogram, through a given point in the diagonal. Such are the parallelograms C and M, (Tab. *Geometry*, fig. 5. n. 2.)—It is demonstrated, that in every parallelogram, the complements C and M are equal: for $Z + C + O = R + M + X$; as making up on each side the great triangles, made = by the diagonal; of which, $Z = R$, and $O = X$, (because the diagonal makes them so;) wherefore, the remaining parallelogram $C = M$. See **PARALLELOGRAM**.

Arithmetical COMPLEMENT. See **ARITHMETICAL**.

COMPLEX, a term ordinarily used as synonymous with *compound*; though, strictly speaking, there is some difference between them.

Complex is properly applied where a thing contains divers others: or consists of divers parts, not really distinct from one another; but only imaginarily, or in our conception.

In which sense, the soul may be said to be *complex*, in respect of the understanding and will, which are two things our reason alone distinguishes in it.

Complex Object. See the article **OBJECT**.

Complex Opposition. See the article **OPPOSITION**.

Complex Term, or *Idea*, is a term or idea compounded of several simple, or incomplex ones. See **TERM**, and **IDEA**.

Thus, in the proposition, *A just God cannot leave crimes unpunished*; the subject of this proposition, *viz. a just God*, is a *complex term*, or stands for a *complex idea*, composed of two simple, or incomplex ones, *viz. God* and *just*.

Complex Proposition, is either that which has at least one of its terms *complex*, as that just mentioned; or such a one as contains several members, as causal propositions. *E. gr. If God be almighty, the wicked can never escape him*.

Mr. Locke observes, that though the mind be perfectly passive in the formation of simple ideas; yet it exerts several actions of its own about them, when once formed: and that by this means it is, that they become the materials and foundation out of which all our knowledge is framed.

These acts are chiefly three, *viz.* 1. The combining of several simple ideas into one compound one: and thus it is that all *complex ideas* are made.

2. The bringing two ideas, whether simple or *complex*, together; setting them by each other, and so viewing them, without uniting them into one: by which it gets its ideas of relation. See **RELATION**.

3. The separating several ideas from all other ideas that accompany them in their real existence: and thus all its general ideas are formed.

As simple ideas are observed to exist in several combinations united together; so the mind may consider them as united, not only as they are really united in external objects, but as itself has joined them: ideas thus made up of several simple ones put together, we call *complex*; as man, beauty, army, gratitude, &c.

Complex ideas, however compounded and decomposed, tho' their number be infinite, and their variety endless, may be all reduced under these three heads, *viz. modes, substances, and relations*; which see under their proper heads, **MODE**, **SUBSTANCE**, and **RELATION**.

COMPLEXIO, **COMPLEXION**, in metaphysics, the union, or coalition of several things different from each other; either really, or only in our conception. See **COMPLEX**.

COMPLEXIO, in logics, is sometimes applied to the second operation of the mind, *viz.* the judgment; considered as it affirms or denies any thing: such affirmation, &c. necessarily importing a combination of several things.

Complexio, is sometimes also used by logicians in the sense of dilemma.

COMPLEXIO, in rhetoric, &c. is a figure including a repetition, and a conversion at the same time; the sentence both beginning, and ending with the same word.

Thus Tully: *Quis legem tulit? Rullus. Quis majorem partem populi suffragiis privavit? Rullus. Quis comitiis praesuit? Rullus.*

COMPLEXION, in physics, is used for the temperature, habitude, or natural disposition of the body.

Some philosophers distinguish four general and principal *complexions* in man, *viz. the sanguine complexion*, which, according to them, answers to the air; having the qualities thereof, as being hot, and moist. It takes its name from *sanguis*; because the blood is there supposed to be predominant.

The *phlegmatic complexion* takes its name from the pituita, or phlegm, in which it abounds; and corresponds to water; being cold, and moist.

The *bilious, or choleric complexion*, takes its name from the bile, or choler; it is supposed of the nature of fire, hot and dry.

Lastly, the *melancholic complexion* partakes of the nature of earth, being cold and dry. But this sort of reasoning is now out of doors.

COMPLEXUS, or *Par COMPLEXUM*, in anatomy, is a pair of muscles, arising with six thin small tendons from the transverse processes of the vertebrae of the neck and thorax; growing fleshy in its ascent; again becoming tendinous about the

middle; and again fleshy, where it is inserted laterally into the upper part of os occipitis, and the hind part of the proceffus mastoideus.—See Tab. *Anatomy*, (Myol.) fig. 7. n. 5.

When they act together, they pull the head directly backwards, but either of them acting alone, it draws it obliquely back.

COMPLICATION of *diseases*, a mixture, or combination of several diseases; especially where they have any affinity to one another; as the dropsy, asthma and jaundice happening together.

What much perplexes the physicians is, when with a fever there is a *complication* of some other disorder.

COMPONE, or **COMPONED**, or *Gobony*, in heraldry.—A *bordure compone*, is that formed or composed of a row of angular parts, or chequers of two colours.—See Tab. *Heraldry*, fig. 19.

COMPONED, or **COMPOSED**, is also used in the general for a *bordure*, a *pale*, or a *fess*, composed of two different colours, or metals, disposed alternately, separated and divided by fillets, excepting at the corners; where the junctures are made in the form of a goats-foot.

COMPOS Mentis.

COMPOSED Bastion. } See the articles { **NON-COMPOS.**
 } **BASTION.**

COMPOSITE Order, in architecture, the last of the five orders of columns; so called, because its capital is *composed* out of those of the other orders.—See Tab. *Architecture*, fig. 30.

It borrows a quarter-round from the Tuscan, and Doric; a double row of leaves, from the Corinthian; and volutes from the Ionic: its cornice has single modillions, or dentils.

The *composite* is also called the *Roman* and the *Italic* order; as having been invented by the Romans; conformably to the rest, which are denominated from the people among whom they had their rise.

Most authors rank this after the Corinthian; either as being the richest, or as the last that was invented: Scamozzi alone places it between the Ionic and Corinthian; out of a view to its delicacy and richness, which he esteems inferior to that of the Corinthian; and therefore makes no scruple to use it under the Corinthian; wherein he is followed by M. le Clerc. See **CORINTHIAN**.

The proportions of this order are not fixed by Vitruvius; he only marks its general character, by observing that its capital is composed of several parts taken from the Doric, Ionic, and Corinthian: he does not seem to regard it as a particular order; nor does he vary it at all from the Corinthian, except in its capital. In effect, it was Serlio who first added the *composite* order to the four of Vitruvius, forming it from the remains of the temple of Bacchus, the arches of Titus, Septimius, and the goldsmiths: till then, this order was esteemed a species of the Corinthian, only differing in its capital.

The order being thus left undetermined by the antients, the moderns have a kind of right to differ about its proportions, &c. accordingly Scamozzi, and after him M. le Clerc, make its column 19 modules and an half, which is less by half a module than that of the Corinthian: as, in effect, the order is less delicate than the Corinthian. Vignola makes it 20; which is the same with that of his Corinthian; but Serlio, who first formed it into an order, by giving it a proper entablature and base, and after him M. Perrault, raise it still higher than the Corinthian.

This last does not think different ornaments and characters sufficient to constitute a different order, unless it have a different height too; agreeably, therefore, to his rule of augmenting the heights of the several columns by a series of two modules in each; he makes the *composite* 20 modules, and the Corinthian 18; which, it seems, is a medium between the arches of Titus and the temple of Bacchus.

For the parts of the Order, see **COLUMN**, **ENTABLATURE**, **CAPITAL**, **BASE**, **FREEZE**, **PEDESTAL**, &c.

M. Perrault, in his Vitruvius, distinguishes between *composite* and *composed* order.—The latter, he says, denotes any composition whose parts and ornaments are extraordinary, and unusual; but have, withal, somewhat of beauty; both on account of their novelty, and in respect of the manner, or genius of the architect: so that a *composed* order is an arbitrary, humorous composition, whether regular or irregular.

The same author adds, that the Corinthian order is the first *composite* order, as being composed of the Doric and Ionic; which is the observation of Vitruvius himself, Lib. 4. cap. 1.

COMPOSITION, in a physical sense, is the uniting or joining of several different things, so as to form one whole, called a *compound*.

The schoolmen distinguish two kinds of *composition*; the one *entitative*, which is between things of the same nature, *e. gr.* two or more drops of water: the other *essential*, when things of different kinds are joined, and thus constitute new things, or essences, different from any of the parts; and thus, say they, from the matter and the form of wood, arises wood; whose essence is very different from either of those ingredients taken separately.

COMPOSITION of *Ideas*, is an operation of the mind, whereby it combines several of its simple ideas into complex ones. See **COMPLEX Idea**.

Under the same operation may likewise be reckoned that of enlarging; whereby we put several ideas together of the same kind, as several unites to makes a dozen.

In this, as in others, brutes come far short of men; for though they take in and retain several combinations of simple ideas; as possibly, a dog does the shape, smell, and voice of his master: yet these are rather for many distinct marks whereby he knows him, than one complex idea, made out of those simple ones.

COMPOSITION, in grammar, denotes the joining of two words together; or prefixing a particle to another word, to augment, diminish, or change its signification. See **WORD**, &c.

COMPOSITION, in oratory, the order and coherence of the parts of a discourse.

To **composition** belong, both the artful joining of the words, whereby the style is formed, and whereby it is rendered soft and smooth, gentle and flowing, full and sonorous; or the contrary: and the order, which requires things first in nature and dignity, to be put before those of inferior consideration.

COMPOSITION, in painting, includes the invention as well as disposition of the figures, the choice of attitudes, &c.

Composition, therefore, consists of two parts; one of which finds out, by means of history, proper objects for a picture; and the other disposes them to advantage.

COMPOSITION, in music, is the art of disposing musical sounds into airs, songs, &c. either in one, or more parts; to be sung with the voice, or played on instruments.

Zarlino defines **composition** to be the art of joining and combining condescs together, which are the matter of music: but this definition is too scanty; in regard, discords are always used with concords in the **composition** of parts. See **CONCORD**, and **DISCORD**.

Under **composition** are comprehended the rules, 1^o. of *melody*, or the art of making a single part; *i. e.* of contriving and disposing the simple sounds, so as that their succession and progress may be agreeable. 2^o. Of *harmony*, or the art of disposing and concerting several single parts so together, that they may make one agreeable whole.

It may be here observed, that melody being chiefly the business of the imagination, the rules of **composition** serve only to prescribe certain limits to it; beyond which, the imagination, in searching out the variety and beauty of airs, ought not to go: but harmony, being the work of judgment, its rules are more certain, extensive, and more difficult in practice.

In the variety and elegance of the melody, the invention labours a great deal more than the judgment; so that method has but little place: but in harmony it is otherwise; the invention, here, has nothing to do; and the **composition** is conducted from a nice observation of the rules of harmony, without any assistance from the imagination at all.

COMPOSITION, in logic, is a method of reasoning, wherein we proceed from some general self-evident truth, to other particular and singular ones.

The method of **composition**, called also *synthesis*, is just the reverse of that of *resolution*, or *analysis*.

Resolution is the method whereby we ordinarily search after truth; **composition**, that whereby a truth found, is discovered and demonstrated to others: resolution is the method of investigation, **composition** of demonstration.

The method of **composition** is that used by Euclid, and other geometers; resolution that used by algebraists and philosophers.

The two methods differ, just as the methods of searching a genealogy; which are either by descending from the ancestors to the posterity, or by ascending from the posterity to their ancestors: each have this in common, that their progression is from a thing known, to another unknown.

The method of **composition** is best observed by the mathematicians: the rules hereof are, 1^o. To offer nothing but what is couched in clear express terms; and to that end, to begin with definition. 2^o. To build only on evident and clear principles; to that end, to proceed from axioms or maxims. 3^o.

To prove demonstratively all the conclusions that are drawn hence; and to this purpose, to make use of no arguments or proofs, but definitions already laid down, axioms already granted, and propositions already proved; which serve as principles to things that follow.

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

If a point move or flow according to one and the same direction; whether that motion be equable or not, yet it will still keep the same right line; the celerity alone being changed, *i. e.* increased, or diminished according to the forces with which it is impelled. If the directions be opposite, as one, *e. gr.* directly downward, the other upward, &c. yet still the line of motion will be the same.

But if the compounding motions be not according to the same line of direction, the compound motion will not be according to the line of direction of any of them, but in a different one from them all; and this either straight or crooked, according as the direction or celerities shall require.

If two compounding motions be each of them equable, the line of the compound motion will still be a straight line; and this,

though the motions be neither at right angles one to another, nor equally swift, nor (each to itself) equable; provided that they be but similar; that is, both accelerated and retarded alike.

Thus, if the point *a*, (Tab. *Mechanics*, fig. 4.) be impelled equally with two forces; *viz.* upwards, towards *b*, and forwards, towards *d*; it is plain, that when it is gone forwards as far as *ac*, it must of necessity be gone upwards as far as *ce*; so that were the motions both equable, it would always go on in the diagonal *ae*.

Nay, suppose the motions unequal as to celerity, so *v. gr.* as that the body move twice as fast upwards as forwards, &c. yet still it must go on in the diagonal *ae*; because the triangles *ace*, *ace*, &c. and *acd* will still be similar, being as the motions are. But, if the motions be dissimilar, then the compound motion must be a curve.

Thus, if a body, as *b*, (fig. 5.) be impelled or drawn by three different forces, in the three different directions *ba*, *bc*, and *bd*, so that it yields to none of them, but continues in *equilibrium*: then will those three powers or forces be to one another, as three right lines drawn parallel to those lines, expressing the three different directions, and terminated by their mutual concourses.

Let *be* represent the force by which the body *b* is impelled from *b* to *a*, then will the same right line *be*, represent also the contrary equal force, by which it is impelled from *b* to *e*; but by what hath been said before, the force *be* is resolvable into the two forces acting according to the two directions *bd* and *bc*, to which the other impelling from *b* to *a*, is as *b* to *bd*, and *bc* or *de*, respectively.

So likewise two forces, acting without the directions *bd*, *bc*, and being equipollent to the force acting without the direction *be*, from *b* to *e*; will be to the force acting according to the direction *be*, from *b* to *e*, as *bd*, *bc*, to *be*: and therefore, the forces acting in the directions *bd*, *bc*, and equipollent to the force acting in the directions *bc*, *ce*, are to the force acting in the direction, as *bd*, *bc*, or *de* to *be*: that is, if a body be urged by three different equipollent powers in the directions *ba*, *bd*, and *bc*; these three forces shall be to one another as *be*, *bd*, and *de*, respectively. \square . *E. D.*

This theorem, with its corollaries, Dr. Keill observes, is the foundation of all the new mechanics of M. Varignon: by help hereof, may the force of the muscles be computed, and most of the mechanic theorems in Borelli, *de motu animalium*, be immediately deduced.

COMPOSITION of Proportion.—If there be two ratios, wherein the antecedent of the first is its consequent, as the antecedent of the other is to its consequent: then, by **composition** of proportion; as the sum of the antecedent and consequent of the first ratio, are to the antecedent, or the consequent of the first; so is the sum of the antecedent and consequent of the second ratio, to the antecedent or the consequent of the second.

E. gr. If $A : B :: C : D$, then by **composition**, $A + B : A (B) :: C + D : C (D)$.

COMPOSITION, in pharmacy, the art, or act of mixing divers ingredients together into a medicine; so as they may assist each other's virtues, supply each other's defects, or correct any ill qualities thereof. See **PHARMACY**.

COMPOSITION, in printing, ordinarily called **composing**, is the arranging of several types, or letters in the composing-stick, in order to form a line; and of several lines ranged in order in the galley, to make a page; and of several of those to make a form. See **PRINTING**, &c.

The **composing-stick** is made of iron generally, sometimes brass, or wood; of more or less length or depth, according to the page to be composed, or the compositor's fancy: it hath two sliding pieces, to be fastened by means of a nut and screw, which are slipped forwards or backwards, at the pleasure of the compositor; and according to the space which the lines, notes, &c. are to take up. See Tab. *Miscellany*, fig. 9.

The **composing-stick** ordinarily contains seven or eight lines of a middle-sized letter; these, when set, are taken out, by help of a thin slip of brass, termed a rule, and disposed in the galley; and others composed, till a page be formed. The page being composed, is tied up, and set by; and the rest of the pages of the sheet prepared in the same manner: when done, they are carried to the imposing or **correcting-stone**; there ranged in order, and disposed in a chase, or iron frame, fitted with wooden furniture; then, the quoins being struck in, it is carried to the press to be printed.

COMPOSITION, in commerce, a contract between an insolvent debtor and his creditors; whereby the latter agree to accept of a part of the debt, in compensation for the whole, and give a general acquittance accordingly.

COMPOSSIBLES, **COMPOSSIBLIA**, in logick, such things as are compatible, or capable of subsisting together. See **COMPATIBLE**.

COMPOST, in agriculture and gardening, a compound, or mixture, of earths, dungs, &c. applied, by way of manure, for the meliorating and improving of soil, and assisting the natural earth in the work of vegetation. See **MANURING**.

The gardeners have magazines, or laystalls of **composts**, adapted

to the different sorts of soil. Light loose land requires a *compost* of a heavy nature; such as the scouring of ditches, ponds, &c. mixed with earth, dung, &c. A heavy, clayey, or cloudy land requires a *compost* of a more sprightly and active kind, to infuse into the heavy, lumpy clods; as dungs, sand, ashes, and natural mould.

Mr. Bradley prescribes seven different sorts of *composts*, to forward the growth of trees; *viz.* a quantity of stiff soil, broke, and mixed with sharp sand, and ashes of burnt furzes, weeds, &c. or stiff soil with sand and burnt grass-turf, and rotten-wood; or stiff soil with sand and rape-seed, after the oil is pressed out, with burnt turf; or stiff soil with sand and malt grains; or sheeps dung, with wood ashes and loam, or mother earth. See SOIL.

The same author recommends a mixture or preparation of soils answering to loam, or mother earth, as greatly preferable for planting or sowing forest-trees in, to any of these richer *composts*; which, though they hasten the growth of the tree, will not make the timber neat so firm and durable.

COMPOUND, the result or effect of a composition of different things; or that which arises therefrom.

Strictly speaking, every new *composition* does not produce a new *compound*; but only that from which a new essence arises.

Thus, when one drop of water is added to another, there does not arise a new physical *compound*; the essence being the same now, as before the union.

COMPOUND differs from **COMPLEX**, and stands opposed to *simple*. See COMPLEX and SIMPLE.

We say, the ingredients of a *compound*; apothecaries are great dealers in *compounds*; they prepare a *compound diacodium*, *compound diamargariton*, *compound diamorum*, *compound diaprunum*, *compound oxymel*, *compound fomentations*, *compound waters*, &c.

COMPOUND Flowers, called also *composite*, and *aggregate* flowers; are such as consist of many little flowers, concurring to make up one whole one; each of which has its style, stamina, and adhering seed, but all are contained within one and the same calyx, or perianthium.

This *compound* flower distinguishes a large genus of plants, which Mr. Ray divides thus.—Herbs having *compounded* or *aggregated* flowers, are,

1^o. Such as have a *plain-leaved* flower naturally, and for the most part full; and having their whole body milky, (yielding a milky juice on cutting them;) and these have their seeds, Firstly, Pappous, or winged; that is, having a little lanugo adhering to each seed, by which the wind can easily carry it from place to place: such are the *Lactuca*, *Tragopogon*, *Scorzoneria*, *Dens Leonis*, *Hieracium*, and the *Pilosella*. Secondly, Such as have a solid seed, without any Pappus or down upon them; as the *Eryngium Luteum*, *Cichorium*, *Lampfana*.

2^o. Such as have a *discous* flower; *i. e.* one composed of many short, thick, compalled, small, tubiculi (which some, by mistake, call *flavina*) set together, so as to make one flat, or hollow superficies; and these are also either such as have their seeds.

Firstly, Pappous, as the *Tussilago*, *Petasites*, *Carlina*, *Helonium*, *Doronicum*, *Conyza*, *Aster*, *Virga Aurea*, *Jacobaea*, *Stachas Citrina*, *Jacea*, *Senecio*, *Eupatorium Avicennae*, *Callia Vulgari*, *Gnaphalium Maritimum*, and *Montspeliense*. Secondly, Such whose seeds are solid, and not pappous; as the corymbiterous herbs.

COMPOUND force.	} See the articles	{	FORCE.
COMPOUND forms.			FORMS.
COMPOUND fossils.			FOSSILS.
COMPOUND fractions.			FRACTIONS.
COMPOUND gland.			GLAND.
COMPOUND harmony.			HARMONY.

COMPOUND interest, called also *interest upon interest*, is that which is reckoned not only upon the principal, but upon the interest itself forborn; which hereby becomes a sort of secondary principal. See INTEREST.

COMPOUND machine. See the article MACHINE.

COMPOUND masonry. See the article MASONRY.

COMPOUND motion, that motion which is effected by several conspiring powers.

Powers are said to conspire, if the direction of the one be not directly opposite to that of the other; as when the radius of a circle is conceived to revolve about a centre; and at the same time a point to move straight along it. All curvilinear motion is *compound*. It is a popular theorem, in mechanics, that in an uniform *compound* motion, the velocity produced by the conspiring powers, is to that of either of the powers separately, as the diagonal of a parallelogram according to the direction of whose sides they act separately, to either of the sides.

COMPOUND Numbers, are those which may be measured, or exactly divided, by some other number beside unity. Such is 15; which is measured by 3, and also by 5.

COMPOUND Pendulum, in mechanics, that which consists of several weights constantly keeping the same distance, both from

each other, and from the centre about which they oscillate. See PENDULUM.

COMPOUND Proposition. See the article PROPOSITION.

COMPOUND Quantities, in algebra, are such as are connected together by the signs + and —: thus, $a + b - c$, and $bb - b$ are *compound* quantities.

COMPOUND Ratio, is that which the product of the antecedents of two or more ratios has to the product of their consequents.

Thus, 6 to 72 is in a ratio *compounded* of 2 to 6, and 3 to 12. See PROPORTION.

COMPOUND Rule of Three. See the article RULE of Three.

COMPOUND Sounds.

COMPOUND Sord.

COMPOUND Taste.

COMPOUND Ulcer.

COMPOUND Words.

COMPREHENSION, in metaphysics, is that act of the mind whereby it apprehends, or knows any object presented to it, on all the sides whereon it is capable of being apprehended, or known.

To *comprehend* a thing, is defined by the schoolmen, *rem aliquam totam & totaliter cognoscere*: and, in this sense, it is a popular point of controversy among school-divines, *whether the blessed in Heaven comprehend God?* The more orthodox maintain the negative, by reason such knowledge must be infinite.

COMPREHENSION, in rhetorick, a trope, or figure whereby the name of a whole is put for a part; or that of a part for a whole: or a definite number of any thing for an indefinite.

COMPRESS *, in chirurgery, a bolster of linnen cloth, folded in several doubles, and laid under the bandage, to prevent a wound from bleeding or swelling; or to retain the medicines applied thereto.

* The word comes from *contrimere*, to press hard.

Scultetus, in his *Asynal of Chirurgery*, observes, that the antients composed their *compresses* of carded flax, or of feathers, fewed between two lincens; and called them *pillows*, or *plumages*, *pillvoni*, or *pillvilli*, &c.

COMPRESSION, the act of pressing, or squeezing something, so as to set its parts nearer each other, and make it possess less space.

Compression properly differs from *condensation*, in that the latter is performed by the action of cold, the former by some external violence.

Pumps, which the antients imagined to act by suction, do, in reality, act by *compression*; the embolus, or sucker, in going and returning in the narrow pipe, *compresses* the air inclosed therein, so as to enable it by the force of its elasticity to raise the valve, and make its escape: upon which, the balance being destroyed, the pressure of the atmosphere on the stagnant surface, drives up the water in the pipe thus evacuated of its air. See PUMP.

Water is incapable of *compression*: after the air has been purged out of it, no art or violence is able to bring its parts closer, or make it take up less compass. In an experiment made by the academy del Cimento, water, when violently squeezed, made its way through the infinitely fine pores of a ball of gold, rather than it would undergo *compression*.

The *compression* of the air, by its own weight, is surprizingly great: it appears, by calculation, that the common air we breathe, near the surface of the earth, is *compressed* by the weight of the super-incumbent atmosphere, into $\frac{1}{23789}$ part of the space it would take up were it at liberty.

But the air may be still further *compressed* by art; and it appears from Mr. Boyle's experiments, that the space which the air takes up, when at its utmost dilatation, is to that it takes up when most *compressed*, as five hundred and fifty thousand to one.

This immense *compression* and dilatation, Sir Isaac Newton observes, cannot be accounted for from supposing the particles of the air elastic and branched, or in form of slender twigs interwoven into circles; nor any other way, but by a repelling force, wherewith they are endued; by virtue whereof when at liberty, they mutually fly each other. See ATTRACTION. This repelling power, he adds, is stronger and more sensible in air, than in other bodies; in regard air is generated out of very fixed bodies, but not without great difficulty, and the help of fermentation: Now those particles always recede from each other with the greatest violence, and are *compressed* with the greatest difficulty, which, when contiguous, cohere the most strongly.

That there is such a repelling power, appears from this; that flies walk on the water without wetting their feet; that the object-glasses of telescopes laid on each other do not touch; that dry dust is not brought to touch or cohere without difficulty, *v. gr.* unless either liquified by fire, or wet with water; and that two polished pieces of marble, when as often as they touch cohere, are yet very hardly pressed so closely, and joined so aptly as to cohere. See REPELLING Force; see also COHESION, DILATATION, &c.

COMPRISE *Nient.* See the article **NIENT**.

COMPROMISE, a treaty, or contract, whereby two contending parties establish one, or more arbitrators, to judge of and terminate their differences in an amicable way.

The regular way of appointing a *compromise*, is by a writing, expressing the names of the arbitrators, the power of chusing an umpire, or super-arbitrator in case of need, a time limited for the arbitrage, and a penalty on the party who does not abide by the decision.

By the civil law, a slave cannot make a *compromise* without the leave of his master, nor can a pupil without the authority of his guardian, or a wife without that of her husband. So a slave, a deaf or dumb man, a minor, and the person who is a party in the cause, are incapable of being chosen arbitrators in a *compromise*.

The occasions on which a *compromise* is not allowed of, are restitutions, marriage causes, criminal affairs, questions of state; and, generally, any thing wherein the publick interest is more concerned than that of private persons.

In our law, *compromise* is not of so much extent: West defines it the faculty, or power of pronouncing sentence between persons at controvery, given to arbitrators by the parties mutual private consent, without publick authority.

COMPROMISE is also used in beneficiary matters; where it signifies an act, whereby those who have the right of election, transfer it to one or more persons, to elect a person capable of the office or dignity.

We have seen members of parliament elected by *compromise*; when the electors, not being able to agree among themselves, give the power of electing, at least of nominating, to two persons; obliging them by oath, or otherwise, to chuse such as they think the most capable, and best disposed.

COMPTING, or **COUNTING-HOUSE**, an office in the king's household, under the direction of the lord steward; so called, because the accounts for all expences of the king's household are there taken daily by the lord steward, comptroller, cofferer, master of the household, the two clerks of the green-cloth, and the two clerks comptrollers. They also there make provision for the household, and make payments, and orders for the good government thereof.

In the *compting house* is the board of *green-cloth*. See **GREEN-CLOTH**.

COMPTRROL. See **CONTROL**.

COMPTRROLLER. See **CONTROLLER**:

COMPULSOR *, an officer under the Roman emperors, dispatched from court into the provinces, to compel the payment of taxes, &c. not paid within the time prescribed.

* The word is Latin, formed of the verb *compellere*, to oblige, constrain.

These were charged with so many exactions, under colour of their office, that Honorius cashiered them by a law in 412. The laws of the Visigoths mention military *compulsors*; which were officers among the Goths, whose business was to oblige the tardy soldiers to go into the fight, or to run to an attack, &c.

Cassian mentions a kind of monastick *compulsors*, whose business was to declare the hours of canonical office, and to take care the monks went to church at those hours.

COMPUNCTION *, in theology, an inward grief in the mind, for having offended God.

* The word comes from *compungere*, of *pungere*, to prick.

The Romanists own their confession insignificant, unless attended with *compunction*, or pricking of heart. See **CONFESSION**.

Among spiritualists, *compunction* carries a more extensive signification; and implies not only a grief for having offended God, but also a pious sensation of grief, sorrow, and displeasure on other motives.—Thus, the miseries of life, the danger of being lost in the world, the blindness of the wicked, &c. are to pious people motives of *compunction*.

COMPURGATOR, in law, one that by oath justifies, or clears another's innocence.

COMPUTATION, the manner of accounting and estimating time, weights, measures, and monies.

The word is sometimes also used among mathematicians in the like sense as calculation. See **CALCULATION**.

COMPUTATION of a planet's motion. See **PLANET**.

COMPUTATION is particularly used in law, in respect of the true account, or construction of time, so understood, as that neither party do wrong to the other, nor the determination of time be left at large, or be taken otherwise than according to the judgment and intention of law.

If indentures of demise be ingrossed, bearing date May 11, 1679. to have and to hold the land in S. for three years from henceforth; and the indentures be delivered the 4th of June following: in this case, *from henceforth* shall be computed from the day of the delivery, and not from the date. And if the indentures be delivered at four of the clock in the afternoon, the said 4th of June, the lease shall end the third day of June in the third year: the law, in such *computation*, rejecting all fractions or divisions of the day, on account of that uncertainty which is the mother of contention.—In writings, or-

dered by the stat. 27 Hen. VIII. to be inrolled within six months; if such writings have date, the six months shall be accounted from the date, and not from the delivery: if they want date, it shall be accounted from the delivery. Coke, lib. 5.

If a deed be shewed to a court at Westminster, it shall remain in court (by judgment of law) all the term in which it is shewed: for all the term is but as one day in law. Coke, *ibid*.

—If a church be void, and the patron does not present within six months, the bishop of the diocese may collate his chaplain: but these six months shall be computed according to twenty-eight days of the month; and not according to the calendar. See **CALENDAR**.

COMPUTO, a writ, thus called from its effect, which is to compel a bailiff, chamberlain, or receiver to yield his accounts. See **ACCOUNT**.

The same lies for executors of executors; and against the guardian in focage, for waste made in the minority of the heir.

COMPUTO vicemittis habendo respectu. See **RESPECTU**.

CONARION, or **CONOIDE**, a name for the *pinial gland*; a small gland, about the bigness of a pea, placed in the upper part of that hole in the third ventricle of the brain called the *anus*; and tied by some fibres to the nates.

It is composed of the same substance as the rest of the brain; and has this peculiar, that it is single; whereas all the other parts are double: Hence, Des Cartes takes occasion to suppose it the immediate place, or seat of the soul.

CONATUS *endeavour*, a term frequently used in philosophical and mathematical writers; nearly equivalent to *visus*.

Conatus, seems to be the same, with respect to notion, that a point is with respect to a line; at least, the two have this in common, that as the point is inceptive of the line, or the term from which it commences; so is the beginning of all motion called the *conatus*. Add, that as in mathematical demonstrations, the extension of the point is conceived as if it were nothing at all; so, in the *conatus* of motion, there is no regard to the time wherein, or the length which it advances. See **LEWS** of **NATURE**.

Hence, some define *conatus* to be a quantity of motion not capable of being expressed by any time or length.—Accordingly, all motion tends precisely the same way wherein the moveable is acted on, or determined by the moving power. See **MOTION**.

CONCATENATION, in philosophy, a connection of things, in manner of a chain.

The concatenation of second causes, is an effect of providence. See **CAUSE**, **PROVIDENCE**, &c.

CONCAVE, is applied to the inner surface of a hollow body; especially if it be circular.

CONCAVE is particularly understood of mirrors and lenses: *concave lenses*, are either *concave* on both sides, called *concavo-concave*; or *concave* on one side, and plane on the other, called *plano-concave*; or *concave* on one side, and convex on the other, called *concavo-convex*, or *convexo-concave*, as the one or the other surface is a portion of a less sphere.

The property of all *concave* lenses is, that the rays of light, in passing through them, are deflected, or made to recede from one another; as in convex lenses they are inflected towards each other; and that the more, as the concavity and convexity are portions of less circles.

Hence, parallel rays, as those of the sun, by passing through a *concave* lens, become diverging; diverging rays are made to diverge the more, and converging rays either made to converge less, or become parallel, or go out diverging.

Hence, objects viewed through *concave* lenses, appear diminished; and the more so, as they are portions of less spheres; and this in oblique, as well as in direct rays.

Concave mirrors have the contrary effect to lenses: they reflect the rays which fall on them, so as to make them approach more to, or recede less from each other than before; and that the more as the concavity is greater, or the spheres whereof they are segments, less.

Hence, *concave* mirrors magnify objects presented to them; and that in a greater proportion, as they are portions of greater spheres.

Hence also, *concave* mirrors have the effect of burning objects, when placed in their focus. See **BURNING-GLASS**.

CONCEALERS *, in law, such as find out concealed lands, *i. e.* lands kept privily from the king, by common persons, having nothing to shew for their title, or estate therein.

* They are thus called *per antiphrasim*, à *concelando*; as *mons* is à *movendo*, &c. My lord Coke calls them *turkidan hominum genus*.

CONCENTRATION, the retiring, or withdrawing of a thing inwards, towards the centre, or middle.

External cold is said to *concentrate* the heat within bodies: after meals, the natural warmth retires, and as it were *concentrates*, to promote the digestion.

CONCENTRATION is also used by Dr. Grew for the highest degree of mixture, *viz.* that wherein two or more atoms or particles touch, by a reception, and intrusion of the one within the other. See **MIXTION**.

This he takes to be the case of all fixed bodies without taste or smell; their constitution being so firm, that till the particles be detached

detached from each other by some extraordinary means, they cannot affix to those fenest.

CONCENTRIC, in geometry and astronomy, something that has the same common centre with another.

The word is principally used in speaking of round bodies, and figures, viz. circular, elliptical ones, &c. but may be likewise used for polygons, drawn parallel to each other, upon the same centre.

Concentric stands opposite to *excentric*. See **EXCENTRIC**, and **EXCENTRICITY**.

Nonius's method of graduating instruments consists in describing with the same quadrant 45 *concentric arches*, dividing the outermost into 90 equal parts, the next into 89, &c.

CONCEPTION, in logicks, the simple apprehension, or perception, which we have of any thing, without proceeding to affirm, or deny any thing about it.

The schoolmen usually make two kinds of *conception*; the one *formal*, the other *objective*.

The *first* is defined to be the immediate and actual representation of any thing proposed to the mind: on which footing, it should be the same thing to the understanding, that a word or voice is to the ear; whence some also call it, *verbum mentis*.

The *second* is the thing itself represented by a formal *conception*. But others explode the notion of an *objective conception*, as being, in reality, no conception at all; excepting where the mind contemplates its own acts, &c.

Formal, or *proper conceptions*, are subdivided into *univocal*, where several things are distinctly represented as under some common ratio, or in the same degree of perfection; *analogous*, where several things are represented as under some proportional likeness; and *equivocal*, where they are represented immediately as such, without regard to any common ratio or likeness.

CONCEPTION, in medicine, denotes the first formation of the embryo, or fœtus, in the womb.

Conception is no other than such a concourse and commixture of the prolific seed of the male, with that of the female, in the cavity of the uterus, as immediately produces an embryo. See **EMBRYO**.

The symptoms of *conception*, or pregnancy, are, when in a few days after the conjugal act, a small pain is perceived about the navel, and is attended with some gentle commotions in the bottom of the abdomen; and within one, two, three, or even four months, the menses cease to flow, or prove in less quantity than usual. Upon the first failure of this kind, the woman begins to count the series of her weeks, without taking any notice of the time before elapsed: after this, or between the second and third months, but generally about the third, the motions of the embryo become perceivable to the mother; who hereupon becomes troubled with a nausea, vomiting, loathing, longing, &c. About this time, the breasts begin to swell, grow hard and painful, and contain a little milk; the nipples also become larger, firmer, and darker coloured, a livid circle appearing around them: the eyes seem sunk and hollow. During the two first months pregnancy, the woman grows thinner, and slenderer; the abdomen being also depressed; though it afterwards distends, and grows gradually larger.

The manner wherein *conception* is effected, is thus laid down by the modern writers: in the supericies of the ovaries of women, there are found little pellucid spherules, consisting of two concentric membranes, filled with a lymphatic humour, and connected to the surface of the ovaria, underneath the tegument, by a thick calix, contiguous to the extremities of the minute ramifications of the fallopian tubes.

These spherules, by the use of venery, grow, swell, raise, and dilate the membrane of the ovary into the form of papillæ; till, the head propending from the stalk, it is at length separated from it; leaving behind it a hollow cicatrix, in the broken membrane of the ovary; which, however, soon grows up again.

Now, in these spherules, while still adhering to the ovary, fœtus's have been frequently found: whence it appears, that these are a kind of ova, or eggs, deriving their structure from the vessels of the ovary, and their liquor from the humours prepared therein.

Hence, also, it appears, that the fallopian tubes being swelled, and stiffened by the act of venery, with their muscular fibrillæ, like fingers, may embrace the ovaries, compress them, and by that compression, expand their own mouths: and thus the eggs now mature, and detached as before, may be forced into their cavities; and thence conveyed into the cavity of the uterus; where they may either be cherished and retained, as when they meet with the male seed; or, if they want that, again expelled.

Hence the phenomena of false *conceptions*, abortion, fœtus's found in the cavity of the abdomen, the fallopian tubes, &c.

For, in coition, the male seed, abounding with living animalcules, agitated with a great force, a brisk heat, and, probably, with a great quantity of animal spirits, is violently impelled through the mouth of the uterus, which on this occasion is opener; and through the valves of the neck of the uterus,

which on this occasion are laxer than ordinary, into the uterus itself; which now, in like manner, becomes more active, turgid, hot, inflamed, and moistened with the flux of its lymph and spirits, by means of the titillation excited in the nervous papillæ by the attrition against the rugæ of the vagina.

The semen thus disposed in the uterus, is retained, heated, and agitated by the convulsive constriction of the uterus itself; till meeting with the ova, the finest and most animated part enters thro' the dilated pores of the membrana of the ovum, now become glandulous, is there retained, nourished, dilated, grows to its umbilicus, or navel; stifles the other less lively animalcules: and thus is *conception* effected.

Hence, it appears, that *conception* may happen in any part where the semen meets with an ovum: thus, whether it be carried thro' the fallopian tube to the ovary, and there cast upon the ovum; or whether it meet with it in some recess of the tube itself; or, lastly, whether it join it in the cavity of the uterus, it may still have the same effect; as it appears from observation it actually has. But it is probable that *conception* is then most perfect, when the two, viz. the semen and ovum, are carried at the same time into the uterus, and there mixed, &c.

Other anatomists chuse to suppose the male seed taken up, ere it arrive in the uterus, by the veins which open into the vagina, &c. and thus mixed with the blood; by which, in the course of circulation, it is carried, duly prepared, into the ovary, to impregnate the eggs. See **GENERATION**.

CONCEPTION *immaculate* of the holy virgin, is a feast established in honour of the holy virgin; particularly with regard to her having been conceived and born *immaculate*, i. e. without original sin; held in the Romish church on the 8th of December.

Allatius, in his *prologomena* on Damascenus, endeavours to prove this feast to have been celebrated by several churches in the east, as early as the eighth century.

The *immaculate conception* is the great head of controversy between the Scoists and Thomists; the former maintaining, and the latter impugning it.

The Dominicans espoused the party of S. Thomas, and held out a long time in defence of the virgin's being conceived in original sin: they were condemned by pope Clement VII. in 1308. at the prosecution of the university of Paris, and were obliged to retract. The council of Trent, *sess. v.* in the decree of *original sin*, declares it not to be the intention of the council to include the virgin under it; her *conception* it calls *immaculate*; and appoints the constitutions of Sixtus IV. to be observed with regard thereto.

Some authors have observed several passages dispersed in the old editions of S. Thomas's works, which assert the *immaculate conception* in express terms; but many of them are corrupted in the later editions, say some: though others will have the corruption lie on the side of the old ones.

In the three Spanish military orders of S. James of the sword, calatrava, and alcantara; the knights take a vow, at their admission, to defend the *immaculate conception*. This resolution was first taken in 1652.

Peter d'Alva and Astorga, has published forty-eight huge volumes in folio, on the mysteries of the conception.

Religious of the order of CONCEPTION, see **THEATINS**.

CONCERT, or **CONCERTO**, a number, or company of musicians playing, or singing the same song, or piece of musick together.

The word *concert* may be applied where the musick is only melody, i. e. where the performers are all either in unison, or only at the interval of an octave; but it is more properly, as well as more usually understood of harmony, or where the musick consists of divers parts; as bass, tenor, &c.

CONCESSI, a term much used in conveyances, &c. its effect is to create a covenant, as *dedi* does a warranty. See **COVENANT**.

CONCESSION, in rhetorick, a figure whereby something is granted, or allowed to the adversary, either to prevent being detained by unnecessary incidents, or to make some advantage of. *I will not contest with you the reality of the contract; what I plead for is relief against the injustice of it.—True, she is fair, but ought she not to show her acknowledgments to heaven for the favour, by making a virtuous use of her beauty?*

CONCHA, in anatomy, a name given the second, or inward cavity of the auricle, or external ear; reaching to the entrance of the auditory duct. See **EAR**.

* The name has its origin from a resemblance this cavity bears to a sea shell, call'd in Latin *concha*.

Some also give the same name to the first cavity of the inward ear, which others call the *drum*; and others to the vestibulum of the labyrinth, which is the second cavity of the internal ear.

CONCHOID, or **CONCHILIS**, in geometry, a curve line which always approaches nearer a straight line to which it is inclined, but never meets it.

It is described thus: draw a right line BD. (Tab. *Analyticks*, fig. 1.) and another A C, perpendicular to it in E; draw any number of right lines, as CM, CM, cutting BD in Q; make QM = QN = AE = EF; the curve wherein the points MM are found, is the *conchilis*, or *conchoids prima*; so called by its inventor Nicomedes.

inedes. The others, wherein the points NN are found, is the *conchoid scanda*; the right line BD the *rule*, the point C the *pole*. The inventor also contrived an instrument, whereby the first *conchoid* may be described mechanically: thus, in the rule AD, (Tab. *Analyticks*, fig. 2.) is a channel or groove cut, so as a smooth nail, firmly fixed in the moveable rule CB, in the point F, may slide freely within it: into the rule EG is fixed another nail in K, for the moveable rule CB to slide upon. If then the rule BC be so moved, as that the nail F passes along the canal AD; the style, or point in C, will describe the first *conchoid*.

Now let $AP = x$, (fig. 1.) $AE = a$; $PE = MR = a - x$; wherefore, as x increases, $a - x$ or MR will decrease; and therefore the curve continually approaches nearer to the rule BD.

In the same manner it appears, that the right line NO must continually decrease; and therefore that the second *conchoid*, also, must continually approach nearer the rule.

But inasmuch as between each *conchoid* and the right line BD, there will still be the right line QM or QN, equal to AE; neither of the *conchoids* can concur with the right line BD: consequently, B is an asymptote of each *conchoid*. See *ASYMPTOTE*. There will be other kinds of *conchoids* produced, if $CE : CQ :: QM : AE$; wherefore, if $CE = b$, $EA = a$, $CQ = x$, $QM = y$; then, $ab = xy$; and for infinite *conchoids*, $a^n b^m = x^n y^m$.

CONCILIO—*Querclam coram rege* & CONCILIO. See *QUERELA*.

CONCINNOUS intervals, in musick.—Discords are distinguished into *concinuous* and *inconcinuous* intervals: the *concinuous* are such as are fit for musick, next to, and in combination with concords; being neither very agreeable nor disagreeable in themselves; but having a good effect, as by their opposition they heighten the more essential principles of pleasure; or as by their mixture and combination with them, they produce a variety necessary to our being better pleased.

The other discords, that are never used in musick, are called *inconcinuous*.

Systems are also divided into *concinuous* and *inconcinuous*. A system is said to be *concinuous*, or concinnously divided, when the parts thereof, considered as simple intervals, are *concinuous*; and are, besides, placed in such an order, between the extremes, as that the succession of sounds from one extreme to the other, may have an agreeable effect.

Where the simple intervals are *inconcinuous*, or ill-disposed between the extremes, the system is said to be *inconcinuous*.

CONCLAVE, an assembly, or meeting of all the cardinals that are at Rome, shut up for the election of a pope. See *POPE*, and *ELECTION*.

The *conclave* had its rise in the year 1270, and on this occasion: Clement IV. being dead at Viterbo, in 1268; the cardinals were two years without being able to agree on the election of a successor: in effect, things were carried to such pass, that they were upon the point of breaking up, without coming to any conclusion at all.

The inhabitants of Viterbo, then, being apprized of their design, by the advice of S. Bonaventure, then at Viterbo, shut the gates of their city, and locked up the cardinals in the pontifical palace adjoining to the cathedral, till they were brought to a better understanding.

Hence arose the custom which has since prevailed, of shutting up the cardinals in a single palace, till they have elected the pope.

Such was the origin of the *conclave*, as related by Onuph. Panvinius, Ciaconius, and Papebroch.

CONCLAVE is also used for the place wherein the election of the pope is performed; which is, now, at St. Peter's in the vatican; tho' Gregory X. and Clement V. appointed it should always be held in the place where the last pope should die.

While the affair is in hand, if it be in winter, the walls and windows are all mured up, excepting only a single pane, to give a little light: in summer the windows are not closed; but the great door of the hall is secured with four locks, and four bolts; an aperture being, however, left, to supply the imprisoned prelates with victuals through.

In the hall, which is very ample, there are cells or stalls erected for as many cardinals as are to be present at the election; the cells being only separated by deal boards.

The cells are marked with letters of the alphabet, and are distributed to the cardinals by lot: each cardinal puts his arms on the cell that falls to his share.

After the assembly has continued three days, they are only allowed one dish for a meal; and after five days, only bread and water: though this rule is not over-religiously regarded.

Each cardinal is allowed two *conclavists*, or servants to attend him, and to be shut up with him.

Matthew Paris says, the word *conclave* antiently signified the pope's wardrobe.

It is a popular proverb in Italy, *chi entra papa, esce cardinale*; he who enters pope, comes out cardinal; *q. d.* he who according to common report will be elected pope, ordinarily is not.

CONCLUSION, in logic, the last part of an argument; or the

consequence drawn from something either assumed or proved before.

The *conclusion* of an argument contains two parts: the *consequent*, which is the matter of it; and the *consequence*, which is its form, and which, of a simple/absolute proposition, renders the *conclusion* relative to the premises whence it is drawn.

The question, and *conclusion*, say the schoolmen, are the same ideas, only considered in different views, or relations: in the question they are considered as doubtful; in the *conclusion* as void of doubt.

CONCLUSION, in oratory, consists of two parts; the *recapitulation* or *enumeration*, and the *passions*.

The *recapitulation* consists in a repetition of the principal arguments. See *RECAPITULATION*.

CONCLUSIVE Conjunctions. See the article *CONJUNCTION*.

CONCOCTION, in medicine, the change which the food undergoes in the stomach, &c. to become chyle.

This change consists in destroying the texture and cohesion of the parts of the food; preparing part of it for some particular service of the animal frame, and the rest to be carried off as excrements, by proper emunctories.

The antients gave the term *coction*, or *concoction*, to what we now ordinarily call *digestion*; from a notion of the food's being, as it were, boiled in the stomach; and its nutritious juice expressed by the heat of the adjacent parts.

They assigned two *concoctions*, viz. one in the stomach, and a second in the small intestines, &c. which latter they attributed to the admixture of the bile and pancreatic juice.

The several *concoctions* in the body, with regard to the propagation of the species, and the preservation of the individual, have been since reduced to five; these are *chylifis* for chyle, *chymifis* for chyme, *haematifis* for blood, *pneumatifis* for spirits, and *spermatifis* for seed. See *CHYLOSIS*, *CHYMOSIS*, *HÆMATOSIS*, &c. see also *COCTION*.

CONCOMITANT, in theology, something that accompanies, or goes along with, another.

Concomitant grace, is that which God affords us during the course of our actions to enable us to perform them; and as the Romish schoolmen say, to render them meritorious.

Concomitant grace differs, at least with regard to its effect, from preventing grace: the latter is given us to prevent an action, the former to accompany it.

According to the Romish doctrine, the blood of Jesus Christ is under the accidents of wine, as his body is under the accidents of bread, by *concomitance*.

CONCOMITANT Necessity. See the article *NECESSITY*.

CONCORD, in grammar, that part of syntax, or construction, whereby the words of a sentence agree among themselves, *i. e.* whereby nouns are put in the same case, number, gender, &c. and verbs in the same number and person with nouns and pronouns.

The rules of *concord* are generally the same in all languages, as being of the nature of what is in use almost every where for the better distinguishing of discourse.

Thus, the distinction of the two numbers singular and plural, obliges us to make the adjective agree with the substantive in number; that is, to put the one either in this or that number, according as the other is: for the substantive being the thing confusedly, tho' directly marked by the adjective; if the substantive word mark several, there are several subjects of the form marked by the adjective, and of consequence this should be in the plural; as *homines docti*, &c.

Again, the distinction of masculine and feminine, renders it necessary to put the substantive and adjective in the same degree.

And verbs should have *concord* or agreement with nouns and pronouns in number and person.

If any thing occur apparently contrary to those rules, it is by a figure, *i. e.* something is implied, or the ideas are considered more than the words themselves.

CONCORD, in law, is the agreement between two parties who intend the levying a fine of lands to one another, how and in what manner it shall pass.

CONCORD is also an agreement made upon any trespass committed, (betwixt two, or more) and is divided into *concord executory*, and *concord executed*.

Plowden observes, that the first binds not, being imperfect; but the latter is perfect, and binds the party.

Others are of opinion, that *concord's* executory are perfect, and bind no less than those executed.

CONCORD, in musick, denotes the relation of two sounds that are always agreeable to the ear, whether applied in succession or consonance.

If two single sounds be in such a relation, or have such a difference of tune, as that being sounded together, they make a mixture, or compound sound, which affects the ear with pleasure; that relation is called *concord*: and whatever two sounds make an agreeable compound in consonance, those same will always be pleasing, in succession, or will follow each other agreeably.

The reverse of a *concord*, is what we call a *discord*; which is a denomination of all the relations or differences of tune that have a displeasing effect. See *DISCORD*.

Concord and harmony are, in effect, the same thing; though custom has applied them differently. As concord expresses the agreeable effect of two sounds in consonance; so harmony expresses the same sort of agreement in a greater number of sounds in consonance: add, that harmony always implies consonance; but concord is sometimes applied to succession: though never but when the terms will make an agreeable consonance: whence it is that Dr. Holder, and some other writers, use the word *consonance* for what we call *concord*.

Unifonance, then, being the relation of equality between the tones of two sounds, all unisons are *concord*s, and in the first degree: but an interval being a difference of tone, or a relation of inequality between two sounds, becomes a *concord* or *discord*, according to the circumstances of that particular relation. Indeed, some restrain *concord* to intervals, and make a difference of tone essential thereto; but that is precarious: and Mr. Malcolm thinks, that as the word implies agreement, it is applicable to unison in the first degree.

It is not easy to assign the reason or foundation of concordance: the differences of tone, we have elsewhere observed, take their rise from the different proportions of the vibrations of the sonorous body, i. e. of the velocity of those vibrations in their recurses; the frequenter those recurses are, the more acute will be the tone, and *vice versa*.

But the essential difference between *concord* and *discord* lies deeper: there does not appear any natural aptitude in the two sounds of a *concord*, to determine it to give us a pleasing sensation, more than in the two sounds of a *discord*: these different effects are merely arbitrary, and must be resolved into the divine good pleasure.

We know by experience what proportions and relations of tone afford pleasure, and what do not; and we know also how to express the difference of tone by the proportion of numbers; we know what it is pleases us, though we do not know why: we know, *v. gr.* that the ratio of 1 : 2 constitutes *concord*, and 6 : 7 *discord*; but on what original grounds agreeable or disagreeable ideas are connected with those relations, and the proper influence of the one on the other, is above our reach!

By experience, we know that the following ratios of the lengths of chords are all *concord*, *viz.* 2 : 1, 3 : 2, 4 : 3, 5 : 4, 6 : 5, 5 : 3, 8 : 5; that is, take any chord for a fundamental, which shall be represented by the number 1, and the following divisions thereof will be all *concord* with the whole, *viz.* $\frac{1}{2}$, $\frac{2}{3}$, $\frac{3}{4}$, $\frac{4}{5}$, $\frac{5}{6}$, $\frac{5}{8}$.

So that the distinguishing character between *concord*s and *discords*, must be looked for in these numbers, expressing the intervals of sound; not abstractedly, and in themselves, but as expressing the number of vibrations.

Now, unisons are in the first degree of *concord*, or they have the most perfect likeness or agreement in tone; and therefore have something in them accessory to that agreement which is found, less or more, in every *concord*: but it is not true, that the nearer two sounds come to an equality of tone, the more agreement they have; therefore, it is not in the equality or inequality of the numbers that this agreement lies.

Further, if we consider the number of vibrations made in any given time by two chords of equal tone; on the principle laid down, they are equal: and therefore the vibrations of the two chords coincide, or come together as frequently as possible, *i. e.* they coincide at every vibration; in the frequency of which coincidence, or united mixture of the motions of the two chords, and of the undulations of the air occasioned thereby, it is, that the difference of *concord* and *discord* must be sought.

Now, the nearer the vibrations of two strings approach to a coincidence as frequent as possible, the nearer they should approach that condition, and consequently the agreement, of unisons; which is confirmed by experience.

For if we take the natural series 1, 2, 3, 4, 5, 6, and compare each number to the next, as expressing the number of vibrations in the same time of two chords, whose lengths are reciprocally as those numbers; the rule will be found exact, for 1 : 2 is best, then 2 : 3; after 6 the consonance is unassurable; the coincidences being too rare: though there are other ratios that are agreeable, besides those found in that continued order, *viz.* 3 : 5, and 5 : 8, which, with the preceding five are all the *concord*ing intervals within, or less than an octave, or 1 : 2; that is, whose acutest term is greater than half the fundamental.

On this principle, 3 : 5 will be preferable to 4 : 5; because those being equal in the number of vibrations of the acuter term, there is an advantage on the side of the fundamental in the ratio 3 : 5, where the coincidence is made at every third vibration of the fundamental, and every fifth of the acuter term: so also the ratio 5 : 8 is less perfect than 5 : 6; because, though the vibrations of each fundamental that go to one coincidence are equal; yet in the ratio 5 : 6, the coincidence is at every sixth of the acuter term, and only at every eighth in the other case.

Thus, we have a rule for judging of the preference of *concord*s, from the coincidence of their vibrations: agreeable to which rule, they are disposed into the order of the following table; to which the names of the *concord*s in practice, the ratio of their vibrations, the lengths of the chords, and the number of coincidences in the same, are expressed.

	Ratio's, or vibrations.		Coincid.
	Grave Term.	Acute Term.	
Unison	1	1	
Octave, 8ve	2	1	60
Fifth, 5th	3	2	30
Fourth, 4th	4	3	20
Sixth, gr.	5	3	20
Third, gr.	5	4	15
Third, lesser	6	5	12
Sixth, lesser	8	5	12
	Grave Acute Lengths.		

Though this order be settled by reason, yet it is confirmed by the ear. On this bottom, *concord*s must still be the more perfect, as they have the greatest number of coincidences, with regard to the number of vibrations in both the chords; and where the coincidences are equal, the preference will fall on that interval, whose acutest term has fewest vibrations to each coincidence: which rule, however, is in some cases contrary to experience; and yet it is the only rule yet discovered. F. Merfenne, indeed, after Kircher, gives us another standard for settling the comparative perfection of intervals with regard to the agreement of their extremes in tone: and it is this.

The perception of concordance, say they, is nothing but the comparing of two or more different motions which in the same time affect the auditory nerve: now we cannot make a certain judgment of any consonance, till the air be as oft struck in the same time by two chords, as there are unites in each member expressing the ratio of that *concord*, *v. gr.* we cannot perceive a fifth, till two vibrations of the one chord, and three of the other are accomplished together; which chords are in length as 3 to 2: the rule then is, that those *concord*s are the most simple and agreeable, which are generated in the least time; and those, on the contrary, the most compound and harsh, which are generated in the longest time.

For instance, let 1, 2, 3, be the lengths of 3 chords 1 : 2 is an octave; 2 : 3 a fifth; and 1 : 3 an octave and fifth compounded, or a twelfth. The vibrations of chords being reciprocally as their lengths, the chord 2 will necessarily vibrate once, while the chord 1 vibrates twice, and then exists an octave; but the twelfth does not yet exist, because the chord 3 has not vibrated once, nor the chord 1 thrice, which is necessary to form a twelfth.

Again, for generating a fifth, the chord 2 must vibrate thrice, and the chord 3 twice; in which time, the chord 1 will have vibrated 6 times; and thus the octave will be thrice produced, while the twelfth is only produced twice; the chord 2 uniting its vibrations sooner with the chord 1, than with the chord 3; and they being sooner consonant than the chord 1 or 2 with that 3. Whence, that author observes, many of the mysteries of harmony, relating to the performance of harmonious intervals and their succession, are easily deduced.

But this rule, upon examining it by other instances, Mr. Malcolm has shewn defective, as it does not answer in all positions of the intervals with respect to each other; but a certain order, wherein they are to be taken, being required: and there being no rule, with respect to the order, that will make this standard answer to experience in every case: so that at last we are left to determine the degrees of *concord* by experience and the ear.

Not but that the degrees of *concord* depend much on the more or less frequent uniting the vibrations, and the ear's being more or less uniformly moved, as above; for that this mixture or union of motion, is the true principle, or, at least, the chief ingredient in *concord*, is very evident: but because there seems to be something further in the proportion of the two motions, necessary to be known, in order to fix a catholic rule for determining all the degrees of *concord*, agreeable to sense and experience, The result of the whole doctrine is summed up in this definition.

—*Concord* is the result of a frequent union, or coincidence of the vibrations of two sonorous bodies, and, by consequence, of the undulating motions of the air, which, being caused by these vibrations, are like and proportionable to them; which coincidence, the more frequent it is, with regard to the number of vibrations of both bodies, performed in the same time, *ceteris paribus*, the more perfect is that *concord*: till the rarity of the coincidence, in respect of one or both the motions, commence *discord*. See some of the remarkable phenomena of sounds accounted for from this theory, under the word UNISON; see also INTERVAL, &c.

M. Carre, in the memoirs of the royal academy of sciences, lays down a new general proposition, to determine the proportion which cylinders are to have, in order to form the *concord*s or consonances of musick. And it is this—that the solid cylinders, whose sounds yield those *concord*s, are in a triplicate and inverse ratio of that of the numbers which express the same *concord*s. Suppose, *v. gr.* two cylinders, the diameters of whose bases and lengths, are as 3 to 2; it is evident their solidities will be in the ratio of 27 to 8, which is the triplicate ratio of 3 to 2: we say then, that the sounds of those two cylinders will produce a fifth, which is expressed by those numbers; and that the big-

gest and longest will yield the grave sound, and the smallest the acute one. — And the like of all others.

Concords are divided into *simple*, or original, and *compound*.

A *simple*, or *original concord*, is that whose extremes are at a distance less than the sum of any two other *concords*.

On the contrary, a *compound concord* is equal to two or more *concords*.

Other musical writers state the division thus: an octave 1 : 2 and all the inferior *concords* above expressed, are all simple and original *concords*: and all greater than an octave, are called *compound concords*; as being composed of, and equal to the sum of one or more octaves and some single *concord* less than an octave; and are usually, in practice, denominated from that simple *concord*.

As to the composition and relations of the original *concords*, by applying to them the rules of the addition and subtraction of intervals, they will be divided into *simple* and *compound*, according to the first and more general notion; as in the following table.

Simple <i>Concords</i>	Compound <i>Concords</i>	} 5th 4th or 6th g. 3d l. or 3d g. 3d l. 4th.
5 : 6 a 3d lef.	5th } 3d g. and 3d l.	
4 : 5 a 3d gr.	6th l. } 4th 3d l.	
3 : 4 a 4th.	6th g. } 4th 3d g.	

The octave is not only the first *concord* in point of perfection, the agreement of whose extremes is greatest, and the nearest to union; inasmuch that when sounded together, it is impossible to perceive two different sounds; but it is also the greatest interval of the seven original *concords*; and as such, it contains all the lesser, which derive their sweetness from it, as they arise more or less directly out of it; and which decrease gradually, from the octave to the lesser sixth, which has but a small degree of *concord*.

What is very remarkable, is the manner wherein these lesser *concords* are found in the octave, which shews their mutual dependencies.

For, by taking both an harmonical and arithmetical mean between the extremes of the octave, and then both a harmonical and arithmetical mean betwixt each extreme, and the most distant of the two means last found; *viz.* betwixt the lesser extreme and the first arithmetical mean, and betwixt the greater extreme and the first harmonical mean; we have all the lesser *concords*.

Thus, if betwixt 360 and 180 the extremes of octave, we take an arithmetical mean, it is 270; and an harmonical mean is 240; then, betwixt 360 the greatest extreme, and 240 the harmonical mean, take an arithmetical mean, it is 300; and an harmonical mean, is 288. Again, betwixt 180 the lesser extreme of the octave, and 270 the first arithmetical mean, it is 225, and an harmonical one 216.

Thus have we a series of all the *concords*, both ascending towards acuteness from a common fundamental, 360; and descending towards gravity from a common acute term 180: which series has this property, that taking the two extremes, and any other two at equal distances, the four will be in geometrical proportion.

The octave, by immediate division, resolves itself into a fourth and fifth; the fifth, again, by immediate division, produces the two thirds; the two thirds are therefore found by division, though not by immediate division: and the same is true of the two sixths. Thus do all the original *concords* arise out of the division of the octave; the fifths and fourths immediately and directly, the thirds and sixths mediately.

From the perfection of the octave arise this remarkable property, that it may be doubled, tripled, &c. and yet still will persevere a *concord*, *i. e.* the sum of two or more octaves are *concord*; though the more compound will be gradually less agreeable: but it is not so with any other *concord* less than octave; the doubles, &c. whereof, are all discords.

Again, whatever found is *concord* to one extreme of the octave is *concord* to the other also: and if we add any other simple *concord* to an octave, it agrees to both its extremes; and to the nearest extreme it is a simple *concord*, and to the farthest a compound one.

Another thing observable in this system of *concords*, is, that the greatest number of vibrations of the fundamental cannot exceed five; or that there is no *concord* where the fundamental makes more than five vibrations, to one coincidence with the acute term. It may be added, that this progress of the *concords* may be carried on to greater degrees of composition, even in *infinitum*; but still the more compound, the less agreeable.

So a single octave is better than a double one, and that than a triple one; and so of fifths, and other *concords*. Three or four octaves is the greatest length we go in ordinary practice: the old scales went but to two; no voice or instrument will well go above four. See **THIRD, FOURTH, and FIFTH.**

CONCORDANCE, a dictionary or index to the bible, wherein, all the words, used in the course of the inspired writings, are ranged alphabetically; and the various places where they occur referred to; to assist in finding out passages, and comparing the several significations of the same word.

Cardinal Hugo de St. Charo is said to have employed 500 monks at the same time in compiling a Latin *concordance*: be-

side which, we have several other *concordances* in the same language; one, in particular, called the *concordance* of England, compiled by J. Darlington of the order of predicants; another more accurate one, by the jesuit de Zamora.

R. Mordecai Nathan has furnished us with a Hebrew *concordance*, first printed at Venice in 1523; containing all the Hebrew roots branched into their various significations, and under each signification all the places in scripture wherein it occurs: but the best and most useful Hebrew *concordance* is that of Buxtorf, printed at Basil in 1632.

The Greek *concordances* are only for the new testament: indeed we have one of Conn. Kircher's on the old; but this is rather a concordantial dictionary than a *concordance*; containing all the Hebrew words in an alphabetical order; and underneath, all the interpretations or senses the seventy give them; and in each interpretation, all the places where they occur in that version.

Calafius, an Italian cordelier, has given us *concordances* of the Hebrew, Latin, and Greek, in two columns; the first, which is Hebrew, is that of R. Mordecai, word for word, and according to the order of the books and chapters: in the other column is a Latin interpretation of each passage of scripture quoted by R. Mordecai: this interpretation is Calafius's own; but in the margin he adds that of the seventy and the vulgate, when different from his. The work is in four volumes folio, printed at Rome in 1621.

CONCORDANT *verses*, such as have several words in common; but which, by the addition of other words, convey an opposite, at least, a different meaning. Such are those,

Et { *Ganis* } in *silva* { *venatur* } & *omnia* { *servat*.
Lupus } { *nutritur* } } { *vestit*.

CONCORDAT, in the canon law, denotes a covenant, or agreement concerning some beneficiary matter, as a resignation, permutation, promotion, or the like.

The council of Trent, sess. vi. *de reform.* cap. 4. speaking of *concordats* made without the authority and approbation of the pope, calls them *concordias quae tantum suos obligant auctores, non successores*. And the congregation of cardinals, who have explained this decree, declares also, that a *concordat* cannot be valid so as to bind successors, unless confirmed by the pope.

CONCORDAT is also used, absolutely, among the French, for an agreement concluded at Bologna in 1516, between pope Leo I. and Francis I. of France, for regulating the manner of nominating to benefices.

The *concordat* serves in lieu of the pragmatic sanction, which had been abrogated; or, rather, it is the pragmatic sanction softened and reformed.

There is also a German *concordat*, made between pope Nicholas V. and the emperor Frederick III. and the princes of Germany, in 1448, relating to beneficiary matters.

CONCOURSE, or **CONCURRENCE**, the reciprocal action of divers persons, or things, co-operating toward the same effect, or end.

Divines generally hold, that the actions and operations of all creatures are continually dependent on the immediate *concurrence* of the divine mind: for second causes to act, or produce effects, God himself must *concur*, and by his influence give them the efficacy they themselves are destitute of: if they did not need the immediate *concurrence* of God to make them act, they would have a sort of independency, which must be injurious to the immediate creator to suppose. See **CAUSE**.

The schoolmen distinguish two kinds of *concurrence*, *viz. mediate*, which consists in giving a power or faculty to act; and *immediate*, which is a cotemporary influence of one cause along with another, to produce an effect: — Thus, the grandfather *concur* mediately to the production of a grandson, as he originally gives the power of generating to the father: but the father *concur* immediately with the mother to the production of the same child. Now it is allowed that God *concur* mediately with all his creatures, to enable them to act: but whether this be sufficient; or whether it be farther required that he *concur* with them immediately by a new influence, for the production of every act, in the same manner as the father concurs with the mother toward producing the child, is controverted! — The generality of scholastic writers are for the affirmative; Durandus and his followers maintain the negative.

Point of **CONCOURSE**. See the article **FOCUS**.

CONCRETE, in the school philosophy, an assemblage, or compound. See **COMPOUND**.

Physical CONCRETE, or a **CONCRETE body**, may denote any mixed body, or body composed of different principles; and consequently, all sensible bodies whatever, as all bodies arise from a coalition of divers elements, or at least of divers principles, matter and form.

But, in strictness, *concrete* is only used for those compounds wherein the ingredients still retain their distinct natures, nor are wholly converted into any new common nature.

Authors distinguish *natural concretes* and *artificial ones*: *antimony* is a *natural concrete*, and soap a *facitious concrete*.

Logical CONCRETE, or a **CONCRETE word**, called also *paronymum*, is that which has a compound signification, as denoting both the subject,

subject, and some quality or accident of the subject, which gives it its denomination.

Such, e. gr. are, *man, learned, white*; for *man* signifies as much as *having human nature*; *learned*, as much as *having learning*, &c. Hence, the word *concrete* is chiefly used to express the union of qualities or quantities with the bodies or subjects, without any separation even in idea.

The opposite term, whereby things are separated in thought, is *abstract*.

Concrete properly signifies a subject accompanied with its form or quality; as *pious, hard, white*: *abstract*, on the contrary, expresses the form and quality without the subject, as, *piety, hardness, whiteness*.

CONCRETE numbers, are those which are applied to express or denote any particular subject; as, two men, three pounds, two thirds of a shilling, &c.

Whereas, if nothing be connected with a number, it is taken abstractedly or universally; thus, three signifies only an aggregate of three units; let those units be men, pounds, or what you please.

CONCRETION, the act whereby soft bodies are rendered hard: or, an insensible motion of the particles of a fluid or soft body, whereby they come to a consistence.

The word is used indifferently for *induration, condensation, congelation, and coagulation*.

CONCRETION is also used for the coalition of several little particles into a sensible mass, called a *concrete*; by virtue of which union, the body acquires this or that figure, and these, or those properties. See **CONCRETE**.

CONCUBINAGE, sometimes expresses a criminal, or prohibited commerce between the two sexes; in which sense it comprehends *adultery, incest, and simple fornication*.

In its more restrained sense, *concupiscence* is used for a man's and a woman's cohabiting together in the way of marriage; without having passed the ceremony thereof.

Concupiscence was antiently tolerated: the Roman law calls it an allowed custom, *licita consuetudo*. When this expression occurs in the constitutions of the Christian emperors, it signifies what we now call a *marriage in conscience*.

The *concupiscence* tolerated among the Romans in the time of the republick, and of the Heathen emperors, was that between persons not capable of contracting marriage together: nor did they even refuse to let inheritances descend to children which sprung from such a tolerated cohabitation.

Concupiscence between such persons they looked on as a kind of marriage, and even allowed it several privileges: but then this *concupiscence* was confined to a single person, and was of perpetual obligation, as much as marriage itself.

Hotoman observes, that the Roman laws had allowed of *concupiscence* long before Julius Cæsar made that law whereby every one was allowed to marry as many wives as he pleased. The emperor Valentinian, Socrates tells us, allowed every man two. See **MARRIAGE**.

CONCUBINAGE is also used for a marriage performed with less solemnity than the formal marriage; or a marriage with a woman of inferior condition, and to whom the husband does not convey his rank, or quality.

Cujas observes, that the antient laws allowed a man to espouse, under the title of *concubines*, certain persons, such as were esteemed unequal to him, on account of the want of some qualities requisite to sustain the full honour of marriage. He adds, that though *concupiscence* was beneath marriage, both as to dignity and to civil effects; yet was *concubine* a reputable title, very different from that of *mistress* among us.

The commerce was esteemed so lawful, that the *concubine* might be accused of adultery in the same manner as a wife.

This kind of *concupiscence* is still in use in some countries, particularly in Germany, under the title of a *half-marriage, morgengabic marriage, or marriage with the left hand*; alluding to the manner of its being contracted, *viz.* by the man's giving the woman his left hand instead of the right. See **MARRIAGE**.

This is a real marriage, though without solemnity: the parties are both bound for ever; though the woman be thus excluded from the common rights of a wife, for want of quality or fortune.

CONCUBINE, a woman whom a person takes to cohabit with him, in the manner, and under the character of a wife, without being authorized thereto by a legal marriage. See **CONCUBINAGE**.

CONCUBINE is also used for a real, legitimate, and only wife, distinguished by no other circumstance, but a disparity of birth or condition, between her and the husband.

Du Cange observes, that one may gather from several passages in the epistles of the popes, that they antiently allowed of such *concubines*. The seventeenth canon of the first council of Toledo, declares, that he who with a faithful wife, keeps a *concubine*, is excommunicated; but that if the *concubine* served him as wife, so that he had only one woman, under the title of *concubine*, he should not be rejected from communion: which shews that there were legitimate wives under the title of *concubines*.

In effect, the Roman laws did not allow a man to espouse whom

he pleased; there was required a kind of parity, or proportion, between the conditions of the contracting parties: but a woman of inferior condition, who could not be espoused as a wife, might be kept as a *concubine*; and the laws allowed of it, provided the man had no other wife.

The children of *concubines* were not reputed either legitimate or bastards, but natural children, and were capable only of donations.

They were deemed to retain the low rank of the mother; and were on this ground unqualified for inheriting the effects of the father.

It is certain the patriarchs had a great number of wives, and that these did not all hold the same rank; some being subaltern to the principal wife; which were what we call *concubines*, or half-wives. The Romans prohibited a plurality of *concubines*, and only had regard to the children issuing from a single *concubine*, because she might become a legitimate wife. Solomon had 700 wives, and 300 *concubines*: the emperor of China has sometimes two or three thousand *concubines* in his palace. Q. Curtius observes, that Darius was followed in his army by 365 *concubines*, all in the equipage of queens.

CONCUPISCENCE, among divines, an irregular desire, appetite, or lust after carnal things, inherent in human nature ever since the fall.

F. Malebranche defines *concupiscence*, to be a natural effort, which the traces or impressions of the brain make on the mind, in order to attach it to sensible things. The dominion or prevalence of *concupiscence*, according to him, is what we call *original sin*. See **ORIGINAL SIN**.

The origin of *concupiscence* he ascribes to those impressions made on the brain of our first parents at their fall; which are still transmitted and continued on those of their children: for as animals produce their like, and with like traces in the brain; (whence the same sympathies and antipathies in the same kind; and whence the same conduct on the same occasions;) so our first parents, after their fall, received such deep traces in the brain, by the impression of sensible objects, that they might well be supposed to communicate them to their children.

The schoolmen use the term *concupiscible appetite*, for the desire we have of enjoying any good; in opposition to *irascible appetite*, whereby we eschew what is evil.

CONCURRENCE. See the article **CONCOURSE**.

COND, **CON**, or **CONN**, in the sea language, signifies to guide or conduct a ship in her right course.

He that *conds* her, stands aloft with a compass before him, and gives the word of direction to the man at helm how he is to steer. See **STEERING**.

If the ship go before the wind, or, as they call it, betwixt the sheats, the word is either *starboard*, or *port the helm*; according as the *condor* would have the helm put to the right or left side of the ship, upon which the ship always goes the contrary way.

If he says, *helm a mid-ship*, he would have the ship go right before the wind, or directly between her two sheats.

If the ship sail by a wind, or on a quarter wind, the word is, *aloof, keep your huffs, fall not off, steer no more, keep her to, touch the wind, have a care of the lee-latch*: all which expressions are of the same import, and imply that the steersman should keep the ship near the wind.

On the contrary, if he would have her sail more large, or more before the wind, the word is, *ease the helm, no near, bear up*. If he cries *steady*, it means, *keep her from going in and out, or making yaws*, (as they call it) howsoever the sails, whether large or before a wind; and when he would have her go just as she does, he cries, *keep her thus, thus, &c.*

CONDEMNATION, the act of passing, or pronouncing sentence, or giving judgment against a man; whereby he is subjected to some penalty or punishment; either in respect of fortune, reputation, or life. See **SENTENCE**, and **PUNISHMENT**.

CONDEMNATION to the galley. See **GALLEY**.

CONDENSATION, the act whereby a body is rendered more dense, compact, and heavy.

Condensation consists in bringing the parts closer to each other, and increasing their contact: in opposition to *rarefaction*, which renders the body lighter and looser, by setting the parts further asunder, and diminishing their contact, and of consequence their cohesion.

Wolffius, and some of the more accurate writers, restrain the use of the word *condensation* to the action of cold: what is done by external application, they call *compression*.

Air easily *condenses*, either by cold, or by art: water congeals, but never *condenses*; can never be brought into a less space, but will even penetrate the most solid body, even gold, rather than lose of its bulk.—A syrup condenses in ebullition.

It was found, in the observatory of France, during the great cold of the year 1670, that the hardest bodies, even metals, glass, and marble itself, were sensibly *condensed* by the cold, and became much harder, and more brittle than before; till their former state was retrieved by the ensuing thaw.

Water alone seems to expand by cold; inasmuch as when congealed, the ice takes up more space than the water did before. But this must be rather owing to the intromission of some foreign matter;

matter; as the nitrous particles of the ambient air, than to any proper rarefaction of the water by the cold.

The Cartesians, indeed, taking it for granted that there is no vacuum, deny that there can be any such thing as proper *condensation*, or rarefaction. According to them, when a body takes up more space than it is before, its parts are distended by the destruction of a subtle matter through its pores: and when its bulk, again, is reduced into less space, this is owing to the extrusion or egress of that matter through the same pores; by virtue whereof, the parts of the body, though not the parts of matter, come nearer each other.

For as extension and matter, according to them, are the same thing; a body can never take up more or less place, any otherwise than by the accession or diminution of matter: and thus they conclude there is no vacuum.

Now, that, in the rarefactions of gross bodies, their parts are distended by the accession of air, is frequently manifest; but this does not follow from the plenitude of the world, but from the fluid and elastic nature of air; or from its gravity and pressure.

That there is such a thing as *condensation*, without the loss of any matter, is evident from Galileo's experiment: a cock, being with a female screw fitted to a hollow brass ball, or cylinder, so as that a syringe, by means of a male screw, may be applied to it; by working the syringe, the air will be forced into the ball, and turning the cock, it will be retained; inasmuch, that upon examining the vessel by the balance, its weight will be found increased. If the cock be re-turned, the air will burst out with violence, and the ball will sink to its former weight.

From the experiment it follows, 1°. That air may be crowded into a less volume and bulk than it ordinarily takes up, and is therefore compressible.—For the quantity of its compression, see COMPRESSION.

2°. That from the recovery of its weight, just so much air is expelled as was injected; and that, therefore, compressed air returns to its primitive expansion, if the compressing force be removed; and it has therefore an elastic force.

3°. That it is a certain sign of compression, if, upon opening the orifice of a vessel, any portion of air be observed to fly out.

4°. That since the weight of the vessel is increased by injecting air; the aerial mass must have a visus downwards, in lines perpendicular to the horizon; and is therefore heavy, and presses subject bodies in lines perpendicular to the horizon; according to the conditions of gravity.

Condensed air, has effects just opposite to those of rarefied air; birds, &c. appear brisker and more lively therein than in the common air, &c. See VACUUM, RAREFACTION, &c.

CONDENSER, a pneumatic engine, whereby an unusual quantity of air may be crowded into a given space. See AIR.

They can by this throw in 2, 3, 4, 5, or 10 atmospheres into the condenser, i. e. twice, thrice, four, &c. times as much air as there would be in the same compass without the engine. See CONDENSATION.

CONDERS, in our customs, are persons who stand on high places near the sea coast, in the time of herring-fishing, to make signs with boughs, &c. to the fishers which way the shoal of herrings passes: their course being more discernable to those who stand on high cliffs, by means of a blue colour they cause in the water, than to those aboard the vessels. They are also called *huers*, *halkers*, *directors*, &c.

CONDIGNITY.—Merit of CONDIGNITY. See MERIT.

CONDITION, in the civil law, an article of a treaty, or contract; or a clause, charge, or obligation, stipulated in a contract, or added in a donation, legacy, testament, &c.

The donee does not lose his donative, if it be charged with any diftinct or impossible conditions. Lawyers distinguish three kinds of conditions, under which a legacy or donation may be made: these are the *casual*, which depends merely on chance; the *potestative*, which is absolutely in our power; and the *mixed condition*, which is both casual and potestative together.

CONDITION, in common law, is a manner, quality, or restriction annexed to an act; qualifying or suspending the same; and making it precarious and uncertain, whether or no it shall take effect.

In a lease there may be two sorts of conditions, *condition collateral*, and *condition annexed to the rent*.

Collateral CONDITION is that annexed to a collateral or foreign act; as, *v. gr.* that the lessee shall not go to Paris.

Condition is also divided into *condition in deed*, and *condition implied*.

CONDITION in deed, is that knit and annexed by express words to the feoffment, lease, or grant, either in writing, or without.—As if I feoffee a man in lands, reserving a rent to be paid at such a feast; upon condition, if the feoffee fail of payment, it shall be lawful for me to re-enter.

CONDITION implied, called also *condition in law*, is when a man grants to another the office of a steward, bailiff, keeper of a park, &c. for life: though there be no condition expressed in the grant, yet the law makes one covertly; which is, that if the grantee do not justly execute all things belonging to his office, it shall be lawful for the grantor to discharge him.

CONDITION without which, sine qua non, is used in philosophy, in speaking of some accident or circumstance, which is not essen-

tial to the thing, but is yet necessary to its production.

Thus, light is a condition without which a man cannot see objects, though he have good eyes; and thus fire, though considered in itself may burn without wood; yet is its presence a condition without which the wood cannot be burnt.

CONDITIONAL, something not absolute, but subject to limitation and conditions. See CONDITION.

Conditional legacies are not due till till the conditions are accomplished. The right of conquest does not suppose any conditional consent on the part of the people.

The Arminian divines maintain, that all the decrees of God, relating to the salvation and damnation of man are truly conditional; and the Calvinists, that they are all absolute. See ARMINIAN, &c.

In logick, *conditional propositions* admit of all kinds of contradictions, *v. gr.* if my Tranfalpin mule flew, my Tranfalpin mule had wings.

CONDITIONAL conjunctions, in grammar, are those which serve to make propositions conditional.—As, *if, unless, provided that, in case of, &c.*

CONDITIONAL propositions, are such as consist of two parts, connected together by a conditional particle.

Of these, the first, wherein the condition lies, is called the antecedent, and the other the consequent.

Thus, if the soul be spiritual, it is immortal; is a conditional proposition, wherein, *if the soul, &c.* is the antecedent, and *is immortal* the consequent.

CONDITIONAL estate. } See the articles } ESTATE.

CONDITIONAL resignations. } See the articles } RESIGNATION.

Science of CONDITIONALS, i. e. of conditional truths, imports that knowledge which God has of things, considered, not according to their essence, their nature, or their real existence; but under a certain supposition, which imports a condition never to be accomplished.

Thus, when David asked of God whether the people of Keilah would deliver him up to his enemies; God, who knew what would befall in case David should continue at Keilah, told him that they would deliver him: which he knew by the science of conditionals.

Some of the schoolmen deny that God has the knowledge of conditionals: the Thomists maintain, that God's knowledge of conditionals depends on a predetermining decree: others deny it.

F. Daniel observes, that the truths which compose the knowledge of conditionals, being very different from those which compose the knowledge of intuition, and that of understanding; a third class must be added, and the knowledge of God be divided into *intuitive, intellectual, and conditional*. See KNOWLEDGE.

CONDORMIENTES, religious sectaries, whereof there have been two kinds.—The first arose in Germany, in the thirteenth century; their leader was a native of Toledo. They held their meetings near Cologne; where they are said to have worshipped an image of Lucifer, and to have received answers and oracles from him: the legend adds, that an ecclesiastick having brought the eucharist to it, the idol broke into a thousand pieces; which put an end to the worship.

The other species of condormientes, were a branch of Anabaptists in the sixteenth century; so called, because they lay, several of both sexes, in the same chamber; on pretence of evangelical charity.

Safe-CONDUCT. See SAFE-Conduct.

CONDUCTOR, the name of a surgeon's instrument, which being put up into the bladder, serves to guide or conduct the knife, in the operation of cutting for the stone. See LITHOTOMY.

CONDUCTOS *ad profectendum*. See CAPIAS.

CONDUIT, a canal, or pipe, for the conveyance of water, or other fluid matter. See TUBE, &c.

In the earth are several subterraneous conduits, through which the waters pass that form springs; and through which also pass the vapours, which form metals and minerals.—See SPRING, METAL, &c.

Artificial conduits for water, are made of lead, stone, cast iron, potter's earth, &c. See PIPE, and PLUMBERY.

In the province of New Mexico, there is said to be a subterraneous conduit, in form of a grotto, extending 600 miles in length. See DUCT.

CONDYLOMA, in anatomy. See CONDYLUS.

CONDYLOMA*, in medicine, is a soft, painless tumor, of the cedematous kind, arising on the internal coat of the anus, and the muscles of that part, or in the neck of the cord.

* The word comes from *condyla*; in regard the condyloma has usually rugae, or wrinkles, like the joints of the body.

The condyloma, by long continuance, grows fleshy, and shooting out as from a stalk, takes the denomination *fungus*. See FIGUS.

Condylomata are frequently the effect of venereal ailments, and, if neglected, sometimes prove cancerous: their cure depends on mercurial unctions, and proper escharotics to consume them; though extirpation either by ligature or incision, if the nature of the part will admit, is the most expeditious.—A salivation is often necessary, in order to facilitate and complete the cure.

CONDYLUS,

CONDYLUS, *Κονδύλα*, a name which anatomists give to a little round eminence, or protuberance at the extremity of a bone.—See *Tab. Anatomy*, (Osteol.) fig. 2. lit. n. Such is that of the lower jaw, received within the cavity of the os petrosum.

When this eminence is large, it is called the *head* of the bone. **CONE**, in geometry, a solid body, having a circle for its base, and terminated a-top in a point, or vertex.—See *Tab. Conics*, fig. 2. The cone is generated by the motion of a right line, KL, round an immoveable point K, called its *vertex*, along the circumference of a plane, called its *base*, MN: or it may be conceived as generated by the revolution of the triangle KLM, about the right line KL, which is called the *axis* of the cone, and KM its *latus*, or side. See *AXIS*, &c.

If the axis be perpendicular to the base, it is said to be a *right cone*; and if inclined, or oblique, a *scaleneus cone*.—*Scaleneus cones* are again divided into *obtusè-angled*, and *acute-angled*. Euclid defines a cone a solid figure, whose base is a circle, as CD (fig. 3.) and is produced by the entire revolution of the plane of a right-angled triangle CAB, about the perpendicular leg AB. If this leg, or axis, be greater than CB, half the base: the solid produced is an *acute-angled cone*: if less, it is an *obtusè-angled cone*; and, if equal, a *right-angled cone*.

But, Euclid's definition only extends to a *right cone*: that is, to a cone whose axis is at right angles to the base; and not to oblique ones, whose axis is not at right angles to the base. For a more general and comprehensive description of a cone, which may take in both right and oblique ones, suppose, an immoveable point A, (fig. 4.) without the plane of the circle BDEC; and suppose a right line AE, drawn through that point, and produced infinitely both ways, to be moved quite about the circumference of the circle; the two superficies that will arise from this motion, are each called *conic superficies*; but, taken conjunctly, they are called *superficies vertically opposite*, or *only opposite superficies*. See *OPPOSITE*. The immoveable point A, common to both the superficies, is called the *vertex*; the circle BDEC the *base*; the right line AE, drawn through the vertex A and C, the *center of the base*; and if infinitely produced, the *axis*; and the solid comprehended under the conical superficies and the base, is a *cone*.

Properties of the CONE.—1°. The area or surface of every right cone, exclusive of its base, is equal to a triangle whose base is the periphery, and its height the side of the cone.

Or, the curve superficies of a right cone, is to the area of its circular base, as A C, (fig. 3.) the length of the hypotenuse of the right-angled triangle describing it, is to C B, the base of the same triangle: that is, as the slant height of the cone, to the semidiameter of the base.

Hence, the surface of a right cone is equal to a sector of a circle described on the side of the cone, as a radius, whose arch is equal to the periphery of the cone; and has therefore the same proportion to its periphery, which the diameter of the base has to the side of the cone.

Hence we have a method of describing a rete or cage that shall just cover a cone.—Thus, with the diameter of the base A B, (Tab. Conics, fig. 6.) describe a circle, and produce the diameter to C, till A C be equal to the side of the cone. To 2 A C and A B, determined in numbers, and 360°, find a fourth proportional; and with the radius CA, on the center C, describe an arch D E equal to the number of degrees found: the sector C D E with the circle A B will be a rete for the right cone.

If, then, the side of a truncated cone be set off from A to F, and an arch G H be described with the radius C F; by finding a fourth proportional to 360°, to the number of degrees of the arch G H, and to F C; and thence determining the diameter of the circle I F, we shall have a net or cover for the truncated cone.

For C D B A E is a net for the entire cone; C G F I H for the cone cut off; therefore, D B E H I G for the truncated cone.

2°. Cones and pyramids, having the same bases and altitudes, are equal to each other.

Now, it is shewn, that every triangular prism may be divided into three equal pyramids; and therefore, that a triangular pyramid is one third of a prism, standing on the same base, and having the same altitude.

Hence, since every multangular body may be resolved into triangular ones, and every pyramid is a third part of a prism having the same base and altitude; since a cone may be esteemed an infinite-angular pyramid, and a cylinder an infinite-angular prism; a cone is a third part of a cylinder, which has the same base and altitude.

Hence we have a method of measuring the surface and solidity of a cone and a cylinder.—Thus, for the solidity: find the solidity of a prism, or cylinder, having the same base with the cone, or pyramid. Which found, divide by 3: the quotient will be the solidity of a cone, or a pyramid.—Thus, v. gr. if the solidity of a cylinder be 605592960, the solidity of the cone will be found 201864320.

For the surfaces; that of a right cone is had by multiplying the semi-periphery of the base into the side, and adding the product to the base.

Suppose, e. gr. the diameter of the cone N M, (fig. 2.) 56, its

V o l. I.

periphery will be 17584; and the base 246176°. Suppose the altitude of the axis K L, 246; since L M = 1/3 N M = 28; and K M² = K L² + L M² = 60516 + 784 = 61300, K M = 2474°. Consequently, the superficies of the cone, exclusive of the base, is 4² 310' 28" 16"; and the whole together 455645760.

As to the measure of the surface, and solidity of a truncated cone, A B C D, (fig. 7.) Its altitude C H, and the diameters of its bases A B and C D being given, find their circumferences. To the square of the altitude C H, add the squares of the semi-difference of the radii A H, and from the aggregate extract the square root, which will give the side A C: the semi-sum of the peripheries, multiplied by that side, gives the superficies of the truncated cone.

To find the solidity: As the difference of the semidiameter A H is to the altitude of the truncated cone C H, so is the greater semidiameter A F, to the altitude of the entire cone F E. This being found, subtract the altitude of the truncated cone G F, which will leave that of the cone taken off E G.

Find the solidity of the cone C E D and A E D; subtract the other from this; the remainder will be the solidity of the truncated cone A C D B.

For the sections of the CONE, see *CONIC SECTION*.—For the ratio of CONES and cylinders, see *CYLINDER*.—For the centers of gravity and of oscillation of a CONE, see *CENTER*.

CONES of the higher kinds, are those whose bases are circles of the higher kinds; and are generated by supposing a right line fixed in a point, on high, though conceived capable of being extended more or less, on occasion; and moved or carried round a circle.

CONE of rays, in optics, includes all the several rays which fall, from any point of a radiant, on the surface of a glass. See R.

CONFARRICATION, a ceremony among the antient Romans used in the marriage of persons whose children were destined for the honour of the priesthood.

Confarrication was the most sacred of the three manners of contracting marriage among that people; and consisted, according to Servius, in this, that the pontifex maximus and flamen dialis joined and contracted the man and woman, by making them eat of the same cake of salted bread.

Ulpian says, it consisted in the offering up of some pure wheat bread; rehearsing, withal, a certain formula, in presence of ten witnesses. Dionysius Halicarnassensis adds, that the husband and wife did eat of the same wheat bread, and threw part on the victims.

CONFECTIO, in pharmacy, a kind of compound remedy of the consistence of a soft electuary.

There are several electuaries, which bear the name of *confectiones*; some whereof, in the physicians language, are *correctiva*, and others *purgative*.

Of the number of the corroborative *confectiones* are those of *alkermes*, of *hyacinth*, and the *anacardine*: a purgative one is the *confection hamech*. The *confection of alkermes*, has its name from the principal ingredient therein; which is the *hermes*, or *alkermes*, or *scarlet-grain*.—The other ingredients are pearls, musk, cinnamon, ambergris, leaf gold, juice of pippins, and rose-water.—It is ranked among the best cardiacks, and is frequently used for the palpitation of the heart, or syncope; and sometimes in the small-pox and measles.

The *confection of hyacinth* has nearly the same virtues with that of *alkermes*; but, beside, it is frequently used as an astringent.—It consists of near triple the number of drugs; whereof the precious stone, called the *hyacinth*, is esteemed the principal; the chief of the rest are red coral, bole armoniac, terra sigillata, myrrh, the santals, burnt hartshorn, camphire, sapphir, emerald, topaz, and most of the ingredients of the *confection of alkermes*.

The *anacardine confection*, now diffused in England, is composed chiefly of *anacardiuns*, whence the name.—The other drugs are long pepper, black pepper, most kinds of myrobalans, castoreum, &c.—It is used to purge the blood, and is proper in cold diseases.

The *confection hamech* takes its name from that of its inventor, an Arabian physician.—Its ingredients are polydopy, myrobalans, agaric, senna, tamarinds, red roses, manna, colocynth, &c. It is applied as a drastic for the purging of the grosser humours and viscidities; it is also of some reputation in vertiges and cancers.

CONFECTOR, among the antient Romans, a sort of gladiator, hired to fight in the amphitheatre against beasts; thence also denominated *bestiarius*. See *GLADIATOR*.

The *confectores* were thus called *confectiones bestium*, from their dispatching and killing beasts.

The Greeks called them *Παραβολοι*, q. d. daring, rash, desperate; whence the Latins borrowed the appellations *parabolani*, and *parabolarii*. See *PARABOLANI*.

CONFECTS, or CONFITS, a denomination given to fruits, flowers, herbs, roots, and juices, when boiled and prepared with sugar, or honey, to dispose them to keep, or render them more agreeable to the taste.

The antients only *confited* with honey; at present, sugar is more frequently used.—*Confets half figured*, are those only covered with a little sugar, to leave more of the natural taste of the fruit.

Confects are reduced to eight kinds, *viz.* *liquid confects, marmalades, jellies, pasts, dry confects, conserves, candies, and dragees, or sugar-plumbs.*

Liquid confects, are those whole fruits, either whole, in pieces, in seeds, or in clusters, are *confited* in a fluid transparent syrup, which takes its colour from that of the fruits boiled in it.—There is a good deal of art in preparing these well; if they be too little figured they turn; and if too much, they candy. The most esteemed of the liquid *confects* are plums, especially those called mirabels, berberies, quinces, apricots, cherries, orange-flowers, little green citrons from Madera, green cassia from the Levant, myrobalans, ginger, cloves, &c.

Marmalades are a kind of pasts, almost liquid, made of the pulp of fruits, or flowers, that have some consistence; such as apricots, apples, pears, plumbs, quinces, oranges, and ginger.—Marmalade of ginger is brought from the Indies by way of Holland: it is esteemed good to revive the natural heat in old men. See MARMALADE.

Jellies are juices of several fruits, wherein sugar has been dissolved, and the whole, by boiling, reduced into a pretty thick consistence; so as, upon cooling, to resemble a kind of thin transparent glue, or size. *Jellies* are made of various kinds of fruits, especially gooseberries, apples, and quinces: there are other jellies, made of flesh, fish, hartshorn, &c. but they are not to be kept, being very subject to corrupt.

Pasts are a kind of marmalades, thickened to that degree by a proper boiling, as to assume any form, when put into little molds, and dried in the oven. The most in use are those of gooseberries, quinces, apples, apricots, and orange-flowers: those of pistachoes are much esteemed; those of ginger are brought from the Indies. *Dry confects*, are those whole fruits, after having been boiled in the syrup, are taken out again, drained, and put to dry in an oven.—These are made of so many kind of fruits, that it would be hard to explain them all: the most considerable are citron and orange-peel, plumbs, pears, cherries, apricots, &c.

Conserves are a kind of dry *confects*, made with sugar, and pasts of flowers or fruits, &c. the most usual among these are those of roses, mallows, rosemary; of heps, of orange-flowers, violets, jessamin, pistachoes, citrons, and loes.

Note, the apothecaries, under the title of *conserves*, comprehend all kind of *confects*, both dry and liquid; whether of flowers, fruits, seeds, roots, barks, or leaves, prepared with sugar or honey, to preserve, &c.

Candies are ordinarily entire fruits, candied over with sugar, after having been boiled in the syrup; which renders them like little rocks, crystallized; of various figures and colours, according to the fruits inclosed within them.—The best candies are brought from Italy. See CANDY.

Sugar-plumbs, are a kind of little dry *confects*, made of small fruits, or seeds, little pieces of bark, or odoriferous and aromatic roots, &c. incrustated and covered over with a very hard sugar, ordinarily very white.—Of these there are various kinds, distinguished by various names: some made of raspberries, others of berberies, melon-seeds, pistachoes, filberds, almonds, cinnamon, orange-peel, corianders, aniseed, carraways, &c.

CONFEDERACY, an alliance or league between divers princes and states.

CONFEDERACY, in law, is when two or more persons combine to do any damage to another, or to commit any unlawful act.

Confederacy is punishable, though nothing be put in execution: but then it must have these four incidents; 1^o. That it be declared by some matter of prosecution; as by making of bonds or promises to one another: 2^o. That it be malicious, as for unjust revenge: 3^o. That it be false, *i. e.* against the innocent: and lastly, that it be out of court, voluntary.

CONFESSION, in a civil sense, a declaration, or acknowledgment of some truth, though it be against the interest of the party who makes it; whether it be in a court of justice, or out of it. It is a maxim, that in civil matters, the *confession* is never to be divided; but always taken entire. And that a criminal is never condemned on his simple *confession*, without other collateral proofs: nor is a voluntary extrajudicial *confession* admitted as any proof.—A person is not admitted to accuse himself, according to that rule in law, *non auditur perire volens*.

CONFESSION, in a theological sense, is a declaration of a person's sins, made to a priest, in order to obtain absolution for the same. The Romish church makes *confession* a part of the sacrament of penance.

Confession was antiently publick and general, in the face of the church; though the Romanists have since altered it, and made it private, and auricular.

Confessions are to be buried in eternal silence, under pain of the last punishment to the priest who reveals them.

Bellarmin, Valentin, and some other Romish controversy-writers, endeavour to trace up auricular *confession* to the earliest ages; and thus contend for a point given up by the rest. M. Fleury owns that the first instance of auricular *confession* he can meet with, is that of S. Eloi, who being grown old, made a *confession* to a priest of all his sins from his youth upwards.

The Indians, according to Tavernier, have a kind of *confession*;

and the same may be said of the Jews: these last have formulas for those who are not capable of making a detail of all their sins: the ordinary form is in alphabetical order, each letter containing a capital sin. This they usually rehearse on Mondays and Thursdays, and on fast days, and other occasions; some, every night and morning. When any of them find themselves near death, he sends for ten persons, more or less, one of them a rabbin; and in their presence recites the *confession*. See Leo de Modena.

CONFESSIONS OF FAITH, denotes a list, or enumeration and declaration of the several articles of belief, in a church.

The Augsburg *confession* is that of the Lutherans; it was presented to Charles V. in 1530.

In the council of Rimini, the catholic bishops found fault with dates in a *confession of faith*, and observed that the church never used to date them.

CONFESSIONAL, or CONFESSORIAL, in church-history, a place in churches, usually under the main altar, wherein were deposited the bodies of deceased saints, martyrs, and confessors.

CONFESSIONAL is also used in the Romish church for a little box, or desk in the church, where the confessor takes the confessions of the penitent.

CONFESSO.—*PRO CONFESSO*. See the article PRO.

CONFESSOR, a Christian who has made a solemn, and resolute profession of the faith, and has endured torments in its defence.

A meek saint is called a *confessor*, to distinguish him from the roll of dignified saints; such as *apostles, martyrs, &c.*

In ecclesiastical history, we frequently find the word *confessor* used for martyrs: in after-times, it was confined to those, who after having been tormented by the tyrants, were permitted to live and die in peace. At last it was also used for those, who after having lived a good life, died under an opinion of sanctity. According to S. Cyprian, he who presented himself to torture, or even to martyrdom, without being called thereto, was not called a *confessor*, but a *professor*: and if any out of a want of courage abandoned his country, and became a voluntary exile for the sake of the faith, he was called *extorris*.

CONFESSOR is also a priest, in the Romish church, who has a power to hear sinners in the sacrament of penance, and to give them absolution.

The church calls him in Latin *confessorius*, to distinguish him from *confessor*, which is a name consecrated to saints.

The *confessors* of the kings of France, from the time of Henry IV. have been constantly Jesuits: before him, the Dominicans and Cordeliers shared the office between them. The *confessors* of the house of Austria have also, ordinarily, been Dominicans and Cordeliers, but the latter emperors have all taken Jesuits.

CONFIGURATION, the exterior surface, that bounds bodies, and gives them their particular figure.

That which makes the specific difference between bodies, is the different *configuration*, and the different situation of their parts.

A short, or a long sight, depend on the different *configuration* of the crystalline.

CONFIGURATION of the planets, in astrology, is a certain distance, or situation of the planets in the zodiac, whereby they are supposed to aid, or oppose each other. See ASPECT.

CONFIRMATION, the act of ratifying, or rendering a title, claim, pretension, report, or the like, more sure and indisputable.

CONFIRMATION, in law, is particularly used for the strengthening or homologating an estate of one already in possession of it by a voidable title.

Thus, if a bishop grant his chancellorship by patent, for term of the patentee's life; this is no void grant: yet it is voidable by the bishop's death, except it be strengthened also by the dean and chapter's *confirmation*.

CONFIRMATION, in rhetoric, is the third part of an oration, wherein the orator undertakes to prove, by laws, reasons, authorities, and other arguments, the truth of the propositions advanced in his narration.

Confirmation is either *direct*, or *indirect*; the first confirms what the orator has to urge for strengthening his own cause: the second, properly called *confutation*, refutes the opposite arguing of the adversaries. The two parts together are sometimes placed under the head or title of *contention*.

The *confirmation* is, as it were, the life and soul of the oration: in this the main stress of the argumentation lies. Whence Aristotle, properly enough, calls it *crisis, fides*.

CONFIRMATION, in theology, the ceremony of laying on of hands, for the conveyance of the Holy Ghost.

The antients called it *chryisma* and *unction*; among them it was conferred immediately after baptism; and was esteemed, in some measure, to be a part thereof: whence the fathers call it the *accomplishment* of baptism.

Among the Greeks, and throughout the East, it still accompanies baptism; but the Romanists make it a distinct independent sacrament.

It appears that *confirmation* has all along been ordinarily conferred by the bishop: S. Cyprian, and most of the fathers, speak of it in such terms as imply it to have been confined to the bishop alone; and Fleury, and most of the moderns, from them, lay it down as a distinguishing character between the offices of a priest

of deacon, and that of a bishop, that the former might baptize, but the latter alone might anoint and confirm; by virtue of their succession to the apostles, to whom it originally belonged. But from some passages in S. Gregory, &c. others gather, that the priests, on occasion, had likewise the power of confirming. It is certain, among the Greeks, the priest who baptizes also confirms: which practice, Lucas Holstenius shews, is of so old a standing among them, that it is now generally looked on as belonging properly and of right to the priest: though some will have it to have been borrowed by them from the bishops. Hence, some of the Latin divines acknowledge, that though the bishop be the ordinary minister of confirmation, yet, that the priest, in his absence, may also confer it, in quality of minister extraordinary.

The council of Rouen, held in 1072, decrees, that confirmation must be conferred fasting, both on the side of the giver and that of the receiver.

CONFISCATE *, in law, is applied to goods forfeited to the exchequer, or publick treasury.

* The word is derived from *fyfca*, a hamper, panier, or basket, wherein the emperor's money used to be kept.

The title to goods which are not claimed by any other, is given by law to the king. If a man indicted for stealing the goods of another, in which case they become, in effect, the proper goods of him indicted, be asked about them in court, and disclaim them; he thereby loses the goods, though he be afterwards acquitted of the theft, and the king shall have them as *confiscate*: but otherwise, had he not disclaimed them.

CONFISCATION, a legal adjudication of goods or effects to the fisc, or treasury.

Thus, the bodies and effects of criminals, traitors, &c. and merchandizes that are contraband, prohibited, or brought aboard or ashore without paying the duties, when seized, are *confiscated*.

It is an axiom in law, that he who *confiscates* the body, *confiscates* also the effects, to the profit of the king, or the lord of the fee; i. e. he who is condemned to lose his life, must also lose his goods: yet the widows of criminals do not lose their dowries, nor their share in the goods of the community, by the forfeiture of their husbands.

CONFLAGRATION, a general burning of a city, or other considerable place.—In which sense, Nero is said to have procured the christians to be accused of the *conflagration* of Rome, which was done by his own order.

But the word is more ordinarily restrained to that grand period, or catastrophe of our world, wherein the face of nature is to be changed by a deluge of fire, as it was antiently by that of water. The antient Pythagoreans, Platonists, Epicureans, and Stoicks appear to have had a notion of the *conflagration*; though whence they should derive it, unless from the sacred books, is difficult to conceive; except, perhaps, from the Phœnicians, who themselves had it from the Jews.

Seneca, says expressly, *tempus advenit quo sidera sideribus incurrant. & omni flagrante materia una igne, quicquid nunc ex depolito luceat, ardebit*. This general dissolution the Stoicks call *εκπύρωσις*, *εσπύρωσις*. Mention of the *conflagration* is also several times made in the books of the Sibyls, Sophocles, Hytaspes, Ovid, Lucan, &c.

Dr. Burnet, after F. Tachard and others, relate that the Siamese believe that the earth will at last be parched up with heat; the mountains melted down; and the earth's whole surface reduced to a level, and then consumed with fire. And the Bramins of Siam do not only hold that the world shall be destroy'd by fire; but also, that a new earth shall be made out of the cinders of the old. Various are the sentiments of authors on the subject of the *conflagration*; the cause whence it is to arise, and the effects it is to produce.—Divines ordinarily account for it metaphysically; and will have it take its rise from a miracle, as a fire from heaven. Philosophers contend for its being produced from natural causes; and will have it effected according to the laws of mechanics: Some think an eruption of the central fire sufficient for the purpose; and add, that this may be occasioned several ways, *viz.* either by having its intension increased; which, again, may be effected either by being driven into less space by the encroachments of the superficial cold, or by an increase of the inflammability of the fuel whereon it is fed: or by having the resistance of the imprisoning earth weakened; which may happen, either from the diminution of its matter, by the consumption of its central parts, or by weakening the cohesion of the constituent parts of the mass by the excess or the defect of moisture.

Others look for the cause of the *conflagration* in the atmosphere; and suppose, that some of the meteors there engendered in unusual quantities, and exploded with unusual vehemence, from the concurrence of various circumstances, may be made to effect it, without seeking any further.

The astrologers account for it from a conjunction of all the planets in the sign Cancer; as the deluge, say they, was occasioned by their conjunction in Capricorn.

Lastly, others have recourse to a still more effectual and flaming machine, and conclude the world is to undergo its *conflagration* from the near approach of a comet, in its return from the sun.

Those wandering bodies do indeed seem to menace us a little; being able, both by their transverse motion across the earth's

way, by the hugeness of their size, and the intense fire wherewith they glow in their recess from the perihelion, to produce the most signal changes and revolutions in the system of things. See **COMET**.

Mr. Whiston has shewn, that they are extremely well fitted to produce the phenomena of the deluge; and has gone a good way towards proving, that the comet of 1668 was the very body to which that event was owing; as being then in its approach toward the sun, and its atmosphere crouded with the watery vapours it had gathered in those inconceivable cold regions, into which it had fled off in its aphelion.

This same comet, Sir Isaac Newton has calculated, when in its perihelion, December the 8th, was heated by the vicinity of the sun, to a degree 2000 times more hot than red-hot iron: he shews likewise, that it would scarce be cool again in 50000 years.

This same comet, again, Dr. Halley observed November 11, was not above a semidiameter of the earth from the earth's way: so that had the earth at that time been in that part of its orbit, something very extraordinary might have been apprehended: but whether in the way of fire or water, may, perhaps, to some, leave room to doubt: to us it is none; it being scarce conceivable that the comet should bring any vehement degree of heat, out of those bleak regions it comes from, whatever heat it might carry thither.

CONFLUENCE, CONFLUX, the place where two rivers join, and mix their waters. See **RIVER**.

CONFLUENT, in medicine, an epithet given to that species of small-pox wherein the pustules run into one another. See **Small-Pox**.

CONFORMATION, the particular texture and consistence of the parts of any body, and their disposition to make a whole.

We say, light of different colours is reflected from bodies according to their different *conformation*; in opposition to the Cartesianians, who pretend, that reflected light becomes of different colours, according to the different *conformation* of the bodies that reflect it. The *conformation* of the members of an embryo, is not perfect enough to allow of dissection.

CONFORMATION, in medicine, is used to express that make and construction of the human body which is peculiar to every individual.

Hence, a *mala conformatio* signifies some fault in the first rudiments; whereby a person comes into the world crooked, or with some of the viscera, or cavities unduly framed, or proportioned.

—Many are subject to incurable asthma's, from a too small capacity of the thorax, and the like original vitiou *conformations*.

CONFORMITY, in the schools, is the congruency, or relation of agreement between one thing and another: as between the measure, and the thing measured; the object, and the understanding; the thing, and the conception; the thing, and the division thereof, &c. See **CONGRUENCY**.

Occasional CONFORMITY. See **Occasional Conformity**.

CONFRONTATION, the act of bringing two persons in presence of each other, to discover the truth of some fact which they relate differently.

The word is chiefly used in criminal matters; where the witness is *confronted* with the accused; the accused with one another, or the witnesses with one another.

CONFUSED Nation. See the article **NOTION**.

CONFUSION, in a general sense, is opposed to *order*; in a perturbation whereof, *confusion* consists: *e. gr.* when things prior to nature do not precede; or posterior do not follow, &c. See **ORDER**. In a logical sense, *confusion* is opposed to *distinctness*, or *perspicuity*; and may happen, either in words, as when misconstrued or misapplied; or in ideas, as when the idea of any thing presents something along with it, which does not properly belong to that thing.

In a physical sense, *confusion* is a sort of union, or mixture by mere contiguity.—Such is that between fluids of contrary nature, as oil and vinegar, &c. See **UNION** and **MIXTION**.

CONFUTATION, in rhetoric, &c. a part of an oration, wherein the orator seconds his own arguments, and strengthens his cause, by refelling and destroying the opposite arguments of the antagonist.

Confutation makes a branch of what we call the *confirmation*.—The confirmation and *confutation* are sometimes called *contention*. See **CONFIRMATION**.

CONGE *, in the French law, a license, or permission, granted by a superior to an inferior, which gives him a dispensation from some duty to which he was before obliged.

* The word is French: *Ménage* derives it from the Latin *con-matru*, used for *commatru*, and *commearu*, often seen among ancient writers: the Italians say *congedo*.

A woman cannot obligate herself without the *conge* or the license of her husband: a monk cannot go out of his convent, without the *conge* of his superiors.

CONGE d'Elire, is the king's permission royal to a dean and chapter, in time of a vacancy, to chuse a bishop. See **CHAPTER**, **CANON**, and **COLLATION**.

Gwyn observes, that the king of England, as sovereign patron of all bishopricks and other benefices, has antiently the free appointment of all ecclesiastical dignities; investing, first, *per*
bacculin

baeculum & amulum; and afterwards by letters patent: but that, in process of time, he made the election over to others, under certain forms and conditions: as, that they should at every vacancy, ere they chose, demand of the king *come d'elire*, i. e. leave to proceed to election; and after election to crave his royal assent, &c.—He adds, that king John was the first who granted this; which was afterwards confirmed by *stat. Westminster*, and again in the *articuli cleri*.

CONGE, in architecture, denotes a moulding either in form of a quarter-round, or of a cavetto; which serves to separate two members from one another.—See *Tab. Archit. fig. 6*.

Such is that which joins the shaft of the column to the cincture, called also *apophyge*; which, in Greek, signifies escape; the column seeming to spring hence: by the Latin it is called *scapus*, the shaft of the column.

CONGELATION, *Freezing*; the act of fixing the fluidity of any liquid, by cold, or the application of cold bodies: in which it differs from *coagulation*, which is produced by other causes.

Salt-petre *congeals* water in summer. See **ICE**. Metals and minerals are said to be juices *congealed* in the veins of the earth, by their mixing with one another, or with other heterogeneous bodies, or by the consumption and evaporation of their finest parts.

Rock crystal was by the antients held to be nothing but water *congealed* in the mountains. See **CRYSTAL**.—The bites of aspics become mortal, by the sudden *congelation* which they induce on the blood, which stops its circulation.

CONGERIES, a Latin word, sometimes used for a collection, or heap of several particles, or bodies, united into one mass, or aggregate.

CONGESTION, in medicine, a mass, or collection of humours, crowded together, and hardened, in any part of the body; and there forming a preternatural tumor.

Congestion is effected by little and little; in which it differs from *defluxion*, which is more sudden.

CONGIARIUM*, **CONGIARY**, among medalists, a gift, or donative represented on a medal.

* The word comes from the Latin *congus*; in regard, the first presents made the people of Rome consisted in wine and oil, which were measured out to them in *congii*. See **CONOVUS**.

The *congariy* was properly a present made by the emperors to the people of Rome.—Those made the soldiers were not called *congariies*, but *donatives*.

The legend on medals representing *congariies* is **CONGIARIUM**, or **LIBERALITAS**.

Tiberius gave a *congariy* of three hundred pieces of money to each citizen: Caligula twice gave three hundred sesterces a head: Nero, whose *congariies* are the first that we find represented on medals, gave four hundred. See **SESTERCE**.

CONGIUS, an ancient Roman measure for things liquid; containing six sesterces; equal to seven pints English wine measure. The *congus* has also been used in England, as appears by a charter of king Edmund in 946.

CONGLOBATE Glands, in anatomy, those glands whose substance is not divided, but firm, entire, and continued; and their surface smooth and uniform.

They are thus called, in opposition to *conglomerate* glands.

Conglobate glands have each of them an artery which brings them blood, a vein which carries it back again, after the proper juice has been filtrated; and several excretory ducts.

Some of them have a cavity in the middle, with lymphatick vessels, which discharge themselves into a common reservoir, or canal. See **LYMPHATICKS**.

CONGLOMERATE glands, are those which are composed of several little ones; or they are several glandulous bodies joined together under the same common membrane. See **GLAND**. Such are the salival glands, lachrymal glands, the pancreas, &c. which see under their proper articles.

The *conglomerate glands*, besides their arteries, veins, and nerves, are also each furnished with an excretory vessel, ramified throughout their own substance; by means whereof they discharge the liquors they have filtrated into reservoirs.

CONGLUTINATION, the act of gluing, or fastening two bodies together, by the intervention of some third, whose parts are unctuous and tenacious, in the nature of a glue, *gluten*; from whence the word is formed.

In the animal oeconomy, the parts of the body are said to be *conglutinated* by means of their natural moisture; by the help of bandages, as in several cases of surgery; or by the supply of viscid particles.—In which last acceptance, *conglutination* differs little from *accrescion*, or *nutrition*.

CONGREGATION, an assembly of several ecclesiasticks, united so as to constitute a body.

The term is principally used for assemblies of cardinals, appointed by the pope, and distributed into several chambers, for the discharge of certain functions and jurisdictions, after the manner of our offices and courts.

The first is the *congregation* of the holy office, or the inquisition; the second, that of jurisdiction over bishops and regulars: the third that of councils; this has power to interpret the council of Trent: the fourth that of customs, ceremonies, precedences, canonizations, called the *congregation of rites*: the fifth that of

St. Peter's fabrick, which takes cognizance of all causes relating to piety and charity, part whereof is due to the church of St. Peter: the sixth, that of waters, rivers, roads: the seventh, of fountains and streets: the eighth that of the index, which examines the books to be printed or corrected: the ninth that of the government of the whole state of the church: the tenth *de bono regimine*; of which two last, the cardinal-nephew is chief: the eleventh that of money: the twelfth that of bishops; wherein those who are to be promoted to bishopricks in Italy are examined: this is held before the pope: the thirteenth that of consistorial matters; the chief whereof is the cardinal-dean. There is also a *congregation* of alms, which takes care of every thing that relates to the subsistence of Rome, and the state of the church.

CONGREGATION is also used for a company or society of religious; canted out of this or that order; and making, as it were, an inferior order, or a subdivision of the order itself. Such are the *congregations* of the oratory, and those of Cluny, &c. among the Benedictines.

The word is also used for assemblies of pious persons, in manner of fraternities; frequent among the jesuits, in honour of the virgin, &c.

CONGREGATION of Penitence. } See { **PENITENCE**.

CONGREGATION of the holy Trinity. } See { **TRINITY**.

CONGREGATION of the immaculate Conception. See the article **IMMACULATE**.

CONGREGATION of the Lateran. See the article **LATERAN**.

CONGREGATION, in physics, is used by Dr. Grew for the least and lowest degree of mixture; or that wherein the parts of the mixt do not consist with, or adhere to each other, but only touch in one point.

That author declares himself of opinion, that the particles of all fluids only touch in this manner; or that their cohesion only amounts to a *congregation*. See **FLUID**, and **COHESION**.

CONGRESS, **CONGRESSUS**, is used for an assembly of commissioners, deputies, envoys, &c. from several courts, meeting to concert matters for their common good.

The *congress* at the Hague, which held during the course of the war terminated in 1697 by the treaty of Relswick, was composed of the envoys of all the princes in the confederacy against France.

CONGRESS is also used in an obscene sense, for an essay, or trial, made by appointment of a lay or a spiritual judge, in the presence of chirurgions and matrons, to prove whether or no a man be or be not impotent; in order for the dissolving of a marriage. See **IMPOTENCE**.

Neither the civil nor canon law make any mention of this trial of virility by *congress*: it had its origin in France, from the boldness of a young fellow, who in open court, being hard pressed by his wife, demanded the *congress*. The judge, surprized with the novelty of the demand, found it could not be denied, as being the surest evidence the case could admit of.

In time it became a branch in the French jurisprudence, and was authorized by decrees and arrests. It obtained for about the space of 120 years, and was annulled by an arrest of parliament in 1677, as being found precarious; some having failed under the experiment out of mere modesty and shame, which is found to have the same effect with actual impotency.

CONGRUITY, or **CONGRUENCY**, in the schools, a suitability or relation of agreement between things; whereby we come at the knowledge of what may be expected therefrom.

The system of *congruity* in matters of grace consists in this; that God, who knows perfectly the nature of grace, and the dispositions of the will in all the circumstances that shall befall a man, give graces, wherewith, by virtue of their *congruity* with the will of man, considered in those circumstances, man will always infallibly, but not necessarily, do, what God would have him do: in regard, the will, in the language of the *congruists*, does always infallibly, though voluntarily, chuse what appears best.

CONGRUITY, in geometry, is applied to figures, lines, &c. which exactly correspond when laid over one another; as having the same terms, or bounds.

Those things between which there is a *congruity*, are equal, and similar.

Euclid, and by his example, most other geometricians, demonstrate all their elements from the sole principle of *congruity*: M. Leibnitz, and after him Wolfius, substitute the notion of similitude in lieu of that of *congruity*. See **SIMILITUDE**.

CONGRUITY, in a lax sense, is used to express an aptitude in some bodies, to unite, or incorporate; by reason of some similitude or fitness of their figures: as *incongruity* denotes an unfitness of their surfaces for joining together.

Thus, quicksilver will unite with gold, and many other metals, but will roll off from wood, stone, glass, &c. and water, which will wet salt, and dissolve it, will slip off from tallow without adhering to it; as also from a dusty surface, and from the feathers of water-foul.

Two drops of water, or of mercury, will, on contact, immediately join and coalesce; but oil of tartar, poured upon quicksilver, and spirit of wine and oil of turpentine on that, and air

over all, will remain in the same vessel without any manner of union, or mixture with each other.

And the cause hereof, is, that the figures of some bodies will not admit other bodies near enough to be within their spheres of attraction, whence they cannot join, and cohere; but where their fitness of figure will let them approach near enough to feel each others attractive power, then they close and hold together. See COHESION.

CONIC Section, a curve line arising from the section of a cone by a plane.

The conic sections are three, viz. the *elliptic*, *hyperbola*, and *parabola*; beside the *circle*, and the *triangle*, which though they arise from the section of a cone, are not usually considered in that capacity*.

* That the triangle is a conic section, as well as the other four, is shewn by Apollon. in Con. l. 1. p. 3. For the circle it arises either from the section of a cone by a plane parallel to the basis, or from the subtransary section of the scalene cone.—Vid. Apoll. Con. lib. 1. prop. 5.

Though the equations, genesis, and many of the properties, with the ratios, dimensions, &c. of each of the conic sections, be separately given under their respective articles in this work, **ELLIPTIC**, **HYPERBOLA**, and **PARABOLA**; yet, to make the doctrine of conics, which is so considerable a part of the higher geometry, and of such frequent use in the new astronomy, the motion of projectiles, &c. more complete, we shall here put the whole in a new light, and bring it together into one contracted view.

The common intersection, then, of any plane with a conic superficies, we observe, is called a *conic section*: and this section varies, and acquires a different name, according to the different inclinations of the cutting plane. For,

1st, If a cone be any way cut by a plane, through the vertex; and again by another plane parallel to the former plane: then, the section, made in the superficies thereof, is called an *hyperbola*; the plane of which being produced to meet the opposite superficies, will make another section, which is likewise called an *hyperbola*: and both of these, conjunctly, are called *opposite sections*.

2^{ly}, If through the vertex of a cone, a plane passes without the superficies thereof, that is, neither cutting nor touching it; and the cone be again cut by another plane parallel to the former; the section made in the superficies thereof, is called an *elliptic*.

3^{ly}, If a plane touch the superficies of a cone, and the cone be cut by a plane, the section is a *parabola*.

But instead of considering these curves as arising by section of the cone itself, their description, nature, and properties, are found more easy of conception, when considered as drawn on a plane: for which reason, after Des Cartes and most of the later writers, we shall rather chuse to lay them down in this second manner.

Genesis, or construction of the Ellipsis.—To conceive the production and nature of an ellipsis, let H and I, (fig. 13.) be two points, nails, or little pegs, about which put a thread BHI, then putting your finger to the thread, and keeping the same always in an equal tension, move the finger round from the point B, till you return to the same point B again.

By this revolution of the point B, will be described the curve line called the *elliptic*; which differs from the delineation of a circle only in this, that a circle hath only one center, but the ellipsis two: though if the points H and I should come together, into one, the elliptic curve would become perfectly circular.

But by how much greater the distance is betwixt those points, the same length of the thread will remain; by so much the farther is this figure removed from the circular. So that according to the divers proportion of the distance H I to the thread BHI, or to the line DK, which is equal to the same thread, divers species of ellipsis will be described.

But then, if the length of the thread be increased or diminished, in the same proportion as the distance of the points H and I is increased, or diminished, there will indeed be described divers ellipsis, but all of the same species: whence it appears, that ellipsis are not only innumerable in magnitude, but in species also; and reach from a circle to a right line: for, as when the points H and I meet together, the ellipsis becomes a circle; so, when they are removed from each other half the length of the thread, it becomes a right line, both sides meeting together.

Whence also it appears, that every species of ellipsis is no less different from any other, than the extremes of them are different on this side from a circle, and on that from a right line. It also appears from this delineation, that if from a point taken at pleasure in the elliptick periphery, as the point B, you draw two lines to the two central points; these two lines BH and BI, taken together, will be equal to the greatest diameter DK; and consequently, that the sum of them is always given.

In the ellipsis DFKR (fig. 14.) the point C is called the *center*, the points H and I the *foci*, DK the *greater axis*, or *transverse axis*, or the *principal diameter*, or *latus transversum*; and FR the *lesser axis*: all the right lines passing through the center C are *diameters*; and all right lines terminated at the periphery, and divided into two equal parts by any diameter, are called *ordinates*. That part of every diameter intercepted betwixt the vertex thereof, and the ordinate, as M μ , is called the *absciss* thereof. A line drawn from the vertex of the diameter, parallel to the ordinates thereof, as $\nu\theta$, is a *tangent* to the ellip-

sis in that vertex. A diameter parallel to the ordinates of another diameter, is termed a *conjugate diameter*; and the ordinate to the greater axis, which passes through either of the foci, as MA, (fig. 13.) is termed the *principal latus rectum*, or the *parameter* of the greater axis. See CENTER, FOCUS, AXIS, DIAMETER, ORDINATE, PARAMETER, &c.

Properties of the Ellipsis.—1^o. The ordinates of every diameter are demonstrated to be parallel to each other.

2^o. The ordinates of the diameters or axes are perpendicular to the axes themselves; but the ordinates of the rest of the diameters are oblique to their diameters; and in ellipses of divers species, are so much the more oblique, at equal distance from the axis, by how much the proportion of the greater axis to the lesser is the greater; but in the same ellipsis, so much the more oblique, by how much the more remote the diameters are from the axes.

3^o. There are only two conjugate diameters, which are equal each to other; viz. those whose vertices are at equal distances from the vertices of the axes: thus, the diameter VT (fig. 14.) is conjugate, and equal to that other GM; where VF is equal to MF, and VD equal to MK.

4^o. The obtuse angle VCM of these two diameters, which are conjugate and equal, is greater, and the acute angle VCG is less than every other angle contained under the rest of the diameters that are conjugate to each other.

5^o. If the lines μP and νB be semi-ordinates to any diameter, as MG, the square of the semi-ordinate μP is to the square of the semi-ordinate νB , as is the rectangle $M\mu \times \mu G$, to the rectangle $M\nu \times \nu G$; that is, $\nu P g$ is to the rectangle comprehended under the two parts, into which the diameter is divided by the ordinate KP, as $\nu B g$ is to the rectangle under the parts of the diameter made by the ordinate AB.

6^o. The parameter, or latus rectum of any diameter, is a third proportional to that diameter and its conjugate: that is, (in fig. 13.) if the diameter DK is to its conjugate diameter EF, as EF is to Y; then Y is the parameter or latus rectum of the diameter DK: whence AM, an ordinate to the axis through the focus, is, as above, equal to the principal parameter, and is a third proportional to the greater and lesser axis.

7^o. The square of every semiordinate, as MI, is always less than the rectangle made of any absciss whatever, as IK drawn into the latus rectum of its own diameter, or than IKAY. And in figure 14. $P\mu g$ is less than the rectangle made of the absciss $M\mu$, and the latus rectum of MG: from which defect, or *excessus*, this section hath its name.

8^o. If from any point, as B, in figure 13. you draw the right lines BH and BI to the foci, the sum of them will be equal to the greater axis, as was shewed above: and if the angle IBH, comprehended by those lines, be bisected by the right line ba , the line a is perpendicular to the tangent VB in the point B; that is, to the curve in the point of contact.

9^o. The distance of a body turned round in an ellipsis, about the focus H, from the same focus, is the greatest of all in the point K; least of all in the point D; and mean in the points E and F; and that mean distance HF is equal to the greater half-axis DC or CK; as is manifest from the production of the ellipsis.

10^o. The vanishing subtense of the angle of contact, parallel to the distance from the focus, at an equal perpendicular interval from that distance, always remains given and unvaried in the same ellipsis, yea, and in the same parabola and hyperbola too. Thus if dZ be always given, gd also will always remain given in a distance infinitely small.

11^o. The area of the ellipsis is to the area of the circle circumscribed, as the lesser axis is to the greater; and so are all correspondent parts whatsoever among themselves, as MIK, mIK: and the ordinates to the greater axis, as MI, are divided by the elliptick periphery always in the same proportion, so that $M I$ is to $m I$ always in the same proportion; to wit, that of the lesser axis to the greater. And we are to reason in the same manner concerning a circle inscribed in an ellipsis.

12^o. All parallelograms described about the conjugate diameters of the ellipsis, and comprehending the ellipsis, are equal. Thus, the parallelogram $a\gamma d\delta$, fig. 14. is equal to the other parallelogram $e\zeta\nu\theta$: and thus it is every where.

13^o. If a right line always passing through one of the foci be so moved, that the elliptic area described by the same, is proportional to the time; the angular motion of a right line drawn from the other focus to the former line, will be almost equal: thus, in figure 13. if the angular motion of the line HB be so tempered, that the same being according to the reciprocal proportion of the distance accelerated or retarded, describes the area DHB, proportional to the time; the angular motion KIB about the other focus I, will be almost proportional to the time, and consequently without any notable acceleration or retardation, and nearly equal; that is to say, where the ellipsis does not differ much from a circle.

Genesis of the Parabola.—Let DI be an infinite right line, and IL another perpendicular to it; (fig. 15.) then, taking in the line DI, any point, F, let the line FI be bisected in the point T; and let there be taken two threads joined together in the point T, one TI, the other TF: and let a pin fixed to the threads in the point T be moved to the right and left, in such a manner, that

when the pin is in any other position, as in P, the thread T I, which here becomes P L, be always perpendicular to I L; or, which is the same thing, parallel to D I, but equal to the thread T F; which in this case becomes P F, ever passing through the point F.

The curve thus generated by the pin, infinitely produced both ways, is a parabola: in which $g P i T$; $R o$, is called the *periphery*; I D the *axis*, or *principal diameter*; F the *focus*; the point T the *principal vertex*.

An ordinate to the axis through the focus, is equal to the principal latus rectum: all right lines $n i$, or $R Z$, parallel to the axis, are diameters, as dividing the lines $i b$ and $K T$, which are parallel to the tangents at their vertices, into two equal parts; and they are called diameters belonging to the vertices in which they terminate, as T, i.

Properties of the Parabola.—1°. Every diameter, or right line parallel to the axis, bisects all the lines within the figure, which are parallel to the tangent of the vertical point: and these bisected lines are called *ordinates*.

2°. The ordinates of the axis are perpendicular thereto; but the ordinates of the rest of the diameters are oblique to their diameters; and so much the more oblique, by how much the vertex of the diameter is further removed from the principal vertex of the parabola.

3°. The latus rectum, or parameter to every diameter, is a third geometrical proportional to any absciss, and its semi-ordinate; that is, if the latus rectum of the diameter $i n$, or that of the vertex i , be y ; then, as the absciss $i q$ is to the semi-ordinate $q k$, so is that semi-ordinate $q k$ to y .

4°. The principal latus rectum, or that belonging to the axis, is equal to the ordinate $b i$ passing through the focus; and quadruple of F T, the least distance of the focus from the principal vertex.

5°. The latus rectum belonging to any vertex or diameter, is also quadruple of the distance of that vertex from the focus: thus, the latus rectum of the vertex i is quadruple F i , and so it is every where.

6°. The distance of any vertex or point in the parabola whatever, from the focus, is equal to the least distance of the same from the line L L, which is perpendicular to the axis; and is distant from the principal vertex, by a quarter of the principal latus rectum.

7°. The square of every semi-ordinate, as $q k$, is equal to a rectangle made of the latus rectum, of the same vertex as Y, and $i q$ the absciss of the diameter of the vertex. And from the equality of the $\pi\alpha\pi\sigma\lambda\alpha\sigma$, or comparison in the figure, betwixt the rectangle and the square of the semi-ordinate, without any excess or defect, the name of the section is derived.

8°. Since therefore the latus rectum in any diameter is given, the absciss will be as the squares, or in the duplicate ratio of the semi-ordinates. Thus, T F is to T G as $i F q$ is to $g G q$, and so likewise is $i q$ to $i r$, as the square of $q T$ is to the square of $r l$: and thus every where. From whence, also, when the absciss of the axis is equal to the principal latus rectum, or fourfold of the distance from the vertex, it will be equal to its semi-ordinate.

9°. The angle, comprehended by any tangent whatever, and a line from the focus, is equal to an angle comprehended by the same tangent, and any diameter, or the axis. Thus, the angles $i F P$, and $p i n$ are equal: whence, by the way, all the rays of light which fall on the concave part of the surface, produced by the convolution of the parabola about the axis, which fall, we say, on the same parallel to the axis; will be reflected from a concave paraboloid figure to the focus F, and there beget a most vehement burning: from which property, the point F has the name *focus*, and has communicated the same to the like points in the hyperbola and ellipsis.

10°. A parabola, like an hyperbola, does not inclose a space, but stretches out in infinitum.

11°. A parabolic curve always tends more and more, in infinitum, to a parallelism with its diameters; but can never arrive therat.

12°. If two parabolas be described, with the same axis and vertex; the ordinates to the common axis will be cut off by the parabola in a given proportion; and the areas comprehended by the same axis and ordinate, and the respective curves, will be in the same given proportion to one another.

13°. Every parabolic space comprehended betwixt the curve and the ordinate, is to the parallelogram made of the same base and altitude, in a subsecquialteral proportion; that is, as 2 is to 3; and to the external space in a duplicate proportion, or as 2 is to 1: so $q i T$ is to $q i I$, as 2 is to 3; and to $i I T$ as 2 is to 1. From whence it becomes easy to square the parabola.

14°. The distance between the vertex of the axis, and the point where any tangent intersects it, as I, is equal to the absciss of the axis which belongs to the ordinate applied from the point of contact: so T I is equal to T F; and thus it is every where.

15°. All parabolas are like, or of the same species; as are also all circles.

16°. If a diameter be continued through the point of concurrence of two tangents; this diameter will bisect the line that joins the contacts: whose property of the parabola may likewise be understood of the ellipsis, and hyperbola.

Genesis of the Hyperbola.—Suppose a staff or rule of a sufficient length, as I B, (fig. 16.) let I and H be two central points, answering to the foci of an ellipsis, in which let nails be fastened; then, there being tied to one end of the stick, a rope or thread as long again as the stick, let the other end thereof be bored through, and so fixed upon the nail I; and fix the other end of the rope, by a knot, upon the other nail H: which done, laying your finger on the point B, where the rope and staff are tied together, let your finger descend so long, till you have thereby applied, and joined the whole rope to the staff, or rule; the staff having been in the mean while, as it needs must, wheeled about the centre I. Thus, with the point B, the vertex of the angle H B I, you will have described a curve line X B D, which is part of an hyperbola; the whole consisting of that curve which will result from the curve X B D, which hath added to it the curve Y D, the produce of the rule and work, as turned to the other side.

Further, transferring the hole, or knot of the rope to the nail I, and fastening the end of the staff on the nail H, you will describe another hyperbola, vertically opposite to the former, which will be altogether like and equal thereto. But if, without changing any thing in the rule and nails, you only apply a longer rope; you will have an hyperbola of a different species from the former: and if you still lengthen the rope, you will have still other sorts of hyperbolas; till at length, making the rope double the length of the rule, you will have the hyperbola changed into a right line.

But if you alter the distance of the nails, in the very same proportion in which you change the difference between the length of the rope, and that of the stick; in this case you will have hyperbolas marked out, which are altogether of the same species, but have their similar parts differing in magnitude.

Lastly, if the length of the rope and rule be equally increased, their difference in the mean while, and the intervals of the nails remaining the same; not a different hyperbola, either as to species or magnitude, will be described, nor any other than a greater part of the same hyperbola.

It must be owned, however, that many properties of an hyperbola are better known from another manner of generating the figure, which is as follows: Let L L and M M, (fig. 17.) be infinite right lines intersecting each other at any angle whatever, in the point C: from any point whatever, as D or e , let D c D d be drawn parallel to the first lines; or $e c$, $e d$; which, with the lines first drawn, make the parallelograms, as D c C d, or $e c C d$. Now, conceive two sides of the parallelogram, as D c D d, or $e c e d$, to be so moved, this way and that way, that they always keep the same parallelism; and that at the same time the areas always remain equal; that is to say, that D c and $e c$ remain always parallel to M M; and D d or $e d$ always parallel to L L; and that the area of every parallelogram be equal to every other, one side being increased in the same proportion wherein the other is diminished: by this means, the point D or e will describe a curve-line within the angle comprehended by the first lines; which is altogether the same as that described above. So also in the angle vertically opposite will be described a like and equal hyperbola; if the parallelogram C c K d, equal to the former, be supposed to be moved, in the same manner as before: which hyperbolas are, as was said before, called *opposite sections*, or *opposite hyperbolas*.

In each figure, D K is the *transverse axis*, or *transverse diameter* of the hyperbola or the *opposite sections*; the point C the *centre*; H and I the *foci*. In the latter figure, all the lines passing through the centre C, as $i b$, are *diameters*: but if hyperbola's be described in the following angles, as L C M, M C L, those sections will be called *following sections*: and if the distance of the primary vertex of those hyperbola's from the common centre C, as C β , or C γ , be equal to the semi-tangent K r or K o, at the primary vertex of each, those sections are called *conjugate sections*: and all the figures together form the *hyperbolic system*.

Further, $i b$ the ordinate to the axis through the focus, is equal to the principal latus rectum, or the parameter of the axis; and an indeterminate diameter which is parallel to the ordinates of any determinate diameter, is called the *conjugate diameter* of the same.

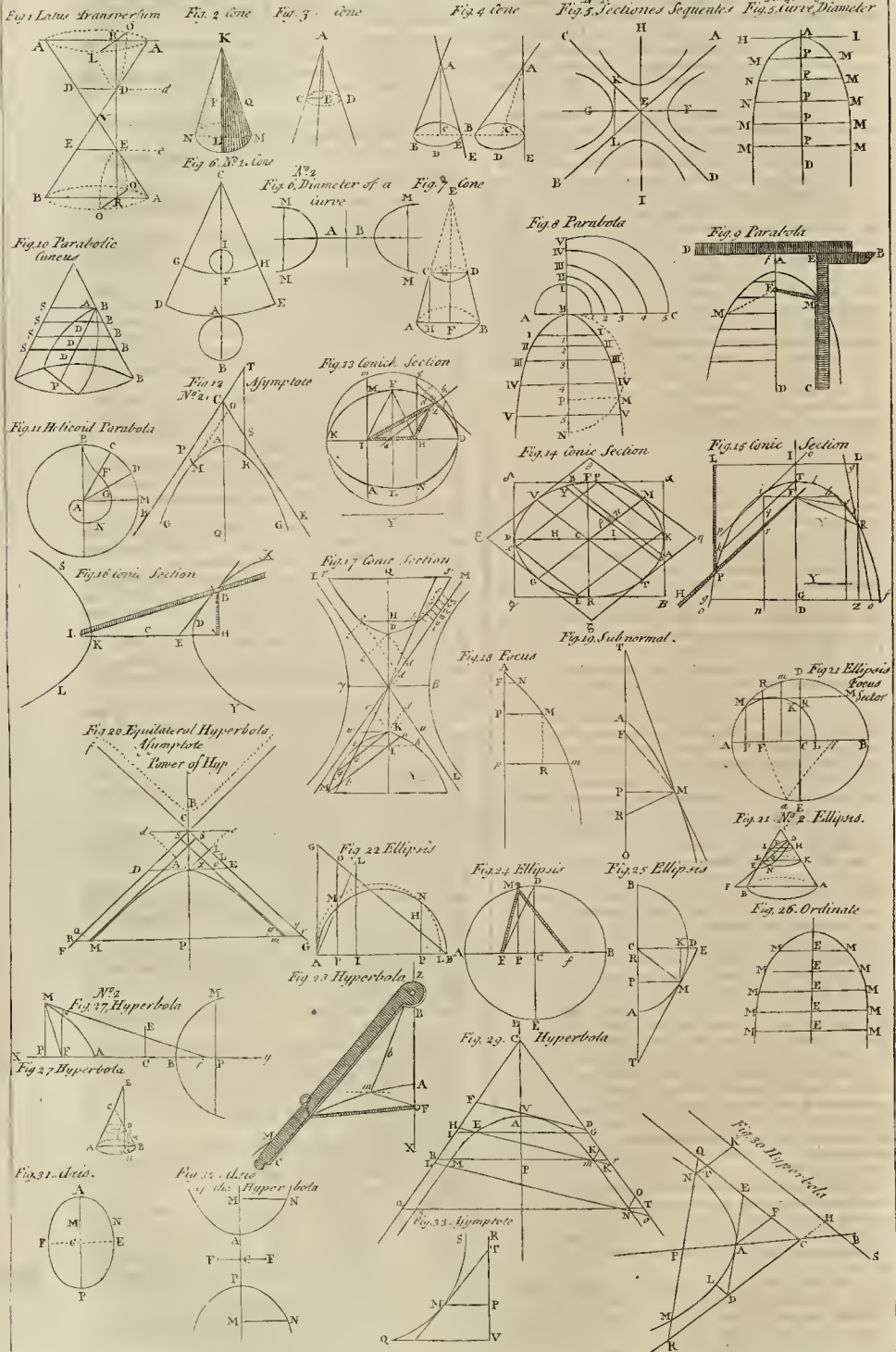
Properties of the Hyperbola.—1°. Any diameter or right line passing through the centre, bisects all its ordinates; that is, all the right lines which are terminated on both sides by the hyperbolic periphery.

2°. The ordinates of the axis are perpendicular to the same; but the ordinates of the rest of the diameters are oblique to their diameters: and so much the more in divers species, at equal distances from the axis, by how much the difference of the angles including the hyperbola's is the greater: and in the same hyperbola, so much the more oblique, by how much the diameters are further removed from the axis.

3°. If any lines, as H b and Q s, be semiordinates to any diameter whatever, as K D; the square of the semi-ordinate H b, is to the square of the semi-ordinate Q s, as the rectangle K H D H is to the rectangle K Q D Q; and so the square $b n$ is to the square $a k$, as the rectangle $i b b b$, is to the rectangle $i a b a$: and thus every where.

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TAB: CONICKS



4^o The latus rectum, or parameter of every diameter, is a third geometrical proportional to the diameter, and the conjugate thereof, (or its tangent, which is equal to it :) that is, if the latus rectum of any diameter, as DK, be y ; then, as the diameter DK is to its conjugate βr , or is equal ωr ; so is that conjugate βr , or that tangent ωr to y . And as the ordinate to the axis through the focus is the principal latus rectum, so it is more than double of the least distance of the focus from the vertex.

5^o The square of any semi-ordinate, as Qr, is greater than a rectangle made of the absciss DQ, drawn into the latus rectum of its own diameter, as y : and, in like manner, the square of the semi-ordinate bn , is greater than the rectangle of the absciss ib , into the latus rectum of the diameter bi . From which $\omega m \omega n$, or excess, this section hath its name.

6^o If from any point of the hyperbola, as B, (fig. 16.) there be drawn right lines to both the foci, as BH, B1, the difference of these lines will always be equal to the axis DK; as will easily appear from the delineation itself.

7^o If the angle HBI, comprehended by lines drawn to the foci, be bisected by the right line EB, that right line will be a tangent to the hyperbola in the point B.

8^o The right lines LL and MM, (fig. 17.) which inclose the hyperbola's, are asymptotes of the hyperbola's; that is, they are such, to which, on both sides, the curve approaches nearer and nearer, but is never able to touch or coincide therewith.

9^o The species of hyperbola's are various, according to the different magnitude of the angle LCM, comprehended by the asymptotes; but that angle remaining the same, the species of the hyperbola remains unchanged: yet according to the different magnitudes of the parallelograms, by which hyperbola's are described, hyperbola's of divers magnitudes do arise: if the angle contained by the asymptotes be a right angle, the hyperbola is called *equilateral*, or *rectangular*; and the latus rectum of all the diameters will (as in a circle) be equal to the diameters.

Lastly, if hyperbola's be described about the same axis in divers angles of the asymptotes, the right lines perpendicular to the axis will be cut off in a given proportion by them all; and the spaces likewise inclosed by the right lines, or ordinates, the produced axis, and the curves, will be in the same given proportion.

10^o If the distances from the center of the hyperbola, be taken in a geometrical proportion in one of the asymptotes, so that C1, CII, CIII, CIV, CV, C VI, be in continued geometrical proportion; and if from those points there be drawn parallel to the other asymptote the lines, I1, II2, III3, IV4, V5, VI6, the spaces I2, II3, III4, IV5, V6, will be equal among themselves. And consequently, if that asymptote CM be supposed to be divided, according to the proportion of number exceeding one another in a natural series, those spaces will be proportional to the logarithms of all those numbers.

Common properties of all the CONIC Sections.—From the whole it may be gathered, 1^o That the *conic sections* are in themselves a system of regular curves, naturally allied to each other; and that one is changed into another perpetually, when it is either increased, or diminished, *in infinitum*.

Thus, the circle, the curvature thereof being never so little increased or diminished, passes into an ellipse; and the ellipse, its centre going away infinitely, and the curvature being by that means diminished, is turned into a parabola, and when the curvature of the parabola is never so little changed, there ariseth the first of the hyperbola's; the species whereof, which are innumerable, will all of them arise orderly by a gradual diminution of the curvature; till the curvature vanishing away, the last hyperbola ends in a right line perpendicular to the axis. From whence it is manifest, that every regular curvature, like to that of a circle, from the circle itself to a right line, is a conical curvature, and is distinguished with its peculiar name, according to the divers degrees of that curvature.

2^o That the latus rectum of a circle, is double to the distance from the vertex: that all the latera recta of ellipses, are in all proportions to that distance betwixt the double and quadruple, according to their different species: that the latus rectum of the parabola is just quadruple of that distance; and, lastly, that the latera recta of hyperbola's are in all proportions beyond the quadruple, according to their various kinds.

3^o That all diameters in a circle and ellipse, intersect one another in the centre of the figure within the section: that in the parabola they are all parallel amongst themselves, and to the axis; but that in the hyperbola they intersect one another, but this without the section, in the common centre of the opposite sections.

4^o That the curvature, with respect to the focus, in all these figures, is increased or diminished proportionally.

CONICKS, that part of the higher geometry, or geometry of curves, which considers the cone, and the several curve lines arising from the sections thereof. See **GEOMETRY**.

Similar CONIC sections. See the article **SIMILAR**.

CONFIFEROUS, a term applied to such trees, shrubs, or herbs, as bear a squamous or scaly fruit, of a woody substance, and a figure approaching to that of a cone; in which there are usually many seeds, and when they are ripe, the several cells or partitions in the cone gape or open, and the seeds drop out.—

Of this kind are the firr, the pine, beech, and the like. **CONJOINT**, or **CONJUNCT**, is applied in the ancient musick, in the same sense as *consonant*, to two or more sounds heard at the same time. See **CONSONANCE**.

CONJOINT degrees, two notes which immediately follow each other in the order of the scale; as *ut* and *re*.

CONJOINT tetrachords, are two tetrachords, where the same chord is the highest of the one, and the lowest of the other. See **CHORD**.

CONISOR, or **COGNISOR**, in law, is used in the passing of fines, for him that acknowledges the fine. See **FINE**.

He to whom the fine is acknowledged, is called the *cognizee*, or *confisee*.

CONJUGATE diameter, or *axis*, in conicks, is a right line bisecting the transverse diameter. See **DIAMETER**, **CONIC section**, and **AXIS**.

CONJUGATE axis, of an ellipse, is the shortest diameter, or axis, bisecting the longer, or transverse axis.—Such is FF, Tab. *Conicks*, fig. 31.

It is demonstrated, 1^o That in an ellipse, the *conjugate axis* is a mean proportional between the transverse axis and the parameter. 2^o The square of the *conjugate axis*, is to that of the transverse, as the square of the semi-ordinate is to the rectangle of the segments of the axis. 3^o That a right line drawn from the focus to the extremity of the semi-*conjugate axis*, is equal to the transverse semi-axis.

Hence, the *conjugate axes* being given, the focus is easily determined. See **FOCUS**. And the ellipse thence easily described.

CONJUGATE axis, in an hyperbola, is a mean proportional between the transverse axis and the parameter.

It is thus called, because the *conjugate axis* of an ellipse has the same ratio—in an hyperbola, the square of the *conjugate axis*, is to the square of the transverse, as the parameter to the transverse axis.

CONJUGATION, in grammar, an orderly distribution of the several parts, or inflexions of verbs, in their different moods and tenses, to distinguish them from each other.

The Latins have four *conjugations*, distinguished by the terminations of their infinitive, *are, ere, ere, ire*; and most of the French grammarians reduce the *conjugations* of their language to the same number; ending in *er, re, ir, and air*.

In English, where the verbs have scarce any natural inflexions, but derive all their variations from additional particles, pronouns, &c. we have hardly any such thing as strict *conjugations*. See **MOOD**.

CONJUGATION, in anatomy, is understood of a pair of nerves; or two nerves, arising together, and serving for the same operation, sensation, or motion; there being scarce any nerve in the body without its fellow. See **NERVE**.

The ancient physicians only knew of seven pairs, or *conjugations* of nerves; the moderas have discovered thirty new ones. See **CONJUNCT**. See the article **CONJOINT PAIR**.

CONJUNCT sentence. See the article **SENTENCE**.

CONJUNCTION, in astronomy, the meeting of two stars, or planets, in the same optical point of the heavens, *i. e.* in the same degree of the zodiack.

If the two bodies meet both in the same degree of longitude and latitude, a right line drawn from the eye through the centre of one of them, passes through that of the other; and the *conjunction* is said to be *true*.

If the lower hides the upper, the *conjunction* is said to be *corporal*; and if the same right line, continued back from the two centres through the eye, do also pass through the centre of the earth, the *conjunction* is said to be *central*.

If the line pass wide of the centre of the earth, the *conjunction* is said to be *partile*.

If the bodies do not meet precisely in the same degree, but are joined with some latitude, the *conjunction* is said to be *apparent*.

—Thus, when a right line, supposed to be drawn through the centres of two planets, does not pass through the centre of the earth; but through the eye of the spectator: it is said to be an *apparent conjunction*.

Conjunctions are also divided into *great* and *greatest*: *great conjunctions* are those which only happen at considerable distances of time from each other; as that of Saturn and Jupiter, which happens every twenty years.

Greatest conjunctions are those which happen in times very remote; as the *conjunction* of the three superior planets, Mars, Jupiter, and Saturn, which only return once in 500 years. But this division has little place in astronomy; being founded on the notion of the particular influences, &c. of the heavenly bodies in such and such aspects.

Astrologers maintain, that the deluge was owing to a *conjunction* of all the planets in Capricorn; and that the conflagration will be occasioned by their *conjunction* in Cancer: whence they pretend to foretel the end of the world.

The *conjunction* is the first, or the principal of all the aspects; and that whence the other aspects commence; as opposition is the last, where they terminate.

The moon is in *conjunction* with the sun every month. See **MOON**, and **MONTH**.—Her *conjunctions* and oppositions are called by a general name, *syzygies*.

Eclipses of the sun never happen, but when there is a *conjunction* of the sun and moon in the nodes of the ecliptic.

CONJUNCTION, in grammar, a particle which expresses a relation or dependence between words, and phrases; thus called, because serving to join, or connect the parts, or members of a discourse.

The *conjunction* is the sixth of the eight vulgar parts of speech. *Conjunctions* render the discourse more smooth and fluent; and serve very good purposes in the argumentative, and narrative style; but they must ever be omitted where a person speaks with emotion, as only serving to weaken and enervate it. Boileau observes, that nothing gives more warmth and life to a discourse, than to drop the *conjunctions* or copulatives: a passion, adds he, embarrassed with *conjunctions* and useless particles, loses all the fire and vehemence it would get in its progress.

Conjunctions are of various kinds.—*Copulative* or *conjunctive* **CONJUNCTIONS**, are those which express a relation of union, or comparison between things: as, *and, et; only, tantum; as much as, tantum quantum; in the same manner as, quemadmodum; neither more nor less, tantundem; inasmuch as, quippe; not only, but also, non modo, sed etiam, &c.*

CONJUNCTIONS adverbial, those which express a restriction, or contrariety.—As, *but, sed; nevertheless, tamen; although, etiamsi; far from, adeo non.*

CONJUNCTIONS causal, those which shew that the reason of something is brought.—As, *for, nam; because, quia; seeing, quippe; the rather since, eo magis quo; inasmuch as, quatenus.*

CONJUNCTIONS conclusivæ, those which denote a consequence drawn.—As, *for which reason, quapropter; but then, atqui; of consequence, ideoque; so that, ita ut, &c.*

CONJUNCTIONS conditional, are those which import a condition.—As, *if, si; if not, si minus; on condition that, ea lege ut; provided that, dummodo; in case of, si vero.*

CONJUNCTIONS continuatives, those which express a succession, or continuation of the discourse.—As, *in effect, reipsa; even, etiam; whatever it be, quicquid sit.*

CONJUNCTIONS disjunctivæ, those which express a relation of separation or division.—As, *neither, nec; whether, sive; or, vel.* See **DISJUNCTIVE**.

CONJUNCTIONS dubitative, those which express some doubt, or suspension of opinion.—As, *if; that is to say, if, &c.*

EXCEPTIVE CONJUNCTIONS are, *if it be not, nisi si; unless that, nisi, &c.*

CONJUNCTIVA, *tunica, adnata, or albuginea*, in anatomy, the outermost coat, or membrane of the eye; so called, because it incloses all the rest; or because it fastens the eye in its orbit.

It is very smooth, when found, and is of a white colour, like alabaster; whence it is ordinarily called *the white of the eye*. It is said to have its rise from the pericranium, and to be only a continuation or extension thereof.

It does not invest the globe of the eye intire; but terminates at the edge of the sclerotica.

It is covered with a vast number of fine veins and arteries, which never appear, unless when the motion of the blood is more than usually rapid, as in ophthalmia's; or when the vessels are more full and distended than ordinary, as in drunkenness.

CONJURATI fratres. See the article **FRATRES**.

CONJURATION, magick words, characters or ceremonies, whereby evil spirits, tempests, &c. are supposed to be raised, or driven away.

The Romish priests pretend to expel devils, by preparing holy water in a particular manner, and sprinkling it over the possessed, with a number of *conjurations*, and exorcisms.

Some authors make the difference between *conjuratio* and *witchcraft* to consist in this; that the former effects its end by prayers, and invocation of God's name, &c. to compel the devil to do what is desired; so that the conjuror is supposed to be at war with the devil, and that evil spirit to act merely out of constraint: whereas the latter attains its end by an immediate application to the devil himself; and the devil's compliance is supposed to be the consequence of some compact between them: so that the devil and the witch have a good understanding with one another.

But these, again, differ from *enchantment* and *forcery*; in that these latter are pretended to operate secretly, and slowly, by spells, charms, &c. without ever calling on the devil, or having any conference with him. See **CHARM**, &c.

CONN, in the sea-language. See **COND**.

CONNECTION, or **CONNEXION**, a relation whereby one thing adheres to, or depends on another.

Euclid's propositions have such a *connection* among themselves, that the latter cannot subsist without the former.—Philosophers are at a loss as to the manner of the *connection* between soul and body; between causes and effects, &c.

CONNECTION, or *continuity* in the drama, consists in the joining of the several scenes together.

When the scenes of an act succeed one another immediately, and are so joined as that the stage is never left empty, the *connection* is said to be observed.

CONNER.—ALE-**CONNER**. See the article **ALE-CONNER**.

CONNIVENTES *valvulae*, in anatomy, wrinkles, or corrugations in the inner coat, or membrane of the two large intestines, the jejunum and ileum.

They are formed as the rugæ of the stomach, *viz.* by the inner coat's being larger than the outer. These folds, or corrugations, some anatomists imagine in some measure to do the office of valves; by straitning the passages, and consequently impeding the motion of their contents: by which means, the lacteals have the more time to imbibe the chyle. See **LACTEAL**, **CHYLE**, and **DIGESTION**.

CONNOISSEUR, a French term, of late used in English: it literally denotes a person well versed in anything; being formed of the verb *connoître*, to know, understood.—Hence it comes to be used in our language for a critic, or person who is a thorough judge, or master, in any way; particularly in matters of painting, and sculpture.

CONOID, **CONOIDES**, in geometry, a solid body, resembling a cone, except in this, that instead of a perfect circle for its base, it has an ellipsis, or some other curve approaching thereto.

The *conoid* is produced by the entire circumvolution of a conic section around its axis; and according to the denomination of the section from whence it is generated, it is differently denominated: if, *v. gr.* the solid be produced by the motion of a parabola, it is called a *parabolic conoid*; if by that of an hyperbola, an *hyperbolic conoid*; and an *elliptic conoid*, or a *spheroid*, when produced by the rotation of an ellipsis, around one of its axes.

The famous solid of the least resistance, Sir Isaac Newton, M. Fatio, and the marquis de l'Hopital, have demonstrated to be a *conoid*.

CONOIDES, or **CONARIUM**, is a name given by anatomists to a gland found in the third ventricle of the brain, resembling a pine-apple; whence M. Des Cartes called it *pinealis*; and has fixed there the seat of the rational soul. See **PINEAL gland**.

CONSANGUINITY, the relation of kinship, between persons of the same blood, or sprung from the same root.

Marriage is prohibited by the church, to the fourth degree of *consanguinity*, inclusive; but by the law of nature, *consanguinity* is no obstacle to marriage, except it be in the direct line.

Consanguinity terminates in the sixth and seventh degree, excepting in the succession to the crown; in which case, *consanguinity* is continued to infinity.

The civilians call *fratres consanguinei*, those born of the same father; in opposition to *fratres uterini*, who are only born of the same mother.

According to the common opinion, these were not allowed to complain of an inofficious testament, *i. e.* of being disinherited without cause; excepting from the turpitude of the person appointed heir in their place. But Van Water endeavours to shew the contrary; and urges, that the *consanguinei* might plead inofficiousity, even where the testament was not made in favour of a person incapable.

CONSCIENCE, **CONSCIOUSNESS**, in ethics, a secret testimony or judgment of the soul, whereby it gives its approbation to things it does that are naturally good; and reproaches itself for those that are evil.

Or, *conscience* is a dictate of the understanding power, concerning moral actions; considered as it has the knowledge of laws; and consequently as conscious of what is to be done, or not done, with regard to the legislator.

In the more popular sense of the word, *conscience* is a judgment, either true or false, whereby we pronounce a thing good or evil. This makes what we call the *inner forum*, or tribunal.

Some divines maintain, that *conscience* is infallible; and hold it to be that immutable law whereby God will judge men: they deny that the understanding can be the source of errors, and lay them all at the door of the will. A man, say they, may secure himself from error, by forbearing to judge of things till he have a clear and distinct perception thereof.

Some of the schoolmen distinguish between the *conscience* antecedent to an action, and that consequent thereto: the first, called *antecedent conscience*, determines what is good and what evil; and consequently prescribes what is to be done, and what avoided.

Consequent conscience is a kind of secondary or reflex judgment, with regard to the goodness, &c. of things already done or committed.

The rule of *conscience* is the will of God, so far as it is made known to us, either by the light of nature, or by that of revelation.

With respect to the knowledge of this rule, *conscience* is said to be *rightly informed*, or *mistaken*; *firm*, or *wavering*, or *servubus*, &c.—With respect to the conformity of our actions to this rule when known, *conscience* is said to be *good*, or *evil*, &c.

Philosophers, in lieu of the word *conscience*, which seems appropriated to theological matters, ordinarily use that of *consciousness*; whereby they mean an inner sentiment of a thing, whereof one may have a clear and distinct notion.—In this sense, they say, that we do not know our own soul, nor are assured of the existence of our own thoughts, otherwise than by *self-consciousness*.

CONSCRIPT, **CONSCRIPTUS**, a popular term in the Roman history, used in speaking of fenators, who were called *conscripti fabiani*, *patres conscripti*; by reason that their names were written in the register, or catalogue of the senate.

Livy, l. i. c. 1. tells us, that when Brutus filled up the places of the fenators cut off by Tarquin, with others chosen out of the equestrian order, those new fenators only had the appellation given them of *patres conscripti*. But it is certain, that in after-times, all the fenators were called *patres conscripti* without any distinction.

CONSECRATION, the act of converting, or setting apart any profane, or common thing, to a pious purpose; with certain ceremonies, prayers, benedictions, &c. appropriate thereto. *Consecration* is the reverse of sacrilege and profanation, which consist in perverting a thing set apart for a pious purpose, to a profane and popular one.

The bishop *consecrates* a church, or a chalice; the pope *consecrates* medals, agnus dei's, &c. and grants indulgences to those who bear them about them with devotion.

The *consecration* or dedication of a church, is an episcopal ceremony, consisting in a great number of benedictions, with aspersions and unctions of chrism, &c. on the walls, both within and without.

The custom of *consecrating* persons, temples, altars, vestments, utensils, &c. is very ancient; and all the ceremonies thereof are prescribed under the old law. Under the new law, when those *consecrations* relate to men, and are performed by appointment of Jesus Christ, they are properly called *ordinations*; excepting those performed to bishops and kings, which still retain the name of *consecration*.

Those which only consist in a ceremony instituted by the church, are more properly called *benedictions*. See **BENEDICTION**.

When they regard churches, altars, vessels, &c. they are properly called *dedications*. See **DEDICATION**.

CONSECRATION is particularly used for the benediction of the elements in the eucharist.

The Romanists define it, the conversion of the bread and wine into the real body and blood of Jesus Christ: and that this is the sentiment of their church, is evident from the priest's elevating the host immediately after *consecration*, for the people to adore it. See **ELEVATION**, &c.

There is a great controversy between the Latin and Greek churches, touching the words of *consecration*: the common opinion among the Romanists, agreeable to St. Thomas and the schoolmen, is, that the *consecration* of the bread and wine consists in these words, *This is my body; this is my blood*. The Greeks, on the contrary, attribute the change of the elements to a certain prayer which they call the *invocation of the Holy Ghost*, rehearsed after the words *this is my body, this is my blood*, which the Greeks maintain are only necessary in the process of the *consecration*, as they contain the history of the institution; not as they contribute any thing to the change.

CONSECRATION, among medalists, is the ceremony of the apotheosis of an emperor; or his translation into heaven, and reception among the gods: the process whereof, see under **APOTHEOSIS**.

On medals, the *consecration* is thus represented; on one side is the emperor's head, crowned with laurel, sometimes veiled, and the inscription gives him the title of *divus*: on the reverse is a temple, a bustum, an altar, or an eagle taking its flight towards heaven, either from off the altar, or from a cippus: at other times the emperor is seen in the air, born up by the eagle; the inscription always, **CONSECRAO**.

These are the usual symbols: yet on the reverse of that of Antoninus, is the Antonine column.—In the apotheosis of empresses, instead of an eagle there is a peacock.

For the honours rendered these princes after death, they were explained by the words *consecratio*, *pater*, *divus*, and *deus*.—Sometimes, around the temple or altar are put, *memoria felix*, or *memoria eterna*: for princeless, *aternitas*, and *sideribus recepta*; on the side of the head, *dea*, or *Dea*.

CONSECUTARY, a proposition that follows, or is deduced from some preceding definition, lemmata, axioms, conclusions, or the like.—Some rather chuse to call it a *consequence*; and others a *corollary*, &c.

CONSECUTIVELY, **CONSECUTIVE**, in the school-philosophy, is sometimes used in opposition to *antecedently*, and sometimes to *effectively*, or *causally*.

Thus, say the schoolmen, the corruption of one thing is the generation of another, not *effectively*, but *consecutively*: that is, since matter cannot be without form, it is necessary that the generation of one thing follow upon the corruption of another.

CONSENT of parts, in the animal oconomy, a certain agreement, or sympathy, by means whereof, when one part is immediately affected, another, at a distance, becomes affected in like manner.

This mutual accord, or *consent*, is doubtless effected by the commerce of the nerves, and their artful distribution and ramification throughout the body.

The effect is so sensible, as even to come under the physicians

cognizance: thus, the stone in the bladder, by vellicating the fibres there, will pain and draw them so much into spasms, as to affect the coats of the bowels in the same manner, by the inter-mediation of nervous threads, and make a colic there; and also extend their twitches sometimes as far as the stomach, and occasion grievous vomitings: the remedy, therefore, in such cases, is to regard the part originally affected, how remote and grievous soever may be the consequences and symptoms in other places.

The fifth conjugation of nerves branched to the parts of the eye, the ear, those of the mouth, cheeks, præcordia, and parts adjacent, &c. is supposed by naturalists to be the instrument of that particular and extraordinary *consent* between those parts. Hence it is, that a favourable thing seen or smelt, excites the appetite, and affects the glands and parts of the mouth; that a shameful thing seen or heard, affects the cheeks with blushes; on the contrary, if it please, it affects the præcordia, and excites the muscles of the mouth and face to laughter; if it grieve, it affects the glands of the eyes, so as to occasion tears, and the muscles of the face, putting them into an aspect of crying.

Dr. Willis, quoted by Mr. Derham, imputes the pleasure of kissing, and its effects in exciting love, and even lechery, to this pair of nerves; which being branched both to the lips and the genital parts, when the former are affected, an irritation is occasioned in the latter: and Dr. Sachs judges it to be from the *consent* of the labia uteri with the labia oris, that a breeding lady, frighted with the sight of scabby lips, had pustules of the like kind broke out in the labia uteri.

CONSEQUENCE, in philosophy, the conclusion of a reasoning, or argument.

The two premises of a syllogism being granted, the *consequence* must also be granted.

In a more restrained signification, *consequenter* is used for the relation or connection between two propositions, whereof one follows, or is inferred from the other.—Thus: *It is an animal, and therefore feels*.

CONSEQUENT, the last proposition of an argument; being something deduced or gathered from a preceding argumentation. An enthymeme only contains two propositions, the *antecedent*, and *sequela*, or *consequent*: if the antecedent be absurd, the *consequent* must be so too.

CONSEQUENT, in a more precise sense, is used for the proposition which contains the conclusion, considered in itself, and without any regard to the antecedent: in which sense, the *consequent* may be true, though the consequence be false. For instance; virtue ought to be rewarded; therefore temperance is a virtue.

CONSEQUENT of a ratio, in arithmetick, the latter of the two terms of a ratio; or that to which the antecedent is referred. See **RATIO**, and **PROPORTION**.

Thus, in $a : b$, or a to b , b is the *consequent*, a the antecedent.

CONSERVATIVE Sature. See the article **SUTURE**.

CONSERVATOR, an officer established for the security and preservation of the privileges granted some cities, and communities; or, a person who has a commission to judge of, and decide, the differences arising among them.

In most catholick universities, there are two *conservators*; the *conservator* of royal privileges, or those granted by kings; and the *conservator* of apostolical privileges, or those granted by the pope.

The first takes cognizance of personal and mixt causes, between the regents, students, &c. and the latter of spiritual matters between ecclesiastics.

Antiently, there were appointed *conservators* of treaties of peace between princes; which *conservators* became judges of the infractions made on a treaty, and were charged with the procuring satisfaction to be made. These were usually the feudataries of the several powers.

In lieu of *conservators*, princes now have recourse to other indifferent princes to guarantee their treaties. See **GUARANTEE**.

CONSERVATOR of the peace, in our antient customs, was a person who had an especial charge, by virtue of his office, to see the king's peace kept.

Till the erection of justices of the peace by king Edward III. there were several persons who by common law were interested in keeping the same: some having that charge as incident to other offices; and others simply, or of itself, called *custodes*, or *conservators of the peace*. See **JUSTICE**.

The chamberlain of Chester is still a *conservator* in that county; and petty constables are, by the common law, *conservators*, &c. in the first sense.

CONSERVATORY, in gardening. See **GREEN-HOUSE**.

CONSERVE, in pharmacy and confectionary, a dry confection, or form of medicine, or food, contrived to preserve the flowers, leaves, roots, peels, or fruits of several simples, as near as possible to what they were when fresh gathered; and to give them an agreeable taste.

Physicians, under the name of *conserves*, commonly comprehend all kinds of confections of flowers, fruits, roots, seeds, barks, &c. both liquid and dry.

Conferves are made by beating up the thing to be preserved, with sugar; viz. a triple quantity thereof to those which are most moist, and corruptible, and a double quantity to such as are least so.

Thus, e. gr. to make *conferve* of roses, rosemary flowers, sage-flowers, or the like; they pound them in a stone mortar, and when pounded, put to them fine sugar, and beat the whole well together. For fruits, as currants, &c. they set them on the fire to make them yield their juice, then drain and strain them, and thicken what comes from them over the fire, and add to it the sugar. This last sort of *Conferve* is particularly called a jelly.

CONSIDERATION, in law, the material cause, or quid pro quo of any contract, and without which no contract is obligatory or binding.

This *consideration* is either *expressed*; as if a man bargain to give ten guineas for a horse; or *implied*, when the law it self enforces a *consideration*; as if a man coming into an inn, take meat, drink, and lodging for himself and horse, the law presumes he intends to pay for them, though there be no express contract between him and his host; and if he discharge not the house, the host may stop his horse.

CONSIGNMENT, or **CONSIGNATION**, the depositing any sum of money, bills, papers, or commodities, in sure hands; either by order of a court of justice, in order to their being delivered to the persons to whom they are adjudged; or voluntarily, in order to their being remitted to the persons they belong to, or sent to the places they are destined for.

CONSIGNMENT of Goods, is the delivering, or making them over to another.—Thus, goods are said to be *consigned* to a factor, when they are sent to him to be sold, &c. or when a factor sends back goods to his principal, they are said to be *consigned* to him. See **FACTOR**.

CONSIMILI Casu. See the article **CASU**.

CONSISTENCE, a state of rest, wherein things capable of growth, or decrease, continue for some time at a stand, without either.

The term is particularly used with regard to trees, for the acme, or age beyond which they do not grow, and yet at which they do not decline.

Thus we distinguish three states or stages of a tree; its growth, *consistence*, and return: and these are common to all trees, even fruit-trees.

The *consistence* of an oak, is from 50 to 160 years: some, however, hold that their *consistence* only commences from 100 years; asserting that they grow till that time, and that they continue in that state of perfection to 200 years of age.

CONSISTENCE, in physics, is that state of a body wherein its component particles are so connected, or entangled among themselves, as not to separate or recede from each other.

Consistence only differs from *continuity* in this, that *consistence* implies a regard to motion or rest, which continuity does not; it being sufficient to denominate a thing *continuous*, that its parts are contiguous to each other.

CONSISTENCE is particularly used with regard to bodies considered as they are more soft, or more hard, more liquid, or more dry. Forms of medicines, as electuaries, lambratives, bolus's, syrups, unguents, &c. differ chiefly in *consistence*.

CONSISTENT Bodies, is a term much used by Mr. Boyle for such as we ordinarily call *firm*, or *fixed bodies*; in opposition to *fluid* ones.

That author has a particular essay of the *atmosphere of consistent bodies*; wherein he shews, that all, even solid, hard, ponderous, and fixed bodies, do exhale or emit effluvia to a certain space all around them.

CONSISTORIAL Advocate. See the article **ADVOCATE**.

CONSISTORY*, or **Roman CONSISTORY**, denotes the college of cardinals; or the pope's senate, and council, before whom judiciary causes are pleaded.

* Du Cange derives the word from *consistorium*, i. e. *locus ubi consistitur*; used chiefly for a vestibule, gallery, or antechamber, where the courtiers wait for admission; and called *à consisterie* *multitudine*.

The *consistory* is the first court, or tribunal of Rome: it never meets but when the pope pleases to convoke it: the pope presides in it in person, mounted on a magnificent throne, and habited in his pontificalia; on the right are the cardinal-bishops and priests, and on the left the cardinal-deacons. See **CARDINAL**.

The place where it is held, is a large hall in the apostolical palace, where princes and ambassadors of kings are received.

The other prelates, protonotaries, auditors of the rota, and other officers, are seated on the steps of the throne; the courtiers sit on the ground; ambassadors on the right, and *consistorial* and fiscal advocates behind the cardinals.

Besides the public *consistory*, there is also a private one, held in a retired chamber, called the chamber of *papegay*; the pope's throne here being only raised two steps high.

No body is here admitted but the cardinals, whose opinions are collected, and called *sentences*. Here are first proposed and passed all bulls for bishopricks, abbies, &c.

Hence bishopricks and abbies, are said to be *consistorial benefices*; in regard, they must be proposed in the *consistory*, the annates be paid to the pope, and his bulls taken.

Antiently they were elective; but by the concordat which abolishes elections, they are appointed to be collated by the pope alone, on the nomination of the prince.

CONSISTORY was also the name of a court under Constantine, where he sat in person, and heard causes: the members of this court were called *comites*. See **COUNT**.

CONSISTORY is also used among the reformed, for a council or assembly of ministers and elders, to regulate their affairs, discipline, &c.

CONSISTORY, or **Court Christian**, in the English laws, is a council of ecclesiastical persons, or the place of justice in an ecclesiastical or spiritual court.

Every archbishop and bishop has a *consistory-court*, held before his chancellor or commissary, either in his cathedral, in some chapel, isle, or portico belonging thereto; or in some other convenient place of his diocese, for ecclesiastical causes.

The spiritual court was antiently, in the time of the Saxons, joined with the county or hundred court; and the original of the *consistory* court, as divided from those courts, is found in a law of the conqueror, quoted by my lord Coke.

CONSOLATION, one of the places in rhetoric, wherein the orator endeavours to abate, and moderate the grief, or concern of another.

In *consolation*, a principal regard is to be had to the circumstances, and relations of the parties. Scaliger considers this exceeding well, *de arte poetica*: 'The *consolator*, says he, is either a superior,

'an inferior, or an equal; with regard, either to preferment, honour, wealth, wisdom, or age. Livia is therefore to com-

'fort Ovid, in a manner very different from that wherein Ovid comforts Livia. Thus, as to authority, a father and son,

'Cicero and Pompey, are to conduct their *consolations* very differently: so in wealth; as if a client should undertake to

'comfort Crassus, in wisdom; as when Seneca comforts Polybius and his mother: as to age, there need no examples.

'A superior may interpose his authority, and may even chide: a wife man may even dispute; sentences will become him. An

'inferior is to shew respect and affection, and own he had this from some wife or learned person: an equal to appeal to their common friendship.'

CONSOLE*, in architecture, a part or member projecting in manner of a bracket, or shoulder-piece; serving to support a cornice, bust, base, beam, little vault, or the like. See **Tab. Architecture**, fig. 51.

* The word is derived from the French *consolider*, to reunite, join, &c. agreeable to the office of this member.

Consoles are also, upon occasion, called *mutules*, *modillions*, &c. according to their form.

Some of them are striated or fluted; others in form of cartouches; others have drops, in the manner of triglyphs. Vitruvius calls all those of gates *prothyrides*; or *thyra*, gate. See **PROTHYRIS**.—Those made of the end of a plank of wood, cut triangular-wise, are called *ancones*.

Consoles are frequently used as keys of arches, projecting out, to support a vane, or other ornament.

CONSOLIDATION*, in law, the combining and uniting two benefices into one.

* The term is borrowed from the civil law; where it properly signifies an union of the possession, or occupation, with the property.—Thus, if a man have by legacy *usum fructum fundi*, and afterwards buy the property, or fee-simple of the heir; this is called a *consolidation*.

CONSOLIDATION, in medicine, expresses the action of uniting broken bones, or the lips of wounds, by means of *consolidating remedies*, as they are called; which cleansing with a moderate heat and force, taking corruption out of the wounds, and preserving the temperature of the parts, cause the nourishment to be fitly applied to the part affected. See **WOUND**, and **FRACTURE**.

CONSONANCE, in musick, is ordinarily used in the same sense with *concord*, viz. for the union or agreement of two sounds produced at the same time, the one grave, the other acute; which mingling in the air, in a certain proportion, occasion an accord agreeable to the ear.

Dr. Holder, on this principle, defines *consonancy*, 'A passage of several tunable sounds through the medium, frequently mixing

'and uniting in their undulated motions, caused by the well-proportioned commensurate vibrations of the sonorous bodies, and

'consequently arriving smooth, and sweet, and pleasant to the ear; as, on the contrary, *dissonancy*, he maintains to arise from

'disproportionate motions of sounds, not mixing, but jarring and clashing as they pass, and arriving in the ear grating and

'offensive.'

Which notion of a *consonance*, exactly quadrates with that we have already laid down for a *concord*. Accordingly, most authors confound the two together: though some of the more accurate distinguish them; making *consonance* to be what the word implies, a mere *soundings of two or more notes together*, or in the same

same time; in contradistinction to the motion of those founds in *succession*, or one after the other.

In effect, the two notions coincide; for two notes, thus played in *consonance*, constitute a concord; and two notes that please the ear in *consonance*, will likewise please it in *succession*.

Notes in *consonance* constitute harmony, as notes in *succession* constitute melody.

In the popular sense, *consonances* are either *simple*, or *compound*, &c. The most perfect *consonance* is union; though many, both among the antients and moderns, discard it from the number of *consonances*; as conceiving *consonance* an agreeable mixture of different founds, grave and acute; not a repetition of the same found.

The second *consonance* is the octave; then the fifth, the fourth, the thirds, and the sixths: the rest are multiples, or repetitions of these.

CONSONANCE, in grammar, denotes a like cadence, or close of words, periods, &c.

Consonances are ordinarily faults in discourse, especially in English prose: though the ancients make a figure of them, which they call *ἁρμονία*. Too great a *consonancy* in the rhymes has always an ill effect.

CONSONANT *, a letter which produces no found alone, or without some other letter, either vowel or *consonant*, joined along with it.

* And hence the name *con-sonant*, q. d. *quæ sonant cum alia*.

A *consonant*, considering it philosophically, is nothing else but the modification of a found, produced by means of the organs of the voice, not a production of found itself: thus, *v. gr.* the founds signified by the characters *a, e, i, o, u, &c.* are differently modified when we say *ab*, than when we say *ac* or *ca*, *ad* or *da*; and those modifications are called *consonants*.

The letters of the alphabet are divided into vowels and *consonants*. *Consonants*, again, are divided into *singles*, as *b, h, m, n, g, &c.* and *double*, as *x* in *axillary*, corresponding to the ξ of the Greeks.

Consonants, again, are divided into *liquid*, as *l, r, m, n*; and *mute*, as *b, d*, and the rest: these last make no found at all without a vowel.

But the most natural division of *consonants* is that of the Hebrew grammarians; who have been imitated therein by the grammarians of other oriental languages: these divide the *consonants* into five classes, with regard to the five principal organs of the voice; which all contribute, it is true, but one more notably than the rest, to certain modifications, which make five general kinds of *consonants*. Each kind, or class, comprehends several *consonants*, which result from the different degrees of the same modification, or from the different motions of the same organs.

These organs are the *throat, palate, tongue, teeth, and lips*; and the five classes of *consonants* are denominated *guttural, palatal, lingual, dental, and labial*.

We account sixteen *consonants* in the English alphabet, *viz.* *b, c, d, f, g, h, k, l, m, n, p, q, r, s, t, x, z*; to which there are three more to be added, *viz.* the *h, the j consonant, and v consonant*, which makes the whole number of *consonants* nineteen: one whereof is *guttural*, *viz.* the aspirate *h*; five *palatal*, *viz.* *c, g*, as when pronounced before *a, e, o, u*, as in *ca-vern, corn, curiosity*; *g*, as in *geneva*; *j* consonant in *julep*; *k* in *kernel*; and *q* in *query*.

The four *lingual consonants* are *d, l, n, t*; the four *dental*, are *r, s, x, z*, the three last whereof are hisfers; and five *labial*, *b, f, m, p, and v consonant*.

With regard to which division, it may be observed, that tho' the *g* be modified in three different manners, as it comes before an *a*, an *o*, or a *u*; yet it is still a *consonant* of the palate; that the *j* consonant differs in nothing but its figure from the *g* before *e* or *i*; that *k* has the same pronunciation with the *c*; that *x* comprehends the found of two letters in its found, *viz.* *c* or *k*, and *f* or another *c*, as in *Alexander*, and *Alexis*, which we pronounce as if wrote *Alecfander*, and *Aleccis*, or *Aleccis*; and that the *c* before an *e* or *i*, is no *consonant* of the palate, because in that case it loses its proper found, and assumes the hissing found of the *f*.

The abbot Dangeau thinks the nature of the division of the Hebrew grammarians to be very reasonable; but he does not acquiesce in the distribution they have made of them: to find a natural and just division of the *consonants*, he observes, no regard must be had to the characters that represent them; nor any thing be considered but their found, or the modification they give the found.

On this principle, the same author finds in the French, five *labial consonants*, *b, p, v, f*, and *m*; five *palatal* ones, *d, j, g, k, n*; four hisfers, *s, z, x, c*; two *linguals*, *l* and *r*; two that run into and mix with each other, as *h*, and *g*; which last, however, is peculiar to the French language; and the *h* aspirate.

He adds, 1^o. That *m* and *n* are properly two nasal *consonants*; the *m*, a *b* passed through the nose, and the *n* a *d*, in like manner, pronounced through the nose; and in effect, people in a cold pronounce *market* for *market*, *deed* for *need*, &c.

2^o. That among the *consonants*, some are *weak*, others *strong*;

their difference consisting in this, that the former are preceded with a small emission of the voice which softens them; which the latter have not. The weak are *b, c, d, g, z, i*; the strong, *p, f, t, h, j, ch*.

It may be here observed, that when we speak of a person's talking *through the nose*, it must be understood in a sense quite different from what the words seem naturally to import: since the nose in this case concurs less to the pronunciation than when we do not speak through the nose; in regard the air not being able to make its way through the nose; is returned into the mouth, where it forms a dull obtuse found, called *nasal*.

From the whole we may conclude, that the excess of *consonants* in one language above another only consists in this, that there are more modifications of found received and established in the one than in the other: for all men having the same organs, may form the same modifications; so that it is entirely owing to custom, nothing to nature, that the English have not the δ of the Greeks, the *ain* and *heth* of the Hebrews, the *ch* of the Germans, the *gn* of the French, the *gl* of the Italians, the *ll* of the Welch, &c.

Also, that the Chinese have no *r*, the Iroquois no labial *consonants*, the Hurons have abundance of aspirates, and the Arabs and Georgians abundance of double *consonants*: which last is owing to this, that they make several organs concur strongly and equally to the modification of a found; whereas, in the rest, only one organ is moved very strongly and sensibly, and the rest weakly.

It is hence also visible, that in all languages the aspirates, or guttural letters, are real *consonants*; since the throat modifies the found as much as the palate, tongue, or lips.

Lastly, to find all the *consonants* that may be formed in any language; there needs nothing but to observe all the modifications that the sounds of speech will admit of, by which we shall have all the *consonants* practicable.

CONSORT, in music. See the article CONCERT.

QUEEN-CONSORT. See the article QUEEN.

CONSPIRACY, in law, is taken for a combination or confederacy to do something evil, or illegal: though in the original sense of the word, and in its use in other languages, it signifies merely an agreement, whether for good, bad, or matters indifferent. See CONFEDERACY.

In our statutes and law-books, *conspiracy*, in a general sense, is frequently confounded with *maintenance*, and *champarty*.

CONSPIRACY, in its special signification, is used for a confederacy of two, at least, falsely to indict one, or procure one to be indicted of felony.

The punishment of this *conspiracy*, at the king's suit, antiently was: that the party attained lose his frank-law; to the end that he may not be impeached on juries, and the like; that his lands, goods, and chattels be forfeited; his trees rased, and his body committed to prison.

Even *conspiracies*, or combinations in cases of less moment, as those of victuallers, touching selling of victual, shall be grievously punished. 37 Hen. VIII.

CONSPIRING powers, in mechanicks, are all such as act in directions not opposite to one another. See POWER, and MOTION.

CONSTABLE *. Lord High CONSTABLE, is an antient officer of the crown, now disused in England, but still subsisting in France, where the *constable* commands the marshals, and is the first officer in the army.

* Some derive the word from the Saxon, and make it originally signify the *stay*, or hold of the *king's*, or king: others, with more probability, derive it from *comes stabuli*, the master of the stable, or perhaps of the horse, and suppose that the dignity which at first was civil, in time became military, and the master of the stables was made general of the army.

The function of the *constable* of England, consisted in the care of the common peace of the land, in deeds of arms, and matters of war. To the court of the *constable* and that of the marshals, belonged the cognizance of contracts, deeds of arms without the realm, and combats, blasphemy of arms, &c. within it.

The first *constable* of England was created by the conqueror: the office continued hereditary till the thirteenth of Hen. VIII. when it was laid aside, as being too powerful as to become troublesome to the king. Since that time, the *constable* is only created occasionally.

From those mighty magistrates, the *constables* of England, are derived those inferior ones, since called the *constables of hundreds and franchises*; these were first ordained in the thirteenth year of Edward I. by the statute of Winchester; which for the conservation of the peace, and view of armour, appointed that two *constables* should be chose in every hundred and franchise.

These are what we now call *constabularii capitales*, or *high constables*; in regard, continuance of time and increase of people, &c. have occasioned others of like nature, but inferior authority, in every town, called *petty-constables*, or *sub-constabularii*.

—The appointing of a *petty-constable* belongs to the lords of divers manners, *jure feudi*.

Besides these, we have *constables* denominated from particular places, as *constable of the Tower*, of *Dover-castle*, of *Windsor-castle*, of *the castle of Caernarvan*, and many other of the castles of Wales; whose office is the same with that of the Castellani, or governors of castles.

Proofs of the CONSTABLE. See PROVOST.

CONSTANT winds. See the article WIND.

CONSTANT, in law, a certificate given out of the court of exchequer, of all that there is upon record relating to any matter in question.

It is also used for an exemplification, or copy of the enrolment of letters patent.

CONSTELLATION, in astronomy, an assemblage or system of several stars, expressed and represented under the name and figure of some animal or other thing: this assemblage is by some called also an *asterism*.

The antients portioned out the firmament into several parts, or *constellations*; reducing a certain number of stars under the representation of certain images, in order to aid the imagination and the memory to conceive and retain their number, disposition, and even to distinguish the virtues which they attributed to them: in which sense a man is said to be born under a *happy constellation*, i. e. under a happy configuration of the heavenly bodies.

The division of the heavens into *constellations* is very antient; and for ought that appears, as old as astronomy itself; at least, it was known to the most antient authors extant, whether sacred or profane. In the most antient book of Job, mention is made of the names of some of them; witnesses that sublime expostulation, *Canst thou restrain the sweet influence of the Pleiades, or loosen the bands of Orion?* And the same may be observed of the oldest among the heathen writers Homer and Hesiod.

The division of the antients only took in the visible firmament, or so much as came under their notice: this they distributed into 48 *constellations*; twelve whereof took up the zodiac: the names they gave them are *Aries, Taurus, Gemini, Cancer, Leo, Virgo, Libra, Scorpius, Sagittarius, Aquarius, Capricornus, Pisces*: from whence the signs of the ecliptic and zodiac take their names; though now no longer contiguous to the *constellations* which denominate them. See SIGN.

The other stars, on the northern side of the zodiac, were disposed into 21 *constellations*, viz. *Ursa major and minor, Draco, Cepheus, Bootes, Corona Septentrionalis, Hercules, Lyra, Cygnus, Cassiopeia, Perseus, Andromeda, Triangulum, Auriga, Pegasus, Equuleus, Delphinus, Sogitta, Aquila, Ophiuchus or Serpentarius, and Serpens*: to which have been since added *Antinous, and Coma Berenices*.

The stars on the southern side of the zodiac, were distributed into 15 *constellations*; their names are, *Cetus, Eridanus fluvius, Lepus, Orion, Canis Major and Minor, Argo, Hydra, Crater, Corvus, Centaurus, Lupus, Ara, Corona meridionalis, and Piscis australis*: to which have been since added twelve others; viz. *Phoenix, Grus, Indus, Pavo, Piscis australis, Piscis volans, Tucan, Hydrus, and Xiphius*. See each constellation, and the stars contained in it, under its proper head, *ARIES, TAURUS, &c.*

Of these *constellations*, the 15 last, with the greatest part of *Argo* *noctis, Centaurus, and Lupus* are not visible in our horizon. The other stars, not comprehended under these *constellations*, yet visible to the naked eye, the antients called *informes, or sporades*, some whereof the modern astronomers have since reduced into new figures, or *constellations*. See INFORMES and SPORADES.

Thus, *Hevelius, v. gr.* between *Leo* and *Ursa major*, make *Leo minor*; and between *Ursa minor* and *Auriga*, over *Gemini*, makes *Lynx*; under the tail of *Ursa major*, *Canes venatici, &c.*

In these *constellations*, the stars are ordinarily distinguished by that part of the image wherein they are found. Bayer distinguishes them further by the letters of the Greek alphabet: and many of them, again, have their peculiar names, as *Arcturus*, between the feet of *Bootes*; *Gemina, or Lucida*, in the *Corona septentrionalis*; *Pallistim*, in the *Bull's* eye; *Pleiades* in the back, and *Hyades* in the forehead of the *Bull*: *Caster* and *Pollux* in the heads of *Gemini*; *Capella*, with the *Hedi* in the shoulder of *Auriga*; *Regulus, or Cor Leonis*; *Spica Virginis* in the hand, and *Vindematrix* in the shoulder of *Virgo*; *Antares, or Cor Scorpii*; *Fomalhaut*, in the mouth of *Piscis australis*; *Regel*, in the foot of *Orion*; *Sirius*, in the mouth of *Canis major*; and the *pole-star*, the last in the tail of *Ursa minor*.

The Greek and Roman poets, from the ancient theology, give us wild and romantick fables about the origin of the *constellations*; which may be seen in Hyginus, Natalis Comes, and Ricciolus. Hence, some out of a vain zeal, rather than any love for the science, have been moved to alter either the figures of the *constellations*, or at least their names.

Thus, venerable Bede, instead of the profane names and figures of the twelve *constellations* of the zodiac, substituted those of the twelve apostles; whose example being followed by Julius Schillerius, in 1627, he completed the reformation, and gave scripture-names to all the *constellations* in the heavens.

Thus, *Aries*, or the ram, became converted into St. Peter; *Taurus*, or the Bull, into St. Andrew; *Andromeda* into the sepulchre of Christ; *Lyra* into the manger of Christ; *Hercules* into the Magi coming from the East; *Canis major* into David,

&c. Weigelus, professor of mathematicks in the university of Jena, made a new order of *constellations*; converting the firmament into a *caelum heraldicum*; and introducing the arms of all the princes in Europe, by way of *constellations*.

Thus, *Ursa major*, he transformed into the elephant of the kingdom of Denmark; and the *Swan* into the Rota with swords of the house of Saxony; *Ophiuchus* into the Cross of Cologne; the *Triangle* into the compasses, which he calls the *Symbol of artificers*; and the *Pleiades* into the *Abacus Pythagoricus*, which he calls that of merchants, &c.

But the more knowing among astronomers never approved of these innovations; as serving no purpose but to introduce quarrels and confusion into astronomy. The old *constellations*, therefore, are still retained; both because better could not be substituted, and likewise to keep up the greater correspondence and uniformity between the old astronomy and the new.

CONSTIPATION, in medicine, a hardness of the alvus, or belly, with a difficulty of discharging the same; otherwise called *costrivens*.

Riding post, eating of medlars, or quinces, several preparations of milk, hard-roasted eggs, &c. *constipate* the belly.

A *constipation* of the belly, if it continue long, sometimes degenerates into the iliac passion, or twisting of the guts.

Most persons of a hot and dry constitution are afflicted with a costiveness, or *constipation*: but this is seldom attended with any ill consequences.

The proper remedy for a *constipation* is a clyster; if this fail, lenient catharticks; and when they also fail, others must be exhibited of a more drastic or powerful nature.

CONSTITUTION, an establishment, ordinance, decision, regulation, or law, made by authority of a prince or other superior, ecclesiastical or civil. See LAW, &c.

The *constitutions* of the Roman emperors make a part of the civil law. See CIVIL LAW.—The *constitutions* of the church make a part of the canon law. See CANON LAW. Some of the papal *constitutions* are in form of bulls, others of briefs.

APOSTOLICAL CONSTITUTIONS, denote a collection of regulations attributed to the apostles, and supposed to have been collected by S. Clement, whose name they likewise bear.

These are divided into eight books; consisting of a great number of rules and precepts, relating to the duties of christians, and particularly to the ceremonies and discipline of the church.

Authors are divided about their genuineness: the generality hold them spurious, and endeavour to prove them posterior to the apostolick age; maintaining they were unknown till the fourth century: which, if so, shews S. Clement had no hand in them.

Mr. Whiston has ventured to oppose the general opinion; and with some reason, much learning, and more warmth, asserted the *apostolical constitutions* to be one of the sacred writings, dictated by the apostles in their meetings, written down from their mouths by S. Clement, and intended as a supplement to the new testament; or, rather, as a scheme and system of christian faith and polity. See his *essay on the apostolical constitutions*, and his *historical preface*; wherein the several steps he made in his fancied discovery are traced.

What makes the *constitutions* more suspected by the orthodox, is, that they seem to favour of Arianism.

CONSTITUTION, is also used in a physical sense, for the temperament of the body, or for that disposition of the whole arising from the quality and proportion of its parts.

Physicians consider the *constitution*, as depending chiefly on the humours or juices of the body; and hence, as this, or that humour is supposed to predominate, the bile, *e. gr.* or the blood, phlegm, cholera, or spirit; the person used to be denominated of a *bilious, sanguine, phlegmatic, choleric, or mercurial constitution*.

CONSTRUCTION*, the act of binding, or drawing the parts of a thing close together.

* The word is compounded of *con*, together; and *stringere*, to tie or close-up.

CONSTRUCTOR *labiorum, or orbicularis*, a muscle proper to the lips.—See Tab. Anat. (myol.) fig. 1. n. 8. See also the article LIP.

Its fibres make a kind of (*orbis*) ring about the mouth (whence it is also called *orbicularis*) and serve to constrict, and draw up the lips, as in kissing, &c. whence some call it *basiliatur, and osculatorius*.

This, Verheyen will not have to be one muscle, but a pair, whose fibres meet and join at both corners of the mouth; each acting on one lip only, though concurrently.

Other authors are unanimous in calling it one muscle; and will have it of the sphincter kind; though Dr. Drake thinks improperly; in regard, it is not like the other sphincters in constant action, but at the command of the will: the distinguishing mark between a sphincter and another muscle. See SPHINCTER.

CONSTRUCTOR *palpebrarum*. See ORBICULARIS.

CONSTRICTORES *nasi*, a pair of muscles common to the alæ of the nose, and the upper lip.

They arise fleshy from the forepart of the fourth bone of the upper jaw; and after a strait ascent, are inserted into the roots of the alæ nasi, and superior parts of the upper lip.

Their use is to draw the alæ downwards, nearer each other: and

and at the same time draw the upper lip also downwards: an action which we use in taking of fruit, or in smiling at any thing.

CONSTRUCTION, in geometry, the art or manner of drawing, or describing a figure, scheme, the lines of a problem, or the like. The equality of the lines of such a triangle, &c. is demonstrated from their construction.

CONSTRUCTION of equations, is the method of reducing a known equation into lines, and figures; whereby the truth of the rule, canon, or equation, may be demonstrated geometrically. See EQUATION.

The method of *constructing* equations is different, according to the diversity of equations. For simple and quadratick equations the methods shall be here subjoined; as to cubic equations, geometrical *constructions* are of no use, in practice; their intent being much better answered by the method of extracting roots by approximation.

To *construct a simple equation*: the whole mystery consists in this; that the fractions, to which the unknown quantity is equal, be resolved into proportional terms: the method of which will be better shewn by examples than it can be taught by many rules.

1^o. Suppose $x = \frac{a+b}{c}$; then will $c : a : b : x$, to be determined by the method of finding a fourth proportional.

2^o. Suppose $x = \frac{abc}{dc}$; let $d : a : b : \frac{ab}{d}$. This fourth proportional found, being called g ; $x = \frac{gc}{e}$ which is therefore found as in the former case.

3^o. Suppose $x = \frac{a-b}{c}$. Since $a-b = (a+b)(a-b)$; $c : a+b : a-b : x$.

4^o. Suppose $x = \frac{a^2b-bcc}{ad}$. By the first case we find $g = \frac{ab}{d} = \frac{a^2b}{ad}$ and $h = \frac{bc}{d}$; again, by case 1, $i = \frac{bc}{d}$ and $x = g - i$, the difference of the lines g and i .

5^o. Suppose $x = \frac{a}{c} + \frac{ad}{bc}$. Find, as in the preceding case, $g = \frac{a}{c}$, and $f = \frac{ad}{bc}$. Then will $x = g + f$ be the sum of the lines g and f .

6^o. Suppose $x = \frac{a^2b+bc d}{af+cg}$. Seek $\frac{cg}{a}$, and let $f + \frac{cg}{a} = b$; then will $a f + cg = ab$; consequently, $x = \frac{a^2b+bc d}{ab}$. Thus is the present case brought to the preceding one.

7^o. Suppose $x = \frac{a^2b-bad}{af+bc}$. Find $\frac{af}{b}$, and make $\frac{af}{b} + c = b$; then will $a f + bc = b h$. Hence, $x = \frac{a^2b+bad}{bh}$.

Consequently, $b : a : a - d : x$.

8^o. Suppose $x = (a^2 + b^2) : c$. Construct the triangle ABC, (Tab. Algebra, fig. 1.) whose side AB = a, BC = b; then will AC = $\sqrt{a^2 + b^2}$. Let AC = m; then will $a^2 + b^2 = m^2$. And therefore $x = \frac{m^2}{c}$; consequently, $c : m : m : x$.

9^o. Suppose $x = \frac{a^2-b^2}{c}$. On AB, (fig. 2.) = a describe a semicircle, and therein set off AC = b. Since the triangle ACB is rectangular; CB = $\sqrt{a^2 - b^2}$. Let CB = m: then will $x = \frac{m^2}{c}$; consequently, $c : m : m : x$.

10^o. Suppose $x = \frac{a^2b+bc d}{af+bc}$. Say, $b : a : f : \frac{fa}{b}$; and let $\frac{fa}{b} + c = b$; then will $bc + af = bh$. Hence, $x = \frac{a^2b+bc d}{bh}$.

Find betwixt AC = c₂ (fig. 3.) and CB = d₂ a mean proportional CD = \sqrt{cd} . Let CE = a; then will DE = $\sqrt{a^2 - cd}$. Call this m; then will $x = \frac{m^2}{b}$; consequently, $b : m : m : x$.

To *construct a quadratic equation geometrically*. Since quadratic equations may be reduced to simple ones, (see EQUATION;) those may likewise be *constructed* from the methods already laid down: for if the equation be pure, $x^2 = ab$; then will $a : x : x : b$; wherefore, we shall find $x = \sqrt{ab}$; if between AC = a, and BC = b, we find a mean proportional DC. If the equation be affected, $x^2 + ax = b^2$; then will $x = \frac{1}{2}a + \sqrt{\frac{1}{4}a^2 + b^2}$ that is, either $x = \frac{1}{2}a + \sqrt{\frac{1}{4}a^2 + b^2}$ or, $x = \sqrt{\frac{1}{4}a^2 + b^2} - \frac{1}{2}a$, or, $x = \frac{1}{2}a + \sqrt{\frac{1}{4}a^2 - b^2}$ or, $x = \sqrt{\frac{1}{4}a^2 - b^2} - \frac{1}{2}a$.

The whole mystery, therefore, of *constructing* quadratics comes to this: that the value of $\sqrt{\frac{1}{4}a^2 + b^2}$, and also the value of $\sqrt{\frac{1}{4}a^2 - b^2}$ be found; both of which are shewn in the preceding article. For, in the rectangular triangle, (fig. 1.) AB = $\frac{1}{2}a$ and BC = b; then will AC = $\sqrt{\frac{1}{4}a^2 + b^2}$. But if on AB = $\frac{1}{2}a$, (fig. 2.) be described a semicircle; and therein

applied AC = b; CB = $\sqrt{\frac{1}{4}a^2 - b^2}$, as was shewn in the article preceding. See EQUATION; see also CURVE.

CONSTRUCTION, in grammar, *syntax*; or the arranging and connecting the words of a sentence, according to the rules of the language.

The *construction* is generally more simple, easy, and direct in the modern tongues than in the antient: we have very few of those inversions which occasion so much embarrass and obscurity in the Latin; our thoughts are usually delivered in the same order wherein the imagination conceives them: the nominative case, for instance, always precedes the verb, and the verb goes before the oblique cases it governs.

The Greeks and Latins, M. St. Evremont observes, usually end their periods, where, in good sense and reason, they should have begun them; and the elegance of their language consists, in some measure, in this capricious arrangement, or rather in this transposal and disorder of the words.

Construction is either *simple* or *figurative*.—*Simple*, is that wherein all the terms, or parts of the discourse are placed in their natural order.

Figurative construction, is that wherein we recede from this simplicity, and use certain expressions, shorter, and more elegant than nature affords.

The *syntax*, or *construction* of words, is distinguished into two parts, *concord*, and *regimen* or *government*. See CONCORD, and REGIMEN.

CONSUALIA, feasts which were held among the antients, in honour of the god *Consus*, i. e. *Neptune*; different from those other feasts of the same deity called *neptunalia*.

They were introduced with a magnificent cavalcade, or procession on horseback; by reason *Neptune* was reputed to have first taught men the use of horses; whence his surname of ἵππιος , *equystris*.

Evander is said to have first instituted this feast: it was re-established by Romulus, under the name of *Consus*; in regard it was some god under the denomination of *Consus*, that suggested to him the rape of the Sabines.

It is said, that it was with a view to this rape, that he made that establishment. This, however, is certain, that it was to this feast all his neighbours were invited; when, taking advantage of the solemnities and sacrifices, he seized the women. To draw the greater concourse of people, he gave out, that he had found an altar hid under ground, which he intended to consecrate, with sacrifices to the god to whom it had been originally erected.

Those who take upon them to explain the mysteries of the heathen theology, say, that the altar hid under ground is a symbol of the secret design of Romulus to seize his neighbours wives. The *consualia* were of the number of feasts called *sacred*; as being consecrated to a divinity.—Originally they were not distinguished from those of the circus: whence it is, that Valerius Maximus says, that the rape of the Sabines was effected at the games of the circus.

Plutarch observes, that during the days of this solemnity, horses and asses were left at rest, and were dressed up with crowns, &c. on account of its being the feast of *Neptunus Equetris*.—Festus says, the cavalcade was performed with mules; it being an opinion, that this was the first animal used to draw the car. Servius gives us to understand, that the *consualia* fell on the thirtieth of August; Plutarch in Romulus places them on the 18th, and the old Roman calendar on the 21st day of that month.

CONSUBSTANTIAL, in theology, a term of like import with *co-essential*; denoting something of the same substance with another.

The orthodox believe, the Son of God to be *consubstantial* with the Father.

The term ὁμοουσιος , *consubstantial*, was first adopted by the fathers of the councils of Antioch and Nice, to express the orthodox doctrine the more precisely, and to serve as a barrier and precaution against the errors and subtleties of the Arians; who owned every thing excepting the *consubstantiality*.

The Arians declared that the Word was God, as having been made God; but they denied that he was the same God, and of the same substance with the Father: accordingly, they exerted themselves to the utmost to abolish the use of the word. The emperor Constantine used all his authority with the bishops, to have it expunged out of the symbols; but it still maintained itself, and is at this day, as it was then, the distinguishing criterion between an Athanasian and an Arian.

Sandius will have it, that the word *consubstantial* was unknown till the time of the council of Nice; but it is certain it had been before proposed to the council of Antioch, wherein Paulus Samosatensis had been condemned; though it had there the fortune to be rejected. Curcellæus on the other hand, maintains, that it was an innovation in doctrine in the council of Nice, to admit an expression, the use whereof had been abolished by the council of Antioch.

According to S. Athanasius, the word *consubstantial* was only condemned in the council of Antioch, inasmuch as it implied the idea of a pre-existent matter, prior to the things formed thereof: now, in this sense, it is certain, the Father and the Son are not *consubstantial*, there having been no pre-existent matter.

CONSUBSTANTIATION, a tenet of the Lutheran church, with regard to the manner of the change made in the bread and wine in the eucharist.—The divines of that profession maintain, that after consecration, the body and blood of our Saviour are substantially present, together with the substance of the bread and wine; which is called *consubstantiation*, or *impanation*. See **IMPANATION**, **TRANSUBSTANTIATION**, and **LUTHERANISM**.

CONSUETUDINIBUS servituti, in law, a writ of right, which lies against the tenant that deinceith his lord of the rent, or service due to him.

CONSUL, the chief magistrate of the Roman commonwealth. The *consuls* were the head of the senate; they commanded the armies of the republic, and were supreme judges of the differences between the citizens. In regard, however, that they had made some abuse of this power, it was allowed, by the Valerian law, for the party aggrieved to appeal from their tribunal to the people; especially in cases where the life of a Roman citizen was concerned.

In progress of time, the *consuls* being too much taken up with the grand affairs of state, or at the heads of armies, there were other magistrates created for the distribution of justice to the people, in lieu of the *consuls*.

After the Romans had expelled their kings, they were governed by two *consuls*, established in the year of Rome 240; having their name *à consulendo*. Brutus and Collatinus were the first, elected by an assembly of the people: their office was to hold a year; and if either of them died in the course of the year of their *consulate*, a new one was to be elected.

To be elected *consul*, it was regularly required that the candidate should be at least 43 years old; though we meet with some few exceptions from this rule. The election was held in the month of January, in the Campus Martius; and afterwards in the Capitol.

Consuls were even continued under the emperors, after the republic was destroyed: but *consul* was here little more than an honourable title; which, however, the people were fond of keeping up; as esteeming it some remain of their ancient liberty. It dwindled for a long time; and at last, became absolutely extinct in the time of Justinian: after whom, no emperor either created any *consul*, or assumed the dignity himself. Basil is the last in the consular list, for the year 241. By this time, the dignity was depreciated to that degree, that it was conferred on the meanest persons: indeed, Justinian endeavoured to retrieve it 25 years after, and created himself *consul*, but without effect.

From the establishment of the republic, and the consulate under L. Jun. Brutus and L. Tarq. Collatinus, to the consulate of Basil, *i. e.* from the year of Rome 244 or 245, 509 years before Jesus Christ; to the year of Rome 1294, the space of 1049 years, the years were accounted by the *consuls*: but from the time of Basil, in the year of Christ 541, we find no mention made of *consuls* or *consulates*; but the time was then computed by the years of the emperors reigns, and the indictions.

Indeed, for some time after the consulate of Basil, the years are marked thus; *post consulatum Basilii*, 1, 2, 3, &c. See the *fasti consulares* of M. d'Almeveen. That author reckons 1060 pairs of *consuls*, beside the substitute *consuls*, *suffragani*, elected to supply vacancies by death; and yet there were but 1049 years, and consequently only so many *consulates*.

The perpetual *consulates* of the eastern emperors, which compose the *Fasti Bizantini*, commenced in the year of Christ 567, and ended in 668, in the last year of Constantine.

Constantine Pogonates would have the *consulate* inseparable from the empire; which it continued to be till the time of Constantine Porphyrogenetus.

In this form of government, the empire and *consulate* were so closely united, that the empress Irene would needs assume the *consulate*, when she was only regent of the empire.

But the French kings, those of Italy, and the Sarazens princes who commanded in Spain, taking on them the title of *consuls*, as well as emperors of Constantinople; these last despised it, and laid it aside: so that the name was only continued to the magistrates of some cities, and certain other officers, as is shewn by F. Pagi.

Under the emperors there were *ordinary consuls*, *honorary consuls*, and *suffragani*; which last were also on foot in the time of the republic.

In the middle age, we find the word *consul* used for *comes*, count, and *proconsul* or *viconsul*, for *viscount*; as is observed by Spelman, and de Marca. See **COUNT**.

CONSUL, at present, is used for an officer established by virtue of a commission from the king, and other princes, in the ports and factories of the Levant, on the coasts of Africa, Barbary, Spain, and other foreign countries of any considerable trade; to facilitate, and dispatch business, and protect the merchants of the nation.

These commissions are never granted to persons under the age of thirty years. When the *consulate* is vacant, the most ancient of the deputies of the nation are to discharge the function thereof, till the vacancy be filled up by the king.

The *consuls* are to keep up a correspondence with the ministers of

England residing in the courts whereon their *consulates* depend. Their business is to support the commerce, and the interest of the nation; to dispose of the furs given, and the presents made to the lords and principals of places; to obtain their protection, and prevent the insults of the natives on the merchants of the nation. There are also *consuls* of other nations established in the Levant, especially French and Dutch.

CONSULS also denote judges, elected among merchants and dealers, in ports and trading towns chiefly in France; to terminate, *gratis*, and on the spot, without any process, such differences and demands as may arise relating to their merchandizes, bills of exchange, and other articles of commerce.

The first jurisdiction of *consuls* established in France, is that of Tholouse; the edict of whose establishment bears date 1549, under the reign of king Henry II. that of Paris followed fourteen years afterwards. By degrees, they were established in most of the considerable trading towns in that kingdom.

CONSUL*, in our ancient law-books, signifies an *earl* or *count*, *comes*. See **EARL**, and **COUNT**.

* According to some, what we now call a *county*, *comitatus*, was by the ancient Britons named *consulate*, *consulatus*; and those now called *viconsul*, *vitecomites*, were then called *vite-consuls*.

CONSULAR comitia. See the article **COMITIA**.

CONSULAR Medals. See the article **MEDAL**.

CONSULTATION, in law, a writ whereby a cause formerly removed by prohibition from the ecclesiastical court to the king's court, is returned thither again.

If the judges of the king's court, upon comparing the libel with the suggestion of the party, find the suggestion false, or not proved; and therefore the cause to be wrongfully called from the court-christian; then, upon such deliberation, or *consultation*, they decree it to be returned again. And the writ obtained hereon is called a *consultation*.

CONSUMMATION, the end, period, or completion of any work.—Thus, we say, the *consummation* of all things, meaning the end of the world. By the incarnation, all the prophecies are said to be *consummated*.

Consummation of marriage, denotes the last act of marriage, which makes its accomplishment; or the most intimate union between the married pair.

CONSUMPTION, *tuberc*, in medicine, a disease arising from a defect of nourishment; or, a preternatural decay of the body, by a gradual waste of muscular flesh.

It is frequently attended with an hectic fever; and is divided by physicians into several kinds according to the variety of its causes; as *universal*, or *scorbatic consumption*, where it arises from a cacochymia, or scorbutic habit; and *pulmonic consumption*, or *consumption of the lungs*, where it arises from some cause in the lungs, properly called a *phthisis*. See **PHTHISIS**, **SCORBUTUS**, &c.

A *consumption* may either be *accidental*, *natural*, or *hereditary*.—*Accidental consumptions* may arise, 1^o. From ulcers, chalky stones, or polypus in the lungs, caused by something that obstructs the circulation in the pulmonary vessels, or renders the blood viscid, as a suppression of any natural evacuation. 2^o. From intemperance, occasioning either a cacochymia, or plethora. 3^o. From peripneumonies, pleuridies, asthma's, coughs, catarrhs, diarrhæas, venereal disorders, and excess of venery. 4^o. From grief, hard study, &c.

Natural consumptions may arise from the straitness of the thorax, or an ill conformation of the parts.

An *hereditary consumption* may be communicated from the parents without any other visible cause.

A *consumption* usually begins with flying pains, and stitches; a troublesome pain at the pit of the stomach, or in the diaphragm; frequent spitting, loss of appetite, a quick pulse, a sweetness or saltness in the saliva, heat and flushings in the face and palms of the hands after meals, an hectic fever toward the evening, heaviness, faintness, night-sweats; and where the lungs are first disordered, a cough, catarrh, or asthma usually precede it.

When these symptoms are violent, it is confirmed; and then comes on an expectoration of purulent or bloody matter, and the vomica pulmonum; at length, the feet swell, the expectoration stops, a diarrhæa comes on; and then the facies hippocratica, and death. The cure of an *universal*, or *muscular consumption*, depends principally upon removal into a proper air, and the using of a regular nourishing diet: the appetite is to be excited by proper bitters, and other stomachics.

In a *pulmonary consumption*, or *phthisis*, balsamics, and oleaginous medicines, are usually added.

Dr. Wainwright, indeed, takes the particles of oily medicines to be too gross and viscid to enter the small orifices of the lacteals; and thinks, that their operation or effect being confined to the first passages, they are not only of no service in the cure, but are apt to pall the appetite, occasion obstructions in the mouths of the lacteals, and diarrhæas.

But this seems contrary to common experience: that their particles are small enough to enter the lacteals, is evident from the sudden relief nephritic persons find in violent paroxysms of the stone by the passages being relaxed soon after their exhibition. That diarrhæas, and blunting the appetite; in some constitutions, will be the consequence of their continuance, or exhibition in too great

great quantities, must be allowed; but then this is either accidental to some kinds of constitutions, or arises from some error in using them.

As to the lacteals being obstructed by their use, it seems a mere notion, and as much unsupported by experience as that other hypothesis, which a late author, Dr. Quincy, has been fond of asserting, viz. that the use of butter is apt to foul the glands. See *Supplement, article PHTHISIS*.

CONTACT, the relative state of two things that touch each other, or whose surfaces join to each other without any interstice. The *contact* of two spherical bodies, is only in one point: and the same holds of a tangent and the circumference of a circle.—Hence, because very few surfaces are capable of touching in all points, and the cohesion of bodies is in proportion to their *contacts*; those bodies will stick fastest together, which are capable of the most *contact*.

Angle of CONTACT, is the angle HLM, (Tab. *Geometry*, fig. 43.) formed by the arch of a circle ML, with the tangent HL, at the place of the *contact*.

Euclid demonstrates, that the right line HL, standing perpendicular on the radius CL, touches the circle only in one point: nor can there be any other right line drawn between the tangent and the circle.

Hence, the angle of *contact* is less than any rectilinear one; and the angle of the femicircle between the radius CL and the arch ML, is greater than any rectilinear acute angle.

This paradox of Euclid has exercised the wits of mathematicians: it was the subject of a long controversy between Peletarius and Clavius; the first of whom maintained the angle of *contact* heterogeneous to a rectilinear one; as a line is heterogeneous to a surface: the latter maintained the contrary. Dr. Wallis has a formal treatise on the *angle of contact*, and of the femicircle; where, with other great mathematicians, he approves of the opinion of Peletarius. See **TANGENT**.

CONTAGION, *infection*, or the communicating, or transferring a disease from one body to another.

Contagion, in some diseases, is only effected by an immediate *contact*, or touch: as the madness of a dog, which is communicated by biting; and the venom of the pox, which is transmitted from the infected person in the act of copulation. In others it is conveyed by infected clothes; as the itch.—In others the *contagion* is transmitted through the air to a great distance, by means of steams or effluvia expiring from the sick; as in the plague, and other pestilential distempers: in which case, the air is even said to be *contagious*, i. e. full of *contagious* particles. See **PLAQUE**, and **POISON**.

CONTEMPLATION, an act of the mind, whereby it applies itself to consider, reflect on, and admire the wonderful works of God, nature, &c.

CONTEMPLATION, among mystick divines, is defined a simple, amorous view of God, as present to the soul.—This *contemplation* is said to consist in acts so simple, so direct, so uniform and peaceful, that there is nothing for the mind to take hold on, whereby to distinguish it.

In the *contemplative* state, the soul is to be entirely passive, with regard to God; to be in a continual repose, without any perturbation, or motion; free from the activity of unequal minds, which must agitate themselves, to have their operation sensible.—Hence, some call *contemplation* a prayer of silence and quietude.

Contemplation is not a ravishment, or an extatick suspension of all the faculties of the soul; but it is something passive, it is peace and infinite plianthness; leaving it perfectly disposed to be moved by the impressions of divine grace, and the fitter to follow the divine impulse.—*Contemplation* is the height of perfection of the mystic divines.

CONTEMPORARY, or **COTEMPORARY**, a person, or thing of the same time, or that existed in the same age with another.—Socrates, Plato, and Aristophanes were *contemporaries*: the best histories are those of *contemporary* authors.

CONTENEMENT, a word in our ancient law-books, about whose signification authors are not rightly agreed.—According to some, it should signify the countenance, credit, or reputation a person has, from, and by reason of, his freehold. In which sense it is used in the stat. 1 Edw. III. &c. where it stands as synonymous with *countenance*.

Others will have it signify what is necessary for the support and maintenance of men, according to their several qualities, conditions, or states of life.—Thus, Spelman, *contenentiam est estimatio & conditionis forma qua quis in republica subsistit*.

CONTENT, in mathematics, a term frequently used for the capacity of a vessel, or the area of space; or the quantity of any matter or space included in certain bounds.

The *content* of a tun of round timber is 43 solid feet. A load of hewn timber contains 50 cubic feet: in a foot of timber are contained 1728 cubic or square inches, and as often as 1728 inches are contained in a piece of timber, be it round or square; so many foot of timber are contained in the piece. See **TIMBER**.

In gauging, the gallon for beer and ale is allowed to contain 282 cubic inches, and the wine gallon 231: the gallon of dry measure 272.

Hence, as oft as 282 cubic inches are contained in any vessel round or square, so many gallons of ale or beer it holds, and the like may be observed of the other measures.

Multiply, therefore, one side of a square or oblong into the other; and divide by one of those numbers, according to the quality of the liquor; the quotient gives the area in gallons, upon an inch deep.

Though the work may be considerably shortened by only multiplying the sides of squares, or the diameters of rounds into themselves; the product is the number of gallons, and parts the vessel contains, upon an inch in depth: and when that receives an augmentation, by being two, three or four inches deep, it then commences a solid body, and contains as many gallons and parts, as it is inches and parts deep.

A cubic foot contains six gallons, and almost a pint, of ale and beer; and seven gallons, two quarts of wine. A cubic foot of dry measure contains six gallons and a half, and something more. A bushel of salt contains 56 pound averdupois.

CONTENTIOUS jurisdiction, in law, *forum contentiosum*, denotes a court, or assembly, which has a power to judge and determine differences between contending parties.

The lords chief justices, judges, &c. have a *contentious jurisdiction*: but the lords of the treasury, the commissioners of customs, &c. have none; being merely judges of accounts, and transactions.

CONTEXT, among divines and critics, that part of scripture, or other writing, which lies about the *text*, before, or after it, or both. See **TEXT**.

To take the full sense of the text, the *context* should be regarded.

CONTIGNATION, in the ancient architecture, the art or act of flooring, by laying tigna, rafters, together. See **FLOORING**, and **RAFTER**.

CONTIGUOUS, a relative term, understood of things disposed so near each other, that they join their surfaces, or touch.

The houses in ancient Rome were not contiguous as ours are, but all insulated.

CONTIGUOUS angles, in geometry, are such as have one leg common to each angle; otherwise called *adjoining angles*.—In contradistinction to those produced by continuing their legs through the point of *contact*, which are called *opposite* or *vertical* angles. See **ANGLE**.

CONTINENT, in geography, a terra firma, main-land, or a large extent of country, not interrupted by seas: so called, in opposition to *islands*, *peninsula*, &c. See **EARTH**, **OCEAN**, &c. Sicily is said to have been antiently torn from the *continent* of Italy; and it is an old tradition, which some of our antiquaries have still a regard to, that Britain was formerly a part of the *continent* of France.

The world is ordinarily divided into two grand *continents*, the old and the new: the old comprehends Europe, Asia, and Africa: the new the two America's, north and south.

The antient *continent* is also called the *upper continent*, from a vulgar opinion, that it possesses the upper part of the globe.

It is doubted whether Japan be an island, or joined to the *continent*; the same may be said of California.—Some authors are of opinion, the two grand *continents* are in reality no more than one; imagining the northern parts of Tartary to run out and meet those of N. America.

CONTINENT cause of a distemper, is that whereon the disease depends so immediately, that it continues so long as that remains, and no longer.

Thus a stone in the bladder may be the *continent cause* of a suppression of urine.

CONTINENT fevers, is that which goes on to a crisis without either intermission, or remission. See **FEVER**.

CONTINGENT, something casual, or uncertain. See **CHANCE**.

Future CONTINGENT, in logick, denotes a conditional event, which may, or may not happen, according as circumstances fall out.

The Socinians maintain, that God cannot foresee *future contingents*, because depending on the free motions of the will of man. See **PRESCIENCE**.

CONTINGENT is also a term of relation for the quota that falls to any person upon a division.

Each prince of Germany, in time of war, is to furnish so many men, so much money, and munition for his *contingent*. By the new treaty of Hanover it is stipulated, that in case of a rupture with the emperor, the kings of Great Britain and Prussia may furnish their *contingents*, as feils of the empire, at the same time they are at war therewith.

CONTINGENT use, in law, is an use limited in a conveyance of land, which may, or may not, happen to vest, according to the *contingency* expressed in the limitation of such use.

CONTINGENT line, or *line of CONTINGENCY*, in dialing, is a line that crosses the substyle at right angles. See **SUBSTILE**, and **DIALING**.

CONTINGENTS is sometimes also used by mathematicians in the same sense as *tangents*. See **TANGENT**.

CONTINUAL claim. See *Continual CLAIM*.

CONTINUANCE, in law, is much the same as *prorogation* among the civilians. See *PROROGATION*, and *DISCONTINUANCE*.

CONTINUANCE of a writ, or *Assize*, is its holding in force from one term to another, in a case where the sheriff has not returned, or executed a former writ issued out in the same action.

CONTINUANCE of *assize*. If a record in the treasury be alleged by one party, and denied by the other; a certiorari shall be sued to the treasury and chamberlain of the exchequer: who, if they certify not that the said record is there, or likely to be in the tower; the king shall then send to the justices, repeating the certificate, and will them to *continue the assize*.

CONTINUANDA *assize*. See the article *ASSISA*.

CONTINUANDO, in law, a term used where a plaintiff would recover damages for several trespasses in the same action.

To avoid multiplicity of suits, a man may in one action of trespass recover damages for forty, or more trespasses; laying the first to be done with a *continuance* to the whole time wherein the rest of the trespasses were done: which is done in this form, *continuando transgressionem prædictam, &c. a prædicto die, &c. usque, &c.*

CONTINUANDO *Processum*. See the article *PROCESSUM*.

CONTINUANS *Punctum*. See the article *PUNCTUM*.

CONTINUATION of motion. See *MOTION*, and *PROJECTILE*.

CONTINUATIVE conjunctions. See the article *CONJUNCTION*.

CONTINUAL, or CONTINUED fever, is such an one as sometimes remits, but never intermits, or goes entirely off, till its period. See *FEVER*.

A continual fever, may be defined to be the continuance of an increased velocity in the circulation of the blood, beyond what is natural to the constitution. See *BLOOD*, and *CIRCULATION*.

If this velocity often decreases, and rises again to the same height, it is called a *continual periodical fever*.

And if it entirely cease in the space of a day, or two, it is called an *epheueris*.

A continual fever, then, may remit, or abate and increase again, alternately; but not intermit, which would constitute it an *intermitting fever*, or *ague*.

CONTINUED Quantity. } See *CONTINUUM*, *CONTINUITY*,
CONTINUED Body, &c. }
and *QUANTITY*.

CONTINUED, or *through, bass*, in musick, is that which continues to play constantly; both during the recitatives, and to sustain the choir, or chorus.

CONTINUED Proportion, in arithmetick, is that wherein the consequent of the first ratio is the same with the antecedent of the second—*as 3 : 6 :: 6 : 12*. See *PROPORTION*.

On the contrary, if the consequent of the first ratio be different from the antecedent of the second, the proportion is said to be *discrete*; *as, 3 : 6 :: 4 : 8*. See *DISCRETE*.

Attic CONTINUED. }
CONTINUED Community. } See the articles } *ATTIC*,
CONTINUED Pedestal. } *COMMUNITY*,
CONTINUED Salutio. } *PEDESTAL*,
} *SOLUTIO*.

CONTINUITY, is usually defined among schoolmen, the immediate cohesion of parts in the same *quantum*.—Others define it a mode of body, whereby its extremes become one: and others, a state of body resulting from the mutual implication of its parts.

There are two kinds of continuity, *mathematical* and *physical*.—The first is merely imaginary, and fictitious; since it supposes real or physical parts where there are none.

Physical continuity, is, strictly, that state of two or more parts or particles, wherein they appear to adhere, or constitute one uninterrupted quantity, or *continuum*; or between which we perceive no intermediate space.

The schoolmen distinguish two other sorts of continuity, *viz. homogeneus* and *heterogeneus*.—The first, where our senses do not perceive the bounds, or extremes of the parts; and this agrees even to air, water, &c.—The second, where our senses do indeed perceive the extremes of certain parts, yet at the same time observe the same parts closely linked to each other; either in virtue of their situation or figure, &c. and this is chiefly attributed to the bodies of animals and plants.

The continuity of bodies, is a state merely relative to our sight and touch: *e. gr.* if the distance of two separate objects be such, as that the visual angle they subtend is insensible to the eye, which it will be if less than 16 seconds, the two separate bodies will then appear *contiguous*.

Now, the result of several contiguous objects is a *continuity*; so that any number of visible objects, being placed so as that their distances subtend angles of less than 16 seconds, they will appear to form one *continuum*.

And hence, as we can determine the distance at which any given magnitude becomes invisible; it is easy finding at what distance any two bodies, however remote from each other, will appear as contiguous; and several, as forming one *continuum*.—For the physical cause of Continuity, or cohesion. See *COHESION*.

CONTINUUM, or CONTINUED Quantity, in physics, denotes

a quantity or coextension, whose parts are not divided, but joined and connected together; so as to leave no room to determine where one begins, and another ends. See *CONTINUITY*.

It is controverted among philosphers, whether a *continuum* be infinitely dividible, *i. e.* dividible into infinite proportionable parts?

The antients attributed the rise of water in pumps to the love of continuity, and the abhorrence of a vacuum; in regard the weight and pressure of the air was not then known. See *VACUUM*.

Mathematicians divide quantity into *continued* and *discrete*. See *QUANTITY*.

Continued quantity is that expressed by lines, and makes the subject of geometry.

Discrete quantities, are those expressed by numbers, which make the subject of arithmetick.

In medicine and chirurgery, wounds, ulcers, fractures, &c. are expressed by the phrase *salutis continuæ*, or *salutis of continuity*.

In a critical sense, we say, there ought to be a *continuity*, *i. e.* a connection, between the parts of a discourse.

In the Epic poem, particularly, the action should have a *continuity* in the narration; though the events or incidents be not continued. As soon as ever the poet has opened his subject, and brought his persons on the stage, the action is to be continued to the end: every character must be at work; and no such thing as an idle person to be seen.

F. Boffu observes, that by retrenching dull languishing incidents, and intervals void of action, which break the *continuity*, the poem acquires a *continued force*, which makes it run equally throughout.

CONTOBADDITES, Κοτοβადιται, a sect of hereticks in the VIth century.—Their first leader was Severus of Antioch, who was succeeded by John the grammarian, surnamed Philoponus, and one Theodosius; whose followers were also called *Theodosians*.

Part of them, who were willing to receive a book composed by Theodosius on the trinity, made a separate body, and were called *Contobaddites*, from I know not what place, which Nicephorus does not mention, but which must apparently have been the place where they held their assemblies.

The *Contobaddites* allowed of no bishops; which is the only circumstance that historian gives us concerning them.

CONTORSION, the action of twisting; or writing a member of the body out of its natural situation.

Rope-dancers accustom themselves to *contorsions* of their limbs from their youth, to render the fibres of their articulations lax, and supple to all kinds of postures.

CONTORSION is also used passively for the state of a thing, *v. gr.* for a member that is a-wry.

The *contorsion of the neck*, is usually occasioned, according to Nucke, by a relaxation, or paralysis of one of the mastoid muscles: for hence it happens that its antagonist, whose power is now no longer balanced, contracting with its proper force, draws the head towards that side.

He adds, that this disorder cannot be remedied too speedily; and prescribes from the beginning, liniments capable of relaxing and softening the fibres, to be used, not only to the muscle in contraction, but also and principally to the paralytick muscle, which is the seat of the disorder.

CONTOUR, Outline; that which terminates, and defines a figure.

A great part of the skill of the painter consists in managing the contours.

The contour of a figure, makes what we call the *draught*, or *design*. The contour of a face, the Italian painters ordinarily call the *lineaments* thereof.

CONTOURNE, in heraldry, is used when beasts are represented standing or running with their face to the sinister-side of the escutcheon; they being always supposed to look to the dexter-side, unless it be otherwise expressed.

CONTOURNIATED, a term applied among antiquaries to a kind of medallions, which have a broad, rising rim on each side; and figures that have scarce any relieve, in comparison with the true medallions.

They have their name from their edges, which appear as if turned in the lathe.—All we have remaining of these *contourniated* medals seem to have been struck about the same time. F. Hardouin conjectures them not to be earlier than the XIIIth century: other antiquaries go back as far as the fifth; and others find instances of them as ancient as the time of Nero.

This sort of work seems to have had its origin in Greece, and to have been appropriated to honour the memories of great men; principally, those who had bore away the prize at the solemn games: such are those remaining of Homer, Solon, Euclid, Pythagoras, Socrates, Apollonius Tyaneus, and several Athletes, whose victories are expressed on them by palms and chariots, either bigæ, or quadrigæ.

CONTRA, or COUNTER, in composition. See *COUNTER*.

CONTRA *formam collationis*, is a writ that lies where a man has given lands in perpetual alms, to a religious house, hospital, school

school, or the like, and the governor or managers, have alienated the lands, contrary to the intention of the donor.

CONTRA formam feoffamenti, is a writ for a tenant who is infeoffed by the lord's charter to make certain suit and service to his court; and is afterwards distrained for more than is contained therein.

CONTRABAND *, in commerce, a prohibited commodity; or a merchandize bought or sold, imported or exported, in prejudice and contrary to the laws and ordinances of a state, or the public prohibitions of the sovereign.

* The word comes from the Italian *contrabando*, of *contra*, and *banda*, q. d. contrary to edict, or publication of prohibition.

Contraband goods are not only liable to confiscations themselves; but do also subject all other allowed merchandises found with them in the same box, parcel, or bale, together with the horses, waggons, &c. which conduct them to the same.

There are *contraband* goods, which besides confiscation, are prohibited on pain of death; as *v. gr.* in France, India and China stuffs, linens, &c.

In England there are two principal *contrabands* for exportation, wools and live sheep, which all strangers are prohibited from carrying out, on pain of having the right hand cut off; the other that of sheep-skins and calf-skins, which all foreigners are in like manner prohibited from exporting, on pain also of having the right hand cut off; yet, the subjects of England are allowed to transport the same from France to England.

Other *contrabands* for exportation are raw horns, white ashes, stocking looms, or any part thereof, fuller's earth, and all raw hides, or skins.

Of goods *contraband* as to the import, there are above 50 in the lists made in 1662; and yet there are 25 of them which now stand in the tariff; the non-execution of the acts of parliament whereby they were imposed, seeming to have restored them to the freedom of importation.

The chief of those still *contrabanded*, and not tarified, are woolen caps, woolen cloths, saddles and harness, dice, billiards, all sorts of tanned or dressed hides, dressed furs, all sorts of shoemakers ware, locks, and divers sorts of cutlers ware; all painted goods, except paper; wivers, buckles, gold and silver leaf, and horns for lanterns.

Since the year 1662, several other commodities have been made *contraband*; particularly silk and gallions, laces, embroideries, fringes, buttons, and other silk and thread manufactures; black taffaties, called *alamades*, or lutestring.

In 1719 and 1720, an attempt was made in parliament to pass a bill for putting gold and silver, whether in coined species or otherwise, among the number of *contraband* goods for exportation; but in vain, by reason of the strong opposition made by those who enrich themselves by the export of these metals; which, by the laws of the kingdom, are allowed to be sent away, upon entering them, paying the duty of the export, and making oath of their being foreign, *i. e.* of their not being the coin, or the plate of the kingdom melted down.

It may be judged whether those who promoted the bill, were for the interest of the nation, from this, that in the single month of September 1720, there were entered at the customhouse in London 468119 ounces of gold, and 28988 ounces of silver; *viz.* 34302 ounces of gold, and 4000 ounces of silver for Holland; 12320 ounces of gold for France; 197 ounces of gold, and 5648 ounces of silver for Portugal; and 19340 ounces of silver for the East-Indies; exclusive of what was exported fraudulently, by private persons, without paying the duties.

This shews, indeed, the plenty of gold and silver in England; but it shews, at the same time, the danger it is in of being, at length, exhausted.

CONTRACT, a mutual consent of two, or more, parties, who promise and oblige themselves voluntarily, to do something, pay a certain sum, or the like.

Sales, exchanges, donations, leases, &c. are so many different species of *contracts*. See **EXCHANGE**, and **DONATION**.

CONTRACT is particularly used in common law, for an agreement or covenant between two, with a lawful consideration or cause.

As, if I sell my horse for money; or covenant, in consideration of 20*l.* to make you a lease of a farm; these are good *contracts*, because there is quid pro quo.

Nude CONTRACT. } See the articles } **NUDE**.

Quasi CONTRACT. } See the articles } **QUASI CONTRACT**.

Usurious CONTRACT, is a contract to pay more interest for money than the laws allow.

It is a devastavit in executors to pay a debt upon an usurious *contract*.

In marriage, the Romanists distinguish the civil *contract*, which is the consent of the parties, from the sacrament, which is the benediction of the priest.

Those *contracts* are said to be null which the law prohibits the making of; such are all *contracts* between persons incapable of *contracting*, as minors, religious, lunatics, wives without consent of their husbands, &c.

CONTRACT is also used for the instrument in writing, which serves as a proof of the consent granted, and the obligation passed between the parties.

Among the ancient Romans, *contracts*, and all voluntary acts, were wrote, either by the parties themselves, or by one of the witnesses, or by a domestick secretary of one of the parties, whom they call a *notary*; but who was no publick person, as among us.

The *contract*, when finished, was carried to the magistrate, who gave it a publick authority by receiving it *inter acta*, into the number of the acts under his jurisdiction; giving each of the parties a copy thereof, transcribed by his clerks or domestick registers, and sealed with his seal.—Which practice passed into France, where it obtained a long time. See **ACT**, &c.

CONTRACTILE Force, that property or power inherent in certain bodies, whereby, when extended, they are enabled to draw themselves up again, to their former dimensions.

For the cause of this property, which is of the utmost consequence to a right understanding of the animal economy; see **FIBRE**.

CONTRACTION, in logicks, a species of reduction, wherein the thing that reduces, does also abridge, or bring the thing reduced into a lesser compass.

The design of *contraction* is to bring things, which before were too lax and diffusive, nearer together; that so their mutual relation may appear the more clearly, and they may better strengthen and support each other.

Thus, the following argumentation, 'From that proposition, therefore, now I am standing, follows this other, therefore, now I am existing;' may be thus *contracted*: *ex se sequitur sum, standing implies existing*.

To this head are referred the arguments, as they are called, of poems and orations; the titles and summaries of chapters, &c.

CONTRACTION, in physicks, denotes a diminishing of the extent or dimensions of a body; or a bringing of its parts closer to each other: upon which it becomes heavier, harder, &c. See **CONDENSATION**.

Contraction, in this sense, stands opposed to *dilatation*.

All bodies *contract* by cold, and dilate or rarely by heat. See **COLD**, **HEAT**, and **RAREFACTION**.

CONTRACTION, is frequently used by anatomical writers, to express the shrinking up of a fibre, or an assemblage of fibres, when extended.

Convulsions and spasms proceed from a preternatural *contraction* of the fibres of the muscles of the part convulsed.

On the contrary, paralytick disorders generally proceed from a too great laxness of the fibres of the parts affected; or from the want of that degree of *contraction* necessary to perform the natural motion or action of the part.

In the first, therefore, the animal spirits are supposed to flow, either in too great a quantity, or irregularly; and in the last, the animal spirits are either denied a free passage into the part affected, or the tension of the fibrillæ is supposed insufficient to promote the circulation.

Contraction evidently appears to be the true natural state of all the muscles: for if a muscle be at any time freed from the power of its antagonist, it is immediately found to *contract*; and is not by any diction of the will or the spirits, to be reduced to a state of dilatation.

CONTRACTION of the Heart, Arteries, Lungs, &c. See **SYSTOLE**, **HEART**, **ARTERY**, **PULSE**, &c.

CONTRACTION, in grammar, the reduction of two vowels or syllables into one: as, *maynt*, for *may ne*; *shouldest*, for *shouldestt*, &c.

The Greeks abound in *contractions*, both in their verbs and their nouns; as, *πρω* of *πρωω*, *facio*; *ερω* of *ερωω*, *clamo*; *χερω* of *χερωω*, *inuro*; *παω* of *παωω*, *ambulo*; *μαω* of *μαωω*, *ambulas*; *Δημωδωω*, of *Δημωδωωω*.

The French have something like it too, at least in their pronunciation; as in *saouler*, *baouiller*, *paans*, which they pronounce *souler*, *bailler*, *paan*.

CONTRADICENTE. See **NEMINE Contradicente**.

CONTRADICTION, a species of direct opposition, wherein one thing is found diametrically opposite to another.

The schoolmen usually define it, *oppositio inter ens, & non-ens medio carens*: where, by *ens*, and *non-ens*, are understood any two extremes, whereof one affirms, and the other denies: and it is said to be *medio carens*, to distinguish it from the other species of opposition; the extremes, here, neither agreeing in subject, as is the case in privation; nor in essence and kind, as in contrariety. See **PRIVATION**, and **CONTRARIETY**.

Freedom of CONTRADICTION. See the article **FREEDOM**.

Imply a CONTRADICTION. See the article **IMPLY**.

CONTRADICTIONARY, in a legal sense, a person who has a right or title to contradict, or gain say.

An inventory of the effects of a minor ought to be made in presence of his guardian, or trustee, who is the legal *contradictor*: a decree against a farmer has no effect on the landlord, the first not being the legitimate *contradictor*.

CONTRADICTIONARY Propositions, are opposites, one of which imports a mere, and naked, denial of the other.

Of these, therefore, one must be positive, and the other negative;

gative; as sitting, and not sitting; white, and not white.—*Contradictory* propositions mutually destroy each other.

To have two propositions truly *contradictory*, they must be opposite both in quantity and quality, *i. e.* one must be universal and the other particular, which makes the opposition of quantity; and the one affirmative and the other negative, which makes the opposition in quality.—Thus, *v. gr.* *All use of wine and flour is evil*; false: *Some use of wine and flour is not evil*; true.

To this it is necessary that the one deny, and the other affirm the same thing, of the same subject, considered in the same circumstances: unless the question be about an essential attribute, in which case, no regard is had to circumstances; every thing having always its own essence.—This the logicians express by *affirmare & negare idem, de eodem, secundum idem.*

There may likewise be *contradictory* propositions on a particular subject, *e. gr.* an individual.—These are called *single contradictory propositions*: as *Peter is innocent*; *Peter is not innocent*, or *is a criminal*. Now, to have these propositions *contradictory*, Peter must be considered at the same time; without which they may be both true: since there may be a time wherein Peter was innocent, and another wherein he was a criminal.

CONTRA-FISSURE, **CONTRA-FISSURA**, **Απρηξια**, in medicine, a term applied to that species of fracture, or fissure, in the skull, where the side opposite to that where the blow was received, is cracked.

This species of fracture is taken notice of by Celsus, l. 8. c. 4. yet Aegineta denies the possibility of it; and is herein followed by Gorræus, and many of the moderns. Their chief argument is, that the skull is not one uniform continuous bone, but is divided by several sutures, which prevent the effects of a stroke from being communicated to the opposite part, and confine the mischief to the part struck.—Here, say they, if a skull be found crack'd on the opposite side, or any where but in the place where the blow is immediately received, this must proceed from a 2d or a 3d blow, which perhaps, the patient being stunned, does not remember.—But there are so many cogent instances on the other side of the question, that the reality of *contra-fissures* is now generally allowed. *Virg. à Meckren. Obs. Medic. Chirurg. c. 1. p. 20.* *Dion. ap. Bibl. Anat. Med. T. 1. p. 560.*

The usual symptoms attending a *contra-fissure*, are a delirium, sometimes a bleeding at the nose and mouth, stupidity, and involuntary passing of the urine and excrements, and convulsions. If these happen, and after search made in the part where the injury was received, no fracture or depression of the skull be found, there is suspicion of a *contra-fissure*; especially if the patient be apt to point to that part.

If the symptoms be by intervals, and not to a great degree, or there be reason to believe the fissure to have reached only through one of the tables, it is sufficient to bare the bone, and use a raspatory; then to fill the rima, or crack with proper powders, as of iris, gum, myrrh, powder of diapente, &c. and above all apply a pledget dipped in the tincture of euphorbium, or of equal parts of spirit of wine, and honey of roses.—If these fail, the trepan must be had recourse to.

CONTRA-HARMONICAL Proportion, that relation of three terms, wherein the difference of the first and second, is to the difference of the second and third, as the third is to the first. Thus, *e. gr.* 3, 5, and 6, are numbers *contra-harmonically* proportional; for 2 : 1 :: 6 : 3.

To find a mean contra-harmonically proportional to two given quantities: the rule is, divide the sum of the two squared numbers by the sum of the roots; the quotient is a *contra-harmonically* mean proportional between the roots.

CONTRA-INDICATION, is an indication which forbids that to be done which the main scope of a disease points out. See **INDICATION**.

Suppose, *e. gr.* in the cure of a disease a vomit were judged proper; if the patient be subject to a vomiting of blood, it is a sufficient *contra-indication* as to its exhibition.

CONTRAMANDATIO Placiti, in our ancient law-books, signifies a respiting, or giving the defendant farther time to answer: or, an imparlance, or countermanning of what was formerly ordered. See **COUNTERMAND**.

CONTRAMANDATUM, a lawful excuse, which the defendant by his attorney alledgeth for himself, to shew that the plaintiff has no cause to complain, *si dies placiti sit contramandatus*. 11 Hen. 1. See **COUNTERMAND**.

CONTRAMURE, in fortification, an outwall, built about the main wall of a city. See **WALL**, and **RAMPART**.

CONTRAMURE, in civil architecture. See **COUNTERMURE**.

CONTRAPPOSITION, in logicks. See **CONVERSION**.

CONTRARIENTUM Rotulus. See the article **ROTULUS**.

CONTRARIETY, that which denominates two things *contrary* to each other.

Contrariety consists in this, that one of the terms imports a negation of the other, either mediately or immediately; so that *contrariety* may be said to be the contrast or opposition of two things, one of which implies the absence of the other.

Freedom of CONTRARIETY. See the article **FREEDOM**.

CONTRARIES, are positive opposites; which being of the same kind, or same common nature, and subsisting by turns in the same subject, are as remote from each other as possible, and mu-

tually expel each other.—Such are whiteness and blackness, cold and heat, &c. See **OPPOSITES**.

Hence, properly speaking, only qualities can be *contraries*: *contrariety*, in effect, only agrees to qualities *per se*; to other things it agrees *per accidens*, or *in ordine ad qualitationem*.

CONTRARY, however is often used in a more extensive signification, *viz.* for any inconsistency or difference between the nature and qualities of things.—It is a popular maxim in philosophy, that *contraria juxta se posita magis elucescunt*; *contraries set off one another*. In this sense is the word *contrary* used in the schools: and hence, an argument *à contrario*: *e. gr.* if bodies whose surfaces are rugged do not reflect any light, polished bodies must, by the rule of *contraries* reflect it.

This method of proving things *à contrario*, is much used, and with good success, by F. Bourdaloue in his sermons.

The schools also use the word *contraries* in a more precise signification, as implying two positive things which cannot subsist together in the same subject, but destroy or expel each other, as heat and cold, dryness and moisture.

CONTRARY, in rhetoric. F. de Colonia lays down three kinds of *contraries* in rhetoric, *viz.* *adversatives*, *privatives*, and *contradictories*.

Adversatives are those that differ much in the same things, as virtue and vice, war and peace: thus Tully, *si stultitiam sequimur, sapientiam sequamur*; & *bonitatem, si malitiam*. And Quintilian, *malum causa bellum est, erit emendatio pax*. Drances argues thus in Virgil, *nulla fuit bello: pacem te posticinus omnes*.—*Privatives* are habits, and their privations. *Contradictories* are those, one whereof affirms, and the other denies the same thing, of the same subject.

Point of CONTRARY flexure. See the article **POINT**.

CONTRAST *, in painting and sculpture, expresses an opposition, or difference of position, attitude, &c. of two or more figures; contrived to make a variety in a painting, &c.

* The word comes from the Italian *contrastare*, to oppose, or thwart; and that, according to M. Huet, from the latin *contra statio*.

Thus, when in a group of three figures, one appears in front, another shews his hind-parts, and a third is placed sidewise, there is said to be a *contrast*.

M. de Piles defines *contrast* an opposition between the lines which form the objects; by means whereof they tend to set off one another.

A *contrast* well managed, is one of the greatest beauties of a painting.—The *contrast* is not only to be observed in the position of several figures, but also in that of the several members of the same figure: thus, if the right arm advance the furthest, the right leg is to be hindmost; if the right eye be directed one way, the right arm is to go the contrary way, &c. The *contrast* must be pursued even into the drapery.

To CONTRAST, in architecture, is to avoid the repetition of the same thing, in order to please by variety; as is done in the great gallery of the Louvre, where the pediments are, alternately, arched and angular.

CONTRAT-WHEEL, in clock-work. See **WHEEL**; see also **CLOCK**, and **WATCH**.

CONTRAVALLATION. *Line of CONTRAVALLATION*, in fortification, is a trench guarded with a parapet; made by the besiegers, betwixt them and the place besieged, to secure themselves on that side, and stop the sallies of the garrison.

It is without musket-shot of the town, and sometimes goes quite round it, sometimes not, according as the general finds occasion.

The army forming a siege, lies between the lines of *circumvallation* and *contravallation*. See **CIRCUMVALLATION**.

CONTRAVENTION, a man's failure of performing or discharging his word, obligation, or duty, or the laws and customs of the place.—The penalties imposed in cases of *contravention*, only pass for comminatory.

In a more limited sense, *contravention* implies the non-execution of an ordinance, or edict.

Contravention is supposed to be a degree below prevarication; and to be only the effect of negligence or ignorance. See **PREVARICATION**.

CONTRA-YERVA, a root brought from Peru, esteemed a very great alexiterial, and a sovereign antidote against poison.

It is said to take its name from *yerva*; which in the Spanish signifies white hellebore, a plant whose juice is a violent poison, and is used by the Peruvians to poison their arrows withal: in which sense, *contra-yerva* signifies *counter-poison*.

The root is smaller than that of the iris, reddish without and white within, knotty and fibrous. To be good, it must be new, heavy, and of a dusky red colour.—In smell it resembles fig-leaves; its taste is aromatick, accompanied with somewhat of acrimony.

There is an official composition which takes its name from this root, prepared with it, mixed with the testaceous powders, called *lapis contrayervæ*. Both the root and lapis are of great efficacy in the small pox, measles, fevers, and in all cases where either a diaphoresis or perspiration is required: its success being much more to be depended on than the Gascogins powder; which, among the more knowing, is now very much despised.

It is agreed on, by the generality of writers, that the *contra-yerva* root is one of the best anti-epidemics yet known. Dr. Hodges, in his treatise of the last London plague, has a receipt which he says was attended with great success, and of which this root was one of the chief ingredients. See **PLAGUE**.

There

There is another kind of *contra-yerva*, brought from Virginia, more ordinarily called *serpentaria*, this is very aromatic; it is but seldom prescribed singly, though said to have the same success against poisons and venoms with the *contra-yerva* of Peru. See SERPENTARIA.

CONTRE-BEND, in heraldry. The bar is called a *contrebend*, or *counter-band*, because it cuts the shield contrary, and opposite ways.

They also say, *contre-chevron*, *contre-pal*, &c. when there are two ordinaries of the same nature opposite to each other; so as colour be opposed to metal, and metal to colour. And the coat is said to be *contre* or *counter-paled*, *counter-banded*, *counter-fessed*, *counter-compounded*, or *counter-barred*, when so divided.

Counter-quartered, is when one of the quarters is quartered again: hence also *counter-flowered*, *counter-coloured*, &c. — Animals are said to be *counter-passant*, when one passes on one side, and another on another.

CONTRECOMPONE.

CONTRE-CHANGE.

CONTRE-BANDE.

CONTRE-BARRÉ.

CONTRE-CHEVRONNE.

CONTRE-ERMINE.

CONTRE-ESCARTELE, &c.

COUNTER-COMPOUND.

COUNTER-CHANGED.

COUNTER-BEND.

COUNTER-BARRÉ.

COUNTER-CHEVRONNED.

ERMINE.

COUNTER-QUARTERED.

in heraldry. See

CONTRIBUTION, the payment of each person's quota, or the part he is to bear in some imposition, or common expence.

Contributions are either *involuntary*, as those of taxes and imposts; or *voluntary*, as those of expences for carrying on some undertaking for the interest of the community.

CONTRIBUTIONS, in a military sense, are impositions payed by frontier countries to secure themselves from being plundered, and ruined by the enemy's army.

The peasants till their ground under the faith of *contributions*, as securely as in time of profound peace.

CONTRIBUTIONE *facienda*, a writ which lies where several persons are jointly bound to the same thing, and one or more of them refuse to contribute their share.

If tenants in common, or joint, hold a mill *pro indiviso*, and equally share the profits thereof; the mill falling to decay, and one or more of them refusing to contribute to its repair, the rest shall have the writ *de contributione facienda* to compel them. And if there be three coparceners of land that owe suit to the lord's court, and the eldest performs the whole; then may he have this writ to compel the refusers to a contribution.

CONTRITION, in theology, expresses a real sorrow, resulting from the thought of having offended God; from the sole consideration of his goodness; without any regard to the punishment the sin is intitled to.

Some of the Romish doctors avow, notwithstanding the practice of their church, that *contrition* is valid, and carries with it every thing necessary to obtain pardon, without the ceremony, or, as they call it, the *sacrament* of confession and absolution.

And in this they make the difference between *contrition* and attrition to consist. See ATTRITION. — This doctrine was lately maintained by F. Seguenot upon St. Augustin; but it was censured by the faculty of Paris.

CONTROL, **COMPTROL**, or **CONTROLE**, is, properly, a double register, kept of acts, issues, &c. of the officers or commissioners in the revenue, army, &c. in order to perceive the true state thereof, and to certify the truth, and the due keeping of the acts subject to that enregistrement. See REGISTER. Hence,

CONTROLLER, or **COMPROLLER**, an officer established to control, or over-see public accounts, and to certify, on occasion, whether things have been controlled, and examined, or not. — Thus, we have a **CONTROLLER** of the king's household, or of the accounts of the board of green cloth. *Controller-general* of the customs. *Controller* of the navy. *Controller* of the mint. *Controller* of the excise. *Controller* of the accounts of the army; of the chamber, &c. See CHAMBER.

CONTROLLER of the Hanaper, is an officer in chancery, attending the lord chancellor daily in term and seal time.

This officer is to take all things sealed from the clerk of the hanaper, inclosed in bags of leather, and to note the just number and effect thereof; to enter them in a book, with all the duties belonging to the king and other officers for the same, and to charge the clerk of the hanaper with them. See HANAPER.

CONTROLLER of the Pipe, an officer of the exchequer, who writes out summons twice a-year, to levy the farms and debts of the pipe. See PIPE, and EXCHEQUER.

He was antiently called *duplex infrascripter*.

CONTROLLERS of the Pells, are officers of the exchequer, whereof there are two, viz. two chamberlains clerks, who keep a control of the pell of receipts, and goings-out: originally they took notes of other officers accounts, in order to discover if they did amiss. See EXCHEQUER, &c.

CONTROVER, in law, he who of his own head devises or invents false, or feigned news.

CONTROVERSIAL divinity. See POLEMICAL divinity.

CONTUMACY, in law, a refusal to appear in court when legally summoned; or a disobedience to the rules and orders of a court having power to punish such offence.

The word is used in civil, as well as criminal matters; but more rarely in the first, wherein the words *default*, and *contempt*, ordinarily supply its place: the refunding of the charges of a contempt-judged at the hearing is also the penalty of *contumacy*.

In a criminal sense, the *contumacious* is condemned, not because the crime is proved on him, but because he is absent.

By the Roman laws, there was no process in case of *contumacy*, during the first year of absence: they only took an inventory of the goods of the fugitive, and if he died in the year, he died *integriflatus*; but after the year was expired he was deemed culpable.

In England, *contumacy* is to be prosecuted to outlawry. — In France, all *contumacies* are annulled, if the accused make his appearance in five years; if he die in that time, his relations are permitted to purge his memory.

CONTUSION, *bruise*, in medicine, a solution of continuity, either in flesh or bone, occasioned by a fall, a blow, or a violent pressure, whereby the flesh is damaged, but without any external rupture, or any manifest loss of substance; and an effusion of blood ensues, from several little broken vessels, so as to discolour the skin, though it do not make its way through the pores thereof.

Or, *contusions* may be defined a particular sort of tumors, attended with a stagnation of the blood in the part affected; and, generally, with an inflammation, discoloration, and pain.

Contusions are either *internal*, or *external*. When from any external injury, there proceeds an internal disorder, e. gr. an asthma, spitting of blood, or the like, the *contusion* is said to be *internal*. If only external symptoms appear, as a tumor, blackness, &c. it is termed *external*.

In case of inward *contusions*, bleeding the patient is always necessary, and balsamicks must be given internally; such as sperma ceti, powder of rhubarb, irish slate, oleaginous and pectoral medicines, &c. Externals proper for *contusions*, are liniments or ointments of marshmallows, oil of sweet almonds, spirit of wine with camphire; proper fomentations and strengthening emplasters, as that of oxycrocum, &c. according as the nature of the *contusion* and part *contused* requires.

CONVENT, a monastery of religious, of the one or the other sex. See MONASTERY.

* The word comes from the Latin *conventus*, meeting, of *convenire*, to come together.

CONVENT A *plena*. See the article PACTA:

CONVENTICLE, a diminutive of *convent*; denoting, properly, a cabal, or secret assembly of a part of the monks of a *convent*, to make a brigue in the election of an abbot.

From the ill use of these assemblies, the word is come into disrepute; and now stands for any mischievous, seditious, or irregular assembly. — F. Doucine observes, the occidentals always esteemed the fifth general council an unlawful *conventicle*. See COUNCIL. — The term *conventicle* is said by some to have been first applied in England, to the schools of Wickliff; it at present is applied to the meetings of nonconformists.

CONVENTION, a treaty, contract, or agreement between two or more parties.

Every *convention* between men, provided it be not contrary to honesty and good manners, produces a natural obligation, and makes the performance a point of conscience.

Every *convention* has either a name, and a cause or consideration, or it has none: in the first case, it obliges civilly and naturally; in the latter only naturally. See CONTRACT and CONSIDERATION.

CONVENTION is much used both in antient and modern pleadings for an agreement, or covenant.

In the book of rolls of the manor of Hatfield in Yorkshire, we have a record of a pleasant *convention*, Anno r. Ed. III. between Robert de Roderham and John de Ithen, the latter of whom sold the devil in a string for three-pence halfpenny to the former, to be delivered on the fourth day after the *convention*: when, the purchaser making his demand, the seller refused to give him livery; to the great loss (as the record represents it) of forty shillings to the purchaser, &c. But it appearing to the court that such a plea does not lie among Christians; the parties were adjourned to hell for judgment.

CONVENTION is also the name given to an extraordinary assembly of parliament, or of the states of the realm, held without the king's writ.

The *convention* of estates, in 1688, after the retreat of king James II. upon mature deliberation, came to a conclusion, that king James, by his practices here, and his flight hence, had abdicated the kingdom; and that the throne was vacant; and therefore devolved upon king William and queen Mary. Upon this, their assembly expired as a *convention*, and was converted into a parliament. See ABDICATION.

There was a *convention* of the like kind in Scotland, and with the like effect.

CONVENTIONAL *subrogation*. See SUBROGATION.

CONVENTIONE *facienda*, in law, is a writ which lies for the breach

breach of any covenant in writing. Fitzherbert calls it a writ of *covenant*.

CONVENTUAL, something belonging to a convent. See **CONVENT**, and **COENOBITE**.

CONVENTUAL, is particularly used for a religious who actually resides in a convent; in contradistinction to those who are only guests, or are entertained there, or are in possession of benefices depending on the house.

CONVENTUAL prior, differs from a *claustral prior*, in that the former has the full right and authority of an abbot; the only difference between them being in the name: whereas the claustral prior is a dependant of the abbot, and derives all his authority from him.

The *conventual prior* is obliged to take priests orders in a year, or at most in two years, from the day of his admission: in default whereof, the benefice becomes vacant.

Some priories are actually *conventual*, i. e. they are stocked with religious; others are only *conventual in habitu*, v. gr. where there have been no religious during the space of 40 years: the continuance of one single religious, keeps the priory *conventual aliu*; for in default of one, the priory becomes simple.

By a declaration of the king of France, in 1680, it is decided, that a *conventuality* never degenerates, or ceases, while there are regular places subsisting in it for twelve religious, with revenues for their support. See **PRIORY**.

CONVENTUAL auditors. See the article **AUDITOR**.

CONVERGING, or **CONVERGENT lines**, in geometry, are those which continually approximate, or whose distance becomes continually less and less.

In opposition to *divergent lines*, whose distance becomes continually greater. Lines that *converge* one way, diverge the other.

CONVERGING rays, in dioptricks, are those rays which in their passage out of one medium, into another of a different density, are refracted towards one another; so, as if far enough continued, they will meet in a point, or focus.

All convex lenses make the rays *converge*, and concave ones diverge, i. e. the one infects them towards a center, and the other deflects them from it; and the more, as such lenses are portions of smaller spheres. On which properties, all the effects of lenses, microscopes, telescopes, &c. depend.

Rays coming *converging* out of a denser medium into a rarer, become more *convergent*, and concur sooner than if they were to continue their motion through the first. See **MEDIUM**.

Rays coming *converging* out of a rarer into a denser medium, *converge* less, and concur later, than if they had continued their motion through the first medium.

Parallel rays, passing from a denser into a rarer medium, v. gr. from glass into air, the surface of the glass being towards the air, will become *convergent*, and concur in a focus. See **PARALLEL**. Diverging rays, or rays coming from a point, under the same circumstances, become *converging*, and meet in a focus; and as the radiant point comes nearer, the focus recedes further off: if the radiant be near, the focus will be infinitely distant; i. e. the rays will be parallel: and if the point be brought nearer still, the rays will diverge.

CONVERGING series, in mathematicks. See the article **SERIES**.

CONVERSE, in geometry, &c. A proposition is said to be the *converse* of another, when, after drawing a conclusion from something first supposed, we proceed to suppose what had been before concluded, and to draw from what it had been supposed. Thus, it is demonstrated in geometry, that if the two sides of a triangle be equal; the two angles opposite to those sides are equal also: the *converse* of the proposition is, that if the two angles of a triangle be equal, the two sides opposite to those angles are equal also.

In astrology, **CONVERSE direction** is used in opposition to *direct direction*; i. e. by the latter, the promoter is carried to the significator, according to the order of the signs; by the former it is carried from East to West, contrary to the order of the signs.

CONVERSION, in a moral sense, a return from evil to good; resulting from a sense, either of the natural deformity of the one, and amiableness of the other; or of the advantages and disadvantages that await the one, and the other.

Or, it is a change of the heart, with regard to the morals, passions, desires, and pursuits; and of the mind, with regard to the sentiments, &c. See **REGENERATION**.

CONVERSION, **CONVERSIO**, in logicks, a circumstance or affection of propositions, wherein the order of the terms, or extremes is changed; so that the subject comes into the place of the predicate, and the predicate into that of the subject; without any alteration in the quality of either.

As, *No virtue is vice*; *No vice is virtue*: in which we see the subject of the former, made the predicate of the latter, and the predicate the subject; yet both true.

Conversion is usually defined a due change of the order of the extremes, i. e. under such a habitude and coherence with respect to each other, that the one is rightly inferred from the other. Hence, in every legitimate *conversion* two things are required; 1^o. A communication, or reciprocation of terms; not in respect

of words, but of order. 2^o. The inference of one proposition from the other.

Aristotle makes two kinds of *conversion*; the one *simple*, by others called *universal*; wherein nothing is changed beside the order of extremes, i. e. the terms are transposed, without altering either the quality or quantity thereof: as, *No mind is body*, *No body is mind*.

The 2^o. *per accidens*, called also *particular*; wherein, beside changing the places of the terms, there is a change of an universal sign into a particular one: as, *Every good man studies the welfare of his country*; *some man that studies the welfare of his country is good*.

To these, some of Aristotle's followers add a third kind of *conversion*, called by *contraposition*: as, *Every man is an animal*, *every no-animal is no-man*.

CONVERSION, in rhetoric, &c. is understood of arguments which are returned, retorted, and shewn on opposite sides, by changing the subject into the attribute, and the attribute into the subject. There are *conversions* of arguments, from one figure to another, and also from general propositions to particular ones.—Thus Cicero against Anthony; *Doleatis tres exercitus P. R. interfectos? interfecit Antonius. Desideratis clarissimos viros? eosque vobis eripuit Antonius. Auctoritas hujus ordinis afflicta est? afflicta Antonius*.

CONVERSION, in war, is when the soldiers are ordered to present their arms to the enemy who attack them in flank, whereas they were before supposed to be in front: the evolution necessary thereto is called *conversion*, or *quarter-wheeling*. See **QUARTER-WHEELING**.

CONVERSION of equations, in algebra, is when the quantity sought, or any part thereof, being in fractions, the whole is reduced to one common denomination; and then, omitting the denominators, the equation is continued in the numerators only.

Thus, suppose $a - b = \frac{aa + cc}{d} + b + b$; multiply all by *d*, and it will stand thus, $da - db = aa + cc + d b + d b$.

In arithmetick, we use the term *proportion by conversion of ratio*, for a comparison of the antecedent, and consequent in two equal ratios.

Thus, as there is the same ratio between two and three, as between eight and twelve; it is concluded there is the same ratio between two and one, as between eight and four.

Center of CONVERSION in mechanics. See **CENTER**.

CONVERSOS. See the article **CONVERT**.

CONVERT, a person who has undergone a *conversion*. See **CONVERSION**.

CONVERT is chiefly used in respect of changes from one religion or religious sect to another.

Converts with relation to the religion turned to, are denominated *apostates*, with regard to that they have relinquished.

The Jews formerly converted to Christianity in England, were called *convertos*. Henry III. built them a house in London, and allowed them a competent subsistence for their lives; which house was called *domus convertorum*. But the number afterwards increasing, they grew a burden to the crown; upon which they were distributed among the monasteries: and after the expulsion of the Jews under Edward III. the *domus convertorum* was given for keeping of the rolls.

CONVERTS, in a monastick sense, are lay-friars, or brothers, admitted for the service of the house; without orders, and not allowed to sing in the choir.

Till the eleventh century, the word was used for persons who embraced the monkish life at the age of discretion; by which they were distinguished from those devoted in their childhood by their parents, called *oblats*.

But in the eleventh century, when they began to receive into monasteries illiterate persons, incapable of being clerks, and only destined for bodily labour; the signification of the word was necessarily changed. F. Mabillon observes, that it was John first abbot of Vallombrosa, who first introduced these *brothers-converts*, distinguished by their state from the monks of the choir, who were then either clerks, or capable of becoming so.

CONVEX .	} See the articles	CONVEXITY .
CONVEX freeze.		FREEZE.
CONVEX lens.		LENS.
CONVEX mirror.		MIRROR.
CONVEX superficies.		SUPERFICIES.

CONVEXITY, the exterior surface of a *convex*, i. e. gibbous and globular thing; in opposition to *concavity*, or the inner surface, when hollow or depressed.

The word is of particular import in catoptricks and dioptricks; where it is applied to mirrors and lenses.

A *convex mirror* represents its images smaller than the objects; as a concave one represents them larger: a *convex mirror* reflects the rays from it, diverging; and therefore disperses and weakens their effect: as a concave one reflects them converging, so as they concur in a point, and have their effect increased: and by how much the mirror is a portion of a smaller sphere, by so much does it diminish the objects, and disperse the rays the more. See **MIRROR**.

A *convex lens* is either *convex* on both sides, called a *convexo-convex*;

convex; or it is plain on one side, and *convex* on the other, called a *plano-convex*: or concave on one side, and *convex* on the other, called a *convexo-concave*, or *concavo-convex*, as the one or the other surface prevails; *i. e.* as this or that is a portion of a smaller sphere. All *convex* lenses infect the rays of light in their passage, *i. e.* fend them out from their *convex* surface converging; so as that they concur in a point, or focus.

Hence, all *convex* lenses magnify, *i. e.* represent their images larger than their objects; and this the more, as they are portions of smaller spheres. See LENS, and REFRACTION.

CONVEYANCE, in law, a deed, or instrument, by which lands, &c. are conveyed, or transferred by the proprietor, or owner thereof, to some other person. See DEED.

CONVICT, in common law, one who is found guilty of an offence, by the verdict of a jury.

According to Crompton, a person is also a *convict*, or said to be *convicted*, when, after having been outlawed, he appears and confesses.—*Conviction* and *attainder* are frequently confounded. See ATTAINDER, and ATTAINTED.

CONVICT recusant, he who has been legally presented, indicted, and convicted for refusing to come to church to hear the common prayer, according to the statutes 1 and 32 Eliz. and 3 Jac. I. This is commonly understood to be a popish recusant; though any others who refuse coming to church on the same account are as properly denominated *recusants*. See RECUSANT.

CONVICTION, in theology, expresses the first degree of repentance; wherein the sinner becomes sensible of his guilt, of the evil nature of sin, and of the danger of his own ways.

CONVICTION, in law. See the article CONVICT.

CONVIVIUM *banquet*, in our ancient customs, and law-books, signifies the same thing among the laity, as *præcatio* among the clergy; *viz.* when the tenant was obliged, in virtue of his tenure, to provide meat and drink for his lord once, or oftner in the year. See PROCURATION.

CONVOCAATION, a general assembly of the clergy of a province, summoned by the king's writ to consult of the more weighty affairs of the church, as oft as a parliament is convoked to consult of those of the state.

The king's writ is directed to the archbishop of each province, requiring him to summon all bishops, deans, archdeacons, cathedral and collegiate churches, &c.

Upon which, the archbishop directs his mandate to his dean provincial, first citing him peremptorily; then willing him, in like manner, to cite all the bishops, deans, &c. and all the clergy of his province; but directing, withal, that one proctor sent for each cathedral and collegiate church; and two for the body of the inferior clergy of each diocese may suffice: which the dean accordingly does.

The place where the *convocation* of the province of Canterbury has been usually held is St. Paul's church; whence, of late, they have been prorogued to St. Peter's in Westminster, in the chapel of Henry VII. or the Jerusalem-Chamber, where there is an upper and lower house. Chamberlayne.

The upper house, in the province of Canterbury, consists of 22 bishops, whereof the archbishop is always president; all, at the opening of a *convocation*, are in their scarlet robes and hoods.

The lower house consists of 22 deans, 24 prebendaries, 54 archdeacons, and 44 clerks, representing the diocesan clergy.

Things are first usually proposed in the upper house; then communicated to the lower. All the members of both houses have the same privileges for themselves and menial servants as the members of parliament have.

The archbishop of York, at the same time, holds a *convocation* of the clergy of his province, after the like manner, at York; and, by constant correspondence, debates and concludes of the same matters as are debated by that of Canterbury. Not that the northern province is obliged to follow what the southern one does.

The English clergy, antiently, had their representatives in the lower house of parliament; as appears by the record much prized by my lord Coke.

CONVOLUTION, a winding or turning motion, proper to the trunks of some plants; as the convolvulus, or bind-weeds, and the claspers of vines, and briony.

Dr. Grew thinks, that all those plants whose roots are twisted, have such a *convolution*: and he assigns two great efficient causes of this winding motion, the sun and the moon.

It is very easy to try whether there be any such *convolution* or not in the trunks of plants; which may be done, as he hints, by tying a little bit of paper to any of the branches which are exactly north, south, &c. and then seeing whether it will change its position, or not, in respect of the point of the compass.

CONVOY, *Escort*, a sea term, signifying one, or more vessels of war, intrusted with the conducting of a fleet of merchants; serving as a watch, and a shelter from the insults of the enemies of the state, or of pirates.

Convoy is also used in speaking of military affairs by land; where it signifies a body of forces sent to guard a supply of provisions, arms, or ammunition, going to a camp, or the like.

CONUSANCE. } See the articles { COGNISANCE.
CONSOR. } { COGNISOR.

CONVULSION, *spasmus*, in medicine, a continued involuntary contraction of some parts of the body, otherwise accustomed to move according to the direction of the will.

It owes its origin to a contraction of the muscles of the part, occasioned by a too copious and violent influx of the nervous juice: of which there may be infinite causes in the blood, arteries, meninges, brain, nerves, muscles, cranium, &c.

If the *convulsion* be universal, attended with violent motions, foaming at the mouth, and periodical; it is usually called an *epilepsy*. See EPILEPSY.

The usual evacuations and medicines proper for the cure of *convulsions*, are phlebotomy, emetics, catharticks, epispasticks, and proper cephalicks; as sal volat. oleof. spirit of lavender, spirit of hartshorn, tincture of castor, cinabar of antimony, casumunar root, valerian root, volatile salt of amber, &c. given in different forms.—In periodical universal *convulsions*, a salivation sometimes answers, after other courses have failed.

Women and children are particularly liable to *convulsions*: women after delivery; as upon a stoppage of the lochia, or a violent extraction of the placenta. See Supplement, article SPASM.

CONVULSIVE, in medicine, is applied to those motions which, naturally, should depend on the will; but which, by some external cause, become involuntary.

A *convulsive* motion, is a contraction made by fits and intervals; wherein it differs from a *convulsion*, which is a continued contraction.

Convulsive motions arise from a disorder in the origin of the nerves. A *convulsive* tension of the solids, is one of the principal causes which destroy the equilibrium that should obtain between the solids and the fluids. *Journ. de Sav.*

CONVULSIVE is also used for any thing that occasions a *convulsion*, or *convulsive* motion.

Wounds of nerves are said to be *convulsive*; white hellebore is *convulsive*.—Children are very liable to *convulsive* disorders from various causes; as repletion, curdling of the blood in the stomach or intestines, worms, dentition, &c.—The cramp is a *convulsive* contraction of some muscular part of the body. See CRAMP.

CONVULSIVE asthma. See the article ASTHMA.

COOK-ROOM, in a ship, is where the cook and the mate dress and deliver out the meat, &c.—See Tab. Ships, fig. 2. n. 32.

COOLERS, in medicine, remedies so called: which may be considered under these two divisions:—1^o. Those which produce an immediate sense of cold; which are such as have their parts in less motion than those of the organs of feeling.

2^o. Such as by a particular viscosity, or grossness of parts, give a greater consistency to the animal fluids than they had before; whereby they are disabled from moving so fast, and will therefore have less of that intestine force on which their heat depends.

Of the former kind are fruits, and all acid liquors.—To the latter belong cucumbers, and all substances producing viscosity.

COOM, a term for soot that gathers over an oven's mouth: also for that black greasy substance which works out of the wheels of carriages.

Coom, or soot, is sometimes used in medicine, infused in wine with other ingredients, as an antihysterick, and against palpitations of the heart, &c.—The spirit of soot is also used for the same intentions, and in cephalick cates.

COOMB, or COMB of corn, is a dry measure, containing four bushels, or half a quarter. See MEASURE; see also BUSHEL, &c.

COOPERIRE *pallio*. See PALLIO.

COORDINATE, something of equal order, rank, or degree with another. See ORDER, &c.

COORDINATION, in respect of causes, denotes an order of causes, wherein several of the same kind, order, and tendency, concur to the production of the same effect.

COPAL, a gum, or resin of an agreeable smell, resembling that of frankincense; it is brought from New Spain, where it oozes out from incisions made in the bark of a large tree; much after the manner in which the vine yields its sap, when cut in the spring.

The Indians use it to burn on their altars: among the Europeans, it is used against disorders of the breast, having a warming, resolving, and humectating power. It is very rare; when good, it is of a fine transparent yellow; and melts easily, either in the mouth, or on the fire.

In defect of this is brought another kind from the Antilles, which is almost the only one known among the druggists; and its chief consumption is in the making of varnish.

COPARCENARY, the share, or quota of a *coparcener*. See COPARCENERS.

COPARCENERS, or *Parceners*, such as have equal portions in the inheritance of their ancestor.

Coparceners are so either by law, or custom. *Coparceners by law*, are the issue female; which, in default of a male heir, come equally to the lands of their ancestor.

Coparceners by custom, are those who by some peculiar custom of the country, challenge equal parts in such lands; as in Kent, by the custom of Gavelkind.—The crown of England is not subject to *coparcenary*.

COPE, an ecclesiastical ornament, usually wore by chantors and sub-chantors, when they officiate in the church-solemnity. It is also wore by the Romish bishops and other ordinaries: it reaches from the shoulders to the feet. The antients called it *phociale*.

S. Martin's COPE, was a relic, formerly in great esteem among the French kings; and was often carried with them to war as their standard.

COPERNICAN sphere. See the article SPHERE.

COPERNICAN system, or *hypothesis*, is that system of the world, wherein the sun is supposed at rest in the center; and the planets with the earth, to move in ellipses round him. See SYSTEM. The heavens and stars are here supposed at rest; and that diurnal motion which they appear to have from east to west, is imputed to the earth's motion from west to east.

This system was asserted by many of the antients; and particularly Ephantus, Seleucus, Aristarchus, Philolaus, Cleanthes Samius, Hicetas, Heraclides Ponticus, Plato, and Pythagoras; from which last it was antiently denominated the *pythagoric system*.

It was also held by Archimedes, in his book *de granorum arena numero*; but after him it became neglected, and even forgotten, for many ages; till about 250 years ago, when Copernicus revived it; from whom it took the new name of the *copernican system*. Nich. Copernicus, now a name so popular, was born at Thorn, in Polish Prussia, in the year 1472, according to Junctinus, or 1473 according to Mæstlinus. After the usual domestick education, he was sent to the university of Cracow; where he applied himself to philosophy and physick, and at length commenced doctor in medicine. In the mean time, having a strong propensity to mathematics, he diligently attended the lectures of Albert. Brudzevius, and even learnt of him at home. After he had here attained to the use of the astrolabe, and was entering upon astronomy, he took Regiomontanus for his guide: though he run through all the mathematics of the age, yet he seemed most taken with perspective; on occasion whereof he learned painting, in which he is said to have excelled. When 23 years of age, being at Bologna, he became acquainted with that eminent mathematician Dom. Maria Ferrariensis; and was admitted to share with him in making of astronomical observations. Here, in the year 1497, Copernicus first observed an occultation of palilicium by the moon. Going on to Rome, he taught publicly, and made some considerable observations; and at his return to Cracow, he was made canon of the church of Wermelant, or Ermeland, and at length vicar-general.

The course he took in prosecuting astronomy, which has rendered his name immortal, was as follows: Observing how the astronomers of those times were grieved to make the planets move equally in circular orbits, *viz.* to suppose them to move, not about their own center, but that of the equant; and that they could no way make out a tolerably regular system, out of all their shifts and hypotheses; he resolved to try what he could do. With this view he perused the writings of all the philosophers and astronomers extant; and picked out of each what appeared probable and elegant. In this review he was chiefly taken with two almost similar opinions; (the one attributed to Martianus Capella, the other to Apollonius Pergeus;) which give a very good account of the motions of Venus and Mercury; and explain the cause of their directions, stations, and retrogradations very happily: the latter, withal, performing the same in the three superior planets. But, then, in both these hypotheses, the earth is supposed the center; Copernicus chose rather to adopt the opinion of the Pythagoreans; to remove the earth out of the center of the world, and to give it, not only a diurnal motion round its own axis; but also an annual one round the sun.

On this footing he began to observe, calculate, compare, &c. and at length, after a long solicitous disquisition, found himself in a condition to account for the phenomena and motions of all the planets; and to make an orderly arrangement, or disposition of the whole heavens: wherein nothing could be altered, or displaced, without bringing the utmost confusion into the whole. These things he began to write down about the year 1507. He then proceeded to furnish himself with some new apparatus; particularly a parallactick instrument, and some Ptolemaic rulers, wherewith to observe the altitude of the stars, and determine the periods of the sun and moon: and without other means, composed his six books *de orbium coelestium revolutionibus*; containing the whole of astronomy, delivered after the example of Ptolemy, in a geometrical method. We have already observed that he began it in 1507; he finished it in 1530. Five years after he published and improved it. He died of a dysentery, and a palsy on his right side, in the year 1543.—See the *order, and disposition of the heavenly bodies*, as laid down by him, compared with those in the other systems, under the head SYSTEM.

COPERNICUS, is the name of an astronomical instrument, contrived by Mr. Whiston, for the calculation and exhibition of eclipses, and of the motions of the planets, both the primary and secondary ones, &c.

It was so called by the inventor, as being built on the *copernican system*; or as representing the heavenly bodies agreeable thereto. It consists of several concentric circles of wood; upon which are inscribed numbers, transferred either from the astronomical

tables: by the various dispositions of these circles, which are made so as to slide within each other, questions are solved; and thus long calculations are saved, and the work of many hours brought into a few minutes.

For the exhibition of eclipses, there is a peculiar apparatus, consisting of a terrestrial globe, so disposed, as that being turned round its axis, the light of the sun, or a candle, is projected through a glass plane, marked out into concentric circles, expressing digits of the eclipse; and thus is the path of the eclipse, with its degree or quantity in every part of its path, agreeably and accurately represented.

The instrument not being very common, a particular description were superfluous. The author of it has wrote a book expressly to explain it.

COPHTI, COPHTS, or COPTI, a name given to the christians of Egypt; who are of the sect of Jacobites.

* The critics are extremely divided about the origin, and orthography of the word: some write it *gopht*, others *cophtite*, *cophtite*, *copht*, &c. Scaliger derives the name from *copht*, an antiently celebrated town of Egypt, the metropolis of the Thebaid. Kircher refutes this opinion, and maintains, that the word originally signifies *cut*, and *circumscised*: and was given these people by the Mahometans, by way of reproach, in regard of their practice of circumcising: but P. Sollier, another Jesuit, refutes this opinion. Scaliger afterwards changed his opinion, and derived the word from *Ar-vee*, the antient name of Egypt, by retrenching the first syllable: but this opinion, too, P. Sollier disputes. John de Leo and others say, that the Egyptians antiently called their country *elchibb* or *chibb*, from Chibb their first king, whence *cophtite*, &c. others say from Costim second king of Egypt. Vanleb derives the word *copht* from Copt son of Miffaam, grandson of Noah.—All these etymologies P. Sollier rejects, on this principle, that were they true, the Egyptians ought all equally to be called *cophts*; whereas, in effect, none but the Christians, and among those none but the Jacobites bear the name; the Melchites not being comprehended under it.—Hence he chuses to derive the word from the name *Jacobite*, by retrenching the first syllable; whence *coibite*, *coibta*, *copta*, and *cophtia*.

The *Cophts* have a patriarch, who resides at Cairo, but he takes his title from Alexandria: he has no archbishop under him, but eleven or twelve bishops. The rest of the clergy, whether secular or regular, is composed of the orders of S. Anthony, S. Paul, and S. Macarius, who have each their monasteries.

Beside the orders of priests, deacons, and subdeacons, the *Cophts* have likewise archimandrites, the dignity whereof they confer with all the prayers and ceremonies of a strict ordination.

This makes a considerable difference among the priests; and besides the rank and authority it gives them with regard to the religious, it comprehends the degree and functions of arch-priests. By a custom of 600 years standing, if a priest elected bishop be not already archimandrite, that dignity must be conferred on him before episcopal ordination.

The second person among the clergy, after the patriarch, is the titular patriarch of Jerusalem, who also resides at Cairo, by reason of the few *Cophts* at Jerusalem; he is, in effect, little more than bishop of Cairo: only he goes to Jerusalem every Easter, and visits some other places in Palestine near Egypt, which owns his jurisdiction. To him belongs the government of the *cophtic* church, during the vacancy of the patriarchal see.

To be elected patriarch, it is necessary the person have lived all his life in continence; and even that he be a virgin: it is he confers the bishopricks. To be elected bishop, the person must be in the celibate; or, if he have been married, it must not be above once.

The priests and inferior ministers are allowed to be married before ordination; but are not obliged to it, as Ludolphus mistakenly observes. They have an infinity of deacons, and even confer the dignity frequently on children. None but the lowest rank among the people commence ecclesiastics; whence arises that excessive ignorance found among them: yet the respect of the laity towards the clergy is very extraordinary.

Their office is longer than the Roman office, and never changes in any thing: they have three liturgies, which they vary occasionally.

The monastick life is in great esteem among the *Cophts*: to be admitted into it, there is always required the consent of the bishop. The religious *Cophts* make a vow of perpetual chastity; renounce the world, and live with great austerity in deserts: they are obliged to sleep in their cloths and their girdle, on a mat stretched on the ground; and to prostrate themselves every evening 150 times, with their face and breast on the ground. They are all, both men and women, of the seam of the people; and live on alms. The nunneries are properly hospitals; and few enter but widows reduced to beggary.

F. Roderic reduces the errors and opinions of the *Cophts* to the following heads: 1°. That they put away their wives, and espouse others while the first are living. 2°. That they have seven sacraments, *viz.* baptism, the eucharist, confirmation, ordination, faith, fasting, and prayer. 3°. That they deny the holy spirit to proceed from the son. 4°. That they only allow of three oecumenical councils; that of Nice, Constantinople, and Ephesus. 5°. That they only allow of one nature, will, and operation in Jesus Christ after the union of the humanity with the divinity.

For their errors in discipline, they may be reduced, 1^o. To the practice of circumcising their children before baptism, which has obtained among them from the twelfth century. 2^o. To their ordaining deacons at five years of age. 3^o. To their allowing of marriage in the second degree. 4^o. To their forbearing to eat blood: to which some add their belief of a baptism by fire, which they confer by applying a hot iron to their forehead or cheeks.

Others palliate these errors, and shew that many of them are rather abuses of particular persons, than doctrines of the sect. This seems to be the case with regard to their polygamy, eating of blood, marrying in the second degree, and the baptism of fire; for circumcision, it is not practised as a ceremony of religion; nor as of any divine appointment, but merely as a custom which they derive from the Ishmaelites; and which, perhaps, may have had its origin from a view to health and decency in those hot countries.

The *Cophits*, at different times, have made several re-unions with the Latins; but always in appearance only, and under some necessity of their affairs. In the time of pope Paul IV. a Syrian was dispatched to Rome from the patriarch of Alexandria, with letters to that pope; wherein he acknowledged his authority, and promised obedience; desiring a person might be dispatched to Alexandria, to treat about a re-union of his church to that at Rome: pursuant to which, Pius IV. successor to Paul, chose F. Roderic, a Jesuit, whom he dispatched in 1561, in quality of apolloical nuntio.

But the Jesuit, upon a conference with two *Cophits* deputed for that purpose by the patriarch, was made to know, that the titles of *father of fathers*, *pastor of pastors*, and *master of all churches*, which the patriarch had bestowed on the pope in his letters, were no more than mere matters of civility and compliment; and that it was in this manner the patriarch used to write to his friends: they added, that since the council of Chalcedon, and the establishment of several patriarchs independent of one another; each was chief and master of his own church. This was the answer the patriarch gave the pope, after he had received a sum of money remitted to him from Rome, by the hands of the Venetian consul.

COPHTIC, or **COPTIC**, the language of the Cophits.

This is the antient language of the Egyptians, mixed with a great deal of Greek; the characters it is written in being all Greek.

F. Kircher is the first who published a grammar, and vocabulary of the *Cophitic*. There is not known any book extant in the *Cophitic*, except translations of the holy scriptures, or of ecclesiastical offices; or others that have relation thereto, as dictionaries, &c.

The antient *Cophitic* is now no longer found, but in books: the language now used throughout the country is Arabic.

The old *Cophitic*, which Kircher maintains to be a mother-tongue, and independent of all others, had been much altered by the Greek: for besides that it has borrowed all its characters from the Greek, with a very little variation, a great number of the words are pure Greek.

Vossius, indeed, asserts that there was no *Cophitic* language till after Egypt became subject to the Arabs. The language, according to him, is a mixture of Greek and Arabic: the very name thereof not being in the world till after the Arabs were masters of the country. But this, M. Simon observes, proves nothing; except that what was antiently called *Egyptian*, has since by the Arabs been called *Cophitic*, by a corruption of speech. There are, it is true, Arabic words in the *Cophitic*; yet this by no means proves but that there was a language before that time, either *Cophitic* or Egyptian. Pietro de la Valle observes, that the Cophits have entirely lost their antient tongue; that it is now no longer understood among them; and that they have nothing extant therein but some sacred books; and that they still say mass in it: *solo hanno in essa alcuni libri sacri, dicendo ancora la massa in quella lingua.*

All their other books have been translated into Arabic, which is their vulgar tongue; and this has occasioned the originals to be lost: it is added, that they rehearse the epistles and gospels in the mass, twice; once in Arabic, and once in *Cophitic*.

Indeed, if we believe F. Vanlebe, the *Cophits* say the mass in Arabic, all but the epistles and gospels, which they rehearse both in that and *Cophitic*: *La massa celebrano in lingua Arabica, eccetto l'Evangelio & alcune altre cose che sogliono leggere nella lingua Copta & Araba.*

COPHTIC bible. See the article **BIBLE**.

COPIA libelli deliberanda, a writ which lies in case where a man cannot get the copy of a libel at the hands of the ecclesiastical judge.

Cornu COPIA. See **CORNUCOPIA**.

COPIATA, under the western empire, a *grave-digger*.—In the first ages of the church, there were clerks defined for this employment. In the year 357, Constantine made a law in favour of the priests *copiatæ*, i. e. of those who had the care of interments; whereby he exempts them from the lustful contribution which all other traders paid.

It was under him also that they first began to be called *copiatæ*, q. d. clerks destined for bodily labour, from *κοπιω*, of *κοπιω*.

findo, caedo, ferio, I cut, beat, &c. Before that time they were called *decani* and *lecticarii*; perhaps, because they were divided by decads or tens, each whereof had a bier or litter for the carriage of the dead bodies. Their place among the clerks, was the next in order before the chantors.

COPING of a wall, the top or cover of a wall, made sloping to carry off the wet.

COPING over, in carpentry, a sort of hanging over, not square to its upright, but bevelling on its under side till it end in an edge.

COPIVI, **CAPIVI**, **COPAYBA**, or **CUPAYBA**, a balm or balsam, oozing out of incisions made in a tree of Brazil; not taken notice of but by very late writers; at least, not under this name.

It is of a thinner consistence than common turpentine, but much more fragrant, and detersive. It is extremely quick in passing off by urine, and mightily cleanses those passages; by which it has obtained very much in gonorrhæas, seminal weaknesses, the whites, and all obstructions, and ulcerations of those parts. It is likewise a powerful balsamick, and is good in many distempers of the breast, especially in catarrhs, tickling coughs, spitting of blood, &c. In dysenteries and diarrhæas of long continuance, where the mucus that lines the intestines is by the acrimony of the humours abraded, it is of great service in supplying its place by its balsamick quality. It mixes intimately with the yolk of an egg.—The Jews use it to stop the flux of blood after circumcision.

COPPEL, **COPEL**, or **CUPPEL**, a vessel used by refiners, and essayers, to try, and purify their metals.

The *coppel of assay*, is a little flat vessel, made of vegetable ashes, and bones of sheeps feet, calcined and lixiviated, to separate the salts, which would otherwise make it crack. At the bottom of the vessel is a little cavity filled with a kind of white varnish, composed of hartshorn, or pike-bones, calcined and diluted in water: the use of this liquor is, that the gold or silver to be essayed may be more conveniently lodged, and that the button of the essay may be separated the more easily.

Note, Though metals may be tried otherwise than by *coppelling*: and though the touchstone, graver, &c. are of some service to the goldsmith in judging of their purity; yet, without the *coppel*, it is difficult, not to say impossible, to know their precise degree of purity.

The *refiner's coppel*, is a large freestone vessel, lined within with a kind of plaster made of ashes well lixiviated, cleaned, dried, beaten and sifted.

In this kind of *coppel* it is that they purify their gold and silver, by adding lead to it, and exposing the whole to a violent fire. See **Supplement**, article **COPPEL**.

COPPER, a hard, heavy, ductile metal; found in mines, in several parts of Europe, but most abundantly in Sweden.

Copper is of all metals the most ductile and malleable after gold and silver; and it abounds very much in vitriol and sulphur.

The chymists call it *venus*; as supposing it to have some more immediate relation to that planet. By an analysis it appears composed of a sulphur ill digested, a yellowish mercury, and a red salt.

Copper is found in gtebes or stones of various forms and colours; which are first beaten small and washed, to separate them from the earthy, &c. parts wherewith they are mixed.

After washing they are melted, and the melted matter run into a kind of moulds, to form large blocks, by some called *salmons*, and by others *cakes of copper*. This is the ordinary *copper*.

To render it more pure and beautiful, they melt it again once or twice; some of its coarse earthy parts being left behind at each fusion, and a quantity of tin and antimony added in each. In this state it is called *rose copper*, in Latin *æs pelustum*.

Copper is sometimes also found native and pure in the mines, either in form of threads, or in flakes, plates, grains, or other masses and lumps.—This is called *virgin copper*.

Of a mixture of *copper* and lapis calaminaris, is formed brass, which the French call *cuivre jaune*, *yellow copper*, in contradistinction to natural *copper*, which they call *cuivre rouge*, *red copper*. See **BRASS**.

Copper melted together with 22 or 23 pounds of fine tin per quintal, makes bell metal. See **BELL metal**.

Copper and brass melted in equal quantities, make what the French call *bronze*, used for figures, statues, &c.

Copper turns white by an unction of spirit of wine and orpiment: Pliny says there is a *copper* naturally white, found underneath the silver mines. See **Supplement**, article **CUPRUM**.

Engraving on COPPER. } See the articles { **ENGRAVING**.

Refining of COPPER. } See the articles { **REFINING**.

Chymists give the denomination *saffron of copper*, or *crocus venis*, to a preparation of *copper* plates frassified with decrepitated salt, in a crucible; after having extinguished them in water, and scraped them with iron instruments. It is very red, and is used in emplasters to cleanse wounds, and ulcers.

Some chymists have pretended that the spirit of *copper* is a real alkahest, capable of dissolving wholly pearls, corals, crabs eyes, &c. without any diminution of its force; but experience has shewn the contrary.

Æsustum, sometimes also called *saffron of venus*, is nothing but *copper* calcined in a violent fire.

Verdigrease is a rust of *copper*. See VERDIGREASE.—Becher observes, that the drinking of acid liquors, even out of common silver plate, is very unwholesome, by reason of the mixture of *copper* therein; much more is it so out of vessels of *copper*.

COPPERAS, a name given to vitriol, particularly to vitriol of iron.

Copperas is purified and prepared in the same manner as alum and salt-petre, by passing through several lixiviums, till it be wholly reduced to crystal.

Some make *copperas* to be the chalcitis of the antients. But the more common opinion is, that their chalcitis was a stone, not a pure salt.

There is *copperas* of England, of Pisa, Germany, Cyprus, Hungary, and Italy, which differ from each other in colour, richness, and perfection.

White copperas, is a vitriol of iron, with a mixture of some other mineral, brought from Germany in cakes of 40 or 50 pound each: such are those brought from Goslar in Saxony.

The English *copperas* is of a fine green; that of Cyprus and Hungary is of a sky blue, and has copper for its basis. It is in pieces cut like the point of a diamond. That of Pisa and Italy is likewise green; and the last as transparent as glass.

The English green *copperas* is of considerable use in many preparations; but especially in dyeing. The haters also use it in their dye; and this and galls are the ingredients that compose writing-ink.

The ordinary English *copperas* is made of a kind of stones found on the sea-shore in Essex, Hampshire, and so westward, ordinarily called *gold stones*, from their colour: they abound much in iron.

To prepare the *copperas* from them, they are exposed to the weather in beds above ground, and receive the rains and dews, which in time break and dissolve the stones: the liquor that runs off is pumped into boilers, in which is first put old iron, which in boiling dissolves. When the boiling is finished, the liquor is drawn off into coolers, where it shoots into crystals.

The works at Deptford for making it, are known to most people.—Many chymists dissolve this, and shoot it again, to sell it for the common salt of steel.

COPPICE, or COPSE, a little wood, consisting of under-woods; and such as may be raised either by sowing, or planting.

COPULA, in logic, a verb that connects any two terms in a proposition, either negative or affirmative: as, *A rose is sweet*; where *is* is the *copula*.

COPULATION. See the articles COITION, CONGRESS, and CONSUMMATION.

COPULATIVE Propositions, are those which include several subjects, or several attributes joined together by an affirmative or negative conjunction.

Thus, *v. gr. power and riches do not make a man happy*. Where *and* is the conjunction that couples *power* and *riches*.

Conjunction COPULATIVE. See CONJUNCTION.

COPY, in a law-sense, a transcript of a writing or instrument, made for the use and satisfaction of some of the parties concerned; or in order to preserve the memory thereof. See COPIA.

Such a *Copy* was taken from the original; has been collated with the original. Antient documents do now few of them subsist otherwise than in *copies*.

Copy is also used for an imitation of any original work; particularly a painting, draught, figure, &c.

Copy, among printers, denotes the manuscript, or original of a book given to print from.

In this sense, they say, the press stands still for want of *copy*: such an author's *copy* is good, *i. e.* it is fair, legible, orderly, &c. and such another's otherwise.

In the bookseller's language, a *good copy* is that which produces a saleable book.

To cast off a *copy*, is to make a computation of the number of sheets a manuscript will make in print.

Tenant by COPY of court-roll. See TENANT.

COPY-HOLD, is a tenure for which the tenant has nothing to shew but the *copy* of the roll made by the steward of the lord's court.

The steward of the court is, among other things, to enroll and keep a register of all such tenants as are admitted to any parcel of land, or tenement belonging to the manor; and the transcript is called the *copy* of the court-roll, which the tenant keeps as his own evidence.

This tenure is called a *base tenure*, because the tenant holds, in some sort, at the will of the lord. Fitzherbert says, it was formerly called *tenure in villenage*; and that *copy-hold* is but a modern name. However, it is not simply at the lord's will, but according to the custom of the manor; so that if the *copy-holder* doth not break that custom, and forfeit his tenure, he seems not to stand at the lord's courtesy.—These customs are infinite; varying in one point or other almost in every manor.

Copy-holders, upon admittance, pay a fine to the lord; which fines are in some manors certain, in others not; but yet, if the

lord exceeds two years value, the court of chancery, king's-bench, &c. have, in their several jurisdictions, power to reduce the fine.

In many places, the *copy-holds* are a kind of inheritance, and termed *customary*, because the tenant dying, and the hold becoming void, the next of blood paying the customary fine, as two shillings an acre, or the like, may not be denied his admission. Some *copy-holders* have by custom the wood growing upon their own land; some, again, hold by the verge in anti-ent demesne, so that though they hold by *copy*, they are yet accounted a kind of freeholders: lastly, some others hold by common tenure, called *mere copy-hold*; whose land, upon felony committed, escheats to the lord of the manor.

This is the land which the Saxons called *folkland*, as being held *sine scripto*, in contradistinction to *bockland*, or charter-land, *terra ex scripto*, and now free-land. See CHARTER-LAND, and FREE-HOLD.

COPY-HOLDER, is defined by West, a person admitted tenant of any lands, or tenements within a manor, which, time out of mind, by the use and custom thereof, have been devisable to such as will take the same by *copy* of court-roll, according to the custom of the said manor.

COQ, *ad med. consumpt.* an abbreviation among physicians, signifying that the thing is to be boiled till half of it be consumed.—*Coq. in S. Q. Ag.* implies it to be boiled in a sufficient quantity of common water.

COR, in anatomy. See the article HEART.

COR *carolis*, in astronomy, an extra constellated star in the northern hemisphere, situated between the comae berenices and urfa major; so called by Dr. Halley in honour of king Charles.

COR *hydrae*, in astronomy, a star of the second magnitude, in the heart of the constellation hydra; the twelfth in order in Ptolemy's catalogue; the eleventh in Tycho's; and the twenty-fifth in the Britannic. Its longitude is 22° 57' 59", its latitude 22° 24' 32" south.

COR *lemis*, or *regulus*, a fixed star of the first magnitude, in the constellation leo. See LEO.

CORACOBRACHIALIS, a muscle which arises from the processus coracoides of the scapula, by a tendinous beginning; and passing over the articulation of the humerus, is inserted into the middle and internal part of that bone, and with the deltoides and supra-spinatus, lifts the arm upwards; and alone, obliquely outwards.—See Tab. Anat. (myol.) fig. 1. n. 23.

CORACOCHYOIDEÆUS *, in anatomy, a muscle which has its origin from the processus coracoides of the omoplate; or rather, according to Keil, from the upper edge of the scapula, near its neck; whence ascending obliquely under the mastoideus, it is inserted into the os hyoides; which it serves to pull obliquely downwards.—See Tab. Anat. (myol.) Fig. 2. lit. o. fig. 1. n. 17. See also HYOIDES.

* The word is formed from *coracoides* and *hyoides*, the two parts. It is also called *digestivus*, as having two bellies at its two extremities, and a tendon in the middle to give room for the passage of the carotid and inner jugular artery. See DIGESTRIC.

CORACOIDES *, in anatomy, a small, sharp process of the scapula, so called from its resembling a crow's bill.—See Tab. Anat. (Osteol.) fig. 3. n. 5. 5. See also PROCESS, and SCAPULA.

* The word comes from the Greek *κοραξ*, *κοραξ* & *corvus*, and *ειδω*, *imago*.

The *coracoides* is placed in the upper part of the neck, and projects over the head of the bone of the arm.—It serves to strengthen the articulation of the shoulder; and gives origin to one of the muscles of the arm.

CORAL, in natural history, a production of the sea, usually ranked among the number of marine plants *.

* The nature of coral must needs be very difficult to determine: for the antients, without hesitation, took it for a stone; most of the moderns hold it a vegetable; of late days, M. de Reaumur maintains it partly plant, partly stone; while another curious and able naturalist, who has much studied the productions of the sea, almost ranks it in the number of animals, as imagining it the work of certain sea insects. Vid. Hist. Acad. R. Scienc. an. 1728. p. 50. mem. p. 378.

The opinion of its being a vegetable, is, however, now so well established, that all other sentiments seem almost precluded. P. Kircher supposes entire forests of it, at the bottom of the sea; and M. Tournesort, an able botanist, maintains that it evidently multiplies by seed; and the count de Marfigli has even discovered some parts therein which seem to serve the purpose of seeds and flowers.

Coral, then, being established a plant, has, in that quality roots, wherewith it is fastened to the rock whereon it grows: these roots are covered with a bark, often beset with stony pores, which traverse them from top to bottom. Above the roots is the ligneous part of the plant, if we may so call a substance that rather seems to resemble stone than wood. It is divided into branches like other plants; having white streaks therein, which seem to represent a kind of fibres. The extremities of the plant are rounded with little bowls, ordinarily divided into six cells, filled with a humour somewhat like milk, fatty, sharp, and astringent.

Lastly,

Lastly, that nothing may be wanting to constitute a real plant, these bowls are esteemed a kind of pods, or capsules, containing the seed of the coral. It is even said, that in what place, or on what matter soever this juice be shed, it carries fecundity with it, and produces a plant of coral: whence it is, that in the cabinets of the curious, we find some of it on dead mens skulls, pieces of earthen ware, and other kinds of solid bodies, which chance and the working of the sea have thrown into some of F. Kircher's forests. Coral, M. le Comte de Marigli observes, grows chiefly in grottos whose mouth or aperture is towards the south, and their vault, or concave arch nearly parallel to the surface of the earth. For its growth, it is necessary the sea be as quiet as a pond: it vegetates the contrary way to all other plants; its foot adhering to the top of the grotto, and its branches shooting downwards. The foot takes the exact form of the solid it grows to, and even covers it, like a plate, to a certain extent; which M. de Marigli thinks a proof that its substance was originally fluid: and what confirms the thought, is, that the same substance shall sometimes line the inside of a shell, which it could never have entered but in form of a fluid.

Upon a nice examen of the several parts of coral, M. de Marigli gathers, that all its organism, with regard to vegetation, consists in its rind; that the tubules of this rind filtrate a juice which fills the cellulæ, and runs along the canals as far as the extremities of the branches*; and that this juice being petrified, both in the cells encompassing the coralline substance, and in those of the extremities of the branches whose substance is not yet formed, makes the plant grow both in height and bulk.

* It was held a paradox in 1710 to assert, that all that appears organic in coral, with regard to vegetation, consisted in its rind, and in the surface of the proper coralline substance immediately covered with this rind.—But M. de Reaumur has lately adopted and fortified this opinion.—He takes for a plant the coarse visible rind of coral, which is very different from what we properly call coral; and also another much finer rind which the eyes do not distinguish from the proper coralline substance covered by it: and all the rest, that is, almost the whole coralline substance, he takes for a mere stone without any organization. There are many plants which cannot grow without being supported: this is under the same necessity. But whereas others go out in search of supports, and meet with foreign bodies already formed; coral forms itself a support within itself, and invests it with its own substance. Hist. Acad. R. Scienc. An. 1727. p. 51.

The ancients believed that coral was soft while it continued at the bottom of the water; and that it only became hard and solid by the impression of the air. But the moderns are convinced of the contrary from experience; and know that there was more of imagination than truth in the name *gorgonium*, which they gave it, to shew that Medusa's head did not convert objects into stone, more surely than coral became petrified as soon as it appeared in the air.

There are, properly, but three kinds of coral, red, white, and black: the black is the rarest and most esteemed; but it is the red that is ordinarily used in medicine. It must be chosen thick, smooth, and shining, and of a beautiful red, not covered with any tartarous matter.

There is a kind of white coral pierced full of holes, and a black coral, named *antipates*; appearing of a different nature from the rest: but these are of no use.—The chymists draw a magisterial tincture from coral, and a salt.

Coral gives title to an official composition, called *syrup of coral*, sometimes prescribed by physicians; as is likewise the powder of coral finely ground, and afterwards levigated on a marble, and made up into a proper form. But there are few except those who are fond of medicines with gems in them that make use hereof. By means of its exceeding hardness, it is suspected to take away with it a great deal of the levigating stone.

The virtues attributed to coral and its preparations, are that it is astringent, and therefore of use in diarrhæas, too large fluxes of the menstrua, and floodings; of service in the fluxus albus, and to prevent miscarriages; beside its use in common as a testaceous powder in childrens diseases, &c.

Some also attribute to coral the immediate stopping of blood, the securing of houses from thunder-bolts, the keeping away of evil spirits, and the promoting of dentition. It is added that coral appears redder wore on a man than on a woman; that it becomes pale and livid when wore by a sick person; and that the changes in the plant correspond with those in the disease. But for these, and many more fancies of the same kind, credit *Judæus apella*.—Its chief use we know of, is in chaplets, beads, and other toys.

CORAL Fishery. The time for fishing coral is from April to July: the places are the Persian Gulf, Red Sea, coasts of Africa towards the Bastion of France, the Isles of Majorca and Corfica, and the coasts of Provence and Catalonia.

The method of fishing is nearly the same in all places; that used at the Bastion of France, where there is an established fishery, under the direction of a company at Marseilles, is as follows.

Seven or eight men go in a boat, commanded by the patron or proprietor; the cater throws his net, if we may so call the machine wherewith he uses to tear up the coral from the bottom of

the sea; and the other six manage the boat. The net is composed of two beams tied across, with a leaden weight to press them down: to the beams is fastened a great quantity of hemp loosely twisted round, among which they mix some strong nets.

In this condition the machine is let down into the sea; and when the coral is pretty strongly embarrassed in the hemp and the nets, they draw it out by a rope; which they unwind according to the depth, and which sometimes requires half a dozen boats to draw. If the rope happen to break, the fishermen are in great danger of drowning.

Before the fishermen go out, they agree on the price of the coral, which is ordinarily at the rate of 4s. 6d. per pound.

When the fishery is over, which in a season usually amounts to 25 quintals of coral each boat; it is divided into 13 parts; the patron whercof, or master *coraller*, has four, the cater two, and each of the six companions one: the 13th being reserved for the company, &c.

Artificial CORAL, is made of cinnabar well beaten; a layer whereof is applied on a piece of wood well dried, and polished, first moistened with size: the whole is then again polished; and for varnish, rubbed over with the white of an egg.

CORALLINE, *Sea Moss*; a plant found adhering to rocks, shells, and even to coral.—It has no stem, but its branches shoot immediately out of the root. Its use in medicine is not very considerable: yet it is supposed of some effect to destroy worms in children when taken in powder; and is also used as an ornament in rock-work. The best is greenish; the worst ash-coloured; the red is not much better.

CORALLINUM Arcanum. See the article ARCANUM.

CORAM non Judice, in law, is when a cause is brought into a court whercof the judges have no jurisdiction.

CORBAN, a scripture term, signifying an oblation, or offering to God on the altar.

CORBAN, also denotes a ceremony in use among the Mahometans, yearly performed at the foot of mount Ararat in Arabia, near Mecca.—It consists in slaying a great number of sheep, and distributing them among the poor.

CORBELLS, in fortification, little baskets, about a foot and an half high, eight inches wide at the bottom, and twelve at the top; which being filled with earth, are frequently set one against another upon the parapet, or elsewhere; leaving certain port-holes, from whence to fire upon the enemy under covert, without being seen by them.

CORBEL, in architecture, the representation of a basket, sometimes seen on the heads of Caryatides.

The word is also used for the vase or tambour of the Corinthian column; so called from its resemblance of a basket; or because it was first formed on the model of a basket.

CORBEL, or **CORBIL**, is also used in building for a short piece of timber placed in a wall, with its end sticking out six or eight inches, as occasion serves, in manner of a floudering-piece.

The under part of the end thus sticking out, is sometimes cut into the form of a bouldin; sometimes of an ogee, and sometimes of a face, &c. according to the workman's fancy; the upper side being plain and flat.

These *corbels* are usually placed for strength immediately under the semi-girders of a platform, and sometimes under the ends of camber-beams: in which latter case, they are commonly placed a foot or two below the beam, and have a piece of timber standing upright close to the wall from the *corbel* to the beam.

CORBEL is also used by some architects for a niche, or hollow left in walls for images, figures, or statues to stand in.

CORD*, or **CHORD**, an assemblage of several threads of hemp, cabled or twisted together by means of a wheel.

* The word comes from the Greek *χορδή*, which properly signifies an intestine, or gut, whercof cords may be made. See **CHORD**.

CORD of S. Francis, a kind of rope adorned with knots, wore by the brothers of the fraternity instituted in honour of that saint. Some, as the cordeliers, capuchins, minorites, and recolets, wear it white; others, as the pique-puces, black.—Its design is to commemorate the bonds wherewith Jesus Christ was bound.

The *society of the CORD*, includes a great number of people besides religious. To obtain indulgences, they are only obliged to say five paters, five ave marys and gloria patri's, and to wear this rope, which must have been first blessed by the superiors of the order.

CORD of Wood, a certain quantity of wood for burning; so called, because formerly measured with a cord.

It is now measured between two stakes of wood, four foot high, and eight foot apart; and is to be four foot broad, or deep.

CORD-WOOD, is properly new wood; and such as when brought by water comes aboard a vessel, in opposition to that which is floated. All burning wood not exceeding 18 inches circumference, is deemed cord-wood.

CORD, in geometry, music, &c. See **CHORD**.

CORDAGE, in the sea-language, is used in general for all the ropes and cords, big and small, used in the rigging and fitting out of a vessel. See **ROPE** and **RIGGING**.

The word is also used for the art of preparing and manufacturing the ropes, &c.

The *cordage* is said to be *baked*, when having passed a stove or other hot place, it is drained of all its moisture.

White cordage, is that not yet pitched. — *Cordage pitched in the stove*, is that which is passed through hot pitch as it comes out of the stove. Each quintal of *cordage* may take up about 20 pounds of pitch. The *cordage* is sometimes pitched in the thread.

When a rope is said to be of *six inches*, it is understood of six inches around, or in circumference. The commerce of *cordage* is very considerable at Amsterdam: that made of Coningsberg hemp is valued at 20 per cent. more than that of Muscovy hemp. They are sold by weight.

The number of ropes required in fitting out a vessel is almost inconceivable: each has its particular name and use.

The Spaniards make a kind of shoes of *cordage*, which they call *alpargates*, whereof they use great quantities at home, and yet drive a very considerable commerce to the Indies; so as to send away whole ship-loads thereof. — The Indians make their *cordage* of the bark of cocos, maguay, and other trees.

As to the *strength of ropes*, or *CORDAGE*, M. Reaumur takes occasion, in the memoirs of the royal academy, to consider the question, whether a rope composed of several twists or strands interwoven, &c. gr. ten, have more strength to sustain a weight, than the ten twists would have separately, placed parallel over one another: or, which is the same thing, whether if each twist be capable of sustaining the weight of a pound, the whole *cord* be able to sustain more than ten?

There, indeed, appears no great difficulty in the question; the evidence seems strong on the side of the affirmative: For 1^o. by virtue of the twisting, the diameter of the rope is made larger than are those of the ten twists together; but, it is apparently by its thickness that a rope sustains a weight or resists a fracture. 2^o. Twisted strands have not all, as when parallel, a vertical direction with regard to the weight: several of them, and even the greatest part, have oblique directions, and of consequence do not bear all the share of the burden they would otherwise bear. In effect, they are inclined planes that are only pressed with a part of the load.

Hence it would follow, that the surplus of the strength of the twists, might be employed in raising a larger weight.

On the other hand, it is true, that in twisting the strands, some are stretched, and others left more loose; and the new tension given the former, serves to weaken them, and has of itself the effect of a weight: thus they become less able to sustain one so large. Those more lax, on the contrary, evade in some measure the action of the weight. For the action is distributed equally on the ten supposed equal twists; and if some, by reason of their particular disposition, receive less than their quota, the weight will act more forcibly on the rest, and will break them first, as being more tense; after which it will easily dispatch the rest, as not being in sufficient number to oppose it.

This is the sum of what can be urged for and against the twisting. To decide between them M. Reaumur had recourse to experiment. The result was, that contrary to all expectation, he still found the twisting diminished the strength of the rope: whence it is easily inferred, that it diminishes it the more, as the rope is the thicker: for inasmuch as the twisting diminishes, the more twisting, the more diminution.

The *resistance or friction of CORDAGE*, is very considerable; and by all means to be considered in calculating the power of machines. M. Amontons observes, in the memoirs of the royal academy, that a rope is so much the more difficult to bend, 1^o. As it is stiffer, and more stretched by the weight it draws. 2^o. As it is thicker; and, 3^o. As it is to be more bent; i. e. as it is to be coiled, for instance, into a smaller ring.

The same author has thought of ways to prove in what proportion these different resistances increase: that arising from the stiffness or rigidity occasioned by the weight which draws the rope, increases in proportion to the weight; and that arising from its thickness, in proportion to the diameter. Lastly, that arising from the smallness of the gyres, or pulleys about which it is to be wound, is indeed greater for smaller circumferences than large ones, but does not increase so much as in the proportion of those circumferences.

On this footing, the loss a machine sustains by the *cordage* being estimated in pounds, becomes, as it were, a new weight, to be added to that which the machine is to raise. This augmentation of weight will render the *cards* still the more stiff: which excess is to be computed as before.

Thus we shall have several sums still decreasing: which are to be added together, as in the article of *friction*; and it will be surprising to see what a sum they will amount to. See *friction*. Where ropes are used in a machine, all the resistance resulting from their stiffness is to be put together; and all that occasioned by the friction: which will make so considerable an augmentation to the difficulty of the motion, that a power which to raise a weight of 3000 pound, by means of a fixed and a moveable pulley, needed only 1500 pound; must, according to M. Amontons, have 3942 pounds, on account of the frictions, and the resistance of the *cordage*.

CORDED, in heraldry. A cross **CORDED**, some authors take for a cross wound or wrenched about with *cards*: though others, with more probability, take it for a cross made of two pieces of *cord*.

CORDELIER, a Franciscan, or religious of the order of S. Francis. See **CORD**.

The *cordeliers* are clothed in thick grey cloth, with a little cowl, a chaperon, and cloke of the same; having a girdle of rope or *cord*, tied with three knots: whence the name. See **CORD**.

The *cordeliers* are otherwise called *minor friars*, their original name. The denomination *cordelier* is said to have been first given them in the war of S. Louis against the Infidels; wherein the *friars minor* having repulsed the Barbarians, and that king having enquired their name; it was answered they were people *cordeliez*, tied with ropes. — The *cordeliers* are, to a man, professed Scotts. See **SCOTTIST**.

CORDIAL, *Cardiac*, in medicine, a comforting, or refreshing remedy, that gives a sudden strength, and cheerfulness, by raising the spirits when depressed by too much exercise, some disease, or the like cause.

Cordials act by giving a springiness and force to the fibres, and by some of their fine particles directly entering the tubuli, or pores of the nerves and minute vessels, and so mixing immediately with the fluids.

Thus, some of the particles of the spirit of lavender, when dropped into sugar and taken, are supposed to enter the nerves of the palate directly. Spirituous liquors, as brandy, cinnamon-water, &c. are supposed also to act immediately on the palate; but especially on the nervous coat of the stomach, and not by the common current of the circulation: by which means they often prove an immediate *cordial*.

In faintings, where the circulation of the blood is languid, fal volatile oleum, or spirit of hartshorn dropt in cold water and drank immediately, occasion a contraction of the fibrillae, the last by its coldness, and the first by entering the small vessels; and thus they instantly augment the circulation, or in other words, prove *cordial*. — In official compositions, the four *cordial* flowers are burrage, bugloss, roses and violets.

The four *cordial* waters are those of burrage, bugloss, endive, and chicory; some add those of *cardus benedictus* and *scorzonera*, scabiosa, sorrel, &c.

CORDIS *Capsula*.
CORDIS *Fovea*.
CORDIS *Mucro*.
CORDIS *Septum*.

See the articles } CAPSULA.
 } FOVEA.
 } MUCRO.
 } SEPTUM.

CORDON, in fortification, a row of stones jutting out between the rampart and the basis of the parapet, like the torse of a column. The *cordons* ranges round the whole fortress; and serves to join the rampart, which is sloped, and the parapet, which is perpendicular, more agreeably together.

In fortifications raised of earth, this space is filled up with pointed stakes instead of a *cordon*.

CORDWAINERS*, or **CORDINERS**, the term whereby the statutes denominate *shoe-makers*.

* The word is formed from the French *cordonnier*, which Menage derives from *cordouan*, a kind of leather brought from *Cordouan*, whereof they formerly made the upper-leathers of their shoes. Others derive it from *corde*, rope, because anciently shoes were made of cords; as they still are in some parts of Spain, under the name of *alpargates*. See **CORDAGE**. But the former etymology is better warranted: for, in effect, the French workmen who prepare the *cordons* are still called *cordouanniers*.

In Paris they have two pious societies, under the titles of *freres cordonniers*, brothers shoemakers; established by authority towards the middle of the seventeenth century; the one under the protection of S. Crispin, the other of S. Crispianus, two saints who had formerly honoured the profession. They live in community, and under fixed statutes and officers; by which they are directed both in their spiritual and secular concerns. The produce of their shoes goes into a common stock, to furnish necessaries for their support; the rest to be distributed among the poor.

Benedict Baldwin, a native of Amiens, the son of a *cordwainer*, and himself a workman in his father's shop, has among other learned writings, published a treatise *de calceo antiquo & mystico*, to do honour, as he himself owns, to his antient trade. John Battista Gallo, a shoemaker of Florence, has published some fine pieces in the Italian language; and among others, dialogues in imitation of Lucian.

CORED herrings. See the article **HERRING**.

CORIANDER, the seed of a plant of the same name.

Both the taste and the smell of the seed is very agreeable; yet both in the plant are extremely nauseous. Besides the confections made of the *coriander*-seed, it is of use in medicine as a carminative, and a corrective to some sorts of catharticks. It is much used by the brewers both in England and Holland, to give a flavour to their strongest beer. The antients had a notion that the juice of *coriander* would deprive people of their senses, and even of life.

CORIDOR*, or **CORRIDOR**, in fortification, a road or way along the edge of the ditch, withoutside; encompassing the whole fortification.

* The word comes from the Italian *coridore*, or the Spanish *coridor*. It is also called the *covert way*; because covered with a glacis, or esplanade, serving it as a parapet. See **COVERT way**. — The *corridor* is about 20 yards broad.

CORRIDOR, is also used in architecture for a gallery, or long aisle, around a building, leading to several chambers at a distance from each other.

CORINTHIAN order, the fourth, or as Scamozzi and M. le Clerc make it, the fifth, and last of the orders of architecture; being the noblest, richest, and most delicate of them all. See *Tab. Archit. fig. 26.*

The invention of this order most of the moderns, after Vitruvius, ascribe to Callimachus a Corinthian sculptor, who passing by the grave of a young lady, over which her nurse had placed a basket with some of her play-things, and covered it up from the weather with a tile; the whole having been placed on a root of acanthus; as it sprung up, the branches encompassed the basket, and bending down atop under the corners of the tile, formed a kind of volutes. Hence Callimachus took his hint: the basket he imitated in the vase of his column; the leaves in the volutes; and the tile in the abacus of his order. See **ABACUS**, **ACANTHUS**, &c.

Vallapandus treats this story of Callimachus as a fable; and will have the Corinthian capital to have taken its origin from an order in Solomon's temple, the leaves whereof were those of the palm-tree.

The *Corinthian* order has several characters whereby it is distinguished from the rest: its capital is adorned with two rows of leaves, between which rise little stalks, or caulicoles, whereof the volutes are formed, which support the abacus, and which are in number sixteen.

It has no ovolo, nor even abacus properly speaking; for the member which goes by that name is quite different from the abacus in the other orders; being cut with a sweep, in the middle of which is carved a rose, or other ornament.

Vitruvius observes, that the Corinthian order has no particular ordonnance for its cornice, or any of the other ornaments of its entablature; nor does he give it any other proportions than those of the Ionic order: so that if it appears higher than the Ionic, it is purely owing to the excess of the height of its capital.

He also makes the rest of the entablature the same; and the Attic base he uses indifferently for the one and the other.

But Vitruvius differs widely in this order from all the examples now remaining of antiquity; the most beautiful whereof have a particular base, and the whole order twenty modules in height: whereas the Ionic has but eighteen. Again, its capital is higher than that of Vitruvius by one third of a module; and its entablature, which has modillions, and sometimes dentils together with modillions, is very different from the Ionic entablature.

Most of the modern architects set aside Vitruvius's Corinthian ordonnance, and follow that of the ancient buildings; selecting from them according to their several tastes: so that the modern Corinthian is a kind of composite; differing from any of the ancient buildings, and much more from Vitruvius's rules.

Vignola and M. le Clerc make the Corinthian order 20 modules high; yet Serlio only makes it 18; and M. Perrault 18 $\frac{2}{3}$, retrenching something from the 19 of Vitruvius.

The height of the shaft M. Perrault makes less than that of the Ionic, by reason of the excess of its capital. See **COLUMN**.

CORINTHIAN brass. See the article **BRASS**.

CORK, the bark of a tree of the same name, a species of the ilex or holm oak.

Its leaves are green above, and white underneath; and its fruit a real acorn, which feeds much more than that of the oak. It is found in great abundance in Spain, Italy, France, &c.

To take off the bark they make an incision from the top to the bottom of the tree, and at each extremity another round the tree, perpendicular to the first. When stripped from the tree, which does not therefore die, the bark is piled up in a pond or ditch, and laden with heavy stones to flatten it, and reduce it into tables: hence it is taken, to be dried; and when sufficiently dry, put in bales for carriage.—If care be not taken to strip the bark, it splits and peels off of itself; being pushed up by another bark formed underneath.

The bark of *cork*, as well as the acorn, are of some use in medicine; being both reputed astringents, after being burnt and powdered, when used externally; but the chief employ of the former, is to put in shoes, slippers, &c. and to stop bottles.—The Spaniards burn it to make that light kind of black we call *Spanish black*, used by painters.

CORN, a plant, or rather genus of plants, which produce a grain fit for bread, the ordinary food of man.

CORN is also used for the grain, or seed of that plant, separated from the spike, or ear.

In the commerce of grain, they distinguish three kinds, *viz.* *corn* properly so called, or *wheat*; *rye*, which is a species very different, and of a quality far inferior; and a third kind resulting from a mixture of the two, and called *maslin*.

The farmers, indeed, rank among the number of *corns* several of the grains sowed in March; as barley, oats, and even pulse, as peas, vetches, &c. which, however, they sometimes distinguish by the denomination, *smaller corn*. Maise and farrasin

are numbered among the *corns*; the first called *Turkey* and *Indian corn*, the second *French*, or *black corn*.

Europe, in every part of it; Egypt, and some other cantons of Africa, particularly the coasts of Barbary; and some parts of America cultivated by the Europeans, particularly New-England, New-France, and Accadia, are the places which produce *corn*. Other countries have maise and rice in lieu of it; and some parts of America, both in the islands and continents, simple roots, such as potatoes, and manioc.

Egypt was antiently the most fertile of all other countries in *corn*; as appears both from sacred and profane history: it furnished a good part of the people subject to the Roman empire, and was called the dry nurse of Rome and Italy. England, France and Poland seem now in the place of Egypt, and with their superfluities support a good part of Europe.

For the first discovery and culture of *corn*, authors are much divided: the common opinion is, that in the first ages men lived on the spontaneous fruits of the earth; as acorns, and the nut or mast produced by the beech, which, they say, took its name *fagus* from the Greek *φαγος*, *I eat*. It is added, that they had not either the use of *corn*, nor the art of preparing or making it eatable. See **BAKING**.

Ceres has the credit of being the first that shewed the use of *corn*, on which account she was placed among the gods. Others give the honour to Triptolemus: others share it between the two; making Ceres the first discoverer, and Triptolemus the first planter and cultivator of *corn*.

Diodorus Siculus ascribes the whole to Isis; in which, Polydore Virgil observes, he does not differ from the rest; Isis and Ceres being in reality the same. The Athenians pretend it was among them the art began, and the Cretans or Candiots, Sicilians, and Egyptians lay claim to the fame. Some think the title of the Sicilians best supported, that being the country of Ceres; and authors add, she did not teach the secret to the Athenians, till she had first instructed her own country-men. Others say, Ceres passed first into Attica, thence into Crete, and last of all into Sicily. Many of the learned, however, maintain it was in Egypt the art of cultivating *corn* first began; and it is certain there was *corn* in Egypt and the East, long before the time of Ceres.

For the preservation of *corn*: It must be well dried and cleaned; the granary must have its openings to the North or East, and ventholes a-top. For the first six months it must be well stirred every fifteen days; afterwards it will be sufficient to stir it once per month: after two years it heats no more; nor is there any thing to fear, but from the air and foreign moisture.

A little time after the siege of Metz under Henry II. of France, the duke d'Espernon laid up vast stores of *corn* in the citadel; which was preserved in good plight to the year 1707, when the French king and his retinue passing that way eat bread baked thereof.

The chief thing that contributes to the preservation of *corn*, is a crust which forms on its surface, by the germination of the grain next underneath, to the thickness of an inch and half. On that at Metz people walked, without its giving the least way. At Sedan was a granary cut in a rock, wherein a heap of *corn* was preserved 110 years: it was covered with a crust a foot thick. At Chalons they have granaries where they still keep *corn* thirty or forty years: over the heap they strew quicklime, in fine dust, to the thickness of three inches, and sprinkle this over with water, whence arises a crust. The grain near the surface sprouts to the height of a foot and half: these the winter kills; and the heap is left untouched till necessity obliges them to it. See *Supplement*, article **GRANARY**.

CORN measure.
Sharpened CORN. } See the articles { **MEASURE**.
Trug-CORN. } **SHARPING**.
Wood-CORN. } **TRUG-CORN**.
WOOD-CORN. } **WOOD-CORN**.

CORNACHINE powder, a purging powder, called also *earl of Warwick's powder*, and *pulvis de tribus*.

It is composed of equal parts of antimonium diaphoreticum, diagyridium, and cream of tartar.

CORNAGE, an antient tenure, the service whereof was to blow a horn, when any invasion of the Scots was perceived. See **SERVICE**.

This tenure was very frequent in the northern counties, near the Picts wall. But by stat. 12 Car. II. all tenures are converted into free, and common socage.

An old Rental calls *cornage*, *newgeld*, q. d. *neat-geld*. My lord Coke says, in old books it is called *horngeld*.

CORNEA, *Horny*: from cornu, a horn.

CORNEA tunica, in anatomy, the second coat of the eye; so called from its substance resembling the horn of a lantern.

It is situated in the fore part; and is surrounded by the sclerotic. It has a greater convexity than the rest of the globe of the eye, and is composed of several parallel laminae, which are nourished by many blood-vessels, so fine, as not to hinder even the smallest rays of light from entering the eye. It has a most exquisite sense, to the end that upon the least pain, the tears may be squeezed out of the lachrymal gland, to wash off any filth, which, by sticking to the cornea, might render it cloudy or dim.

In the memoirs of the royal academy, M. Gandolphe gives us an instance of incisions designedly made in the *cornea*, to discharge a quantity of blood fettered there by a violent blow on the eye, by means whereof the sight had been almost entirely extinguished.

The extravasated blood, it seems, was in too great a quantity to be dissipated by topical medicines; besides, that the process would have been so tedious, that the aqueous humour would have been in danger of being quite ruined in the mean time.—The *cornea*, therefore, was opened by three incisions, all made across; the blood was discharged; the eye bound up with compresses steeped in a mixture of four ounces of plantain water, and two of vulnerary water. In eight days the eye resumed its natural transparency; and there remained no fear after the incisions.—After the cure, the pupil of that eye continued dilated much beyond its natural dimensions. See EYE.

CORNELIAN *, or **CARNELIAN**, **CARNEOLUS**, a precious stone, ordinarily red, bordering on orange; called also *Sardius*, or the sardian stone.

* The *cornelian* is otherwise called *carneola* and *corneola*; the Italians call it *corniola*; it is said from *cornu*, horn; on account of the resemblance it bears to horn in its transparency.

It cuts easily, and we find most of the fine gravings of antiquity, whether in relievo, or indented, are on this stone.

It bears the fire admirably. The finest *cornelians* are those brought from near Babylon; the next are those of Sardinia; the last those of the Rhine, Bohemia, and Silezia.—To give these stones the greater lustre, in setting them they usually lay a piece of silver leaf underneath.

The principal use made of *cornelians* is in seals; by reason they grate well, and take a fine polish.—The author of the book usually, but falsely, attributed to Albertus Magnus, gives the *cornelian* virtues which, were they real, would make it inestimable. See *Supplements*, article **SARDA**.

CORNER-PYLES. See the article **TYLE**.

CORNET, **CORNU**, a horn, or musical instrument used by the ancients in their wars.

Vegetius informs us, that the legions had trumpets, *cornets*, and *buccinæ*: that when the *cornets* sounded, only the ensigns regarded; none of the soldiers: that when the ensigns were to march alone without the soldiers, the *cornet* alone was sounded; as, on the contrary, when the soldiers were to move without the ensigns, the trumpets alone were sounded: that the *cornets* and *buccinæ* sounded the charge and retreat; and the *cornets* and trumpets during the course of the battle.

CORNET, in the modern war, denotes an officer in the cavalry, who bears the ensign or colours of a troop.

The *cornet* is the third officer in the company, and commands in the absence of the captain and lieutenant. He takes his title from his ensign which is square, and is supposed to be called by that name, from *cornu*; because placed on the wings, which form a kind of points or horns of the army.

Others derive the name from *coronet*; alleging that it was the ancient custom for these officers to wear coronets or garlands on their heads.

CORNICHE *, **CORNISH**, or **CORNICE**, in architecture, the uppermost member of the entablature of a column; or that which crowns and finishes the order.

* The word is formed from the Latin *cornis*, a crowning. The *corniche* is the third grand division of the trabecation, commencing from the freeze and ending with the cymatium.

The *corniche* is different in the different orders: in the Tuscan order it is the most plain. Vignola makes it to consist of an ovum or quarter-round, an astragal or baguette, a reglet or fillet, a larmier, and a talon.—See *Tab. Archit.* fig. 24.

In the Doric, he uses capitals to the triglyphs of the freeze with their bandelletes, a talon, mutules, or dentils, a larmier with its guttz underneath, a talon, fillet, cavetto, and reglet.—See *Tab. Archit.* fig. 28.

In the Ionic, the members are in most respects the same as in the Doric; except that they are frequently enriched with carving, and there are always dentils.—See *Tab. Archit.* fig. 32.

In the Composite there are dentils; its mouldings are carved, and there are channels under the soffit.—See *Tab. Archit.* fig. 30.

The Corinthian *corniche* is the richest; and is distinguished by having both modillions and dentils: contrary to the opinion of Vitruvius, who looks on those two ornaments as incompatible; and of M. le Clerc, who regards the dentils as peculiar to the Ionic.—See *Tab. Archit.* fig. 26.

For the heights and projectures of the *corniches* in the several orders; Goldman makes the height of the Tuscan $1\frac{1}{2}$, and its projecture $2\frac{1}{2}$ modules: the height of the Doric $1\frac{1}{2}$, its projecture $2\frac{1}{2}$; height of the Ionic $1\frac{1}{2}$, its projecture $2\frac{1}{2}$; height of the Composite $1\frac{1}{2}$, projecture $2\frac{1}{2}$; height of the Corinthian $1\frac{1}{2}$, projecture $2\frac{1}{2}$.

Architrave **CORNICHE**, is that immediately contiguous to the architrave; and the freeze being retrenched.

Mutilated **CORNICHE**, is that whose projecture is omitted, or else interrupted, right to the larmier, or reduced into a platband with a cinnatum.

Cantaliver **CORNICHE**, a term used by the workmen for a *corniche* that has cantalivers underneath it. See **CANTALIVER**.

Modillion **CORNICHE**, a *corniche* with modillions under it. See **MODILLION**.

Coving **CORNICHE**, a *corniche* which has a great estement, or hollow in it; ordinarily lathed and plaitered upon compasses, sprokets, or brackets.

CORNICHE is also used in the general, for any little projecture either of masonry, or joinery; even where there are no columns.—Thus, we say, the *corniche* of a chimney, a buffet, &c.

CORNICHE is also applied to the crownings of pedestals.—See *Tab. Archit.* fig. 24, 26, 28, 30, and 32.

This *corniche* is different in the different orders: in the Tuscan, according to M. Perrault, it has a platband which serves as a corona, and a cavetto with its fillet: in the Doric, it has a cavetto with a fillet, which bears a drip crowned with a square: In the Ionic, a cavetto with its fillet above, and a drip or pendent square crowned with an ogee and its fillet: in the Corinthian, an ogee with its fillet, a cymatium under the corona, which it hollows to make a drip, a corona, and an ogee with its fillet: Lastly, in the Composite, a fillet with a sweep over the die, an astragal, cyma with its fillet, corona, and ogee with its fillet: See each in its place.

Glacis of the **CORNICHE**. See the article **GLACIS**.

CORNICHE ring of a piece of ordnance, is that which lies next the trunnion ring; or the next ring from the muzzle backwards.

See **ORDNANCE**.

CORNICULARIS *processus*, the process or knob of the shoulder bone; thus called, as resembling the figure of a crow's beak.

CORNICULARIUS, in antiquity, an officer in the Roman army, whose business was to aid and assist the military tribune in quality of lieutenant.

The *cornicularii* went the rounds in lieu of the tribune, visited the watch, and were nearly what the aids major are in the French army,

The denomination *cornicularius* was given them from a little horn, called *corniculum*, which they used in giving orders to the soldiers: though Salmasius derives it from *corniculum* the crest of an head-piece; it being an observation of Pliny, that they wore iron or brass horns on their helmets; and that these were called *cornicula*. In the notitia imperii, we find a kind of secretary, or register of the same name: * his business was to attend the judge, and enter down his sentences and decisions.

* The critics derive the word, in this sense, from *corniculum*, a little horn to put ink in.

CORNICULATE *flowers*. See the article **FLOWER**.

CORNICULATE plants, are such as after they have blown into flower, produce many distinct and horned pods, or seed-vessels, called *siliquæ*; for which reason, the plants are also by some denominated *siliquous plants*.

Such are the sedum or sempervivum, telephium, juncus floridus, helleborus niger, peonia, caltha palustris, althæa lutea, &c.

CORNISH. See the article **CORNICHE**.

CORNISH *ing.* See the article **HUG**.

CORNU ammonis, in natural history, an extraordinary kind of stone, some of which in vinegar, juice of lemons, &c. have a motion like that of an animal.

It is rough, knotty, of an ash-colour, and twisted in manner of a ram's-horn; such as those wherewith the ancients represented Jupiter Ammon: whence its name.

It is disputed among naturalists, whether it be a native fossil, a nautilus, or a rock-plant? Camerarius maintains the first, urging that it is frequently dug out of the tops of mountains; and that it is seldom found near the sea-shore.

Dr. Woodward asserts it a shell, and of the number of the nautilus, formed in the sea, and carried thence by the waters of the deluge into the *countries* whence it is dug. He argues, that if it be rarely found on the sea-coasts, it is because shells and other bodies lying in the bottom of the sea, as most kinds of the *cornua ammonis* must do, are only to be torn thence and driven a-shore by tempests: but the most violent tempests never move the bottom of the sea, as the divers have put past doubt; so that it is no wonder if none of these *cornua* be thrown up: but in the overturning of the earth by the deluge, these, with a thousand more productions of the sea, might be thrown from the bottom of the waters to the places where they are now found.

The *cornua ammonis* are of different thickneses and lengths; some of them weigh twenty pounds. They are found in several places in Germany and elsewhere. From some experiments that have been made, some of them are found to contain a little quantity of gold, which sinks to the bottom upon pounding them small, and stirring them in a running water, till all the earthy parts be carried off.

Mr. Beaumont's account of them is this: 'The stone called *cornu ammonis* is frequent in the clay wherein the trochites and entrochi are found: the largest I have is seven inches in length, and four in circumference at the big end, and two and a half at the smaller; the tip being broke off. Tracing its origin, I find some little ones about the bigness of a young cock's spur, and very much like it: I have some in raw clay; and one growing of a white cawky stone. They generally become at last a whitish spar, and some milk white, as some of the trochites are.'

'There are of all intermediate proportions between these two; though very few of any bigness are to be found entire, but all broken

broken and imperfect pieces. The texture of the stone is thus: some have a massy spar in their insides, which takes up three parts of the stone; then from the sharp top there grow thin flat cells, or small pipes of spar set edgewise one close to the other, which flow towards the broad end, and appear outwardly like small ridges or seams. There are likewise rings running round it, tending in their growth towards the broad end, as in a ram's horn. Most of the lesser stones have very little spar within them, and some none, but have cells coming down inwardly from the top of the stone, resembling those in the flowers of coral that terminates its branches. Mr. Beaumont, in *Philosop. Transact.* N^o 129. See Supplement, article CORNU AMMONIS.

CORNU cervi, hartshorn; in medicine, makes one of the testaceous powders. See TESTACEOUS.
Among chymists, the same name is used for the mouth of an alembic.

CORNUA Uteri. See the article UTERUS.

CORNUCOPIA, among the ancient poets, a horn out of which proceeded plenty of all things; by a particular privilege which Jupiter granted his nurse, supposed to be the goat Amalthea. The real sense of the fable is this; that in Lybia there is a little territory shaped not unlike a bullock's horn, exceeding fertile, given by king Ammon to his daughter Amalthea, whom the poets feign to have been Jupiter's nurse.

In architecture and sculpture, the *cornucopia*, or horn of plenty, is represented under the figure of a large horn, out of which issue fruits, flowers, &c.—On medals, P. Joubert observes, the *cornucopia* is given to all deities, genii, and heroes.

CORNUTUM argumentum. See the article DILEMMA.

CORONA, crown, or crowning, in architecture, a large, flat, massive member of the cornice; so called, because it crowns not only the cornice, but the entablature, and the whole order.—See Tab. *Archit.* fig. 9.

The French call it *larmier*, our workmen the *drip*, as serving by its great projection, to screen the rest of the building from the rain.

Some Latin authors call it *supercilium*; but, that as it should seem by mistake for *fillicidium*. Certain French writers call it *mouchette*; and certain Latin ones, *mentum*, chin; from its keeping off the weather from the parts underneath, as the chin does the sweat, &c. out of the neck.

Some call it absolutely the *corniche*, as being the principal member thereof. Vitruvius frequently uses the word *corona* for the whole cornice.

The *corona* is itself crown'd or finish'd with a reglet, or fillet.—There are sometimes two *coronae* in a cornice; as in the Corinthian of the Rotonda.

CORONA Borealis, northern crown, or garland, in astronomy, a constellation of the northern hemisphere; whose stars in Ptolemy's catalogue are 8; in Tycho's as many; in the Britannic Catalogue 21. The order, names, longitudes, latitudes, magnitudes, &c. whereof are as follow.

Names and Situations of the Stars.	Dist. from Pol.	Longitude.	Latitude North.	Magnit.
That preced. the <i>corona</i> , without file.	♄	2 5 16	45 57 52	6 7
That next the lucida, towards the n.		2 44 45	46 49 30	5
Another following this, and more nor.		4 45 53	46 4 40	4
Lucida of the <i>corona</i> .		5 5 20	48 34 50	4 5
		7 55 56	44 21 17	2 3
1st of the informers over the crown		0 58 43	55 48 50	5
Second		3 58 22	53 59 32	4
That following the lucida to the south.		10 31 50	44 32 18	4
Nor. in the circumference of the <i>corona</i>		7 50 41	50 30 3	5
Sou. in the circumference of the <i>corona</i>		12 40 33	44 48 22	4
3d of the informers over the crown		8 17 34	53 59 43	5
4th of the informers		3 49 7	60 15 50	6
5th over the <i>corona</i>		8 18 21	56 23 32	5
3d of those following the lucida south.		14 46 15	46 6 27	5
Last of all in the <i>corona</i>		14 39 38	49 11 21	5 6
6th over the <i>corona</i>		12 48 24	52 30 42	6
North. of those following the <i>corona</i>		13 42 50	55 57 53	6
Preced. of the middle		17 4 43	53 52 41	6
South of those following the <i>corona</i>		19 51 15	49 28 4	6
Posterior of the middle ones		20 54 10	51 27 0	5
Another following them all	♄	13 40 31	54 16 36	5

LUCIDA CORONA. See the article LUCIDA.

CORONA Clericalis. See CROWN; see also COIF.

CORONÆ Jus. See Jus.

CORONÆ Placitorum Custos. See Custos.

CORONALE os, in anatomy, the bone of the forehead; called also *os frontis*, *os oppis*, and *verecundum*. See Os FRONTIS.

CORONALIS, denotes the first future of the cranium, or skull. See SUTURE.

The *coronal suture* reaches transversely from one temple to the other; and joins the os frontis, with the ossa parietalia.—See Tab. *Anat.* (Osteol.) fig. 1. lit. g. and fig. 2. lit. n.
It is open, the breadth of a finger or two, in the middle, in

young children, but grows closer with age; though sometimes, by convulsion-fits, or a bad conformation, it not only closes in children, but the edges shoot over one another; which is what the women call *head-mould-shot*; after which they seldom live long.

CORONARIA Vasa, CORONARY Vessels, the arteries and veins which surround the heart: to nourish and supply it with blood, &c.—See Tab. *Anat.* (*Splanchn.*) fig. 12. lit. cc. See also **CORONARY Arteries, &c.**

CORONARY arteries, are two arteries springing out of the aorta, ere it leaves the pericardium; and serving to carry the blood into the substance of the heart.

They are called *coronary*, because of their spreading into branches, and encompassing the basis of the heart, in manner of a crown or garland.—In their progress, they send out several branches lengthwise of the heart; and, as Ruych observes, to the auricles, and into the very substance of the heart: after encompassing the basis, and meeting again, they inoculate with each other.

CORONARY vein, is a vein diffused over the exterior surface of the heart.—It is formed of several branches arising from all parts of the viscus, and terminates in the vena cava, whither it conveys the remains of the blood brought by the *coronary arteries*.

At its rise out of the heart, there is a valve to hinder the reflux of the blood; first discovered by B. Eustachio, a native of San Severino.

Stomachic CORONARY, is a vein inserted into the trunk of the splenic vein; which by uniting with the mesenteric, forms the vena porta. See PORTA.

CORONE, in anatomy, a sharp-pointed eminence, or process of a bone.—See Tab. *Anat.* (*Osteol.*) fig. 2. lit. m. See also BONE. Of these there are several in the body, distinguished, according to their figures, by different names; e. g. one of the os petrosum, called *styloides*, as being sloped like a bodkin; another called *mastoides*, from its resembling a nipple; another of the omoplate, called *coracoides*, as being of the figure of a crow's bill; lastly, another of the os sphenoides, called *pterygoides*, from its shape, which resembles the wings of a bat.

CORONER, an officer, whereof there are two in every county, whose business is to enquire, by a jury of twelve neighbours, how, and by whom any person came by a violent death; and to enter the same upon record.

This, being matter criminal, and a plea of the crown, it is hence they are called *coroners*, or *ayoners*.—They are chosen by the freeholders of the county, by virtue of a writ out of chancery.

This officer, by the statute of Westminster, ought to be a knight; and there is a writ in the register, called *nisi sit miles*, whereby it appears to be a sufficient cause for removal of a *coroner* chosen, if he were not a knight, and had not 100 fillings per ann. freehold. Mention is made of this officer as early as the time of king Athelstan, anno 925.

The lord chief justice of the king's bench is the sovereign *coroner* of the whole realm, or whereforever he abides.

There are also certain *special coroners* within divers liberties, as well as the ordinary officers in every county; and some colleges and corporations are empowered by their charters, to appoint their *coroner* within their own precincts.

CORONET electoral. See ELECTORAL coronet.

COROPITÆ. See AGONISTICI.

CORPORA cavernosa, in anatomy, two spongy bodies, called also *corpora nervosa*, and *corpora spongiosa*. See CAVERNOSA corpora, &c.

CORPORA olivaria. See OLIVARIA corpora.

CORPORA pyramidata, are two protuberances of the under-part of the cerebellum; about an inch long; so called from their resemblance to a pyramid. See CEREBELLUM.

CORPORA striata, two protuberances of the crura of the medulla oblongata. See MEDULLA oblongata.

CORPORA habes, in law. See the article HABES.

CORPORAL, an inferior officer in a company of foot, who has charge over one of the divisions; he places and relieves centinels, and keeps good order in the *corps de garde*; receiving, withal, the word, of the inferior rounds that pass by his *corps de garde*.—There are usually three corporals in each company.

The word comes from the Italian *caporale*, which signifies the same thing; and that from *caput*, head, chief; the *corporal* being the first of the company.

CORPORAL of a ship, is an officer who hath the charge of setting the watch and centries, and relieving them; and who sees that all the soldiers and sailors keep their arms neat and clean: he also teaches them how to use their arms, and hath a mate under him.

CORPORAL oath. See the article OATH.

CORPORAL, CORPORALE, is also an ancient church term, signifying the sacred linen spread under the chalice in the eucharist and mass, to receive the fragments of the bread, if any chance to fall. Some say, it was pope Eusebius who first enjoined the use of the *corporal*; others ascribe it to S. Silvester. It was the custom to carry *corporals*, with some solemnity, to fires, and to heave them against the flames, in order to extinguish them. Philip de Comines says, the pope made Louis XI. a present of the *corporale* whereon my lord S. Peter sung mass.

CORPORATE county. See the article COUNTY corporate.

CORPORATION, a body politick, or incorporate; so called, because the several members thereof are formed into one body; and are qualified to take, purchase, grant, have a common seal, sue and be sued, &c. in their joint capacity. See INCORPORATION.

A corporation may be established three ways, *viz.* by prescription, by letters patent, and by act of parliament. Corporations are either ecclesiastical, or lay.—Ecclesiastical are either regular, as abbies, priories, chapters, &c. or secular, as bishopricks, deaneries, archdeaconries, parsonages, &c. to which add universities, colleges, hospitals, &c. see also HOSPITAL, &c.—Lay, as those of cities, towns, mayoralties, bailiwicks, companies or communities of commerce, &c. Again, a corporation is either sole, or an aggregate of many; which last is what the civilians call a college. See COLLEGE; see also COMMUNITY.

CORPOREAL. See the article INCORPOREAL.

CORPOREAL qualities. See the article QUALITY.

CORPOREITY, the quality of that which is corporeal, or has body; or that which constitutes or denominates it such.

The corporeity of God was the capital error of the Anthropomorphites. Some authors reproach Tertullian with admitting a corporeity in the deity; but it is manifest, by body he means no more than substance.

The Mahometans reproach the Samaritans at this day, with a belief of the corporeity of God. Many of the antients believed the corporeity of angels.

Form of CORPOREITY. See the article FORM.

CORPORIFICATION, in chymistry, the operation of recovering spirits into the same body, or at least into a body nearly the same, with that which they had before their spiritualization.

CORPUS de garde, a post in an army, sometimes under covert, sometimes in the open air, to receive a body of soldiery, who are relieved from time to time, and are to watch in their turns, for the security of a quarter, a camp, station, &c.

The word is also used for the men who watch therein.

It is usual to have, beside the great, a little corps de garde, at a good distance before the lines; to be the more readily advertised of the approach of the enemy.

CORPUS de Bataille, is the main body of an army, drawn up for battle. See LINE and GUARD.

CORPUS, in architecture, is a term borrowed from the French, signifying any part that projects or advances beyond the naked of a wall; and which serves as a ground for some decoration, or the like.

CORPULENCY, in medicine, the state of a person too much loaded with flesh, and fat.

CorpuleNCY amounts to the same with what physicians call obesity, and we popularly fatness.

Etmuller defines it to be such an increase both of the venter and limbs, as impedes the actions of the body, especially motion and respiration.

CorpuleNCY, or obesity, Boerhaave observes, does not consist in the solids of the body being increased, but in their being distended to a greater pitch by the abundance of humours collected in them.

CorpuleNCY, or fatness, arises from a laudable, copious, oily, soft blood, containing less than its share of fat.

Such a constitution of blood, occasioning but a feeble fermentation, there is less consumed, than is made; the lymph, which seems to be the matter of nutrition, preserves its viscid consistence longer; and by that means adheres the more plentifully to the divers parts of the body. Add, that there is more fat separated from the blood, than can well be deposited in the adipose cells. Hence the body grows very considerably, and the parts sometimes distend to a monstrous bulk.

CorpuleNCY is promoted by any thing that tempers and softens the blood, and renders it less sharp, and saline; such is want of exercise and motion, an indolent life, too much sleep, nourishing foods, &c. It is prevented, or removed, by the contrary causes; and particularly by the use of saline and acid meats, and drinks.

CorpuleNCY is the occasion of divers diseases, and particularly the apoplexy.—It was held infamous among the antient Lacedaemonians.

Etmuller affirms, that there is no better remedy against excessive fatness, than acetum scillicetum. Borrelli recommends the chewing of tobacco; which Etmuller however dissuades, lest it induce a consumption.

Sennertus mentions a man that weighed six hundred pounds; and a maid, 36 years of age, who weighed 450. Chiapin Vitelli, marquis of Cerona, a noted Spanish general in his time, from an excessive corpuleNCY, is said to have reduced himself by drinking of vinegar, to such a degree of leanness, that he could fold his skin several times round him.

CORPUS, body, in anatomy, is applied to several parts in the animal structure; as corpus callosum, corpus glandulosum, corpus reticulare, &c.

CORPUS callosum, is the upper part, or covering of the two lateral ventricles of the brain, appearing immediately under the process of the dura mater, below the depth of all the circumvolu-

tions; being formed by the union of the medullary fibres of each side. See BRAIN.

CORPUS cavernosum urethrae. See CAVERNOSUM.

CORPUS glandulosum. See PROSTATA.

CORPUS pampiniforme. } See the articles { PAMPINIFORME.

CORPUS pyramidale. } PYRAMIDALE.

CORPUS reticulare. See RETICULARE corpus.

CORPUS, is also used in matters of learning, for several works of the same nature, collected, and bound together.

Gratian made a collection of the canons of the church, called corpus canonum. The corpus of the civil law is composed of the digest, code, and institutes; see also CODE and DIGEST.

We have also a corpus of the Greek poets; and another of the Latin poets. See BODY.

CORPUS cum causa, in law, a writ issuing out of chancery, to remove both the body, and record, touching the cause of any man lying in execution upon a judgment for debt, into the king's bench, &c. there to lie till he has satisfied the judgment.

CORPUS cepi. } See the articles { CEPI.

CORPUS habetas. } HABEAS.

CORPUSCULE, in physics, a diminutive of corpus, used to express the minute parts, or particles that constitute natural bodies.

Corpuscles amount to much the same with what the antients called atoms; and differ both from the elementary and hypostatical principles of the chymists, and the materia subtilis of the Cartesians.

Sir Isaac Newton shews a method of determining the sizes of the corpuscles whereof the particles that compose natural bodies consist, from their colours.

CORPUSCULAR philosophy, that scheme or system of physics, wherein the phenomena of bodies are accounted for, from the motion, rest, position, arrangement, &c. of the minute corpuscles, or atoms, whereof bodies are composed.

The corpuscular philosophy, which now flourishes under the title of the mechanical philosophy, is exceedingly antient. Leucippus and Democritus were the first who taught it in Greece; from them Epicurus received it, and improved it, inasmuch that it came at length to be denominated from him, and was called the Epicurean philosophy.

Leucippus, again, is said to have received it from Mochus, a Phoenician physiologist, before the time of the Trojan war, and the first who philosophized about atoms; though Gale, who borrows all profane philosophy from the sacred philosophy in the books of Moses, is of opinion that he might take the hint from the Mosiac history of the formation of man out of the dust of the earth.

Indeed, Casaubon takes Μωχ, or Μωχ, to be the name of a Tyrian, who among his own countrymen was called משה מופה, or according to the method of writing which then obtained, Moses; whence it is conjectured that the Mofche, or Mochus of the Tyrians, was, in effect, the Moises of the Hebrews.

This appears to be the sentiment of Selden, Arcerius, &c. But the opinion of Bochart is more probable, who from Possidonius and others, takes Mochus for an inhabitant of Sidon, and his philosophy to be nothing else but a physiological or natural history of the creation.

After Epicurus, the corpuscular philosophy gave way to the peripatetic, which became the popular system.

Thus, in lieu of atoms, were introduced specific and substantial forms, qualities, sympathies, &c. which amused the world till Gassendus, Charleton, Des Cartes, Boyle, Newton, and others, retrieved the old corpuscularian hypothesis; which is now become the basis of the mechanical, and experimental philosophy.

Mr. Boyle reduces the principles of the corpuscular philosophy to the four following heads:

1^o. That there is but one catholic, or universal matter, which is an extended, impenetrable, and divisible substance, common to all bodies, and capable of all forms.

This, Sir Isaac Newton finely improves on: "All things considered, says that great author, it appears probable to me, that God, in the beginning, created matter in solid, hard, impenetrable, moveable particles; of such sizes and figures, and with such other properties, as most conducing to the end for which he formed them: and that these primitive particles, being solids, are incomparably harder than any of the sensible porous bodies compounded of them; even so hard as never to wear or break in pieces: no other power being able to divide what God made one in the first creation. While these corpuscles remain entire, they may compose bodies of one and the same nature and texture in all ages; but should they wear away, or break in pieces, the nature of things depending on them would be changed; water and earth, composed of old worn particles, and fragments of particles, would not be of the same nature and texture now, with water and earth composed of entire particles at the beginning. And therefore, that nature may be lasting, the changes of corporeal things are to be placed only in the various separations and new associations of these permanent corpuscles." Opticks.

2°. That this matter, in order to form the vast variety of natural bodies, must have motion, in some or all its assignable parts; and that this motion was given to matter by God the creator of all things: and has all manner of directions and tendencies.

3°. *The corpuscles*, says Sir Isaac Newton, have not only a vis inertia; accompanied with such passive laws of motion as naturally result from that force; but also are moved by certain active principles; such as that of gravity, and that which causes fermentation, and the cohesion of bodies.

4°. That matter must also be actually divided into parts; and each of these primitive particles, fragments, or atoms of matter, must have its proper magnitude, figure, and shape.

5°. That these differently sized and shaped particles, have different orders, positions, situations, and postures; from whence all the variety of compound bodies arises.

CORRECTED *calendar*. See CALENDAR.

CORRECTION, in printing, the act of retrenching the faults in a work; or the reading which the matter, or in his place the corrector, gives the first proofs, to point out and amend the faults, to be rectified, in the forms, by the compositor.

The *corrections* are placed on the margin of each page, right against the line where the faults are found. There are different characters used to express different *corrections*, *v. gr.* *D* or *S* *del*, for any thing to be effaced, or left out. When any thing is to be inserted, the place is marked in the line with a caret \wedge and the insertion added in the margin. When a word, syllable &c. is to be altered, it is erased out of the proof, and that to come in its room written in the margin; always observing, if there be several in the same line, that they be separated by little bars or strokes, |. If a space be omitted, its place is marked with a caret, and the thing expressed on the margin with \times . If a letter be inverted, it is expressed on the margin with ∇ . If any thing be transposed, it is marked thus; *The shortest are the shortest best*; for, *The shortest fallies are the best*: and in the margin is added *tr* in a circle. If Roman characters are to be changed for *Italic*, or *vice versa*, a line is drawn under them thus, and Roman or *Italic* added in the margin.

CORRECTION, in rhetoric, a figure, whereby a person in a passion, fearing he has not expressed a thing fully, or strongly enough, calls it back again, as it were, by a stronger phrase, and *corrects* the error.

CORRECTION, in pharmacy, the qualifying of a medicine, in order either to moderate the too great violence of its action; as when glass of antimony is calcined with a little salt-petre; or, to prevent its raising some disorder in the body; as when salt of tartar is dissolved in an infusion of fenna, to prevent its giving the gripes.

CORRECTORS, in medicine, such ingredients in a composition as guard against, or abate the force, or dangerous qualities of others.

Thus, lixivious salts prevent the grievous vellications of refinous purges, by dividing their particles, and preventing their adhesions to the intestinal membranes, whereby when given alone they sometimes occasion intolerable gripings: and thus spices, and carminative seeds also, assist in the easier operation of some cathartics, by dissipating collections of wind.

In the making a medicine, likewise, such things are called *correctors*, as destroy or diminish a quality in it that could not otherwise be dispensed with: thus, turpentine may be called the *corrector* of quicksilver, by destroying its fluxility, and making it thereby capable of mixture: and thus rectified spirit of wine breaks off the points of some acids, so as to make them become safe and good remedies, which before were destructive.

CORRELATIVE, something opposed to another in any certain relation.

Thus, Father and Son are *correlatives*; *pater & filius sibi mutuo respondent*. Light and darkness, motion and rest, are *correlative* and opposite terms.

CORRIVAL, a relative term, signifying, originally, a person who derived water from the same source, or spring with another; by means of some common canal, which carried it to both their lands; and which proved the occasion of frequent disputes. Hence the word came to be used for those who have the same pretensions; whether to glory, to love, or the like: but use has abridged the word; and we now both write and pronounce, *rival*.

CORROBORANTS. See the article STRENGTHENERS.

CORROBORATIVE, in medicine, any thing that increases strength, or gives new force.

The word is likewise frequently applied to such medicines as are of use in particular weaknesses; as the fluor albus, gonorrhoeas, &c. Such are terbinths, &c.—All cardiacs are *corroborative*.

CORROSION, the act of *corroding*, or gnawing away, by little and little, the continuity of the parts of bodies.

Acids *corrode* most natural bodies; and arsenic only kills, because it *corrodes* the bowels with its sharp, pointed particles.

CORROSION is used both in chymistry, medicine, and natural philosophy; where it stands for a particular species of dissolution, by an acid, or saline menstruum. See DISSOLUTION.

What *corrosion* has peculiar to it, is, that it is mostly designed

for the resolution of bodies the most strongly compacted, as bones and metals; so that the menstrua employed require an uncommon moment, or force.

Now *corrosive* liquors, whether acid or urinous, are nothing but salts dissolved in a little plegm: therefore, these being solid, and consequently containing a considerable quantity of matter, do both attract one another the more, and are also more attracted by the particles of the body which is to be dissolved. And as their attractions at equal distances are proportional to their bulks, *ceteris paribus*; so when the more solid bodies are put into saline menstrua, the attraction is stronger than in other solutions; and the motion, which is always proportional to the attraction, is more violent.

Hence we easily conceive, how they should drive those salts, like so many darts, into the pores of the bodies, and open and loosen the cohesion of them, though ever so firm. See ACID.

Again, we know, the more minute the particles of the menstruum are, the sooner they penetrate, and with the greater force: the motion produced by attraction, being always greatest in the least corpuscles, and next to nothing in the large ones. Add to this another advantage gained by this minuteness of the particles, *viz.* that they approach nearer the body to be dissolved; without which, the attractive force would be insensible. Hence, those very salts, which dissolved in water will hardly touch metals, if once turned into acid spirits, easily penetrate them: for in distillation, not only a greater quantity of water remains, but the saline bodies are so minutely broken, and divided by the fire, as to make them more readily capable of being moved by an attractive force; and therefore such a distilled menstruum is much more efficacious than any solution of salt made with water. See MENSTRUUM.

CORROSIVE *sublimato* of mercury. See MERCURY.

CORRUGATOR, or **CORRUGENS** *supericilli*, a muscle arising from the great canthus of the orbit of the eye, and terminating in the skin about the middle of the eyebrows. See the article EYE.

* Its name declares its use; being formed of *con*, together; and *raga*, wrinkle.

Some reckon this muscle only a prolongation of the frontales. **CORRUGENT** *muscle*, the same as *corrugator supericilli*.

CORRUPTIBLE. See the article INCORRUPTIBLE.

CORRUPTICOLÆ, a sect of ancient hereticks, who arose out of the Eutychians in Egypt, about the year 531, under their chief, Severus, the pretended patriarch of Alexandria. Their distinguishing doctrine, whence they derived their name, was, that the body of Jesus Christ was *corruptible*; that the fathers had owned it; and that to deny it was to deny the truth of our Saviour's passion.

On the other hand, Julian of Halicarnassus, another Eutychian; a refugee as well as Severus, in Alexandria, maintained that the body of Jesus Christ had been always incorruptible; that to say it was corruptible, was to make a distinction between Jesus Christ and the Word, and by consequence to make two natures in Jesus Christ.

The people of Alexandria were divided between the two opinions; and the partisans of Severus were called *corrupticolas*, q. d. worshippers of something *corruptible*: sometimes they were denominated *corruptibles*; and the adherents of Julian *incorruptibles*, or *phantasistas*.—The clergy and secular powers favoured the first; the monks and the people the latter.

CORRUPTION, the extinction of any thing; or the act whereby it ceases to be what it was.

Thus, wood is justly said to be *corrupted*, when we do not see it remain wood any longer, but find fire in its stead. And thus the egg is *corrupted*, when it ceases to be an egg, and we find a chicken in its room.—Hence that axiom in philosophy, *The corruption of one thing is the generation of another*.

Corruption, differs from *generation*, as two contraries differ from each other.

It differs from *alteration* as a less from a greater, or a part from the whole; a thing being said to be *altered*, when it is not so far changed but it may be known, and still keeps its old name; both which it loses by *corruption*.

But, as in generation, no matter is produced that did not before exist; so in *corruption*, nothing is lost, but that particular modification which constituted its form, and made it to be of such a species.

Dr. Drake accounts for *corruption* in animal and vegetable bodies thus; 'The principle of *corruption* is, perhaps, the same which in a state of circulation is the principle of life; *viz.* the air, which is found mixed in considerable quantities with all sorts of fluids; as necessary to vegetable, as to animal life. Now this air has two motions, *viz.* an expansive one, from its natural elasticity, by means whereof it communicates that intestine motion which all juices have, and by which the containing parts are gradually extended and grow; and a circulatory or progressive motion, which is not essential to it, but is occasioned by the resistance of the solid parts of those bodies, which obliges it to take that course which is most free and open, which is thro' the vessels of animals and plants.'

* Now,

Now, this course being stopped, the expansive motion still remains, and continues to act, till by degrees it has so far overcome the including bodies, as to bring itself to an equal degree of expansion with the external air; which it cannot do without destroying the texture and continuity; or specific degree of cohesion of those solids: which is what we call a *state of corruption*.

This expansive or destructive quality of the air in bodies, may be promoted two ways, and therefore *corruption* may be accelerated in as many, *viz.* either by weakening the tone or cohesion of the including parts, and so facilitating the work of the air; as is the case when fruit is bruised, which is found to *corrupt* much sooner there than in any other part: or by extending the expansive force of the air itself, by heat, or some other co-operating circumstance; and so helping it to overcome the resistance the fooder.

CORRUPTION of blood, in law, an infection accruing to a man's state, attainted of felony or treason, and to his issue.

For, as he loses all to the prince, or other lord of the fee, so his issue cannot be heirs to him, or to any other ancestor by him; and if he were noble, or a gentleman, he and his heirs are thereby ignobled and ungentled. See **ESCHEAT**.

The king's pardon cleanses the *corruption* of blood in those children born after the pardon, not of those born before it; these latter continuing still incapable of inheriting the land of their father, purchased before the time of the pardon.

But note, there are several offences now made treason by act of parliament which do not *corrupt* the blood; nor shall the criminal forfeit any thing thereby, beside what he has for life.

CORSAIR*, a pirate, or person who scours the seas, especially the Mediterranean, with a vessel arm'd for war, without commission from any prince, or power; to plunder merchant vessels.

* The word comes from the Italian *corsare*, of *corsa*, or à *curiosus*, by reason of their courses or excursions.

A *corsair* is distinguished from a *privateer* in this, that the latter does it under a commission, and only attacks the vessels of those at war with the state whence his commission is derived.

The punishment of a *corsair* is to be hang'd, without remission; whereas privateers are to be treated as prisoners of war.—All *corsair* vessels are good prizes. See **PRIZE**.

CORSELET, a little cuirasse, according to some: and according to others, a coat, or cover for the whole trunk, antiently wore by the pikemen, commonly placed in the front and flanks of the battles, for the better resistance of the enemies assaults, and the surer guard of the soldiers placed behind, or within them. See **CUIRASSE**.—Vaugelas observes, that the seamen were antiently armed with *corselets*.

CORSEPRESENT*, in our antient authors, denotes a *mortuary*.

* The word is formed of the French, *corps present*; and the reason of the denomination is probably this: that where a mortuary after any man's death became due, the best or second best beast was offered or *presented* to the priest, and carried along with the *corps*.

CORSENE Bread, a superstitious manner of trial, used among our Saxon ancestors, by a piece of barley-bread, first execrated by the priest, then offered the suspected criminal to be swallowed, by way of purgation; from an opinion that a guilty person could not swallow a piece of bread so accur'd, or if he did, that it would choke him.

The ceremony was accompanied with a prayer, beseeching God, "That the criminal's jaws might be shut, his throat so narrow that he might not swallow, and that he might cast it out of his mouth."

CORTES, a term purely Spanish, properly signifying the *courts*, *i. e.* the states, or assembly of the states, at Madrid.

CORTEX, a Latin name, denoting the bark, or outer coat of a tree, or shrub. See **BARK**.

CORTEX peruvianus, called also *quinaquina*, *kinquina*, *quinaquina*, *pulvis patrum*, and popularly the *jesuit's bark*; is the bark of a tree growing in the West-Indies, called by the Spaniards *palo de calenturas*, *q. d.* *fever-wood*; by reason of its extraordinary virtue in removing all kinds of intermitting fevers and agues. See **FEVER**.

The Indians commonly call it the *sudding tree*, from the property it has of intoxicating fishes, when either its wood or bark is beaten, and steeped in the water where they are.

The tree that yields this noble specific, is only found in Peru; in the province of San Francisco de Quitto, or Quinto, near the city of Loxa: though some say it is also found in that of Potosi; and F. Labat, in the island of Guadeloupe.—The bark, while on the tree, is streaked, of a whitish yellow withoutside, and a pale tan colour within.

It is about 80 years since this noble febrifuge was first known in England. It was first introduced into use by the cardinal de Luigo; whence, in France, it was first called from the name of that cardinal. Afterwards it became known by the name of the *jesuit's powder*, and the *jesuit's bark*; because sold by the jesuits, to whom that cardinal, who had been of their society, left great quantities of it.

When first introduced, it is said to have been sold for about eight shillings sterling the dose; which great price, with the little effects found from it, by reason of their ignorance of the manner of preparing and prescribing it, occasioned its being diffused

till about the year 1679, that Mr. Talbor, an English practitioner in physic, brought it into vogue again, by the great number of cures wrought about the court and city of Paris, with this powder, prepared after his manner: the secret whereof was soon after made publick by the munificence of Louis XIV. who rewarded Talbor for the communication, with 5000 crowns.

The quinquina is sold either in bark or in powder: those who buy it in the bark, must chuse it very dry and compact; such as has never been moistened, and which is not too easily reduced into powder by breaking. The small, fine, quilled barks, flagreened without, and reddish within, of a bitter disagreeable taste, are the most esteemed.—For the powder, it must be well sifted, and care be taken it be bought of persons that may be trusted; it being very easy to sophisticate it, and difficult to find it out.

The *cortex* is a bitter, absorbent, and astringent or styptic: from its bitterness, M. Renuaume observes it becomes fit to fatten four acrimonious juices; for a four and a bitter make a sweet. Again, as an absorbent it blunts the points of acids, and prevents their action; and of consequence preserves the fluidity of the juices, which acids would coagulate. As a styptic it must have earthy parts to absorb ferocities, by which the parts before moistened and relaxed, will contract themselves: and by this means, the *cortex* augments the spring and tension of the fibres. As a bitter it warms; and it facilitates perspiration, by warming and augmenting the fluidity of the juices. On these properties it is that its medicinal uses are ascertained.

Its chief use is in curing of agues, and intermitting fevers; for which purpose it is applied in all ages, and most constitutions. Dr. Cockburn says, it produces this effect better than any other medicine of the same intention, in the ratio of 365 to 1. It is usual to give a gentle emetic of ipecacuanha before the exhibition of the *cortex*: by thus preparing the passages, the *cortex* has not only more success, but also is not subject to cause these indispositions, *viz.* swelling in the belly, nausea, &c. which often arise when such preparation is neglected.

The *cortex* must never be exhibited in the paroxysm of an ague, or intermitting fever; but given in such a quantity at times between the paroxysms, as to prevent a return of the fit.

The *cortex* exhibited in continual fevers is held dangerous; and care must be taken, that the remission of a continual fever be not mistaken for its intermission: when there is a remission, it usually happens indifferently at any time; whereas an intermission happens at particular or stated times.

The *cortex* is given several ways, *viz.* in powder, in form of electuary, bolus, infusion, tincture, &c. The arcaicum Talborianum is about two ounces of the *cortex* in powder, digested in a sand-heat, with about a quart of red wine: after digestion, the wine must be poured off, and two or three ounces given every three or four hours between the paroxysms, till the intention is answered. If the bark take downward, venice treacle, discordium, conserve of roses, terra japonica, doses of laudanum, &c. must be added to its preparations. When there happens to be an obstruction of the menues from the exhibition of the *cortex*, or to prevent it, it is advisable to add to its preparations the black hellebore, aethiops mineral, cinnabar, &c.—The *cortex* is often used for young children in agues, by way of clyster; and also applied to the wrists, and soles of the feet, wrought up into a stiff mass, with turpentine, venice treacle, &c. which usually answers the purpose.

Dr. Helvetius, physician to the king of France, about 20 years ago, wrote a book entirely upon the subject of curing agues by giving the *cortex* clyster-wise: in which he pretends, that this is more safe, and no less certain than the *cortex* given by the mouth. Dr. Cockburn, in his treatise of *sea diseases*, asserts the contrary: he alleges that the *cortex* given inwardly is as safe, and by much more certain and expeditious; and notes that we know how to remedy all the inconveniencies the *cortex* may occasion.

Dr. Sydenham, and after him M. Renuaume, and others, have prescribed the *cortex* with success in melancholic and hysterical affections, commonly called *vapours*.

CORTEX Winteranus, or *Winter's*, the bark of a tree brought from the freights of Magellan, by captain Winter, in his voyage with Sir Francis Drake.—Clusius calls the tree, *magellanica aromatica arbor*.

The bark is aromatick, and found of good use at sea against the scurvy: half a dram of it, boiled with some carminative seeds, sweats, and relieves scorbutic patients. It has also proved an antidote against a poisonous sort of seal, called a *sea lion*, frequent in those parts.

The bark sold in the shops under the name of *cortex winteranus*, or wild cinnamon, Dr. Sloane observes, is not the true *cortex winteranus*; they grow on different trees, and in different countries, and their appearance is very different: yet are they so like in taste, that he thinks they may be used as succedaneums to each other.

CORTEX Capparis. See the article **CAPER**.
CORTEX Cerebri, the *cerebral* or *cineritious* substance of the brain. See **CORTICAL**, and **BRAIN**.

CORTICAL substance of the brain, in anatomy, the exterior part of the brain and cerebellum; or that part immediately under the pia mater; so called, because of its investing the inner or medullary part, as a bark does a tree. See **BRAIN**.

The fame is also called the *cineritious substance*, from its greyish or ash-colour.

Archangelo Piccolomini, a Ferrarese, first introduced this division of the brain into *cortical* or cineritious, and medullary or fibrous substance, in the year 1526.

The *cortical* substance is more soft and moist than the medullary; and follows or attends it through all its prominences and sinu's. It is formed, from the minute branches of the carotid arteries, interwove in the meninges, and thence continued hither in infinitely fine ramifications.

Most anatomists, after Malpighi, agree in its being glandulous, and that the medullary parts are only a continuation thereof; Rayfeh alone excepted; who, from his admirable skill in injections, and the discoveries he has made thereby, maintains that it has nothing glandular in it.

CORTIN, in fortification. See the article CURTIN.

CORVET, or CURVET, in the manege, an air, in which the horse's legs are raised higher than in the demi-volt; being a kind of leap up and a little forwards, wherein the horse raises both his forelegs at once, equally advanced, (when he is going strait forward, and not in a circle;) and as his fore-legs are falling, he immediately raises his hind-legs, equally advanced, and not one before the other: so that all his four legs are in the air at once; and as he sets them down, he marks but twice with them. See *ATR*.

Horses that are very dull, or very fiery, are improper for *corvets*; this being the most difficult air they can make, and requiring a great deal of judgment in the rider, as well as patience in the horse, to perform it.

CORUSCATION, *glittering*; a gleam of light emitted from any thing.

The term is chiefly used for a flash of lightning nimbly darting down from the clouds, in time of thunder. See THUNDER, &c.

CORVUS, *raven*; in astronomy, a constellation of the southern hemisphere; whose stars in Ptolemy's catalogue are 7; in Tycho's as many; in the Britannic catalogue 10. The order, names, longitudes, latitudes, magnitudes, &c. whereof are as follow:

Names and Situations of the Stars.	Sig.	Longitude.	Latitude South.	Magni.
That in the beak	♄	0 1 0	0 21 26	4
In the neck nigh the head		7 55 35	19 39 41	4
Small one following these		7 21 59	20 27 40	6
In the preceding wing		8 0 16	20 27 40	6
In the beak		6 25 58	14 29 0	3
		9 29 58	18 16 40	5
<i>Informis</i> over the wings		5 54 35	10 21 48	6
		11 16 15	20 23 42	6
Preced. of two in the hind wing.		9 9 13	12 9 47	3
subseq.		9 32 0	11 39 31	5
In the foot, common with <i>Hydra</i>	♄	13 3 25	18 1 40	3

CORYBANTES, in antiquity, priests of Cybele, who danced and capered to the sound of flutes, and drums. See CROTALUM. Catullus, in his poem called *Alys*, gives a beautiful description of them; representing them as madmen. Accordingly, Maximus Tyrius says, that those possessed with the spirit of *corybantes*, as soon as they heard the sound of a flute, were seized with an enthusiasm, and lost the use of their reason. And hence, the Greeks use the word *κωρυβαντες*, to *corybantise*, to signify a persons being transported, or possessed with a devil. See ENTHUSIASM. Some say, that the *corybantes* were all eunuchs; and that it is on this account Catullus, in his *Alys*, always uses feminine epithets, and relatives, in speaking of them.

Diodorus Siculus remarks, that Corybas son of Jason and Cybele, passing into Phrygia with his uncle Dardanus, there instituted the worship of the mother of the Gods, and gave his own name to the priests.—Strabo relates it as the opinion of some, that the *corybantes* were children of Jupiter and Callope, and the same with the *cabiri*.—Others say, the word had its origin from this, that the *corybantes* always walked dancing (if the expression may be allowed) or tossing the head, *κωρυβαντες βαινοιν*.

CORYMBIFEROUS Plants, these are distinguished into such as have a *radiate* flower: as, the flos solis, calendula, &c.—and such as have a *naked* flower: as, the abrotanum fœmina, eupatorium, and artemisia—to which are added the *corymbiferis affines*, or those akin hereunto; such as scabious, dipascus, carduus, and the like.

CORYMBUS, in the general, signifies the top, or summit of any thing; but among the ancient botanists it was particularly used to express the bunches, or clusters of ivy berries, &c. Some also call the top of the stalk of a plant, when so subdivided and adorned with flowers or fruits, as to make a round spherical figure, by this name; as the tops of leeks, onions, and the like: others confound the word with *umbella*, which expresses the showy tops of such plants as have their branches and flowers spread round, into the form of what the women now call an *umbrella*.

But among the modern botanists, *corymbus* is chiefly used for a compound discous flower, whose seeds are not pappous, or winged with down: such are the flowers of daisies, common marigold, &c.

Mr. Ray, therefore, makes a distinct genus of plants of such as have a compound discous flower, but without any downy wings to carry off their seeds.

CORYPHÆUS *, in the antient tragedy, was the chief or leader of the company that composed the chorus.

* The word is formed from the Greek *κωρυνη*, *tip of the head*.

The *coryphæus* spoke for all the rest, whenever the chorus took part in the action, in quality of a person of the drama, during the course of the acts.

Hence, *coryphæus* has passed into a general name for the chief or principal of any company, corporation, sect, opinion, &c. Thus, Eufacius of Antioch is called the *coryphæus* of the council of Nice; and Cicero calls Zeno the *coryphæus* of the Stoicks.

CORYZA, *Κορυζα*, in medicine, a running at the nose; or a defluxion of sharp serous humours from the glands of the head; arising from a diminution of perspiration, or catching of cold.

Proper evacuations, as bleeding, epispasticks, sternutatories, &c. are usual in cases of *coryza*'s.

COSCI NOMANCY *, the art of divination, by means of a sieve.

* The word comes from the Greek *κοσκινω*, *siftum*, a sieve, and *μαντια*, *divination*.

The sieve being suspended; after rehearsing a formula of words, it is taken between two fingers only; and the names of the parties suspected, repeated: he at whose name the sieve turns, trembles, or shakes, is reputed guilty of the evil in question.

This must be a very antient practice: Theocritus, in his third Idyllion, mentions a woman very skilful in it.—It was sometimes also practised by suspending the sieve by a thread, or fixing it to the points of a pair of shears, giving it room to turn, and naming, as before, the parties suspected: in which last manner, *coscinomancy* is still practised in some parts of England. It appears from Theocritus that it was not only used to find out persons unknown; but also to discover the secrets of those that were known.

CO-SECANT, in geometry, the secant of an arch, which arch is the complement of another arch to 90 degrees. See SECANT, and COMPLEMENT.

CO-SINE, is the right sine of an arch, which is the complement of another to 90 degrees. See SINE.

COSMETIC, a term in physick, used for any medicine, preparation, or means employed to beautify, and embellish the face, and preserve, or improve the complexion; as cerufs, and the whole tribe of fucus's washes, cold creams, lip-falves, &c. See WATER. The Indians use the water of green cacao-nuts as a grand *cosmetic*, which wonderfully improves their complexion.

COSMICAL, *Κοσμικη*, something that refers, or has a relation to the world.

COSMICAL *Aspect*, among astrologers, is the aspect of a planet with respect to our earth. See ASPECT.

COSMICAL *Qualities* are used by Mr. Boyle in the same sense with systematical ones.

Though, in considering the qualities of natural bodies, we usually only take in the powers any particular one has of acting on, or its capacity of suffering from the action of, another, wherewith it is observed to have some manifest commerce, by a communication of impressions: yet there may be some attributes belonging to a particular body, and several alterations to which it may be liable, not barely on account of those qualities presumed to be evidently inherent in it, nor of the respects it bears to those other particular bodies, whereto it seems manifestly related; but on account of a system constituted as our world is, of such a fabric, that there may be many unheeded agents, which by unperceived means have great operations on the body we consider, and work such changes in it, and enable it to work such changes on other bodies, as are rather to be ascribed to some unheeded agents, than to those other bodies with which the body proposed is observed to be concerned. So that if many bodies that might be named, were placed together in some imaginary space, beyond the bounds of our system; tho' they would retain many of the qualities they are now endowed with, yet they could not possess them all: but by being restored to their former places in this world, they would regain a set of faculties and dispositions, depending on some unheeded relations, and impressions from the determinate fabric of the grand system, or world, wherof they are parts. And these are what Mr. Boyle calls *cosmical*, or *systematical qualities*. To account for these *cosmical* qualities, the same author proposes some *cosmical* suspensions, as to some unobserved laws and orders of nature; and refers them principally to the action of certain effluvia hitherto unobserved.

COSMICAL, is also used in astronomy, to express one of the poetical figns of a star.

A star is said to rise *cosmically*, when it rises together with the sun; or with that degree of the ecliptic whereto the sun then abides.

Cosmical setting is, when a star sets and goes down in the west, at the same time the sun rises in the east.

But, according to Kepler, to rise or set *cosmically*, is only to ascend above, or descend below the horizon.

COSMOGRAPHY *, the description of the world; or the art which teaches the construction, figure, disposition, and relation of all the parts of the world, with the manner of representing them on a plane.

* The word comes from the Greek *κοσμος*, *mundus*, world, and *γραφω*, *scribo*, I describe.

Cosmography consists chiefly of two parts.—Astronomy, which shews the structure of the heavens and the disposition of the stars. And geography, which shews those of the earth.

COSMOLABE, an antient mathematical instrument, serving to measure distances, both in the heavens and on earth.

The *cosmolabe* is in great measure the same with the *astrolabe*. It is also called *panacosm*, or the *universal instrument*, by L. Morgard, in a treatise expressly thereon, printed in 1612.

COSMOPOLITE, or **COSMOPOLITAN** *, a term sometimes used to signify a person who has no fixed living, or place of abode; or a man who is a stranger no-where.

* The word comes from the Greek *κοσμος*, *mundus*, and *πολις*, *city*.

One of the antient philosophers being interrogated what countryman he was; answered he was a *cosmopolite*, i. e. an inhabitant or citizen of the world.

COSTÆ, in anatomy. See the article **RIBS**.

COSTAL, in anatomy.—There are eight vertebræ distinguished by the name of *costales*, or *pleurites*; because serving to articulate the *costæ*, or ribs, which are lined with the *pleura*.

See **VERTEBRÆ**.

These vertebræ are the eight which follow the second, called the *axillary*; and are therefore the third, fourth, fifth, and to the tenth inclusive.

COSTIVENESS, in medicine, a preternatural detention of the excrements, with an unusual hardness and dryness thereof; and, thence, a difficulty of discharging them.

This is the opposite to a *diarrhœa*, or looseness.

In the *Philosophical Transactions*, we have an uncommon instance of *costiveness* by Mr. Sherman: the patient, one Thomas Philips, for several years, never went to stool in less than 19 or 20 weeks: he generally eat and drank as well as his neighbours; and did all the while the office of a labouring man: yet was not any of the other evacuations sensibly greater than in other people. He died of it at 23 years old.

In *costiveness*, the usual remedies are gentle preparations of senna, lenitive electuaries, cream of tartar, laxative clysters, &c.

COSTUS Arabicus, the root of a tree resembling elder, brought from Arabia; whence its name.—Its chief use in medicine, is as an ingredient in Venice treacle.

The best is heavy, of a cineritious colour withoutside, a reddish one within, difficult to break, of a strong smell, and an aromatic taste.

This root was formerly called *costus verus*, and was divided into two kinds, the *sweet* and the *bitter costus*: both of which are now uncommon. M. Charas, and others, are of opinion, there is but one kind of *costus*, which proves more or less sweet or bitter, according to the soil where it is produced.

COSTUS Indicus, an American bark, called also *costus corticosus*, *costus corticus*, or *winter's bark*. The islands of Madagascar in Africa, of Domingo and Guadaloupa in America, are the places where the most and best is found.

COTAGE, or **COTTAGE**, antiently denoted a little house or habitation without land belonging to it. Stat. 4. Edw. I.

By a later Statute, 31 of Eliz. no man may build a house without laying four acres of land to it: so that, properly, a *cottage* now, is a house without four acres of land to it.

CO-TANGENT, is the tangent of an arch, which is the complement of another arch to 90 degrees. See **TANGENT**.

COTHURNUS, *buskin*, a very high shoe, or patten raised on soles of cork; wore by the antient actors in tragedy, to make them appear taller, and more like the heroes they represented; most of whom were supposed to be giants.

It covered the greatest part of the leg, and was tied beneath the knee.—Sophocles is said to have invented the *cothurnus*.

COTICE, or **COTISE**, in heraldry, is the fourth part of the bend; which, with us, is seldom or ever born but in couples, with a bend between them: whence, probably, the name; from the French *coûte*, *side*; they being born, as it were aside of the bend. See **BEND**.

A bend thus bordered is said to be *coticed*, *coticed*.—He bears fable on a bend *coticed* argent three cinque foils. See **Tab. Herald. fig. 61**.

COTTON *, or **COTON**, a sort of downy matter, encompassing the seed of a tree of the same name.

* *Ménage* derives the word from the Latin *cotonea*, the fine mofs growing on quinces, which resembles *cotton*: but Nicod says, the Arabs call it *cotum*, and *bombafum*; whence our *cotton*, and *bombazœn*.

The tree which produces this useful merchandise, grows common in several places of the Levant, and of the East and West-Indies, especially in the Antilles. Its fruit is of an oval form, about the size of a nut: as it ripens, it grows black withoutside; and by the heat of the sun opens in several places, discovering the *cotton* through the clefts, which is of

an admirable whiteness. In each fruit are found several little beans, which are the seed of the tree.

There is another kind of *cotton* plant, called, by botanists, *gossypium herbaceum*, which creeps along the ground, as the vine would do if unsupported, the *cotton* whereof is the most esteemed. And the late relations from the fourth mention two other kinds, the one in the terra firma of Brazil, the other in the ile of St. Catherine.

The seed of the *cotton* being mixed, in the fruit, together with the *cotton* itself, they have invented little machines, which being play'd by the motion of a wheel, the *cotton* falls on one side, and the seed on the other; and thus they are separated.

Cotton makes a very considerable article of commerce: it is distinguished into *cotton in the wool*, and *spun cotton*. The first used for various purposes, as to be put between two stuffs, in quilts, night-gowns, &c. but it is the latter is more general; furnishing various cloths, mullins, calicoes, dimities, and hangings; besides that it is frequently joined with silk and flax, in the composition of other stuffs.

The first kind is ordinarily brought from Cyprus and Smyrna: near Smyrna its produce is greater than any where else: they sow the seed in June, and gather it in October; and the soil is so favourable that they can have three crops in a year. There are ordinarily brought from Smyrna 10000 bales of *cotton per annum*; and yet there is, at least, as much more spent in the manufactures of the country.

For the spun *cottons*, they are distinguished by various names, the best are those from Jerusalem, called *bazaac*; and those of Damascus, called *cottons of the ounce*. See **OUNCE**. Others are *demi-bazaac*, *haladins*, *payas*, *cottons of josph*, *genegurjo*, &c.

Cotton antiently only grew in Ægypt, and was used by the priests and sacrificers for a very singular kind of gowns, wore by them alone.

Cotton, applied to wounds in lieu of linnen, produces an inflammation: Leewenhoek, examining into the reasons of this with a microscope, found its fibres to have each two flat sides; whence he concludes that each of its minute parts must have two acute angles, or edges; which acute edges being not only thinner and more subtile than the globules whereof the fleshy filaments consist, but also more firm and stiff than any of the globulous flesh; it follows, that upon the application of *cotton* to a wound, its edges must not only hurt and wound the globules of the flesh, but also cut incessantly the new matter brought to them to produce new flesh, and that with the more ease, as this matter, not having attained the firmness and consistence of flesh, is the less able to resist its attacks: whereas the linnen ordinarily used in wounds, being composed of little round parts, very close to each other, forms larger masses, and is thus incapable of hurting the globulous parts of the flesh.

COTTON Paper. See the article **PAPER**.

COTYLA, or **COTULA**, a liquid measure, in use among the antients, equal to the Roman semi-fextary. See **MEASURE**.

Savot adds, that the Roman *cotyla* contained twelve ounces of any liquor: upon which principle there must have been as many *cotylæ* as there were liquors ordinarily sold; which is nothing strange, since, in several countries, we still find measures of different capacity, called by the same name, when they contain the same weights, though under different bulks. Fannius says, the *cotyla* was the same thing with the hemina, which was half a fextary.

*At Cotylas, quas, si placeat, dixisse licet
Heminas, recipit geminas fextary unus.*

Chorier observes, that the *cotyla* was used as a dry measure, as well as a liquid one; from the authority of Thucydides, who in one place mentions two *cotylæ* of wine, and in another two *cotylæ* of bread.

COTYLA, or **COTYLE**, or **COTYLOIDES**, in anatomy, is a name given the cavities at the extremities of large bones, encompassed with thick strong edges, which receive the heads, or apophyses of other bones articulated with them. See **BONE**.

Such is the cavity in the scion, or hip-bone, which receives the head of the bone of the thigh.—It is also called *acetabulum*, *i. e. cup*.

COTYLEDONES, in anatomy, little glands dispersed throughout the outermost membrane of the fetus, called *chorion*, and supposed to separate a nutritious juice for the subsistence of the fetus.

Cotyledones, in this sense are only found in sheep, goats, and some other animals; the placenta in the womb, supplying the place thereof in women. See **PLACENTA**.

Other authors use *cotyledones* for the apertures of the veins in the inner surface of the womb. See **MATRIX**.

COUARD, in heraldry. See the article **COWARD**.

COUCH, in painting, denotes a lay, or impression of colour, whether in oil or water, wherewith the painter covers his canvas, wall, waincot, or other matter to be painted.

The word is also used for a lay or impression on any thing, to make it more firm, and consistent, or to screen it from the weather.

Paintings are covered with a *couch* of varnish: a canvas to be painted, must first have two *couches* of size ere the colours be laid:

two or three *couches* of white lead, are laid on wood ere the *couch* of gold be applied: the leather-gilders lay a *couch* of water and whites of eggs on the leather, ere they apply the gold or silver leaf.

The gold wire-drawers also use the word *couch* for the gold or silver leaf wherewith they cover the mafs to be gilded or filvered, before they draw it through the iron that is to give it its proper thickness.

The gilders use *couch* for the quantity of gold or silver leaves applied on the metals in gilding or filvering. Each *couch* of gold is but one leaf, or two at most, and each of silver three; to gild: if the gilding be hatched, there are required from eight to twelve *couches*, and only three or four if it be without hatching. To filver there are required from four to ten *couches*, according to the beauty of the work.

COUCHANT, in heraldry, is understood of a Lyon or other beaft, when lying down; but with his head lifted up: which distinguishes the posture of *couchant* from *dormant*, wherein he is supposed quite stretched out and asleep.

COUCHANT and Levant, in law. See the article **LEVANT**.

COUCHE, in heraldry, denotes any thing laid all along: thus, a *chevron couché*, is a chevron lying sideways with the two ends on one side of the shield, which should properly rest on the base.

COUCHING of Cataracts. See **CATARACT**.

COVENANT, the consent or agreement of two or more parties, to do or perform something.

A *covenant* seems to be much the same with a *pactum*, or *conventum* among the civilians.

Covenant is either in law, or in fact.

COVENANT in Law, is that which the law intends to be made, though it be not expressed in terms: as, if the lessor demise, and grant a tenement to the lessee for a certain term; the law intends a *covenant* on the lessor's part, that the lessee shall, during the term, quietly enjoy the lease against all lawful incumbrances.

COVENANT in Fact, is that which is expressly agreed between the parties.

There is also a *covenant merely personal*, and a *covenant real*.

Fitzherbert defines a *COVENANT real* to be that whereby a man ties himself to pafs a thing real, as lands or tenements, or to levy a fine on lands, &c.

COVENANT merely personal, is where a man covenants with another by deed to build him a house, or to serve him, &c.

Suit-COVENANT. See the article **SUIT**.

Ark of the COVENANT. See the article **ARK**.

COVERED Flank. } See the articles { **FLANK**.
COVERED Fountain. } **FOUNTAIN**.
COVERED Medals. } **MEDAL**.

COVERING, in architecture, one of the principal parts of a building. See **ROOFING**.

CO-VERSED Sine, a term which some people use for the remaining part of the diameter of a circle, after the versed sine is taken from it. See **SINE** and **VERSED**.

COVERT, in law.—*Feme COVERT* denotes a woman married, and so covered by, or under the protection of, her husband.

COVERT Way, in fortification, a space of ground level with the adjoining country, on the edge of the ditch, ranging quite round the half-moons, and other works without-side the ditch.—See **Tab. Fortification**, fig. 21. lit. b, b, &c.

It is otherwise called *corridor*, and hath a parapet together with its banquette, and glacis, which form the height of the parapet.

One of the greatest difficulties in a siege, is to make a lodgment on the *covert way*; because, usually, the besieged palliade it along the middle, and undermine it on all sides.

This is sometimes also called the *counterfarp*, because it is on the edge of the farp.

COVERTURE, in law, is particularly applied to the state and condition of a married woman; who, by the laws of our realm, is under *covert-barron*, or *sub potestate viri*; and therefore disabled to make bargains with any, to the prejudice of herself or her husband, without his consent or privity; or at least without his allowance and confirmation: and if the husband alien the wife's lands, during the marriage, he cannot gain say it during his life.

COUGH, **TUSSIS**, in medicine, a disease affecting the lungs, occasioned by a sharp ferous humour, vellicating the fibrous coat thereof, and urging it to a discharge by spitting, &c. See **LUNGS**.

When the humour is so subtle, that the lungs cannot lay hold of it, to throw it off; or when the humour is so thick that it will not give way, it is said to be a *dry cough*.

Dry coughs are the most dangerous.—Hippocrates says, the *cough* ceases, if the testicles swell.

Chin-COUGH. See the article **CHIN-COUGH**.

COVIN, a deceitful compact, or agreement between two or more, to deceive or prejudice a third person.

As, if a tenant for life conspire with another, that this other shall recover the land which the tenant holds, in prejudice of him in reversion.

Dr. Skinner takes the word to be a corruption of the Latin *conventum*, and therefore writes it *coven*. See **CONSPIRACY**.

COVING, in building. When houses are built projecting over

the ground-plot, and the turned projection arched with timber, lathed and plaistered; the work is called *coving*.

COVINO corniche, is a corniche with a great catement, or hollow therein.

COUL,* or COWL, a sort of monkish habit wore by the Bernardines, and Benedictines.

* The word is formed from the Latin *cutillus*, by confounding the two first syllables into one, as being the same twice repeated.

There are two kinds of *couls*; the one white, very large, worn in ceremony, and when they assist at the office: the other black, wore on ordinary occasions, in the streets, &c.

F. Mabillon maintains the *coul* to be the same thing in its origin with the scapular. The author of the apology of the emperor Henry IV. distinguishes two forms of *couls*; the one a gown reaching to the feet, having sleeves and a capuchon, used in ceremonies; the other a kind of hood to work in, called also a *scapular*; because it only covers the head and shoulders.

COUNCIL, or **COUNSEL**, an assembly, or meeting of divers considerable persons, or officers, to consider and concert measures touching the administration of publick affairs, rendering justice, or the like.

The king's *privy-council*, is the primum mobile of the civil government of England; and that from which all the inferior orbs derive their motion.

In the French polity, *councils* are very numerous: they have their *council of state*, *council of the finances*, *council of dispatches*, *council of directions*, *grand council*, *council of the regency*, *council of conscience*, &c.

Aulic COUNCIL. See the article **AULIC**.

COUNCIL, in church-history and policy, a synod, or assembly of prelates, and doctors, met for the regulating of matters relating to the doctrine, or discipline of the church.

Provincial COUNCIL, is an assembly of the prelates of a province, under the metropolitan. See **PROVINCE**, and **CONVOCAION**.

National COUNCIL, is an assembly of the prelates of a nation, under their primate, or patriarch. See **PRIMATE**.

Oecumenical or general COUNCIL, is an assembly of all the prelates of christendom. See **OECUMENICAL**.

Indeed, to constitute a *general council*, it is not required that all the prelates should be actually present; it is sufficient that the *council* be regularly appointed, and that they may be there, or are called thereto.

General councils are frequently called by ecclesiastical authors *plenary councils*.—The Romanists reckon eighteen *general councils*; whereof only the four first are admitted by the reformed. The number is made out thus: two of Nice, four of Constantinople, one of Ephesus, one of Chalcedon, five of the Lateran, two of Lyons, one of Vienne, one of Florence, and the last of Trent, which held from 1545 to 1563.—The *council* of Trent ordains *provincial councils* to be held every three years; yet the last held in France is that of Bourdeaux, 100 years ago.

There have been various collections of the canons or decrees of *councils*, as that of Dr. Merlin at Paris in 1524; one of F. Crabbe, a Franciscan, in 1536; another of Surius in 1567; another at Venice, in 1585; another at Rome, in 1608; one of Binus, canon of Cologne, in 1606, in ten volumes: another at the Louvre, in 1664, in thirty-seven volumes: another of F. Labbe and F. Cossart, Jesuits, in 1672, in seventeen volumes, more ample than the rest. Lastly, another by F. Hardouin. See **CANON**.

COUNCIL of war, is an assembly of the principal officers of an army, or fleet, occasionally called by the general, or admiral, to consider of the present state of things, and concert measures for their conduct, with regard to sieges, retreats, engagements, &c. The same term is sometimes also used for an assembly of the officers of a regiment, or ship; met to try soldiers or sailors accused of any crime.

Common COUNCIL, is a court or assembly, wherein are made all by-laws which bind the citizens of London.

It consists, like the parliament, of two houses; an *upper*, consisting of the lord-mayor and aldermen; and a *lower*, of a number of *common-council* men, chose by the several wards, as representatives of the body of the citizens.

COUNSELLORS of honour. See the article **HONOUR**.

COUNT, **COUNTEE**, **COMES**, a nobleman who possesses a domain erected into a *county*. See **COUNTY**, and **VICOUNT**.

English *counts* were distinguished by the title of *earls*; foreign ones still retain their proper name.

The dignity of a *count*, is a medium between that of a duke and a baron.

According to the modern use, most plenipotentiaries and embassadors assume the title of *counts*; though they have no county; as the *count d'Arvaux*, &c.

Antiently, all generals, counsellors, judges, and secretaries of cities under Charlemaign were called *counts*; the distinguishing character of a duke and a *count* being this, that the latter had but one town under him, but the former several.

A *count* has a right to bear on his arms a coronet, adorned with three precious stones, and surmounted with three large pearls, whereof

whereof those in the middle and extremities of the coronet, advance above the rest.

Counts were originally lords of the court, or of the emperor's retinue, and had their name *comites*, à *comitando*, or à *commando*: Hence, those who were always in the palace, or at the emperor's side, were called *counts palatine*, or *comites à latere*. See PALATINE.—In the times of the commonwealth, *comites*, among the Romans, was a general name for all those who accompanied the proconsuls and proprietors into the provinces, there to serve the commonwealth; as the tribunes, prefects, scribes, &c. Under the emperors, *comites* were the officers of the palace. The origin of what we now call *counts*, seems owing to Augustus, who took several senators to be his *comites*, as Dion observes, *i. e.* to accompany him in his voyages and travels, and to assist him in hearing of causes; which were here judged with the same authority as in full senate. Gallienus seems to have abolished this council, by forbidding the senators being found in the armies; and none of his successors re-established it.

These counsellors of the emperor, were really *counts*, *comites*, *i. e.* companions of the prince; and they sometimes took the title thereof, but always with the addition of the emperor's name whom they accompanied: so that it was rather a mark of their office, than a title of dignity.

Constantine was the first who converted it into a dignity; and under him it was, that the name was first given absolutely. The name once established, was in a little time indifferently conferred, not only on those who followed the court, and accompanied the emperor, but also on most kinds of officers; a long list whereof is given us by Du Cange.

Eusebius tells us, that Constantine divided the *counts* into three classes; the first bore the title of *illustres*, the second that of *clarissimi*, and afterwards *spectabiles*; the third were called *perfectissimi*.

Of the two first classes the senate composed; those of the third had no place in the senate, but enjoyed several other of the privileges of senators.

There were *counts* who served on land, others at sea; some in a civil, some in a religious, and some in a legal capacity; as, *comes ærarii*, comes sacrarum largitionum, comes sacri consistorii, comes curiæ, comes capelle, comes archiatrorum, comes mercatorum, comes vestiarii, comes horreorum, comes opsoniarum or annonæ, comes domesticorum, comes equestrum regionum, or comes stabuli; comes domorum, comes excubitorum, comes notariorum, comes legum, or professor in jure, comes limitum, or marcarum; comes portus romæ; comes patrimonii, &c.

The Franks, Germans, &c. passing into Gaul and Germany, did not abolish the form of the Roman government; and as the governors of cities and provinces were called *counts*, *comites*, and *dukes*, *duces*, they continued to be called so.

These governors commanded in time of war; and in time of peace they administered justice. Thus, in the time of Charlemain, *counts* were the ordinary judges and governors of the cities, all under one.

These *counts* of cities were beneath the dukes and counts who presided over provinces; the first being constituted in the particular cities under the jurisdiction of the latter. The *counts* of provinces were in nothing inferior to dukes, who themselves were only governors of provinces.

Under the last of the second race of French kings, they got their dignity rendered hereditary; and even usurped the sovereignty when Hugh Capet came to the crown: his authority was not sufficient to oppose their encroachments; and hence it is they date the privilege of wearing coronets in their arms: they assumed it then, as enjoying the rights of sovereigns in their particular districts, or *counties*. But, by degrees, most of the *counties* became re-united to the crown.

The quality of *count* is now become very different from what it was anciently; being now no more than a title, which a king grants upon erecting a territory into a county, with a reserve of jurisdiction and sovereignty to himself.

At first there was no clause in the patent of erection, intimating the reversion of the county to the crown in default of heirs male; but Charles IX. to prevent their being too numerous, ordained that duchies and counties, in default of heirs male, should return to the crown.

The point of precedence between *counts* and marquises, has been formerly much controverted; the reason was, that there are *counts* who are peers of France, but no marquises: but the point is now given up, and marquises take place; though anciently, when *counts* were governors of provinces, they were on a level even with dukes.

William the conqueror, as is observed by Camden, gave the dignity of *counts* in fee to his nobles; annexing it to this or that county, or province, and allotting for their maintenance a certain proportion of money, arising from the prince's profits in the pleadings and forfeitures of the provinces. To this purpose he quotes an ancient record, thus: Hen. II. rex anglie his verbis comitem creavit; sciat is nos scisse Hugonem Bigot comitem de Norf. &c. de tertio denario de Norwiche & Norfolk sicut aliquis comes anglie, &c.

The Germans call a *count*, *graf*, or *graff*; which, according to

a modern critic, properly signifies *judge*; and is derived from *gravia*, or *graffio*, of *γρᾶφο*, I write.—They have several kinds of these *counts*, or *graffs*; as *landgraves*, *marchgraves*, *burggraves*, and *palgrave*, or *counts palatine*.

These last are of two kinds; the one are of the number of princes, and have the investiture of a palatinate; the others have only the title of *count palatine*, without the investiture of any palatinate.

Some assert, that by publicly professing the imperial laws for twenty years, the person acquires the dignity of a *count palatine*; and there are instances of professors of law, who have assumed the title accordingly: but there are others who call this right in doubt.

COUNT, in law, denotes the original declaration in a real action; as the declaration is in a personal one: the libellus of the civilians answers to both.

Yet, *count* and declaration are sometimes confounded; and used for each other: as, *count in debt*, *count in appeal*, &c.

COUNT-WHEEL, in clock-work, a wheel which moves round in twelve hours; called also the *lacking-wheel*. See CLOCK.

COUNTER, of the Latin preposition *contra*, against, is used in the composition of divers words in our language; and generally implies the relation of opposition.—As,

COUNTER-ALLEYS in gardening. See ALLEY.

COUNTER-APPROACHES, in fortification, lines or trenches made by the besieged, when they come out to attack the lines of the besiegers in form.

Line of COUNTER-APPROACH, a trench which the besieged make from their covered-way to the right and left of the attacks, in order to fower or enfilade the enemy's works.

It should commence in the angle of the place of arms of the half moon that is not attacked, and of the bastion that is attacked; about 50 or 60 fathoms from the attacks; and continued as far as shall be found necessary in order to see the enemy in his trenches and parallels. This line must be perfectly enfiladed from the covered way and the half-moon, that if the enemy get possession of it, it may be of no service to him. In this line the governor must frequently in the night time send small parties of horse, or foot, to drive the workmen from their posts; and if possible carry off the engineers, who have the direction of the works. Savin. Nouv. Ecol. Milit. p. 280.

COUNTER-BARRY; or **CONTRE-BARRE**, is used by the French heralds, for what we more ordinarily call *bendy sinister per bend countercharged*. See BARRY.

COUNTER-BATTERY, a battery raised to play on another, in order to dismount the guns. See BATTERY.

COUNTER-BENDY, or **CONTRE-BANDE**, in heraldry, is used by the French to express what we ordinarily call *bendy of six per bend sinister countercharged*. See BENDY.

COUNTER-BOND, is a bond given to save a person harmless, who has given his bond for another.—This is also called *counter-security*.

COUNTER-BREAST-WORK, in fortification, a *fausse-braye*. See FAUSSE-BRAYE.

COUNTER-CHANGE, in commerce, &c. a mutual exchange between two parties. See EXCHANGE.

COUNTER-CHANGED, in heraldry, is when there is a mutual changing of the colours of the field and charge in an escutcheon, by means of one or more lines of partition.

Thus, in the coat of the famous Chaucer: he beareth, party per pale argent and gules, a bend *countercharged*; that is, that part of the bend, which is in that side of the escutcheon which is argent, is gules; and that part of it which is on the other, is argent. V. Tab. Heraldry, fig. 50.

COUNTER-CHARGE, is a reciprocal charge, or recrimination, brought against an accuser. See RECRIMINATION.

COUNTER-CHARM, a charm or spell, contrived to hinder the effect of another. See CHARM, SPELL, LIGATURE, &c.

COUNTER-CHEVRONED, denotes a shield *chevronny*, or parted by some line of partition.

COUNTER-COLOURED. See the article CONTREBAND.

COUNTER-COMPONED, or **CONTRE-COMPONE**, or **COUNTER-COMPONY**, is when a bordure is compounded of two ranks of panes; as represented in Tab. Heraldry, fig. 51.—When it consists but of one rank, it is called *compand*; and when of more than two, *checky*. See CHECKY, &c.

COUNTER-DEED, a secret writing, or a private act, either before a notary, or under a privy seal; which destroys, changes, annuls or alters some more solemn and publick act.

Counter-Deeds, are rather tolerated than permitted: in many cases they are actually prohibited; as being usually no better than frauds.—The custom of Paris annuls all *counter-deeds*, contrary to the tenor of a marriage.

COUNTER-DRAWING, in painting, &c. the copying a design or painting, by means of a fine linen cloth, an oiled paper, or other transparent matter; whereon the strokes appearing through, are followed and traced with a pencil, with or without colour.

Sometimes they *counter-draw* on glass, and with frames or nets divided into squares, with silk or with thread; and also by means of instruments invented for the purpose, as the parallelogram.

COUNTER-

COUNTER-ERMINE. See the article ERMINE.

COUNTERFEAT *Architecture*. See the article ARCHITECTURE.

COUNTER-FISSURE. See the article CONTRAFISSURE.

COUNTER-FOLL, or COUNTER-STOCK, is that part of a tally struck in the exchequer, which is kept by an officer of the court. See TALLY, and EXCHEQUER.

COUNTERFORTS, *Battresses*, or *Spurs*, are pillars of masonry, serving to prop or sustain walls or terraces, subject to buldge, or be thrown down.

These works are usually turned archwise, and placed at a distance from each other.

When any thing is built on the descent of a mountain, it must be strengthened with *counterforts* well bound to the wall, and at the distance of about twelve yards from each other.

COUNTER-FUGUE, in music, is when fugues proceed contrary to one another. See FUGUE.

COUNTER-GAGE, in carpentry, a method used to measure the joints, by transferring, *v. gr.* the breadth of a mortise to the place in the timber where the tenon is to be, in order to make them fit each other.

COUNTER-GUARD, in fortification. See ENVELOPE.

COUNTER-HARMONICAL. See the article CONTRA-HARMONICAL.

COUNTER-INDICATION. See the article CONTRA-INDICATION.

COUNTER-LIGHT, a window or light opposite to any thing, which makes it appear to a disadvantage.—A single *counter-light* is sufficient to take away all the beauty of a fine painting.

COUNTERMAND, in a general sense, a revocation of an order; or an excuse for setting aside, or deferring a thing ordered to be done.

By the French law, a *countermand* differs from an *essoin*, 1^o. In that in the *countermand*, the consignment is proposed to be deferred to a day certain, which is not in the *essoin*. 2^o. In the *essoin*, the cause of deferring the consignment is expressed and affirmed to be true, but in a *countermand* that affirmation is not required.

COUNTERMAND, in the English law, is where a thing formerly executed is afterwards, by some act or ceremony, made void by the party that first did it.

As, if a man make his last will, and devise his land to T. S. and afterwards enfeoffs another of the same land; this enfeoffment is a *countermand* of the will, and the will void as to the disposition of the land.

COUNTERMANDATE. See the article CONTRAMANDATUM.

COUNTER-MARCH, in war, a change of the face, or wings of a battalion; whereby the men who were in the front, come to be in the rear.

This is an expedient they have recourse to when the enemy attacks their rear; or when they change their march for a direction opposite to that wherein they had begun.

The *counter-march* is either made by files, or ranks; by files, when the men in the front of the battalion go into the rear; by ranks, when the wings or flanks of the battalion change ground with one another.

The term is also used at sea, for the like change or motion of a squadron of ships.

COUNTER-MARK, a second or third mark, put on any thing marked before.

The word is applied in commerce, to the several marks put on a bale of goods belonging to several merchants; that it may not be opened but in the presence of them all, or their agents.

In goldsmiths works, &c. the *counter-mark* is the mark or punchion of the hall, or company, to shew the metal is standard, added to that of the artificer who made it.

Counter-mark of a horse, is an artificial cavity, which the jockeys make in the teeth of horses that have out-grown the natural mark; to disguise their age, and make them appear as if they were not above eight years old.

Counter-mark of a medal, is a mark added to a medal, a long time after its being struck.

Counter-marks appear to be faults or flaws in medals, disfiguring the ground, sometimes on the side of the head, and sometimes on the reverse; particularly in the large and middle-sized brass; yet are they esteemed as beauties among the curious, who set a particular value on such medals, in regard they know the several changes in value they have undergone; which are expressed by those *counter-marks*.

Antiquaries, however, are not well agreed about the significance of the characters they find on them. On some, N. PROB. on others, N. CAPR. on others, CASR. RM. NT. AUG. SC. Some have for their *counter-marks*, an emperor's head; some several; some a cornucopia.

Care must be taken not to confound the monograms with the *counter-marks*; the method of distinguishing them is easy. The *counter-marks* being struck after the medal, are dented or sunk in; whereas the monograms being struck at the same time with the medals, have rather a little relief.

COUNTER-MINE, in war, a subterraneous vault, running the

whole length of a wall, three foot broad, and six deep, with several holes and apertures therein; contrived to prevent the effect of mines, in case the enemy should make any to blow up the wall.

This kind of *counter-mine* however is now little in use. The modern *counter-mine* is a well or pit, and a gallery, sunk on purpose till it meet the enemy's mine, and prevent its effect: it being first pretty well known whereabouts that is.

COUNTER-MURE, COUNTER-WALL, a little wall built close to another, to fortify and secure it, that it may not receive any damage from the buildings contiguous to it.

By the custom of Paris, if a stable be erected against a partition-wall, there must be a *counter-wall* added, eight inches thick. M. Bullet observes, that the *counter-wall* ought never to be bound, or connected with the proper wall.

COUNTER-MURE, in fortification. See CONTRA-MURE.

COUNTER-PALED, CONTRE-PALE, is when the escutcheon is divided into twelve pales parted per fesse, the two colours being counter-changed: so that the upper arc of one colour, or metal, and the lower of another.

COUNTER-PART, a part of something opposite to another part.

Thus, in music, the bass and treble are two *counter-parts*, or opposite parts.

COUNTER-PART, in law, is the duplicate, or copy of any indenture, or deed.

COUNTER-PASSANT, is when two lions are in a coat of arms, and one appears to be passing or walking quite the contrary way from the other. See PASSANT.

COUNTER-PLEA, in law, a replication to a plea or prayer.

When a tenant by courtesy, in dower, or other real action, prays the view or aid of the king, or him in the reversion, for his better defence; or if a stranger to the action begun, desire to be admitted, to say what he can for the safeguard of his estate: that which the demandant alleges against this request, why it should not be admitted, is called a *counter-plea*.

COUNTER-PLOT, a plot, or intrigue contrived to thwart and overthrow another.

COUNTER-POINT, in music, the art of composing harmony; or of disposing and concerting several parts together, as that they make an agreeable whole.

Counter-point is divided into *simple*, and *figurative*; agreeably to the division of harmony, into the harmony of concords, and that of discords.

Counter-point took its name hence: when music in parts was first introduced, their harmony being so simple they used no notes of different time, and marked their consonances by points set against each other. Hence, in regard of the equality of the notes of time, the parts were made to concord in every note.

This afterwards became denominated *simple* and *plain counter-point*; to distinguish it from another kind, wherein notes of different value were used, and discords brought in betwixt the parts; which they call *figurative counter-point*.

Simple counter-point, or the harmony of concords, consists of the imperfect, as well as the perfect concords, and may therefore be denominated *perfect*, or *imperfect*, according as the concords are, whereof it is composed: thus, the harmony arising from a conjunction of any note with its fifth and octave, is perfect; but with its third and sixth, imperfect.

Now, to dispose the concords or the natural notes and their octaves in any key in *simple counter-point*, observe, with regard to the distinction into perfect and imperfect harmony, this general rule, *viz.* to the key *f*, to the fourth *f*, and to the fifth *f*, a perfect harmony must be joined; to the second *f*, the third *f*, and seventh *f*, an imperfect harmony is indispensable; to the sixth *f*, either an imperfect or perfect harmony.

In the composition of two parts, observe, that though a third appears only in the treble on the key *f*, the fourth *f*, and the fifth *f*; yet the perfect harmony of the fifth, is always supposed, and must be supplied in the accompaniments of the thorough bass to these fundamental notes.

More particularly, in the composition of two parts, the rules are, that the key *f* may either have its octave, its third, or its fifth; the fourth *f*, and fifth *f*, may have either their respective thirds or fifths; and the first may have its sixth; as, to favour a contrary motion, the last may have its octave.

The sixth *f* may have either its third, its fifth, or its sixth.—The second *f*, third *f*, and seventh *f*, may have either their respective thirds or sixths; and the last, on many occasions, its false fifth. Which rules hold the same both in flat and sharp keys.

For the rules of *counter-point*, with regard to the succession of concords; it must be observed, That as much as can be in parts, may proceed by a contrary motion, *i. e.* the bass may ascend when the treble descends, and *vice versa*. The parts moving either upwards or downwards the same way; two octaves or two fifths never to follow one another immediately. Two sixths *l* never to succeed each other immediately. Whenever the octave or fifth is to be made use of, the parts must proceed by a contrary motion, except the treble move into such octave or fifth gradually. If in a sharp key, the bass descend gradually from the fifth *f* to the fourth *f*, the last, in

that case, must never have its proper harmony applied to it; but the notes that were harmony in the preceding fifth *f*, must be continued on the fourth *f*. Thirds and fifths may follow one another as often as one has a mind.

Figurative counter-point is of two kinds: in the one, discords are introduced occasionally; serving only as transitions from concord to concord: in the other, the discord bears a chief part in the harmony.

For the *first*, nothing but concords are ever to be used on the accented parts of the measure: in the unaccented parts, discords may pass transiently, without any offence to the ear. This the French call *suffosion*; because the transient discord always supposes a concord immediately following it: which is of infinite service in music.

For the *second*, wherein the discords are used as a solid and substantial part of the harmony; the discords that have place are the fifth when joined with the sixth, to which it stands in the relation of a discord: the fourth when joined with a fifth; the ninth, which is in effect the second; the seventh; and the second and fourth.

These discords are introduced into the harmony with due preparation; and are to be succeeded by concords: which is commonly called the *resolution of a discord*.

The discord is prepared by first substituting in the harmony in quality of a concord; *i. e.* the same note which becomes the discord is first a concord to the bass note immediately preceding that to which it is a discord. The discord is resolved by being immediately succeeded by a concord descending from it by the distance only of second *g*, or second *l*.

As the discord makes a substantial part of the harmony, so it must always possess an accented part of the measure. Now to introduce the discords into harmony; it must be considered what concords may serve for their preparation and resolution: the fifth, then, may be prepared, either by being an octave, sixth, or third. It may be resolved either into the sixth or third. The fourth may be prepared in all the concords, and may be resolved into the sixth, third, or octave. The seventh may be prepared in all the concords; and resolved into the third, sixth, or fifth. The second and fourth are used very differently from the rest: being prepared and resolved into the bass. See farther under HARMONY, CONCORD, DISCORD, KEY, CLEF, and MODULATION.

COUNTER-POINTED, by the French called *contre-pointé*, is when two chevrons in one escutcheon meet in the points; the one rising, as usual, from the base; and the other inverted, falling from the chief: so that they are *counter*, or opposite to one another in the points.

They may also be *counter-pointed* the other way; that is, when they are founded on the sides of the shield, and the points meet that way; called *counter-pointed in fesse*.

COUNTER-POISE, any thing serving to weigh against another; particularly a piece of metal, ordinarily of brass or iron, making a part of the *statera romana*, or steelyard. See STEELYARD. It is contrived to slide along the beam; and from the division in which it keeps the balance in equilibrio, the weight of the body is determined.

It is also by some called the *pear*, on account of its figure; and *maß*, by reason of its weight.—Rope-dancers use a pole by way of *counter-poise*, to keep their bodies in equilibrio.

COUNTER-POISON, an antidote, or remedy, which prevents the effect of a poison.

Of this kind are Venice treacle, mithridate, oviatan, &c.

Counter-poisons are either *general*, or *specific*: to the general kind belong angelica, carduus benedictus, the vine-toxicum, dittany, ferroznera, citrons, bezoar, hartshorn, &c.

For specificks, citron-bark is supposed a *counter-poison* to nux vomica; Venice-treacle to the bite of a viper; oil of scorpion, to the bite of scorpions; oil of pine-apples, to orpiment; gentian, to the cicuta, &c.

Vander Linden, in his treatise *de venenis*, says, that in every putrid indisposition, whether arising from the bite of venomous beasts, or from an alcali formed by putrefaction, vinegar drank is sovereign, either simple or distilled; either with honey in form of oxymel, or with squills.

COUNTER-POTENT, or *potent counter-potent*, by the French heralds called *contre-potence*, is reckoned a fur, as well as vair and ermine; but composed of such pieces as represent the tops of crutches, called in French *potences*, and in old English *potents*.

COUNTER-PROOF, in rolling-press printing, a print taken off from another fresh printed; which, by being passed through the press, gives the figure of the former, but inverted.

To *counter-prove*, is also to pass a design in black lead, or red chalk, through the press, after having moistened with a sponge, both that, and the paper on which the *counter-proof* is to be taken.

COUNTER-QUARTERED, by the French called *contre-escartelé*, denotes the escutcheon, after being quartered, to have each quarter divided again into two: so that there are in it eight quarters, or divisions.

COUNTER-ROLL, a copy of the rolls relating to appeals, inquests, &c. See ROLL.

COUNTER-ROUND, a body of officers going to visit, and inspect the rounds.

COUNTER-SALIENT, is when two beasts are borne in a coat of arms in a posture of leaping from each other, directly the contrary way.

COUNTER-SCARP, in fortification, the exterior slope, or acclivity of the ditch, looking towards the campagne.—See Tab. *Fortification*, fig. 21. lit. cc.

COUNTER-SCARP is also used for the covert-way and the glacis. *Counter-Scarps* are sometimes made of stone, and without any slope.

To be *lodged on the counter-scarp*, is to be lodged on the covert-way, or the glacis. See COVERT-WAY.

Angle of the counter-scarp. See ANGLE.

COUNTER-SIGNING, the signing an order, or patent of a superior, in quality of secretary; to render the thing more authentic.

Charters, &c. are signed by the king, and *counter-signed* by a secretary of state, or lord-chancellor.

COUNTER-SWALLOW-TAIL, an outwork, in form of a single tenaille, wider at the gorge, or next the place, than at the head, or next the campaign.

COUNTER-TALLY, one of the two tallies whereon any thing is scored.

COUNTER-TENOR, is one of the mean or middle parts of music; so called, as being opposite to the *tenor*.

COUNTER-TRENCH, in fortification, a trench made against the besiegers, and which, of consequence, has its parapet turned towards them.

There are usually a great many communications between this and the place, to prevent the enemy from making any use of it, in case they render themselves masters thereof.

COUNTER-TRIPPING, is when two beasts are borne in a coat of arms tripping, *i. e.* in a walking posture, and the head of the one to the tail of the other.

COUNTER-VALLATION, a *counter-line*, or ditch, made around a place besieged; to prevent the sallies and excursions of the garrison, when it is strong.—Along its edge, on the side of the place, runs a parapet; and it is flanked from space to space.

COUNTER-VENTION. See the article CONTRAVENTION.

COUNTER-WORKING, in the military art, the raising of works, in order to oppose those of the enemy.

COUNTING, or **COMPTING-HOUSE**. See COMPTING-HOUSE.

COUNTRY wakes. See the article WAKES.

COUNTRY, originally signifies the territory of a *count*, or earl. But now it is used in the same sense with *shire*; the one word coming from the French, the other from the Saxon. See SHIRE.

In this view, a *county* is a circuit, or portion of the realm, into 52 of which, the whole land, England and Wales, is divided, for the better government thereof, and more easy administration of justice therein.

These *counties* are subdivided into rapes, lathes, wapentakes, hundreds; and these again into tithings.

For the execution of the laws in the several *counties*, excepting Cumberland, Westmorland, and Durham, every Michaelmas term, officers are appointed, under the denomination of *sheriffs*.

This officer has a double function: first, *ministerial*, to execute all processes and precepts of the courts of law directed to him; and secondly, *judicial*; whereby he has authority to hold two courts, the one called the *sheriff's-turn*, the other the *county-court*.

Other officers of the several *counties*, are, a *lord-lieutenant*, who has the command of the militia of the county; *custodes rotularum*, *justices of peace*, *bailiffs*, *high constable*, and *coroner*. See farther under LORD-LIEUTENANT, MILITIA, CUSTOS ROTULARUM, JUSTICE OF THE PEACE, HIGH CONSTABLE, BAILIFF, and CORONER.

Of the 52 *counties*, there are four of special note, which are therefore termed *counties palatine*, as, Lancaster, Chester, Durham, and Ely; Pembroke also, and Hexham, were antiently *counties palatine*; which last belonged to the archbishop of York, and was stripped of its privilege in the reign of queen Elizabeth, and reduced to be a part of the county of Northumberland.

The chief governors of these *counties palatine*, heretofore, by a special charter from the king, sent out all writs in their own names; and, touching justice, did all things as absolutely as the king himself in other *counties*; only acknowledging him their superior and governor. But in Henry VIII's time, the said power was much abridged.

COUNTY-CORPORATE, is a title given to several cities, or antient boroughs, on which the English monarchs have thought fit to bestow extraordinary privileges; annexing to them a particular territory, land, or jurisdiction.

The chief of these is the famous city of London; with York, Canterbury, Bristol, Chester, Norwich; the town of Kingston upon Hull, Newcastle upon Tyne, and Haverford West in Wales, &c. See CITY. COUNTY.

COUNTY-COURT, is a court of justice held in each county by the sheriff thereof, or his deputy, every month. See **SHERIFF**.

This county-court had antiently the cognizance of matters of great moment; but it was much abridged by *magna charta*, and more by Edward IV. but it has still the determination of debts and trespasses under forty shillings.

In effect, till the courts at Westminster were erected, the county-courts were the chief courts of the kingdom. See **COURT**.

Among the laws of king Edgar is this, *viz.* Let there be two county-courts in a year, and let there be present a bishop and an alderman or earl; one whereof shall judge according to the common law, the other according to the ecclesiastical law.—The conjunction of these two powers to assist each other, is as antient as the English government itself.

They were first separated by William the conqueror, who brought all the ecclesiastical business into a consistory, erected for that purpose; and the law-business into the king's-bench.

Rier COUNTY. See the article **RIVER**.

COUPED, **COUPE**, in heraldry, expresses a head, limb, or other thing in a escutcheon which is borne as if cut clear and even off, from the trunk; in opposition to its being forcibly torn off, which they call *avaled*.

Thus, the arms of Ulster, which all baronets carry, is a dexter-hand *couped*, or cut off at the wrist.

COUPED, *coupees*, is also used to denote such crosses, bars, bends, chevrons, &c. as do not touch the sides of the escutcheon, but are, as it were, cut off from them.

COUPEE*, a motion in dancing, wherein one leg is a little bent, and suspended from the ground; and with the other a motion is made forwards.

* The word, in the original French, signifies a cut.

COUPLE *elby*, in heraldry, the fourth part of a chevron: never borne but in pairs, except a chevron be between, faith Guillim; though Bloom gives an instance to the contrary. See **CHEVRON**.

COUPLED columns. See the article **COLUMN**.

COUPLET*, a division of an hymn, ode, song, or the like, wherein an equal number, or equal measure of verses is found in each part.

* The word is French, formed from the Latin *copula*.

In odes, these divisions are more ordinarily called *strophes*. See **STROPHE**.

By an abuse, *couplet* is sometimes used to signify a couple of verses.

COURANT*, or **CURRENT**, a term used to express the present time: thus, the year 1749 is the *courant* year; the fifteenth *courant*, the fifteenth day of the month now running.

* The term is French, and properly signifies running.

With regard to commerce, the *price courant* of any merchandize, is the known, and ordinary price accustomed to be given for it.

COURANT is also used for any thing that has course, or is received in commerce: in which sense, we say, *courant* or *current* coin, &c.

COURANT is also a term in musick and dancing; being used to express both the tune or air, and the dance.

With regard to the first, *courant* or *current* is a piece of musick in triple time: the air of the *courant* is ordinarily noted in triples of minims; the parts to be repeated twice.

It begins and ends, when he who beats the measure falls his hand; in contradistinction from the faraband, which ordinarily ends when the hand is raised.

With regard to dancing, the *courant* was long the most common of all the dances practised in England: it consists, essentially, of a time, a step, a balance, and a couple; though it also admits of other motions.

Formerly they leaped their steps; in which point, the *courant* differed from the low dances and pavades. There are *simple courants*, and *figured courants*, all danced by two persons.

COURIER, or **CARRIER**, a messenger sent post, or express, to carry dispatches.

Antiquity, too, had its *couriers*; we meet with two kinds, *viz.* those who ran on foot, called by the Greeks *hemerodromi*, q. d. *couriers of a day*. Pliny, Corn. Nepos, and Cæsar, mention some of these, who would run 20, 30, 36, and, in the circus, even forty leagues per day.—And *riding couriers*, *cursores equitantes*, who changed horses, as the modern *couriers* do.

Xenophon attributes the first *couriers* to Cyrus. Herodotus says, they were very ordinary among the Persians, and that there was nothing in the world more swift than these kind of messengers.

* That prince, says Xenophon, examined how far a horse would go in a day; and built stables, at such distances from each other, where he lodged horses, and persons to take care of them;

* and at each place kept a person always ready to take the packets, mount a fresh horse, and forward it to the next stage;

* and this quite through his empire.

But it does not appear, that either the Greeks or Romans had any regular fixed *couriers*, till the time of Augustus: under that prince they travelled in cars; though it appears from Socrates, they afterwards went on horseback.

Under the western empire, they were called *viatores*; and under that of Constantinople, *cursores*: whence the modern name.

COURIERS extraordinary. See the articles **EXTRAORDINARY**.

VAN-COURIERS. See the articles **VAN-COURIERS**.

COURSE, in navigation, the point of the compass, or horizon; on which a ship steers.

When a vessel begins its *course*, the wind wherewith it is driven makes a certain angle with the meridian of the place; and, as it is here supposed, the vessel follows exactly the direction of the wind; it makes the same angle with the meridian which the wind makes.

The wind is further supposed always the same; and because each point, or instant of a *course*, may be regarded as the first; every moment of the *course* it makes the same angle with the wind.

Now a wind that is north-east, *v. gr.* here, (and by consequence makes an angle of 45 degrees with our meridian) is north-east where-ever it blows, and makes the same angle of 45 degrees with all the meridians it meets.

The *course* of a vessel, therefore, driven by the same wind, makes the same angle with all the meridians on the surface of the globe. If the vessel run north and south, it makes an angle infinitely small with the meridian, *i. e.* is parallel to it, or never goes from it: if it run east and west, it cuts all the meridians at right angles.

In the first case it describes a great circle; in the second, either a great circle, which is the equator, or a parallel. But if the *course* be between the two, it does not then describe a circle; because a circle drawn in such a manner, would cut all the meridians at unequal angles. It describes, therefore, a spiral, or curve, the essential condition whereof, is to cut all the meridians under the same angle; called the *loxodromic curve*, or *loxodromy*, popularly *rhumb*.

The ship's *course*, therefore, except in the two first cases, is always a loxodromic curve; and the hypotenuse of a right-angled triangle, the two other sides whereof, are the ship's way in latitude and longitude.

The latitude is usually had by observation.

The *rhumb*, or angle of the *course*, is had by the compass, together with the one or other of the two sides; and what remains to be calculated in sailing, is the quantity of the longitude, and of the *rhumb*, or *course*.

Complement of the COURSE. See **COMPLEMENT**.

COURSE of a river. See the article **RIVER**.

COURSE, in architecture, denotes a continued range of stones, level, or of the same height, throughout the whole length of the building; and not interrupted by any aperture.—See **Tab. Architecture**, fig. 16. see also **BUILDING**, **WALL**, and **MASONRY**.

COURSE of plinths, is the continuity of a plinth of stone, or plaster, in the face of a building; to mark the separation of the stories. See **PLINTH**.

COURSE, is also used for a collection, or body of laws, canons, or the like. See **CORPUS**.

The *civil course*, is the collection of Roman laws, compiled by order of Justinian. See **CIVIL law**.—*Canonical course*, is the collection of the canon law, made by Gratian.

COURSE, again, is used for the time ordinarily spent in learning the principles of a science, or the usual points and questions therein.—Thus, a student is said to have finished his *course* in the humanities, in philosophy, &c.

COURSE is also used for the elements of an art exhibited and explained, either in writing, or by actual experiment.

Hence our *courses* of philosophy, anatomy, chymistry, mathematics, &c. probably so called, as going throughout, or running the whole length or *course* of the art, &c.

COURSE of the moon. See the articles **MOON**.

Paddock COURSE. See **PADDOCK**.

COURT*, an appendage to a house, or habitation; consisting of a piece of ground inclosed with walls, but open upwards. See **HOUSE**.

* The word is formed from the French *cour*, and that from the Latin *curvus*; whence also *cortis*, and *curtis* is sometimes used for the same. In the laws of the Germans, there is one article, *de eo qui in curte regis factum commiserit*; and another, *de eo qui in curte ducis hominem occiderit*. Others derive *court* from the Gaulish *Cors*, formed of *cur*, and *cor*; from *χρησθαι*. See **COHORT**.

The *court* before a house is properly called the *fore-court*; that behind, the *back-court*: that where country-affairs, &c. are managed, *i. e.* where cattle, &c. come, the *baize-court*.

COURT is also used for the palace, or place where a king, or foreign prince resides.

COURT, *curia*, in a law sense, is the place where the judges distribute justice, or exercise their jurisdiction.—Also the assembly of judges, jury, &c. in that place.

In this sense, *courts* are divided into *sovereign*, or *superior*, and *subaltern*, or *inferior*: and, again, into *courts of record*, and *base courts*.—Crompton describes 32 *courts* in England, most of them *courts of record*.

Again, *courts* are either such as are held in the king's name; as all the ordinary *courts*: or those held by his authority, where the precepts are issued in the judge's name, *virtute magistratus sui*; as the admiral's *court*.

In England, we have four principal *courts* subsisting; all established by antient custom of the realm, rather than by any statute; tho' their establishments have been from time to time since confirmed by acts of parliament. These are, the *courts of king's bench*, the *common-bench* or *pleas*, the *exchequer*, and the *court*

of chancery. See each in its place, KING'S-BENCH, COMMON-PLEAS, EXCHEQUER, and CHANCERY.

COURT of admiralty, is a court for the decision of maritime controversies. See ADMIRALTY COURT, and ADMIRAL.

COURT of arches. See the article ARCHES COURT.

COURT of attachment. } See ATTACHMENT.

COURT of augmentation. } See AUGMENTATION.

COURT of chivalry, or the marshal's court; a court whereof the judges are the lord high constable, and the earl marshal of England.

This court is the fountain of marshal law; and the earl marshal is not only one of the judges, but also to see execution done. See CHIVALRY.

COURT of delegates, is a court where delegates or commissioners are appointed by the king's commission, under the great seal upon an appeal to him.

It is granted in three cases; first, when a sentence is given in an ecclesiastical cause, by the archbishop, or his official; secondly, when a sentence is given in an ecclesiastical cause, in places exempt; thirdly, when sentence is given in the admiralty court, in suits civil or marine, by order of the civil law.

COURT of faculties. See the article FACULTY.

COURT of the legate, was a court obtained by cardinal Wolsey of pope Leo X. in the ninth year of Henry VIII. wherein he, as legate of the pope, had power to prove wills, and dispense with offences against the spiritual laws, &c. It was but of short continuance.

COURT of peculiars, is a spiritual court, held in such parishes as are exempt from the jurisdiction of the bishops, and are peculiarly belonging to the archbishop of Canterbury.

COURT of pie-powders. See PIE-POWDERS.

COURT of requests, was a court of equity, of the same nature with the court of chancery, but inferior to it; being principally instituted for the help of such petitioners, as in conicionable cases, dealt by supplication to his majesty.

Of this court the lord privy-seal was chief judge; assisted by the matters of requests. It had its beginning about 9 Hen. VII. according to Sir Julius's Caesar's tract on this subject—Mich. 40 and 41 Eliz. in a case of common-pleas, it was adjudged, upon solemn argument, that this court of requests, or the white-hall, was no court that had the power of judicature, &c. Coke Inst. fol. 97. It had assumed so great power to itself, that it grew burdensome and grievous, and was therefore taken away, with some others, by a statute made 16 and 17 Car. I. cap. 10.

COURT of verge. See the article VERGE.

COURT of wards and liveries. See WARDS and MASTER.

Bouche of COURT.

Despight of the COURT.

Forejudged the COURT.

Inns of COURT.

Perquisites of COURT.

Suit of COURT.

Ambulatory COURT.

Base COURT.

Bishop's COURT.

Christian COURT.

County COURT.

Dutchy COURT.

Honour COURT.

Lawless COURT.

MAYOR'S COURTS.—To the lord-mayor and city of London, belong several courts of judicature. The highest and most ancient is that called the *hustings*, destined to secure the laws, rights, franchises, and customs of the city. The second is a COURT of requests, or of conscience; so called, as meddling with nothing above forty shillings value; or rather, because here the oath of the creditor himself is accepted.—The third is the COURT of the lord-mayor and aldermen, where also the sheriffs sit; to which may be added, two courts of sheriffs; and the court of the city orphans, whereof the lord-mayor and aldermen have the custody.—Also, the COURT of common council, consisting of two houses; the one for the lord-mayor and aldermen, and the other for the commons: in which court are made all by-laws, which bind the citizens.—Also, the chamberlain's COURT, where every thing relating to the rents and revenues of the city, as also the affairs of servants, &c. are transacted. Lastly, to the lord-mayor belong the courts of coroner, and of *escheator*; another court for the conservation of the river of Thames; another of goal-delivery, held usually eight times a year, at the Old-Bailey, for the trial of criminals, whereof the lord-mayor is himself the chief judge.

There are other courts called *wardmotes*, or meetings of the wards; and courts of *balymote*, or assemblies of the several guilds and fraternities.

Prerogative COURT. See the article PREROGATIVE.

Sedentary COURTS. } See the articles } SEDENTARY.

Wood plea COURT. } See the articles } WOOD.

COURTS-BARON are courts that all lords of manors, who were antiently called *barons*, have within their respective precincts. This court is two-fold; 1^o. by custom: as, if a man having a manor in a town, grant the inheritance of the copyholds thereto

belonging to another; this grantee may keep a court for the customary tenants, and accept surrenders to the use of others, and make both admittances and grants.

2^o. By common law. This is of freeholders, which is properly called a *court-baron*, wherein the freeholders are judges: whereas of the other, the lord or his steward is judge.

COURT-DAYS, are days when the courts of judicature are open, and pleas held.

COURT-LANDS, such as the lord of the manor keeps in his own hands, for the use of his family, and for hospitality. See MANOR.

COURT-LEET, a court belonging to a lord of a manor in which all offences under high-treason are inquired into.

COURT-ROLL, a roll which contains an account of the number, &c. of lands, depending on the lord of the manor; with the names of the tenants, &c.

Tenants holding by copy of this roll, are denominated *copy-holders*. See COPY-HOLDER, and TENANT.

COURTAIN. See the article CURTIN.

COURTESY, or CURTESY of England, a tenure, whereby a man marrying an inheritrix, or a woman seized of lands in fee-simple, or fee-tail general, or seized as heir of tail-special, and getting a child by her which cometh alive into the world, tho' both wife and child die forthwith; yet, if the were in possession, he shall keep the land during his life, and be called *tenant by the courtesy of England*; this privilege being not allowed in any other country, except Scotland, where it is called *curialitas Scotiae*. This tenure was introduc'd by the conqueror, and borrowed by him from his own country, Normandy, where it obtained before, under the name of *curveil*.

Arms of COURTESY. See the article ARMS.

COURTIN, or COURTAINE, in fortification. See CURTIN.

COURTISAN, a term of infamy, applied to women who expose their persons, and make a trade of prostitution.

Lais, the famous Theban *courtisane*, stands on record for requiring no less than ten thousand crowns for a single night. Of all places in the world, Venice is that where *courtisans* abound the most: It is now 250 years since the senate, which had expelled them, was obliged to recall them; to provide for the security of women of honour, and to keep the nobles employed, lest they should turn their heads to make innovations in the state.

COUSIN*, a term of relation and kinship, applied to those who are issued from two brothers, or two sisters.

* The word is ordinarily derived from *conanguineus*; though Meagre brings it from *congenius*, or *congenius*, q. d. *ex eodem genere*.

In the first generation they are called *cousin germans*, i. e. next *cousins*.—In the second, *second cousins*; in the third and fourth, *cousins in the third and fourth degrees*.

In the primitive times, it was allowed *cousin germans* to marry, to prevent their making alliances in heathen families; but Theodosius the great prohibited it under pain of death; on pretence that they were, in some sort, brothers and sisters, with regard to each other.

Paternal *cousins*, are those sprung from relations on the father's side.—Maternal, those on the mother's

Quarter COUSINS. See the article QUATER.

COUSIN is also a title of honour, which kings bestow on peers, or nobles, foreign princes of the blood, cardinals, and the principal persons of their state.

COUSSINET, *cushion*, in architecture, the stone that crowns a pierdrot, or peer; or that lies immediately over the capital of the impost.

Its under-side is level, and its upper curved; receiving the first rise or spring of the arch, or vault.

COUSSINET is also used for an ornament in the Ionic capital, between the abacus, and echinus or quarter-round; and which serves to form the volutes.

It is thus denominated from its representing a pillow or cushion, pressed by the weight over it, and bound with the strap or girdle, called by Vitruvius, *balbeus*.

COUSU, in heraldry, is used in the same sense as *remply*; viz. for a piece of another colour or metal, placed on an ordinary as if it were sewed on; which the word in the French language naturally implies.—By reason the additional piece is not properly on the field, but in the nature of a thing sewed on, *adstitus*. This is generally of colour on colour, or metal on metal, contrary to the general rule of heraldry.

COUTHUTLAUCH, (from the Saxon *couth*, knowing; and *utlaugh*, out-law;) he that wittingly receives a man outlawed, and cherishes or conceals him: for which offence he was, in antient time, subject to the same punishment with the outlaw himself. Bracon.

COUVERT, in heraldry, denotes something like a piece of hanging, or a pavilion falling over the top of a chief, or other ordinary; so as not to hide, but only be shading thereto.

COWARD, in heraldry, a lion borne in an escutcheon, with his tail doubled or turned in between his legs, is called a *lion coward*.

COWL, or COVL, *cuculle*, a sort of hood, wore by certain monks. See COUL.

COWRING,

COWRING, in falconry, the quivering of young hawks, who shake their wings, in sign of obedience to the old ones.

COXÆ OS. See the article COCCYGIS.

COXÆ, COXENDICIS, ossa, and in English the *hip-bones*, called also *ossa innominata*, are two large bones, situate on either side of the os sacrum.—See Tab. *Anatomy*, (Osteol.) fig. 3. n. 16, 17, 18, 19.

In infants, each of these consists of three distinct bones, separated by cartilages; which, in adults, grow up, and constitute one firm, solid bone; whose parts, however, retain three distinct names, according to their former division, *viz.* the *os ilium*, or *ischium*, by some peculiarly called *coxendicis*, and the *os pubis*.

COXÆ MUSCULUS, according to Dr. Drake, is a pair of muscles arising fleshy from the os ischium, between the muscoli marsupialis, and pyriformis, and which descending obliquely, terminate on each side the os coccygis, and adjoining part of the os sacrum; serving to draw the os coccygis upwards and inwards, as antagonists to two ligaments springing from the back part of the os sacrum, and terminating in the external surface of the os coccygis.

CRABS-EYES, Oculi cancerorum, or lapides cancerorum, in natural history and medicine, are little, white, round stones, ordinarily flat; so called, tho' really taken out of the craw-fish, or river lobster: and bearing no great resemblance to eyes, though resembling them more than any other part.—They are much used in medicine, as a powerful alkali, or absorbent.

The most able naturalists long imagined them formed in the brain of the animal. Van Helmont first found them in the region of the stomach: M. Geoffroy the younger has observed the manner of their formation much more accurately.

According to him, we may lay down one class of animals, which have their bones without-skin; whereas the rest have them within-skin: of the first kind are the fishes we are speaking of. Those of the rivers divest themselves every year in June of the bones wherewith they are covered and armed: a membrane wherewith the inside of those scales is lined, takes their place, and hardens, by degrees, into a new shell.

Indeed, it is much less wonder an animal should cast its skin, or covering; than that it should discharge itself of its stomach, as the craw-fish does; and even, as M. Geoffroy thinks, of its intestines too: the exterior membranes of those viscera taking the place thereof.

There is room to believe, that as they putrify and dissolve, they serve for food to the animal; during the time of the re-formation, the old stomach seems to be the first food the new one digests.

It is only in this time that the stones are found, called *crabs-eyes*: they begin to be formed when the antient stomach is destroyed; and are afterwards wrapped up in the new one, where they decrease by degrees till they disappear entirely.

CRAFT, a sea term, signifying all manner of lines, nets, hooks, and the like, which serve for fishing. See FISHING.
Hence, as those who use the fishing trade, use small vessels, such as ketches, hoyes, smacks, &c. they call such little vessels *small craft*.

CRAMP*, a kind of numbness, or convulsion, occasioned by a thick viscid vapour entering the membranes of the muscles, which contracts or extends the neck, arms, legs, &c. with a violent, but transitory pain; being usually driven off with friction alone.

* The word comes from the German *krampfe*, which signifies the same.

CRAMP-IRON*, a piece of iron, bent at each extreme, serving to bind together pieces of wood, stones, or other things.

* Some derive the word, by corruption, from the French *agrapon*, or the Italian *crampone*, which signify the same thing.

CRAMPONEE, in heraldry. A *cross cramponee*, is that which at each end has a *cramp*, or square piece coming from it.—As presented in Tab. *Heraldry*, fig. 52.

CRAMPOONS, CRAMPONS, pieces of iron, hooked at the ends; for the drawing or pulling up of timber, stones, &c.

CRANAGE*, a liberty to use a *crane*, for drawing up wares out of a ship, or boat, &c. at a wharf; and to make profit thereof.

* The word also signifies the money taken, or paid for the same.

CRANE, a machine used in building and commerce, for the raising large stones and other weights.

M. Perrault, in his notes on Vitruvius, makes the *crane* the same with the *corvus*, or raven of the antients.

The modern *crane* consists of several members, or pieces, the principal whereof is a strong perpendicular beam, or arbor, firmly fixed in the ground, and sustained by eight arms, coming from the extremities of four pieces of wood laid across, through the middle whereof the foot of the beam passes. About the middle of the arbor the arms meet, and are mortised into it: its top ends in an iron pivot, whereon is bore a transverse piece, advancing out to a good distance in manner of a *crane's* neck; whence the name. The middle and extremity of this is again sustained by arms from the middle of the arbor; and over it comes a rope, or cable, to one end whereof the weight is fixed; the other is

wound round the spindle of a wheel, which turned, draws the rope, and that heaves up the weight; to be afterwards applied to any side or quarter, by the mobility of the transverse piece on the pivot.

CRANE is also a popular name for a siphon.

CRANE-LINES, in a ship, are lines going from the upper end of the sprit-fail-top-mast, to the middle of the fore-stays; serving to keep the sprit-fail-top-mast upright and steady.—See Tab. *Ship*, fig. 1. n. 137.

CRANIUM*, in anatomy, an assemblage of several bones, which cover and enclose the brain and cerebellum; popularly called the *skull*.—See Tab. *Anatomy*, (Osteol.) fig. 1. and 2.

* The word comes from the Greek *κρανιον*, of *κραν*, *galea*, helmet; in regard it serves to defend the brain, like a head-piece. Pеззон again, derives *κρανιον* from the celtic *cran*, by reason of its roundness.

The *cranium* is divided into two tables, or laminae, laid or applied over each other; between which is a thin spongy substance, made of bony fibres detached from each lamina, and full of little cells of different bignesses, called *diploe*, or *medullullum*.

The tables are hard and solid, the fibres being close to one another; the diploe is soft, in regard the bony fibres are here at a greater distance: a contrivance whereby the skull is not only made lighter, but less liable to fractures.

The external lamina is smooth, and covered with the pericranium; the internal is likewise smooth, abating the furrows made by the pulsation of the arteries of the dura mater, ere the *cranium* be arrived at its consistence.

It has several holes, through which it gives passage to the spinal marrow, nerves, arteries, and veins, for the conveyance and re-conveyance of the blood, &c. between the heart and the brain.

Its figure is round, which is an advantage to its capacity; but a little depressed, and length; advancing out behind, and flattened on the two sides, which form the temples; which contributes to the enlargement of the sight and hearing.

It is composed of eight bones, six whereof are *proper*, and two *common*:—the *proper* are, the bone of the forehead, *os frontis*, that of the back of the head, *os occipitis*, the two *os parietalia*, and the two of the temples, *os temporum*. See each in its place, **FRONTIS, OCCIPITIS, TEMPORIS, &c.**

Within the eminences of the bones of the temples, is contained the organ of hearing, with the four little bones belonging thereto, *viz.* the malleolus, incus, stapes, and os orbicularis. See **EAR**.

The *common* bones of the *cranium* are the os sphenoides, and ethmoides.

The *cranium* has three *common* sutures, which divide it from the jaw: it has others *proper*, whereof there are three genuine, the coronalis, sagittalis, and lambdoides; the rest spurious, called *squamosae*, or *temporales*.

This division of the *cranium* into pieces by sutures, is of good use, as it makes it less liable to break, gives passage to the membranes which sustain the pericranium, and affords vent to the matter of insensible perspiration. See FRACTURE.

CRANK, a contrivance in machines, in manner of an elbow, only of a square form; projecting out from an axis, or spindle; and serving by its rotation, to raise, and fall the pistons of engines for raising water, or the like.

CRANK, in the sea language.—A ship is said to be *crank-sided*, when she cannot bear her sails, or can bear but small sail for fear of oversetting.

She is said to be *crank by the ground*, when her floor is so narrow, that she cannot be brought on ground without danger.

CRAPE, a light transparent stuff, in manner of gauze; made of raw silk, gummed and twisted on the mill; wove without crossing, and much used in mourning.

Crapes are either *craped*, i. e. *crippled*, or *smooth*: the first *double*, expressing a closer mourning; the latter *single*, used for that less deep.—Note, white is reserved for young people, or those devoted to virginity.

The silk destined for the first is more twisted than that for the second; it being the greater or less degree of twisting, especially of the warp, which produces the crisping given it when taken out of the loom, steeped in clear water, and rubbed with a piece of wax for the purpose.

Crapes are all dyed raw.—The invention of this stuff came originally from Bologna: but the chief manufacture hereof is said to be at Lyons.

History tells us, that S. Bathilda, queen of France, made a fine *crapa*, *crepa*, of gold and silver, to lay over the body of S. Eloy. The Bollandists own they cannot find what this *crepa* was. Binet says, it was a frame to cover the body of the saint withal: but others, with reason, take it to be a transparent stuff, through which the body might be seen; and that this was the *crepa* whence our word *crapa* was formed.

CRAPULA, a surfeit by over-eating and drinking. See SURFEIT.

CRASIS * of the blood, denotes a due temperament or constitution of that humour; wherein the several principles, viz. salt and oil, whereof it is composed, are found in their just proportion and purity:—in contradistinction to *dyserasis*, which consists in an improper mixture of the principles, or an unnatural state of some of the ingredients thereof.

* The word is Greek, *κρᾶσις*, signifying mixture, temperament. The chief dyserasies the blood is susceptible of, whence flow most of the diseases of the body, are coagulation, dissolution, oilyness, fizyness, and saltness.

CRASIS, in grammar, is a figure, whereby two different letters are either contracted into one long letter, or a diphthong.—

Such, e. g. is *opsis* for *opias*; *αλυσιν* for *αλυσισιν*, &c. *τυχης* for *τυχηςσ*, &c. where *i* and *a* are contracted into *i*; *e* and *a* into *e*; and *o* and *o* into *o*.

CRASSAMENTUM, a term used by some anatomists, for the cruror of the blood; or that part which, upon standing to cool, and separate, forms the coagulum;—in opposition to the *serum*, or whey, wherein it swims.

Some authors have supposed the *crassamentum* to be specifically lighter than the serum; but Dr. Jurin shews the contrary from repeated experiments.

CRATER, *cup*, in astronomy, a constellation of the southern hemisphere; whose stars in Ptolemy's catalogue are 7; in Tycho's 8; in the Britannic catalogue 11. The order, names, longitudes, latitudes, &c. whereof are as follow.

Names and Situations of the Stars.	Sign.	Longitude.	Latitude South.	Magni.
That in the foot	♄	19 26 3	22 42 47	4 3
Preced. of 3 in the middle of the cup		22 23 50	17 35 20	4
South. in the middle of the cup		25 5 50	20 47 43	4
Preced. in the north part of the circumference of the mouth		21 55 59	13 28 28	4
Middle of 3 in the middle of the cup		24 56 16	19 39 22	4
Subj. in north. circumf. of the mouth		23 9 20	14 35 16	6
In the north. handle		24 16 26	11 18 33	4
In the middle of the mouth		26 8 52	14 13 32	5
In the fourth. circumf. of the mouth		29 45 50	18 17 29	4
In the fourth. handle	♄	1 47 42	16 4 46	4
10	♄	3 58 41	17 52 59	5 6

CRATER, in falconry, denotes a line on which hawks are fastened when reclaimed.

CRAVEN, or **CRAVENT**, in our ancient customs, a term of reproach used in trials by battle.

The law was that the victory should be proclaimed, and the vanquished acknowledge his fault in the presence of the people; or pronounce the word *cravent* in the name of recreant, or cowardice, &c. and, presently, judgment to be given; and the recreant, *amittere legem terræ*, i. e. become infamous.

Coke observes, that if the appellated join battle, and cry *craven*, he is to lose, *liberam legem*. If the appellated cry *craven*, he is to be hanged.

CRAYON, a general name for all coloured stones, earths, or other minerals, used in designing, or painting in pastel; whether they have been beaten and reduced to a paste, or are used in their primitive consistence of a stone, after sawing or cutting them into long narrow slips.

In this last manner are red *crayons* made, of blood-stone, or red chalk; black ones, of charcoal and black lead. *Crayons* of all other colours are compositions of earths reduced to paste.

CREAM *, the thickest and fittest part of milk; being that whereof butter is made.

* The word is derived from the Latin *cremor*, which signifies the same thing; though in the lower Latin we find *crema lactis*.

CREAM of tartar, **CREMOR tartari**, in pharmacy, a preparation of tartar, otherwise called *crystal of tartar*.

It is made by boiling tartar in water till it be dissolved, and passing the dissolution through a straining-bag: half the liquor being evaporated, the remainder is set in a cool place; where it shoots into crystals, part of it swimming a-top, in form of *cream*.

—This latter is properly the *cream of tartar*, the rest *crystal of tartar*, both are of the same nature and use.

Cream of tartar is reputed a great sweetner of the blood; for which some take it in whey or water-gruel in the spring-time, to the quantity of half an ounce every morning, for three or four weeks.

Its operation is by stool; and, by its saline particles, pretty much also by urine.—It is generally mixed with lenitive electuaries, and other gentle catharticks, in nephritic and antivenereal cases, where it often proves serviceable.

CREASE-TYLES. See the article **TYLE**.

CREATION. } See the articles **GENESIS**.

Epoche of the CREATION. } **EPOCHA**.

CREDENTIALS, letters of credit and recommendation; especially such as are given to ambassadors, plenipotentiaries, &c. sent to foreign courts.

CREDIBILITY, a quality in objects whereby they become fit to be believed. See **FATH**.

A thing is said to be *credible*, which is not apparent of itself, nor is certainly to be inferred either from the cause or effect; and yet has the attestation of a truth.—Things which appear immediately true, as the whiteness of snow, or that the whole is equal to its parts, are not said to be *credible* but evident.—Those to which we only give our assent in virtue of some competent authority, or testimony of others, are, by the schoolmen said to be *credible*; as Christ was incarnate, crucified, &c. In the *Philosophical Transactions*, we have a mathematical computation of the *credibility* of human testimony.

CREDIT, in commerce, a mutual trust or loan of merchandise or money, on the reputation of the probity and solvability of a dealer.

Letters of CREDIT, are those given to persons in whom a merchant, &c. can trust, to take money of his correspondent abroad, in case he happens to need it.

CREDIT is also used for the currency which papers, or bills, have in the publick, and among dealers.

In this sense, *credit* is said to *rise*, when in negotiating the shares of a company, they are received and sold at prices above *par*, or the standard of their first creation.

Discredit is opposed to *credit*, and is used where money, bills, &c. fall below *par*.

CREDIT was also antiently a right which lords had over their vassals; consisting in this, that during a certain time they might oblige them to lend them money.

In this sense, the duke of Brittany had *credit* during fifteen days on his own subjects, and those of the bishop of Nantes; and the bishop had the same *credit* or right among his subjects, and those of that prince.

CREDITOR, a person to whom any sum of money is due, either by obligation, promise, or otherwise.

The laws of the twelve tables, which were the foundation of the Roman jurisprudence, allowed the *creditor* to tear or cut his debtor to pieces, in case he proved insolvent.

CREDITOR, in book-keeping. See **BOOK-KEEPING**.

CREED, **CREDO**, a short, or summary account of the chief articles of the christian faith; thus called from the first word thereof in Latin, *credo*, I believe. See **SYMBOL**.

CREEK, part of a haven, where any thing is landed from the sea. See **HARBOUR**.

So many landing-places as there are in a harbour or port, so many *creeks* there are. **Crompt**.

CREMASTERS *, in anatomy, an epithet given two muscles, otherwise called *suspensores*; serving to raise, or draw up the testicles. See **Tab. Anat. (Myol.) fig. 2. n. 32**.

* The word comes from the Greek *κρεμαστω* (*suspenderet*) to suspend, to hang.

CRENATED leaves, a term used by botanists, for such leaves of plants as are jagged, or notched round their edges. The more accurate writers, indeed, distinguish between crenated and dentated; the former denoting such leaves as are divided into obtuse or rounded segments; the latter, such as are divided into pointed ones of the number of dentated leaves, are those of mint; of the number of the crenated, are those of wood betony.

CRENELLE *, *imbattled*, in heraldry, is when any honourable ordinary is dented, after the manner of battlements of a wall.

* The French word comes from *cren*, a notch, or interval; the English from its being a place of fighting, or battle. Upton, in Latin, calls this *imbatalatum*, a word forged from the English; but most others term it *pinnatum*, from *pinnæ*, a battlement.

The origin hereof is, doubtless, from the figures of such walls being given to warriors, either for having been the first at mounting, or the chief in defending them.

CREPITATION, that noise of which some salts make over the fire in calcination; called also *detonation*.

CREPITUS lupi, in natural history, a kind of fungus, popularly called *puff-ball*.

Mr. Derham observes, that upon examining the powder thereof with a microscope, he found the seeds to be so many exceeding small puff-balls, with round-heads, and long, sharp-pointed stalks; as if made on purpose to prick into the ground.

The seeds become hurtful to the eyes, probably by their sharp stalks pricking and wounding them.

CREPUSCULUM *, in astronomy, *twilight*; the time from the first dawn or appearance of the morning, to the rising of the sun; and again, between the setting of the sun, and the last remains of day.

* Papias derives the word from *creperus*; which, he says, antiently signified *uncertain*, *doubtful*, q. d. a *divinis light*.

The *crepusculum* is usually computed to begin and end when the sun is about 18 degrees below the horizon.—It is of longer duration in the solstices than in the equinoxes, longer in an oblique than in a right sphere.

The *crepuscula* are occasioned by the suns rays refracted in our atmosphere, and reflected from the particles thereof, to the eye.

—For suppose an observer in O, (**Tab. Astronomy, fig. 41.**) the sensible horizon A B, and the sun under the horizon in H K; and let the ray S E fall in the atmosphere below the horizon. Since it passes out of a rarer into a thicker medium, it will be refracted,

refracted, and that towards the perpendicular, *i. e.* towards the semidiameter CE. It will not, therefore, proceed to T, but touching the earth in D, it will fall upon A, the eastern part of the sensible horizon: nor can any other ray besides AD, of all those refracted in E, arrive at A. But now, since the particles of the atmosphere reflect the sun's rays, (see REFLECTION;) and since the angle DAC is equal to CAO; the rays reflected in A will be carried to O, the place of the spectator; who will therefore see the particle A shining in the sensible horizon, and consequently the beginning of the morning *crepusculum*. And in the same manner might be shewn the refraction and reflection of the sun's rays in the atmosphere, in the evening *crepusculum*.

Kepler, indeed, assigns another cause of the *crepusculum*, *viz.* the luminous matter around the sun; which arising near the horizon, in a circular figure, exhibits the *crepusculum*; in no wise, as he would shew, owing to the refraction of the atmosphere. The depth of the sun below the horizon, at the beginning of the morning *crepusculum*, or end of the evening one, is determined in the same manner as the arch of vision, *viz.* by observing the moment wherein the air first begins to shine in the morning *crepusculum*, and that wherein it ceases in the evening; and finding the sun's place for that moment.

Alhazen found it 10 degrees; Tycho 17°; Rothmannus 24°; Stevener 18°; Cassini 15°; Ricciolus, in the equinox in the morning, 16°, in the evening 20° 30'; in the summer solstice in the morning, 21° 25'; in the winter solstice in the morning, 17° 25'.

Nor need we wonder at this difference among astronomers; the cause of the *crepusculum* being inconstant: for, if the exhalations in the atmosphere be either more copious, or higher than ordinary; the morning *crepusculum* will begin sooner, and the evening hold longer than ordinary: for the more copious the exhalations are, the more rays will they reflect, consequently the more will they shine; and the higher they are, the sooner they will be illumined by the sun. To this it may be added, that in a denser air, the refraction is greater; and that not only the brightness of the atmosphere is variable, but also its height from the earth.

Hence, when the difference between the sun's declination and the depth of the equator is less than 18°, and does not, in effect, exceed 15°, the *crepusculum* will continue the whole night. The elevation of the pole PR, (fig. 42.) and the sun's declination OS, being given, to find the beginning of the morning *crepusculum*, or end of the evening. Since in the triangle PSZ the several sides are given, *viz.* PZ the complement of the elevation of the pole PR, and PS the complement of the declination OS, and SZ the aggregate of the quadrant ZD, and the sun's depth DS, find the angle ZPS, whose measure is the arch AO. See TRIANGLE.

Convert AO into solar times: thus have you the time elapsed from the beginning of the morning *crepusculum*, to noon. See TIME.

To find the *crepusculum* by the artificial globe. See GLOBE.

CRESCENT*, the new-moon, which, as it begins to recede from the sun, shews a little rim of light, terminating in points, or horns, which are still increasing, till it become full, and round in the opposition.

* The word is Latin, *crestens*, formed from *cretesco*, I grow, or increase.

The term is also used for the same figure of the moon in its wane, or decrease; but improperly: in regard the points or horns are then turned towards the west, whereas they look to the east in the just *crefcent*.

CRESCENT, in heraldry, is a bearing in form of a half moon.—The Ottomans bear sinople, a *crefcent* montant, argent.

The *crefcent* is frequently used as a difference in coat-armour, to distinguish it for that of a second brother, or junior family.

The figure of the *crefcent* is the Turkish symbol; or rather, it is that of the city Byzantium, which bore this device from all antiquity; as appears from medals struck in honour of Augustus, Trajan, &c.

The *crefcent* is sometimes *montant*, *i. e.* its points look towards the top of the chief, which is its most ordinary representation: whence some contend, that the *crefcent*, absolutely so called, implies that situation; though other authors blazon it *montant*, when the horns are towards the dexter-side of the escutcheon, when others call it *incurvant*.

*Crefcent*s are said to be *addesed*, when their backs or thickest parts are turned towards each other; their points looking to the sides of the shield.

Crefcent *inverted*, is that whose points look towards the bottom:—turned *crefcent*s are placed like those *addesed*; the difference is, that all their points look to the dexter-side of the shield:—*conturned crefcent*s on the contrary, look to the sinister-side:—*affronted* or *appointed crefcent*s, are contrary to the *addesed*, the points looking towards each other.

CRESCENT is also the name of a military order, instituted by Renatus of Anjou, king of Sicily, &c. in 1448; so called from the badge, or symbol thereof, a *crefcent* of gold enamelled. What gave occasion to this establishment, was, that Renatus took for his device a *crefcent*, with the words *loz, graife*; which,

in the stile of Rebus, makes *loz* in *crefcent*, *q. d.* by advancing in virtue, one merits praise.

CREST, in armoury, the uppermost part of the defensive armour of the head; rising over the rest, in manner of the comb or tuft of a cock; to sustain the effort of very keen scimitars, &c.—It has its name from *cresta*, cock's comb.—Hence, also, CREST, in heraldry, denotes the uppermost part of an armoury; or that part rising over the cask, or helmet. See CASK.

Next to the mantle, says Guillim, the *crest* or *cognizance* claims the highest place, being seated on the most eminent part of the helmet; yet so, as to admit an interposition of some escrol, wreath, chapeau, crown, &c.

The *crest* of the arms of England, is a lion passant gardant, crowned with an imperial crown; that of France, a flower-de-lis.

In the ancient tournaments, the cavaliers had plumes of feathers; especially those of ostriches and herons, for their *crests*; these tufts they called *plumarts*; and were placed in tubes, on the tops of high caps, or bonnets.—Some had their *crests* of leather; others of parchment, pasteboard, &c. painted or varnished, to keep out the weather; others of steel, wood, &c. on which were sometimes represented a member or ordinary of the coat; as, an eagle, flower-de-lis, &c. but never any of those called honourable ordinaries, as pale, fesse, &c.—The *crests* were changeable at pleasure; being reputed no other than as an arbitrary device, or ornament.

Herodotus attributes the rise of *crests* to the Carians, who first bore feathers on their casks, and painted figures on their bucklers; whence the Persians called them *acks*.

The oldest of the heathen gods are said to have wore *crests*, even before arms were made of iron and steel.—Jupiter Ammon bore a ram's head for his *crest*; Mars that of a lion, or a tyger casting out fire at his mouth and nostrils. Alexander the great wore for his *crest* a ram's head, to inculcate that he was the son of Jupiter Ammon. Julius Cæsar sometimes bore a star, to denote that he was descended from Venus; and sometimes the head of a bull, or an elephant with his trunk; and sometimes the wolf that suckled Romulus and Remus.

The Christians, in their first religious wars, were wont to wear a cross darting forth rays, for their *crests*, as well as on their shields and banners, as Prudentius informs us;

—*Clypeorum insignia Christus*

Serisferat, ardebat summis crux addita crestis.

The ancient warriors bore *crests* to strike terror in their enemies, as the sight of the spoils of animals they had killed; or to give them the more formidable mien, by making them appear taller, &c.—Plutarch observes, that the *crest* of Pyrrhus was a bunch of feathers, with a stag's horns; and Diodorus Siculus, that of the kings of Egypt, a lion's head, or bulls, or dragons. The *crests* have given rise to several fables: the antients, *v. gr.* give Serapis the head of a spar-hawk; this being the *crest* of that cavalier. Geryon they made a monster with three heads, because he bore a triple *crest*; they feigned, that Proteus changed his form every moment, because, being king of Egypt, he frequently changed his *crest*; sometimes bearing that of a lion, sometimes of a dragon, &c.

The *crest* is esteemed a greater mark of nobility, than the armoury, as being bore at tournaments; to which none were admitted, till they had given proof of their nobility. Sometimes it serves to distinguish the several branches of a family. It has also served, on occasion, as the distinguishing badge of factions. Sometimes the *crest* is taken from the device; but more usually it is formed of some piece of the arms: thus, the emperor's *crest* is an eagle; that of Castile a castle, &c.—Families that exchange arms, as have done the houses of Brunswick and Cologne, do not change their *crests*; the first still retain the horse, and the latter the mermaid.

CREST, among carvers, an imagery, or carved work, to adorn the head, or top of any thing; like our modern cornice.

CREST-FALLEN, is spoken of a horse, when the upper part of the neck, on which the main grows, does not stand upright, but hangs either to one side or the other.

CRESTED *stalk*. See the article STALK.

CREUX, a term in sculpture, much used by the French; though not yet, that we know of, naturalized among us: but the want of a word of equal import in English, as it has frequently put us under a necessity of using this in the course of the present work; so it pleads strongly for its admission into our language. *Creux* originally signifies a hollow, cavity, or pit, out of which something has been scooped, or dug: hence it is used to denote that kind of sculpture, and gravure, where the lines and figures are cut, and formed within the face, or plane of the plate, or matter engraven on.

In which sense, it stands opposed to *relievo*; where the lines and figures are embossed, and the prominent above the face of the matter.

CREW, the company of sailors belonging to a ship, boat, or other vessel.

The sailors that are to work and manage a ship, are regulated by the number of lasts it may carry; each last making two ton. The crew of a Dutch ship, from 40 to 50 lasts, is seven failors and a swabber; from 50 to 60 lasts, the crew consists of eight

men and a swabber; and thus increases at the rate of one man for every 10 lasts; so that a ship of 100 lasts has 12 men, &c. —English and French crews, are usually stronger than Dutch; but always in about the same proportion. In a ship of war, there are several particular crews, or gangs; as the boatswain's crew, the carpenter's crew, the gunner's crew, &c.

CRIBRATION, in phytology, *sifting*; the act of separating the finer parts of a medicine, whether dry, or humid, from the grosser; the latter by means of a pulping-sieve, the former by a fine searce.

CRIBROSUM *os*, or *os CRIBRIFORME*, in anatomy, a little bone at the top of the nose, pierced like a sieve, to let pass several little fibres, arising from the mamillary productions, and terminating in the membrane that lines the cavity of the nostrils: called also *os ethmoides*.

CRICOARYTÆNOIDÆUS, in anatomy, a name given two pair of muscles, serving to open the larynx. The *cricoarytænoidei* are either *posterior*, or *lateral*: the former are the first pair of openers of the larynx; the latter, the second pair.

The *lateral* have their origin in the edge of the lateral and superior part of the cartilage cricoidee, and are inserted into the lateral and superior part of the arytenoides.

The *posterior* have their origin in the posterior and lower part of the cricoidee: and hence, the reason and etymology of the name is evident.

CRICOIDES *, in anatomy, a cartilage of the larynx; so called, as being round, like a ring, and encompassing the whole larynx.]

* The word is formed from *κρικος*, used by transposition for *κικος*, circle, and *ειδος*, form.

The *cricoides* is the second cartilage of the larynx: it is narrow before, thick behind; and serves as a base to all the other cartilages; being, as it were, let into the thyroids.

It is by means of this, that the other cartilages are joined to the trachea; on which account it is immovable.

CRICOTHYROIDÆUS, in anatomy, a name given to the first pair of muscles proper to the larynx.

Their name is derived hence, that they have their origin in the lateral and anterior part of the *cricoides*; and are inserted into the inferior part of the thyroids.—Their use is to dilate the scutiform cartilage.

CRIME *, a breach or transgression of a law, or an action contrary to the purport of a law, either natural or divine, civil, or ecclesiastick; to which a penalty is annexed.

* The term *crime* includes in it the idea of a determination, and design formed to do an injury: it is derived from the Latin *crimen*, of the Greek *κρῖμα*, *judicio*, I judge.

The Romans distinguished two kinds of crimes, *viz.* *private*, which only affected particular persons; the prosecution whereof was not allowed by the laws to any but those interested therein; as *adultery*, &c. and *publick crimes*; the prosecution whereof was permitted to all persons, though in no wise immediately interested.

With us, crimes are distinguished into *capital*; as *treason*, *murder*, *robberies*, &c. and *common*, as *perjuries*, &c.

They are again divided into crimes cognizable by the king's judges; as those abovementioned: and such as are only cognizable in the spiritual courts, as *simple fornication*, &c.

Quasi CRIME. See the articles **QUASI CRIME**.

CRIMEN falsi. See the article **FALSI**.

CRIMSON *, one of the seven red colours of the dyers.

* The word comes from the Arabic *kermish*, of *hermes*, red.—The Bollandists insinuate, that *crimson* comes from *cremona*, and is used for *cremonasi*.

The stuffs to be dyed in *crimson*, after they have been cleared of their soap, and strongly allumed, are put in a decoction of cochineal, each according to its colour.

CRINONES, in medicine, a sort of worms, sometimes found under the skin, in children; resembling short thick hairs, or bristles.

They are also called *dracunculi*, and *comedones*, from the Latin *comedere*, to eat; by reason they prey on the substance of the child, or consume its nourishment. See **DRACUNCULI**.

CRISIS, in medicine, a change, or turn in acute diseases; wherein the morbid matter is so altered, as determines the patient either for recovery or death.

The cause of such change is owing to the remaining vital force's being irritated by the matter of the disease to or so conditioned; *i. e.* fit either to be evacuated, or translated, or to kill.

If the matter be disposed for evacuation or translation, but is not salubrious, it produces a change called a *critical perturbation*, or *imperfect crisis*.

If the change become sensible, they are called *critical symptoms*, or *signs of a crisis*, either future or present. See **SIGNA**.

The symptoms of the *crisis* are frequently confounded with those arising from the cause of the disease, and the disease itself, or the matter of the disease; whence the most unhappy consequences.

The differences between *critical symptoms* and morbid ones, are, that the first proceed from the vital power's prevailing over the force of the disease; but the latter from the disease's

prevailing over the vital faculty: that the first are preceded by a manifest concoction, but the latter are formed even in crudities: that the former happen about the critical times, but the latter at all times of the disease, chiefly during its increase.

The principal symptoms of an approaching crisis, are, after digestion, and about the critical time, a sudden stupor, drowsiness, waking, delirium, anxiety, dyspnoea, grief, redness, titillation, pricking, heaviness, darknes, light, spontaneous tears, nausea, heat, thirst, trembling of the lower lip, &c.

The symptoms and effects of a present crisis, are, after the preceding ones, a vomiting, salivation, looseness, thick sediment in the urine, bleeding at the nose, hemorrhoids, sweat, abscesses, pustules, tumors, buboes, parules, aphthae, &c.

CRISTA galli, in anatomy, an eminence in the middle of the os ethmoides, advancing within the cavity of the cranium; and to which is fastened that part of the dura mater which divides the brain, called *falx*.

It has its name from its figure, which resembles that of a cock's comb.—In adults, this process appears of a piece with the septum narium.

CRISTÆ is also a term used by surgeons for certain præternatural excrescences arising about the fundament, resembling cock's combs.

These, M. Dionis says, are taken off either by ligature, cauterisation, or amputation. When they have other figures, they have other names, as *ficus*, &c.

CRISTA is also used for a crooked, twisted, spiral eminence, in the middle of the spine of the omoplate.

CRITERIUM, or **CRITERION**, a rule or standard, whereby to compare propositions and opinions, in order to discover their truth or fallshood.

The doctrine of *criteria*, and the characters and rules thereof, make the first part of the Epicurean philosophy.

CRITHOMANCY *, a kind of divination, performed by considering the dough, or matter of the cakes offered in sacrifice; and the meal strewd over the victims to be killed.

* Hence, in regard they ordinarily used barley-meal in these ceremonies, this kind of divination was called *crithomancy*; from *κριθον*, barley, and *μαντεια*, divination.

CRITICAL days *, symptoms, &c. are certain days, and symptoms, usually arising in the course of acute diseases, as fevers, small-pox, &c. which indicate the patient's state, and determine him either to recover or grow worse.

* The word comes from the Greek *κρινω*, *judico*, I judge.

The crises have been frequently observed to happen on the seventh, fourteenth, or twentieth day; whence those are denominated *critical days*.

For the theory of *critical days*, it may be observed, that the concoction of any morbid matter, and the humour to be discerned, is nothing else but a change thereof into such a due magnitude, or smallness, as it may be carried by the circulating blood along the canals, and excerned by vessels destined for that purpose. But if the morbid matter cannot be reduced to such a magnitude or smallness as may correspond to the orifices of the secretory vessels; then either an abscess or a hemorrhage will follow, if a crisis be begun; for which reason, abscesses, &c. are accounted less perfect crises.

But, that the morbid matter may be reduced to a due magnitude, or smallness, and its with-drawal for discharge take place, there is required a considerable time, if the quantity of matter be large; that is, if the distemper be great and severe: and since there are a great many causes, and those very constant, which may occasion the blood, and offending humours therein, to be of a different fluidity in the inhabitants of different climates;

it is impossible but that different spaces of time should be required for the finishing concoction: which makes it impossible to determine the *critical days* in one climate, from what they are found to be in another.

The causes of real *critical days*, that is, such on which happens the last concoction of the morbid matter, which is always attended with its expulsion, are all those things which occasion the humours to become of such a certain magnitude or minuteness, and of a greater or lesser cohesion; but with any given power, bodies unequally large, or unequally cohering, cannot be concocted in an equal time: wherefore, it is to be found by the observations made by all nations among themselves, which are the usual causes and conditions of those diseases, which require a certain number of days to finish such a concoction in.

CRITICISM, the art of judging concerning discourse and writings. See **JUDGMENT**.

Some define *criticism* more amply, the art of judging of a history, or a work of genius, with the various incidents there met with, their style, and authors.

On which footing M. le Clerc seems to have given a defective idea of *criticism*, when he defines it simply the art of entering into the meaning of ancient authors, and of making a just discernment of their genuine works.

Philosophical CRITICISM, or the art of judging of opinions and hypotheses in philosophy.

We may distinguish divers sorts, or branches of this art: as,

Thecla

Theological CRITICISM, the art of judging of explications of doctrines of faith, &c.

Political CRITICISM, the art of judging of the means of governing, acquiring, and preserving states.

But the ordinary use of the word is restrained to

Literary CRITICISM, which, however, is of great extent, as it takes in the art of judging of facts: a branch of *criticism*, which regards not only history, but also the discernment of the real works of an author, the real author of a work, the genuine reading of a text, and the art of discovering supposititious monuments, charters, interpolated passages, &c.

The other parts of *literary criticism*, are, the art of judging of works of genius, their excellencies and defects. We have also *Grammatical* CRITICISM, or the art of interpreting and discovering the words and meanings of an author.

CRITICISM of antiques, which consists in distinguishing genuine medals, and the different taste and spirit found among them, according to the different people, the different country, and the different times wherein they were struck; the distinguishing between what is cast and what struck; what has been retouched, and repaired or added, from what is really antique; the genuine from the spurious, &c. and to decypher and explain them, &c.

Sacred CRITICISM, in general, is that employed in ecclesiastical matters, the history of the church, the works of the fathers, councils, lives of the saints, &c. but more particularly what concerns the books of the holy scriptures, and the canon thereof.

Aristotle, if we believe Halicarnassus, is the first inventor of the art of *criticism*. Aristarchus, Dionysius Halicarnassus himself, Varro and Longinus, distinguished themselves therein in their days. Among the Christians, Dionysius Alexandrinus, Eusebius, Jerome, S. Jerom, and Theodoret, were the greatest masters in this art. The decree of pope Gelasius about the apocryphal books, required a good share of *criticism*.

But the critical art fell with the other arts; and lay unknown till the time of Charlemaign, when it was re-established under him and his sons.—The care which the religious Cistercians took to correct the manuscripts of the bible, shew that the rules of *criticism* were not entirely unknown in the eleventh century.—The works of Johannes Sarisburiensis, Eustathius, and Tzetzes, make it evident, it was cultivated in the twelfth.—The manuscripts of the bible corrected by the Dominicans of Paris, and the doctors of the Sorbonne in the thirteenth, shew it was subsisting then.—In the following ages it was still cultivated with more earnestness; especially in the sixteenth and seventeenth centuries, when all the world made it their study.

From the whole, it follows, that *criticism* does, indeed, suppose an uncommon stock of knowledge of the subject whereon it is employed: but that *criticism*, itself, is nothing else but good sense perfected by grammar and logic.

CROCHES, among hunters, the little buds about the top of a deer's horns.

CROCI, among botanists, the apices, or small knobs on the tops of flowers.

CROCIA, a bishop's or abbot's crozier, or pastoral staff. See **CROSIER**.

CROCODILE, **CROCODILUS**, in rhetoric, a captious and sophistical kind of argumentation; contrived to seduce the unwary, and draw them speciously into a snare.

It has its name, *crocodile*, from the following occasion, invented by the poets.—A poor woman begging a *crocodile* that had caught her son walking by the river-side, to spare and restore him; was answered, that he would restore him, provided she should give a true answer to a question he should propose: the question was, *Will I restore thy son, or not?* to this the poor woman, suspecting a deceit, sorrowfully answered, *Thou wilt not*: and demanded to have him restored, because he had answered truly. Thou liest, says the *crocodile*, for if I restore him thou hast not answered truly: I cannot therefore restore him, without making thy answer false. Under this head may be reduced the propositions called *mentientes*, or *inhabilis*; which destroy themselves. Such is that of the Cretan poet; *omnes ad unum Cretenses semper mentiantur*: all the Cretans, to a man, always lie. Either, then, the poet lies, when he asserts that the Cretans all lie; or the Cretans do not all lie.

CROCOMAGMA, in pharmacy, a name given by some to troches composed of saffron, myrrh, red roses, starch, and gum arabic: thus called from the Greek *κροκος*, *saffron*, and *μαγμα*, a mass of any thing.

CROCUS, a term used for saffron. See **SAFFRON**.

CROCUS, in chymistry, is a name given to several different preparations; from their red, or saffron colour.—As

CROCUS martis, a preparation of iron; which is of two kinds, *viz.* *crocus martis aperientis*, and *crocus martis astringentis*.

CROCUS martis aperientis, opening saffron of mart, is a preparation of iron plates, made by first washing them, then expounding them to the dew, till they have contracted a rust; which rust is scraped off, and the plates exposed for more.

Others prepare it by calcining iron filings, with an equal weight of sulphur.—Others, by clapping a bar of iron, red, or rather white hot, between two rolls of brimstone; in which case, the iron melts, and runs down into a vessel of water below: which

some call *mars cum sulphure preparatus*. Others have other preparations.

M. Lemery endeavours to shew, that iron taken in substance; is much more salutary and efficacious than when thus prepared; the process tending to strip it of its oily part, wherein its chief virtue resides; leaving nothing behind but the mere ferruginous earthy part.

CROCUS martis astringens, binding saffron of iron, is a preparation of iron filings; wherein they are deprived of their more saline parts by washing them five or six times in strong vinegar, and calcining them five or six hours.

CROCUS metallorum, a kind of impure, opaque, glass of antimony, of a liver colour; hence frequently called *liver of antimony*; it is made by firing equal parts of powder of antimony and salt-petre, well mixed in an iron mortar, covered with a tile. See **ANTIMONY**.

This is kindled by dropping in a coal of fire; upon which a great detonation ensues; and the mortar is struck, to make the matter fall to the bottom.—The shining part is the *crocus*, or liver, which is to be separated from the dross, and referred for use.

Its chief use is in making the vinum emeticum, or benedictum, by infusing an ounce or two of the *crocus* powdered, in a quart of wine for 24 hours.

CROFT, **CROFTUM**, a little close adjoining to a dwelling-house, either for pasture or tillage.

* *Passunt etiam dicti monachi de eisten mariscis versus occidentem jacentibus pro se & hominibus suis, includere croftos, sive pratam juxta pontem specialiter quantum illis placuerit.* Ingulf.

In some antient deeds, *crosta* occurs as the Latin word for a *croft*; but *cun toftis* & *croftis* is more frequent. *Croft* is translated in Abbo floriacensis, by *pradium*, a farm.

CROISADE, **CRUZADE**, or **CRUZADO**, a holy war, or an expedition against infidels and heretics; particularly against the Turks, for the Recovery of Palestine.

People antiently flocked on these *croisades* out of devotion; the pope's bulls, and the preaching of the priests of those days, making it appear a point of conscience. Hence several orders of knighthood took their rise.

Those who meant to go on this errand, distinguished themselves by crosses of different colours, wore on their clothes; and were thence called *croisies*: the English wore them white; the French, red; the Flemish, green; the Germans, black; and the Italians, yellow.

They reckon eight *croisades* for the conquest of the holy land: the first undertaken in 1095, at the council of Clermont; the second in 1144, under Louis VII. the third in 1188, by Henry II. of England, and Philip Augustus of France; the fourth in 1195, by pope Celestin III. and the emperor Henry VI. the fifth published in 1198, by order of Innocent III. wherein the French, Germans, and Venetians engaged; the sixth under the same pope, began tumultually, in 1213 and ended in the rout of the Christians; the seventh resolved at the council of Lyons in 1245, undertaken by S. Louis; the eighth, which was the second of S. Louis, and the last of all, in 1268.

It is said, it was the Cistercian monks who first projected the *croisades*; Philip Augustus solicited the execution thereof with the holy see; and Innocent III. raised the first standard of the cross. It was the council of Clermont who ordered that they who embarked herein should bear the cross in their banner; and that those who entered themselves into the service, should also wear it on their clothes.

The abbot Justiniani makes an order of knighthood of the *croisies*, who served in the *croisades*.

Towards the middle of the twelfth century, there was also a *croisade* of the Saxons, against the pagans of the north; wherein the archbishop of Magdeburg, the bishops of Halberstadt, Munster, Mersburgh, Brandenburgh, &c. with several lay-lords embarked.—And towards the beginning of the same century, under the pontificate of Innocent, there was also a *croisade* undertaken against the Albigenes; who were become powerful in Languedoc, &c.

CROISES, or **CROIZES**, in our antient customs, pilgrims bound for the holy land, or had already been there; so called from a badge which they wore on their garments, representing a cross. The word *croisies* is also extended to the knights of S. John of Jerusalem, created for the defence and protection of pilgrims; and all those of the nobility, gentry, &c. who in the reigns of king Henry II. Richard I. Henry III. and Edward I. were *cruce signati*, i. e. dedicated themselves to the wars, for the recovery of the holy land.

CROISIERS, **CRUCIGERI**, or **croisibearers**, a religious order, or congregation of regular canons, so called.

There are three orders which have, or do still bear this name: one in Italy; another in the Low-countries; and a third in Bohemia.

The first pretend to be derived from S. Clet; and add, that S. Quiriacus the Jew, who shewed S. Helena the place of the true cross, and was afterwards converted, reformed them. All we know for certain, is, that they subsisted in Italy before Alexander III. mounted the throne; for that pontiff, flying from Frederick Barbarossa, found an asylum in the monasteries of the *croisiers*.

fers, which he afterwards, in 1169, took under his protection, giving them the rule of S. Augustin, &c.

They were confirmed by Pius V. by the discipline being much relaxed, they were suppressed in 1656, by Alexander VII. Matt. Paris says, that the *croisiers*, bearing staves with crosses at the end, came into England in 1244, and presented themselves before a synod held by the bishop of Rochester, demanding to be admitted.

Dodsworth and Dugdale mention two monasteries of this order in England, the one at London, the other at Ryegate; the first founded in 1245, the latter in 1298: some add a third at Oxford, where they were received in 1349. M. Allemand says, there were fourteen monasteries of *croisiers* in England; adding, that they came from Italy; those of the Low-countries disowning them.

The *croisiers* of the Low-countries and France, were founded in 1211, by Theodore de Celles son of Bofon, who having served in a croisade in Palestine, in 1188, and there found some of the *croisiers* instituted by S. Clet, conceived a design of instituting another congregation in his own country. This is certain, that Theodore, in his return from Palestine, engaged himself in the ecclesiastical state; and went in quality of missionary to the croisade against the Albigenses: and that at his return in 1211, the bishop of Liege gave him the church of S. Thibault near Huy; where, with four companions, he laid the foundation of his order; which was confirmed by Innocent III. and Honorius III. Theodore sent his religious to Tholouse, to join those of S. Dominic, and combat the Albigenses; and the congregation multiplied in France.—The popes have endeavoured to bring the *croisiers* of Italy under those of Flanders.

The *croisiers*, or *port-croix* with a star, in Bohemia, derive their origin from S. Quiriacus, and say they came from Palestine into Europe, where they embraced the rule of S. Augustine, and built monasteries. They add, that S. Agnes of Bohemia, distinguished them from other *croisiers*, obtained of Innocent IV. to add a star to their habit. But the story of S. Quiriacus has no foundation; and it was Agnes herself, daughter of Primilas king of Bohemia, who instituted the order at Prague, in 1234.—They are very numerous; and have, now, two generals.

CROISSANTE, in heraldry. *Croix croissante* is a cross crescented; that is, having a crescent, or half-moon, fixed on each end thereof.

CROOKED *tyles*. See the article *TYLE*.

CROSETTES, in architecture, the returns in the corners of chambranes, or door-cases, or window-frames; called also *ears*, *elbows*, *ancones*, *protubyridet*, &c.

CROSIER, or **CROZIER**, *shepherd's crook*; a symbol of pastoral authority, consisting of a gold or silver staff, crooked a-top, carried occasionally before bishops and abbots, and held in the hand when they give solemn benedictions. See *BISHOP*, and *ABBOT*. At one end it is crooked, at the other pointed; expressed in the verse:—*Curva trahit mites, pars pungit acuta rebelles*.

The custom of bearing a pastoral staff before bishops is very ancient, as appears from the life of S. Casarea of Arles, who lived about the year 500. Among the Greeks, none but the patriarchs had a right to the *crozier*.

The *croisiers* were at first no more than simple wooden staves, in form of a T, used to rest and lean upon: by degrees they were made longer; and at length arrived at the form we now see them of.

Regular abbots are allowed to officiate with a mitre and a *crozier*. See *ABBOT*, and *MITRE*.

CROSIER, in astronomy, four stars, in form of a cross; by help whereof, those who sail in the southern hemisphere find the antartick pole.

CROSS, **CRUX**, a sort of instrument, composed of two pieces of wood, traversing and cutting each other, ordinarily at right angles.

* Pezron derives the word *crux*, from the celtic *croag*, and *croas*; though, perhaps, *croag* and *croas* might with as much justice be derived from *crux*.

The *crux* was used among the antients, as a punishment for malefactors and slaves; and was planted at several places, in *terrorem*, as our gallows, &c.

Sozomen observes, that it was Constantine who by law first abolished the punishment of the *crux*; which had obtained among the Romans till his time.

As to *crucifixion*, or the manner wherein the punishment of the *crux* was effected, the critics, both antient and modern, are exceedingly divided: the points in dispute, are, Whether the criminal was fastened with three nails, or with four; whether the feet were immediately fastened to the *crux*, or whether they rested on a little piece of wood, in manner of a step or rest, called *supplicium*; whether the *crux* was planted in the earth before the person was nailed on, fastening him afterwards by means of a scaffold raised of the height of the place where the feet were to be nailed; or whether he was nailed ere the *crux* was raised or planted, as the painters represent it: or lastly, whether the patient was fastened quite naked, or covered: questions that have all been occasioned by the *crucifixion* of Jesus Christ!

Invention of the Cross, *Inventio Crucis*, an antient feast, solemnized on the third of May, in memory of S. Helena's (the mother of Constantine) finding the true *crux* of Christ deep in the ground,

on mount Calvary; where he erected a church for the preservation of part of it: the rest being brought to Rome, and deposited in the church of the *holy crux* of Jerusalem. See *FEAST*.

Theodore mentions the finding of three *croisiers*, that of Jesus Christ, and those of the two thieves; and that they distinguished between them by means of a sick woman, who was immediately healed by touching the true *crux*.

The place is said to have been pointed out to her by S. Quiriacus, then a Jew, afterwards converted and canonized.

Exaltation of the Cross, an antient feast, held on the fourteenth of September, in memory of this, that Heraclius restored to mount Calvary the true *crux*, which had been carried off fourteen years before, by Cosroes king of Persia, upon his taking Jerusalem from the emperor Phocas.

CROSS-BEARER, *port-croix*, *cruciger*, in the Romish church, the chaplain of an archbishop, or a primate, who bears a *crux* before him on solemn occasions.

The pope has the *crux* borne before him every where; a patriarch any where out of Rome; and primates, metropolitans, and those who have a right to the pallium, throughout their respective jurisdictions.

Gregory XI. forbid all patriarchs and prelates to have it bore in presence of cardinals.—A prelate bears a *single crux*, a patriarch a *double crux*, and the pope a *triple* one on their arms.

Order of the Cross, or *CRUISADE*, an order of ladies, instituted in 1668, by the empress Eleonora de Gonzagua, wife of the emperor Leopold; on occasion of the miraculous recovery of a little golden *crux*, wherein were inclosed two pieces of the true *crux*; out of the ashes of part of the palace.—It seems, the fire had burnt the case wherein it was inclosed, and melted the crystal; yet the wood remained untouched.

CROSS, in botany, is used to express the arrangement of the petals of certain flowers; called *plantæ flore cruciformi*. See *PLANT*, and *FLOWER*.

The flowers are not to have either more or less than four petals; and their calyx only to consist of four pieces. The pistil generally becomes a fruit called *siliqua*. See *Supplement*, article, *CRUCIFORM FLOWERS*.

CROSS, in heraldry, is defined by Guillim, an ordinary composed of four-fold lines; whereof two are perpendicular, and the other two transverse; for so we must conceive of them, though they be not drawn throughout, but meet by couples, in four right angles, near the feet-point of the escutcheon. See *ORDINARY*.

The content of a *crux* is not always the same: for when it is not charged, cantoned, nor accompanied, it has only the fifth part of the field; but if it be charged, it must contain the third part thereof.

This bearing was first bestowed on such as had performed, or at least undertaken, some service for Christ, and the christian profession; and is held, by divers, the most honourable charge in all heraldry. What brought it into such frequent use, was the antient expeditions into the holy land; and the holy war pilgrims, after their pilgrimage, taking the *crux* for their cognizance; and the ensign of that war being the *crux*.

In those wars, says Mackenzie, the Scots carried St. Andrew's *crux*. The French a *crux* argent; the English a *crux* or; the Germans sable; the Italians azure; the Spaniards gules.

St. George's *crux*, or the *red crux*, in a field argent, is now the standard of England; that faint being the reputed patron of this nation.

Guillim enumerates thirty nine different sorts of *croisies* used in heraldry, the several names whereof here follow; the descriptions are to be looked for under their proper articles.—A *crux* voided, a *crux* wavy-voided, a *crux* patee fimbriated, a *crux* patee fished on the foot, a *crux* patee on three parts and fished on the fourth, a *crux* engrailed, a *crux* patonce, a *crux* stony, a *crux* patonce voided, a *crux* avelane, a *crux* patee lanbeaux, a *crux* furbchee, a *crux* crollet, a *crux* crollet fitchee at the point, a *crux* bottonnee, a *crux* pommee, a *crux* urdee, a *crux* degraded fitchee, a *crux* potent, a *crux* potent fitchee, a *crux* calvary, a *crux* crollet set in degrees, a *crux* patriarchal, a *crux* anchored, a *crux* molinee, a *crux* clechee, a *crux* stony, or fleurdelisee, a *crux* double fitchee, a *crux* a-feize points, a *crux* milrince, a *crux* raguled, a *crux* pointed voided, a *crux* pall, a tau or S. Anthony's *crux*, a *crux* voided and couped, a *crux* couped pierced, a *crux* molinee pierced lozenge-ways, a *crux* molinee quarter-pierced, a *salter*, or S. Andrew's *crux*, which will be distinctly spoken of under that denomination; and so all the others may be found more particularly described under the names of their several differences.

Colombiere makes seventy-two distinct sorts of *croisies*, of which we shall only mention those that differ from such as have been mentioned above; as, a *Croix-remply*, which is only one *crux* charged with another: a *crux* party, that is, one half of one colour, and the other of another: a *crux* quartered, that is, the opposite quarters of several colours: a *crux* of five pieces, that is, of so many colours: a *crux* mouffue, and abaïsee; a *crux* barbee; a *crux* croissantee, or crescented, that is, having a crescent at each end: a *crux* forked of three points; a *crux* pomette of three pieces; a *crux* reslercelee; a *crux* pointed; a *crux* ankered, and fur-anker; a *crux* ankered with snakes heads; a *crux* orled; a high *crux*; a *crux* rayonnant, or casting out rays of glory; a *crux* of Malta; a *crux* of the Holy Ghost; a *crux* forked like the an-

tient rests for muskets; a *crofs* with eight points; a *crofs* boutonnee; a *crofs* cramponnee and tournee; a *crofs* cable; a *crofs* inclining; a *crofs* pater noftree, that is, made of beads; a *crofs* trefe; a *crofs* fleur-de-lys; a *crofs* vuidee, clechee, and pommetee; a *crofs* fenellee and bafille; a *crofs* with four steps to every arm; a *crofs* rounded; a *crofs* and an half; a *crofs* estoilee, or flarways; a *crofs* corded; a *crofs* doubled of fix pieces fet together; a double *crofs* fplit in pale; a long *crofs* cut in pieces and difmembered; a *crofs* coupé, or cut through in felle, of the two contrary colours to the field; a chevron furred by an half *crofs*: four tails of ermine in a *crofs*, the tops of the ermines oppofite to each other in the middle: four pieces of vair placed *crofs*-ways, and counter-pointing in the centre: the *crofs* or sword of S. James: *crofs* potence cramponnee on the dexter upper arm, and a potence about the middle of the shaft.

These are the various *croffes* we find in the aforefaid authors; which fome may think too many, as not being all ufed in England: but heraldry extends to all countries; and all terms ufed require to be explained.

Nor is it only in *croffes* that the variety is fo great; the like is found in many other bearings, and particularly in lions, and the parts of them; whereof the fame Colombiere gives us no lefs than ninety-fix varieties.—Leigh mentions but forty-fix feveral *croffes*; Sylvanus Morgan, twenty-fix; Upton, thirty; Johannes de Bado Aurco, twelve; and fo others, whom it is needlefs to mention.

Upton owns he dares not presume to ascertain all the various *croffes* ufed in arms, for that they are at prefent almoft innumerable: and therefore he only takes notice of fuch as he had feen ufed in his own time.

Cross, in furveying, or, the *urveying* **Cross**, is an instrument confifting of a brafs circle, divided into four equal parts, by two lines cutting each other in the centre: at each extremity of either line is fixed a fight, perpendicular over the lines; with holes below each fit, for the better difcovery of diftant objects. The *crofs* is mounted on a ftaff, or ftand, for ufe. Sometimes, inftead of four fights there are eight.—The *urveying* *crofs* is but little known or ufed among us; abroad it is of more account: the manner of applying it is as follows.

Suppofe the field ABCDE, (Tab. *Surveying*, fig. 24.) required to be furveyed: plant poles at all the angles; meafure the line AC, and the perpendiculars let fall from the angles to the line: take down the dimensions of each. Now, to find the point F, plant poles at pleafure in the line AC, and the foot of the instrument in the fame line, in fuch manner, as that through two of the oppofite fights you may obferve two of the ftaffs; and through the other two, the ftaff E. If in this ftation E be not vifible, remove the instrument backwards or forwards, till the lines AF, EF make a right angle in F; by which means, the plot of the triangle AFE will be had. After the fame manner is the point H found, where the perpendicular DH falls; whose length, together with that of HF, is meafured, to have the plot of the trapezium EFHD. Again, meafure HC, making a right angle with HD, and the plot of the triangle DHC will be had. All that now remains, is to find the point G, where the perpendicular BG falls: which being found after the fame manner as the reft, we have the plot of the whole field A, B, C, D, E. The area whereof, is had by adding the triangles and trapeziums together.

Cross multiplication, a method of multiplying feet and inches, by feet and inches, or the like; fo called, becaufe the members are multiplied *crofs*-wife. See the method under MULTIPLICATION.

Cross, in dialling. See the article DIAL.

Cross batteries, in war. See BATTERY.

Cross-grained *ftuff*, in joinery.—Wood is faid to be *crofs*-grained, when a bough or branch has fhot out of it: for, the grain of the branch fhooting forward, runs athwart that of the trunk.

In wood well grown this defect is fcarce perceivable, except in working; but in deal-boards thefe boughs make knots.—If the bough grew up with the young trunk, inftead of a knot is found a *curling* in the *ftuff*; very fenfible under the plane.

Cross-staff, a mathematical instrument, otherwife called the *fore-ftaff*. See its defcription and ufe under FORESTAFF.

Crossulet, little *crofs*, a diminutive of *crofs*, ufed in heraldry, where we frequently fee the field covered with *croffettes*; alfo feffes, or other honourable ordinaries, charged or accompanied with *croffettes*.

Croffes themfelves frequently terminate in *croffettes*: as in Tab. *Heraldry*, fig. 54.

CROTALUM, an ancient kind of caftagnetta, or mufical instrument found on medals, in the hands of the priefts of Cybele.

The *crotalum* differed from the *fystrum*; though authors frequently confound the two. It confifted of two little brafs plates, or rods, which were fhook in the hand, and in ftriking againft each other made a noife.

It was fometimes alfo made of a reed fplit lengthwife; one part whereof they ftruck againft the other: and as this made

a noife fomewhat like that of a crane's bill, they called that bird *crotaliftria*, *player* on *crotala*.

An antient, in Pausanias, fays, that Hercules did not kill the birds of the lake Stymphalus, but that he drove them away by playing on *crotala*. On this footing, the *crotalum* muft be exceedingly antient.

Clemens Alexandrinus attributes the invention to the Sicilians; and forbids the ufe thereof to the Chriftians, becaufe of the indecent motions and geftures that accompany it.

CROTAPHITES, a mufcle of the lower jaw, ferving to draw it downwards.—Its fibres fpring feverally from the bones of the forehead, the finciput, fphenoides, and temporal; which meeting, and as it were centering under the os jugale, whence alfo this mufcle receives fome fibres, proceed to the proceffus corone, into which they are inferted.

CROTCHET, in mufick, one of the notes, or characters of

time marked thus ♪ equal to half a minim, and double a quaver.

It is not eafy to conceive how this character comes by the name *crotchet*: the word is apparently borrowed from the French *crochet*, of *croc*, a crook or hook, ufed by them for what we call the *quaver*, or *half crotchet*; by reafon of the additional ftroke at bottom, which gives it an appearance of a crook.

A dot added to the *crotchet*, thus ♪ increases its time by half;

that is, makes it equal to a *crotchet* and an half, or to three quavers.

CROTCHET, in printing, denotes a fort of line, fometimes ftrait, fometimes waved, but always turned up at each extreme; ferving to bind or link together feveral articles, that are to be read together, ere you proceed to the fubdivifions, placed afide of them with fimilar or fmall *crochets*; much ufed in genealogies, analytical tables, &c. for facilitating the divifion and fubdivifion of any fubject.

CROTCHETS are alfo ufed for two oppofite characters, ferving to inclofe what we call a *parenthefis*, or any other part of a difcourfe, to be diftinguifhed from the reft of the work; fometimes in this form [] and fometimes in this ().

CROW, in the fea language, a machine with an iron hook, for faftening hold, and grappling with the enemies vefel, in an engagement.

The name *crow*, or *raven*, *corvus*, was antiently given to feveral machines of war, ufed in the defence of places: one invented by Diades; another by the Tyrians, mentioned by Q. Curtius; another by Cn. Ovilius.

Vitruvius calls the firft the *demolifhing crow*, *corvus demolitor*, and alfo *depredator*: others called it the *crane*, *grus*.—Polybius defcribes another invented by C. Duillius ufed againft the Carthaginian fleet.

They were all a kind of grappling-hooks; ferving to drag things towards the engineer.—That defcribed by Q. Curtius was thrown out of a ballifta.

Crow's-BILL, an instrument ufed by chirurgeons, in their operations; efpecially for the drawing bullets and other foreign bodies out of wounds.—It has its name from its figure.

Crow's-Feet, in the military art, are irons with four points, each three or four inches long; fo that which way foever they fall, one point will be uppermoft.

Crow's-Feet, in a fhip, are fmall ropes, or lines, fometimes fix, eight, or ten, reeved through the dead man's eye: of little ufe further than to make a fhew of fmall rigging.

CROWN, *corona*, a mark of regal dignity; being an ornament worn on the head by kings and fovereigns, as a fymbol of their authority.

In the remotef antiquity, the *corona* was only given to Gods: Pliny fays, that Bacchus was the firft who ufed it: Pherecydes, cited by Tertullian *de Corona*, fays Saturn: Diodorus afcribes it to Jupiter, after his victory over the Titans. Q. Fabius Piclor attributes the invention to Janus; adding, that it was an ornament he ufed in facrificing: Leo the Egyptian fays, it was Ifis who firft wore a *corona*; and that it confifted of ears of corn, the ufe whereof the firft taught men.

In this, moft authors agree, that the *corona*, originally, was rather a religious than a civil ornament; rather one of the pontificalia, than the regalia: that it only became common to kings, as the antient kings were priefts as well as princes; and that the modern princes are entitled to it, in their ecclefiaftical capacity rather than their temporal. See KING, &c.

The firft *crowns* were no more than a bandelet, or headband, drawn round the head, and tied behind; as we ftill fee it reprefented on medals, around the heads of Jupiter, the Ptolemies, and the kings of Syria.

Afterwards they confifted of two bandelets; by degrees they took branches of trees of divers kinds: at length they added flowers; infomuch that Tertullian *de corona*, affures us, (from Claudius Saturninus, who had wrote exprefly on the fubject) there was not any plant whereof *crowns* had not been made.

The woods and groves were fearch'd, to find different *crowns* for the feveral deities: thus, on medals, we find Jupiter's *corona* of flowers, more frequently of laurel; Juno's of the vine;

that

that of Bacchus, the vine with grapes, vine-leaves, and branches of ivy, with flowers and berries: those of Castor, Pollux, and the river-gods, of bulrushes: that of Apollo, sometimes of laurel, sometimes of rushes; that of Saturn, new figs: that of Hercules, poplar; that of Pan, pine or alder; that of Lucina, dittany; that of the Horse, the fruits proper to each season; that of the Graces, olive-branches, as well as that of Minerva; that of Venus, roses: of Ceres, ears of corn, as well as that of Isis: that of the Lares, myrtle or rosemary, &c.

Crowns were not only used on the statues and images of the Gods, by the priests in sacrificing, and by kings and emperors; but also on altars, temples, doors of houses, sacred vessels, victims, ships, &c.

The agonothetæ crowned those who were victors in the solemn games, warriors, &c.

From some passages in Eusebius Cæsariensis, some authors conclude, that bishops had likewise antiently their *crowns*.

The Roman emperors had four kinds of *crowns*, still seen on medals; *viz.* a *crown* of laurel, a radiating *crown*, a *crown* adorned with pearls and precious stones; and the fourth a kind of bonnet, or cap, something like the mortar.

The first was that ordinarily used from the time of Julius Cæsar: the right of bearing it was granted him by the senate; some say, on account of his baldness: and afterwards continued to his successors. Justinian was the first who took that of the bonnet-kind. The *papal crown*, is composed of a cap or tiara, and a triple *crown* encompassing it; having two pendants, like the bishop's mitres: these three *crowns* represent the pretended triple capacity of the pope, *viz.* as high priest, supreme judge, and sole legislator of the christians.

The *imperial crown* is a bonnet or tiara, with a semi-circle of gold, supporting a globe, with a cross a-top.

The *English crown* is adorned with four crosses, in the manner of those of Malta; between which are flower-de-luces. It is covered with four diadems, which meet at a little globe supporting a cross.

The *French crown* is a circle of eight flower-de-luces, encompassed with six diadems; bearing a-top a double flower-de-luce, which is the crest of France.

The *Spanish crown* is adorned with large indented leaves, covered with diadems, bordering on a globe, surmounted with a cross.

Among the Romans, there were various kinds of *crowns*, distributed as rewards of military achievements.—The *oval crown* was the first, made of myrtle; and was bestowed on generals who had been victorious over slaves or enemies unworthy of the Roman valour, and who were entitled to the honours of the lesser triumph, called *ovatio*.

The second was the *naval or rostral crown*, consisting of a circle of gold, raised with prows and poops of ships; given to the captain who first grappled, or the soldier who first jumped aboard, an enemy's ship.

The third called *vallaris*, or *castrensis*, was also a circle of gold, raised with piles or palisades; given him who first leaped into the enemy's camp, or forced the palisades.

The fourth, called *mural crown*, was a circle of gold, indented or embateled; given him who first mounted the wall of a place besieged, and there lodged a standard: this *crown* we also find given, on medals, to the particular geni and guardians of provinces and places.

The fifth, the *civic crown*; made of a branch of green oak: given to him who had saved the life of a citizen in a battle or assault.

The sixth was the *triumphal crown*, made of branches of laurel, given to a general who had gained a battle, or conquered a province. This was afterwards made of gold.

The seventh the *corona obsidionalis*, or *graminea*, made of grass or herbs found on the ground; given to generals who had delivered a Roman army besieged by the enemy, and obliged him to decamp.

The eighth was also a *crown* of laurel, given by the Greeks to their athlete; and by the Romans, to those who had negotiated, or confirmed a peace with an enemy: this was the least esteemed. Besides these, in antiquity, we meet with *radial crowns*, given to princes at their translation among the gods; whether before or after their death.—Cæsaubon says, this sort of *crown* was peculiar to deities; yet, it is certain Nero took it in his life-time.

Athletic crowns, were destined to crown victors at the publick games.

Father Daniel says, that S. Louis ransomed the *crown* of thorns of our Saviour, which had been pawned by Baldwin, emperor of Constantinople, for an immense sum of money; and transported it with great ceremony to France: where it is still kept in the holy chapel. The author of the history of S. Louis, adds, that the thorns were still green in his days. Some writers from Clemens Alexandrinus, hold that it was made of bramble, *ex rubo*; others of buckthorn, *ex rhamno*; or of white thorn. Those who see it in the chapel, take it to be the juncus marinus. Galot derives the word *corona*, whence *crown*, from the Latin *cornu*, horn; because the antient *crowns* were pointed in manner of horns; which were antiently, both by Jews and Gentiles, esteemed as marks of power, strength, authority,

and empire.—Hence, in the holy scripture, horns are used for the regal dignity: and accordingly, *horn* and *crown*, in the Hebrew, are expressed by the same word.

Ch. Paschal has wrote expressly *de coronis*: Baudelot in his history of Ptolemy Auletes has a good number of curious observations on the same subject, that had escaped Paschal. Du Cange gives us a curious dissertation on *crowns*; and Schmeizell, a German, a treatise of *royal crowns*, both antient and modern.

Royal Crown. } See the articles { ROYAL.
Electoral Crown. } ELECTORAL.

CROWN, in an ecclesiastical sense, is used for the clerical tonsure; which is the mark, or character of the Romish ecclesiastics.

This is a little circle of hair, shaved off from the *crown* of the head; more or less broad, according to the quality of the orders received.—That of a mere clerk is the smallest; that of priests and monks the largest.

The *clerical crown*, was antiently a round list of hair, shaved off around the head, representing a real *crown*: this is easily observable in several antient statues, &c. The religious of S. Dominic and S. Francis still retain it.

CROWN, in commerce, is a general name for coins both foreign and domestic, of or near the value of five shillings sterling.

In its limited sense, *crown* is only applicable to that popular English coin which bears the name, and which is equivalent to sixty English pence, or five shillings; or to five livres 16 sols French money.—But, in its extensive sense, it takes in several others; as the French *ecu*, which we call the French *crown*, struck in 1641 for sixty sols, or three livres; also the patagon, dollar, ducat, rix-dollar, and piastre or piece of eight.

CROWN, in architecture, denotes the uppermost member of the cornice; called also *corona* and *larmier*. See CORONA, and LARMIER.

CROWN, in astronomy, is a name given to two constellations; the one called *septentrionalis*, the other *meridionalis*.

CROWN, or CORONET, in heraldry, is used for the representation of that ornament, in the mantling of an armoury; to express the dignity of the person who bears it.

The *crown* here is of more antiquity even than the helmet; and was used as a symbol of victory and triumph.

Radiated, or *painted CROWNS*, are those of the antient emperors, which had twelve points; representing, as some will have it, the twelve months of the year.

Pearled, or *flowered CROWNS*, those with pearls, or leaves of mallage, parsley, &c. Such were antiently almost all *crowns*, even those of sovereign princes: though they were not used in their armouries, till about 200 years ago.

CROWN, in geometry, a plane ring included between two parallel or concentric peripheries, of unequal circles; generated by the motion of some part of a right line round a centre, the moving part not being contiguous to the centre.

The area of this is had, by multiplying its breadth by the length of the middle periphery: for a series of terms in arithmetic progression being $n \times \frac{a + o}{2}$; that is, the sum of the first and last multiplied by half the number of terms, the middle element must be $\frac{a + o}{2}$; wherefore, that multiplied by the breadth or sum of the two terms will give the *crown*.

CROWN-OFFICE, a court or office under the king's-bench, so called, because the *crown* is more immediately concerned in what is therein transacted.

Though none of the officers under the lord chief justice of the king's-bench, are employed in summoning a parliament; yet, many of them have business in other matters, during the sitting of the parliament: as, in cases of error, &c. but more especially on trials of peers; wherein the clerk of the *crown* is chief manager. He has likewise, out of parliament, all indictments in the *crown*, informations, recognizances; and a multitude of other business runs through his hands, as the writings of all pleadings, declarations, and other proceedings upon records: but the executive part is left to his secondary or deputy.

Clerk of the Crown. } See the articles { CLERK.
Peers of the Crown. } PLEA.
Officers of the Crown. } OFFICER.

CROWN-GLASS, denotes the finest sort of window-glass. See GLASS.

CROWN-GRAFTING. See the article ENGRAFTING.

CROWN-POST, in architecture, a post which in some buildings stands upright in the middle, between two principal rafters; and from which there go struts or braces to the middle of each rafter.

It is otherwise called a *king's piece*, or *joggle-piece*. See POST.

CROWN-WHEEL of a watch, is the upper wheel next the balance, or that which drives the balance. See WATCH.

CROWN-WORK, in fortification, an outwork running into the field; designed to keep off the enemy, gain some hill, or advantageous post, and cover the other works of the place.—See Tab. Fortif. fig. 21. li. 11.

The *crown work* consists of two demi-bastions at the extremes, and an entire bastion in the middle, with curtains.

CROWNED horn-work, is a horn-work with a *crown-work* before it. See **HORN-WORK**.

CROWNING, in architecture, is understood, in the general, of any thing that terminates, or finishes a member or decoration.

Thus, a cornice, a pediment, a croteria, &c. are called *crownings*. Thus, also, the abacus is said to *crown* the capital; and thus any member or moulding is said to be *crowmed*, when it has a fillet over it; and a niche is *crowmed*, when it is covered with a capital.

CROUPADE, in the manage, a leap, higher than the corvet, wherein the fore and hind parts of the horse keep an equal height; his legs being trusted under his belly, without stretching them out, or flexing his shoes.

CROUPER, or **CRUPPER**. See **CRUPPER**.

CROZIERED abbots. See the article **ABBOT**.

CRUCIAL incision, in chirurgery, an incision, or cut into some fleshy parts, in form of a cross.

CRUCIBLE, a little vessel, ordinarily of earth, sometimes of iron, without any handle; wherein chymists, coiners, goldsmiths, glaziers, and other artificers, use to melt and calcine gold, silver, or other metals whereon they work.

* The word is formed from the French *crucifer*, which signifies the same: Du Cange derives this further from *cruciflammus*; which in the lower Latin, signifies a little drinking vessel.

Earthen crucibles are made of potters-clay, with stone potsherds pounded and sifted: they are of various sizes, but generally of the same form, which resembles that of an inverted cone, or pyramid. It is these chiefly used in coinage, as being the only ones in which gold will melt kindly. Iron crucibles are in form of little buckets without handles, made of iron well forged and hammered: in these they melt silver, copper, &c. There are earthen crucibles that hold from 800 to 24 or 2500 ounces; but those ordinarily used are but of 800.

The iron ones are larger; some holding ten thousand ounces: these are not taken off the furnaces when the plates are to be run, but the metal is laden out with an iron ladle. It is a rule never to put as much metal in the crucible as it will hold. See **COINING**.

The crucibles used by goldsmiths and founders, are like those used in coinage: those of chymists, &c. are of all sizes, according to the quantity and quality of the metal to be put in them. See *Supplement*, article **CRUCIBLE**.

CRUCIFIX, a cross, whereon the body of Jesus Christ is fastened in effigy; much used by the Romanists in their churches, and other places, to recognize the passion of Jesus Christ, and direct their prayers to.

There are some chapters wherein Jesus Christ is the first canon, and the income of the canonry goes to the subsistence of the crucifix.

CRUCIFIXION, an ancient form of execution; by fastening the criminal to an erected cross. See **CROSS**.

CRUCIFORM flowers. See the article **FLOWER**.

CRUCIS experimentum. See the article **EXPERIMENTUM**.

CRUDE, something that has not passed the fire, or has not had the degree of coction, i. e. of heat, requisite to prepare it for eating, or some other use.

Crude, or raw silk, is that which has not been put in boiling water, to unwind it from off the cod; nor boiled in water and soap, to fit it for dyeing.

CRUDE sugar. See the article **SUGAR**.

CRUDE antimony, is that which comes immediately from the mines, without any preparation, except once melting.

In medicine, **CRUDE humours** are those which want of that preparation and elaboration which they ordinarily receive from a thorough digestion.

The retainers to the doctrine of trituration, hold that the crudity of the humours only consists in this; that they are not broke and comminuted so much as they should be by the ordinary action of the stomach.

CRUDITY, sometimes denotes that state of a disease, wherein the moribund matter is of such bulk, figure, cohesion, mobility, or inactivity, as creates or increases the disease. See **DISEASE**.

The crudity is discovered, 1. From the disease's continuing its degree of strength, or increasing. 2. From a continual increase of symptoms. 3. From a disorderly exercise of the functions. 4. But chiefly from a fault in the quantity or quality of the humours; both those still circulating, and those secreted; as of sweat, tears, mucus of the nose, saliva, sputum, the bile, urine, ichor, pus, blood, menses, lochia, milk, apthae, &c. That state of the disease, wherein the crude matter is changed, and rendered less peccant, and laudable, is called *digestion*, *coaction*, or *maturation*.

CRUISE, from the German *kruis*, a-cross, signifies to cross to and fro, to sail up and down for guard of the seas, &c.

CRUOR, a term used by anatomists for the red globules of the blood; in contradistinction to the limpid or serous part. Some authors, Dr. Keill and Dr. Woodward for instance, suppose these globules replete with an elastic aura, or air; and on this principle account for some of the phenomena of the animal economy; particularly muscular motion, &c. But Dr. Jurin has overturned that supposition.

Vanhelmont uses the word *cruror* for the blood in the veins;

in contradistinction to the blood in the arteries, which he calls *sanguis*.

CRUPPER*, is used by some for the hind part of a horse, comprehended between the place of the saddle and the tail.

* The word is formed from the French *cruppe*, which signifies the same.

CRURA clitoridis, in anatomy. Between the corpora nervosa of the clitoris, runs a septum, or membranous partition, from the glans to its divarication at the os pubis; dividing the clitoris into two parts, called the *crura of the clitoris*.—See *Tab. Anatomy*, (Splanch) fig. 13. lit. bb.

These are three times as long as the ordinary trunk of the clitoris itself.

CRURA of the medulla oblongata, are two of the four roots whence the medulla oblongata springs, in the brain.

The *crura* are the larger roots; the two smaller are called *pedunculi*.

CRURAL, in anatomy, an epithet given to the large artery and vein of the thigh.

The *crural* artery arises from the iliac artery; or rather, it is the iliac itself, under another name; being called *crural*, from the place of its entrance into the thigh. See *Tab. Anatomy*, (Angiol) fig. x. n. 69.

It conveys blood through all the part, by means of a great number of branches disseminated through its substance.

The *crural* vein is formed of six other veins, viz. the *great and little sciatica*, the *musculosa*, the *poplitea*, the *saral*, and the *saphena*.

CRURAL nerves. See the article **NERVE**.

CRURÆUS*, in anatomy, a muscle arising from the fore part of the thigh-bone, between the lesser and great trochanter, and lying close upon the bone, joins its tendon with three others, which all together make one broad tendon, that passes over the patella, and is inserted into the little tuberosity on the upper and fore part of the tibia. Its use is to extend the leg. See *Tab. Anatomy*, (Myol) fig. 2. n. 40.

* It is called *crureus*, as being fastened to the thigh-bone in the same manner as the brachius to the arm.

CRUS, among anatomists, denotes all that part of the body which reaches from the buttocks to the toes; and is divided into thigh, leg, and foot. See each in its place, **THIGH**, &c.

CRUSCA, an Italian term, signifying *bran*, or what remains of meal after the flower has been sifted out.—It is only in use among us to denote that celebrated academy called *della crusca*, established at Florence, for purifying and perfecting the Tuscan language.

The academy took its name from its office, and the end proposed by it; which is, to refine the language, and as it were to separate it from the bran. Accordingly its device is a sieve, and its motto, *Il più bel fior ne coglie*; that is, *It gathers the finest flower thereof*.

In the hall or apartment where the academy meets, M. Monconis informs us, every thing bears allusion to the name and device: the seats are in form of a baker's basket; their backs like a shovel for moving of corn: the cushions of grey fustian in form of sacks, or wallets; and the branches where the lights are placed, likewise resemble sacks.

The vocabulary *della crusca* is an excellent Italian dictionary, composed by this academy.

CRUSTA villosa, in anatomy, the fourth tunic, or coat of the stomach.

On the inner surface of this coat, are seen innumerable villi or fibrillae, rising every where perpendicularly from it; which some will have to serve for nothing but a defensive to the stomach, to preserve it from acrimonious humours; but Dr. Drake rather takes them to be excretory ducts to the subjacent glands; which some authors would have to be that now exploded thing a parenchyma; but which are, indeed, the organs by which most of that humour which is discharged into the stomach, is separated; and these villi the immediate channels through which it is conveyed.

CRUSTACEOUS fishes, in natural history, are those covered with shells consisting of several pieces, or scales; as those of crabs, lobsters, &c.

These are usually softer than the shells of the testaceous kind, which consist of a single piece, and usually much thicker and stronger than the former; such as those of the oyster, scallop, cockle, &c. See *Supplement*, articles **CRUSTACEOUS**, and **TESTACEOUS**.

Dr. Woodward observes, in his natural history, that of all the shells found in beds of all the different matters dug out of the earth, there are scarce any of the *crustaceous* kind: the reason he gives for it is, that these being much lighter than the rest, must have floated on the surface at the time of the deluge, when all the strata were formed; and there have corrupted and perished.

CRUX herrings. See the article **HERRING**.

CRUZADO, or **CRUISADE**, an expedition to the holy land. See **CRUISADE**.

CRUZADO, in commerce, is a Portuguese coin, struck under Alphonus V. about the year 1457, at the time when pope Calixtus sent thither the bull for a crusade, against the infidels. See **COIN**. It had its name from a cross, which it bears on one side; the arms of Portugal being on the other. A *crusade* is of the value

loc of 40 French sols, or upwards of 2 s. 10 d. sterl. See SOL.
CRY. See the article HUE, CLAMOR, HARD, &c.

CRYPTA *, a subterraneous cell, or vault; especially under a church, for the interment of particular families, or persons. S. Ciampini, describing the outside of the Vatican, speaks of the *crypta* of St. Andrew, St. Paul, &c.

* The word is formed of the Greek κρυπτός, *abscendo*, I hide; whence κρυπτός, *crypta*.

Vitruvius uses the word *crypta* for a part of a building, answering nearly to our cellar; Juvenal, for a *chaca*.

Hence, CRYPTO-PORTICUS, a subterraneous wall, arched, or vaulted; used as an underwork, or passage in old places.—The same is also used for the decoration at the entry of a grotto.

CRYPTA, is also used by some of our ancient writers, for a chapel, or oratory under ground.

CRYPTOGRAPHY *, the art of secret writing, or writing in cipher. See CIPHER, and DECIPHERING.

* The word is compounded of κρυπτός, *I hide*; and γραφή, *I describe*.

CRYSTAL *, in natural history, a kind of fossil, transparent stone, colourless, like a diamond, but much inferior thereto in lustre and hardness; used for vases, urns, mirrors, &c.

* The word comes from the Greek κρυστάλλος, *glacies*; formed of κρύος, *frigus*, and σάλας, *concretesco*, because of its resembling ice.

The ancients were but little acquainted with the nature of *crystal*: Pliny speaks of it as hardened, petrified water, which was the popular opinion of those days; but experience has shewn us the contrary: for by a chymical analysis, instead of resolving into water, it yields nothing but a calx, earth, and salts. For the places where it is found, Pliny adds, that he has seen it dug from off the highest and roughest rocks of the Alps; whence, doubtless, its name of *rock-crystal*. It is sometimes also found in brooks and rivers, but not formed there; only washed down thither from off the mountains by the violent rains.

Several mountains of Europe, and some of Asia, produce *rock-crystal*. If we may believe the French relation of Madagascar, that island yields more than all the world beside.

Its perfection consists in its lustre and transparency; that with straws, dust, clouds, &c. is little valued. It is frequently found hexagonal; the edges imitatively fine and accurate.

It is cut or engraved in the same manner, with the same instruments, and by the same workmen as diamonds.

Crystal is of some use in medicine, being reputed an astringent; and as such used in diarrhæas and dysenteries: it is also used to increase the milk of nurses; and, further, is esteemed a good antidote against arsenic.

The formation of CRYSTAL is delivered by F. Francisco Lana in the *philosophical transactions*, to this effect: 'In the Val Sabbia I observed a spacious round of a meadow, some parts whereof were bare of all herbs; wherein, and no where else thereabout, *crystals* are generated: all hexangular; both points terminating in a pyramidal figure, likewise hexangular. The country-people told me, they were produced from the dew; & because, forsooth, being gathered over-night, there would others arise, only in a serene and dewy sky. But having observed that there was no mark of any mine thereabout, I concluded them produced by the plenty of nitrous steams, which at the same time might hinder the vegetation in those places, and coagulate the dew falling thereon: for nitre is not only the natural coagulum of water, as is manifest in artificial glaciations, but ever retains the above-said hexangular figure; which, by the way, may be the cause of the hexagonal figure of snow.'

Since *crystals* are only found in certain narrow places, it is probable, thence are raised the exhalations that concrete the dew; after the same manner as the vapour or exhalation of lead coagulates quicksilver.

Rohault argues, that *crystal*, diamond, &c. must have been originally liquid, from their figure, which is such as drops of water of the same size must necessarily assume; and such as globules of meal or flower, heaped up and compressed by their own weight, might have: for as each *crystal* is encompassed and closed round with six others; so it becomes modelled into a hexagonal body, consisting of equal and square sides.

Boerhaave takes *crystal* to be the proper matter, or basis of all gems or precious stones, which assume this or that colour, &c. from the different admixture of mineral and metalline fumes, with the primitive *crystalline* matter. See Supplement, article CRYSTALL.

CRYSTAL is also used for a facitious body, cast in the glass-houses; called also *crystal glass*.

It is, in effect, glass; but carried, in the melting, and in the matter whereof it is composed, to a degree of perfection beyond the common glass: though it come far short of the whiteness and vivacity of the natural *crystal*.

The best artificial *crystals* are said to be those made at Moran near Venice; called *Venice crystals*.

CRYSTALS, in chymistry, express salts, or other matters, shot, or congealed in manner of *crystal*. See CRYSTALLIZATION.—Thus,

CRYSTAL of *alum*, is alum purified, and reduced into *crystals*, in the same manner as tartar. In like manner are vitriol, nitre, and other salts *crystallized*.

Crystals of alum are quadrangular, and brilliant like diamonds; those of nitre, white, and oblong; those of vitriol, green, angular, and shining. See SALT.

CRYSTAL, or *cream of tartar*, is tartar purified and dissolved, and again coagulated in form of *crystals*.

To prepare it, they boil tartar in water, skim it, and strain it; when cool, there are formed little white, shining *crystals* at the edges, as also a pellicle, or cream swimming a-top.

The cream and *crystals* were antiently supposed to be different; but are now found the same thing.

Crystal of tartar is esteemed purgative, and aperitive; proper in hydropical and asthmaical cases, and in intermitting fevers.

CRYSTAL of tartar *calchified*, is when it is impregnated with the most dissoluble parts of iron.

CRYSTAL of tartar *emetic*, is when it is charged with the sulphureous parts of antimony, to render it vomitive.

CRYSTAL mineral, called also *mineral anodyne*, and *sal prunella*, is salt-petre prepared with sulphur; thus: put half a pound of salt-petre in a crucible, and set that in a furnace; and when the salt-petre is in fusion, add, at several times, two drachms of flower of sulphur. After the flame is over, invert the crucible into a brass or copper basin: and it is then *sal prunella*, which being dissolved again in water, and shot into *crystals*, becomes *crystal* mineral.

This is esteemed good against the squinancy, whence its name of *sal prunella*; *pruna*, or *prunella*, expressing that disease.

CRYSTALS of silver, or *luna*, denote silver, penetrated and reduced into the form of salts, by the pointed acids of spirit of nitre.

It is used for making elchairs, by applying it to any part: it is also of use internally, in dropsies, and diseases of the brain.

CRYSTALS of mars, called also *sal*, or *vitriol of mars*; is iron reduced into a salt by an acid liquor; used in diseases arising from obstructions.

CRYSTALS of Venus, called also *vitriol of Venus*; is copper reduced into the form of vitriol by spirit of nitre, very caustick, and used to eat off proud flesh. See VITRIOL.

Island CRYSTAL, is a transparent fissile stone, brought from Iceland; soft, as talc; clear, as *rock-crystal*, and without colour; famous among optic writers for its unusual refractions.

It bears a red heat without losing its transparency; and, in a very intense heat, calcines without fusion: steeped a day or two in water, it loses its natural polish; rubbed on cloth it attracts straws, &c. like amber. In effect, it appears a kind of talc; and is found in form of oblique parallelepipeds with six parallelogramatic sides, and eight solid angles.

The phenomena of this stone are very remarkable, and have been examined with great accuracy by M. Huygens and Sir Isaac Newton: 1^o. whereas in other pellucid bodies there is only one refraction, in this there are two; so that objects viewed through it appear double.

2^o. Whereas in other transparent bodies, a ray falling perpendicularly on the surface, passes straight through, without suffering any refraction; and an oblique ray is always divided: in *island crystal*, every ray, whether perpendicular or oblique, becomes divided into two, by means of the double refraction. One of these refractions is, according to the ordinary rule, the sine of incidence out of air into *crystal*, being to the sine of refraction as five to three; but the other is perfectly new. The like double refraction is also observed in *crystal of the rock*, though much less sensibly.

When an incident ray is thus divided, and each moiety arrives at the further surface; that, refracted in the first surface after the usual manner, is refracted entirely after the usual manner at the second; and that refracted in the unusual manner in the first, is entirely refracted after the like manner in the second: so that each emerges out of the second surface, parallel to the first incident ray. Again, if two pieces of this *crystal* be placed over each other, so as the surfaces of the one be parallel to the corresponding ones of the other; the rays refracted in the usual manner in the first surface of the first, are refracted after the usual manner in all the other surfaces: and the same uniformity appears in the rays refracted after the unusual manner; and this in any inclination of the surfaces; provided their planes of perpendicular refraction be parallel.

From these phenomena, Sir Isaac Newton gathers, that there is an original difference in the rays of light; by means whereof some are, here, constantly refracted after the usual manner; and others in the unusual manner.

Were not the difference original, and did it arise from any new modifications impressed on the rays at their first refraction, it would be altered by new modifications in the three following ones; whereas, in fact, it suffers no alteration at all.

Again, he hence takes occasion to suspect, that the rays of light have several sides, endued with several original properties: for, it appears from the circumstances, that there are not two sorts of rays differing in their nature from each other, one constantly, and in all positions, refracted in the usual, and the other in the unusual manner; the difference in the experiment mentioned, being only in the position of the sides of the rays, to the plane of perpendicular refraction. For one and the same ray is refracted sometimes after the usual, and sometimes after the unusual manner,

ner, according to the position of its sides to the *crystal*: the refraction being alike in both, when the sides of the rays are positioned the same way to both, but different when different.

Every ray, therefore, may be considered as having four sides, or quarters; two of which, opposite to each other, dispose the ray to be refracted after the usual manner; and the other two in the usual. These dispositions, being in the rays before their incidence on the second, third, and fourth surfaces; and suffering no alterations, for what appears, in their passage through them; must be original and connate. See *Supplement, articles ISLAND CRYSTAL, and PARALLELOPIPEDUM.*

CRYSTALLI, among physicians, denote pustules dispersed all over the body, white and transparent, and of the bigness of a lupine: much the same with what are otherwise called *phlyctenae*.

CRYSTALLINE humour, is a thick, compact humour of the eye, in form of a flattish, convex lens, situate in the middle of the eye; serving to make that refraction of the rays of light, necessary to have them meet in the retina, and form an image thereon, whereby vision may be performed.

The *crystalline* is set in the anterior part of the vitreous humour, like a diamond in its collet; and is retained there by a membrane which surrounds it, and which for that reason is called the *capsula of the crystalline*.—This membrane is sometimes also called *crystalloides*; and by others, on account of its fineness, which resembles that of a spider's web, *arachnoides*.

It is the configuration of the *crystalline* that occasions persons to be either *myopes*, or *presbytae*, i. e. to be either long, or short-sighted.

The *crystalline* being of two consistences; outwardly, like a jelly; but toward the center as hard as salt: hence, some authors think that its figure may be varied; which variation they suppose to be effected by the ligamentum ciliare. Hence, Dr. Grew, and others, ascribe to the ciliary ligament a power of making the *crystalline* more convex, as well as of moving it to or from the retina: accordingly, by the laws of optics, something of this kind is absolutely necessary to distinct vision: for, as the rays from distant objects diverge less than those from nigh ones; either the *crystalline humour* must be capable of being made more convex, or more flat; or else there must be an elongation of the eye, or of the distance between that and the retina.

The *crystalline humour*, when dried, appears to consist of a vast number of thin, spherical laminae, or scales, lying over one another: Leewenhoeck reckons there may 2000 of them in one *crystalline*; each of these, he says, he has discovered to consist of a single fibre, or fine thread wound up in a stupendous manner, this way and that; so as to run several courses, and meet in as many centers; and yet not interfere nor cross in any place. *Philos. Transf.* N^o 165, and 293.

The *crystalline* is the subject of the disease called a *cataract*, as well as of the operation of *couching*. See *EYE*.

CRYSTALLINE heavens, in the old astronomy, two orbs imagined between the primum mobile and the firmament, in the Ptolemaic system, where the heavens were supposed solid, and only susceptible of a single motion.

King Alfonso of Arragon is said to have introduced the *crystallines*, to explain what they called the *motion of trepidation*, or *trepidation*.

The first *crystalline*, according to Regiomontanus, &c. serves to account for the slow motion of the fixed stars; which makes them advance a degree in 70 years, according to the order of the signs, *viz.* from west to east; which occasions the precession of the equinox.

The second serves to account for the motion of libration, or *trepidation*; whereby the celestial sphere librates from one pole towards another, occasioning a difference in the sun's greatest declination.

But the moderns account for these motions, in a much more natural and easy manner.

CRYSTALLINE arsenic. See the article *ARSENIC*.

CRYSTALLIZATION, in chymistry, a kind of congealation befalling salts, both essential, fixed, and volatile; when, being set free from the greatest part of their humidity, they are left to harden, dry, and shoot into *crystals*.

The ordinary method of *crystallization*, is performed by dissolving the saline body in water, filtering it, and letting it evaporate, till a film appears at the top; and lastly, letting it stand to shoot.

This shooting is accounted for, on Sir Isaac Newton's principles, from that attractive force which is in all bodies, and particularly in salt, by reason of its solidity; whereby, when the menstruum or fluid in which such particles float, is fated enough, or evaporated, (which brings it to the same) so that the saline particles are within each other's attractive powers, and can draw one another more than they are drawn by the fluid, they will run into *crystals*.

This is peculiar to salts, that let them be ever so much divided, and reduced into minute particles; yet, when they are formed into *crystals*, they each of them re-assume their proper fi-

gures: so that one might as easily divest and deprive them of their saltiness, as of their figure. See *SALT*.

This being an immutable and perpetual law, by knowing the figure of the *crystals*, we may understand what the texture of the particles ought to be, which can form those *crystals*: and, on the other hand, by knowing the texture of the particles, may be determined the figures of the *crystals*.

For, since the figures of the most simple parts remain always the same, it is evident that the figures they run into, when compounded and united, must be uniform, and constant: and since the force of attraction may be stronger on one side of a particle than on another; there will constantly be a greater accretion of salts upon those sides which attract more strongly: from which it may easily be demonstrated, that the figure of the least particles, is entirely different from that which appears in the *crystal*. See *Supplement, article CRYSTAL*.

CRYSTALLOIDES, the crystalline coat of the eye; a fine membrane, immediately encompassing, and containing the crystalline humour; and supposed to serve, by constricting or dilating that humour, to vary the place of its focus.

Anatomists are divided about the reality of such tunic, which is also, from its fine texture, called *aranea tunica*, or *arachnoides*.

CRYSTALLOMANCY, the art of divining, or foretelling future events, by means of a mirror; wherein the things required are represented.

* It is also called *catoptronomy*.—The first from *κατοπτρον*, congealed water, or *crystal*; and the second from *μαροσκόπος*, mirror, and *μαντεία*, divination.

CUBATURE, or **CUBATION**, of a solid; the measuring of the space comprehended in a solid; as a cone, pyramid, cylinder, &c. or finding the solid content thereof.

The *cubature* regards the content of a solid, as the quadrature does the superficies of a figure; so that the *cubature* of the sphere turns on the same thing as the quadrature of the circle.

CUBE, in geometry, a regular or solid body, consisting of six square and equal faces, or sides; and its angles all right, and therefore equal.

* The word comes from the Greek *κუβος*, *testara*, die.

The *cube* is also called *hexaedron*, because of its six sides.

The *cube* is supposed to be generated by the motion of a square plane, along a line equal to one of its sides, and at right angles thereto: whence it follows, that the planes of all sections parallel to the base, are squares equal thereto, and consequently to one another.

To describe a *rete*, or *net*, whence any given cube may be constructed, or wherewith it may be covered. On the right line A B, (Tab. *Geometry*, fig. 49.) set off the side of the *cube*, four times; on A erect a perpendicular, A C, equal to the side of the *cube* A I, and complete the parallelogram A C B D. With the interval of the side of the *cube*, in the line C D, determine the points K, M and O: lastly, draw the right lines I K, L M, N O, and B D; produce I K and L M, each way to E and F, and to G and H; till E I = I K = K F, and G L = L M = M H, and draw the right lines E G, F H.

To determine the surface and solidity of a cube: as the surface of a cube consists of six equal squares, a side multiplied by itself, and the product by six, will give the superficies; and the same product, again, multiplied by the side, the solidity.

Hence, if the side of a *cube* be 10, the solidity will be 1000; if that be 12, this will be 1728: wherefore, the geometrical perch being 10 foot, and the geometrical foot 10 digits, &c. the *cubic* perch is 1000 *cubic* feet, and a *cubic* foot 1000 *cubic* digits, &c.

Hence, also, *cubes* are in the triplicate ratio of their sides; and are equal, if their sides be so.

Duplication of a **CUBE**. } See the articles } DUPLICATION.

Scenography of a **CUBE**. } SCENOGRAPHY.

CUBE, or **CUBIC number**, in arithmetic, is a number arising from the multiplication of a square number by its root.

Thus, if the square number four, be multiplied by its root, two, the factum eight is a *cube*, or *cubic number*; and the number two, with respect thereto, a *cube-root*.

Hence, since, as unity is to the root, so is the root to the square; and as unity is to the root, so is the square to the *cube*; the root will, also, be to the square as the square to the *cube*: that is, unity, the root, the square, and the *cube*, are in continual proportion; and the *cube-root* is the first of two numbers that are mean proportionals between unity and the *cube*.

For the composition of **CUBIC numbers**. Every *cubic* number of a binomial root, is composed of the *cubic* numbers of the two parts, of the factum of thrice the square of the first part into the second, and of the factum of thrice the square of the second part into the first.

Demonst. For a *cubic* number is produced by multiplying the square by the root; but the square of a binomial root, is composed of the squares of the parts, and double the factum of one part into the other.

Wherefore, the *cubic* number is composed of the *cube* of the first part, of the triple factum of the square of the first part into the second,

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second, and of the triple factum of the square of the second part into the first.

An ocular demonstration of this we have in the following example, where multiplication alone is used. Suppose, *v. gr.* the root 24, or $20 + 4$. Here,

$$\begin{array}{r}
 24^3 = 20^3 + 2 \cdot 20 \cdot 4 + 4 \cdot 20^2 + 4^3 \\
 \hline
 20^3 = 8000 \\
 2 \cdot 20 \cdot 4 = 160 \\
 4 \cdot 20^2 = 1600 \\
 4^3 = 64 \\
 \hline
 24^3 = 13824
 \end{array}$$

Hence, as the part on the right hand is placed among units, and that on the left among tens; the cubic number of the right hand part must be put in the right hand place; and the factum of its triple square into the left, in the second place; and the factum of the triple square of the left into the right, in the third: lastly, the cube of the left-hand part falls in the fourth place.

If the root be a multinomial, two or more characters on the right must be esteemed as one; that it may have the form of a binomial. It is obvious, that any cube is composed of the cubes of the several parts of the root, and of the factums of the triple square of any of the left-hand characters into the next on the right; and also of the factums of the triple square of the right-hand characters into all the left. Suppose, *v. gr.* the root 243: take 240 for one part of the root, three will be the other part; consequently,

$$\begin{array}{r}
 240^3 = 13824000 \\
 3 \cdot 240^2 \cdot 3 = 518400 \\
 3 \cdot 240 \cdot 3^2 = 6480 \\
 3^3 = 27 \\
 \hline
 243^3 = 14348907
 \end{array}$$

The places of the several factums, are determined from what was observed above: for regard must here, too, be had to the ciphers to be added to the numbers multiplied by each other, if they be placed alone.

This composition of cubic numbers once well conceived, the extraction of cubic roots will be easy. See EXTRACTION.

CUBE root, or **CUBIC root**, the origin of a cubic number; or a number by whose multiplication into itself, and again into the product, any given number is formed.

The extraction of the cube root, is the same thing as the finding any number, *v. gr.* 2; by whose multiplication into itself twice continually, a given number, *v. gr.* 8, is produced: the process whereof, see under the article EXTRACTION.

CUBEBS, in pharmacy, a fruit brought from the island of Java, in grains or seeds resembling pepper, both in form and size; whence some call it *wild pepper*.

It is said, the natives of the place boil it ere they allow it to be exported, to prevent its being sown in other countries.—

Cubebs fortify the stomach, brain, and other viscera; and enter as an ingredient in several official compositions.

CUBIC equation, is an equation wherein the unknown quantity is of three dimensions, as $x^3 = ax^2 + b$, &c. See EQUATION.

For the construction of cubic equations, see CONSTRUCTION.—For their resolution, see RESOLUTION.—For their roots, see ROOT.

CUBIC foot. See the article FOOT.

CUBICAL parabola, a term used by some writers for a parabola of the higher kind, *v. gr.* where $ax^3 = y$, &c. See CURVE; see also PARABOLA.

CUBING of a solid. See the articles CUBATURE, and SOLID.

CUBIT, a long measure, used by the ancients, especially the Hebrews; taken from the ordinary extent of a man's arm, between the elbow and the tip of the hand.

In the scripture, we find cubits of two lengths, the one equal, according to Dr. Arbuthnot, to 1 foot, 9 inches, $\frac{33}{64}$ of an inch, our measure; being the fourth part of the fathom, double the span, and six times the palm:—the other equal to 1 $\frac{33}{64}$ of a foot, or the four hundredth part of a stadium.—The Romans, too, had a cubit, equal to 1 English foot, five inches, $\frac{13}{16}$ of an inch. F. Merfenne makes the Hebrew cubit 1 foot, 4 digits, and 5 lines, with regard to the foot of the capitol. According to Hero, the geometrical cubit is 24 digits; and, according to Vitruvius, the foot is $\frac{2}{3}$ of the Roman cubit, i. e. 16 digits or finger's-breadths. See FOOT, FINGER'S-breadth, &c.

CUBITÆUS externus, or **ulnaris**, in anatomy, the first of the extensor muscles of the fingers, thus called, as being placed along the cubitus, externally.—It rises from the external protuberance of the humerus, and passing its tendon under the ligamentum annulare, is inserted into the fourth bone of the metacarpus, that sustains the little finger.

CUBITÆUS internus, the first of the flexors, placed along the cubitus, withinside the arm. It rises from the internal protuberance of the humerus, and part of the ulna; upon which it runs all along till it passes under the ligamentum annulare, and is inserted by a strong and short tendon into the fourth bone of the first order of the carpus.

CUBITUS, in anatomy, a bone of the arm, reaching from the

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elbow to the wrist; otherwise called *ulna*, or the *greater scapula*. Some use the word for all that part of the arm between the elbow and the wrist; including the *ulna*, or *cubitus*, properly so called, and the radius.

CUBITI brevis. } See the articles { **BICEPS.**
CUBITI brevis. } **BREVIS.**
CUBITI longus. } **LONGUS.**

CUBO-CUBO-CUBUS. See **CUBUS-CUBI**.

CUBO-CUBUS, the term whereby Diophantus, Vieta, &c. distinguish the sixth power; which the Arabs call *quadratum-cubi*.

CUBOIDES, or **O**; **CUBIFORME**, in anatomy, the seventh bone of the foot; so called, from its being in form of a cube, or die.—See Tab. Anatomy, (Osteol.) fig. 7. lit. b. b. see also FOOT.

Some also call it *multiforme*: it is situate in the forepart of the calcaneum, in the same rank with the ossa cuneiformia.

Behind, it is articulated to the os calcis; before, to the two outer bones of the metatarsus; and within, it is joined to the third os cuneiforme.

CUBUS-CUBI, a name whereby the Arab writers, and those who follow them, to denominate the ninth power, or a number multiplied eight times by itself continually; which Diophantus, and after him Vieta, Oughtred, &c. call *Cubo-cubo-cubus*. See **POWER**.
CUCKING-STOOL, or **COKESTOOL**, antiently called *tumbrel*, and *trebuchet*; an engine for the punishment of scolds and unquiet women, by ducking them in the water.

Kitchen says, 'Every one having view of frank-pledge, ought to have a pillory and a tumbrel.' This machine was much in use, even among our Saxon ancestors, who called it *scalding-stole*.

The punishment was antiently also inflicted on brewers, and bakers transgressing the law; who were thereupon, in such a stool or chair, to be ducked in *stercoraria*, some muddy or stinking pond. This was antiently written *gaging stole*: in Domesday it is called *cathedra stercoris*.

CUCULLARIS, in anatomy, a muscle of the scapula, so called from the resemblance it is supposed to bear to a monk's cowl; and *trapezius*, from its resemblance to a geometrical figure called a *trapezium*.—See Tab. Anatomy, (Myol.) fig. 6. n. 9. fig. 2. n. 4. fig. 1. n. 18.

The fibres of this muscle have various originations and actions: whence Dr. Drake thinks it may be more properly called three, than one muscle.—The upper order of fibres or muscles, springs from the os occipitis; the second from the spine of the vertebrae of the neck; and the third from the spines of the eight upper vertebrae of the thorax, or back: and are inserted into the spine, acromium, and basis of the scapula, and part of the clavicle.

From the different dispositions of these fibres, the scapula is drawn different ways; the first pulling obliquely upwards, the last obliquely downwards, and the middle backwards: when they act all three together, they are said to draw backwards only; i. e. the two extremes antagonizing, the middle one alone is at liberty to act.

CUCULLATE flowers, among botanists, are such as resemble a cucullus, or monk's hood, or cowl. See **FLOWER**.

CUCULLUS, was antiently a traveller's cap; called also *cowl*, *gowl*, or *gula*: whence the name passed to the monks, among whom it signified their frock and cap, which were of one piece.

CUCUPHA, an antient form of medicine; being a cap, or cover for the head, with cephalic powders quilted therein; wore in many nervous distempers, and particularly such as more immediately affect the head: as against catarrhs, desquittions, &c.—It is now much out of use.

CUCURBITACEOUS plants, a class of plants, so called from their resemblance to the gourd, called by the Latins *cucurbita*, which is the head of this family.

Plants of the *cucurbitaceous* kind, send out their branches every way; which are soft, and generally be-fet with tendrills, by means whereof they cling to the bodies that are near them.

Their flowers are either sterile, or fertile: the last knit, and yield fleshy fruits of various figures; containing within them several flat seeds placed in three or four lodges, or even a greater number.

These seeds have usually a white sweetish kernel; the greatest part of them being of those called *frigida majores*, or the greater cold seeds.

The pumpkin, melon, &c. are of the *cucurbitaceous* kind.
CUCURBIT, **CUCURBITA**, in chymistry, an earthen, or glass vessel, called also *body*; of the figure of a gourd, or a pear: wherein are put the matters to be distilled.

It is sometimes also made of tin, and sometimes of brass, tinned. When a distillation is to be made, they fit on to it a glass head, with an aperture, and a neck proportional.

CUCURBITULA, in chirurgery, a cupping-glass, or instrument used in the operation of cupping. See **CUPPING-GLASS**.

CUDDY, in a first rate man of war, is a place lying between the captain-lieutenant's cabin, and the quarter-deck; and divided into partitions, for the master and other officers.—See Tab. Ships, fig. 2. lit. R.

CUE, an item, or inuendo, given to the actors on the stage, what, or when to speak. See **PROMPTER**.

CUERPO. *To walk in CUERPO*, is a Spanish phrase, for going without a cloke; or without all the formalities of a full dress.

CUI ante divorcium, a writ, which a woman divorced from her husband, hath, to recover lands or tenements from him to whom her husband alienated them during marriage; because, during the marriage, she could not gainay it.

CUI in vita, is a writ of entry, which a widow hath against him to whom her husband alienated her lands or tenements in his life-time; specifying, that, during his life, she could not withland it.

CUIRASSE *, a piece of defensive armour, made of an iron plate well hammered; serving to cover the body, from the neck to the girdle, both before and behind.

* Some derive the word, by corruption, from the Italian *cuors* heart; because it covers that part; others from the French *cuir*, or the Latin *corium*, leather; whence *coriaceous*: by reason defensive arms were originally made of leather.

The *cuirasse* was not brought into use till about the year 1300. Hence, *cuirassiers*, the cavalry armed with *cuirasses*.

The French have still a regiment of *cuirassiers*; and a good part of the German cavalry, are *cuirassed*.

In the Roman calendar, we find the name of S. Dominic the *cuirassid*; a title given a faint of the eleventh century, from his constant wearing of an iron *cuirass*, by way of penance.

CULINARY *, an epithet frequently added to fire; determining it to be a common fire, excited in wood, coals, or other ordinary fuel: in contradistinction to solar fire, or that raised by the action of a burning-glass; also to central fire; to animal fire, &c.

* The word is formed from the Latin *culina*, kitchen; this being the chief place of such fires.

Culinary fire, according to Boerhaave, consists of a portion of pure elementary, or solar fire, attracted by the oily, or sulphurous parts of the fuel, with such velocity, as that it moves the fame, agitates and whirls them violently about, and by degrees breaks and attenuates them; renders them volatile, and disperses them in air.

The effect of air upon this fire, is to make, as it were, a vault around it, and by that means, restrain and keep it in, determine it upon the sulphur, and thus prevent its too hasty dissipation.

CUL de lamp, a French term, properly signifying the bottom of a lamp. It is applied in architecture to several decorations, both of masonry and joinery, used in vaults and ceilings, to finish the bottom of works, and wreathed somewhat in manner of a testudo; particularly a kind of pendentive in Gothic vaults.

CUL de four, a sort of low, spherical vault, oven-like. See VAULT. *Cul de four of a niche*, denotes the arched roof of a niche on a circular plan.

CULLIAGE *, or **CULLAGE**, a right usurped by the ancient lords, and established by a shameful custom, which gave them the first night with their vassal brides.

* The word is formed from the French *cul pedes*, the breech.

It is said this right was established by Ewenus III. king of Scotland, and finally abolished by Malcolm III. a compensation being settled in its stead; as occasioning frequent revolts of the vassals against their lords.

CULMIFEROUS, in botany, a term applied to such plants as have a smooth-jointed stalk, usually hollow; the stalk wrapped about, at each joint, with single, narrow, sharp-pointed leaves; and the seeds contained in chaffy husks.

Culmiferous plants are divided by Ray, into two kinds; those with a greater, and those with a smaller seed.

Those with a larger seed are called *frumentaceous*, or *cereales*; and are again divided into *spicatus*, as wheat, rye, spelt, barley, rice, pease, &c. and *paniculatus* or *jubatus*, as oats, scordium, millet, and maize.

CULMINATION, in astronomy, the transit of a star, or planet over the meridian; or that point of its orbit wherein it is at its greatest altitude.

Hence, a star is said to *culminate*, when it passes the meridian.

To find the culmination of a star, or the time wherein it passes the meridian: on a meridian-line AB, (Tab. Astronomy, fig. 48.) stretch a thread, DC, perpendicularly; and from D to E another, DE, cutting the meridian obliquely, at any angle: the triangular thread, DCE, will cut the plane of the horizon in the meridian line, or at right-angles; and consequently will be in the plane of the meridian.

The eye, therefore, being so placed as that the thread DE may cover the thread DC; wait till the star be bisected by the triangle DCE; for then the eye and the star will, together with the triangle DCE, be in the same plane: consequently the star is in the meridian. To find the culmination of a star by the globe. See GLOBE.

To find the time of a star's culminating; its right ascension, and the sun's place in the ecliptic being given.—From the sun's place find his right ascension: and from this subtract the right ascension of the star: the difference being converted into solar time, gives the time elapsed from mid-day to the time of the star's culmination.

CULMUS, properly denotes the stem or stalk of corn, or grass; which in other plants is called *caulis*.

Hence the appellation, *culmiferous plants*.

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CULPABILIS. See the article *Non est culpabilis*.

CULPRIT, a term used by the clerk of the arraignments, when a person is indicted for a criminal matter.

After the indictment is read in court (which is the crown's charge against the prisoner at the bar) he is asked if guilty, or not guilty? If he answers, *not guilty*, there is next a replication from the crown, by continuing the charge of guilt upon him; which is expressed by pronouncing the word *cul-prit*; *cul* being an abbreviation of the Latin word *culpa*, guilt, or *culpabilis*, guilty, and *prit* (now *pret*) the old French word for *ready*; or, as others rather think, the Latin *apparet*, appears.

From this formula, therefore, of the clerk of the arraignments, the prisoner is deemed guilty of the crime charged on him; and that the crown is ready to prove it upon him.

That this is the true explanation of the term, seems evident from the form of the entry of the record of the trial, when drawn at large.

CULTELLATION, a term which some authors use for the measuring of heights, and distances, by piecemeal; that is, by instruments which give us such heights and distances by parts, and not all at one operation.

CULTRARIUS. See the article *POPA*.

CULTURE. See *AGRICULTURE*, and *HORTICULTURE*.

CULTURE of hops. See the article *HOPS*.

CULVERIN *, a long slender piece of ordnance or artillery, serving to carry a ball to a great distance.

* *Ménage* derives the word from the Latin *culubrina*; others from *culuber*, snake; either on account of the length and slenderness of the piece, or of the ravages it makes.

Of these there are three kinds, *viz.* the *culverin extraordinary*, the *ordinary*, and the *leaf fixed*.

The *culverin extraordinary* has $5\frac{1}{2}$ inches bore; its length 32 calibers, or 13 foot; it weighs 4800 pound; its load is above 12 pound; carries a shot 5 inches $\frac{1}{2}$ diameter, weighing 20 pound weight.

The *ordinary culverin* is 12 foot long; carries a ball of 17 pound 5 ounces; caliber $5\frac{1}{2}$ inches; its weight 4500 pound.

The *culverin of the leaf fixed*, has its diameter 5 inches; is 12 foot long; weighing about 4000 pounds; carries a shot 3 inches $\frac{1}{2}$ diameter, weighing 14 pounds 9 ounces. See *DEMIL-CULVERIN*.

CUMMIN *, the seed of a plant of the same name, much like that of fennel; growing abundantly in the isle of Malta, where it is sown and cultivated after the manner of corn.

* The French frequently call it *anis aigre*, sharp or sour anise.

It is used with success in vertigo's, wind-colics, tympanies, &c. It is esteemed excellent to retrieve the natural heat in stallions, bulls, &c. Pigeons are exceedingly fond of it; whence some make use of it to people their dove-houses, incorporating it with an earth naturally saline, or some other earth that has imbibed urine.

This seed, as well as the common anise, yields, by expression, a kind of oil, esteemed sovereign in rheumatism; and provided it be used with precaution, and in small quantities.

CUNEIFORME *os*, in anatomy. See *SPHENOIDES*.

CUNEIFORMIA ossa, denote the fourth, fifth, and sixth bones of the foot; thus called from their wedge-like shape, being large above, and narrow below.—See *Tab. Anat. (Osteol.) fig. 7. lit. c. c. fig. 3. n. 27. 27.*

They lie all three a-side of one another, and are of different sizes; their upper side convex, and their under hollow, by which means, the muscles and tendons in the bottom of the foot are not hurt in walking.

At one end they have each a sinus, which receives the os naviculare; and at the other end they are joined each to one of the three inner bones of the metatarsus.

CUNETTE, or **CUVETTE**, in fortification, a deep trench, about three or four fathom wide, sunk along the middle of a dry moat, to lade out the water; or to make the passage more difficult to the enemy.

CUNEUS, one of the mechanical powers; more usually, by English writers, called the *wedge*. See *WEDGE*.

Parabolic CUNEUS. See the article *PARABOLIC*.

CUNNUS *, the pudendum muliebre; or the anterior parts of the genitals of a woman, including the labia, pudendi, and mons veneris. See *PUDENDUM*.

* The word is formed from the Greek *κυνος*, to kiss, or to be with-child.

CUP, *calyx*, a vessel so called, of various forms and uses.

In the Ephem. German. we have a description of a *cup* made of a common pepper-corn, by Oswald Nerlinger; which holds 1200 other ivory cups, each having its several handle; all gilt on the edges: with room for 400 more.

CUPS, among herbalists, are those short green husks in which flowers grow; some being divided into two, three, four, five, or six leaves. See *Supplement, article CALYX*.

CUP fountain. See the article *FOUNTAIN*.

CUPOLA *, in architecture, the same with dome. See *DOME*.

* The word is Italian, formed of the barbarous Latin *cuppala*, otherwise called *ibola*, and *ferrix*.

CUPPEL, **CUPEL**, or **COFFEL**, among chymists, a vessel or utensil, used in the trying and purifying of gold and silver; called also *test*. See *Supplement, article COPPELL*.

CUPPING, an operation in chirurgery, for the discharge of blood, and other humours by the skin.

It is performed by collecting the humours into a tumour under the cutis; and letting them out thence, by scarification; *i. e.* by several incisions made with a scarificator.

The instruments used herein, are the *cucurbitula*, or *cupping-glasses*, and *scarificator*: the description of each whereof see under their proper head.

Cupping is performed either *with*, or *without fire*.

Cupping with fire, is the more usual process; and is commonly, among us, thus effected: the air in the cavity of the *cucurbitula* is heated, and so rarefied, by the application of the flame of a lamp, or the like; and the vessel immediately applied to the part to be *cupped*.

Others, especially the French, proceed thus: a piece of card is cut round, and a lamp, or four little wax candles affixed to it: this is placed after the manner of a candlestick on the part whereon the operation is to be performed, and covered with a *cucurbitula* or *cupping-glass*.

After the included air has been well heated and rarefied with the flames of the candles, the glass is clapped close to the skin; which it has no sooner touched but the candles are extinguished, and the tumour is raised.

In *cupping without fire*, instead of rarefying the air included in the *cupping-glass* by heat, it is done by a syringe applied to the neck of the *cupping-glass*, fitted with a brass collar, cap, and valve: the *cupping-glass* being applied to the skin, and the syringe wrought, part of the air is pumped out of the *cucurbitula*; and thus the tumour rises, as in the former case. See **SYRNACE**. The reason of the phenomenon is this: the air included in the *cupping-glass* being rarefied, a great part of the load which before pressed the part and kept it down, and which still continues to press the rest of the body, is taken off; upon which the air, known to be contained in the vessels of the body, and mixed with the blood and juices, expands itself; and raises a tumour, carrying with it the fluids wherewith it is mingled.

The operation is performed on the back, and on the breasts and thighs, to stop or promote the menes; on the navel for the colick.—*Cupping* is also used for defluxions on the eyes, for venomous wounds, and buboes; on the head, for apoplexies, &c.

CUPPING-GLASS, *cucurbitula*, in chirurgery, a glass vessel, applied to certain parts of the body, to draw the blood and other humours from within outwards; to be afterwards discharged, through several incisions made with a scarificator.

The vessel is of various dimensions: sometimes, instead of glass, it is made of wood, horn, brass, silver, &c.

When the *cupping* is to be performed with fire, the vessel is heated with candles, tow, a torch, lamp, or the like; and in this state applied close to the part: the air in its cavity being by this means rarefied, and brought near to the condition of a vacuum; that part of the body covered by it becoming less pressed by the air than the rest, its juices are forced up with the cutis, and raise a bunch in the cavity of the vessel: to which the scarificator being applied, and ten or twelve incisions made at the same time, a plentiful evacuation is effected.

To cup without fire, the vessel is fitted with a brass neck; to which a syringe being applied, a rarefaction is produced, by working it to and fro: the rest is done as in the former case.

CURATE, is properly a parson, or vicar of a parish, who hath the charge or cure, of the parishioners souls. See **CURE**, and **PARSON**.

CURATE is now more generally used for a deputy, or substitute of the parson; or one who officiates in the place of the incumbent, or beneficiary.

CURATIVE indication, among physicians, that which directs what is to be done for the cure of a disease. See **SYMPTOM**, and **INDICATION**.

CURATOR, in the civil law, a trustee, or person nominated to take care of the affairs, and interests of a person emancipated, or interdicted.

In countries where the Roman law prevails, between the age of 14 and 24 years, minors have *curators* assigned them: till 14, they have tutors.

CURATOR of an university, in the united provinces, is an elective office, to which belongs the direction of the affairs of the university; as, the administration of the revenues, the inspection of the professors, &c.

The *curators* are chose by the states of each province: the university of Leyden has three; the burghermasters of the city have a fourth.

CURDLING, the coagulating, or fixing of any fluid body; particularly milk.

Pausanias says, Aristæus son of Apollo, and Cyrene daughter of the river Peneus, were the first who found the secret of *curdling* milk.

At Florence, they *curdle* their milk for the making of cheese with artichoke flowers; in lieu of the rennet used for the same purpose among us.

The Bisâtze a people of Macedonia, Rochfort observes, live wholly upon *curdled* milk, *i. e.* of curds. He adds, that curds is the whole food of the people of the upper Auvergne in France, and whey their only drink.

Women newly delivered are subject to have their milk *curdled*,

converted into little grumæ in their breasts, which occasions violent pains, with a shivering in the back.

It is owing to the want of being sucked, whence the method of remedying, and preventing it, is apparent.

CURE, in medicine. See **PALLIATIVE cure**.

CURE of souls, a benefice, the incumbent whereof has the charge, and guidance of the souls of the people within a certain extent of ground, called a *parish*.

Such is a vicar, a rector, &c. in contradistinction to a prebend, a dean, a chanor, &c.

Sine CURES. See the article **SINE**.

CURE, in falconry, the same with *casting*. See **CASTING**.

CURETES *, in antiquity, a sort of priests, or people of the isle of Crete; called also *corybantes*.

* The name *curetes*, according to Strabo, was giving them by reason of their cutting off the hair before, to prevent the enemy's taking hold thereof: the word being Greek, κούρης, of κούρη, *tonsure*, from κείρω, *tendo*. Others derive it from κωστρεαία, the feeding or educating of a child; by reason they are said to have educated Jupiter.

The *curetes* are said to have been originally of mount Ida, in Phrygia; for which reason they were also called *idæi dactyli*. Ovid says, they had their origin from a huge shower of rain: Lucian and Diodorus Siculus represent them as very expert in casting of darts; though other authors give them no weapons but bucklers and pikes: but all agree in furnishing them with tabors, and castanets; and relate that they used to dance much to the noise and clashing thereof.

Some authors, however, give a different account of the *curetes*: according to Pezron, and others, the *curetes* were, in the times of Saturn, &c. and in the countries of Crete and Phrygia, what the druids and bards were afterwards among the Gauls, &c. *i. e.* they were priests who had the care of what related to religion, and the worship of the Gods.

Hence, as in those days it was supposed there was no communication with the Gods but by divinations, auguries, and the operations of magic; the *curetes* passed for magicians and enchanters: to these they added the study of the stars, of nature, and poetry; and so were philosophers, astronomers, &c.

Such were the *curetes*, and after them the druids; with this difference, that the *curetes*, in the time of the Titans, went to the wars; for which reason they were armed, and were wonderfully dextrous in dancing, cap-a-pe, shaking their bucklers and javelins: from which action, Pezron conjectures, they took their name, *curetes*; *cur*, in the Celtic, being the same with *curus*, in the Greek: *q. d.* I strike or beat.

According to Kircher, the *curetes* were what the *spirits* are among the Cabbalists, the *powers* in Dionysius, the *demons* among the Platonists, and the *genii* among the Egyptians.

Vossius, *de Idolat.* distinguishes three kinds of *curetes*; those of Ætolia, those of Phrygia, and those of Crete, who were originally derived from the Phrygians.

The first, he says, took their name from κούρη, *tonsure*; in regard, from the time of a combat wherein the enemy seized their long hair, they always kept it cut: those of Phrygia and Crete, he supposes were so called from κούρη, *young man*; in regard they were young; or because they nursed Jupiter when he was young.

CURFEW, *q. d.* *couvre-feu*, a signal of retreat, given in cities taken in war, &c. to advertise the inhabitants to go to bed, and not to stir out any more.

The *curfew-bell*, wherewith the signal was antiently given, was sometimes hung up as a punishment of sedition. Pasquier says, it was called *curfew*, and *garofeu*; as being intended to advertise the people to secure themselves from the robbers and debauches of the night.

The most antient *curfew*, was that established in England, by William the conqueror; who appointed, under severe penalties, that at the ringing of a bell, at eight a-clock in the evening, every one should put out their lights, cover, or rake up their fires, and go to bed.—Whence, to this day, where a bell is accustomed to be rung about bed-time, it is called *curfew-bell*.

CURIA, in our antient customs.—It was usual for the kings of England to summons the bishops, peers, and great men of the kingdom, to some particular place, at the chief festivals in the year; and this assembly is called, by our historians, *curia*; because there they consulted about the weighty affairs of the nation: whence it was sometimes also called, *plenaria curia*, *generalis curia*, *augustalis curia*, and *curia publica*, &c.

CURIA advocare vult, in law, is a deliberation, which the court sometimes take, before they give judgment in a cause wherein there seems to be any point of difficulty.

Accedas ad CURIAM. } See the articles } **ACCEDAS.**
Auxilium CURIAE. } } **AUXILIUM.**

CURIA baronum. See **COURT-BARON**.

CURIA claudenda, is a writ that lies against him who should fence and enclose the ground, but refuses or defers to do it.

CURIA militum *, a court so called; antiently held at Carisbrook-castle, in the isle of Wight.

* *Et idem Dominus Willielmus de Insula facere debet festam ad curiam domini castri de Carisbroce, de tribus septimanis in tres septimanas, in curia quæ vocatur curia militum.*

Rectus in CURIA. See the article RECTUS.

CURIA, among the Romans, denoted a portion, or division of a tribe.

In the time of Romulus, a tribe consisted of ten *curiæ*, or a thousand men; each *curia* being one hundred: that legislator made the first division of his people into thirty *curiæ*.

Afterwards, *curia*, or *domus curialis*, became used for the place where each *curia* held its assemblies.

Hence, also, *curia* passed to the senate-house; and it is from hence the moderns come to use the word *curia*, court, for a place of justice, and for the judges, &c. there assembled*. See COURT.

* Varro derives the word from *cura*, care, *q. d.* an assembly of people charged with the care of public affairs: others deduce it from the Greeks; maintaining, that at Athens they called *κῆρυξ* the place where the magistrate held his offices, and the people used to assemble: *κῆρυξ*, again, may come from *κῆρυξ*, authority, power; in regard, it was here the laws were made.

CURIALITAS *anglicæ*. See COURTESY of England.

CURIO, the chief, and priest of a *curia*. See CURIA.

Romulus, upon dividing the people into *curiæ*, gave each division a chief, who was to be priest of that *curia*, under the title of *curio*, and *flamen curialis*.

His business was to provide and officiate at the sacrifices of the *curia*, which were called *curionæ*; the *curia* furnishing him with a sum of money on that consideration: which pension or appointment was called *curionium*.

Each division had the election of its *curio*; but all these particular *curio's*, were under the direction of a superior, or general, called *curio maximus*; who was the head of the body; and elected by all the *curio's*, assembled in the *comitia curiata*.

All these institutions were set a-foot by Romulus, and confirmed by Numa, as Halicarnassus relates it. Godwyn will have two *curio's* in each *curia*.

CURIOSUS, an officer of the Roman empire, during the middle age, appointed to take care that no frauds and irregularities were committed; particularly no abuses in what related to the posts, the roads, &c. and to give intelligence to the court of what passed in the provinces.

This made the *curiosi* people of importance; and put them in a condition of doing more harm than they prevented: on which account, Honorius cashiered them, at least in some parts of the empire, anno 415.

The *curiosi* came pretty near to what we call controllers: they had their name from *cura*, care; and *quod curis agendis & œconomibus curis publicis inspectendis operam darent*.

Academy of the CURIOSI *naturæ*. See ACADEMY.

CURLING *stuff*, in joinery. See CROSS-GRAINED *stuff*.

CURNOCK, a measure of corn, containing four bushels, or half a quarter.

CURRENTS, or CURRANS, a kind of little raisins, or dried grapes of different colours, black, white, or red; brought from several places of the Archipelago, and among others, from the isthmus of Corinth; whence their name, *currants*, *q. d. corinthi*.

They must be chosen new, small, and in large masses; and care be taken that the little Spanish *currants* be not soiled in their room.—When made up in bales, they may keep two or three years, without stirring, or giving them air.—Their use is in seasoning several viands, and in some medicinal compositions; where they serve in lieu of raisins. Sir George Wheeler's account of these fruits, and the manner of preparing them is very curious.—The island of Zant, he observes, is the chief place whence *currants* are brought: the Morea, or the isthmus of Corinth, which was antiently the principal plantation, and whence the Latins denominated them *uvæ Corinthiacæ*, now produces no more; as having been much neglected: the jealousy of the Turks not allowing large vessels to enter the gulph to take them off their hands.

They do not grow on bushes, like our gooseberries, though that be the common opinion; but on vines, like other grapes; except that the leaves are somewhat thicker, and the grapes somewhat smaller: they have no stone, and, in this country, are all red, or rather black.

They gather them in August, dispose them in couches on the ground till they be dry, clean them, and lay them up in magazines, which the natives call *seraglio's*; pouring them in at a hole, till the magazine be full. They cling so fast together by their own weight, that they are forced to be dug out with iron instruments.

To barrel them for sending abroad, they have people who grease their feet and legs, and tread them close, that they may keep the better. They are sold for about twelve crowns the thousand weight; and pay as much custom to the state of Venice.

Zant produces enough yearly to load five or six vessels; Cephalonia three or four; and the other islands one. The English have a factory at Zant; the Dutch two or three merchants, and the French one: the English consuming more than six times the quantity that both France and Holland do together.

Those of Zant know but little of the use we make of them; being persuaded they only serve in dyeing of cloth; and being entirely ignorant of the luxury of Christmas pyes, and English puddings.

CURRENT, or COURANT *money*, good money, or that which

passes in commerce from one to another. See COURANT.

CURRENT *accounts*.

CURRENT *coins*.

CURRENT *price*.

CURRENT, CURRENTO, also denotes a sort of running French

dance—sometimes, a musical air in triple time. See COURANT.

CURRENT, in hydrography, a stream, or flux of water in any

direction.

Currents, in the sea, are either *natural* and *general*, as arising from the diurnal rotation of the earth on its axis; or *accidental* and *particular*, caused by the waters being driven against promontories, or into gulphs and fraights; where, wanting room to spread, they are driven back, and thus disturb the ordinary flux of the sea.

The *currents* are so violent under the equator, where the motion of the earth is the greatest, that they carry vessels very speedily from Africa to America; but absolutely prevent their return the same way: so that ships are forced to run as far as the fortieth degree of latitude, to find a passage into Europe.

In the Straights of Gibraltar, the *currents* almost constantly drive to the eastward, and carry ships into the Mediterranean: they are usually, too, found to drive the same way in St. George's channel. The great violence and dangerousness of the sea in the fraights of Magellan, is attributed to two contrary *currents* setting in, one from the south, and the other from the north sea.

CURRENTS, with respect to navigation, may be defined, certain progressive motions of the water of the sea, in several places, either quite down to the bottom, or to a certain determinate depth; by which a ship may happen to be carried forward more swiftly, or retarded in her course, according to the direction or setting of the *current*, in, with, or against the course or way of the ship.

The business of *currents* making a considerable article in navigation; the way they set, together with their strength, is to be carefully observed: this some do by the ripples of the water, and by the driving of the froth along the shore, when in sight of it; but the more usual, as well as more accurate way, is thus: They first fix their boat, by throwing out a triangular piece of wood, with a piece of lead fastened to it and tied to the stem of the boat with a cord; and letting it sink sixty fathom, or more; or, sometimes, by a kettle tied by the bowl, and sunk, as the other.

By either of these means, the boat is brought to ride as at anchor; which done, the log is cast over, the glass turned, and as the log-line veers out, the drift of the log is set with the compass.

This shews whether there be any *current*, or none; and if any, which way it sets, and at what rate it drives: observing, however, to add something to the drift, for the boat's drift; for tho' she appear to stand still, yet, in reality, she is found to move. This addition experience has thus determined; if the line she ride by be sixty fathom, a third part of the drift to be added; if eighty fathom, a fourth; if an hundred, a fifth.

If a ship sail along the direction of a *current*, it is evident the velocity of the *current* must be added to that of the vessel: if her course be directly against the *current*, it must be subtracted; if she sail athwart the *current*, her motion will be compounded with that of the *current*; and her velocity augmented or retarded, according to the angle of her direction, with that of the direction of the *current*; *i. e.* she will proceed in the diagonal of the two lines of direction, and will describe or pass through that diagonal in the same time wherein she would have described either of the sides, by the separate forces.

To determine a ship's course and distance, sailing obliquely with, or against a current. Suppose, *v. gr.* the sails N. E. 110 miles, in a current which sets S. W. 30 miles in the same time: to solve the problem geometrically; set off four points from N towards E, (Tab. Navigation, fig. 15.) and draw AC equal to 110 miles; from C draw CB, parallel to the line NNE, and equal to 30 miles: lastly, draw AB, which will be the ship's true course and distance.

To find which trigonometrically. In the triangle ABC, there are given AC 110, BC 30, and the angle C, $22^{\circ} 30'$; then, $A - B C$: $A C - B C$: t , $\frac{1}{2} A + B$: t , $\frac{1}{2} B - A$. That is, as the sum of AC and BC, *viz.* 140, is to their difference 80:: so is the tangent of $78^{\circ} 45'$ to the tangent $10^{\circ} 49'$. Hence her true course appears to be N. E. $7^{\circ} 56'$ easterly. For her distance; as the sine of the angle A, $7^{\circ} 56'$, is to the drift of the current BC, 30, so is the sine of the angle at C $22^{\circ} 30'$, to the distance run, 83, two miles.

Under-CURRENTS.—Dr. Halley makes it highly probable, that in the Downs, in the Straights of Gibraltar, &c. there is an *under-current* whereby as much water is carried out, as is brought in by the *upper-current*. See UNDER-CURRENTS.

This he argues from the offing between the north and south Foreland, where it runs tide and half-tide, *i. e.* it is either ebb or flood in that part of the Downs three hours ere it is so off at sea: a certain sign, that though the tide of flood runs aloft, yet the tide of ebb runs under-foot, *i. e.* close by the ground; and so at the tide of ebb it will flow under-foot. This he confirms by an experiment in the Baltic Sound, communicated to him by an able seaman present at the making it: being there, then, with one of the king's frigates, they went with

with their pinnace into the mid-stream, and were carried violently by the *current*. Soon after that, they sunk a basket with a large cannon-bullet, to a certain depth of water, which gave check to the boat's motion; and sinking it still lower and lower, the boat was driven a-head to the windward, against the *upper-current*: the *current* aloft, not being above four or five fathom deep. He added, that the lower the basket was let down, the stronger the *under-current* was found. From this principle, it is easy to account for that vast draught of water continually pouring in with the *current* out of the Atlantic into the Mediterranean, through the Straights of Gibraltar; a passage about twenty miles broad: yet, without any sensible rising of the water along the coasts of Barbary, &c. or any overflowing of the lands, which there lie very low.

CURRICULUS*, in our ancient writers, denotes the year, or course of a year.

* *Annus est hoc eorum dominicæ incarnationis quater quinquagenis & quingenis, quibus lustris & tribus curriculum, i. e. In the year 1028; for four times fifty makes two hundred, and five times two hundred makes one thousand; five lustra are twenty-five years, and three curricula are three years.*

CURRIED *hide*. See the article HIDE.

CURRYING, a method of preparing leather, with oil or tallow; which raises on the hair, or wool-side, a kind of grain, not unlike that of morocco.—Though there is also a kind of *curried* leather without grain.

Currying is the last preparation, and puts the leather in a condition to be used for shoes, saddles, harness, &c. It is equally practised on sheep, calf, and bullocks-skins.

The colours given in *currying* are, black, white, red, yellow, and green: the other colours are given by the skinners; who differ from the *curriers* in this, that they apply their colours on the flesh-side; the *curriers* on the hair-side.

Manner of currying in black, with the grain.—Of blacks there are four cases: either the skins are put in tallow on both sides; or oil is used, in lieu of tallow, on the flesh-side; or tallow is used alone on the hair-side, and nothing on the other; or tallow is used on both sides, but no grain raised.

The two first are used for cows and calves leather; the second is the only way used for sheep; and the two last are used occasionally for cow and bullock: for calf and sheep, they use *sumac* on the flesh-side, which gives an orange-cast.

For *neats-skin* in black; the skin, coming from the tanner, is wet several times with a broom, rolled and trod under-foot to make it tractable, drained, and as much of the remaining flesh as possible taken off with the knife; hung in the air till half dry, then wet and trampled again, and again.

This done, it is rubbed over with a pummel, or call having niches in manner of teeth, to render it still more pliant; and singed with straw, to prepare it to receive the tallow; which is applied, boiling hot, on both sides.

The skin is then singed a second time, laid four hours in a vessel of fresh water, trampled, and worked a second time with the pummel on each side, and stoutly drained; smeared over with its first black made of galls and ferailles, boiled in beer-agre, or four beer; half dried, stretched on a table, and the grain beat down with a flat iron instrument drawn over it from place to place.

It now receives its second black, made of galls, coppers, and gum arabic; when dry, and stretched on a table, it is finished over with beer-agre; then folded from corner to corner, and the pummel drawn over it to cut the grain, first on the hair-side, then on the flesh-side; the last with a pummel of cork: the beer hanging in it is taken out with a hair rubber, boiled in hatter's lye; and the skin fastened to the table, and cleaned with the iron instrument abovementioned, and again wiped with a piece of worsted stocking. The skin is now brightened, on the hair-side with a lustre made of barberries, to prepare it to receive its last grain. The grain, we already observed, is begun, by folding the skin, the hair-side inwards, several ways: to finish it, it is again folded, after its first lustre, two ways; first from corner to corner, a little slanting; then a-crois, i. e. first directly, or from eye to eye, then from head to tail.

The grain thus formed, the last lustre, which makes its last preparation, is given; composed of gum arabic, garlic, beer vinegar, and Flanders size, boiled together, and applied cold.

Calf-skin, in black, is prepared much after the same manner; though begun differently. After wetting, taking off as much of the flesh remaining as possible, and drying; they pounce the flesh-side with a hard, rough, pumice-stone, which makes it more smooth and gentle; and then give the grain with the pummel, put in the tallow: the rest as before.

Sheep-skins, in black. What these have peculiar in their preparation, is, that they are first stretched on a table to get off the bourre, or tan wherewith they are laden; then wet, trod under-foot, and tallow added on the hair-side: they are again wet, again trod, stretched on the table, and the water squeezed out with the pummel; then blacked, repassed under the pummel on each side, dried, and all the roughness and inequality pared off with a flat, round, cutting instrument: the rest as before.

Sheep-leather, or that without any grain, made of cows or bul-

locks skins, differs a little in its preparation from the former. The skins being wet, trod, and passed under the pummel, the flesh is taken off; the rest as in the first article: observing, that the tallow be applied on both sides as thick as possible: being now steeped in water, trod, frized, and blacked the first time; the second black is next laid on, till the hair-side be quite smooth. Lastly, after receiving the two lustres, they are prepared between two tables; without plaiting or folding them in any manner during the whole preparation.

CURSED. See the articles ACCURSED and CORZNED.

CURSOR, an officer or clerk belonging to the court of chancery, who maketh out original writs.

These are also called *clerks of the course*; and are twenty four in number: making a corporation of themselves. To each of them are allotted several shires; in which shires they make out such original writs as are by the subject required.

CURSOR, a little ruler, or label of brass, divided like a line of fines, and sliding in a groove, or notch, along the middle of another label, or ruler, representing the horizon, and always at right angles to it.—It is used in the analemma.

CURSOR is also used for a point (screwed on the beam-compass; and which may be moved, or slid along the beam thereof, for the striking of greater or less circles. See *Beam-Compass*.

CURTAINING, in the manage, the docking, or cutting off a horse's tail.

The practice of *curtailing* is no where in vogue so much as in England; it being a popular opinion, that the cutting off the tail renders the horse's chine or back the stronger, and more able to bear burdens: which seems warranted by experience. The amputation is usually made between the fourth and fifth joints of the tail; a ligature being first tied tight about the place, to prevent the flux of blood; and the raw stump afterwards seared up with a hot iron, till the extremities of the vessels be all stopped.

CURTAIN, in fortification. See the article CURTIN.

CURTATE *distance*, in astronomy, the distance of a planet's place from the sun, reduced to the ecliptic; or, the interval between the sun, and that point where a perpendicular let fall from the planet, meets with the ecliptic.

CURTATION, the interval between a planet's distance from the sun, and the *curtate* distance.

From the preceding article, it is easy to find the *curtate distance*; whence the manner of constructing tables of *curtatims* is obvious.

The quantity of inclination, reduction, and *curtation* of a planet, depending on the argument of the latitude; Kepler, in his *Rudolphin tables*, reduces the tables of them all into one, under the title of *tabule latitudinarie*.

CURTESY. See the article COURTESY.

CURTICONE, in geometry, a cone whose top is cut off by a plane parallel to its basis; called also *truncated cone*. See TRUNCATED.

CURTIN*, CURTAIN, or COURTINE, in fortification, that part of a wall, or rampart, which is between two bastions; or which joins the flanks thereof.—See Tab. *Fortif.* fig. 21. lit. q. q.

* Du Cange derives the word from the Latin *curtina*, *quasi minor curtis*, a little country court, inclosed with walls: he says, it was in imitation hereof, that they gave this name to the walls and parapets of cities, which inclose them like courts; he adds, that the *curtains* of beds take their name from the same origin; that *curtis* was the name of the general's, or prince's tent; and that those who guarded it were called *curtinarii* and *curtiarii*.

The *curtin* is usually bordered with a parapet five foot high; behind which the soldiers stand to fire upon the covert way, and into the moat.

Besiegers seldom carry on their attacks against the *curtin*; because it is the best flanked of any part. See FLANK.

Angle of the CURTIN. } See the articles } ANGLE.
Complement of the CURTIN. } See the articles } COMPLEMENT.

CURVATURE of a line, is its bending, or flexure; whereby it becomes a curve, of such peculiar form and properties.

Thus, the *curvature* of the circle is such, as that all points of the periphery are equally distant from one point within, called the *center*.

The *curvatures* of different circles, are to each other reciprocally as their radii.

CURVE, in geometry, a line whose several points tend several ways, or are posited towards different quarters. See LINE.

In this sense, the word is used in opposition to a *straight line*; whose several points are posited towards the same quarter.

Hence, figures terminated with lines of the first sort are called *curvilinear* figures; in opposition to those terminated with the latter, called *retilinear* figures.

The doctrine of *curves*, and of the figures and solids generated from them, constitute what we call the *higher geometry*.

In a *curve*, the line A D, (Tab. *Geometry*, fig. 51.) bisecting the parallel lines M M, is called the *diameter*: if the lines be equidistant, and it cut them at right angles, it is called the *axis*; and the point A, whence the diameter is drawn, is called the *vertex*.

The equidistant lines M M are called *ordinates*, or *applicates*; and

and their halves, PM , *semiordinates*.
 The portion of the diameter AP , between the vertex, or other fixed point, and an ordinate, is called the *abscissa*.
 And the concurrence of all the diameters, the center.
Curves are distinguished into *algebraic*, frequently with Des Cartes called *geometrical*; and *transcendental*, called by the same Cartes, &c. *mechanical curves*.

Algebraical CURVES, are those wherein the relation of the abscisses AP , AP , AP , fig. 52. to the semiordinates MP , MP , MP , may be expressed by an algebraical equation.
 Suppose, *v. gr.* in a circle, $AB = a$, $AP = x$, $PM = y$; then will $PB = a - x$; consequently, as $PM = AP \cdot PB$, $y = ax - x^2$. Or, suppose $PC = x$, $AC = a$, $PM = y$; then will $MC = PC^2 = PM^2$; that is, $a^2 - x^2 = y^2$.

Note, Those are also called *algebraical curves*, which are of a determinate order; so, as that the equation always continues the same in the several parts of the curve.
 Most authors, after Des Cartes, call algebraic curves, *geometrical* ones; as admitting none else into the construction of problems; and nor, consequently, into geometry. But Sir Isaac Newton, and after him Messrs. Leibnitz and Wolfius are of another opinion; and think, that in the construction of a problem, one curve is not to be preferred to another, for its being defined by a more simple equation, but for its being more easily described.

Transcendental CURVE, is that which cannot be defined by an algebraic equation.

These curves, Des Cartes, &c. call *mechanical* ones (see *MECHANICAL*) and under that notion exclude them out of geometry: but Newton and Leibnitz, for the reason above-mentioned, are of another opinion. Indeed, Leibnitz has found a new kind of equations, which he calls *transcendental equations*; whereby even *transcendental curves*, and those which are not of any determinate order, *i. e.* which do not continue the same in all the points of the curve, may be defined. *Act. erudit. Lips.* an. 1684. p. 234.

Algebraical CURVES of the same kind or order, are those whose equations rise to the same dimension.

Geometrical lines being defined by the relation between the ordinates and abscisses, or (which is the same, by the number of points wherein they may be cut by a right line) are well distinguished into two kinds or orders: in which view, lines of the first order will be right lines; and those of the second, or quadratic order, will be curves, *viz.* the conic sections.

Now, a curve of the first kind is the same with a line of the second, (a right line not being numbered among curves) and a curve of the second kind, is the same with a line of the third. Thus, curves of the first kind, are those whose equations rise to two dimensions; if they rise to three, the curves are of the second kind; if to four, of the third, &c.

Thus, *v. gr.* the equation for a circle is, $y^2 = a^2 - x^2$, or $a^2 - x^2 = y^2$. A circle, therefore, is a curve of the first kind.

Again, a curve of the first kind, is that defined by the equation $a - x = y^2$; and a curve of the second kind, that defined by the equation $a - x = y^3$.

For the various curves of the first kind, and their properties, see *CONIC SECTIONS*.

For curves of the second kind, Sir Isaac Newton has a distinct treatise, under the title of *enumeratio linearum tertii ordinis*.

Curves of the second and other higher kinds, he observes, have parts, and properties similar to those of the first: thus, as the conic sections have diameters and axes; the lines cut or bisected by these, are called *ordinates*; and the intersection of the curve and diameter, the *vertex*: so, in curves of the second kind, any two parallel right lines being drawn so as to meet the curve in three points; a right line cutting these parallels so, as that the sum of the two parts between the secant and the curve on one side, is equal to the third part terminated by the curve on the other side, will cut, in the same manner, all other right lines parallel to these, and that meet the curve in three points, *i. e.* so, as that the sum of the two parts on one side, will be still equal to the third part on the other side.

These three parts, therefore, thus equal, may be called *ordinates*, or *applicates*; the secant the *diameter*; and where it cuts the ordinates at right angles, the *axis*: the intersection of the diameter and the curve, the *vertex*; and the concurrence of the two diameters, the center; and the concurrence of all the diameters, the *common or general center*.

Again, as a hyperbola of the first kind has two asymptotes; that of the second has three, that of the third four, &c. and as the parts of any right line between the conic hyperbola and its two asymptotes are equal on either side; so, in hyperbolas of the second kind, any right line cutting the curve and its three asymptotes in three points; the sum of the two parts of that right line, extended from any two asymptotes, the same way, to two points of the curve, is equal to the third part, extended from the third asymptote, the contrary way, to the third point of the curve. See *ASYMPTOTE*, *HYPERBOLA*, &c.

Again, as in other conic sections, not parabolic, the square of an ordinate, *i. e.* the rectangle of the ordinates drawn to contrary parts of the diameter, is to the rectangle of the parts of the diameter terminated at the vertices of an ellipsis or hyper-

bola, as a given line, called the *latus rectum*, is to that part of the diameter which lies between the vertices, and called the *latus transversum*: so, in curves of the second kind, not parabolic, the parallelepiped under three ordinates, is to the parallelepiped under the parts of the diameter cut off at the ordinates and the three vertices of the figure, in a given ratio: wherein, if there be taken three right lines situate at the three parts of the diameter between the vertices of the figure, each to each; then those three right lines may be called the *latera recta* of the figure, and the parts of the diameter between the vertices, the *latera transversa*.

And, as in a conic parabola which has only one vertex to one and the same diameter, the rectangle under the ordinates, is equal to the rectangle under the part of the diameter cut off at the ordinates and vertex, and a given right line called the *latus rectum*: so, in curves of the second kind, which have only two vertices to the same diameter, the parallelepiped under three ordinates, is equal to the parallelepiped under two parts of the diameter cut off at the ordinates and the two vertices, and a given right line, which may therefore be called the *latus transversum*.

Further, as in the conic sections, where two parallels terminated on each side by a curve, are cut by two parallels terminated on each side by a curve; the first by the third, and the second by the fourth: the rectangle of the parts of the first, is to the rectangle of the parts of the second, as that of the second is to that of the fourth: so, when four such right lines occur in a curve of the second kind, each in three points; the parallelepiped of the parts of the first, will be to that of the parts of the second, as that of the second to the parts of the fourth.

Lastly, the legs of curves, both of the first, second, and higher kinds, are either of the parabolic or hyperbolic kind: an hyperbolic leg, being that which approaches infinitely towards some asymptote; a parabolic, that which has no asymptote.

These legs are best distinguished by their tangents; for, if the point of contact go off to an infinite distance, the tangent of the hyperbolic leg, will coincide with the asymptote; and that of the parabolic leg, recede infinitely, and vanish. The asymptote, therefore, of any leg, is found by seeking the tangent of that leg to a point infinitely distant; and the bearing of an infinite leg, is found by seeking the position of a right line parallel to the tangent, when the point of contact is infinitely remote: for this line tends the same way towards which the infinite leg is directed.

Reduction of CURVES of the second kind.—Sir Isaac Newton reduces all curves of the second kind to four cases of equations: in the first, the relation between the ordinate and abscisse, making the abscisse x , and the ordinate y , assumes this form $xy^2 + ey = ax^2 + bx^2 + cx + d$. In the second case, the equation assumes this form $xy = ax^2 + bx^2 + cx + d$. In the third case, the equation is $y = ax^2 + bx^2 + cx + d$. In the fourth, the equation is of this form, $y = ax^2 + bx^2 + cx + d$.

Enumeration of the CURVES of the second kind.—Under these four cases, the same author brings a vast number of different forms of curves, to which he gives different names.

A hyperbola lying wholly within the angle of the asymptotes, like a conic hyperbola, he calls an *inscribed hyperbola*; that which cuts the asymptotes, and contains the parts cut off within its own periphery, a *circumscribed hyperbola*; that, one of whose infinite legs is inscribed, the other circumscribed, he calls *ambigenous*; that whose legs look towards each other, and are directed the same way, *converging*; that where they look contrary ways, *diverging*; that where they are convex different ways, *cross-legged*; that applied to its asymptote with a concave vertex and diverging legs, *conchoidal*; that which cuts its asymptote with contrary flexures, and is produced each way into contrary legs, *anguineous*, or *snake-like*; that which cuts its conjugate a-crofs, *cruciform*; that which returning around cuts itself, *nodated*; that whose two parts concur in the angle of contact, and there terminate, *cuspidated*; that whose conjugate is oval, and infinitely small, *i. e.* a point, *pointed*; that which from the impossibility of its two roots, is without either oval, node, cusp, or point, *pure*: and in the same manner he denominates a parabola, to be *converging*, *diverging*, *cruciform*, &c. Where the number of hyperbolic legs, exceeds that of the conic hyperbola; he denominates the *hyperbola redundant*.

Now, the various curves which he enumerates under these four cases, are in number 72; whereof nine are *redundant* hyperbolas, without diameters, having three asymptotes including a triangle, the first consisting of three hyperbolas, one *inscribed*, another *circumscribed*, another *ambigenous*, with an oval; the second *nodated*; the third *cuspidated*; the fourth *pointed*; the fifth and sixth *pure*; the seventh and eighth *cruciform*; the last *anguineal*. There are twelve *redundant* hyperbolas, having only one diameter: the first oval, the second *nodated*, the third *cuspidated*, the fourth *pointed*; the fifth, sixth, seventh, and eighth, *pure*; the ninth and tenth *cruciform*; the eleventh and twelfth *conchoidal*. Two are *redundant* hyperbolas, with three diameters.

Nine are *redundant* hyperbolas, with three asymptotes converging to a common point; the first formed of the fifth and sixth *redundant* parabolas, whose asymptotes include a triangle; the second, of the seventh and eighth; the third and fourth, of the

ninth; the fifth is formed of the fifth and seventh of the redundant hyperbolas, with one diameter; the sixth, of the sixth and seventh; the seventh, of the eighth and ninth; the eighth, of the tenth and eleventh; the ninth, of the twelfth and thirteenth: all which conversions are effected, by distinguishing the triangle comprehended between the asymptotes, till it vanish into a point. Six are defective parabolas, having no diameters: the first *oval*, the second *nodated*, the third *cuspidated*, the fourth *pointed*, the fifth *pure*. Seven are defective hyperbolas, having diameters: the first and second *conchoidal*, with an *oval*; the third *nodated*, the fourth *cuspidated*, which is the cissoid of the antients; the fifth and sixth *pointed*, the seventh *pure*. Seven are parabolic hyperbolas, having diameters: the first *oval*, the second *nodated*, the third *cuspidated*, the fourth *pointed*, the fifth *pure*, the sixth *cruciform*, the seventh *anguineus*. Four are parabolic hyperbolas. Four are hyperbolisms of the hyperbola. Three hyperbolas of the ellipsis. Two hyperbolisms of the parabola. Five are diverging parabolas: one, a *trident*, the second *oval*, the third *nodated*, the fourth *pointed*, the fifth *cuspidated*; (this is Neil's parabola, usually called the *semicubic parabola*;) the sixth, *pure*.

Organical description of CURVES.—10. If two angles given in magnitude, P A D, P B D, (Tab. *Geometry*, fig. 53.) revolve round poles given in position, A and B; and their legs, A P, B P, with their point of concurrence, P, pass over another right line: the other two legs A D, B D, with their point of concurrence D, will describe a conic section passing through the poles A, B: unless that line happen to pass through either of the poles A or B; or unless the angles B A D and A B D vanish together: in which cases, the point will describe a right line.

2^o. Now, if the legs, A P, B P, by their point of concurrence, P, thus describe a conic section passing through one of the poles, A; the other two, A D, B D, with their point of concurrence D, will describe a curve of the second kind, passing through the other pole B, and having a double point in the first pole A: unless the angles B A D, A B D, vanish together; in which case, the point D will describe another conic section, passing through the pole A.

3^o. If the conic section described by the point P, pass through neither of the poles A, B; the point D will describe a curve of the second or third kind, having a double point: which double point will be found in the concurrence of the describing legs A D, B D, when the two angles B A P, A B P, vanish together. The curve described will be of the second kind, when the angles B A D, A B D, vanish together; otherwise of the third kind, having two other double points in the poles A and B.

With regard to double points of curves: we have observed that curves of the second kind may be cut by a right line in those points: now two of these sometimes coincide, v. gr. when the right line passes through an infinitely small oval; or through the concurrence of two parts of a curve, mutually cutting each other, and uniting in a cusp. Sometimes all the right lines only cut the curve in one point; as in ordinates of the cartesian and cubic parabola, &c. In which case, we must conceive the right lines passing through two other points of the curve, placed, as it were, at an infinite distance: two of these coincident intersections, whether at a finite or infinite distance, make what we call a double point.

Genesis of CURVES of the second order by shadows.—If the shadows of figures be projected on an infinite plane, illuminated by a lucid point; the shadows of conic sections will still be conic sections; those of curves of the second kind, will be curves of the second kind; those of the third kind, curves of the third kind, &c. And as a circle, in projecting a shadow, generates all the conic sections; so, the five diverging parabolas, with their shadows, generate and exhibit all other curves of the second kind. And in this manner may a train of simple curves of other kinds be found, which shall form all the other curves of the same kind, by their shadows projected from a lucid point, upon a plane.

Description of CURVES of the second order, having double points.—These are all described from seven given points, whereof one is the double point itself: thus, let there be given any seven points of the curve to be described; as, v. gr. A, B, C, D, E, F, G, (Tab. *Geometry*, fig. 54.) whereof A is the double point: join the point A, and any other two points, v. gr. B and C; and let the angle C A B of the triangle A B C, revolve about its vertex A; and another of the angles A B C, about its vertex B. And when the point of concurrence C, of the legs A C, B C, is successively applied to the four other points, D, E, F, G, let the concurrence of the remaining legs A B and B A, fall on the four points P, Q, R, S.

Through those four points, and the fifth A, describe a conic section; and let the forementioned angles C A B, C B A, so revolve, as that the point of concurrence of the legs A B, B A, may pass over that conic section; and the concurrence of the other legs A C, B C, will describe the proposed curve.

Use of these CURVES in the construction of equations.—The use of curves in geometry is, by means of the intersections thereof, to solve problems. See CONSTRUCTION.

Suppose, v. gr. an equation to be constructed of nine dimensions, as $x^9 + b x^8 + c x^7 + d x^6 + e x^5 + f x^4 + g x^3 + h x^2 + k x + l = 0$; where $b, c, d, \&c.$ signify any given quantities affected with the signs + and -; assume the equation to a cubic parabola $x = y$; and the first equation, writing y for x^3 will come out $y^3 + b y^2 + c y + d y^2 + e x y + f x y + g x^2 + h x + k = 0$; an equation to another curve of the second kind, where m or f may be assumed or annulled at pleasure. And by the descriptions and intersections of these curves will be given the roots of the equation to be constructed. It is sufficient to describe the cubic parabola once. If the equation to be constructed, by omitting the two last terms $h x$ and k , be reduced to seven dimensions; the other curve, by expunging m , will have the double point in the beginning of the abscissa, and may be easily described as above: if it be reduced to six dimensions, by omitting the three last terms, taking $g x^2 + b x + k$; the other curve, by expunging f , will become a conic section: and if, by omitting the three last terms, the equation be reduced to three dimensions, we shall fall on Dr. Wallis's construction by the cubic parabola and right line.

Rectification of a CURVE, denotes the finding a right line equal to a curve. For the praxis hereof, see RECTIFICATION of curves.

Inflexion of a CURVE. See the article INFLECTION.

Quadrature of a CURVE, the finding the area, or space included by a curve; or the assigning a square equal to a curvilinear space.

Family of CURVES, is an assemblage of several curves of different kinds, all defined by the same equation of an indeterminate degree; but differently, according to the diversity of their kind. E. gr. Suppose an equation of an indeterminate degree, $a^m - x^m = y^n$. If $m = 2$, then will $a^2 = x^2 + y^n$; if $m = 3$, then will $a^3 = x^3 + y^n$; if $m = 4$, then will $a^4 = x^4 + y^n$, &c. All which curves are said to be of the same family, or tribe.

The equations whereby the families of curves are defined, are not to be confounded with the transcendental ones; for though, with regard to the whole family, they be of an indeterminate degree, yet, with respect to each several curve of the family, they are determinate; whereas transcendental equations are of an indefinite degree, with respect to the same curve.

All algebraic curves, therefore, compose a certain family, consisting of innumerable others; each whereof comprehends infinite kinds. For since the equations whereby the curves are defined enter the facta, either of the powers of the abscissas and semiordinates into the given coefficients, or of the powers of the abscissas into the powers of the semiordinates, or of the mere given quantities; and all equations may be equal to nothing, (v. gr. if $a x = y^2$, then $a x - y^2 = 0$); the equation for all algebraic curves will be $a^m + b x^n + c y^p + d f = 0$.

Causitic CURVE. } See the articles { CAUSTIC.

Diacaustic CURVE. } See the articles { DIACAUSTIC.

Exponential CURVE, is that defined by an exponential equation; that is, by an equation wherein is an exponential quantity, v. gr. $x^x, a^x, \&c.$

The symptoms, properties, genesis, &c. of particular curves, v. gr. the cycloid, logarithmic curves, conchoid, &c. see under their proper heads, CYCLOID, LOGARITHMIC, CONCHOID, &c.

Radial CURVES. } See { RADIAL.

Regular CURVES. } See { REGULAR.

Characteristic triangle of a CURVE. } See { CHARACTERISTIC.

CURVET, in the manage. See COURVET.

CURVILINEAR, or CURVILINEAL figures, in geometry, are spaces bounded by crooked lines; as the circle, ellipsis, spherical triangle, &c.

CURVILINEAR angle. } See the articles { ANGLE.

CURVILINEAR superficies. } See the articles { SUPERFICIES.

CURULE chair, sella CURULIS, in antiquity, a high ivory chair, wherein certain of the Roman magistrates had a right to sit. The curule magistrates were the aediles, pretors, consors, and consuls.

The senators who had born these charges, were carried to the senate on curule chairs; as also those who triumphed: the chair being fitted into a kind of chariot, curvus; whence the origin of the word curulis.

The curule chair is used on medals, to express a curule magistracy: when traversed by a halia, it is the symbol of Juno, and serves to express the conservation of princepses.

CURULE statues. See the article STATUE.

CUSP, cuspis, properly denotes the point or a spear, or sword; but is used in astronomy, to express the points of horns of the moon, or other luminary.

In astrology, CUSP is used for the first point of each of the twelve houses, in a figure, or scheme of the heavens. See HOUSE.

CUSPIDATED, in botany, is when the leaves of a flower end in a cusp, or point, resembling that of a spear.

CUSPIDATED hyperbola, &c. See CURVE.

CUSTODE admittendo, and CUSTODE amovendo, are writs for the admitting, or removing of guardians.

CUSTODES libertatis anglie, auctoritate parlamenti, was the style or title in which writs, and other judicial proceedings, did run in the time from the death of king Charles I. till Oliver was declared protector, &c.

CUSTODIA. See RECTO de custodia terre & hereditatis. He-

Haec de deliberando alii qui habet CUSTODIAM terræ. See HÆREDE.

CUSTOM is used to denote the manners, ceremonies, or ways of living of a people, which in time have turned into habit, and by usage obtained the force of laws.

In this sense, *custom* implies things that were at first voluntary, but are become necessary by use: thus, the presents made by officers at their admission into posts, are only due because they have passed into *custom*.

CUSTOM also signifies the doing, or not doing, certain things, introduced by the greatest part of the people of a country, or province.

If there be nothing evil in such *custom*, it obliges, till it be either abrogated by a contrary *custom*, or a law.

For a *custom* thus established to have the force of a law, it is necessary, ordinarily, that it be founded on some natural equity, or some considerable good; and that it have subsisted *ultra tritavum*: but, as this is hard to prove, it is sufficient if two or more witnesses depose they heard their fathers say the same of their time. If it be matter of record, the continuance of 100 years is sufficient.

The effect of a *custom* thus circumstantiated, is, that it has the same force and authority as a law; making what we call *lex non scripta*; and that in popular states and limited monarchies, it serves to interpret the written laws: for in absolute monarchies, it is the king alone has the power of interpreting laws. Hence, the word *custom* is still retained, and serves to express the particular rights and municipal laws established by usage in particular provinces, &c. after they are reduced into written laws.

In this sense, most of the common law of England is *lex non scripta*; being originally no more than the *customs* of our forefathers.

Lex non scripta, in this sense, is used in opposition to *statutes* or *acts of parliament*; which commence laws at once.

Cowel distinguishes *custom* from *prescription*, in that the former is more general, and relates to several persons; whereas the latter is usually confined to this or that man. Five years time, too, are ordinarily sufficient for prescription, whereas for *custom* there are required 100.

Customs are real things, and are included within their limits or territories: they are either *local*, i. e. restrained to this or that place, or *general*.

The *custom* of Paris, serves as a rule for all the other places of France; where they have no provisions contrary thereto.

The Romans were governed by *customs*, or unwritten laws, after the expulsion of their kings.

Cæsar observes, that the Gauls had their *customs*, which they constantly retained; and that it was impossible for the Romans to govern them by any other laws: so that it was only the provinces bordering on Italy that received the Roman laws.

Dover by CUSTOM. } See the articles { **DOWER.**

Suit CUSTOM. } See the articles { **SUIT.**

CUSTOMS, in commerce, the dues, duties, or tolls, paid by merchants to the king, for carrying out, and bringing in of merchandizes.

The *customs* of goods exported and imported, throughout England, amount yearly to 1300000 pounds; whereof those of the port of London make a third part.

The *customs* in England are very numerous, and very high; perhaps beyond what any other trading nation knows: the principal are duties of *turnage* and *pondage*, which are very ancient, being the only ones in use before the time of king Charles II. But that prince, and his successors, have introduced divers others: at present, the *customs* on liquors are, *turnage*, the *additional* duty, the duty of *excise*, *coinage*, duty of the *old imposition*, duty of the *additional imposition*, duty of *orphans money*, duty on French *wines*, *new subsidy*, $\frac{1}{2}$ and $\frac{2}{3}$ of *subsidies*.

For other merchandizes, the duties are, *pondage*, the *additional* duty on silks and linens, *new imposition* of *pondage*, another of $\frac{1}{4}$; a duty of 25 per cent. on French commodities; the *new subsidy* of *pondage*, in 1697; an *additional subsidy* of $\frac{1}{4}$ of *pondage* in 1703; a third in 1704; a duty on *silk* and *oils*, another on *leathers*, another on *paper*, *soap*, &c. See these described more at large under the article **DUTY**; see also **TUNNAGE**, **POUNDAGE**, &c.

CUSTOM-HOUSE, an office established on the frontiers of a state, or in some chief city, or port, for the receipt of the *customs* and duties of importation and exportation, imposed on merchandizes, by the authority of the sovereign, and regulated by tariffs, or books of rates.

There are several *custom-houses* in the several ports of England: the most considerable is that of London.—It is under the direction of seven commissioners appointed by patent; who have the charge and management of all the *customs* (the petty-farms alone excepted) in all the ports of England.

Other officers are, a *secretary*, *solicitor*, *receiver-general*, *comptroller* of the issues and payments of the receiver-general, *comptroller-general*, *inspector* of the out-port collectors accounts, *inspector-general* of the exports and imports, *register-general* of all ships of Great-Britain, *surveyor-general*, *surveyor* of the out-

ports, *register* of the seizures, &c. all holding their places by patents: with other inferior officers, appointed by warrant from the board of treasury.

CUSTOMARY tenants, **CUSTOMARII**, or *tenentes per consuetudinem*, are such tenants as hold by the custom of the manor as their special evidence.

These were antiently bondmen, or those that held *tenura bondagii*.—*Et omnes illi qui tenerint in bondagii tenura, solent vocari customarii.*—MS. de consuetud. man. de Sutton Colfield, de anno 3 Edw. II.

CUSTOS brevium, a clerk, belonging to the court of common pleas; whose office is to receive, and keep all the writs, and put them upon files; every return by itself; and at the end of each term to receive of the prothonotaries all the records of the nisi prius, called the *poslea*.

The writs are first brought in by the clerks of assize of every county to the prothonotary who entered the issue in that matter, to enter judgment. Four days after the return, the prothonotary enters the verdict, and judgment thereupon, into the rolls of the court; and then delivers them over to the *custos brevium*.

The *custos brevium* also makes entry of writs of covenant, and concords on fines; and makes copies and exemplifications of all writs and records in his office, and of all fines levied: the fines, when engrossed, are divided between the *custos brevium* and chirographer; the former keeping the writ of covenant and the note, the latter the concord, and foot of the fine.

In the court of the king's-bench, there is likewise a *custos brevium* & *rotulorum*, who files such writs as are there used to be filed, and all warrants of attorney; and transcribes or makes out records of nisi prius, &c.

CUSTOS rotulorum, he who has the custody of the rolls, or records of the sessions of peace; and some say, of the commissions of peace itself.

He is always a justice of peace, and quorum, in the county where he hath his office; and by his office appears to be rather a minister than a judge: for that the commission of the peace, by express words, lays this special charge upon him, *Quod ad dies & loca prædicta, brevia, præcepta, processus, & inditamenta prædicta coram te & dilectis sociis tuis venire facias.*

CUSTOS spiritualium, he who exercises spiritual or ecclesiastical jurisdiction in any diocese, during the vacancy of the see.

This, by the canon law, belongs to the dean and chapter; but in England, to the archbishop of the province, by prescription: though, divers deans and chapters do challenge it by ancient charters, from kings of this land.

CUSTOS temporalium, the person to whose custody a vacant fee was committed by the king, as supreme lord; who, as a steward of the goods and profits, was to give an account to the exchequer, and he into the exchequer.

His trust continued till the vacancy was supplied by a successor, who obtained the king's writ *de restitutione temporalium*; which was commonly after consecration, but sometimes before.

CUT a feather, in the sea language, is when a well-bowed ship so swiftly presses the water, that it foams or froths.

To *cut the sail*, is to unfurl it, and let it fall down.

CUT bastion. } See the articles } **BASTION.**

CUT rafter. } See the articles } **ROOF.**

CUT-Water, the sharpness of the head of a ship under the beak.

See **SHIP**.

CUTANEOUS, something that concerns the cutis or skin; whether in the way of distemper or remedy.

Thus, we say, *cutaneous eruptions*; the itch is a *cutaneous disease*.

CUTICULA, **CUTICLE**, in anatomy, a thin, pellucid membrane, void of sense; serving as a cover to the cutis or skin.—See *Tab. Anatomy*, (Myol.) fig. 9.

The *cuticle* is that first, and outermost covering of the body, called also *epidermis*, but more commonly the *scarf-skin*; or that soft tegument which rises in a blister upon a burn, or the application of a cautery.

It sticks close to the surface of the cutis, or true skin, to which it is also tied by the vessels that feed it; though these are so small as not to be seen.

When examined by a microscope, it appears to consist of several layers of exceeding small scales, which cover one another, more or less, according to its different thickness, in the several parts of the body; and in the lips, where the scales appear plainest because the skin is thinnest, they do little more than barely touch.

These scales are either the excretory ducts of the glands of the cutis; as is the case apparently in fishes; or else the glands have their tubes, opening between the scales. See **MILIARY gland**.

Leeuwenhoek reckons, that in one *cuticular* scale there may be 500 excretory ducts; and that a grain of sand will cover 250 scales: so that one grain of sand will cover 1250000 pores or orifices, through which we daily perspire.

Yet, notwithstanding the exceeding porosity of the *cuticle*, it obstructs a great part of the ferous humours which would otherwise be evacuated by the glands of the cutis; as is evident from that plentiful discharge consequent on the application of a blister

blister, or other accident, whereby the *cuticula* is removed, and the *cutis* bared.

The scales are often glued together by the grosser parts of our insensible transpiration hardening upon them by the heat of the body, which carries off the more volatile particles; and in this is supposed to consist that indisposition we popularly call a *colla*.

The humour which is thenceforward separated by the glands of the skin, being pent in between the scales, causes frequent itching; and where the matter has been long pent up, small pimples, and other foulnesses: for removing of which, nature directs to those wholesome remedies of frequent rubbing, washing, or bathing.

Some imagine the *cuticle* to be form'd from the grosser parts of the excrementitious ferous humour, eliminated through the pores of the *cutis*, and condensed on the surface; like the pellicle which appears, upon evaporation, on the surface of the serum of the blood: but Leewenhoeck, with more probability, takes it to be from an expansion of the excretory ducts of the glands of the skin.

Its use is to defend the *nerve* of the *cutis*, which are the origin of the *sense of feeling*, from the injuries of rough and hard bodies, as well as the air: for either of those would make too exquisite and painful an impression on the naked nerves; or the air would dry them, so as that they would be less susceptible of the nicer touches of pleasure.

Riolanus, and several others, maintain that the *cuticula* of women has no pores: Molinette argues the contrary from their sweating; but maintains, withal, that this is true of dogs and cats, which never sweat, how much soever fatigued.

CUTICULARES *carunculae*. See *CARUNCULÆ cuticulares*.

CUTIS, in anatomy, the *skin*; a reticular plexus, or body of vessels, immediately under the *cuticle*, or *scarf-skin*.—See *Tab. Anat. (Myol.) fig. 8.*

The vessels of the *cutis* contain a mucous liquor; from the tincture of which, Malpighi, and others, take the colour of the skin to be derived; founded on this, that the *cutis*, as well as *cuticle* of blacks is white, and the blood red, &c. and that the only thing they have peculiar in this part, is the colour of this liquor.

The *cutis* consists of fibres of its own; or, according to Steno, is formed out of the productions of the tendons of the subjacent parts: which terminate in an infinite number of pyramidal papillæ, interwoven with innumerable nervous fibres, and other vessels, forming what we call a *parenchyma*. See *PARENCHYMA*.—It is by means of these papillæ that the *cutis* becomes the organ of feeling.

The *cutis* is generally connected to the subjacent parts by the *membrana adiposa*, and its proper vessels, the veins, arteries, nerves, &c. Its use, is to wrap up and cover the whole body; to be a general emundatory for the matter of perspiration; and to be the organ of feeling.

The diseases of the *cuticula* and *cutis*, are the *itch*, *leprosy*, *small-pox*, *measles*, *scarlet fever*, and *erysipelatous inflammations*.

CUTTER of the tallies, an officer of the exchequer, who provides wood for the tallies, and cuts the sum paid upon them. See *TALLY*.

CUTTING, a term used in various senses, and various arts; in the general, it implies a division or separation.

CUTTING, is particularly used in heraldry, where the shield is divided into two equal parts, from right to left, parallel to the horizon, or in the fesse-way.

The word is also applied to the honourable ordinaries, and even to animals, and moveables, when they are divided equally the same way; so, however, as that one moiety is colour, the other metal.—The ordinaries are said to be *cut*, *couped*, when they do not come full to the extremities of the field.

CUTTING, lithotomy, in chirurgery, denotes the operation of extracting the stone out of the bladder by section. See *STONE*.

It appears, that *cutting* was in use for the stone, even in the time of Hippocrates; though we are perfectly in the dark as to the manner in which they performed it: it was, however, wholly disused in the after-ages; inasmuch, that in the beginning of the sixteenth century, there was no body durst practise it. The faculty of medicine at Paris were obliged to petition the parliament, to obtain leave to make a trial on a criminal condemned to death, who had the stone in the bladder: the operation succeeding, the practice became popular.

There are three principal ways of performing the operation; the *apparatus minor*, *apparatus major*, and *apparatus altus*; or the *low*, *lateral*, and *high operations*. The method of performing each, see under the article *LITHOTOMY*.

CUTTING-GLASS, in chirurgery. See *CUPPING-GLASS*.

CUTTING, in coinage. When the laminae, or plates of the metal, be it gold, silver, or copper, are brought to the thickness of the species to be coined, pieces are *cut out*, of the thickness, and nearly of the weight of the intended coin; which are now called *planchets*, till the king's image have been stamped on them.

The instrument wherewith they *cut*, consists of two pieces of steel, very sharp, and placed over one another; the lower a

little hollow, representing a mortar; the other a pestle.—

The metal put between the two, is *cut out* in the manner described under the article *COINAGE*.

Note, Medallions, where the relief is to be great, are not *cut*, but cast, or moulded.

CUTTING, in the manage, is when the horse's feet *interfere*; or when with the shoe of one foot he beats off the skin from the pastern joint of another foot.

This is more frequent in the hind feet than the fore: the causes are either weariness, weakness in the reins, not knowing how to go, or ill shoeing.

CUTTING, in painting, the laying one strong lively colour over another, without any shade or softening.—The *cutting* of colours has always a disagreeable effect.

CUTTING in wood, a particular kind of sculpture, or engraving; denominated from the matter wherein it is employed.

It is used for various purposes; as, for initial or figured letters, head and tail-pieces of books; and even for schemes and other figures, to save the expences of engraving on copper: and for prints, and stamps for paper, callicoes, linnens, &c.

The invention of *cutting in wood*, as well as that in copper, is ascribed to a goldsmith of Florence; but it is to Albert Durer, and Lucas, they are both indebted for their perfection.

One Hugo de Carpi invented a manner of *cutting in wood*, by means whereof, the prints appeared as if painted in chiar-obscure: In order to this, he made three kinds of stamps for the same design; which were drawn, after one another, thro' the press for the same print: they were so conducted, as that one served for the grand lights, a second for the demi-tints, and a third for the outlines, and the deep shadows.

The art of *cutting in wood*, was certainly carried to a very great pitch about 150 years ago; and might even vie, for beauty and justness, with that of engraving in copper: at present it is in a low condition, as having been long neglected, and the application of artists wholly employed on copper, as the more easy and promising province: not but that wooden *cuts* have the advantage of those in copper on many accounts; chiefly for figures and devices in books; as being printed at the same time, and in the same press as the letters: whereas, for the other, there is required a particular impression.

The *cutters in wood* begin with preparing a plank or block, of the size and thickness required, and very even and smooth on the side to be *cut*: for this, they usually take pear-tree, or box; though the latter is the best, as being the closest, and least liable to be worm-eaten.

On this block they draw their design with a pen, or pencil, just as they would have it printed. Those who cannot draw their own design, as many there are cannot, make use of a design furnished them by another; fastening it upon the block with paste made of flower and water, with a little vinegar; the strokes or lines turned towards the wood:

When the paper is dry, they wash it gently over with a sponge dipped in water; which done, they take off the paper by little and little, still rubbing it a little first, with the tip of the finger; till at length there be nothing left on the block, but the strokes of ink that form the design, which mark out so much of the block as is to be spared, or left standing.

The rest they *cut off*, and take away very carefully with the points of very sharp knives, or little chisels, or gravers, according to the bigness or delicacy of the work; for they need no other instruments.

CUTTINGS, or *slips*, in gardening, the branches or sprigs of trees, or plants, *cut* or slipped off to set again; which is done in any moist, fine earth.

The best season is from August to April; but care is to be taken; when it is done, the sap be not too much in the top, lest the cut die ere that part in the earth have root enough to support it: nor yet must it be too dry, or scanty; the sap in the branches assisting it to take root.

In providing the *cuttings*, such branches as have joints, knots, or burrs, are to be *cut off* two or three inches beneath them, and the leaves to be stripped off so far as they are set in the earth. Small top-branches, of two or three years growth, are fittest for this operation. See *Supplement, article CUTTINGS*.

CUVETTE. See the article *CUNETTE*.

CYCLE, in chronology, a certain period, or series of numbers proceeding orderly from first to last, and recurring again from last to first; successively, and without interruption. See *PERIOD*.

The origin of *cycles* was thus: the apparent revolution of the sun round the earth, has been divided, arbitrarily, into 24 hours; the basis or foundation of all our mensuration of time. Civil use knows none but hours; or rather, multiples of hours, as days, and years. But neither the annual motion of the sun, nor that of the other heavenly bodies, can be measured exactly, and without any remainder, by hours, or their multiples. That of the sun, *v. gr.* is 365 days, five hours, forty-nine minutes, nearly; that of the moon twenty-nine days, twelve hours, forty-four minutes.

Hence, to swallow up these fractions, in whole numbers, and yet in numbers which only express days and years, *cycles* have been invented:

invented: which comprehending several revolutions of the same body, replace it, after a certain number of years, in the same points of the heaven, whence it first departed; or, which is the same thing, in the same place of the civil calendar.

Such is the famous *cycle* of 19 years, called also the *CYCLE of the moon*, or *lunar CYCLE*, a period of 19 solar years; equivalent to 19 lunar years, and seven intercalary months: in which time, the new and full moons are supposed to return to the same day of the Julian year.

This is also called the *metonic period*, from its inventor Meton, the Athenian; and the *golden number*.—Though, in propriety, the golden number is rather the particular number which shews the year of the lunar cycle, which any given year is in.—This cycle of the moon only holds true for 312 years: for, though the new moons do return to the same day after 19 years; yet not to the same time of the day, but near an hour and a half sooner: which error, in 312 years, amounts to an entire day.

Yet, those employed in reforming the calendar, went on a supposition of the lunations returning precisely from 19 years to 19 years, for ever.

The use of this cycle in the ancient calendar, is to shew the new moon of each year, and the time of Easter. In the new one, it only serves to find the epacts; which shew, in either calendar, that the new moons fall eleven days too late. As the orientals began the use of this cycle at the time of the council of Nice; they assumed, for the first year of the cycle, the paschal new moon to fall on the 14th of March: on which foot, the lunar cycle three, fell on the first of January, in the third year.

The occidentals, on the contrary, put the number one to the first of January, which occasioned a considerable difference in the time of Easter: hence, Dionysius Exiguus, upon framing a new calendar, persuaded the christians of the West to waive the difference, and come into the practice of the church of Alexandria.—To find the year of the lunar CYCLE, is to find the golden number. See GOLDEN NUMBER.

CYCLE of indictions, is a series of 15 years, returning constantly around, like the other cycles; and commencing from the third year before Christ.

When this cycle of indictions was first set on foot among the Romans, and for what end; is much controverted among chronologers. Petavius leaves it as a thing not to be ascertained. The most probable opinion is, that it was received about the year 312, after the time of Constantine.

To find the cycle of indiction for any given year; add three to the given year, and divide the sum by 15, the remainder is the cycle of indiction.—If there be no remainder the indiction is 15.

CYCLE of the Sun, or solar CYCLE, a revolution of 28 years; beginning with one, and ending with 28; which elapsed, the dominical and Sunday-letters, and those that express the other feasts, &c. return into their former place, and proceed in the same order as before.

It is called *solar cycle*, not with regard to the sun's course, which has nothing to do herein; but from Sunday, anciently called *dies solis*, the day of the sun: in regard, it is the dominical letter is principally fought for from this revolution; the dominical letters, which are the first in the alphabet, having been substituted in lieu of the nundinal letters of the Romans.

The reformation of the calendar under Pope Gregory, occasioned a considerable alteration of this cycle: in the Gregorian calendar, the solar cycle is not constant and perpetual; by reason every fourth secular year is common; whereas, in the Julian it is biffextile. The epocha, or beginning of the solar cycle, both Julian and Gregorian, is the ninth year before Christ.

To find the cycle of the sun for any given year; add nine to the number given, and divide the sum by 28; the number remaining will be the number of the cycle, and the quotient the number of revolutions since Christ.

If there be no remainder, it will be the twenty-eighth, or last year of the cycle.

CYCLE of the Sun in Julian Years.														
1	G	F	5	BA	9	DC	13	FE	17	AG	21	CB	25	ED
2	E	6	G	10	B	14	D	18	F	22	A	26	C	
3	D	7	H	11	A	15	C	19	E	23	G	27	B	
4	C	8	E	12	G	16	B	20	D	24	F	28	A	

CYCLE of the Sun from the Gregorian Year 1700, to the Year 1800.																				
1	D	U	5	F	E	9	A	G	13	C	B	17	E	D	21	G	F	25	B	A
2	B	6	D	10	F	14	A	18	C	22	E	26	G							
3	A	7	C	11	E	15	G	19	B	23	D	27	F							
4	G	8	B	12	D	16	F	20	A	24	C	28	E							

CYCLE, it may be observed, is not only applied in general, to all the numbers that compose the series; but to each number in particular: thus, we compute, that the ordinary epocha from the birth of Jesus Christ, had the solar cycle 10; the lunar cycle, or the golden number 2; the dominical letter B, and the cycle of indiction 4.

CYCLISCUS, (from κυκλῶ, circular;) an instrument in form of an half-moon; used by the surgeons to scrape the skull, in fractures of that part.

CYCLOID, in geometry, one of the mechanical, or, as others term them, transcendental curves; called also the *trochoid*. It is described by the motion of a point A, (Tab. Geometry, fig. 55.) in the periphery of a circle; while the circle makes a revolution along the right line A P.

Hence, the properties of this curve, viz. that the right line A E is equal to the periphery of the circle A B C D; and A c to the semi-periphery; and in any situation of the generating circle, the right line A d is equal to the arch D d.—Again, a d being parallel to A c; A d is equal to the arch of the generating circle d F.—Further, the whole length of the cycloid is four times that of the diameter of the generating circle; and the cycloidal space comprehended between the curve and the subtense A E, is triple the area of the generating circle.—Lastly, any part divided from the vertex, as F I, is every where double the chord of the circle F b; and the tangent thereof G I, perpetually parallel to the same chord F b.

The genesis of the CYCLOID, may be conceived by imagining a nail in the circumference of a wheel: the line which the nail describes in the air, while the wheel revolves on a right line, is the cycloid.

The cycloid is reputed a modern curve, and its invention ascribed by some to Merfenne; by others to Galileo: but Dr. Wallis shews it of an older standing, and to have been known to Bovillus, about the year 1500; and even considered by cardinal Cusanus much earlier, viz. before the year 1451.

M. Huygens has demonstrated, that from whatever point, or height, a heavy body, oscillating on a fixed centre, (p. g. a pendulum) begins to descend; while it continues to move in a cycloid, the times of its falls, or oscillations, will be equal to each other. This property M. Fontenelle states thus: the nature of the cycloid is such, that, if a body which describes it, fall from a greater height, and by that means acquire a certain augmentation of velocity, as in Galileo's theory the greater cycloidal arch which it describes, takes up precisely that excess of velocity. So that the body does not describe it, either sooner for its being accelerated, or later for having a greater space to move: and hence arises an equality in time, notwithstanding the inequality of arches.

On this foundation it is, that the pendulum-clock is built: on the subject whereof, the fame M. Huygens has wrote a large volume, under the title of *horologium oscillatorium*. See PENDULUM; see also OSCILLATION.

CYCLOIDAL space, the space contained between the cycloid, and the subtense thereof.

CYCLOMETRY, the art of measuring cycles, or periods.

CYCLOPÆDIA, κυκλοπαιδεια, the circle, or compass of arts and sciences: more ordinarily called *encyclopaedia*.

- The word *cyclopædia* is not of classical authority, though frequent enough among modern writers, to have got into several of our dictionaries. Some make it a crime in us to have called the present work by this name; not considering, that names and titles of books, engines, instruments, &c. are in great measure arbitrary, and that authors make no scruple even of coining new words on such occasions, when there are no old ones to their mind. Thus it is Dr. Hook calls his fine book of microscopical observations, *Micrographia*, Wolfius his book on the air, *Aerometria*, Drake his book of anatomy, *Anthropologia*, &c. all of them words of modern, if not their own fabric: and on no better authority stand the names of half our later inventions, as *Microscope*, *Telescope*, *Barometer*, *Thermometer*, *Micrometer*, &c.—But it is suggested, the word *cyclopædia* is ambiguous, and may denote the science of a circle, as well as the circle of sciences: we answer, that as custom, the only sovereign rule of language, has determined the word to the latter sense, it is no more chargeable with ambiguity than a thousand other words of received use; no more, for instance, than *micrometer*, which might either denote a little measure, or a measure of little things.

CYDER. See the article CIDER.

CYDER vinegar. See the article VINEGAR.

CYDONITES vinum. See the article VINUM.

CYGNUS, or **CYGNUS**, the swan, in astronomy, a constellation of the northern hemisphere, between Lyra and Cepheus. See CONSTELLATION.

The stars in the constellation *cygnus*, in Ptolemy's catalogue are 17; in Tycho's 19; in the Britannic catalogue 107. The order, names, longitudes, latitudes, magnitudes, &c. whereof, are as follow.

	Names and Situations of the Stars.		Longitude.	Latitude.	Magn.		
	Sign.	North.	°	'			
Preced. of two towards the harp	♊	20	54	46	66	13	6
Subseq. and more north	♊	25	41	28	68	49	57
In the extremity of the north, wing	♊	10	38	18	73	50	11
That preced. the bill towards the fo.	♊	23	47	46	47	44	20
Preced. the bill towards the fourth	♊	25	18	47	50	57	30

Names and Situations of the Stars.	Signs	Longitude.	Latitude North.	Mag.
	° ' "	° ' "	° ' "	
	0	24 16 45	46 25 40	6
		28 51 20	57 20 44	6
That below the bill		25 12 34	45 54 20	4
		25 16 24	45 59 22	6
In the bill		26 55 37	49 0 31	3 4
	♈	13 40 9	72 10 51	6
	♉	29 55 54	55 14 20	6
	♊	13 42 43	71 28 38	4
Middle of 3 in the north. wing		2 38 16	57 23 36	6
		0 36 19	50 39 38	5
In the head		14 22 42	69 37 56	4
		7 54 44	62 42 5	6
South. of 3 in the north. wing		0 18 38	46 10 32	6
		5 50 43	57 15 9	6
Preced. in the inside of the no. wing.		17 1 8	69 30 50	6
		4 36 37	53 42 33	5
Preced. in the neck		11 57 17	64 27 14	3 4
In the angle of the north. wing		1 28 49	42 41 50	4 5
		8 53 22	58 7 12	6
		2 43 29	43 58 26	4 5
		24 13 58	70 53 46	5 6
North of the middle stars in the wing		8 37 28	54 18 48	4
In the middle of the neck		10 31 20	57 31 43	6
		4 7 19	42 40 56	5
		25 11 36	74 10 15	6 7
		25 9 41	69 59 55	5
South. of the middle stars in the wing		6 31 37	47 1 43	4 5
		10 58 10	55 54 29	6
		5 39 1	44 15 50	5
Last of those in the north. wing		23 44 12	67 33 40	6
		6 36 40	42 41 12	4 5
Preced. in the rise of the neck		12 30 29	54 28 16	5
		9 3 51	45 34 54	6 5
Middle of 3 in the rise of the neck		13 57 43	55 1 40	5
		9 24 14	45 24 28	6
		9 19 24	45 4 48	5 6
		10 53 28	47 2 3	5 6
		9 7 46	42 0 27	5
Subseq. in the rise of the neck		15 34 43	54 30 33	5
		11 3 12	46 5 20	4 5
		9 58 47	43 1 53	5
Preced. in the foot, which is } double		23 46 19	63 43 29	5
		23 47 55	63 38 3	4
Subseq. in the fame foot		25 31 58	64 18 53	5 6
A new one of the breast, anno 1600		17 29 12	55 29 20	6
		15 44 13	52 36 15	6
South of two under the new one		17 2 13	54 33 16	6
North. of the fame		11 26 23	42 26 36	6
In the breast (of the n. wing)		20 32 51	57 9 20	3
Middle of 3 informes preced. the angle		15 42 22	49 36 33	4
		20 51 58	55 4 46	6
South. of the fame		16 24 20	47 28 53	4
		20 0 57	53 7 6	4
	♋	1 22 17	64 41 46	5 6
	♌	20 57 9	53 23 53	6
		1 46 7	64 3 51	5
Middle and brighter agst. the no. knee	♋	2 31 4	64 10 7	5 6
Subseq. at the knee	♌	20 37 18	51 38 16	5
North. of those preced. in the angle (gle near the tropic)	♍	16 10 4	42 45 11	6
Preced. of the informes in the trian-		16 42 41	43 13 32	5 6
		19 28 14	47 57 16	6
South. in that triangle		16 2 55	40 54 36	5 6
		14 56 59	38 7 7	5
Bright star in the tail	♋	20 54 55	48 21 13	6
		1 1 32	59 56 37	2
		18 22 34	41 30 54	6
Subseq. of the said triangle	♌	7 17 32	64 4 18	6 7
		21 21 29	46 30 26	5
Inform. under the ang. of the f. wing	♍	23 22 52	49 26 21	3
In the angle or elbow of the f. wing		25 26 47	51 38 37	4
		4 8 54	49 57 10	5
		21 18 12	42 37 9	6
South. of those preced. the extreme } of the 2 informes of the f. wing }	♋	2 22 56	58 5 31	6 5
		3 39 19	58 5 13	6
(the wing		22 45 37	43 13 58	5
North of those prec. the extrem. of		20 45 4	37 39 42	6
		1 51 21	54 56 25	4
In the fourth foot (tail)	♋	8 49 9	60 6 19	5 6
Foremost of 3 in the north part of the		7 42 10	58 50 19	6 7
South of the fame		1 57 3	51 50 35	5
		6 32 3	56 36 5	4
Against the fourth knee		10 50 42	59 33 35	6 5
Subseq. in the north part of the knee	♌	24 51 36	37 59 50	6
		28 44 36	43 43 13	3
In the extrem. of the fourth wing	♍	4 16 38	50 32 40	4
Middle of those in the fourth wing				

Names and Situations of the Stars.	Signs	Longitude.	Latitude North.	Mag.
	° ' "	° ' "	° ' "	
South of 3 in the wing		2 57 29	47 29 10	5
North of the fame		6 3 49	51 30 45	4
A fall one following the fourth knee		10 14 21	55 20 9	6
		6 1 38	48 25 8	6
That under the extrem. of the f. wing		1 14 9	40 0 20	6 5
		7 1 15	48 34 55	6
North of 2 in the extrem. of the tail		15 39 47	50 25 37	6
		9 59 28	49 7 0	6
South in the extremity of the tail		15 53 18	55 12 21	4 5
		12 1 23	50 32 2	6
		15 15 52	52 39 30	6
		13 31 55	50 25 21	6
		13 56 49	50 34 26	6
Under the fourth wing, towards } the foot of Pegasus }		6 8 0	39 32 10	3 4
		12 3 43	48 3 34	6
N. of the informes following the tail		24 1 45	58 52 37	4 5
South of those following the tail	♋	23 17 18	57 12 6	4 5

CYLINDER, in geometry, a solid body, contained under three surfaces; supposed to be generated by the rotation of a parallelogram, as CBEF, (Tab. *Geometry*, fig. 56.) about one of its sides, CF.

If the generating parallelogram be rectangular, as CBEF, the cylinder it produces will be a right cylinder, i. e. a cylinder whose axis is perpendicular to its base.

If the parallelogram be a rhombus, or rhomboides, the cylinder will be oblique, or scalenus.

The surface of a right cylinder, exclusive of its bases, is demonstrated to be equal to a rectangle contained under the periphery, and the altitude of the cylinder.

The periphery, therefore, of the base, and thence the base itself, being found, and multiplied by two, and the product added to the rectangle of the height, and periphery of the cylinder; the sum will be the area or superficies of the cylinder: multiply this by the area of the base; and the product will be the solidity of the cylinder.

For it is demonstrated, that a circle is equal to a triangle, whose base is equal to the periphery, and height, to the radius; and also, that a cylinder is equal to a triangular prism, having the same base and altitude with itself: its solidity, therefore, must be had by multiplying the superficies into the base.

Again, since a cone may be esteemed an infinite-angular pyramid; and a cylinder an infinite-angular prism: a cone is one third part of a cylinder, upon an equal base, and of the same height. Further, a cylinder is to a sphere of the same base and altitude as 3 to 2.

Lastly, It being demonstrated in mechanics, that every figure, whether superficial or solid, generated, either by the motion of a line, or of a figure; is equal to the factum of the generative magnitude into the way of its centre of gravity, or the line its centre of gravity describes: hence, if the rectangle ABCD, (Tab. *Mechanicks*, fig. 43.) revolve about its axis AD, it will describe a cylinder, and its side BC the surface of the cylinder. But the centre of gravity of the right line BC, is in the middle F; and the centre of gravity of the generating plane in the middle G, of the right line EF. The way of this, therefore, is the periphery of a circle described by the radius FG; and of that, the periphery of a circle described by EF. The superficies, therefore, of the cylinder, is the factum of the altitude BC, into the periphery of the circle described by the radius EF, i. e. into the base: but the solidity of the cylinder, is the factum of the generating rectangle ABCD, into the periphery of the circle described by the radius EG; which is sub-duple of EF, or the semidiameter of the cylinder.

Suppose, *v. gr.* the latitude of the describing plane, and therefore of the cylinder, BC = a, the semidiameter of the base DC = r; then will EG = $\frac{3}{2}r$; and supposing the ratio of the semidiameter to the periphery, = 1: m; the periphery described by the radius, $\frac{3}{2}r$ will be equal to $\frac{3}{2}mr$. Therefore, multiplying $\frac{3}{2}mr$ into the area of the rectangle A = ar, the solidity of the cylinder = $\frac{3}{2}mar^2$: but $\frac{1}{2}mar^2 = r \cdot m \cdot a$, and $\frac{1}{2}r \cdot m \cdot r$, the area of the circle described by the radius DG. The solidity of the cylinder, therefore, is equal to the factum of the base, and the altitude.

For the ratio of CYLINDERS; as the radii of all cylinders, cones, &c. are in a ratio composed of their bases, and altitudes: hence, if their bases be equal, they will be in the ratio of their heights; if their altitudes be equal, in the ratio of their bases.

Hence, also, the bases of cylinders and cones being circles; and circles being in a duplicate ratio of their diameters; all cylinders and cones are in a ratio compounded of the direct ratio of the altitudes, and the duplicate one of their diameters: and, if they be equally high, as the squares of the diameters. Hence, again, if in cylinders the altitude be equal to the diameter of the bases, they will be in a triplicate ratio of the diameters of the base. All cylinders, cones, &c. are in a triplicate ratio of their homologous sides; as also of their altitudes.

Again, equal cylinders, cones, &c. reciprocate their bases and altitudes. See CONE, &c.

Lastly, a cylinder whose altitude is equal to the diameter of the base, is to the cube of its diameter, as 785 to 1000.

To find a circle equal to the surface of a given CYLINDER, we have this theorem: the surface of a cylinder is equal to a circle, whose radius is a mean proportional between the diameter and height of the cylinder.

The diameter of a sphere, and altitude of a CYLINDER equal theorems, being given; to find the diameter of the cylinder: the theorem is; the square of the diameter of the sphere, is to the square of the diameter of the cylinder equal to it, nearly, as triple the altitude of the cylinder, to double the diameter of the sphere. See SPHERE.

To find a rete, or cage, whence a cylinder may be formed, or subverted with any cylinder may be covered. With the diameter of the base, describe two circles; find their peripheries: and upon a line equal to the altitude of the cylinder, form a rectangle, whose other dimension is equal to the found periphery. Thus may the cylinder required, be formed, or covered.

Resistance of a CYLINDER. } See the articles } RESISTANCE.
 Scenography of a CYLINDER. } SCENOGRAPHY.
 CYLINDER charged, in gunnery, is that part of a great gun, which is possessed by the powder and ball.

CYLINDER concave, in gunnery, is all the chace, or hollow length of a piece of ordnance.

CYLINDER vacant, in gunnery, is that part of the hollow that remains empty, after the gun is charged. See CANNON.

CYLINDRICAL column. } COLUMN:
 CYLINDRICAL compasses. } COMPASSES.
 CYLINDRICAL mirrors. } MIRROR.
 CYLINDRICAL wax-candles. } CANDLE.

CYLINDROID*, in geometry, a solid body, approaching the figure of a cylinder; but differing from it in some respect, e. g. as having its bases elliptical, but parallel, and equal.

* The word comes from the Greek κυλινδρῶδες, cylinder; and εἶδος, form.

Hyperbolic CYLINDROID. See HYPERBOLIC.

CYMA, in botany, a term signifying the tender sprout of any plant, especially of the cabbage kind.

CYMA, in architecture. See CIMA, and CYMATIUM.

CYMATIUM, CIMATIUM, or CIMA, in architecture, a member, or moulding of the cornice, whose profile is waved, i. e. concave a-top, and convex at bottom; frequently also called *dentis*, *gorge*, or *gula reata*; especially by the French: by the Italians *golesta*, i. e. *parva gula*; but more usually, *cydatum*, among us; being the last, or uppermost member of the cornice.—See Tab. Architecture, fig. 8.

Some write the word *simais*, from *simus*, *camus*, flat-nosed; but this etymology is unlucky: the beauty of the moulding consisting in its having its projection equal to its height. M. Felibien therefore rejects this origin; contending, that the moulding is not so denominated from its being the uppermost member of the cornice, but, according to the sentiment of Vitruvius, from its being waved, from the Greek κυματιον, undula; of κυμα, wave. This is certain, that Vitruvius sometimes uses the word *unda* for *cydatum*; and sometimes *lysis*, i. e. *solution*, *separation*; in regard, corniches, where the *cydas* are found, separate one piece of architecture from another; as the pedestal from the column, and the frieze from the cornice.

But, withal, it must be observed, that he does not confine *cydatum* to the cornice; but uses it indifferently for any similar moulding, where-ever he meets with it: in which he differs from the more accurate among the moderns.

Fellbien makes two kinds of *cydatiums*; the one right, the other inverted: in the first, that part which projects the furthest is concave, and is otherwise called *gula reata*, and *dentis*. See DOUCINE.—In the other, the part that projects furthest is convex, called *gula inversa*, or *talon*. See TALON.

Our architects do not use to give the name *cydatum* to these mouldings, except when found on the tops of corniches; but the workmen apply the name indifferently, where-ever they find them.—Palladio distinguishes the *cydatum* of the cornice by the name *intavola*.

Tuscan CYMATIUM, consists of an ovolo, or quarter-round. Philander makes two *doric cydatiums*, whereof this is one: Baldus calls this the *lesbian astragal*.

Doric CYMATIUM, is a cavetto; or a cavity less than a semicircle, having its projection subduple its height.—See Tab. Architecture, fig. 28. lit. L. and fig. 6.

Lesbian CYMATIUM, according to Vitruvius, is what we otherwise call *talon*, viz. a concavo-convex member, having its projection subduple its height.

CYMBAL*, a musical instrument, used among the antients; called by the Greeks κυμβαλον, and by the Latins, *cymbalon*.

* Syllburgius derives the word from three several Greek roots, viz. from κυβη, crooked; from κυβαλον, cup; and from σων, voice. Hicore derives it from κυμ, and βαλεmatica, an immodest dance, used to accompany this instrument. The real etymology appears to be from κυμα, cavity.

The cymbal was of brass, like our kettle-drums; and some think in their form, but smaller, and its use different. Cassiodorus, and Isidore, call it *accabulum*, the name of a cup or cavity of a bone wherein another is articulated; and Xenophon compares it to a horse's hoof; whence it must have been hollow; which appears, too, from the figure of several other things, de-

nominated from it, as a basin, caldron, goblet, calque; and even a shoe, such as those of Empedocles, which were of brass. In effect, the antient cymbals appear to have been very different from our kettle-drums, and their use of another kind: to their exterior cavity was fastened a handle; whence Pliny takes occasion to compare them to the upper part of the thigh, *axandibus*; and Rabanus to phials.

They were struck against one another, in cadence, and made a very acute sound. Their invention was attributed to Cybele; whence their use in feasts and sacrifices: setting aside this occasion, they were seldom used but by dissolute and effeminate people. M. Lampe, who has wrote expressly on the subject, attributes the invention to the Curetes, or inhabitants of mount Ida in Crete: it is certain, these, as well as the Corybantes, or guards of the kings of Crete, and those of Rhodes, and Samothracia, were reputed to excel in the music of the cymbal. See CORYBANTES.

The Jews, too, had their cymbals, which they called צלצלים or צלתיים; or at least, instruments that the Greek, Latin, and English translators render cymbals; for as to their matter, form, &c. the critics are wholly in the dark.

The modern cymbal is a paltry instrument, chiefly in use among vagrants, gypsies, &c. It consists of steel wire, in a triangular form, whereon are passed five rings, which are touched and shifted along the triangle with an iron rod held in the left hand, while it is supported in the right by a ring, to give it the freer motion. Durandus says, that the monks used the word cymbal for the bell hung in the cloister, used to call them to the refectory. See BELL.

CYMBIFORME, in anatomy. See NAVICULARE.

CYNEGETICS, κυνηγετικα, books treating of the art of hunting.—Gratius Faliscus has wrote a *cynegetica* with applause.

CYNICS, a sect of ancient philosophers, who valued themselves on their contempt of every thing, especially riches and states, arts, and sciences; all excepting morality.

The founder of this sect is said to have been Antisthenes, a disciple of Socrates; who, after his master's death, quitting the Pyreum, retired to Cynolarges, a kind of academy not far from the gates of Athens.

Hence, some will have it, came the name κυνικος, cynicus, viz. from κυνηγετης. But others, with more probability, derive it from κυων, dog, because of their severity and impatience in reprehending vice. Thus, Aristotle observes, οτι δε κυνικος, &c. the Cynicks were so called, from their free way of rebuking, &c. Hence, Diogenes the cynic said of himself, I bite the evil; and Antisthenes himself was called σαρξας κυων, an ingenious and sincere dog: it being the distinguishing character of the cynicks, to attack and bark at the ill, and to defend and fawn on the good.

Arrian praises the cynic genius to the skies: 'A cynic, says he, is a messenger sent from Jupiter, to overlook human affairs; — a public doctor, and tutor of mankind; who instructs, and chastises at the same time: — an Esculapius; a lord and king, adorned with a scepter and diadem, — who governs the people; and this voluntarily, without trembling, without guards, &c. but by a good conscience.'

The ground of this encomium, may be owing, in some measure, to that affinity between the *storks* and *cynics*: the chief difference between them consisted in this, that the former were more modest and reserved than the latter; who were said to have banished all shame; and were able to practise any obscenity without blushing.

Hence, Laertius observes of Diogenes, that he did every thing openly, whether it belonged to Ceres or to Venus: though, the same Laertius adds, that he did it in imitation of the choriadiscali, i. e. he only ran to an excess of impudence, to put others out of conceit with it.

CYNIC spasm, spasmus CYNICUS, a sort of convulsion, whereby the patient is brought to imitate the gestures, snarlings, howlings, &c. of a dog. See SPASMUS.

Dr. Friend, in the *Philosophical Transactions*, gives us account of a very extraordinary spasmus of this kind, wherewith two families, at Blackthorn in Oxfordshire, were seized.

The novelty of the thing drew abundance of visitors to the village, and among the rest Dr. Willis; who, a good while ere he reached the place, heard a terrible noise of barking and howling: upon his entering the house, he was frast saluted with five girls, bawling, and answering each other by turns, with violent motions of the head. In their face there was no convulsion seen, beside cynic distortions, and oscillations of the mouth: their pulse was pretty regular; their noise was rather like that of the howling, than of the barking of dogs; only that its returns were more frequent, with deep sighings between.

The spasmus had seized them all equally; whereof the youngest was but six, and the eldest fifteen years of age: at intervals they had their reason and senses entire; but not long, ere one of them returning to her yelling, set on the rest: till at length, all fainting, they fell like epilepticks on a bed laid in the middle of the room to receive them.

A little while they would lie quietly and decently together; but upon a new orgasm of the spirits, they began to beat and bruise each other. Two of the youngest awaked while the doctor

stayed,

stayed, and left their sisters on the bed: but the *spasmus* soon had hold on them again.

In July, 1700, Dr. Freind himself visited another family, in the same village; where one boy and three girls had been seized ten weeks, without any apparent preceding cause. A girl had had it first; and the rest, as the mother informed him, were so struck with their sister's disorder, that they too were seized. At his arrival, they were all at play, very briskly, and unconcernedly before the doors; at length the eldest girl, about fourteen years of age, was seized as usual.

The only symptom of its approach, was a swelling of the stomach; which rising gradually up the throat, set the muscles of the larynx and the head upon their usual convulsions: this rising was a certain symptom of an approaching paroxysm in them all; and if they endeavoured to stop it, it burst out with the greater violence, and held the longer.

The noise they made was incessant, and disagreeable; yet not so much like the barking or howling of dogs, as had been given out, as a quaint kind of a song, consisting of three notes, or tones, repeated twice over; and closed by deep sighs, &c. accompanied with extraordinary gestures and nutations of the head.

This disease the doctor takes to be natural; and to rise from the common cause of all convulsions, *viz.* from the animal spirits growing unruly in the nerves, and driving the muscles into various contractions, according to the circumstances of the indisposition.

CYNOCTONON. See **ACONITE**.

CYNODESMUS, or **CYNODESMION**, among anatomists, the band, or ligament, which ties the prepuce of the yard to the nut, or glans.

CYNOREXY, an immoderate appetite, to the degree of a disease; called also *fames canina*, and *bulimy*. See **BULIMY**.

CYNOSURA *, in astronomy, a denomination given by the Greeks to *Ursa minor*, or the little bear. See **URSA**.

* The word is formed of *κυνος*, q. d. *the dog's-tail*.

This is the constellation next our pole, consisting of seven stars; four whereof are disposed like the four wheels of a chariot; and three lengthwise, representing the beam: whence some give it the name of *the chariot*, or *Charles's wain*.

From these seven stars it is the pole takes its name, *septentrio-nalis*; and the rest of the hemisphere, as far as the line, *septentrio-nalis*.

CYON, or **CION**, a graft, sprig, or sucker. See **CION**, **GRAFT**, &c.

CYPHER. See the article **CYPHER**.

CYPHI, a term in the Arabian pharmacy, signifying a kind of cordial perfume.

Mithridates gave the appellation *cyphi* to the troches wherewith the Egyptian priests used to sweeten their gods, to make them grant what they requested. He used the same in the composition of mithridate, on account of their efficacy against poisons, defluxions, &c.

The *cyphi* are composed of raisins, or dried grapes, turpentine, myrrh, bdellium, spica nardi, cassia lignea, aspalathum, saffron, &c. tempered into a mass with honey and a little wine.

CYPHONISM, **CYPHONISMUS**, a kind of torture, or punishment, in use among the antients.

The learned are at a loss to determine what it was: some will have it to be that mentioned by S. Jerom, in his life of Paul the hermit, chap. 2. which consisted in smearing the body over with honey, and thus exposing the party, with his hands tied, to the warm sun, to invite the flies and other vermin to persecute him.

CYPRESS, **CUPRESSUS**, in natural history, a precious sort of wood, the produce of a tree of the same name; frequent in the island of Cyprus.

It is very compact, and heavy; and its smell as agreeable as that of saunders. It scarce ever rots, decays, or is worm-eaten, no more than cedar, or ebony: for which reason, the antients used it to make the statues of their gods.

In Candia, and particularly about mount Ida, the tree is said to rise spontaneously, where-ever the earth is a little dug; but is somewhat difficult to raise by art.

The fruit of this tree, called *cones*, are used in astringent decoctions, against hernia's, hemorrhages, &c.

CYPRUS, an order of knights, called also knights of *silence*, and knights of *the sword*; instituted by Guy de Lusignan, king of Cyprus, in 1192.

The design of the institution was, to oppose the inroads and irruptions of the infidels in that island: accordingly, their motto was *securitas regni*.

CYPRUS vitriol. See the article **VITRIOL**.

CYRENAICI, a sect of antient philosophers; so called from their chief, Aristippus of Cyrene, a disciple of Socrates. See **SOCRATIC**.

Their leading tenet was, that man is born for pleasure; and that virtue is only so far laudable, as it conduces thereto.

By pleasure, they meant, not only a privation of pain, and a tranquillity of mind like what Epicurus preached up; but an assemblage of all the positive pleasures both of the mind and the senses; especially the last. See **EPICUREAN**.

Cicero makes frequent mention of Aristippus's school; and speaks of it as yielding debauchees.

Three disciples of Aristippus, after his death, divided the sect into three branches; under which division it languished and sunk: the first called the *Hegesiac* school; the second the *Amnicerian*, and the third the *Theodoran*; from the names of their authors.

CYRTOMA, a bunch or curvity of the back. See **GIBBOUS**.

CYST-HEPATIC duct, a canal, by which the porus biliaris discharges part of its bile into the gall-bladder.

It was first described by Dr. Giffon, and long afterwards pretended to be discovered by M. Perrault.—See *Tab. Anatomy*, (Splanch.) fig. 5. lit. c c.

Verheyen, from the course of the bile, inverts the name, and more properly calls it *hepaticocystic*.

CYSTIC, an epithet given to two arteries, and two veins opening into the gall-bladder.—See *Tab. Anatomy*, (Angioli) fig. 1. n. 34.

The *cystic arteries*, *cystica gemellae*, are two branches of the cœliac, bestowed on the gall-bladder, and bringing blood to the same.—The *cystic veins* return the remains of this blood into the vena porta.

CYSTICS, denote medicines against distempers of the bladder. See **STONE**, **LITHONTRIPIC**, &c.

CYSTICUS ductus, or *meatus*, a biliary duct, about the bigness of a goose's quill; joined to the *meatus hepaticus*, at about two inches distance from the gall-bladder; the two together forming the *ductus communis*.—See *Tab. Anatomy*, (Splanch) fig. 1. lit. d. fig. 5. lit. e e.

CYSTIS *, the same with vesica, or bladder.

* The word is Greek, *κυστις*, which signifies the same.

CYSTIS choledechæ, the same with *felliculus*, or *vesicula fellis*. See **VESICULA fellis**.

CYTHARA. See the article **CITHARA**.

CYZICENS, **CYZICENA**, among the antient Greeks, were a sort of magnificent banqueting-houses, always looking towards the north, and usually opening upon gardens.

They had their name from Cyzicus, a city very considerable for the grandeur of its buildings; situate in an island of Mysia, bearing the same name.—These *cyzicenes* were among the Greeks, what the *triclina* and *cœnacula* were among the Romans.

CZAR, a title of honour, assumed by the grand-dukes, or, as they are now stiled, emperors, of Russia.

The natives pronounce it *tzar*, or *zaar*; and this, by corruption, from *cæsar*, emperor; on account of I know not what relation to the Roman emperors; by reason of which, they also bear the eagle as a symbol of their empire.

The first who bore the title of *czar*, was Basil, son of Basilides, who freed his country from its subjection to the Tartars, and first set it on its present footing, about the year 1470.

M. Speringius, in his dissertation on the majesty of the name *coming*, observes, that the Russian princes never bore the name *czar*, till their people had embraced the Greek faith: before that time, he says, they were called *konger*, king. See **KING**.

D.

D A C

D, The fourth letter of the alphabet, and the third consonant.

Grammarians generally rank *D* among the lingual letters, as supposing the tongue to have the principal share in the pronunciation thereof; tho' the Abbot de Dangeau seems to have reason in making it a palatal letter. The letter *D* is the fourth in the Hebrew, Chaldee, Samaritan, Syriac, Greek, and Latin alphabets; in the five first of which languages it has the same name, though somewhat differently spoke, *e. gr.* in Hebrew, Samaritan, and Chaldee *Dalath*, in Syriac *Dolath*, and in Greek *Delta*.

The Arabians have three *D's* in their language, the first called *Dal*, which is the eighth of their 28 letters; the second called *Dhhal*, is only distinguished from the former by having a point added over it; though its sound is much the same with that of the *Z*: the third, which is their seventeenth letter, is called *Daq*, and pronounced like our *D*, tho' in form it resembles the Arabic *Ta*, all it differs in, being a point added a-top.

The form of our *D*, is the same with that of the Latins; as appears from all the ancient medals and inscriptions. And the Latin *D*, is no other than the Greek Δ , rounded a little, by making it quicker, and at two strokes. The Δ of the Greeks, again, is borrowed from the ancient character of the Hebrew *Dalath*; which form it still retains on the Samaritan Coins, as is shewn by the Jesuit Soucier in his dissertation on the Samaritan medals. All the alteration the Greeks have made in it, is the making it stoop a little, and taking away a little Line. Nor would it be difficult to shew, that the Syriac *Dolath*, and the Arabic *Dal*, are both borrowed from the ancient Hebrew, as well as the Δ *Dalath* of the modern, or Chaldee Hebrew.

Some indeed will have it, that the Greek, Δ , *Delta*, is borrowed from the Egyptians, who made their *D* of three stars disposed in a triangle; which was a hieroglyphic that among them denoted God, the sovereign Being, as if they had had some notion of a Trinity: but this surmise is but weakly supported.

D is also a numeral letter, signifying five hundred, which arises hence, that in the Gothic characters the *D* is half the *M*, which signifies a thousand. Hence the verse.

Litera D velut A Quingentos significabit.

A dash added at the top of *D*, denotes it to stand for five thousand.

DACRYODES*, in medicine, a term applied to ulcers, which are continually yielding a putrid matter.

* The word is formed from *δακρυ*, tear, and *αδω*, form; denoting the ulcers to weep, or shed somewhat like tears.

DACTYL, **DACTYLUS**, a foot in the Latin and Greek poetry, consisting of a long syllable, followed by two short ones: as *Carmine*.

The *Dactyl* is said to have been the invention of Dionysius or Bacchus, who delivered oracles in this measure at Delphos, before Apollo.—The Greeks call it *πυγμαλίου*. *Diom.* iii. p. 474. The *Dactyl* and spondee are the most considerable of the poetical feet; as being the measures used in heroic verse, by Homer, Virgil, &c. These two are of equal time, but not equal motion. The spondee has an even, strong and steady pace like a trot: the *Dactyl* resembles the nimble strokes of a gallop.

DACTYLUS was also a sort of dance among the ancient Greeks, chiefly performed, as Hesychius observes, by the Athletes.

DACTYLS also denote the fruits of the palm tree; more usually called *Dates*.

DACTYLI, in antiquity, a name attributed to the first priests of the Goddess Cybele; who were particularly called *Dactyli Idaei*, on account of the Goddess herself, who was styled *Cybele Idaea*, because principally honoured on mount Ida in Phrygia. The name *Dactyli* is supposed to have been given them on this occasion; that to prevent Saturn from hearing the cries of Jupiter, whom Cybele had committed to their custody, they used to sing I know not what verses of their own invention, which by their unequal measures seemed to resemble the foot called *Dactylus*.—This is the account of the grammarian Diomedes.

One Sophocles, quoted by Strabo, Lib. X. speaks differently. According to him they were called *Dactyli*, from the Greek word *δακτυλος*, finger, by reason their number was at first equal to that of the fingers of the hand, *viz.* ten; five of them boys, and as many girls.—He adds, that it is to them we owe the invention of iron, and the manner of working it, with diverse other useful things. Others make their numbers more, and others less than ten. Some, again, make them

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natives of Phrygia near the foot of mount Ida; and others bring them from elsewhere.

However, all the Authors Strabo had seen, he says, agreed, that they were the first who wrought in iron; that they had been ministers of the mother of the gods, or Cybele; and that they dwelt at the foot of mount Ida.

It is also conjectured by some authors, not that the Curetes and Corybantes were the same with the *Dactyli Idaei*, but that the Curetes and Corybantes were their posterity; that a hundred men, born in Crete, were first called *Dactyli Idaei*; that each of these had nine children, who were the Curetes; and that each of the Curetes had ten children, who were also called *Dactyli Idaei*.

Strabo only gives us the names of four of the *Dactyli Idaei*, which are Salaminus, Damnaeus, Hercules, and Aemon.

DACTYLIC, something that has a relation to *Dactyl*.

Anciently, there were *Dactylic*, as well as spondaic flutes, *Tibia Dactylica*.—The *Dactylic* flutes consisted of unequal intervals; as the *Dactylic* foot does of unequal measures.

DACTYLIC Verses are hexameter verses, ending in a *Dactyl* instead of a spondee; as spondaic verses are those, which have a spondee in the 5th foot instead of a *Dactyl*.

An instance of a *Dactylic* verse we have in *Virg.* E. L. VII. 33.

Bis patria cecidit manus: quin prostratus omnia

Perlegerint oculis.

DACTYLIOMANCY*, **DACTYLIOMANTIA**, a sort of divination performed by means of a ring.

* The word is composed of the Greek *δακτυλος*, ring; of *μαντις*, finger, and *μαντεα*, divination.

Dactyliomancy consisted principally in holding a ring, suspended by a fine thread, over a round table, on the edge whereof were made diverse marks with the 24 letters of the alphabet. The ring in shaking, or vibrating over the table, stopped over certain of the letters, which being joined together, composed the answer required.

But the operation was preceded and accompanied by several superstitious ceremonies: for first the ring was to be consecrated with a great deal of mystery; the person who held it was to be clad in linen garments, to the very shoes; his head was to be shaved all round; and in his hand he was to hold vervain. And ere he proceeded on any thing, the gods were first to be appeased by a formulary of prayers, &c. Ammianus Marcellinus gives the process at large in his XXIXth book.

DACTYLOLOGY, **DACTYLOLOGIA**, the art of accounting, or numbering by the fingers.

The rule is this: The left thumb is reckoned 1, the index 2, and so on to the right thumb, which is the tenth, and of consequence is denoted by the cypher 0.

DADO, in architecture, is by some writers used for that part in the middle of the pedestal of a column between its base and cornice—it is of a cubic form, whence it is also denominated, *dys*.

DADUCHI, in antiquity, priests of Ceres.

That goddess having lost her daughter Proserpine, say mythologists, began to make search for her at the beginning of the night. In order to do this in the dark, she lighted a torch, and thus set forth on her travels throughout the world: for which reason it is, that she is always seen represented with a lighted torch in her hand.

On this account, and in commemoration of this pretended exploit, it became a custom for the priests, at the feasts and sacrifices of this goddess, to run about, in the temple, with torches after this manner: one of them took a lighted torch from off the altar, and holding it in his hand, run with it to a certain part of the temple; where he gave it to another, saying to him, *Tibi trado*: this second run after the like manner, to another place of the temple, and gave it to the third; and so of the rest*.

* From this ceremony, the priests became denominated *Daduchi*, *δαδυχοι*. *q. d.* torch-bearers; from *das*, an unclean and resinous wood, as pine, fir, &c. whereof the ancients made torches; and *εχω*, I have, I hold.

DÆMON, **ΔΑΙΜΩΝ**, a name the ancients gave to certain spirits, or genii, which they say appeared to men, either to do them service, or to hurt them.

The first notion of *Dæmons* was brought from Chaldea; whence it spread it self among the Persians, Egyptians, and Greeks. Pythagoras and Thales were the first, who introduced *Dæmons* into Greece. Plato fell in with the notion, and explained it more distinctly, and fully, than any of the former philosophers had done. By *Dæmons*, he understood

spirits inferior to gods, and yet superior to men; which inhabiting the middle region of the air, kept up the communication between gods and men, carrying the offerings and prayers of men to the gods, and bringing down the will of the gods to men. But he allowed of none but good and beneficent ones. Though his disciples afterwards, finding themselves unable to account for the origin of evil, adopted another sort of *Demons*, who were enemies to men.

There is nothing more common in the heathen theology, than these good, and evil genii. And the same superstitious notion we find got footing among the Israelites, by their commerce with the Chaldeans. But by *Demons*, they did not mean the devil or a wicked spirit: they never took the word *Demon* in that sense, nor was it ever used in such a signification, till by the evangelists and some modern Jews.

The word is Greek, *δαίμων* Gale endeavours to shew, that the origin, and institution of *Demons*, was an imitation of the Messiah. The Phœnicians called them *בְּלִיַם* *Baalim*. For they had one supreme being, whom they called *Baal*, and *Moloch*, and various inferior deities, called *Baalim*, whereof we find frequent mention in the Old Testament. The first *Demon* of the Egyptians was Mercury, or Thuet. The same author finds some resemblance between the several offices ascribed to the *Demons*, and those of the Messiah.

DÆMONIAC, is applied to a person possessed with a spirit, or *Demon*.

In the Romish church, there is a particular office for the exorcism of *Dæmoniacs*.

DÆMONIACS, are also a party, or branch of the Anabaptists, whose distinguishing tenet it is, that the devils shall be saved at the end of the world.

DAILY, in astronomy, &c. See **DIURNAL**.

DAMAGE, is generally taken for any hurt, or hindrance, that a man receives in his estate; but more particularly for a part of what the jurors are to inquire of, in passing verdict for the plaintiff, or defendant in a civil action, be it personal or real.—After verdict given of the principal cause, they are asked their consciences touching costs and *Damages*, which contain the hindrances that the plaintiff or demandant hath suffered by means of the wrong done him by the defendant or tenant.

DAMAGE has two significations; the one proper and general, the other strict and relative:—*Proper*, as it is in cases, where *Damages* are founded on the statute of 2 H. IV. cap. 1. and 8 H. VI. cap. 9. where costs are included within the word *Damages*. *Damage*, then in its proper signification, is said *à demendo*, when, by diminution, a thing becomes worse; and in this sense costs of suit are *Damages* to the plaintiff, as by them his substance is diminished.

Relative is when the plaintiff declares the wrong done him to the *Damage* of such a sum—this is to be taken relatively, for the wrong which passed before the writ brought; and is assessed by reason of the trespass aforesaid; and cannot extend to the costs of suit, which are future, and of another nature.

DAMAGE Fesant, or *Fesiant*, is when a stranger's beasts are doing hurt, or spoiling the grass, corn, woods, &c. of another man, without his leave or license.

In this case, the party whom they *damage* may disfrain, and impound them both by night and by day; though in other cases, as for rent, services, &c. none may disfrain in the night.

DAMASK, a sort of silken stuff, having some parts raised above the ground, representing flowers, or other figures.

Damask is properly a sort of mohair and fatten intermixed, in such manner as that what is not fatten on one side, is on the other. The elevation which the fatten makes on one side, is the ground on the other. The flowers have a fatten grain; and the ground, a grain of taffetas. It has its name from its being originally brought from *Damascus*, in Syria.

DAMASK EENING, the art, or act of adorning iron, steel, &c. by making incisions therein, and filling them up with gold or silver wire: chiefly used in enriching sword-blades, guards, and gripes, locks of pistols, &c.

Its name shews the place of its origin; or at least, the place where it has been practised in the greatest perfection, viz. the city of *Damascus* in Syria. Though M. Felibien attributes the perfection of the art to his countryman Curfint, who wrought under the reign of king Henry IV.

Damaskening, is partly mosaic work, partly engraving, and partly carving: as mosaic work, it consists of pieces inlaid; as engraving, the metal is indented, or cut in *creux*; and as carving, gold and silver are wrought therein in *relievo*.

There are two manners of *Damaskening*: in the first, which is the most beautiful, the artist cuts into the metal with a graver, and other tools proper for engraving on steel; and afterwards fills up the incisions, or notches with a pretty thick silver, or gold wire.—In the other, which is only superficial, they content themselves to make hatches, or strokes across the iron, &c. with a cutting knife, such as is used in making of small files. For the first, it is necessary the gravings, or incisions be made in the dovetail form; that the gold or silver wire, which is thrust forcibly into them, may adhere the more strongly.

For the second, which is the more usual, the method is thus: Having heated the steel till it changes to a violet, or blue colour; they hatch it over, and across with the knife; then draw the delign, or ornament intended, on this hatching, with a fine brass point or bodkin. This done, they take fine gold wire, and conducting or chasing it according to the figures already designed, they sink it carefully into the hatches of the metal with a copper tool.

DAMASCUS-Steel, a very fine kind of steel, made in some parts of the Levant, and particularly at *Damascus*, remarkable for its excellent temper; and used chiefly in the making of sword-blades.

Some authors assure us it comes from the kingdom of Golconda, in the East-Indies; where the method of tempering with allom, which the Europeans have never been able to imitate, was first invented.

DAMIANISTS*, a branch of the ancient Acephalous Severites; who agreed with the Catholics in admitting the IVth council; but disowned any distinction of persons in the godhead, and professed one single nature incapable of any difference. And yet they called God, the Father, Son, and Holy Ghost. On which account the Severitæ Petritæ, another branch of Acephali, used to call them Sabellianists, and sometimes Tetradiatæ. Thus much we learn from Nicephorus Callistus, L. XVIII. c. 49.

* They took their name from *Damianus* a bishop, who was originally their leader.

DAMNATA Terra, in chymistry, the same with *Caput Mortuum*; that is, the earthy part, or mass remaining at the bottom of the retort, &c. after all the other principles have been drawn out of the body by fire.

DAMPS, in natural history, are noxious steams, or exhalations, frequently found in close, subterraneous places, particularly mines, pits, and Wells.

The *Damps* in mines are of four kinds: the first, which withal is the most ordinary, the workmen apprehend in its approach, by the flame of the candle's becoming orbicular, and lessening by degrees, till it goes quite out; as also by their shortness or difficulty of breathing; those who escape swooning, seldom suffer any great harm by this kind; but such as swoon away, though they are not downright suffocated, yet on their first recovery are tormented with very violent convulsions: the way of cure is to lay the person down on the earth in a prone posture, with a hole dug in the ground under his mouth; if this fail, they fill him with good ale; and if that will not do, they conclude him desperate. These are the miners remedies.

The second is the *Pease-Bloom Damp*, which is called so from its smell. This *Damp* always comes in the summer-time, and hath never been known to be mortal: the miners in the peak of Derby fancy it arises there from the multitude of red trefoil flowers, called by them honey-suckles, with which the lime-stone meadows of the peak much abound; and the smell of this gives timely notice to get out of the way.

The third is the most pestilential, and most strange of all, if what is said of it be true: they, who pretend to have seen it, (for they say it is visible) describe it thus: In the highest part of the roof of those passages in a mine which branch out from the main grove, they see a round thing hanging, about as big as a foot-ball, covered with a skin of the thickness and colour of a cob-web: if this bag, by a splinter, or any other accident, become broken, the *Damp* immediately flies out, and suffocates all the company: the workmen, by help of a stick, and long rope, have a way of breaking this at a distance; and when they have done it, they purify the place well with fire: and they will have it, that it gathers from the steam of their bodies, and candles, ascends up into the highest part of the vault, and there condenses, and in time has a film grown over it, and then corrupts, and becomes pestilential.

The fourth, is the *fulminating*, or *Fire-Damp*, whose vapour being touched by the flame of the candle, presently takes fire, and has all the effects of lightning, or fired gun-powder. These are found frequently in the coal-mines, and sometimes, tho' rarely, in lead ones.—How mineral steams may prove poisonous, may be understood from Doctor Mead's essay on poisons. See **MEPHITICS**, and **POISON**.

Naturalists furnish us with very surprising instances of the effects of *Damps*. In the *Hist. de l'Academie des Sciences An. 1701*; we read of a well in the city of Rennes, into which a mason, at work near its brink, letting fall his hammer, a labourer, who was sent down to recover it, ere he reached the water, was strangled. A second sent to fetch up the corps, met with the same fate, and so a third: at last a fourth, half drunk was let down, with charge to call out as soon as he felt any thing incommode him. He called accordingly, as soon as he came near the water; and was instantly drawn out: yet he died three days afterwards. The information he brought them was, that he felt a heat, which scorched up his entrails. A dog being let down, cried about the same place; and died as soon as he came to air; but throwing water on him, he recovered; as happens to those thrown into

the Grotto del Cane near Naples. The three carcases being drawn up with hooks, and opened; there appeared not any cause of their death.—What renders the relation the more remarkable, is, that the water of this Well had been drawn, and drank several years, without the least ill Consequence.

In the same history, *An. 1710*, we are told of a Baker of Chartres, who having carried 7 or 8 bushels of brands out of his oven into a cellar 36 stairs deep; his son, a robust young fellow, going with more, his candle went out on the middle of the stairs. Having lighted it a-fresh, he was no sooner got into the cellar, than he cried out for help; and they heard no more of him: his brother, an able youth, run immediately after him; cried out, he was dead; and was heard no more. He was followed by his wife; and she by a maid, and still it was the same. Such an accident struck the whole neighbourhood with a panic; and no body was forward to venture any further: till a fellow, more hardy and zealous than the rest, persuaded that the four people were not dead, would go down to give them help: he cried too, and was seen no more. Upon this a sixth man requiring a hook to draw some of them forth without going to the bottom; drew up the maid: who, having taken the air, fetch'd a sigh and died. Next day, the baker's friend, undertaking to get up all the carcases with a hook, was let down with ropes on a wooden horse, to be drawn up whenever he should call. He soon called, but the rope breaking, he fell back again; and tho' the rope was soon pieced again, he was drawn forth dead. Upon opening him, his meninges were found extravagantly stretched; his lungs spotted with black, his intestines swelled as big as one's arm, inflamed and red as blood; and what was most extraordinary, all the muscles of his arms, thighs and legs, torn and separated from their parts. The magistrate, at length taking cognizance of the case, and the physicians, being consulted; they gave their opinion, that the brands had been but ill extinguished: the consequence of which must be, that as all the cellars in Chartres abound with saltpetre, the unusual heat in this had raised a malignant vapour which had done the mischief: and that a good quantity of water must be thrown in to put out the fire, and lay the vapour. This performed, a dog, and a lighted candle were let down without injury to either: an infallible sign the danger was over.

A third history we shall add from Doctor Connor, in his *Dissert. Med. Phys.* Some people digging in a cellar at Paris, for supposed hidden treasure; after a few hours working, the maid going down to call her master, found them all in their digging postures: but stark dead. The person who managed the spade, and his attendant who shoveled off the earth, were both on foot, and seemingly intent on their several offices: the wife of one of them, as if a-weary, was sat down on the side of a hopper, very thoughtful, and leaning her head on her arm: and a boy, with breeches down, was evacuating on the edge of the pit; his eyes fixed on the ground: all of them, in fine, in their natural postures and actions, with open eyes, and mouths that seemed yet to breathe; but stiff as statues, and cold as clay.

DAMSEL, DAMOISEL, or DAMOISEAU, an appellation anciently given to all young people of genteel, or noble extraction of either sex, *e. gr.* to the sons, and daughters of knights, barons, and even of kings.

Thus in history, we read of the *Damsel Pepin*, *Damsel Louis le Gros*, *Damsel Richard*, prince of Wales.

Paquier will have the word a diminutive of *Dam*, an ancient name for Lord; as in some authors we read *Dam Dieu* for Lord God; *Dam Chevalier*, &c. Tho' in its feminine sense he takes it to come from *Dame*.—Others derive the word from *Domicellus*, or *Domnicellus*, a diminutive of *Damnus*, *quasi parvus Dominus*: accordingly, du Cange observes, that it has been sometimes wrote *Damenger*.

They who hold the signory of Commeric, M. de la Roque tells us, anciently held it in the title of *Damoiseau*: and M. de Marca assures us, that the nobleste of Bearn is still divided into three bodies or classes; the barons, the cavers, and the *Damsels*, Domicellos, called in that country *Damengers*.

The Kings of Denmark and Sweden have here the same title, as appears from Pontanus's *hist. of Denmark*, L. VII. and VIII. and Henry of Upsal's *hist. of Suec.* L. III.

From the sons of kings, the appellation passed to those of great lords and barons; and at length, to those of gentlemen who were not yet knights.—

DAMSEL at present is applied to all maids, or girls not yet married; provided they be not of the lowest class of people.

DAMSEL is sometimes also applied to a kind of utensil put in beds, to warm old men's feet withal.

It consists of a hot iron inclosed in a hollow cylinder, which is wrapped round with linnen cloth, and keeps its warmth a long time. Some call it a *Nun*.

DANAIDES, in the ancient Mythology, the daughters of *Danaus*, or *Danaus*, eleventh king of Argos, and brother of *Ægyptus*.

They were 50 in Number, and were espoused to the 50 sons of their uncle *Ægyptus*.

Danaus fearing the accomplishment of an oracle, which had foretold that he should be expelled his kingdom by a son-in-law, persuaded his daughters to murder, each of them, her husband, the first night; which they performed, all but *Hypermnestra*, who spared her husband *Lyncæus*.

In vengeance for this crime of the 49 *Danaides*, the poets have condemned them to hell, to be continually employed in filing a cask perforated at bottom.

The *Danaides* are sometimes also called *Belders*, from their father, who was the son of the Egyptian *Belius*. *Hyginus* has preserved the names of 47 of them.

DANCE*, an agreeable motion of the body, adjusted by art to the measures or tune of a violin, or other Instrument, or voice.

* The Word is French, *Dance*, formed of the German *Dantz*, or *Tantz*, which signifies the same thing: Bochart derives it from the Arabic *Tanza*, and *Guichart* from the Hebrew דאנצא *dantz*, which have all the same signification. *Salmasius* derives the French *Danser* to *dance*, from the Latin *dansare* to thicken; as holding it a practice among the ancient fullers, to leap and *dance* as they fulled their clothes.

Some distinguish the *high Dance*, consisting of capers, gambades, &c. from the *low Dance*, which is the *Terra a Terra*, or close to the ground.

In the Carroual of king Louis XIII. there were *Dances* of horses. The invention of such *Dances* is attributed to the *Sybarites*.

Dancing has always been in use among all nations, both civilized and barbarous: though held in esteem among some, and in contempt among others. Of it self, no doubt, *Dancing* is harmless. There is a time, says the preacher, to *dance*: and sometimes it is even made an act of religion. Thus *David danced* before the ark, to honour God, and expresses his excess of joy for its return into the city of *Sion*. *Socrates* learnt to *dance* of *Alpasia*. And the people of *Crete* and *Sparta* went to the attack, *dancing*. On the other hand, *Cicero* reproaches *Gabinus*, a consular man, with having *danced*. *Tiberius* expelled the *Dancers* out of *Rome*. And *Domitian* excluded several members from the senate, for having *danced*. *Cassor* and *Pollux* are said to be the first who taught the art of *Dancing*; and that to the *Lacedæmonians*: though others attribute the invention to *Minerva*; who they say *danced* for joy after the defeat of the giants.

The ancients had three kinds of *Dances*: the first *grave*, called *Emmelia*, answering to our *low Dances* and pavanés. The second *gay*, called *Cordax*; answering to our *Courants*, *Galliards*, *Gavots* and *Vaults*. The third, called *Sicinnis*, was a mixture of gravity and gaiety. *Neoptolemus*, son of *Achilles*, taught the *Creteans* a new sort of *Dance*, called *Pyrricha*, or the *armed Dance*, to be used in going to war: tho' according to mythologists, the *Curetes* first invented this *Dance*, to amuse and divert the infant *Jupiter*, and to drown his cries with the noise, and clash of their swords, beating against their bucklers.

Diodorus Siculus in the IVth of his *Bibliotheca* assures us, that *Cybele*, daughter of *Menoës*, king of *Phrygia*, and *Dindymenis* his wife, invented divers things, and among others the *Flageolet* of several pipes, *Dancing*, the *Tabor* and the *Cymbal*. *Numa*, 'tis certain, instituted a sort of *Dance* for the *Salii*, priests of *Mars*, who made use of weapons therein. From these *Dances* were composed another sort, called *Saltatio Mimicorum*, or the *Buffoon's Dance*; wherein the *Dancers* were dressed in little corsets, with gilt morions, and had bells on their legs, and swords and bucklers in their hands. *Lucian* has an express treatise, and *Julius Pollux*, a chapter on this head; *Athenæus*, *Cælius Rhodiginus*, and *Scaliger*, also make mention of this *Dance*.

It is not many years ago, since *Thoinot Arbeau*, a *dancing* master of *Paris*, gave an *orchestography*, wherein all the steps and motions of a *Dance* are writ, or noted down; as the founts of a song are scored in music. Tho' the famous *Beauchamp* had some pretensions to be the inventor of this secret, and accordingly procured an *arret* in his favour.

Dancing is usually an effect, and indication of joy among most nations: tho' *Mr. Palleprat* assures us, that there are people in *South America*, who *dance* to show their sorrow.

ROPE-DANCERS, Schoenobates. *Grodeck*, professor of philosophy at *Dantzic*, has published a dissertation on *Rope-Dancers, de Funambulis*; full of learning, and an uncommon knowledge of antiquity. He defines a *Rope-Dancer*, a person who walks on a thick rope fastened to two opposite posts; which is precisely, what is expressed by the Latin word *Funambulus*. But our *Rope-Dancers* do more, for they not only walk, but *dance*, and leap upon the rope.

The ancients, 'tis certain, had their *Rope-Dancers* as well as we: witness the Greek words *Neurobates*, and *Schoenobates*, as well as the Latin *Funambulus*, which every where occur. They had likewise the *Cremnobates* and *Oribates*, that is, people who walked on the brinks of precipices. Nay more, *Suetonius in Galba*, c. 6. *Seneca* in his 85th epistle, and *Pliny*, *Lib. VIII. cap. 2.* make mention of elephants that were taught to walk on the rope.

Acron, an ancient grammarian and commentator on *Horace*, takes occasion to observe on the Xth satire of the first

book, that Messala Corvinus was the first, who used the word *Funambulus*; and that Terence had it from him. But Mr. Groddeck shews that he is mistaken, and that Messala lived after Terence. The business is, Acron confounds Valerius Messala, who got the surname Corvinus in the war against the Gauls about 200 years before Terence, with one of his descendants, who was a famous orator in the time of Horace. Mr. Groddeck coming from the historical to the moral consideration, maintains that the profession of a *Rope-Dancer* is not lawful; that the professors are infamous, and their art of no use to society; that they expose their bodies to very great dangers; and that they ought not to be tolerated in a well regulated state.—But coming afterwards to temper the severity of his morals, he allows that there are sometimes reasons for admitting them: that the people must have shews; that one of the secrets of government is to furnish them therewith, &c. The ancient *Rope-Dancers* had four several ways of exercising their art; the first vaulted or turned round the rope, like a wheel round its axis, and there hung by the heels, or the neck. The second flew or slid from above, downwards, resting on their stomachs with the arms and legs extended. The third run along a rope stretched in a right line, or up and down. Lastly, the fourth not only walked on a rope, but made surprising leaps and turns thereon.

DANCETTE, in heraldry, is when the out-line of any bordure, or ordinary, is indented very largely; the largeness of the indentures being the only thing that distinguishes it from indented.

There is also a bearing of a bend, called *double Dancetté*; thus, he beareth azure, a bend double *Dancetté* argent.

DANCHE, or *Denché* in heraldry, the same with indented; or, as others will have it, with *Dancetté*.

DANEGELT, an annual tax laid on our ancestors, first of 15. afterwards 25. for every hide of land through the realm, for maintaining such a number of forces as were thought sufficient to clear the *British* seas of *Danish* pyrates, which heretofore greatly annoyed our coasts.

DANEGELT was first imposed as a standing yearly tax on the whole nation, under king Ethelred, A. D. 991. That prince, says Camden, *Britan.* 142. much distressed by the continual invasions of the Danes; to procure his peace, was compelled to charge his people with heavy taxes, called *Danegelt*.—At first they paid 10000 *lib.* then 16000 *l.* then 24000 *l.* after that 36000 *lib.* and lastly 48000 *lib. per annum.* Edward the confessor remitted this tax: William I. and II. re-assum'd it occasionally. In the reign of Henry I. it was accounted among the king's standing revenues; but king Stephen, on his coronation day, abrogated it for ever.

No church, or church land pay'd a penny to the *danegelt*; because, as is set forth in an ancient *Saxon* law, the people of England placed more confidence in the prayers of the church, than in any military defence they could make. *Camb. ap. Magn. Brit. p. 68.*

DANTELE, in heraldry, the same with *Danche*, or rather with *Dancetté*, viz. a large, open indenture. See *DANCETTE*.

DAPIFER*, the dignity, or office of grand master, or grand sewer of a king's, or prince's household.

* The word is pure Latin, compounded of *daps*, *dapis*, a dish of meat served on the table, and *fero*, I bear: so that *Dapifer* literally signifies a dish carrier, or an officer who serves the meats upon the table.

The title of *Dapifer* was given by the emperor of Constantinople to the Czar of Russia, as a testimony of favour. In France, the like office was instituted by Charlemain, under the title of *Dapiferat*, and *Seneschauflé*; to which was affixed the superintendance over all the officers of the household.

In England, the office of *Dapifer* was less eminent; being found in several of our ancient charters named one of the last of the officers of the household.

The dignity of *Dapifer* is still subsisting in Germany. Till the year 1623. the elector palatine was *Dapifer*, or grand sewer of the empire: since that time the elector of Bavaria has assumed the title of *Arch-Dapifer* of the empire. His office is, at the coronation of an emperor, to carry the first dish of meat to table on horseback.

The several functions of a *Dapifer* occasioned the ancients to give him divers names: as, *Æsaulq*, and *Eleator*, *Dipnector*, *Convocator*, *Trapezopæus*, *Architriclinus*, *Præpositus*, *Prægyfator*, *Domesticus*, *Megadomesticus*, *Oeconomus*, *Major-domus*, *Seneschallus*, *Schalvus*, *Gastaldus*, *Assessor*, *Præseitus*, or *Præpositus Mensæ*, *Princeps Coenarum* & *Magirus*.

DARAPTI, in logic, a mode of syllogism in the third figure, wherein the major and minor are universal affirmative propositions, and the conclusion a particular affirmative. *E. gr.*

d. A. Every truly religious man is virtuous.

r. A. Every truly religious man is hated by the world.

pt. I. Therefore, some virtuous men are hated by the world.

DARDANARIUS, *Usurer*, *Monopolist*; a name anciently attributed to such as caused a scarcity, and dearth of provisions, particularly corn, by buying and hoarding it up, to raise its value, and sell it again at an extravagant rate.

The name *Dardanarius* was given from one *Dardanus*, who is said to have made a practice of spoiling and destroying the fruits of the earth by a sort of forcery.

The same people are also called *Æryscatores*, *Direclarii*, *Sitocappeli*, *Annonæ Flagellatores*, and *Septesarii*.

DARE, see *FISHING*.

DARII, in logic, a mode of syllogisms in the first figure, wherein the major proposition is an universal affirmative, and the minor and conclusion particular affirmatives. *E. gr.*

d. A. They who speak well of every body have many friends.

r. A. Some speak well of every one.

I. Therefore some have many friends.

DARK-Chamber. See the article *CAMERA Obscura*.

DARK-Tent, a portable Camera Obscura, made not unlike a desk, and fitted with optic glasses; to take prospects of landscapes, buildings, fortifications, &c. See *CAMERA Obscura*.

DARREIN, in law, a corruption of the French *Dernier* last, and used in the like sense: as—*Darrein* continuance. (See *CONTINUANCE*).—*Darrein* presentment. See *ASSISE Darrein presentment*.

DART, in geometry, astronomy, &c. See *SAGITTA*.

DARTOS*, or *DARTUS*, in anatomy, the inner coat of the scrotum, composed of a great number of muscular, or fleshy fibres; whence some consider it as a cutaneous muscle.

* The word is pure Greek, *ἄρτος*, *Excortatus*, *pelle Nudatus*: of *ἄρτος*, *excortis*, probably by reason it lies close under the skin. See *SCROTUM*.

'Tis by means hereof that the scrotum is contracted, or corrugated, which is esteemed a sign of health.

The *Dartus* was anciently taken to be a continuation of the panniculus carnosus; but mistakenly. It has several veins and arteries. It invests the testicles, and extending itself between them, separates them from each other.

DATA, in mathematicks, certain things, or quantities supposed to be given, or known, in order, from them, to find out other things or quantities, which are unknown, or sought for. A problem or question generally consists of two parts; *Data* and *Quæsitæ*.

Euclid has an express treatise of *Data*; wherein he uses the word for such faces, lines and angles as are given in magnitude; or to which we can assign others equal.

From the primary use of the word *Data* in mathematics, it has been transplanted into other arts; as philosophy, medicine, &c. where it expresses any quantity, which, for the sake of a present calculation, is taken for granted to be such, without requiring an immediate proof for its certainty; called also the *given* quantity, number, or power—and hence also such things as are known, from whence either in natural philosophy, the animal mechanism, or the operation of medicines, we come to the knowledge of others unknown, are now frequently in physical writers called *Data*.

DATE*, an addition, or appendage in writings, acts, instruments, letters, &c. expressing the day, and month of the year when the act, or letter, was passed or signed; together with the place where the same was done.

* The word is formed from the Latin *Datum* given, of the participle *do*, I give. The Latins usually say *dabam*, I gave.

In writings of importance the *Date* should be written in words at length, *dated* or given at London this twenty sixth day of March in the year of our Lord one thousand seven hundred and fifty. In letters, the *Date* is usually in figures. London, March the 26th, 1750.

An *Anti-date* is a false *Date*, prior to the real time when the instrument was passed, or signed.

A *Post-date* is that posterior to the real time, &c.

Our ancient deeds had no dates, but only the month and year, to signify that they were not made in haste, or in the space of a day, but upon longer and more mature deliberation. The king's grants began with these words, *Præsentibus* & *futuris*, &c. but the grants of private persons with, *Omnibus præsentibus Literas inspecturis*—

DATE*, *Dactylus*, the fruit of the palm-tree.

* The word is formed of *Dactr*, and that of *Dactylus*, finger; as being round and oblong, resembling a finger's end.

This fruit is gathered in autumn, before it is ripe; and bears a near resemblance to our bullock; being of a green colour, and very sharp and astringent. When ripe, it becomes ruddy, having a hard, longish stone, cloven at bottom, and encompassed with a thin white pellicle or skin.

The husk or covering of the *Date*, called by the ancients *Elate*, or *Spatha*, when the fruit is in its growth, is variable; having as many changes of colour as the fig has.

Some *Dates* are black, some white, some brown, some again are round like apples, and very big. Ordinarily they are oblong, fleshy, yellow, somewhat bigger than the thumb's end, and some are very agreeable to the taste. Some are no bigger than a chick-pea, and others as big as a pomegranate. The best are those called *Royal Dates*. There is also another sort called *Caryote*, which are very good. Some of them have stones, and others none.

Dates are principally used in medicine: their qualities are, to soften the aperities of the gullet, to strengthen the *Fæctus* in the womb, to assuage all immoderate fluxes of the belly, and

to ease disorders of the reins and bladder. Their bad property is, that they digest difficultly, cause pains in the head, and produce a thick melancholic blood.—These effects arise from the principles they contain, which are a moderate share of oil, and a deal of phlegm, and essential salt. The oil and phlegm render them moistning and nutritious, good against acrimonies of the breast, to assuage coughs, &c. And the phlegm and salt render them detensive and astringent, and good against diseases of the throat. For the rest; they are an heavy food, full of earthy juice, and occasion obstructions in the viscera; for which reason, people who eat great quantities of *Dates* become scorbutic and lose their teeth betimes.

Our *Dates* are brought us from Egypt, Syria, Africa, and the Indies. They never come to full maturity in Italy, or the most southern parts of Spain. And yet there are tolerable *Dates* in Provence; but they do not keep, but breed worms. Those from Persia exceed all others in largeness, colour, and Taste.

DATISI, in logic, a mode of syllogisms in the third figure, wherein the major is an universal affirmative, and the minor, and conclusion are particular affirmative propositions.

E. gr.
d. A. All God's friends are kings.
s. I. Some of God's friends are poor.
S. I. Therefore, some poor, are kings.

DATIVE, in grammar, the third case in the declension of nouns; expressing the state, or relation of a thing to whose profit or loss some other thing is referred.

It is called *Dative*, because usually governed by a verb implying something to be given to some person. As, *commendare Socrati*, to lend to *Socrates*; *utilis reipublice*, useful to the commonwealth; *perniciosus ecclesie*, pernicious to the church; *visum est Platoni*, it seemed to *Plato*, &c.

In English, where we have properly no cases, this relation is expressed by the sign *to*, or *for*.

DAUGHTER. See the article *Son*.

The *Sons and Daughters* of the king of England are called the *Sons and Daughters* of England; because all the subjects of England have a special interest in them. See *PRINCES of the Blood*.

DAVIDISTS, DAVIDICI, a sect of heretics, the adherents of *David George*, a glazier, or, as others say, painter of Ghant; who in 1525, began to preach a new doctrine: publishing himself to be the true messiah, and that he was sent thither to fill heaven, which was quite empty for want of people to deserve it.

He rejected marriage, with the Adamites; held with Manes, that the soul was not defiled by sin; and laughed at the sentimental so much recommended by Jesus Christ.—Such were his principal errors.

He made his escape from Ghant, and retired first into Friseland, and then to Basil, where he changed his name, assuming that of John Bruck, and died in 1556.

He left some disciples behind him, to whom he promised that he would rise again at the end of three years. Nor was he altogether a false prophet herein, for the magistrates of that city, being informed at the three years end of what he had taught, ordered him to be dug up, and burnt, together with his writings, by the common hangman.

There are still some remains of this ridiculous sect in Holstein, particularly about Frederickstadt, where they are intermixed with the Arminians.

DAVIS'S Quadrant. See the article *BACK-STAFF*.

DAUPHIN, DOLPHIN, in astronomy. See *DELPHINUS*.

DAUPHIN, is a title given the eldest son of France, and presumptive heir of the crown; on account of the province of *Dauphiné*, which in 1343, was given to Philip de Valois on this condition, by Humbert *Dauphin* of the Viennois.

The *Dauphin*, in his letters patents, styles himself, "By the grace of God, eldest son of France, and *Dauphin* of Viennois."

DAUPHIN * was anciently the title or appellation of the prince of Viennois in France.

* Most authors, who have sought the origine of the name *Dauphin*, and *Dauphine*, seem to have given too much loose to conjecture. Some will have it derived from the Aussenats, an ancient people mentioned by Ptolemy and Piny; but those authors place the Aussenats on the other side of the Alps in the Gallia Cisalpina. Others write that the Allobroges brought the name from Delphos; others, that king Eolus's shield was distinguished by the figure of a Dolphin, which he bore thereon. Others, that the princes who reigned in the Viennois after Eolus, pitched on the *Delphin* for their arms as a symbol of their mildness and humanity. Others, that it was first given by an emperor who made war in Italy, but whom they do not name, to a governor of this province, who sent him a powerful supply with such expedition, that it deserved to be compared with the swiftness of a *Dolphin*. Thaboët fancies the word to be Gothic; as well as the names Brefs, Savoy, Beaujeau, &c. Claud de Grange takes it to have been formed from the word *Viennois*, the ancient name of this province. A person of this province, says he, being asked what countryman he was, answered, *de Viens*, and the prince of the pro-

vince called himself the prince *de Viens*; and afterwards changing the V, according to custom, into F, *de Viens*; and at length retrenching the two ce's, *Defin*: lastly, the common opinion that the word was formed from *Dolphinus*, occasioned them to write *Dauphin*: but this appears to Choricor no better than a ridiculous subtilty. Others will have it that Guy the Fat, having a daughter he was very fond of, used to call her *Dauphin*; and to immortalize her when dead, gave her name to his country. Others are of opinion, that the last count d'Albon, whose estate being incorporated with that of the count de Grefvaudan, by the marriage of his only daughter with the first Guy, was actually named *Dauphin*; and that his eldest grandson, being obliged to take his name, was called *Dauphin*; and bore the figure of a *Dolphin* for his arms. Du Chelne is likewise of opinion, that it was the grandson of Guy the Fat, who first bore the name of *Dauphin*; though not for the reason just alleged, but that it was given him at his baptism, and added to that of Guy. Choricor will not allow any thing probable in any of these opinions: he observes that William canon of Notre Dame at Grenoble, who has wrote the life of Margaret daughter of Stephen earl of Burgundy married with Guy son of Guy the Fat, calls the latter simply *Guy the Old*, and the former always count *Dauphin*; and adds, that no record, no monument, ever attributes the title of *Dauphin* to Guy the Fat, or any of his predecessors; so that it must necessarily have taken its rise in his son, all whose successors so constantly assumed it, that it became the proper name of the family. He died in 1142, in the flower of his youth; so that it must be about the year 1120, that the title commenced; and without doubt, adds he, on some illustrious occasion. He observes farther, that this prince was of a military disposition, and delighted in nothing but wars; and again, that it was the custom of the Cavaliers to deck their casks, coats of arms, and the housing of their horses, with some figure or device peculiar to themselves, whereby they were distinguished from all others engaged in the same combat or tournament. From all these circumstances he conjectures that this Guy chose the *Dolphin* for his signature; that this was the crest of his helmet; and that he bore it on his coat in some notable tournament or battle wherein he distinguished himself. And this, Choricor makes no doubt, is the real origin of the appellation. The President de Valbonnet speaks more justly on the subject: Guignes, or Guy the Fat, son of Guy the old, married Mathilda, who has been supposed to be of the same royal family, as being called *Regina* in several ancient charters. This couple had a son, who, in a deed passed between him and Hugh bishop of Grenoble in 1140, is called *Delphinus*; *Guigo Comes, qui vocatur Delphinus*. This has occasioned some historians, there was no necessity for having recourse to voyages beyond the sea, where the counts de Grefvaudan might take the *Dolphin* for their arms, or badge of distinction. In effect, that conjecture does not stand on any proof; nor is it true that the first and second race of those princes bore the *Dolphin* for their arms; there being scarce any signs thereof before Humbert I. who first wore it on his shield. It is more probable that the surname *Dauphin*, which Guy first assumed, pleased his successors so much, that they added it to their own name, and erected it into a title, which has been retained ever since. Nothing was more common in these times, than to make proper names become the names of families, or dignities. Witness the Ademars, Arthauds, Aynards, Aclmans, Berengers, and infinite others, who all owe their names to some one of their ancestors, from whom it has been transmitted throughout the family.

The seigneurs or lords of Auvergne have likewise bore the appellation of *Dauphin*; but the *Dauphins* of Auvergne had it not till a good while after those of the Viennois, and even received it from them. The manner was this: Guy the VIIIth, *Dauphin* of Viennois, had by his wife Margaret, daughter of Stephen, earl of Burgundy, a son and two daughters. The son was Guy the IXth his successor. Beatrix, one of the daughters, was married to the count d'Auvergne, who, according to Blondel, was William the Vth, or rather, as Choricor and others hold, Robert the Vth, father of William the Vth. This prince lost the greatest part of the county Auvergne, which was taken from him by his uncle William, assisted by Louis the young; and was only left master of the little canton whereof *Vodable* is the capital. He had a son whom he called *Dauphin*, on account of Guy, or Guignes, his uncle by the mother's side. From his time his successors holding the same petty canton of Auvergne, styled themselves *Dauphins* of Auvergne, and bore a *Dolphin* for their arms.

DAY, a division of time, drawn from the appearance, and disappearance of the sun.

The *Day* is of two kinds, *Artificial*, and *Natural*.

Artificial DAY, which seems to be that primarily meant by the word *Day*, is the time of light; determined by the sun's rising and setting.

This is properly defined the stay of the sun above the horizon: In opposition to which, the time of darkness, or, the sun's stay below the horizon from setting to rising again, is called *Night*.

Natural DAY, called also *Civil Day*, is the space of time wherein the sun performs one revolution round the earth: or, more justly, the time wherein the earth makes a rotation on its

axis; which the Greeks more properly express by *ἡμεραν νυκτὸν*, *Nycthemeran*, q. d. night-day.

The *Epocha*, or *Beginning of the Civil Day*, is the term from which one *Day* begins, and in which the preceding *Day* concludes. The fixing of this term is of some importance. It is certain, that for the more commodious distinguishing of *Days*, it ought to be fixed in some moment of time wherein the sun is in some distinguishable part of the heavens. The most eligible therefore should be the moments wherein the sun passes either the horizon, or the meridian. In effect, as there is no moment can be more accurately determined by observation than that in which the sun passes through the upper meridian: if regard be had to the exactness of the measure, the noon-tide has the best pretensions; the rising and setting of the sun being disturbed by the refraction; beside that, the horizon is seldom clear of clouds. But yet, as the *Artificial Day* does begin with the sun's rise, and ends with the setting; and besides, the sun's passing the horizon is a thing easily observed, the rising or setting of the sun should appear the most commodious, tho' not most accurate *Epoch* or beginning of the *Civil Day*.

As then there are not wanting reasons for beginning the *Natural Day*, both from the sun's passing the meridian, and the eastern, and western side of the horizon; it is no wonder that different nations should begin their *Day* differently.

Accordingly, 1st, The ancient Babylonians, Persians, Syrians, and most other eastern nations, with the present inhabitants of the Balearic islands, the Greeks, &c. begin their *Day* with the sun's rising. 2^{dly}, The ancient Athenians and Jews, with the Austrians, Bohemians, Marcomanni, Silesians, modern Italians, and Chinese, reckon it from the sun's setting. 3^{dly}, The ancient Umbri and Arabians, with the modern astronomers, at noon. And, 4^{thly}, The Egyptians and Romans, with the modern English, French, Dutch, Germans, Spaniards, and Portuguese, at midnight.

The *Day* is divided into hours; and the week, month, &c. into *Days*.

For the different lengths of the *Day* in different climates.

It has been a matter of some controversy among astronomers, whether or no the *Natural Days* be all equally long throughout the year; and if not, what is their difference? A professor of mathematics at Sevil, in a memoir in the *Philosophical Transactions*, asserts, from a continued series of observations for three years, that they are all equal. Mr. Flamstead, in the same transactions, refutes the opinion; and shews, that one *Day*, when the sun is in the equinoctial, is shorter than when he is in the tropicks, by 40 seconds; and that 14 tropical *Days* are longer than 10 many equinoctial ones, by $\frac{1}{2}$ of an hour, or 10 minutes. This inequality of the *Days* flows from two several principles: the one, the eccentricity of the earth's orbit; the other, the obliquity of the ecliptic with regard to the equator, which is the measure of time. As these two causes happen to be combined, the length of the *Day* is varied.

DAY, in law, is frequently used for the *Day* of appearance in court, either originally, or upon assignation.

We say, He had a *Day* by the rolls, i. e. he had a *Day* of appearance assigned him.

DAYS in Bank, are *Days* set down by statute, or order of the court, when writs shall be returned, or when the party shall appear on the writ served.

To be dismissed without *Day*, *sine Die*, is to be finally discharged the court.

DAYS of Prevision, in the Exchequer. See REMEMBRANCE.

DAYS of Grace, in commerce, are a number of *Days* allowed by custom for the payment of a bill of exchange, after the same becomes due, i. e. after the time it was accepted for is expired.

In England three *Days of Grace* are allowed; so that a bill accepted in order to be paid, e. gr. ten *Days* after sight, is not to be paid till thirteen *Days*. Throughout France, they allow ten *Days of Grace*; as many at Dantzic; eight at Naples; six at Venice, Amsterdam, Rotterdam, and Antwerp; four at Francfort; five at Leipzig; 12 at Hamburg; 6 in Portugal; 14 in Spain; 30 in Genoa, &c.—Note, fundays, and holidays are included in the number of *Days of Grace*.

Fish DAYS, See the article ABSTINENCE.

Dog-DAYS, *Dies Caniculares*. See CANICULAR.

Critical DAYS, *Dies Critici*. See CRITICAL DAYS.

Intercalary, or Additional DAYS. See INTERCALARY DAYS.

DEACON*, *DIACONUS*, a person in the lowest degree of holy orders, whose business is to baptize, read in the church, and assist at the celebration of the eucharist.

* The word is formed from the Latin *Diaconus*, of the Greek *διακονος*, minister, servant.

Deacons were first instituted, seven in number, by the apostles, Acts, chap. vi. which number was retained a long time in several churches. Their office was to serve in the Agape, and to distribute the bread and wine to the communicants, and dispense the alms.

By the ancient canons, marriage was not incompatible with the state and ministry of a *Deacon*. But it is now a long

time that the Romish church has prohibited their marrying; and the pope only grants them dispensations for very important causes; and after this dispensation, they lose the rank and functions of their order, and return to a lay state.

The *Deacons* were formerly prohibited fitting with the priests: the canons forbid *Deacons* to consecrate; that being a sacerdotal office. They also prohibit a *Deacon* being ordained, unless he have a title, or call, and be at least twenty five years of age. The emperor Justinian, in *Novel* 123, assigns the same age of twenty-five years for a *Deacon*. But this was the custom when priests were not ordained at less than thirty years of age. At present twenty-three years of age suffices for a *Deacon*. At Rome, under pope Sylvester, they had only one *Deacon*; then seven were appointed; then fourteen, and at last eighteen, who were called *Cardinal Deacons*; to distinguish them from those of other Churches.

Their office was to take care of the temporalities of the church, to look to the rents and charities, and provide for the necessities of the ecclesiastics, and even of the pope. The collecting of the rents, alms, &c. belonged to the *Sub-Deacons*; the *Deacons* were the depositaries and distributors. Having thus the management of the revenues of the church in their hands; their authority grew apace, as the riches of the church increased. Those of Rome, as being ministers of the first church, preceded all others, and even at length took place of the priests themselves. Doubtless, it was the avarice of the priests that made them give place to the *Deacons*, who had the disposal of the money. St. Jerom exclaims against this attempt, and proves that a *Deacon* is properly inferior to a priest.

The Council in Trullo, which is the III of Constantinople, Aristenus in his Synopsis of the canons of that council, Zonaras on the same council, Simeon Logotheta, and Oecumenius, distinguish *Deacons* destined for service at the altar, from those who had the care of the distribution of the alms of the faithful. Thus, the custom of constituting *Deacons*, without any other office but to attend the priest at the altar, being once introduced, those simple *Deacons* durst no longer pretend to a superiority over the priests. As to the other *Deacons*, who had got the administration of the revenues, they would still retain the superiority; and for distinction sake, where there were several, the first took the appellation of *Arch-Deacon*.

The *Deacons* rehearsed certain prayers at the holy office, which were thence denominated *Diaconical*.

They took care that the people at church behaved themselves with due modesty and respect. They were not allowed to teach publicly; at least not in the presence of a bishop or priest. They only instructed the Catechumens, and prepared them for baptism. The doors of the church were likewise in their custody: though, in after times, that charge was committed to the *Sub-Deacons*.

Among the Maronites of mount Lebanon, there are two *Deacons*, who are mere administrators of the temporalities. Dandini, who calls them *li Signori Diaconi*, assures us, they are secular lords, who govern the people, sit in judgment on all their differences, and treat with the Turks as to what concerns the taxes and other affairs. In this, the patriarch of the Maronites seems to have aimed to imitate the apostles, who discharged all the temporal concerns of the church on the *Deacons*; it is not well done, say they, to leave the word of God, and serve at tables. And, in effect, it was this that gave occasion to the first establishment of the *Diaconate*.

DEACONESS, *DIACONISSA*, an office in use in the primitive church, though now laid aside. St. Paul makes mention thereof in his epistle to the Romans: and the younger Pliny, in a letter to Trajan, tells that prince, that he had ordered two *Deaconesses*, whom he calls *Ministræ*, to be tortured. *Deaconess* was a title given to certain devout women, who consecrated themselves to the service of the church, and rendered those offices to the women, which men could not decently do; as, in baptism, for instance, which was conferred by immersion, on women as well as men.

They were likewise to look to the doors on the side the women were on, who were separated from the men, according to the custom of those times. They had the care and inspection of the poor, sick, &c. And in times of persecution, when a *Deacon* could not be sent to the women, to exhort and fortify them, a *Deaconess* was sent. See Balsamon on the eleventh canon of the council of Laodicea; and the *Apostolical Constitutions*, L. II. c. 57. To say nothing of the epistle of Ignatius to the people of Antioch; where, what is said of *Deaconesses*, is supposed to be an interpolation.

In Lupus's commentaries on the councils it is said that they were ordained by the imposition of hands: and the council in Trullo uses the term *χειροτονειν*, to impose hands, to express the consecration of *Deaconesses*. Baronius, however, denies that hands were laid on the *Deaconesses*; or that there was any ceremony of consecration: sounding his opinion on the nineteenth canon of the council of Nice, which places them in the rank of the laity, and says expressly, they have had no imposition of hands. And yet the council of Chalcedon decrees they should not be ordained till forty years of age; whereas till then they had not been ordained before sixty;

as is prescribed in the first epistle to *Timothy*, chap. v. 9. And as is seen in the *Nomocanon* of John of Antioch, in *Balsamon*, the *Nomocanon* of Photius, the *Theodorian Code*, *Tertullian de Veland. Virgin. &c.*

Tertullian, ad uxorem, L. i. c. 7. speaks of women who had received ordination in the church, and who, on that account, were deprived of the liberty of marrying. For the *Deaconesses* were widows and might not re-marry. Nor were they capable of being admitted to that order, if they had been married more than once. Though in after-times virgins were also made *Deaconesses*, if we may credit *St. Epiphanius*, *Zonaras*, *Balsamon* and *Ignatius*.

The council of Nice ranks *Deaconesses* among the clergy: though some hold that their ordination was not sacramental, but a mere ecclesiastical ceremony. However, it gave them a preeminence above the rest of their sex; for which reason the council of Laodicea forbade the ordaining of any more for the future. The first council of Orange, held in 441 likewise forbids the ordaining of *Deaconesses*, and enjoins such as had been ordained to receive the benediction with the mere laity.

It is hard to say when the order of *Deaconesses* expired; by reason they did not all cease together. The eleventh canon of the council of Laodicea, it is true, seems to abrogate them; but it is certain they subsisted in diverse places long afterwards. For tho' the twenty sixth canon of the first council of Orange, and the twenty first of that of Epaona, held in 515, forbid the ordination of *Deaconesses*; yet there were some at the time of the council in Trullo.

Atto of Verecil in his VIIIth letter gives the reason of their being abolished: he observes that in the first ages the ministry of women was necessary, in order to the more easy instructing of other women, and recovering them from paganism; and that they likewise served for the more decent administration of baptism to the same: but that it was not then necessary, by reason none but children were baptized; and it might now be added, by reason baptism is only conferred by sprinkling. The number of *Deaconesses* does not seem to have been fixed: the emperor *Heraclius*, in his letter to *Sergius* patriarch of Constantinople, orders that in the great church of Constantinople there be forty *Deaconesses*, whereas there were only six in that of the mother of God, in the quarter of the *Blachernæ*.

DEACONRY, DIACONATE, the order, or ministry of a *Deacon*, or *Deacons*. See **DEACON** and **DEACONESSES**.

DEACONRY, DIACONIA, is also a name still reserved to the chapels and oratories in Rome, under the direction of the several deacons, in their respective regions or quarters.

To the *Deaconries* were annexed a sort of hospitals, or boards for the distribution of alms, governed by the regent deacons, called cardinal deacons, of whom there were seven, answering to the seven regions, their chief being called the arch-deacon.

The hospital adjoining to the church of the *Deaconry*, had an administrator for the temporal concerns, called the *Father of the Deaconry*, who was sometimes a priest, and sometimes a lay-man. At present there are fourteen of these *Deaconries* or hospitals at Rome, which are reserved to the cardinals. *Du Cange* gives us their names: as the *Deaconry* of St. Maria in the broad way; the *Deaconry* of St. Eustachio near the Pantheon, &c.

DEADLY FEUD*, in our law-books, a profession of irreconcilable enmity till a person is revenged by the death of his enemy.

* The word *Feud*, is derived from the German *Fehd*, which, as *Hottoman* observes, signifies, *modo bellum, modo capitales inimicitias*. See **FEUD**.

Such enmity and revenge was allowed by our ancient laws in the time of the Saxons, *viz.* If any man was killed, and a pecuniary satisfaction were not made to the kindred, it was lawful for them to take up arms, and revenge themselves on the murderer: which was called *Deadly Feud*. And this, probably, was the original of an appeal.

DEAD-PLUDGE. See the article **MORTGAGE**.

DEAD-RECKONING, at sea, is that estimation, judgment or conjecture, which the sea-men make of the place where a ship is, by keeping an account of her way by the log, by knowing the course they have steered by the compass, and by rectifying all, with allowance for drift lee-way, &c. according to the ship's trim: so that this *Reckoning* is without any observation of the sun, moon and stars, and is to be rectified as often as any good observation can be had. See **LOG**.

DEAD-WATER, is the eddy-water just behind the stern of a ship: It is so called, because it does not pass away so swiftly, as the water running by her sides doth.

If a ship have a great eddy following her stern, they say, she makes much *Dead-Water*.

DEAFFORESTED, in our law-books, the being discharged from being forest; or freed and exempted from forest-laws*. See **FOREST**.

* *Johannes Dei Gratia, &c. Archiepiscopus, Episcopus, &c. sancti nos omnino Deafforestasse Forestam de Brewood de omnibus que ad Forestam & Forestarias pertinent. Quare volumus & firmiter precipimus, quod predicta Foresta & homines in illa manentes, & heredes eorum sint Deafforestati in perpetuum.*

DEAFNESS, the state of a person who wants the sense of hearing: or a disease of the ear, which prevents its due reception of sounds.

Deafness generally arises either from an obstruction, or a compression, of the auditory nerve; or from some collection of matter in the cavities of the inner ear; or else from the auditory passage being stopped up by some hardened excrement; or, lastly, from some excrecence, as a swelling of the glands, or some foreign body introduced within it.

Those born *deaf* are also dumb, as not being able to learn any language; at least in the common way. However, as the eyes, in some measure, serve them for ears, they may understand what is said by observing the motion of the lips, tongue, &c. of the speaker; and even accustom themselves to move their own, as they see other people do; and by this means learn to speak.

Thus it was that *Dr. Wallis* taught two young gentlemen born *deaf*, to know what was said to them, and to return pertinent answers. *Digby* gives us another instance of the same, within his own knowledge. And there was a *Swiss* physician lately living at Amsterdam, one *Joh. Conrad Amman*, who effected the same in several children born *deaf*, with surprising success. He has reduced the thing to a fixed art or method, which he has published in his *Surdus Loquens*, Amsterdam, 1692. and *de Loquela*, ibid. 1700.

In the *Phil. Transact.* No. 312, we have an account by *Mr. Waller*, R. S. Secr. of a man and his sister, each about fifty years old, born in the same town with *Mr. Waller*, who had neither of them the least sense of hearing; yet both of them knew, by the motion of the lips only, whatever was said to them, and would answer pertinently to the question proposed. It seems they could both hear and speak when children; but lost their sense afterwards; whence they retained their speech, which, though uncouth, was yet intelligible.

Such another instance is that of *Mr. Goddy's* daughter, minister of *St. Gervais* in Geneva, related by *bishop Burnet*. At two years old they perceived she had in great part lost her hearing; and ever after, though she heard great noises, yet she could hear nothing of what was said to her. But by observing the motions of the mouth and lips of others, she had acquired so many words, that out of these she had formed a sort of jargon, in which she could hold conversation whole days with those that could speak her language. She knew nothing that was said to her, unless she saw the motion of their mouths that spoke to her; so that in the night, they were obliged to light candles to speak to her. One thing will appear the strangest part of the whole narration: she had a sister, with whom she had practised her language more than with any body else; and in the night, by laying her hand on her sister's mouth, she could perceive by that what she said, and so could discourse with her in the dark. *Burn. Let. IV. p. 248.*

It is observable that *deaf* persons and several others thick of hearing, hear better and more easily if a loud noise be raised at the time when you speak to them: which is owing, no doubt to the greater tension of the ear-drum, on that occasion. *Dr. Willis* mentions a *deaf* woman, who, if a drum were beat in the room, could hear any thing very clearly; so that her husband hired a drummer for a servant, that by his means he might hold conversation with his wife. The same Author mentions another, who, living near a steeple, could always hear very well, if there was a ringing of three or four bells: but never else. See *Supplement. Article DEAF*.

DEAN*, a prime dignitary in most cathedral and collegiate churches; being usually the president of the chapter.

* He is called *Dean, Decanus*, of the Greek *Ἐπίσκοπος*, ten, as being supposed to preside over ten canons or prebendaries, at least.

Canonists distinguish between *Deans* of cathedral, and those of collegiate churches. The first, with their chapter, are regularly subject to the jurisdiction of the bishop. As to *Deans* of collegiate churches, they have usually the contentious jurisdiction in themselves, that is, they exercise jurisdiction over their canons in all civil, or criminal matters; though sometimes this belongs to them in common with the chapter.

In England, as there are two foundations of cathedral and collegiate churches, the old and the new, (the latter being those founded by *Henry the VIIIth* on the suppression of the Abbots and Priors, when their convents were turned into *Dean* and chapter;) so there are two ways of creating the *Deans*. Those of the old foundation, are brought to their dignity much like a bishop; the prince first sending out his *Congé d'Ellire* to the chapter; the chapter then choosing, the king yielding his royal assent, and the bishop confirming him, and giving his mandate to install him. Those of the new foundation are installed by a shorter course; only by the king's letters patent, without either election or confirmation.

Constantine we are told, erected an office of nine hundred and fifty persons at Constantinople, taken out of diverse trades and professions, whom he exempted from all impositions, and bestowed them on the cathedral church, to render the offices

fices of burial *gratis* to the defunct, particularly to the poor. These he called *Decani* and *Leſſicarii*, probably by reason they were divided by tons; each whereof had a bier or litter to carry the bodies in: it is ſuppoſed to be theſe, who under Conſtantius began to be called *Copiatæ*, i. e. clerks deſtined for labour. For they are uſually ranked among the clerks, and even before the chantors. By a law of the year 357, it appears that there were ſome of theſe *Copiatæ* at Rome.

DEAN is alſo a title applied among us to diverſe Perſons that are the chief of ſome peculiar churches, or chapels: as, the *Dean* of the king's chapel, of the arches, of battel, of bolking, &c.

Rural DEAN, or Urban DEAN, was formerly an eccleſiaſtical perſon, who had a diſtrict of ten churches or pariſhes, either in the country or city, within which he exerciſed juriſdiction. Theſe *Rural Deans* were ſometimes called *Archipreſbyteri*, and at firſt they were both in order and authority, above the arch-deacons. They were at firſt elected by the clergy, and by their votes depoſed; but afterwards they were appointed, and removed, at the diſcretion of the biſhop: and hence they were called *Decani Temporarii*, to diſtinguiſh them from the cathedral *Deans*, who were called *Decani Perpetui*.

We meet with *Rural Deans* as early as the IXth century: Hincmar, in a capitular to his arch-deacons, reſerves the right of electing them to himſelf; and only allows it to the arch-deacons, in caſe he be abſent, and by proviſion only. Some take the *Rural Deans* to hold the rank and place of the Chorepiſcopi. Be this as it will, it is certain they are very ancient in France, Germany, and England; though till the end of the XVIIth century they were unknown in Italy, in regard the biſhopricks being there exceeding ſmall, they were not needed. S. Charles Borromeo is ſaid to have firſt introduced them there.

DEAN, in the ancient monaſteries, was a ſuperior eſtabliſhed under the abbot, to eaſe him in taking care of ten monks; whence he was called *Decanus*, in imitation of thoſe officers called by the ſame name among the Romans, who had ten ſoldiers under them.

Till the time of St. Benediſt, there were uſually in each monaſtery a provost, *Præpoſitus*, and ſeveral *Deans*, *Decani*, under the abbot. In ſome abbies, there was but one *Dean*, and he bleſſed by the biſhop, as well as the abbot himſelf. This privilege gave him occaſion to think himſelf in ſome meaſure the abbot's equal; and to ſcruple obedience to him. St. Benediſt was ſenſible of this inconvenience, and to prevent it in his order, he appointed that the monaſteries ſhould be governed under the abbot by ſeveral *Deans*, whoſe authority being thus ſhared, they would be the leſs dangerous.

The office of the *Deans* we have obſerved, was to have the inſpection each of ten monks, to look to their working, and all their exerciſes. They were not choſe by ſeniority, but merit; and might be depoſed after three admonitions. The monaſteries being now leſs populous than they were in ancient times, the abbot, or prior, do not ſtand in ſo much need of being eaſed; ſo that theſe *Deans* are in general feilade.

DEAN and Chapter.—Anciently, biſhops did not ordinarily tranſact matters of moment *ſine concilio preſbyterorum principalium*, who were then called *Senatores Eccleſiæ*, and colleagues of the biſhops; represented in ſome meaſure by our chapters of cathedrals, wherein the *Dean* and ſome of the prebends are, upon the biſhop's ſummons, to aſſiſt him in ordinations, deprivations, condemnations, excommunications, and other weighty concerns of the church. See CHAPTER.

DEARTICULATION, in anatomy. See DIARTHROSI.

DEATH, *Mors*, is generally conſidered as the ſeparation of the ſoul from the body; in which ſenſe it ſtands oppoſed to life, which conſiſts in the union thereof.

Physicians have uſually defined *Death* by a total ſtoppage of the circulation of the blood; and a ceſſation of the animal, and vital, functions conſequent thereon; as reſpiration, ſenſation, &c.

An animal body, by the actions inſeparable from life, undergoes a continual change. In time, its ſmalleſt fibres become rigid, its minute veſſels grow into ſolid fibres no longer previous to the fluids, its greater veſſels grow hard and narrow, and every thing becomes contracted, cloſed and bound up, whence the dryneſs, immobility, and extenuation obſerved in old age. By ſuch means the offices of the minuter veſſels are deſtroyed, and the humours ſtagnate, harden, and at length coaleſce with the ſolids. Thus are the ſubtleſt fluids in the body intercepted and loſt, the concoction weakened, and the reparation prevented; only the coarſer juices continue to run ſlowly through the greater veſſels, to the preſervation of life, after many of the animal functions are deſtroyed. At length, in the proceſs of theſe changes, *Death* it ſelf becomes inevitable, as the neceſſary conſequence of life.

But it is rare, that life is thus long protracted, or, that *Death* ſucceeds merely from the decays and impairments of old age. Diſeaſes, a long and horrid train, uſually cut the work ſhort.

DEATH-Watch, in natural hiſtory, a little inſect famous for a ticking noiſe, like the beat of a watch, which the populace

have long took for a preſage of *Death*, in the family where it is heard: whence it is alſo called *Pediculus Fatidicus*, *Mortifaga*, *Pulſatorius*, &c.

There are two kinds of *Death-Watches*: of the firſt we have a good account in the *Philophoph. Tranſact.* by Mr. Allen. It is a ſmall beetle $\frac{1}{2}$ of an inch long, of a dark brown colour, ſpotted; having pellucid wings under the Vagina, a large cap or helmet on the head, and two Antennæ proceeding from beneath the eyes. The part it beats withal, he obſerved, was the extreme edge of the face, which he chuſes to call the upper lip, the mouth being protracted by this bony part, and lying underneath, out of view. Its figure, as it appears in a microſcope, ſee represented in *Tab. Nat. Hiſt. Fig. 2.*

This account is confirmed by Mr. Derham, with this difference, that inſtead of ticking with the upper lip, he obſerved the inſect to draw back its mouth, and beat with its forehead. That author had two *Death-Watches*, a male and a female, which he kept alive in a box, ſeveral months, and could bring one of them to beat whenever he pleaſed, by imitating its beating. And by this ticking noiſe he could frequently invite the male to get up upon the other in the way of coition. When the male found he got up in vain, he would get off again, beat very eagerly, and then up again. Whence the ingenious author concludes, thoſe pulſations to be the way whereby theſe inſects woo one another, and find out, and invite each other to copulation.

The ſecond kind of *Death-Watch* is an inſect in appearance quite different from the firſt. The former only beats ſeven or eight ſtrokes at a time, and quicker; the latter will beat ſome hours together, without intermiſſion, and his ſtrokes are more leiſurely, and like the beat of a *Watch*. This latter is a ſmall greyiſh inſect, much like a louſe when viewed with the naked eye. Its figure, as magnified, is ſeen in *Tab. Nat. Hiſt. Fig. 1.*

It is very common in all parts of our houſes in the ſummer-months: is very nimble in running to ſhelter; and shy of beating when diſturbed. But will beat very freely before you, and alſo answer the beating, if you can view it without giving it diſturbance, or ſhaking the place where it lies. The author cannot ſay, whether they beat in any other thing, but he never heard their noiſe except in or near paper. As to their noiſe, he is in doubt, whether it be made by their heads, or rather ſnouts againſt the paper; or, whether it be not made after ſome ſuch manner, as graſhoppers and crickets make their noiſe. But he inclines to the former opinion: the reaſon of his doubt is, that he obſerved the animal's body to ſhake and give a jirk at every beat, but could ſcarce perceive any part of its body to touch the paper. But its body is ſo ſmall, and ſo near the paper, and its motion in ticking ſo quick, that he thinks it might be, yet he not perceive it. The ticking, as in the other, he judges to be a wooing-act; as having obſerved another, after much beating, come and make offers to the beating inſect, who after ſome offers, left off beating, and got upon the back of the other. When they had been a little while joined, he got off again, and they continued ſome hours joined tail to tail, like dog and bitch in coition. This inſect is at firſt a minute white egg, much ſmaller than the nits of lice; though the inſect is near as big as a louſe. In March it is hatched, and creeps about with its ſhell on. When it firſt leaves its ſhell, it is even ſmaller than its egg; though that be ſcarce diſcernable without a microſcope. In this ſtate it is ſomewhat like the mites in cheeſe: from this ſmall ſtate they grow gradually to their mature or perfect ſize: when they become like the old ones, they at firſt run about much more ſwiftly than before.

DE BENE ESSE, a Latin phraſe uſed in our law-books—To take, or do a thing *De bene eſſe*, is to accept, or allow it as well done for the preſent; but when it comes to be more fully examined, or tried, to ſtand or fall, to be allowed or diſallowed, according to the merit, or well-being of the thing in its own nature: or as we ſay, *Valent quantum valere poſſet.*

Thus, in chancery, upon motion to have one of the leſs principal defendants in a cauſe examined as a witneſs, the court (not then thoroughly examining the juſtice of it, or not hearing what may be objected on the other ſide) often orders ſuch a defendant to be examined *De bene eſſe*, i. e. that his depoſitions ſhall be allowed or ſuppreſſed at the hearing of the cauſe upon a full debate of the matter, as the court ſhall think fit; but for the preſent they have a well-being or conditional allowance.

DEBENTURE, a kind of writing in the nature of a bond, firſt given in 1649, to charge the commonwealth to ſecure the ſoldier-creditor, or his aſſigns, the ſum due, upon auditing the accounts of his arrears.

The word is now alſo uſed in the Exchequer, and in the king's houſehold, where *Debentures* are uſually given to the ſervants for the payment of their wages, board-wages, and the like.

Debenture is mentioned in the act of oblivion, 12 Car. II. cap. 2. and since the late revolution, has been used in many acts of parliament, especially in that which relates to the forfeited estates in Ireland, out of which the soldiers *Debentures* are appointed to be satisfied, 11 W. III.

DEBILITY (in a Medicinal sense) is a relaxation of the solids, which often induces weakness and fainting.

DEBILITY (in Astrology) See **DIGNITY**.

DEBRUIZED, or **DEBRUISED**, in heraldry, is when we would intimate the grievous restraint of any animal, which is debarr'd its natural freedom by any of the ordinaries being laid over it.

Thus when a pale, &c. is born upon a beast in an escutcheon, the beast is said to be *debruis'd* by the pale.

DEBT, a thing due to another, whether it consist of money, goods, or services.

By our law, *Debts* due to the king are to be satisfied in the first place in all Cases of executorship, and administratorship; and till the king's *Debt* be satisfied, he may protect the debtor from the arrest of any other creditor.

We meet with divers kinds of *Debts*: *Active Debts*, are those whereof a person is creditor: *Passive Debts*, those whereof he is debtor.—There are also *Real Debts*, *Personal Debts*, and *Mixed Debts*.

Chirographary DEBT, in the French law, is that due by virtue of a note, or writing under one's hand, and not proved in judicature.

Hypothecary DEBT, is that due in virtue of some contract, or judgment.

Prædatory DEBT, is that arising from an alienation of lands, &c. the whole purchase whereof has not been paid.

Privileged DEBT, is that which must be satisfied before all others; as, the king's tax, &c.

DEBTOR, a person who owes something to another: in opposition to creditor, which is he to whom it is owing.

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

If all the sides and angles be equal, it is called a regular *Decagon*, and may be inscribed in a circle.

The sides of a regular *Decagon* are, in power and length, equal to the greatest segment of an hexagon, inscribed in the same circle, and cut according to extreme and mean proportion. A fortification also consisting of ten bastions, is sometimes call'd a *Decagon*.

DECALOGUE*, the ten commandments of God, engraven on two tables of stone, and given to *Moses*.

* The word is Greek, composed of δέκα, ten, and λόγος, word, *g. d.* ten words. Accordingly, the Jews call them עשרת הדברות the ten words, which appellation is very ancient.

The Samaritans, both in their text and version, add after the 17th verse of the XXth chapter of Exodus, and after the 21st verse of the Vth chapter of Deuteronomy, an eleventh commandment, to build an altar on mount Gerizim, &c. But it is apparently an interpolation, to authorize their having a temple and an altar on that mountain, and to discredit, if possible, the temple at Jerusalem, and the worship there performed. It must be added, however, that, though all, both Jews and Christians, agree in the number of ten commandments; there is some difference as to the manner of dividing them.

The Talmudists, and Postellus after them, in his treatise de *Phœnicum Literis*, say, that the *Decalogue*, or ten commandments were engraven quite through the tables which God gave to Moses; but that nevertheless the middle of the D. Mem final, and of the D. Samech, remained miraculously suspended without adhering to any thing. See the *Dissertation on the Samaritan Medals*, printed at Paris in 1715. They add, that the *Decalogue* was wrote in letters of light, i. e. in luminous shining letters.

DECAMERIS*, a term signifying a tenth part; used by Mr. Sauveur, and some other Authors, to mark and measure the intervals of sounds.

* The word is formed of δέκα, ten, and μέρος, part.

DECAMERON, a work containing the actions, or conversations of ten days. *Boccaccio's Decameron* consists of one hundred novels related in ten days.

DECAMP. When an army raises its camp, or breaks up from the place where it lay before, they say it is *decamped*.

DECANUS, among the Romans, an officer who had ten other officers, or persons, under his charge; whence our English dean.

DECANTATION, in chymistry, the act of pouring off a liquor from off the feces, &c. by gently inclining the lip, or *cantus* of the vessel; whence the word is derived. See **CANTHUS**.

DECAPITE, in heraldry. See **DEFFAIT**.

DECAPROTI*, **DECEMPRIMI**, among the ancients, were officers who gathered the tributes, or taxes.

* The word comes from δέκα, ten, and πρωτος, first; probably by reason the ten first, or principal persons of each community, were chose to make the levies.

The *Decaproti* were obliged to pay for the dead; or, to answer to the emperor for the quota parts of such as died, out of their own estates. Cicero in his oration for Roscius, calls them *Decemprini*.

DECASTYLE*, in the ancient architecture, a building with an ordonnance of ten columns in front.—The temple of Jupiter Olympius was *Decastyle*.

* The word is formed of δέκα, ten, and στυλος, column.

DECEMBER, the last month of the year; wherein the sun enters the tropic of capricorn, and makes the winter solstice. In Romulus's year *December* was the 10th month, whence the name, viz. from *Decem*, ten: for the Romans began their year in *March*.

The month of *December* was under the protection of *Vesta*: Romulus assigned it 30 days; Numa reduced it to 29; which Julius Cæsar increased to 31.

Under the reign of *Commodus*, this month was called by way of flattery *Amazonius*, in honour of a Courtezan, whom that prince passionately loved, and had got painted like an *Amazon*; but it only kept the name during that emperor's life.

At the latter end of this month they had the *Juveniles Iudi*, and the country people kept the feast of the goddess *Vacuna* in the fields, having then gotten in their fruits, and sown their corn; whence seems to be derived our popular festival called *Harvest-home*.

DECEMPEDA, ΔΕΚΑΠΕΔΟΣ, *Ten-foot-rod*; an instrument used by the ancients in measuring.

The *Decempeda* was a rule, or rod, divided into ten feet; whence its name, from *Decem*, ten, and *Pes pedis*, foot.—The foot was subdivided into 12 inches; and each inch into 10 digits.

The *Decempeda* was used both in measuring of land, like the chain among us; and by architects to give the proper dimensions and proportions to the parts of their buildings, which use it still retains. Horace, Lib. II. *Od.* 15. blaming the magnificence and delicacy of the buildings of his time, observes, that it was otherwise in the times of Romulus and Cato, that in the houses of private persons there were not then known any portico's measured out with the *Decempeda*, nor turned to the north to take the cool air.

DECEMVIRI, an order of magistrates among the Romans, created with a sovereign power to draw up and make laws for the people; thus called by reason their number was ten.

To the *Decemviri* was given all the legislative authority ever enjoyed by the kings, and after them by the consuls. One among them had all the ensigus and honours of the function; and the rest had the like in their turn, during the year of their *Decemvirate*.

It was the *Decemviri* who drew up the laws of the twelve tables, called thence *Leges Decemvirales*, which for a considerable time were the whole of the Roman law.

In the year 302, the consuls Appius Claudius Crassinus, and T. Genucius Augurinus, being obliged to abdicate; and the first *Decemviri* were created; the year following ten new ones were appointed to succeed them, and in the year 304 another set were to have been chosen, but that the people rose, made them lay down, and refused the consuls. The excessive debauchery of Appius Claudius Crassinus, one of the consuls, who was first obliged to abdicate, and who had been chosen first *Decemvir* three times, was the principal cause of all this. Cicero de *Finib.* Lib. I. Livy, Lib. III. Halicarnassus, Lib. X. and Florus, Lib. c. 24. relate the history.

The *Decemviral* administration, however, it is to be observed, had not its first rise at the time when the authority of the consuls was devolved into the hands of the *Decemviri*: for, during the interregnum that ensued after the death of Romulus, the management of affairs, which the senate then took upon them, is called by Halicarnassus, Lib. II. *Decemviral*, by reason the senators, divided into tens, commanded each in their turn: that is, one of each ten, for five days successively, having the *Fasces*, *Lictors*, &c. like the kings.

There were also military *Decemviri*; and on divers emergencies *Decemviri* were created to manage and regulate certain affairs, after the same manner as boards of commissioners are appointed among us. Thus, we find *Decemviri* for conducting colonies; *Decemviri* to prepare and preside at feasts in honour of the gods; *Decemviri* to take care of the sacrifices; and *Decemviri* to keep the Sybil's books.

Sometimes in lieu of *Decemviri*, they only created *Septemviri*, or *Triumviri*, or *Duoviri*, &c.

DECENNALIA, in antiquity, feasts which the Roman emperors held every tenth year of their reign, with sacrifices, games, largesses to the people, &c.

Augustus was the author of this custom, which was afterwards imitated by his successors.

At the same time they likewise offered vows for the emperor, and the perpetuity of his empire, called *Vota Decennalia*. See **VOW**.

From the time of Antoninus Pius, we find these ceremonies marked on medals. **PRIMI DECENNALES. SECVNDI**

DECENNALES. VOTA SOL. DECEN. II. VOTA SVSCEP. DEGEN. III.

These vows must have been made at the beginning of every tenth year; for on a medal of Pertinax, who scarce reigned four months, we find VOTA DECENN. & VOTIS DECENNALIBUS.

Struvius is of opinion, that these vows took place of those which the censor used to make in the times of the republic for the prosperity and preservation thereof. In effect, they were not only made in behalf of the prince, but also of the state, as may be observed from Dion. Lib. VIII. and Pliny the younger, Lib. X. ep. 101.

Augustus's aim in establishing the *Decennalia*, was to preserve the empire and the sovereign power, without offence or restraint to the people. For during the celebration of this feast, that prince used to surrender up all his authority into the hands of the people, who, filled with joy, and charmed with the goodness of Augustus, immediately delivered it him back again.

DECENNIERS, see the next column.

DECIDUOUS, in the general, expresses a thing apt and ready to fall.

In some plants, the perianthium or calyx is *deciduous* with the flower, that is, falls off from the plant with it; in others not. In some the leaves are *deciduous*, or fall off in autumn; in others they remain all the winter.

DECIES *Tantum*, a writ that lies against a juror, who hath taken money for giving his verdict. It is so called from its effect, which is to recover ten times as much as he took.

It also lies against embracers that procure such an inequity. See EMBRACER.

DECIL, DECILLS, in astronomy, an aspect or position of two planets, when they are distant from each other a tenth part of the zodiac.

DECIMAL *Arithmetic*, the art of computing by *Decimal Fractions*, first invented by Johannes Regiomontanus, and used by him in the construction of his Tables of Sines.

DECIMAL *Fractions* are those whose denominator is 1, with one or more cyphers; as, 10, 100, 1000, 10000, &c. Thus $\frac{6}{10}$, $\frac{7}{100}$, &c. are *Decimal Fractions*.

In the writing of *Decimal Fractions* we usually omit the denominator, as only consisting of unity with cyphers annexed; and in lieu thereof, a point or comma, is prefixed to the numerator. Thus, $\frac{5}{10}$ is wrote .5; $\frac{46}{100}$, .46. So .125 expresses an hundred twenty-five parts of any thing supposed to be divided into 1000 parts.

As cyphers on the right hand of integers, do increase their value *decimally*; as, 2, 20, 200, &c. so when set on the left hand of *Decimal Fractions*, they decrease the value *decimally*; as, .5, .05, .005, &c. when set on the left hand of integers, or on the right hand of *Decimals*, they signify nothing, but only to fill up places; thus, .5000, or .0005. is but five units.

To reduce any *Vulgar Fraction*, as suppose $\frac{2}{3}$ to a *DECIMAL Fraction* of the same value, whose denominator shall be 1000; say, by the Rule of three, as 8 the denominator of the vulgar fraction, is to 5 its numerator: so will 1000, the denominator assigned, be to a 4th term, which by working will be found to be .625, and therefore $\frac{2}{3}$, or .625 is a *Decimal* of the same value with the former fraction $\frac{2}{3}$.

The common operations in *Decimals* are performed as in the vulgar rules, regard being had only to the particular notation, to distinguish the integral from the fractional part of a sum.

In *Addition, and Subtraction of DECIMALS*; the points being all placed under each other, the figures are to be added, and subtracted as in common arithmetic: and when the operation is done, so many figures of the sum, or the remainder, are to be noted for *Decimals*, as there are places of *Decimals* in the greatest given numbers.—An example will make this clear.

Addition of Decimals. Subtraction.

43791	59	271	From 67	9
792	15	040	Take 29	38754
6124	3	791	Rem.	38
053	12	009		0246
10	7	5	From 25	1402
2	97	002	Take 13	07
2,19531			Rem.	12
				0762

For *Multiplication of DECIMALS*, observe to cut off just so many *Decimal* parts from the product as there are *Decimals* in both factors. The work is the same as in integers. Thus,

Multiplication of Decimals.

1472	365	3,650	Note, In the first and second examples the products only amount to six and five places; for which reason cyphers are prefixed, to make up the numbers of <i>Decimal</i> places in the two factors respectively.
175	122	621	
730	730	3 050	
10304	730	73 00	
1472	365	2190 0	
0,257600,	0,44530	2266,650,	

In *Division of DECIMALS*, proceed in all respects as in dividing of integers; and when the operation is done, mark as many place in the quotient for *Decimals*, as, with the number of *Decimals* in the divisor, are equal to the *Decimal* places of the dividend.

22)8,030(3,65	22)8,030(3,65
143	143
132	132
110	110
110	110
..0	..0
22)8,030(3,65	732)83,210(1,13
143	1001
132	732
110	2609
110	2106
..0	503

But there are certain cases in division of *Decimals*, which require some further management: as, first, where the divisor is a *Decimal Fraction*, and the dividend is an integer; add, or annex as many or rather more cyphers to the dividend, than there are places in the divisor: thus, .365)22,000(60,2. For there being three places of *Decimals* in the divisor, and four in the dividend, there will be but one in the quotient. Secondly, Where the divisor is a mixt number, and the dividend a whole number, add at least as many cyphers to the dividend, as there are places in the divisor. Thus .365)22,000(60,2. Thirdly, Wherever the divisor is bigger than the dividend, annex cyphers to the latter. Thus, 365)22,000(60,2.

DECIMAL *Scales*, in the general, denote any *Scales* divided *decimally*; but, particularly certain *Scales* of money, weights, and measures, made from tables so called, to expedite *Decimal arithmetic*, by shewing by inspection the *Decimal Fraction* of any part of money, weight, or measure. See *SCALE*.

DECIMATION, a punishment which the Romans used to inflict on the soldiers who had quitted their post, raised a mutiny in the camp, behaved themselves cowardly in the fight, or otherwise failed in their duty; for which every tenth man was put to death as an example to the rest.

The manner of *decimating* was thus: The general assembled the whole camp, then the tribune brought to him those that were guilty, and impeached, and reproached them, with their cowardly actions, and baseness in the presence of the whole army: then putting their names into an urn, or an helmet, as many were drawn out as made the tenth part of the whole number: and these were put to the sword, and the others saved. This was called *Decimare*, a word of the ancient Roman militia, who, to punish whole legions, when they had failed in their duty, sometimes also made every tenth soldier draw lots, and put him to death for an example to the others.

As the Romans had their *decimatio*, they had also the *vice-simatio*, and even *centesimatio*, when only the twentieth or hundredth man suffered by lot.

DECENNIERS, DECINERS, or DOZINERS, in the ancient monuments of our law, are such as were wont to have the oversight, and check of the *triburghs*, for maintenance of the king's peace; the limits of whose jurisdiction was called *Decenna*, and *Dozein*.

They seem to have had very large authority in the Saxon times; taking cognizance of causes within their circuit, and redressing wrongs by way of judgment. Thus Briton, "We will that all those who are fourteen years old, shall make oath, that they will be sufficient and loyal to us; and neither be felons, nor assenting to felons; and we will, that all profess themselves of this or that *Dozein*, and make or offer surety of their behaviour by those or those *Doziners*, except religious persons, clerks, knights eldest sons, and women." A *Dozein* now seems to be no other than a let: for in lets only this oath is administered by the steward, and taken by such as are twelve years old and upwards.

DECIPHERING, or DECRYPTING, the art, or act of finding the alphabet of a *Cipher*, or of explaining a letter wrote in *Cipher*.

Every language has peculiar rules of *Deciphering*. *Jaques Gesny* has published the principles of *Deciphering the French*; wherein the rules peculiar to that language are laid down.—The principal, we shall here add as a specimen in this kind.—As, First, that when a character is found alone, it must either be an A, J, or O, these being the only letters in the French Alphabet that make words singly. Secondly, the character that occurs the ofteneft in a writing to be deciphered is ordinarily an E; this being the most common letter in that language.

Thirdly, to know the *U*, you must take the character that is always preceded by one certain other, which will be the *Q*. Fourthly, the *I* is also known by means of the *Q*, for since *QUE*, and *QUI*, are the only syllables in the French tongue that begin with *Q*; whenever you find a word of three characters, whereof the first is a *Q*, and the last is not an *E*, it must be an *I*.

Fifthly, in all words of two letters, one of them is a vowel. Sixthly, of the three first characters of a word, one of them is a vowel.

Sevently, the vowels being once deciphered; the consonants are readily found by the connexion which certain consonants usually have with certain vowels.

DECK of a Ship, a kind of planked floor, reaching from stem to stern, whereon the guns are laid, and the men walk to and fro; serving also as a ceiling to separate the stories of the ship, or other vessel.

A Ship is said to have two, or three Decks, when it contains two or three stories. The middling sort of vessels have two Decks; the biggest have three, distant from each other about five feet. The bottom Deck is called the *first Deck*: the second Deck, answering to the second story from the ground in houses, contains an equal number of guns with the first, abating that there is none over the stern, which is the captain's apartment. Before this Deck are the kitchen-offices, &c. In large vessels there is a *third Deck*, and a third battery. Some vessels have likewise a *half Deck*, which reaches from the main-mast to the stern of the Ship: as also a *quarter-Deck*, which is from the steerage aloft to the master's round-house.

Sometimes also there is a *spare-Deck*, which is the uppermost of all, being between the main-mast and the misen, called also the *Orlop*.

A *Refr-Deck*, is that made of cordages interwove, and stretched over a vessel that has no Deck, through which it is easy to annoy the enemy who comes to board her, and has leaped thereon.—These are little used but in merchant-vessels, to defend them from the corsairs.

DECLAMATION, a discourse, or speech made in public, in the tone and manner of an oration.

Among the Greeks, *Declamation* was the art of speaking indifferently on all Subjects, and on all sides of a question; of making a thing appear just that was unjust, and of triumphing over the best, and fondest reasons.

Such sort of *Declamations*, M. de St. Evremont observes, were fit only to corrupt the mind by accustoming men to cultivate their imagination rather than to form their judgment, and to seek for verisimilitudes to impose upon, rather than solid reasons to convince, the understanding.

Among us, *Declamation* is restrained to certain exercises, which scholars perform, to teach them to speak in public. We say, a *Declamation* against Hannibal, against Pyrrhus, the *Declamations* of Quintilian, &c.

In the colleges of the Jesuits, *Declamations* are little theatrical or dramatic performances, consisting of a few scenes not divided into acts, rehearsed by the students by way of exercise, and to form them for speaking in public.

Such *Declamations* are the most useful exercises performed in the colleges.

DECLARATION, in law, the act of shewing in writing the grief and complaint of the demandant, or plaintiff, against the defendant, where he is supposed to have received some wrong. This ought to be plain and certain, both because it impeacheth the defendant, and also compels him to answer thereto.

DECLARATION is also used for a confession which the quakers, who scruple taking the oaths of supremacy, &c. are obliged to make and subscribe in lieu thereof.

Its tenor is a solemn promise before God and the world, to be true to king George, with a detestation and horror of that damnable position, that princes excommunicated by the pope, or any other power, may be deposed or murdered; and a *Declaration*, that no foreign prince, or power, has any right, jurisdiction, or authority in this kingdom.

DECLENSION, in grammar, the inflexion of a noun, according to its diverse cases. See *CASE*, *NOMINATIVE*, &c. The *Declension* of nouns is a different thing in the modern languages, which have not properly any cases; from what it is in the ancient Greek and Latin, which have.

Declension in languages wherein the nouns admit of changes, whether in the beginning, middle, or end, is properly the expressing, or reciting of all those changes in a certain order, and by certain degrees, called *Cases*.

In languages wherein the nouns do not admit of changes in the same number, *Declension* is the expressing of the different states, or habitus of a noun in, and the different relations it has; which difference of relations is marked by particles, called *Articles*; as *a, the, of, to, from*, &c.

DECLENSION of a Disease, is when it is past its height, and the symptoms abate.

DECLINATION, in astronomy, the distance of the sun, a star, planet, or other point of the sphere of the world, from the equator, either northward, or southward.

Declination is either *real* or *apparent*, according as the real or apparent place of the point is considered.

The *Declination* is an arch of a great circle, as GS, (*Tab. Astron. fig. 4.*) intercepted between a given point, as S, and the equator A Q, and perpendicular to the same. Consequently, the circle, by whose arch the *Declination* GS is measured, passes through the poles of the world.

The *Declination* of a star, &c. is found by first observing the altitude of the pole as P R, (*fig. 5.*) This subtracted from 90° gives the height of the equator A H. Then, the meridian altitude of the star, H D, being observed, if it be greater than the altitude of the equator, A H, the latter subtracted from the former; leaves the *Declination* northward A D: or, if the altitude of the star H T be less than that of the equator H A, the former subtracted from the latter leaves the *Declination* southward T A.

E. gr. Tycho at Uranibourg observed the meridian altitude of the Cauda Leonis:

	HD	50°	59'	0"
Altitude of Equat.	HA	34	5	20
<i>Declinat.</i> therefore,	AD	16	53	40

If the star be in the quadrant Z R, then the least altitude MR subtracted from the altitude of the pole P R, leaves the distance from the pole P M: which subtracted again from the quadrant P Q, leaves the *Declination* M Q.—*E. gr.* M. Couplet observed P M 2°. 18' 50" which subtracted from 90° leaves M Q 87° 41' 10". And by this method are constructed the tables of *Declination* of the fixed stars given us by Ricciolus and Dechaules.

By comparing the ancient observations with the modern, it appears, that the *Declination* of the fixed stars is variable; and that, differently, in different stars. For in some it increases, and in others decreases, and that in different quantities. But the greatest increase or decrease does not exceed three minutes and a half in ten years time.

It has been greatly disputed among the later mathematicians, whether or no the *Declination* and obliquity of the ecliptic be variable? but the point seems now decided in favour of the immutability.

Circle of DECLINATION, is a great circle of the sphere, passing through the poles of the world; and on which the *Declination* of a star is measured: such is P G D K, passing through the poles T and K. *Fig. 4.*

Parallax of DECLINATION, is an arch of the circle of *Declination*, whereby the parallax of the altitude increases or diminishes the *Declination* of the star.

Refraction of the DECLINATION, an arch of the circle of *Declination*, whereby the *Declination* of a star is increased, or diminished, by means of the refraction.

DECLINATION of the Needle, or Compass, is its variation from the true meridian.

DECLINATION of a Plane, or Wall, in dialling, is an arch of the horizon, comprehended either between the plane, and the prime vertical circle, if you account it from east to west; or between the meridian, and the plane, if you account it from north to south.

There are many ways given by authors for finding the *Declination* of planes: the most handy and practical way is by a *Declinator*.

DECLINATOR, or DECLINATORY, an instrument in dialling, whereby the declination, inclination, and reclination of planes is determined.

Its structure is as follows: on a square wooden board ABCD, (*Tab. Dial. fig. 1.*) describe semi-circle AED, and divide the two quadrants thereof A E and E D into 90 degrees each, beginning from E, as in the figure. Then, having fixed a pin in the center F, fit a wooden ruler H I upon the same, moveable thereon, with a box and needle K, as shewn under *COMPASS*.

Now, to apply this, in taking the *Declination* of a plane: apply the side A D of the instrument to the plane proposed, as M N (*fig. 2.*) and move the ruler F G, with the compass G this way and that, about the center F, till the needle rest upon the line of the magnetical meridian of the place. Now if the ruler in this situation cut the quadrant in E, the plane is either northern or southern: but if it cut between D and E, the plane declines to the west; or, if between A E, to the east by the quantity of the angle G F E.

The same instrument will also serve to take the inclinations and reclinations of planes. To this end, instead of the ruler and needle, a thread with a plummet is fitted on a pin in the center F: then the side B C of the *Declinator* ABCD, being applied to the proposed plane, as I L (*fig. 3.*) If the plumb-line F G cut the semi-circle A E D in the point E, the plane is horizontal; or if it cut the quadrant E L in any point at G, then will E F G be the angle of inclination: lastly, if applying the side A B to the plane, the plummet cut E, the plane is vertical. Hence, if the quantity of the angle of inclination be compared with the elevation of the pole, and equator, it is easily known

known, whether the plane be inclined, or reclined. See **INCLINATION** and **RECLINATION**.

DECLINERS, or **DECLINING Dials**, are those which cut either the plane of the prime vertical circle, or the plane of the horizon, obliquely.

If we conceive the plane of the prime vertical circle to revolve a little upon a right line drawn from Zenith to Nadir; the plane will become *declining*; nor will it be any longer cut at right angles by the meridian; but by some vertical circle passing through the intermediate points. After the like manner a horizontal plane will be brought to *decline*, if revolving on the meridian line, one part of it be raised a little towards the Zenith, and the other depressed towards the Nadir.

The use of *declining* vertical Dials is very frequent, in regard the walls of houses whereon Dials are commonly drawn, do generally decline from the cardinal points. Incliners and decliners, and especially decliners, are very rare. See **DIAL**.

DECLINING, { *Erecti,*
 { *Inclining,* } Dials. See **DIAL**.
 { *Reclining,*

DECLIVIS, in anatomy, a muscle of the abdomen, called also *Obliquus Descendens*. See **OBLIQUUS Descendens**.

DECLIVITY. See the article **ACCLIVITY**.

DECOCTION, the act of boiling one, or more plants, or other drugs, to extract the virtues out of the same for some medicinal purpose.

Decoctions of guaiacum and sassaaparilla, are the common drink in venereal diseases.

M. Boulduc assures us from his own experience, that the infusions of vegetable purgatives act better, and produce better effects, than their *Decoctions*; which he attributes to this, that the purest and most active principles of those bodies are dissipated and evaporated by a boiling heat. *Memories de l'Académie Royale des Sciences, an. 1710.*

DECOLLATION, *beheading*, a term frequently used in the phrase, *Decollation* of St. John Baptist, which denotes a painting, wherein is represented the baptist's head, struck off from his trunk; or, the feast held in honour of that martyr.

A French ambassador at Constantinople, shewing the grand signor a *Decollation* of St. John admirably represented, except that the painter had not observed, that when a man is beheaded, the skin shrinks back a little; the emperor immediately spied the fault in that exquisite performance; and to convince the ambassador thereof, sent orders for a man to be immediately beheaded, and his head to be brought for a proof. *Catherinet Traitè de la Peinture.*

DECOMPOSITION, in chemistry and pharmacy, the same with analysis, or resolution, *viz.* the reduction of a body into its principles, or component parts.

DECOMPOSITION, is sometimes taken for any sort of resolution, or separation of parts; but in propriety, *Decomposition* is a chemical process, in order to a separation of the heterogeneities, or impurities from any matter.

Tradition, founded on repeated experiments, is a much surer way of arriving at the knowledge of the properties of a plant, than any chemical analysis, or *Decomposition* of its principles. See **MEDICINE**.

DECORATION, in architecture, any thing that adorns, and enriches a building, church, triumphal arch, or the like, either without side, or within.

The orders of architecture contribute greatly to the *Decoration*; but then the several parts of those orders must have their just proportions, characters, and ornaments; otherwise the finest order will bring confusion rather than richness.

Decorations in churches, are paintings, vases, festoons, &c. occasionally applied to the walls; but that with so much conduct and discretion, as not to take off any thing from the form of the architecture: as is much practised in Italy, at the solemn feasts.

DECORATION is more properly applied to the scenes of theatres.

In operas, and other theatrical performances the *Decorations* must be frequently changed conformably to the subject.

The ancients had two kinds of *Decorations* for their theatres: the first, called *Verfaisiles*, having three sides, or faces which were turned successively to the spectators: the other called *Duètiles*, shewing a new *Decoration* by drawing, or sliding another before it.

This latter sort is still used, and apparently with much greater success than among the ancients, who were obliged to draw a curtain whenever they made a change in the *Decoration*; whereas on our stage the change is made in a moment, and almost without being perceived.

DECORTICATION, the act of peeling, or unhusking roots, seeds, fruits, branches, &c. or of freeing them from their barks, rinds, husks, or shells.

DECORUM, **DECOR**, in architecture, denotes the suitability of a building, and of the several parts, and ornaments thereof, to the place and occasion.

Vitruvius is very severe in this point; and gives express rules for the appropriating, or suiting the several orders to their natural characters: so, *e. g.* as that a Corinthian column may not be set at the entrance of a prison, or gate-house; nor a Tuscan, in the portico of a temple; as some have done among us, in breach of *Decorum*. Even in the disposition of the offices of our ordinary houses, we find grievous offences against *Decorum*: the kitchen being often where the parlour should be; and that in the first and best story, which should have been condemned to the lowest, and worst.

DECOUPLE, in heraldry, the same as uncoupled, *i. e.* parted, or severed.

Thus, a chevron *Decouplè*, is a chevron wanting so much towards the point, that the two ends stand at a distance from each other.

DECOURS, } in heraldry. See **DECREMENT**.

DECREASANT, } in heraldry. See **DECREMENT**.

DECOY, a place made fit for catching of wild fowl:

Hence also a *Decoy-duck* is one that flies abroad, and lights into company of wild ones, and being become acquainted with them, by her allurements draws them into the *Decoy*-place, where they become a prey. See *Supplement*, article *wild Fowl*.

DECREE, **DECRETUM**, an order, or resolve made by a superior power, for the regulating of an inferior.

The commerce between soul and body, Fa. Malebranch observes, has no other vinculum, or connexion, but the efficacy of the divine *Decrees*. Second causes only execute the *Decrees* of Providence.

The doctrine of the Calvinists implies, that God concurs to sin by a positive *Decree*; in that if crimes were not ordained by an antecedent *Decree*, God could not foresee the events.

DECREES of councils, are the laws made by them, to regulate the doctrine and policy of the church.

DECREE was originally used by the lawyers for any thing ordained by the prince, upon cognizance of a cause.

But the canonists now restrain the word *Decree* to the ordinances of popes; as the name canon is to what is ordained by councils.

DECREES in chancery, are the determinations, or sentences of the lord chancellor, upon full hearing, and weighing the merits of the cause. See **CHANCERY**.

DECREMENT, or **DECRESSANT**, in heraldry, denotes the wane, or decrease of the moon, when she is receding from the full towards the new.

In this state she is called in blazon, a *moon-decreffant*, or, *en decours*; since to call it a crescent, would be improper, as that term denotes an increase. The moon looking to the left side of the escutcheon, is always supposed to be *decreffant*: when she faces the right, she is crescent, or in her growth.

DECREPITATION, in chymistry, the operation of drying, and calcining salts over the fire, continued till such time as they cease to crackle.

DECREPITATION is also applied to the noise, or crackling of the salts during the operation.

The design of this operation is to free the salt of its superfluous moisture: but the salt is hereby rendered so porous, and apt to imbibe moisture, that unless it be kept very close afterwards, it soon moistens again.

DECRETAL, a rescript, or letter of a pope, whereby some point, or question in the ecclesiastical law is solved, or determined.

The *Decretals*, *Literæ Decretales*, compose the second part of the canon-law.

Pope Gregory IX. in 1220, procured a compilation to be made of all the *Decretals* or pontifical constitutions of his predecessors, in five books, by Friar Raimond, a dominican, his chaplain. Which is the only collection authorized by the holy see to be read in schools. Boniface VIIIth, in 1297, made a new collection, under the name of *Sextus*, containing 5 books. Clement the IIIrd made a third, under the title of *Clementines*; and John the XXIIrd, another under that of *Extravagantes*.

All the *Decretals* attributed to the popes before Siricius, in 318, are evidently supposititious. The imposture is so glaring, that even such as are most favourable to the court of Rome, are obliged to abandon them: though they have been one great means of establishing the grandeur of Rome, and ruining the ancient discipline, particularly as to ecclesiastical judgments, and the rights of bishops. They are supposed by some, the spurious offspring of Isidore, archbishop of Seville, by reason the collection thereof bears the name of Isidore Peccator, or Mercator. They were first published by Riculph bishop of Mentz, in the IXth century.

DECUPLE, in arithmetic, a term of relation, or proportion, implying a thing to be ten times as much as another.

DECURIO, the chief, or commander of a *Decury*, both in the Roman army, and in the college, or assembly of the people. See **DECURY**.

DECURIO Municipalis, was a name given to the senators of the Roman colonies.

They were called *Decuriones*, by reason their court, or company always consisted of ten persons. See **DECURY**.
By means hereof the cities of Italy, at least such as had colonies, had a share, under Augustus, in the election of the Roman magistrates; the *Decuriones* or senators of those cities, having suffrages therein, which they sent, seal'd up, to Rome a little before the election.

DECURIO was also a name given to certain priests intended as it should seem, for some particular sacrifices, or other religious ceremonies; or for the sacrifices of private families and houses, as Struvius conjectures, who thence derives their name.
Be the origin of the name what it will, we have an inscription in Gruter, which confirms what we have said of their function. ANCHIALVS. CVB. AED. Q. TER. IN. AEDE. DECVRIO. ADLECTVS. EX. CONSENSV. DECVRIONVM. FAMILIAE. VOLVNTATE. Where we have a *Decurio* in the house of a private person, Q. Terentius.

DECURY, ten persons ranged under one chief, or leader, the *Decuria*.

The Roman cavalry was divided into *Decuriae*.
Romulus divided the whole Roman people into three tribes; over each of which he appointed a tribune: each tribe he subdivided into ten centuries, with centuries at their heads: and each century he subdivided further into ten *Decuries*, over each of which a *decurio* commanded.

DECUSSATION, in geometry, optics, and anatomy, the point wherein two lines, rays, or nerves, cross, or intersect each other: or the action it self, of crossing.

The optic nerves of both eyes are commonly supposed to *decussate* before they reach the brain; to which *Decussation* many authors attribute it, that we see single with two eyes: though others deny this *Decussation*.

The rays of light *decussate* in the crystalline, before they reach the retina.

There are diverse muscles, membranes, &c. that *decussate*; their fibres running over each other at greater or lesser angles, and by that means giving both strength and conveniency of motion different ways.

DECUSSORIUM, a surgeon's instrument, wherewith the dura mater is pressed down in trepanning, to secure it from damage in the operation.

DEDI, in conveyances, imports a warranty given to the scoffee and his heirs. See **WARRANTY**.

DEDICATION, the act of consecrating a temple, altar, statue, place, &c. to the honour of some deity. See **TEMPLE**, **ALTAR**, **CHURCH**, &c.

The use of *Dedications* is very ancient both among the worshippers of the true God, and among the heathens: the Hebrews call it *הקדש* *hakanachab*, initiation, which the Greek translators render *Εξουσία*, and *Εξουσιοποιος*, *renewing*.

In the scripture we meet with *Dedications* of the tabernacle, of altars, of the first and second temple, and even of the houses of private persons. Numb. VII. 10, 11, 84, 88. Deut. XX. 5. 1st of Kings VIII. 63. 2d of Chronic. VII. 5, 9. Ezra VI. 16, 17. 1st of Esdr. VII. 7. Psalm XXX. 1. Hebr. IX. 18. There are also *Dedications* of vessels, and garments of the priests, and Levites, and even of the men themselves.

Under the Christian dispensation, we call the like ceremonies *Consecrations*, *Benedictions*, *Ordinations*, &c. and not *Dedications*, which is only applied to places.

The *feast* of the **DEDICATION**, or rather the *feast-day* of the saint and patron of a church, called in our law-books, &c. *dedicatio*, was celebrated not only by the inhabitants of the place, but by those of all the neighbouring villages, who usually resorted thither. And such assemblies were authorized by the king.—*Ad dedicaciones, ad synodos, &c. venientes sit summa pars.*

The custom is still retained in diverse places, under the name of *Fasts*, *Wakes*, or *Vigils*.

The heathens had also *Dedications* of temples, altars, and images of their gods, &c. Nebuchadnezzar held a solemn *Dedication* of his statue, Daniel III. 2. Pilate dedicated gilt bucklers at Jerusalem to Tiberius, Philo de *Legat*. Petronius would have dedicated a statue to the emperor in the same city, *ibid.* p. 791. Tacitus, *Hist.* lib. IV. c. 53. mentions the *Dedication* of the capitol, upon rebuilding it by Vespasian, &c.

These *Dedications* were performed with sacrifices proper to the deity they were offered to; but they were never practised without public permission. Among the Greeks, it does not appear who gave that permission: but among the Romans, it was always the magistrate.

The Jews celebrated the anniversary of the *Dedication* of their temple every year for eight days. This was first enjoined by Judas Maccabeus, and the whole synagogue, in the year of the Syro-Macedonian, *Æra* 148, i. e. 164 years before Christ.

The heathens had the like anniversaries, as that of the *Dedication* of the temple of Parthenope, mentioned by Lycophon.

Under Christianity, *Dedication* is only applied to a church; and is properly the consecration thereof, performed by a bishop; with a number of ceremonies prescribed by the church.

The Christians finding themselves at liberty under Constantine, in lieu of their ruinous churches, built new ones in every place; and dedicated them with a great deal of solemnity. The *Dedication* was usually performed in a synod; at least they assembled a number of bishops, to assist at the service. We have the description of those of the churches at Jerusalem and Tyre, in Eusebius, and many others in later writers.

In the sacramentary of Gelafius, the *Dedication* of the baptistery, is delivered separately from that of the church, which was performed with less ceremony than at present.

DEDIMUS Patratum, in law, a writ whereby commission is given to one, or more private persons to assist for the expedition of some act belonging to a judge.

The civilians call it *delegatio*: it is granted most commonly upon suggestion, that the party, who is to do something before a judge, or in a court, is so weak he cannot travel.

Its use is various; as, to take a personal answer to a bill in chancery; to examine witnesses, or to lay a fine, &c.

DEDUCTION, in commerce, a subtracting, or retrenching a little sum paid, from a greater remaining to pay.

When you have made a deduction of 300 l. which I sent you, from the 500, which you lent me, there will only remain 200 due.

DEED, *Factum*, in law, an instrument written on paper or parchment, the validity of which consists in three things, viz. writing, sealing, and delivery; and which comprehends a contract, or bargain between party, and party.

Of these there are two sorts; *Deeds indented*, and *Deeds poll*; which denominations arise from the form and fashion thereof; the one being cut in, and out in the top, or side, called *indented*; and the other plain, or *polled*.

A *Deed indented*, or an indenture, consists of two parts or more, (for there are *tripartite*, *quadripartite*, *septempartite*, &c. *Deeds*) wherein it is expressed, that the parties thereto have to every part thereof interchangeably set their several seals. The cause of their indenting is, that whereas the several parties have each of them one, the indenture may make it appear, that they belong to one and the same contract by their tallying. See **INDENTURE**.

A *Deed poll*, or *polled*, anciently called *charta decima parte*, or *charta simplex*, is a plain *Deed* without indenting, used when the vendor, for example, only seals, and there is no need for the vendee's sealing a counter part, by reason the nature of the contract is such, that it requires no covenant from the vendee.

DEEMSTERS*, or **DEEMSTERS**—All controversies in the life of Man are decided, without process, writings, or any charges, by certain judges chose yearly from among themselves, called *Deemsters*.—This institution they are supposed to owe to the ancient Druids.

* The word is formed from the Saxon *Dema*, judge or umpire.

There are two *Deemsters* for each division of the island; in ancient court rolls they are called *Judicarii Domini Regis*. They set judges in all courts either for life or property; and with the advice of the twenty-four keys declare what is law in uncommon emergencies.

DEEP-Sea Line, or **DIP-Sea Line**, in the sea-language, a small line to found withal when a ship is in very deep water at sea.

At the end of this line is a piece of lead, called the *deep-sea lead*, at the bottom of which is a coat of white tallow to bring up stones, gravel, shells, or the like, from the bottom, in order to learn the differences of the ground; which being entered from time to time in their books, by comparing of observations, they guess by their soundings, &c. what coasts they are on, though they cannot see land.

DE expensis militum, a writ commanding the sheriff to levy four shillings per day, to defray the expences of a knight of the shire attending in parliament. See **KNIGHT**.

There is a like writ of *expensis civium*, & *burgensium*, to levy a shilling per day for every citizen and burgess in parliament. See **REPRESENTATIVE**.

DE facto, something actually in fact, or existing: in contradistinction to *de jure*, where a thing is only so in justice, or equity, but not in fact.

After the revolution, the retainers to the abdicated king insisted much on the difference between a king *de jure*, and *de facto*, or a prince in actual but not legal possession of the crown, and another who had the right, but not the possession. The Nonjurors still hold the pretender for king *de jure*; and only allow king George for king *de facto*.

DEFAULT, in law, an omission of what a person ought to do, particularly before a court of justice, at a day assigned; for which judgment may be given against the *Defaulter*.

DEFECATE, or **DEFÆCATA**, a term applied to some body that is purged, and cleared of faeces, or impurities. Diffusions, and other chemical operations, are intended to separate the most pure, and subtle parts from the faeces, or lees.

DEFLECTION *, the act of abandoning, or relinquishing of a party, or an interest a person had been engaged in.

* The word is formed of the Latin *deficio*, to fail of.

DEFECTIVE, or DEFICIENT *Nouns*, in grammar, are such as want either a whole number, or a particular case, or are totally indeclinable.

The term *defective* is also applied to a verb that has not all its moods and tenses.

DEFESANCE, DEFESANCE, or DEFESANCE, in law, a condition relating to a deed, which being performed, the deed is defeated, or annulled, as if it had never been done.

The difference between a proviso, or condition in a deed, and a *Defesance*, is this, that a *proviso*, or condition is annexed or inserted in the deed of grant, whereas a *Defesance* is usually a deed by itself. See *PROVISO*.

DEFENCE, in sieges, is used for any thing that serves to preserve or screen the soldiers, or the place. See *FORTIFICATION*.

The parapets, flanks, calemats, ravelins, and outworks that cover the place, are called the *Defences*, or covers of the place. And when the cannon has beat down, or ruined these works, so that the men cannot fight under covert, the *Defences* of the city are said to be demolished.

Line of DEFENCE, is that which flanks a bastion, being drawn from the flank opposite thereto.

The line of *Defence* should not exceed a musket shot, *i. e.* 120 fathoms, or 720 foot, or 60 Rhinland perches. Indeed Melder allows 65; Scheiter 70; the counts de Pagan and Vauban 75.

Line of DEFENCE greater, or *sicant*, is a right line, as E C, (*Tab. Fortif. Fig. 1.*) drawn from the point, or vertex of the bastion C to the concourse E of the opposite flank L E, with the curtain EA.

Line of DEFENCE lesser, called also *rasant*, and *flanquant*, is the face of the bastion continued to the curtain; as C I.

DEFENCE *, in old law books, is sometimes used for prohibition.

* Thus, in Rot. Parl. 21. Edw. III. Cries and *Defence* were made throughout England, *i. e.* Proclamation and Prohibition.

Salmons poutant in Defenso Stat. West. 2. c. 47. Salmons are by that act prohibited to be taken at certain times. *Ufararius defendit.* *Rex Edwardus ne remoueat in regno LL. Edu. Confess.* In the statutes of Edward I. we have one, entitled, *Statutum de Defensione portandi arma, &c.* and it is *defended* by law, to distrain on the high-way.

DEFENCE-Month is more usually called *Fence-Month*. See *FENCE-Month*.

DEFENCES, in heraldry, are the weapons of any beast: as, the horns of a stag, the tusks of a wild boar, &c.

DEFENDANT, a term in law, signifying him who is sued in an action personal; as *Tenant* is he who is sued in an action real.

DEFENDEMUS, in law, a term used in feoffments and donations, having this force, that it binds the donor and his heirs to defend the donee, if any man go about to lay any incumbrance on the thing given, other than is contained in the donation. See *WARRANTY*.

DEFENDERS *, were anciently notable dignitaries both in church, and state, whose business was to look to the preservation of the publick weal, and to protect the poor and helpless, and to maintain the interests and causes of churches, and religious houses.

* The council of Chalcedon, Can. 2. calls the *Defender* of a church, *Ecdiastic*. Codin, *de officiis aulae const.* makes mention of *Defenders* of the palace. So does Bollandus, A. S. 8. Januar. T. 1. p. 501. There were also a *Defender* of the kingdom, *Defensor regni*, *Defenders* of cities, *Defensores civitatis*; *Defenders* of the people, *Defensores plebis*; of the poor, fatherless, widows, &c.

About the year 420 each patriarchal church began to have its *Defender*; which custom was afterwards introduced into other churches, and continued to later days under other names, as those of *Advocate*, and *Advoue*. See *ADVOCATE*, and *ADVOCUE*.

In the year 407, we find the council of Carthage asking the emperor for *Defenders*, of the number of *Scholastici*, *i. e.* advocates who were in office; and that it might be allowed them to enter, and search the cabinets, and papers of the judges, and other civil magistrates, whenever it should be found necessary for the interest of the church.

The emperor still retains the quality of advocate of the church; and the kings of Great Britain preserve the title of *Defender of the faith*, granted to king Henry VIII. by pope Leo X. in 1521, on occasion of that prince's writing against Luther, and afterwards confirmed by Clement VII. Tho. Chamberlayne says, the title belonged to the kings of England before that time; and for proof hereof appeals to several charters granted to the university of Oxford. So that pope Leo's bull was only a renovation of an ancient right. *Pres. stat. l. 1. c. 2.*

DEFENDING, in fortification, is ordinarily synonymous with flanking.

Thus we say, the flank *defends* the curtain, and the opposite face of the bastion; this demi-lune-flank, or *defends* the horn,

or crown-work: the ancient fortifications are easily taken, there being nothing to *defend*, that is, to flank them.

When they say, the flank *defends* the curtain, they mean, not only that it is a-side of the curtain, but also, that it prevents the approaches; that is, such as are posted on the flank of a bastion, can see any that come to attack the curtain, and can shoot them, or prevent their approaching it.

Inner DEFENDING-Angle, is the angle CIB, (*Tab. Fortif. Fig. 1.*) made by the lesser line of *Defence* with the curtain.

Outer DEFENDING-Angle, is the angle COF, formed by the two lesser lines of *Defence* CO, and FO.

The lines, or sides of the rampart, or wall are *defended* by muskets or carbines, as more easy, cheap, and commodious than canons.

DEFENSITIVE, in medicine, and chirurgery, denotes a bandage, plaister, or the like, used in the cure of a wound, to moderate the violence of the pain, the flux of blood, and the access or impression of the external air.

The cauterization performed, the wound is covered with lint and the eye with a *Defensive*, and a triangular compress.

For the first dressing of the ear-bole, M. Dionis used a little *Defensive* made of the white of an egg, oleum rosatum, and allium powder.

DEFENSOR. See *ADVOCATE*.

DEFERENT, DEFERENS, in anatomy, is applied to certain vessels of the body, appointed for the conveyance of humours from one place to another.

Vasa DEFERENTIA, are the vessels that convey the seed as fast as it is secreted, and prepared in the testicles, &c. into the vesiculae seminales, there to be deposited till an emission is required.—See *Tab. Anat. (Splanchn) fig. 1. lit. t. t. fig. 8. lit. n. n. fig. 15. lit. a. a.*

Some call them the *Ejaculatory Vessels*: they are white, nervous, and round, fissure partly in the scrotum, and partly in the abdomen.

DEFERENT, or DEFERENS, in the ancient astronomy, a circle invented to account for the excentricity, perigee, and apogee of the planets.

As the planets are found differently distant from the earth at different times, it was supposed that their proper motion was performed in a circle, or ellipsis which is not concentric with the earth; and this excentric circle, or ellipsis, they called the *Deferent*, because, passing through the center of the planet, it seemed to support, or sustain it in its orbit.

The *Deferents* are supposed differently inclined to the ecliptic, but none more than 8 degrees, excepting that of the sun, which is in the plane of the equator it self, and is cut differently by the *Deferents* of the other planets in two places, called *Nodes*.

In the Ptolemaic system, the same *Deferent* is also called the *Deferent of the Epicycle*, because it traverses the centre of the epicycle, and seems to sustain it.

DEFFAIT, or DECAPITE, a term used by the French heralds, to denote a beast whose head is cut off smooth; in which it differs from *erased*, where the head is, as it were, torn off, and the neck left ragged.

DEFICIENT *Numbers*, are such whose parts added together make less than the integer, whose parts they are. See *NUMBER*. Such, *e. gr.* is 8, whose quata parts are 1, 2, and 4, which together only make 7. See *ABUNDANT Number*.

DEFICIENT *Hyperbola*, is a curve of that denomination, having only one asymptote, and two hyperbolic legs running out infinitely towards the side of the asymptote, but contrary ways. See *CURVE*.

DEFILE *, in fortification, a narrow pass or way, through which a company of horse, or foot, can pass only in file, by making a small front, so that the enemy may take an opportunity to stop their march, and to charge them with so much the more advantage, in regard that the front and rear cannot reciprocally come to the relief of one another.

* The word is formed from the French *defile*, to untread, or unstring.

To *DEFILE*, is to go off file by file. See *FILE*.

The army began to *defile* on the left, and was forced to *defile* at each end of the field, by reason of the morasses, and the woods.

DEFINITE, in grammar, is applied to an article that has a precise, determinate signification.

Such are, the article *the* in English, *le* and *la* in French, &c. which fix, and ascertain the noun they belong to, to some particular; as, *the king*, *le roy*: whereas, in the quality of king, *de roy*, the articles *of*, and *de*, mark nothing precise, and are therefore called *indefinite*.

DEFINITION, in logic, an enumeration of the chief simple ideas, whereof a compound idea consists; in order to ascertain, or explain its nature, and character.

The schoolmen give very imperfect notions of *Definition*. Some define it the first notion, or conception, that arises of a thing, whereby it is distinguished from every other, and from which, all the other things that we conceive of it, are deduced. But the usual *Definition* of it is, *oratio explicans quid res est*, a discourse explaining what a thing is; that is, as some further

further explain it, a discourse setting forth those attributes which circumscribe, and determine the nature of a thing. For to explain, is only to propose the parts separately, and expressly, which were before proposed conjunctly, and implicitly; so that every explication has regard to some whole. Hence, according to the diverse kinds of parts in any thing, *viz.* physical parts, metaphysical parts, &c. arise so many different kinds of Definitions of the same thing; thus, man is either defined an animal, consisting of soul and body; or, a reasonable animal, &c.

Definitions are of two kinds; the one Nominal, or, of the Name: the other Real, or, of the Thing.

DEFINITION of the Name, or Nominal DEFINITION, is that which explains the sense, or signification appropriated to a word: or, as Wolfius more accurately considers it, it is an enumeration of certain marks, or characters, sufficient to distinguish the thing defined from any other thing; so to leave it out of doubt, what the subject is that is intended or denoted by the name.

Such is the Definition of a square, when it is said to be a quadrilateral, equilateral, rectangular figure.

By Definition of the Name, is either meant a declaration of the ideas, and characters appropriated to the word in the common usage of the language; or the peculiar ideas, &c. which the speaker thinks fit to denote by that word; *i. e.* the special sense wherein he proposes to use it, in his future discourse. For it may be observed, that the signification of any word depends entirely on our will; and we may affix what idea we please to a sound, which it self signifies nothing at all.

The Definition of the name therefore, in the second sense, is merely arbitrary; and ought never to be called in question; only it is to be minded, that we keep inviolably to the same signification. Hence, a Definition comes to stand, or to be made use of, as an undoubted, or self-evident maxim; as it frequently does, and particularly among geometricians, who, above all other people, make use of such Definitions.

Not that we mean, that after having defined a thing so and so, there is nothing in our idea affixed to the defined term, but must be granted to the thing itself: thus, if any one should define heat to be a quality in certain bodies, like that which we feel upon the application of fire, or hot bodies; no man could find fault with the Definition, as far as it expresses what he means by the word heat; but this does not hinder us from denying, that there is any thing in the body that warms us, like what we feel in ourselves.

DEFINITION of the Thing, or Real DEFINITION, is properly an enumeration of the principal attributes of a thing, in order to convey, or explain its nature.

Thus, a circle is defined a figure, whose circumference is every where equidistant from its centre.

Wolfius defines a Real Definition to be a distinct notion explaining the genesis of a thing, that is, the manner wherein the thing is made, or done: such that of a circle, whereby it is said to be formed by the motion of a right line round a fixed point. On which footing, what was before intimated as a Real Definition of a circle, amounts to no more than a nominal one.

This notion of a Real Definition is very strict and just; and affords a sufficient distinction between a real and a nominal one. But, though it has the advantages of analogy, distinctness, and convenience on its side; yet, being only it self a Nominal Definition, *i. e.* a Definition of the term Real Definition, we must consider it in that light, that is, as an idea fixed arbitrarily to that word, and which the author always denotes by that word in the course of his book. But, in effect, it is not the usual sense, or acceptation of the term; which is much less convenient and distinct. And it is to that usual acceptation we are here chiefly to have regard.

Definitions are usually divided into accurate and inaccurate; the first make what we strictly call a Definition; the second, we distinguish under the name of Description.

Of the parts enumerated in a Definition, some are common to other things beside the thing defined; others are peculiar thereto: the first are called the Genus, or Kind; and the second, the Difference.—Thus, in the former definition of a circle, by a figure whose circumference is every where equidistant from its centre: the word Figure is the Kind, as being a name common to all other figures, as well as the circle: the rest are the Difference, which specify, or distinguish the circle from every other figure.

And hence arises that recipe of Fa. de Colonia, for the making of a Definition. Take, says he, something that is common to the thing defined with other things, and add to it something that is proper, or peculiar to the thing; and you will have a Definition. Thus, *e. g.* rhetoric is defined the art of speaking well; for that it is an art, is common to it with several other things; but that it is the art of speaking well, is peculiar to it alone.

There are three common rules of a good Definition. 1st, That it be clear, and more easy and obvious than the thing defined. 2^{dly}, That it be universal, or adequate to the thing defined; that is, that it agree to all the things contained in the species defined.

And Thirdly, that it be proper or peculiar to the thing defined. The two ordinary defects of Definitions, are, not to agree either to the whole thing, or the sole thing defined: *neque omni, neque soli*; than which nothing is more common, even among the best and justest authors.

Lord Bacon observes of Aristotle's Definitions in the general, that they are very much like that, whereby man should be defined an animal that tills the ground. Nor was his master Plato less exceptionable. The joke put upon him on that account is famous; Plato, it seems, had defined man, *animal bipes & implume*, a two-footed animal without feathers. Upon which, Diogenes the cynic, a great derider of the academics, threw a cock stripped of his feathers, and quite naked, into the middle of Plato's school; crying, "Here is 'Plato's man.'"

Definition it must be observed, has not place every where: it has only to do with compound ideas; as being no more than an enumeration of the chief simple ideas they are compounded of. Simple ideas cannot be defined, as not allowing of an enumeration. He who knows not what it is one calls heat, will only learn it by experience, or some synonymous word, or some word of another language, or by circumlocution, whereby a thing is shewn, not defined; as if we should say, "it was a sensation which we find when we sit by the fire, or in the sunshine"; which shews nothing of the nature of the thing; nor would a person that had never felt the sensation, understand any more what is meant thereby, than a man born blind would know what a green colour was, by telling him it was the sensation we have when we behold the grass in the field.

Our Definitions of substances, it must be added, are very defective: and as for individuals, we have no Definitions at all.—The ideas of substances are compounded of the various simple ideas jointly impressed when they present themselves; and all we can do to define them, is only to enumerate those several sensible ideas, as colour, density, malleability, weight, &c. Thus, gold is defined by such a peculiar colour, gravity, &c.—Yet such Definitions may raise an idea clear enough of that substance in the mind of one who has separately received, by his senses, all the simple ideas that are in the composition of the complex idea defined; though the intimate nature and essence of substance is unknown, and consequently cannot be defined.

It follows, that it is only the modes, or attributes that can be explained by what we properly call a Definition.

DEFINITION, in rhetoric, is defined by Tully, a short comprehensive explanation of a thing.

The Definitions of the orator, it must be observed, differ much from those of the logician, and philosopher: these latter define a thing closely and dryly by genus and difference, *e. g.* man is a reasonable animal, &c.

The orators take a larger compass, and define things more ornamentally from the places of rhetoric, thus: man is a curious work of an Almighty Creator, framed after his own image, endued with reason, and horn to immortality. But this rhetorical Definition, in strictness, comes nearer to the nature of a description, than an accurate Definition.

There are diverse kinds thereof; as, 1st, That drawn from the parts whereof a thing consists: thus, oratory is an art consisting of invention, disposition, elocution, and pronunciation. 2^{dly}, From the effects; as, sin is the plague of the soul, the sting of conscience, the scandal of nature, the ruin of the world, the hatred of God, &c. 3^{dly}, From affirmation and negation, as when we first say what a thing is, not, that it may be the better conceived what it is. Thus Cicero, by defining the consulate, and shewing that it does not consist in ensigns, liçtors, &c. but in virtue, proves that Piso was not consul. 4^{thly}, From the adjuncts, as when alchemy is defined, an art without sense, whose beginning is deceit; its middle, labour; and its end, beggary. And lastly, from similies, and metaphors; as when death is defined, a leap in the dark, &c.

To this last class of metaphorical Definitions, are reducible those five not unlegant Definitions of a man which we shall here subjoin. The poets feign, that the sciences were once called together by Minerva's command, to form a Definition of man: the first, *viz.* logic, defined him, a short enthymeme; his birth the antecedent, and his death the consequent. Astronomy defined him, a changeable moon; which never continues in the same state. Geometry defined him, a spherical figure; which ends in the same point where it began. Lastly, rhetoric defined man, an oration; whose exordium was his birth; narration, trouble; and peroration, death; the figures of the oration being sighs, tears, or joy worse than tears.

DEFINITIVE, is applied to somewhat that terminates or decides a question, or process.

The house of lords have passed a Definitive sentence in such a cause: the church has given a Definitive judgment on such an article of faith.

The word stands in opposition to provisional, and interlocutory. See PROVISIONAL.

DEFINITOR, a term used in several religious orders, for an assessor, or counsellor of a general, or superior, in certain matters.

In most orders of religious, the *Definitor* takes place after the superior of the convent he lives in, when in the convent itself; but out of the convent, the *Definitor's* place is before his own superior.

Definitors are also subjects, in the convent they reside in, to the immediate superior of the convent, as to things relating to the monastic discipline; but in nothing else.

DEFLAGRATION *, in chemistry, the kindling, or setting fire to a salt, a mineral, or other matter, either alone or mixed for that purpose with a sulphureous one, in order to purify it.—As is done in the preparing of *Æthiops mineral* by fire, of sal, prunella, &c.

* The word is formed of the Latin *de*, and *flagrare*, to burn.

DEFLECTION, the turning any thing aside from its former course, by some adventitious or external cause.

The word is often applied to the tendency of a ship from her true course, by reason of currents, &c. which divert her, and turn her out of her right way.

DEFLECTION of the Rays of Light, is a property which Dr. Hook observed 1672, and read an account of before the Royal Society, March 18, the same year.—He says, he found it different both from reflection, and refraction; and that it was made towards the surface of the opacous body perpendicularly.

This is the same property which Sir Isaac Newton calls *Inflexion*. See **INFLECTION**.

DEFLOURATION, or **DEFLOWERING**, the act of violating or taking away a woman's virginity.

Death, or marriage, are decreed by the civil law in case of *Defloration*. Many anatomists make the hymen a real proof of virginity, persuaded that where it is not found, the girl must have been *deflowered*. See **HYMEN**.

The ancients had so much respect for virgins, that they would not put them to death, till they had first procured them to be *deflowered*. It is said, the natives of the coast of Malabar pay strangers to come and *deflower* their brides.

Among the Scots, and in the northern parts of England, it was a privilege of the lords of the manor, granted them by king Ewen, that they should have the first night's lodging with their tenants wives. King Malcolm III. allowed the tenants to redeem this service at a certain rate, called *Marcheta*, consisting of a certain number of cows: Buchanan says, it was redeemed with half a mark of silver. The same custom had place also in Wales, Flanders, Friseland, and some parts of Germany.

By the custom of Anjou, and Maine, a maid after twenty-five years of age, may suffer herself to be *deflowered* without being disinherited for it by her father.

Du Cange quotes an arret of the 19th of March 1409, obtained by the inhabitants of Abbeville against the bishop of Amiens, for taking money to dispense with an injunction he had made, not to suffer them to get their wives maidenheads the three first nights; the injunction being founded on a canon of the IVth council of Carthage, which decrees the same, out of reverence of the matrimonial benediction.

DEFLUXION *, or **FLUXION**, a falling, or flowing of some humour to any part of the body; as of rheum on the trachea, and oesophagus in a catarrh.

* The word is formed from the Latin, *defluo*, I flow down, the humours falling upon some part, where they are gathered together.

Defluxions on the Lungs are of dangerous consequence. See **CATARRH** and **PHTHISIS**.

Defluxions on the Eyes produce a weakness of sight, and frequently blindness. See **EYE**.

DEFORCEMENT, in law, a withholding lands, or tenements, by force, from the right owner.

DEFORCEOR, or **DEFORCIANT**, one that casts out another from his lands, or tenements, by mere *Force*.

Deforceor differs from *Disseisor*, in that a man may disseise without *Force*: and that a man may *deforce* another who never was in possession; as where several persons have a right to lands, as common heirs, and one entering first, keeps out the rest. See **DISSEISOR**.

Deforceor also differs from *Intruder*, in that a man becomes *Intruder* by a wrongful entry only into lands void of a possessor; whereas a *Deforceor* holds out the rightful heir. See **INTRUSION**.

DEFORMITY, a displeasing or painful idea excited in the mind, on occasion of some object which wants of that uniformity, necessary to constitute beauty.

It is an inquiry of some delicacy, and importance, whether there be any such thing as *absolute Deformity*? Our perception of the ideas of beauty, and harmony is justly reckoned a sense; from its affinity to the other senses in this, that the pleasure does not arise from any knowledge of principles, proportions, causes, uses, &c. but strikes at first view; as also in this, that the ideas of beauty, like other sensible ideas, are necessarily pleasant to us, as well as immediately.

But, as the other senses, which give us pleasure, do also give us pain; does this sense of beauty make any objects disagreeable to us, and the occasion of pain?

That many objects give no pleasure to our sense, is obvious; many are certainly void of beauty: but then, says a late ingenious author, there is no form which seems necessarily disagreeable of itself, when we dread no other evil from it, and compare it with nothing better of the kind. Many objects are naturally displeasing, and distasteful to our external senses, as well as others pleasing, and agreeable; as smells, tastes, and some separate sounds: but for our sense of beauty, no composition of objects which give not unpleasant simple ideas, seems positively unpleasant, or painful of itself, had we never observed any thing better of the same kind.

Deformity, then, is only the absence of beauty, or a deficiency in the beauty expected in any species: thus, bad music pleases rustics, who never heard any better; and the finest ear is not offended with tuning of instruments, if it be not too tedious, where no harmony is expected: and yet much smaller dissonancy shall offend amidst the performance, where harmony is expected. A rude heap of stones is no way offensive to one who shall be displeas'd with irregularity in architecture, where beauty was expected. And had there been a species of the form which we now denominate ugly, or *deformed*, and had we never seen or expected greater beauty, we should have received no disgust from it. Though the pleasure would not have been so great in this form as in those we now admire. Our sense of beauty seems designed to give us positive pleasure; but not positive pain, or disgust, any further than what arises from disappointment.

There are indeed many faces which at first view are apt to raise dislike. But this is generally not from any positive *Deformity*, which of itself is positively displeasing, but either from want of expected beauty, or from the carrying some natural indications of morally bad dispositions, which we all acquire a faculty of discerning in countenances, airs, and gestures. That this is not occasioned by any form positively disgusting, appears hence, that if upon long acquaintance we are sure of finding sweetness of temper, humanity, and cheerfulness, though the bodily form continues, it shall give us no disgust. There are horrors raised by some objects, which are only the effect of fear for ourselves, or compassion towards others, when either reason or some foolish association of ideas makes us apprehend danger, and not the effect of any thing in the form it self. For we find, that most of those objects, which excite horror at first, when experience, or reason has removed the fear, may become the occasion of pleasure; as in ravenous beasts, a tempestuous sea, a craggy precipice, a dark shady valley, &c.

This association of ideas makes many objects beautiful and pleasant. The beauty of trees, their cool shades, and their aptness to conceal from observation, have made groves, and woods, the usual retreat of those who love solitude, especially the religious, the pensive, the melancholy, and the amorous: and do not we find, that we have so joined the ideas of those dispositions of mind, with those external objects, that they always occur to us along with them? and according as the habits, or passions contracted, or gratified therein give us pleasure, or pain, the remembrance is pleasurable, or painful. The dim light in Gothic buildings has had an association of a very foreign idea, which Milton expresses by his epithet, *a dim religious light*. After the like manner, the casual conjunction of ideas gives us disgust where there is nothing disagreeable in the form itself. And this, in effect, is the cause of most of our fantastic aversions to the figures of diverse animals, &c. Thus serpents of all kinds, and many insects, really beautiful enough, are beheld with aversion by many people, who have got some accidental ideas of mischief associated to them.

DEFTARDAR *, or **DEFTERDAR**, the treasurer of the revenues of the Turkish empire. See **TREASURER**.

* The word is compounded, first, of דפטר *defter*, a Turkish name for a book, register, memoir, &c. which Meninski derives from the Greek *διπτήρα*, the skin or parchment anciently wrote on. The second word, whereof *Deftdardar* is compounded, is *דאר* *dar*, a Turkish and Persian word, signifying keeping, or holding, *q. d.* book-keeper of the moneys received, and expended.

Meninski calls him *Supremus Thesaurarius*, high treasurer; and *Præfes Cameræ*, president of the exchequer: Castellan makes him the keeper, and comptroller of the books of receipts, and payments. The *Deftdardar*, or as Vigenere calls him, *Deftederari*, has in his charge the rolls, and accounts of the militia, and the treasury; he receives all the grand signior's revenues, pays his forces, and furnishes the expenses of all publick affairs: in which, his office differs from that of the Chaznadar, who is treasurer of the seraglio or court, as the *Deftdardar* is of the state.

Ricaut makes a *Deftdardar*, whom he calls *Testerdar*, in each Beglerbeglic, or government. Vigenere assures us, there are but two, the one for Europe, and the other for Asia; the first resides at Constantinople, and has under him two general commissioners;

missioners, or deputies, one for Hungary, Transylvania, Wallachia, Croatia, Servia, Bulgaria, Bosnia, &c. The other for Greece and the Morea, with the islands of the Archipelago. Each of these has under him as many sub-commissioners, or agents, as there are Sangiackats in his province; which sub-commissioners have as many clerks as there are Sabaffi's in their Sangiackat, to keep the account of the Timariots in their districts. The *Destarder* of Asia has two general deputies, the one for Anatolia, the other for Syria, Arabia, and Egypt; these have likewise their sub-agents, clerks, &c. as those of Europe.

DEGENERATION, the act of falling, or declining from a more perfect, or valuable kind, state, or condition, to a less.

It is a great dispute among naturalists, whether or no animals, plants, &c. be capable of *degenerating* into other species? the affirmative is urged by many as a strong objection against the plant being contained in the seed, and that doctrine of generation wherein that is supposed to be so.

Fortun. Licetus, Lib. IV. *de Spont. vivent. ort.* expressly contends, that the forms of animals *degenerate* into other more imperfect ones: thus, say he, the soul of a calf, after its death, *degenerates* into the souls of the worms, bees, &c. which arise out of its carcass; but the other school-men laugh at this notion.

Others hold, that in the same matter there are diverse forms; and that *Degeneration* is only the putting off one form, and calling forth another latent one: but it is impossible, the form of a worm, and that of a calf, should be actually existing together in the same piece of matter.

Others hold, that *Degeneration* only obtains in vegetables, and define it the change of a plant of one kind into that of another viler kind. Thus, say they, wheat *degenerates* into darnel; barley into oats; ocimum into serpyllum; mint into sisybrubrium; caulis into rapa, &c.

The plantule, or stamen of the future vegetable, they hold to exist in the seed; so that to produce such a plexus, or organization, a matter so and so prepared is only required: and add, that the matter in the soil where the seed is lodged being such as is incapable of producing the said plexus, it must necessarily change into another of a different nature from that the seed required, though in some respects like it, and approaching thereto: thus, darnel and wheat, in many respects agree; so also serpyllum and ocimum, &c. They allow, however, that there is no *Degeneration* in the root, but only in the seed: in as much as the root already supposes a perfect organization.

But our latest and best naturalists maintain the opinion such a *Degeneration*, or transmutation, to be erroneous and a chimera: not but they allow that a plant, by being transplanted to an improper soil, or sun, may be depraved; so as a Dutch rose of an hundred leaves, may only produce another rose far short thereof in number of leaves, colour, smell, &c. Such a depravation is possible, and frequently happens; but a specific transformation seems out of the power of nature; a new form ever supposing a new *Generation*, which again supposes a corruption of the former kind.

DEGLUTITION, in medicine, the act of swallowing the food.

Deglutition is performed, in the first place, by means of the tongue, driving the aliment into the oesophagus, or gullet; and then, by the contraction of the spincter, and the fleshy fibres of the same oesophagus, which lessening the bore, or aperture thereof, protrude the contents downwards into the stomach in our eating.

Deglutition succeeds *Mastication*, and is followed by *Concoction*.

DEGRADATION, in our law-books called *Disgradation*, and *Deposition*, the act of depriving, or stripping a person for ever of a dignity, or degree of honour; and taking away the title, badge, and privileges thereof.

The *Degradations* of a peer, a priest, a knight, a gentleman, an officer, &c. are performed with diverse ceremonies. That which anciently obtained in *degrading* a person from his nobility, is very curious, and deserves to be rehearsed here, after Gelior, and la Colombiere. It was practised in the time of Francis I. upon captain Fangel, who had cowardly given up Fontarabia, whereof he was governor.

On this occasion, twenty or thirty cavaliers without blemish, or reproach, were assembled: before whom the gentleman was accused of treason, and breach of faith, by a king at arms. Two scaffolds were erected, the one for the judges, heralds, and pursuivants, and the other for the guilty cavalier, who was armed at all points, and his shield placed on a stake before him, reversed with the point upwards. On one side assisted twelve priests, in surplices, who sung the vigils of the dead. At the close of each psalm they made a pause, during which the officers of arms stripped the condemned of some piece of his armour, beginning with the helmet, and proceeding thus, till he was quite disarmed: which done, they broke his shield in three pieces with a hammer. Then the king at arms empty'd a basin of hot water on the criminal's

head; and the judges, putting on mourning habits, went to the church. This done, the *Degraded* was drawn from off the scaffold, with a rope tied under his arm-pits, laid on a bier, and covered with morcury-cloaths; the priest singing some of the prayers for the dead; and then he was delivered to the civil-judge, and the executioner of justice.

For a more domestic instance: Sir Andrew Marcla, earl of Carlisle, being attainted and convicted, of treason, 18th Edw. II. *coram rege*; after judgment was pronounced on him, his sword was broke over his head, and his spurs hewn off his heels; Sir Anthony Lucy, the judge, saying to him, "Andrew, now art thou no knight, but a knave." By *Stat. 13 Caroli II.* William, lord Monson, Sir Henry Mildmay, and others, were *degraded* from all titles of honour, dignities, and preeminences, and prohibited to bear, or use the title of lord, knight, esquire; or gentleman, or any coat of arms, for ever afterwards.

As to ecclesiastics, we have an instance of *Degradation* before condemnation to death, in the VIIIth century at Constantinople. It is in the person of the patriarch Constantin, whom Constantin Copronymus caused to be executed. He was made to ascend the Ambo; and the patriarch Nicetas sent some of his bishops to strip him of the pallium, and anathematized him: then they made him go out of the church backwards.

But we have a much later instance in our own history: when Cranmer, archbishop of Canterbury, was *degraded* by order of queen Mary; who dressed him in episcopal robes made only of canvas, put the mitre on his head, and the pastoral staff in his hand: and in this attire shewed him to the people. Which done, they stripped him again piece by piece. At present, they do not stand so much on the ceremony of *Degradation*, in order to the putting a priest to death; by reason of the delays and difficulties that it would occasion. Pope Boniface pronounced, that six bishops were required to *degrade* a priest: but the difficulty of assembling so many bishops, rendred the punishment frequently impracticable.

With us, a priest, after having been delivered to his ordinary, if he cannot purge himself of the crime laid at his door; his gown, and other robes are stripped over his ears by the common hangman, by which he is declared divested of his orders.

It is decided, however, that *Degradation* does not efface the priestly character.

Degradation only seems to differ from *Deposition* in a few ignominious ceremonies, which custom has added thereto. Accordingly, in the business of Arnoul, archbishop of Rheims, sentenced in the council of Orleans, in 991, it was deliberated, what form they should follow in the deposition, whether that of the canons, that is, simple deposition; or that of custom, viz. *Degradation*. And it was declared, that he should surrender the ring, pastoral staff, and pallium, but that his robes should not be tore off him.

In effect, the canons prescribe no more than a mere reading of the sentence. It is the rest, therefore, added hereto by custom, viz. the stripping off the ornaments, and the tearing the pontifical vestments, that properly constitutes *Degradation*.

DEGRADATION, in painting, expresses the lessening, and rendering dim and confused, the appearance of distant objects in a landscape; so as they shall appear there, as they would do to an eye placed at that distance from them. See **PERSPECTIVE**.

DEGRADED, in heraldry.—A *Crofs* **DEGRADED**, is a cross marked, or divided into steps at each end; diminishing as they ascend towards the middle, or centre: by the French called *Perronné*. See **CROSS**.

DEGREE, in geometry, a division of a circle, including a three hundred and sixtieth part thereof.

Every circle, great and small, is supposed to be divided into 360 parts, called *Degrees*: the *Degree* is subdivided into 60 lesser parts, called *minutes*: the minute into 60 others, called *Seconds*: the second into 60 *Thirds*, &c.—It follows, that the *degrees*, minutes, &c. of greater circles, are greater than those of less.

The subdivisions of *Degrees* are fractions, whose denominators proceed in a sexagesuple ratio; that is, a first minute is $\frac{1}{60}$, a second = $\frac{1}{3600}$, a third = $\frac{1}{216000}$, &c. But these denominators being troublesome, their logarithms are substituted in common use, as indices thereof.

Thus, a *Degree*, as being the integer or unite, is denoted by \circ , a first minute or prime by $'$, a second by $''$, a third by $'''$, &c. Accordingly 3 *Degrees*, 25 minutes, 16 thirds, are wrote, $3^{\circ} 25' 16''$.

But though the ancient Egyptians, to whom this division is usually ascribed, did, by means hereof, free astronomical calculations from fractions; since sexagesimal fractions may be handled as integers; and were very happy in the choice of such a number of *Degrees* in the circle, as admitted of a just division by 2, 3, 4, 5, 6, 8, and 9. Yet Stevinus, Oughtred, Wallis, &c. with good reason, with the sexagesimal fractions set aside, and decimals taken in their room. For in decimals there is no occasion for reducing lesser fractions into greater, or greater into lesser; which is a tedious article in

D E G

sexagesimals. Stevinus even holds, that this division of the circle which he contends for, obtained in the wife age, in *Sæculo Sapientii*. Stevin. *Cosmog.* Lib. I. Def. 6.

The magnitude or quantity of angles is accounted in *Degrees*. Thus, we say, an angle of 90 *Degrees*; of 70 *Degrees*, 50 minutes; of 25 *Degrees*, 15 minutes, 45 seconds.

Such a star is mounted so many *Degrees* above the horizon, declines so many *Degrees* from the equator. Such a town is situate in so many *Degrees* of longitude and latitude.

A sign includes 30 *Degrees* of the ecliptic. **DEGREE of Latitude**, is the space of 365184 English feet included between two parallels of latitude.

DEGREE of Longitude, is the space between two meridians; the quantity of which is variable according to the latitude.

These expressions are borrowed from the ancients, who were acquainted with a very large extent of earth from east to west, which they accounted the length, and a much less from north to south, which passed with them for the breadth of the earth. See **LATITUDE** and **LONGITUDE**.

The quantity of a **DEGREE** of a meridian, or other great circle, on the surface of the earth, is variously determined by various observers: the methods too made use of are various. See **EARTH**.—Ptolemy fixes the *Degree* at 68 Arabic miles, accounting $7\frac{1}{2}$ stadia to a mile. The Arabs themselves, who made an exact computation of the diameter of the earth, by measuring the distance of two places under the same meridian, in the plains of Seniar, by order of Almamom, only make 56 miles. Kepler determining the femidiameter of the earth by the distance of two mountains, makes a *Degree* 13 German miles: but his method is far from being accurate. Snellius seeking the diameter of the earth, from the distance of two parallels of the equator, finds the quantity of a *Degree* by one method to be 57064 Paris toises, or 342384 feet; and by another method, 57057 toises, or 342342 feet. The mean between which two numbers M. Picart found by mensuration in 1669, from Amiens to Malvoisin, the most sure, and makes the quantity of a *Degree* 57064 toises, or 342360 feet, which reduced to other measures, gives the quantity of a *Degree* of a great circle in

English miles of 5000 feet each	—	73	$\frac{100}{7}$
Florentine miles of 3000 braccios	—	63	$\frac{7}{38}$
Common French leagues of 220 toises	—	25	
Rhinland perches of 12 feet	—	29556	

However, M. Cassini, at the command of the king of France, in the year 1700, repeated the same labour, and measuring the space of 6 *Degrees*, 18 minutes, from the observatory at Paris, along the meridian to the city of Collioure in Rouffillon, that the greatness of the interval might diminish the error, found the quantity of a *Degree* to be 57292 toises, or 343742 Paris feet, amounting to 365184 English feet.—On which footing, the quantity of a minute of a degree of a great circle of the earth is 5710 Paris feet, and that of a second, 95 feet.

With which account pretty nearly agrees that of our countryman Mr. Norwood, who about the Year 1635, measured the distance between London and York, and found it 905751 English feet; and finding the difference of latitudes 2° , 28', determined the quantity of one *Degree* to be 367196 English feet, or 57300 Paris toises, or 69 English miles, 288 yards. See *Newt. Princ. Phil. Nat. Math.* prop. 19. p. 378. and *Hist. Acad. R. Scienc. An.* 1700, p. 153.

The quantity of a *Degree* of a great circle, with the distance of any other parallel from the equator being given, the quantity of a *Degree* in that parallel is found by this canon: as the whole sine is to the cosine of the distance of the parallel from the equator; so is the quantity of a *Degree* of the equator to the quantity of a *Degree* of the parallel.

Suppose, *e. gr.* the latitude of the parallel 51° , and suppose a *Degree* of the equator 69 miles.

Log. of whole sine	10000000.
Cosine of 51°	97988718.
Log. 69	18388491.
Log. required	— 16377201.

The number corresponding to which in the tables is $43\frac{45}{100}$ miles, nearly; which being multiplied by 5280, the number of feet in a mile, gives the number of English feet in a *Degree* in that parallel.—On which foundation (supposing M. Cassini's proportion of 365184 English feet, or 69 miles, 864 feet to 1 *Degree* of a great circle) is built the following table, exhibiting the quantity of a *Degree* of longitude in each parallel of latitude.

D E G

Deg. of Lat.	English Stat Miles of 5280 Feet	Deg. of Lat.	English Stat Miles of 5280 Feet
Equ.	69 864		
1	69 808	46	48 338
2	69 644	47	47 004
3	69 363	48	46 1575
4	68 554	49	45 2082
5	68 4739	50	44 2515
6	68 4143	51	43 2777
7	68 3422	52	42 3069
8	68 2590	53	41 3293
9	68 1048	54	40 3449
10	68 595	55	39 3540
11	67 4714	56	38 3568
12	67 3443	57	37 3333
13	67 2064	58	36 3438
14	67 57	59	35 3283
15	66 426	60	34 3072
16	66 2557	61	33 2804
17	66 747	62	32 2483
18	66 4110	63	31 2110
19	66 2088	64	30 1686
20	64 5240	65	29 1213
21	64 3008	66	28 743
22	64 672	67	27 128
23	63 3513	68	25 4800
24	63 972	69	24 4150
25	62 5609	70	23 3460
26	62 865	71	22 2732
27	61 3301	72	21 1968
28	61 358	73	20 1169
29	60 2597	74	19 338
30	59 4738	75	17 4756
31	59 1503	76	16 3866
32	58 3453	77	15 2948
33	58 29	78	14 2006
34	57 1791	79	13 1043
35	56 3461	80	12 53
36	55 5040	81	10 4377
37	55 1248	82	9 3303
38	54 2648	83	8 2264
39	53 3661	84	7 1212
40	52 5187	85	6 147
41	52 1147	86	4 3454
42	51 2204	87	3 3272
43	50 3178	88	2 2184
44	49 4071	89	1 1093
45	48 4884	90	0

DEGREE, in civil and canon law, denotes an interval in cognation or kinship, whereby proximity and remoteness of blood are computed.

Degrees are the intervals whereby it is known what persons are nearest to the stock or root.—Or they are the distances of one person from another in the line of consanguinity or affinity, reckoned from some common parent or ancestor. See **CONSANGUINITY**.

We say, the second *Degree*, the third *Degree*; Gregory the great was the first who prohibited marriage to the seventh *Degree*; which restriction was long observed: the second council of Lateran, under Innocent III. restrained the prohibition to the fourth *Degree* inclusive, that is, to cousin Germans children. See **MARRIAGE**.

In the civil law, the *Degrees* of kindred or cognation are differently computed from what they are in the canon law.—The first reckons by the number of persons issued from the same stock; each person sprung therefrom making one *Degree*: but with this difference, that in the direct line the order begins with the first *Degree*; and thus the father and son are in the first *Degree*: but in the collateral line there is no first *Degree* reckoned; two brothers being only related in the second *Degree*, by reason the father, who is the common stock, makes the first *Degree*.

The canon law observes the same rule as to the direct line; but in the collateral line, a generation only makes a *Degree*: thus brothers are in the first *Degree*, and cousin Germans in the second. Whereas, the civil law puts brothers in the second, and cousins German in the fourth.—So that two *Degrees* in the civil law only make one in the canon law.

DEGREE, in medicine, denotes a certain pitch or intension of the elementary qualities.

The *Degrees* usually allowed are four, answering to the number of the peripetetic elements.

In the school philosophy, the same qualities are divided into eight: the last or highest *Degree* of intension is called *utelo*.

We

They say, a thing is cold in the second *Degree*, pepper is hot in the third *Degree*, &c.

Fire was held hot in the eighth *Degree*, and dry in the fourth *Degree*.

DEGREES, in chemistry, is understood of the state or intenseness of the fire or heat.

Our *Chemists* distinguish four *Degrees* of fire or heat: The *first*, is that raised by two or three coals.

The *second*, that of four or five coals, or rather so much as is sufficient to warm a vessel sensibly; yet so, as that the hand may be held on it a considerable time.

The *third Degree*, is when there is a fire capable of boiling a vessel of five or six pints of water.

The *fourth*, is when there is fire enough for a furnace.

These *Degrees*, however, are all varied according to the different circumstances of operations, furnaces, vessels, subjects, &c. See **HEAT**.

DEGREES, in music, are the little intervals whereof the concords, or harmonical intervals, are composed. See **INTERVAL** and **CONCORD**.

The musical *Degrees* are three; the greater tone, the lesser tone, and the semi-tone.

The primary cause of the invention of *Degrees*, or intervals less than concords, and whereby the concords are divided, and as it were graduated, Descartes judges to have been this, that if the voice were always to proceed by harmonical intervals, there would be too great a disproportion or inequality in the intenseness thereof, which would weary both the finger and the hearer.

Thus, supposing A and B the distance of a greater third; if the voice were immediately to ascend from A to B, then because B being acuter, strikes the ear with more force than A, left that disproportion should prove uneasy, another sound, C, is put between them; by which, as by a step or *Degree*, we may ascend more easily, and with less unequal force in raising the voice.

Hence it appears, says that author, that the *Degrees* are only certain mediums contrived to be put betwixt the extremes of the concords, for moderating their inequality, but which of themselves have not sweetness enough to satisfy the ear, and are of use only with regard to the concords. So that when the voice has moved one *Degree*, the ear is not yet satisfied till we come to another, which therefore must be a concord with the first found.

The substance of what is here alledged amounts to this, that by a fit division of the concurring intervals into lesser ones, the voice will pass smoothly from one note to another; and the hearer be prepared for a more exquisite relish of the perfect intervals, whose extremes are the proper points in which the ear finds the expected rest and pleasure.

Such is the end and office of the *Degrees* or lesser intervals.—Now there are only three, that experience recommends as agreeable; whose ratios are 8:9, called the *greater tone*; 9:10, called the *lesser tone*; and 15:16, called the *semi-tone*. By these alone a found can move upwards or downwards successively, from one extreme of a concord to another, and produce true melody: and by means of these, several voices are also capable of the necessary variety in passing from concord to concord. As to the original of these *Degrees*, they arise out of the simple concords, and are equal to their differences. Thus, 8:9, is the difference of a fifth and fourth; 9:10, is the difference of a lesser third and fourth, or of a fifth and greater sixth; and 15:16, the difference of a greater third and fourth, or of a fifth and lesser sixth.

For the Use of **DEGREES**, in the construction of the scale of music. See **SCALE**.

DEGREE, in universities, denotes a quality conferred on the students or members thereof, as a testimony of their proficiency in the arts or faculties; and entitling them to certain privileges, precedencies, &c.

The *Degrees* are much the same in the several universities: but the laws thereof, and the discipline or exercise previous thereto differ.—The *Degrees* are *Bachelor*, *Master* and *Doctor*; instead of which last, in some foreign universities, they have *Licentiate*.

In each faculty there are but two *Degrees*, viz. *Bachelor* and *Doctor*, which were anciently called *Bachelor* and *Master*: nor do the arts admit of more than two, which still retain the denomination of the ancient *Degrees*, viz. *Bachelor* and *Master*. At Oxford, *Degrees* of master and doctor are only conferred once a year, viz. on the Monday after the seventh of July; when a solemn act is held for the purpose. See **ACT**.

The expenses of a *Degree* of doctor in any of the faculties, in treats and set fees, usually amount to 100*l*. and that of a master of arts, 20 or 30*l*.—There are made yearly about 150 doctors and masters.

The *Degree* of bachelor is only conferred in Lent; and there proceed usually about 200 yearly.

To take the *Degree* of bachelor in arts, four years are required, and three more for master of arts.

At Cambridge, matters are nearly on the same footing, only the discipline is somewhat more severe, and the exercises more difficult. The commencement which answers to the act of Oxford, is the Monday before the first Tuesday in July.—The *Degrees* of bachelor are taken up in Lent, beginning on Ash-Wednesday.

To the *Degree* of bachelor of arts, it is required, that the person have resided in the university near four years; and in his last year have kept philosophy acts, *i. e.* have defended three questions in natural philosophy, mathematics or ethics, and answered the objections of three several opponents at two several times; as also, that he have opposed three times. After which, being examined by the masters and fellows of the college, he is referred to seek his *Degree* in the schools, where he is to sit three days, and be examined by two masters of arts appointed for the purpose.

The *Degree* of master of arts is not given till above three years after that of bachelor; during which time, the candidate is obliged three several times to maintain two philosophical questions in the public schools, and to answer the objections raised against him by a master of arts.—He must also keep two acts in the bachelors school, and declaim one.

To pass bachelor of divinity, the candidate must have been seven years master of arts; he must have opposed a bachelor of divinity twice; kept one divinity act; and preached before the university, once in Latin, and once in English.

For the **DEGREE** of doctor. See the article **DOCTOR**.

DECIDE, **DECIDIA**, a term only used in speaking of the condemnation, and execution of the Saviour of the world, by Pontius Pilate, and the Jews; which was an horrible *Decide*.

The Jews, an ingenious author observes, were never more remote from idolatry than at present; never more inviolably attached to the law of Moses, than at present: whence then that load of evils and misfortunes they have for so many ages groaned under, evils incomparably greater and more lasting than all the chastisements wherewith God anciently avenged their most heinous idolatries? whence do they arise, but from the *Decide* they committed in the person of Jesus Christ?

DEJECTION, in medicine, properly signifies the act of ejecting, or evacuating the excrements, by means of the peristaltic motion of the guts.

In which sense it comes to the signification of *Excretion*.

DEJECTION is also, and that more ordinarily, applied to the excrements themselves, thus evacuated; in which sense it is of the same import with *Stool*.

Viscid, glutinous, or as some call them, *unguinous Dejections*, frequent in scorbutic diseases, indicate a colliquation of the solids of the body.

DEJECTION, in astrology, is applied to the planets, when in their detriment, *i. e.* when they have lost of their force, or influence, as is pretended by reason of their being in opposition to some others, which check, and counter-act them.

Or, it is used when a planet is in a sign opposite to that wherein it has its greatest effect, or influence, which is called its *exaltation*. Thus, the sign *Aries* being the exaltation of the sun, the sign *Libra* is its *Dejection*. See **EXALTATION**.

DEIFICATION, in the Pagan theology, the act, or ceremony of deifying their emperors, *i. e.* of placing them among the Gods, and decreeing divine honours to be rendered them. See **GOD** and **CONSECRATION**.

The *Deification* is the same with *Apotheosis*.

DEINCLINERS, or **DEINCLINING Dials**, are such as both decline and incline, or recline at the same time.

Suppose, for instance, a plane to cut the prime vertical circle at an angle of 30 degrees; and the horizontal plane under an angle of 24 degrees; the elevation of the pole being 52 degrees; a dial drawn on this plane, is called a *Deincliner*. See **DIAL**.

DEIPARA, **Θεογονος**. See **MOTHER** of God.

DEISM, the doctrine, or belief of those who hold the existence of a God, as the whole of their religion.

DEISTS, a sect, or class of people, known also under the denomination of *Free-thinkers*, whose distinguishing character it is, not to profess any particular form, or system of religion; but only to acknowledge the existence of a God, without rendering him any external worship or service.

The *Deists* hold, that considering the multiplicity of religions, the numerous pretences to revelation, and the precarious Arguments generally advanced in proof thereof: the best and surest way is, to return to the simplicity of nature, and the belief of one God, which is the only truth agreed to by all nations.

They complain that the freedom of thinking, and reasoning, is oppressed under the yoke of religion; and that the minds of men are ridden, and tyrannized by the necessity imposed on

them of believing inconceivable mysteries; and contend, that nothing should be required to be assented to, or believed, but what their reason clearly conceives.

The appellation *Deist* is also more particularly given to such as are not altogether without religion, but reject all revelation as an imposition, and believe no more than what natural light discovers to them; as that there is a God, a providence, a future state, with rewards and punishments for the good and the bad; that God must be honoured; and his will, so far as we can learn it, performed; but that each person is to do this after his own manner, and as his own conscience suggests.

The number of *Deists* is said to be daily increasing: in England, a great part of the men of speculation, and letters, are said to incline that way: and the like is observed in some of our neighbour nations, where freedom of speaking, writing, and thinking are indulged.

DEITY, *Godhead*; a common appellation given to God and also by the poets to the heathen Gods and Goddesses.

DEIVIRILE*, a term in the school-theology, signifying something divine and human at the same time. See **THEANDRIC**.

* The word is a compound of *Deus*, God, and *Virilis*, of *Vir*, Man.

DELEGATES, certain persons *delegated*, or appointed by the king's commission under the great seal, to sit upon an appeal to the king in the court of Chancery, in three cases: 1. Upon a sentence given in any ecclesiastical cause by the archbishop, or his official: 2. Upon a sentence given in an ecclesiastical cause in places exempt: 3. Upon a sentence given in the admiral court in suits civil, and marine, by order of the civil law.

Court of DELEGATES, is the highest court for civil affairs concerning the church; and for the jurisdiction whereof it was provided 25 H. 8. That it shall be lawful for the subject, in case of defect of justice in the ecclesiastical courts, to appeal to the sovereign in his court of Chancery; whence a commission is directed under the great seal to particular persons therein mentioned, for redress of judgment.

From the highest ecclesiastical court there lies no appeal, but to the court of *Delegates*, and beyond this to no other, except to the house of lords. But the king, of his free-will, may grant a commission of review under the great seal. The citations run all in the king's name.

DELEGATION, a commission extraordinary given a judge to take cognizance of, and determine, some cause which ordinarily does not come before him.

In the civil law, *Delegation* also denotes a sort of surrender, whereby a person substitutes another debtor in his place. See **ULPIAN** l. 11. ff. *de novationibus & delegationibus*.

This *Delegation* differs from transferring, or translation, in that three persons intervene in a *Delegation*, viz. the creditor, the debtor, and a third, who himself is indebted to the debtor, and on whom the debtor transfers the obligation he was under to pay the creditor, *delegating* him, as it were, for that purpose. But in a simple transfer, it is enough the transferrer and the transferee be present.

DELETERIOUS, (from *daucus*, *necce*, I hurt) a term sometimes used among naturalists for such things as are of a pernicious, and poisonous nature. See **POISON**.

DELF*, a quarry, or mine, where stone or coal is dug.

* From the Saxon word *Delfan*, to delve, or dig.

DELF of Coal, denotes coal lying in veins underground, before it is dug up.

DELF, or **DELVE of Coals**, is also a certain quantity dug out of a mine or pit. See **COAL**.

DELF, is also used in heraldry for one of the abatements of honour; being a square in the middle of the escutcheon.

A *Delf* tenne was antiently due to him that receded from his own challenge, or any way departed from his parole, or word. If there be two, or more *Delfs* in an escutcheon, it is then no longer an abatement: so also, if it be of metal, or charged upon; it then becomes a charge of perfect bearing.

DELIA, in antiquity, feasts celebrated by the Athenians, in honour of Apollo, surnamed *Delius*.

The principal ceremony in this feast, was an embassy, or rather a pilgrimage to Apollo of Delos, performed every five years, by a certain number of citizens deputed for that purpose, and called *Deliasæ*, *Δελιασαι*, or *Theori*, *Θεωροι*, *q. d.* the seers; and the first person of the embassy, or deputation, *Architheorus*, *Ἀρχιθεωρος*. To him were added four more of the family of the *Ceryci*, priests descended from Mercury, who resided all the year at Delos, to assist in the temple. The whole deputation set out in five vessels, carrying with them every thing necessary for the feast, and the sacrifices.

The vessels that carried the *Deliasæ*, or *Theori*, was called *Δελιας*, *Delias*; the four others were the *Paralis*, *Antigonis*, *Polemais*, and *Ammanis*. Though this is a circumstance there is some dispute about.

The *Deliasæ*, who went aboard, were crowned with laurel. At their arrival, they immediately offered a sacrifice to Apollo: and after the sacrifice, a number of young maids danced round the altar, a dance called in Greek *Ἰεγυρῶ*: wherein, by their various motions, and directions, they represented the turnings and windings of a labyrinth. When the *Deliasæ* returned to Athens, the people went out to meet them, and received them with all the joy and acclamation imaginable. They never laid aside their crown till their commission was fully completed; and then they consecrated it to some God in his temple.

The whole time of their going and returning, with all the ceremonies thereof, was called the *Delia*; during which time no criminal might be executed, which was a peculiar privilege of this feast, not allowed to any other, not even those of Jupiter. Thus, Plutarch observes, that it was a day consecrated to Jupiter, when Phocion was made to take the poison he was condemned to; whereas they waited thirty days to give it to Socrates, by reason of the *Delia*.

According to Thucydides, the *Delia* were first instituted in the sixth year of the Peloponnesian war, after the Athenians had expiated the isle of Delos, removed all the tombs out of it, and ordained, that no body should either be born, or die in it; but that all their sick people should be removed into a little Island, called *Rhenia*. Though the Ionians, and the neighbouring islands of Ionia, had long before that time held a sort of *Delia*, that is, feasts and games, like those which the Athenians celebrated afterwards.

DELIAC, **DELIACUS**, among the ancients, denoted a poulterer; or a Person who sold fowls, fatted capons, &c.

The traders in this way were called *Deliaci*, by reason it was the people of the isle of Delos who first bethought themselves thereof. They also sold eggs, as appears from Cicero in his academic questions, lib. IV.—Pliny lib X. c. 30. and Columella, lib. VIII. c. 8. likewise mention the *Deliaci*.

DELIACAL Problem, *Problema DELIACUM*, a famous problem among the ancients, concerning the duplication of the cube. See **DUPLICATION**.

DELIBERATIVE, is applied to that kind, or branch of rhetoric employed in proving a thing; or convincing an assembly thereof, in order to oblige them to put it in execution.

The *deliberative* kind was much in vogue among the Greeks and Romans, when the orators harangued the people.

To have a *deliberative voice* in an assembly, is when a person has a right to give his advice, and his vote therein. In councils, the bishops have *deliberative* voices; those beneath them have only consultative voices.

DELINEATING. See the article **DESIGNING**.

DELINQUENT, a person who has committed some fault or offence.

It is the business of a magistrate to be severe in punishing *Delinquents*.

DELIQUIM, or **DELIQUIM ANIMI**, a swooning, or fainting away; called also *Syncope*, *Lipathymia*, *Lipopsychia*, *Echysi*, and *Aphysia*. See **SYNCOPE**.

DELIQUIM, in chymistry, is the dissolution or melting of a salt, or calx, by suspending it in a moist cellar. Salt of Tartar, or any fixed alkali, set in a cellar, or other cool moist place, and in an open vessel, resolves, or runs into a kind of Liquor, called by the chymists oil of Tartar *per Deliquim*.

DELIQUIM, is also used in some authors for a distillation by means of fire. See **DISTILLATION**.

DELIRIUM*, *Lightheadedness*, in medicine, a symptom frequent in fevers caused by internal inflammations, wounds, &c, whereby the mind is disordered to a degree of folly, or even phrenzy.

* Some derive the word from *De*, and *Lira*, which among the ancients signified a furrow drawn in a right line; whence *delirare*, a recto aberrare.

Deliriums also frequently arise from immoderate losses of blood, whereby the brain is too much weakened; from the stings of venomous beasts; from the seed, or menses being retained in the womb; from the rotting of a gangrened member, &c.

A disorder in the diaphragm commonly produces a *Delirium*. There are various species and degrees of *Deliriums*. In some the patient is fierce and outrageous; in others, more mild and easy, offering no violence to any body, but only indulging idle, ridiculous discourses; some laugh and sing; others cry and are fallen, &c.

DELIVERY, *Parturition*, or *child-birth*, the bringing forth of a perfect fetus, or child out of its mother's womb; whether it be living or dead. See **FOETUS**, **BIRTH**, &c.

To a *natural delivery*, according to the physicians, are required three conditions: First, that both the mother and the child strive alike, the one to *deliver*, and the other to be *delivered*: The second, that it come into the world head-formost, which is its natural posture: And the third, that it be quick and easy, without ill accidents.

When the child presents its feet foremost, or comes a-crofs or double, it is no natural *Delivry*; and the Latins call such children *Agrippæ*, q. d. *ægræ partii*.

A *legitimate Delivry*, is that which happens at the just term, *i. e.* in the 10th lunar month. And an *illegitimate*, that which comes either sooner, or later as in the 8th, or after the tenth. Women are indeed *delivered* at 7, 8, 9, 10, and 11 months, and not later. Though there are some physicians who hold, that a *Delivry* may be regular in the 14th month.

It has been observed that *Deliveries* are more happy in the 7th month, than in the 8th, *i. e.* that the child is easier faved, and more frequently lives, when it comes in the 7th, than when in the 8th month.

Monf. Peyssonel, a Physician of Lyons, has a Latin treatise expressly on the term of *Delivry*; wherein he undertakes to reconcile all the apparent contradictions of Hippocrates, with respect thereto. He holds, that the shortest term of a *legitimate* birth, according to Hippocrates, is 182 days, or six complet months; and the longest 280 days, or nine months and 10 days; and that the children who come earlier or later than those terms, do not live, or are not *legitimate*.

Bartholine has composed a book, *de inflatibus partus Viis*, on the extraordinary passages of the fetus; where he gives diverse instances of very extraordinary *Deliveries*. Some have been delivered by the navel, and others by the anus. See Salmuth, *Obs. 94. Cent. 3. Phil. Transf. N° 416. p. 435.*

In the year 1686, at Leckerkerck, 8 or 10 leagues from the Hague, the wife of one Christian Claes was *delivered* of five children. The first was a boy, who lived two months; 17 hours afterwards came a second son, who was dead; 24 hours afterwards a third son was born, who lived about two hours; in 24 hours more she had a fourth, dead. Lastly, she died in bringing forth the fifth, who died also in the birth.

DELPHINUS, the DOLPHIN, in astronomy, a constellation of the northern hemisphere; whose stars, according to Ptolemy, are 10; according to Tycho as many; and according to Mr. Flamsteed 18. The Longitudes, Latitudes, Magnitudes, &c. whereof are as follow.

Names and Situations of the Stars.	Sig.	Longit.	Latitude North.	Magnit.
		° ' "	° ' "	
First of three in the Tail.	♈	8 49 50	28 54 38	6
Betw. the Tail and the prec. Rho.		9 44 27	29 06 21	3
That immediat. preced. the Tail.		10 30 06	30 42 05	6
North of the follow. in the Tail		11 27 04	32 10 27	5
		11 00 18	28 51 03	3
5				
Preced. South in the Rhombus.		12 01 14	31 56 52	3
South of the follow. in the Tail.		10 54 06	27 31 40	6
Betw. the Tail and the hind Rho.		51 54 05	30 38 14	6
North of preced. in the Rhomb.		13 03 24	33 02 58	3
		13 02 25	31 39 48	7
10				
South in the hind Rhombus.		13 48 07	31 58 12	3 4
North of the following.		15 03 41	33 44 32	5
		11 54 12	23 00 05	5
Informes following the <i>Dolphin</i> (towards <i>Equales</i> .)		13 00 33	24 37 30	6
		14 28 25	29 07 05	6
15				
		16 07 40	28 40 19	6
		16 31 05	29 46 35	6
		16 15 57	26 48 35	6

DELTOIDES, in anatomy, a triangular muscle of the shoulder; thus called from the Greek *Delta*, Δ, and εδϞ, *Form.*—See *Tab. Anat. (Myol.) fig. 1. n. 21. fig. 6. n. 10.* It arises, exactly opposite to the trapezius, from one third part of the clavícula, from the acromium, and spine of the scapula, and is inserted tendinous into the middle of the os humeri, which bone it lifts up directly; and it assists with the supra-spinatus, and coracobrachialis, in all the actions of the humerus, except the depression; it being convenient that the arm should be raised, and sustained, in order to its moving on any side.

DELUGE, DILUVIUM, in natural history, a flood, or inundation of water covering the earth, either in the whole, or in part.

We meet with diverse accounts of *Deluges* in ancient history, both sacred and profane: that which happened in Greece, in the time of Deucalion, called *Diluvium Deucalionium*, is famous. This *Deluge* only overflowed Thessaly; its date is fixed to the year before Christ 1529, being the third year before the Israelites coming out of Egypt, according to the computation of Petavius, *Rat. Temp. P. I. Ll. C. 7.*

The *Deluge* of Ogyges happened near 300 years before that of Deucalion, 1020 years before the first Olympiad, and 1796 before Jesus Christ, according to the same author, *Rat. Temp. P. I. L. I. C. 4. P. II. L. II. C. 5.* This only ravaged Attica.

These two *Deluges* are frequently mentioned in ancient Greek authors, under the denomination of *Cataclysmus prior*, and *posterior*.

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Of the like kind were those inundations in the Netherlands, which in 1727 overwhelmed and covered with sea all that part now called the Gulph Dollart in the United Netherlands; and in 1421, all that part between Brabant and Holland.

But the most memorable *Deluge* is that which we particularly, by way of eminence, call the *Deluge*, or the *Universal Deluge*, or *Noah's Flood*; being a general inundation sent by God, to punish the corruption of the then world, by destroying every living thing (Noah, and his family, and what was shut up with him in the ark, only excepted) from off the face of the earth.

This flood makes one of the most considerable events in all history; and one of the greatest epochs in chronology: its history is given us by Moses, Gen. C. VI. and VII. Its time is fixed by the best chronologers to the year from the creation 1656, answering to the year before Christ 2293—From this flood, the state of the world is divided into *Diluvian*, and *Antediluvian*.

The *Deluge* has been, and remains a mighty subject of inquiry and dispute among naturalists, critics, &c. The points chiefly controverted, may be reduced to three: First, its extent, *viz.* whether it were *general*, or *partial*. Secondly, its natural cause. And thirdly, its effects.

I. The immense quantity of water requisite to furnish an universal *Deluge*, has occasioned several authors to suspect it only partial. An universal *Deluge*, they think, had been unnecessary, considering the end for which it was brought, *viz.* to extirpate the wicked inhabitants. The world was then but new, and the people not very many; the holy scriptures only making eight generations from Adam to Noah. It was but a small part of the earth that could be yet inhabited: the country about the Euphrates, which is supposed to have been the scene of the first antediluvian inhabitants, was sufficient to bear them all. Now Providence, say they, which ever acts wisely, and frugally, would never have disproportioned the means to the end so far as to overflow the whole globe, only to drown a little corner of it. They add, that, in the scripture language, the *whole earth* expresses no more than *all the inhabitants*. And on this principle advance, that an overflowing of the Euphrates and Tigris with a vehement rain, &c. might answer all the phenomena of the *Deluge*.

But the *Deluge* was universal. God declared to Noah, Gen. VI. 17. that he was resolved to destroy every thing that had breath under heaven, or had life on the earth, by a flood of waters. Such was the menace: such the execution. The waters, Moses assures us, covered the whole earth, buried all the mountains, and were no less than 15 cubits above the highest of them: every thing perished therein, birds, beasts, men, and all that had life, excepting Noah, and those with him in the ark, Gen. VI. 19. Can an universal *Deluge* be more clearly expressed? If the *Deluge* had only been partial, there had been no necessity to spend 100 years in the building of an ark, and shutting up all the sorts of animals therein, in order to re-stock the world; they had been easily and readily brought from those parts of the world not overflowed, into those that were. At least, all the birds would never have been destroyed, as Moses says they were, so long as they had wings to bear them to those parts where the flood did not reach. If the waters had only overflowed the neighbourhood of the Euphrates and Tigris, they could not be fifteen cubits above the highest mountains; there was no rising to that height, but they must spread themselves, by the laws of gravity, over the rest of the earth: unless, perhaps, they had been retained there by a miracle; and in that case, Moses, no doubt, would have related the miracle, as he did that of the waters of the Red-Sea, and the river Jordan, which were sustained in a heap, to give passage to the Israelites, Exod. XIV. 22. and Josh. III. 16. Add, that in regions far remote from the Euphrates and Tigris, *viz.* in Italy, France, Switzerland, Germany, England, &c. there are frequently found in places many scores of leagues from any sea, and even in the tops of high mountains, whole trees sunk deep under ground, as also teeth, and bones of animals, fishes entire, shells, ears of corn, &c. petrified; which the best naturalists are agreed, could never have come there but by the *Deluge*.

II. The *Deluge* allowed universal, the philosophers are solicitous to find water to effect it.

Moses brings it from two fountains: *The fountains of the great deep were broken up; and the windows of heaven were opened.* Dr. Burnet, in his *Telluris Theoria Sacra*, shews, that all the waters in the ocean were not near enough to cover the earth 15 cubits above the tops of the highest mountains. According to his computation, no less than 8 oceans were required. Supposing the sea, therefore, drained quite dry, and all the clouds of the atmosphere dissolved into rain, we should still want much the greatest part of the water of a *Deluge*.

To get clear of this embarrass, many of our best naturalists, as Seno, Burnet, Woodward, Scheuchzer, &c. adopt des Cartes's system of the formation of the earth. That philosopher

pher will have the primitive world to have been perfectly round and equal, without mountains, or vales; and accounts for its formation on mechanical principles, by supposing it at first in the condition of a thick turbid fluid, replete with diverse heterogeneous matters, which subsiding by slow degrees, formed themselves into different concentric strata, or beds, by the laws of gravity: and thus, at length, left a dry, solid earth. Dr. Burnet improves on this theory: he supposes the primitive earth to have been no more than an orbicular crust, in-velling the face of the abyfs, or deep, which grew chinky, clave, burst, and fell down into the water, and so drowned its inhabitants.

The same theorist adds, that by this catastrophe, the globe of earth was not only shook, and broke in a thousand places, but the violence of the shock it then underwent shifted its situation; so that the earth, which before was placed directly under the Zodiac, became thenceforth oblique to the same. Whence arose the difference of seasons, which the antediluvian earth was not exposed to.

But how all this conflicts with the sacred text above cited, which expressly mentions mountains as the standard of the height of the water; or, with that other passage, Gen. VIII. 22. where God, promising not to bring any more Deluges, but that every thing should be restored on its ancient footing, says, that *seed-time and harvest, and cold and heat, and summer and winter, and day and night shall cease no more*; we do not see.

Other authors, supposing a sufficient fund of water in the abyfs, or sea, are only concerned for an expedient to bring it forth: accordingly, some have recourse to a shifting of the earth's centre, which, drawing after it the water out of its channel, overwhelmed the several parts of the earth successively.

The inquisitive Mr. Whiston, in his *New Theory of the Earth*, has a very ingenious hypothesis, and that perfectly new. He shews, from several remarkable co-incidences, that a comet descending in the plane of the ecliptic towards its perihelion, passed just before the earth on the first day of the deluge; the consequences whereof would be, first, that this comet, when it came below the moon, would raise a prodigious, vast and strong tide, both in the small seas, which according to his hypothesis were in the antediluvian earth, for he allows no great ocean there, as in ours; and also in the abyfs, which was under the upper crust of the earth. And that this tide would rise, and increase all the time of the approach of the comet towards the earth; and would be at its greatest height when the comet was at its least distance from it. By the force of which tide, as also by the attraction of the comet, he judges, that the abyfs must put on an elliptic figure, whose surface being considerably larger than the former spherical one; the outward crust of the earth, incumbent on the abyfs, must accommodate it self to that figure, which it could not do while it held solid, and conjoined together. He concludes, therefore, that it must of necessity be extended, and at last broke by the violence of the said tides, and attraction; out of which, the included water issuing, was a great means of the deluge; this answering to what Moses speaks of the *fountains of the great deep being broke open*.

Again, the same comet, he shews, in its descent towards the sun, must have passed so close by the body of the earth, as to involve it in its atmosphere, and tail, for a considerable time; and of consequence, it must have left a vast quantity of its vapours, both expanded and condensed, on its surface; a great part of which being afterwards rarefied by the solar heat, would be drawn up again into the atmosphere, and afterwards return again in violent rains; and this he takes to be what Moses intimates by the *windows of heaven being opened*; and particularly by the *forty days rain*. For as to the following rain, which with this made the whole time of raining 150 days; Mr. Whiston attributes it to the earth coming a second time within the atmosphere of the comet, as the comet was on its return from the sun. Lastly, to remove this vast orb of waters again, he supposes a mighty wind to have arose, which dried up some, and forced the rest into the abyfs again through the clefts by which it came up: only a good quantity remained in the alveus of the great ocean, now first made, and in lesser seas, lakes, &c.

To the credit of this theory, it must be observed, that it was at first only proposed hypothetically: that is, the author only supposed such a comet, merely as it would account well, and philosophically for the phenomena of the deluge: without any assurance, that there really was any comet so near the earth at that time; and the hypothesis pleased even under such circumstances: but, upon further consideration, he has since, he thinks, proved, that there actually was a comet near the earth at that time, viz. the same great comet which appeared again in 1688. The author no longer, therefore, looks upon it as an hypothesis, but has republished it in a particular tract, entitled, *The Cause of the Deluge demonstrated*.

III. But the great difficulty is yet behind. The orderly strata, or layers of the earth, with the exuvie, or remains of fishes, as their teeth, bones, shells, &c. both marine, and

fluviatile, found in the bodies even of the most solid strata, and in flints, marbles, &c. are not yet dispatched. Those who adhere to Des Cartes's system, as Steno, &c. take the finding of the parts of terrestrial, and aquatic animals, branches of trees, leaves, &c. in the beds, or strata of stone to be a direct proof of the primitive fluidity of the earth. But then they are obliged to have recourse to a second formation of strata, much later than the first; by reason at the time of the first there was neither plant, nor animal in being. Steno, therefore, holds for second formations occasioned at different times by extraordinary inundations, earthquakes, volcano's, &c. — But Burnet, Woodward, Scheuchzer, &c. chuse rather to attribute a second general formation to the *Deluge*: without excluding, however, the particular ones of Steno. But the great objection against this system of fluidity, is mountains; for the whole globe being liquid, whence should such inequalities arise? Mr. Scheuchzer, rather than part with a system which looks so promising, gives into the opinion of those who hold, that after the *Deluge*, God, to remit the waters into their subterranean reservoirs, broke, and displaced, with his own almighty hand, a great number of strata, that were before horizontal, and raised them above the surface of the earth; whence it is, that the strata in mountains, though concentrical, are never horizontal.

Dr. Woodward, taking the several strata for the sediments of a *Deluge*; and considering the circumstances of those shells, fossils, and other exuvie found in them, draws several inferences, which very much illustrate the effects of the *Deluge*. As first, that these marine bodies, and other spoils of salt water fishes, were born forth of the sea, by the universal *Deluge*; and on the return of the water back again, were left behind at land. Secondly, that while the flood covered the globe, all the solid matters, as stones, metals, minerals, and fossils, were totally dissolved, and the cohesion of their corpuscles, destroyed; and that these corpuscles, with those of the less solid bodies, as earth, flesh of animals, and vegetables, were sustained promiscuously in the water, and made one common mass. Thirdly, that all the mass thus sustained, was at length precipitated to the bottom; and that, according to the laws of gravity, the heaviest settling first, and the rest in order. And that the matters thus subsiding, constituted the several strata of stone, earth, coal, &c. Fourthly, That these strata were originally all parallel, even, and regular, and rendered the surface of the earth perfectly spherical; and that the whole mass of water lay upon them, and constituted a fluid sphere encompassing the globe. Fifthly, that after some time, by the force of an agent seated within the earth, these strata were broken on all sides the globe, and their situation varied; being elevated in some places, and depressed in others; whence mountains, valleys, grotto's, &c. with the channel of the sea, islands, &c. In one word, the whole terraqueous globe was put, by this disruption, and dislocation of the strata, into the condition we now behold it in. Sixthly, that upon the disruption of the strata, and the depression of some, and elevation of other parts, which happened towards the end of the *Deluge*; the mass of water fell back again into the depressed, and lowest parts of the earth, into lakes, and other cavities, and the channel of the ocean; and through the fissures, whereby this communicates with the abyfs, which it filled till it came to an equilibrium with the ocean. *Nat. Hist. of Earth. P. I. and II.*

But of all the systems yet advanced, there seems none better calculated to solve the phenomena of those petrified exuvie, than that of Mr. de la Prynne. The antediluvian world, according to this author, had an external sea, as well as land, with mountains, rivers, &c. and the *Deluge* was affected by breaking the subterraneous caverns, and pillars thereof, with dreadful earthquakes, and causing the same to be for the most part, if not wholly, absorbed and swallowed up, and covered by the seas that we now have. Lastly, this earth of ours arose out of the bottom of the antediluvian sea; and in its room, just as many islands are swallowed down, and others thrust up in their stead.

From this system, which is very agreeable to scripture, the great difficulties that clog all the other systems, seem easily solved. It is no longer a wonder, that shells, and shell-fish, and the bones of fishes, and four-footed creatures, with fruits, &c. should be found in beds, and quarries, in mountains, and valleys, and the very bowels of the earth: for here they bred in the antediluvian sea; thither they were elevated with the hills and mountains, in the time of the *Deluge*; and there they fell into, were absorbed, and buried in chafms, and holes, and clefts, that would necessarily happen in the extrusion of the earth. *Phil. Transact. N^o 266.*

DEMAIN, or DEMESNE, in its popular sense, denotes the lord's manour place, with the lands thereto belonging; which he, and his ancestors have from time to time kept in their own manual occupation. See MANOUR.

DEMAIN, or DEMESNE, in a law-sense, signifies, according to Hottoman, *patrimonium domini*, the lord's patrimony; called also *Demain*, and by the Civilians, *Dominicum*. See DOMAIN.

The same author proveth those lands to be *Demain*, which a man holdeth originally of himself; and those to be *Feodum*, which he holdeth of a superior lord.

In England, no common person has any *Demain*, simply understood; for all depends either mediately, or immediately on the crown. When a man, therefore, in pleading, would signify his land to be his own, he saith, that he is, or was seized thereof in his *Demain*, as of fee; whereby he means, that although his land be to him and his heirs for ever, yet it is no true *Demain*, but depends upon a superior lord, and he holdeth by service, or rent, in lieu of service, or by both service and rent.

DEMAIN is sometimes also taken, more largely, for lands and tenements, held for life, &c. and sometimes more strictly, for such only as are generally held in fee.

DEMAIN is sometimes again used for a distinction of those lands that the lord of a manour has in his own hands, or in the hands of his lessee, demised upon a rent, for term of years, or life; and such other lands, pertaining to the said manour, which belong to the free, or copy-holders.

The reason why the copy-hold is accounted *Demain*, is, because they, who are tenants to it, are judged in law to have no other right but at the will of the lord; so that it is reputed still, after a fort, to be in the lord's hands: and yet in common speech that is ordinarily called *Demain*, that is, neither free, nor copy free.

DEMAIN, again, is used in a more special signification, in opposition to *Frank-Fee*.

Thus, those lands, which were in the possession of Edward the confessor, are called, *ancient Demain*; and all others are called, *Frank-fee*: and the tenants who hold any of those former lands, are called, *tenants in ancient Demain*; and the others, *tenants in Frank-fee*, and also, *tenants at common law*. The reason is, because tenants in *ancient Demain* cannot be sued out of the lord's court.

DEMAND, in its popular sense, denotes a calling for, or requiring one's due.

DEMAND, in law, has a more special signification, as contradistinguished from *Plaint*: for all civil actions are pursued, either by *Demands* or *Plaints*; according to which the pursuer is called either *Demandant* or *Plaintiff*; viz. in real actions, *Demandant*, and in personal actions, *Plaintiff*.

Where the party pursuing is called *Demandant*, the party pursued is called *Tenant*; and where *Plaintiff*, *Defendant*.

There are two kinds of *Demands*: the one in *Deed, de Facto*, as in every precipice; the other in *Law, de Jure*; such is entry in land, distress for rent, &c.

If a man release another from all *Demands*, it is the best release the releasee can have, and shall redound most to his advantage. A release of facts is more large than of quarrels or actions; and a release of *Demands* more large and beneficial than either: by a release of all *Demands* to the disseisor, the right of entry into the land, and all contained therein, is released; and he that releaseth all *Demands*, excludes himself from all actions, entries, and seizures. But it is no bar to a writ of error to release an outlawry.

DEMANDANT, *Petens*, he who is actor, or plaintiff in a real action; thus called, because he demands lands, &c.

DEMARCHEUS, in antiquity, the chief of a region, or district in the country of Attica.

The Athenians divided their country into certain regions or districts, which they called *Δημοί*, i. e. people; and established a magistrate at the head of each, under the denomination of *Δημαρχος*, *Demarchos*, of *δημος*, and *αρχη*, rule, government.

DEMEMBRE, in heraldry, is when an animal is *dismembered*, i. e. the limbs cut off its body.

DEMESNE. See **DEMAIN**.

DEMI, a word of the same use and effect in the French language, with *Semi*, in the Latin and English; being formed from *dimidium*; and used in composition with other words, to signify *half*.

In words borrowed from the Latins, we use *Semi*; and in those from the French, we retain their *Demi*. See **SEMI**.

DEMI, or **DEMY**, in heraldry, signifies the *half* of a thing; as, a *Demy-Lion*, &c.

Colombiere has what he calls *Croix & demy*, a cross and an half; being a shaft crossed in the upper part like the Calvary cross, and having but one arm at the lower part.

DEMI-AIR, or **DEMI-VOLT**, in horsemanship, is one of the seven artificial motions of an horse; being an air, in which his fore-parts are more raised than in *Terra a Terra*: but the motion of the horse's legs is more quick in the latter than in the *Demy-Volt*.

DEMI-BASTION, is a kind of fortification, that has only one face, and one flank. See **BASTION**.

DEMI-CANNON, a piece of ordnance, usually about 6 inches bore, 5400 pound weight, 10 or 11 feet long, and carrying a shot of 30 or 32 pound weight.

It carries point blank 150 paces; its charge of powder is 14 pound weight.

There are also two sizes of *Demi-Cannon* above this, which are

something larger: as, the *ordinary Demi-Cannons*, which is 6 inches bore, 12 feet long, weighs 5600 pound; its charge of powder 17 pound 8 ounces, carries a shot 6 inches and a half diameter, and whose weight is 32 pound: this piece shoots blank 162 paces.

Demi Cannon of the largest size, is 6 inches $\frac{1}{2}$ bore, 12 feet long, 6000 pound weight; its charge is 18 pound of powder, and it carries 180 paces.

DEMI-CULVERING, is a piece of ordnance commonly 4 $\frac{1}{2}$ inches bore, 10 feet long, 2700 pound weight; its charge is 7 pound 4 ounces of powder; and it carries a shot of 10 pound 11 ounces; and shoots point blank 175 paces.

Demi-Culvering of the least size, is 4 $\frac{1}{4}$ inches bore, 10 feet long, 2000 pound weight; it carries a ball of 4 inches diameter, its charge is 6 pound 4 ounces of powder, and its level range is 174 paces.

Demi-Culvering of the largest sort, is 4 inches $\frac{1}{4}$ bore, 10 feet long; its charge of powder is 8 pound and 8 ounces; the ball is 4 $\frac{1}{2}$ inches diameter, weighs 12 pound 11 ounces; and the point blank shoot 178 paces. See **ORDNANCE**.

DEMI-GOD, &c. See the articles **GOD**, **HERO**, &c.

DEMI-GORGE, in fortification, is half the gorge, or entrance into the bastion; not taken directly from angle to angle, where the bastion joins to the curtain; but from the angle of the flank to the centre of the bastion or the angle the two curtains would make, were they thus produced to meet in the bastion.

DEMI-LUNE, *Half-Moon*, in fortification, an outwork, as **EFGHK** (*Tab. Fortif. fig. 3.*) consisting of two faces, and two little flanks; frequently built before the angle of a bastion, and sometimes also before the curtain, though now much disused. The gorge terminates in a crescent or half-moon, whence the denomination *Demi-Lune*.

DEMI-QUAVER, is a note in musick, two of which are equal to the quaver.

DEMISE, in law, is applied to an estate either in fee-simple, fee-tail, or for term of life; and so it is commonly taken in many writs.

The king's death is, in law, termed, *The Demise* of the king.

DEMOCRACY, a form of government, wherein the sovereignty, or supreme authority, is lodged in the people, who exercise the same by persons of their own order, deputed for that purpose.

* The word is formed of the Greek *δημος*, people, and *κρατειν*, to command, govern.

The most flourishing *Democracies* were those of Rome and Athens; the modern republics, as Venice, and the United Provinces, are rather Aristocracies than *Democracies*. The government of Basil, however, is a *Democracy*, and so are some of the free cities in Germany. See **REPUBLIC**.

DEMONSTRABLE, a term used in the schools, to signify somewhat that may be clearly and evidently proved.

It is *demonstrable*, that the side of a square is incommensurable with the diagonal. The problem of the motion, or rest of the earth, is not *demonstrable*; by reason the same appearances result from either supposition.

DEMONSTRATION, in logic, a syllogism in form, containing a clear and invincible proof of the truth of a proposition.

A *Demonstration* is a convincing argument, the two first propositions whereof are certain, clear, and evident; and whence of necessity arises an infallible conclusion.

A *Demonstration* usually consists of three parts: Explication, Preparation, and Conclusion.

The *Explication* is the laying down the things supposed to be given or granted; from which the *Demonstration* is to be made.

The *Preparation* is something to be previously done, according to the nature of the *Demonstration* intended.

The *Conclusion* is a proposition that concludes the thing to be *demonstrated*, fully persuading, and convincing the mind.

The method of *demonstrating* things in mathematics, is the same with that of drawing conclusions from principles in logics.

In effect, the *Demonstrations* of mathematicians, are no other than series's of enthymemes; every thing is concluded by force of syllogism, only omitting the premises, which either occur of their own accord, or are recollectied by means of quotations. To have the *Demonstration* perfect, the premises of the syllogisms should be proved by new syllogisms, till at length you arrive at a syllogism, wherein the premises are either definitions, or identic propositions.

Indeed it might be *demonstrated*, that there cannot be a genuine *Demonstration*, i. e. such a one as shall give full conviction, unless the thoughts be directed therein according to the rules of syllogism. Clavius, it is known to every body, resolved the *Demonstration* of the first proposition of Euclid into syllogism: Herlinus, and Dalsipodius, *demonstrated* the whole six first books of Euclid, and Henischius, all arithmetic, in the syllogistic form.

Yet people, and even mathematicians, usually imagine, that mathematical *Demonstrations* are conducted in a manner far remote

note from the laws of fyllogifm; fo far are they from allowing, that thofe derive all their force and conviction from thefe. But we have men of the firft rank on our fide the queftion. M. Leibnitz, for inftance, declares that *Demonftration* to be firm and valid, which is in the form prefcribed by logic. And Dr. Wallis confeffes, that what is propofed to be proved in mathematics, is deduced by means of one or more fyllogifms. The great Huygens too obferves, that paralogifms frequently happen in mathematics, through want of obferving the fyllogiftic form. See SYLLOGISM.

Problems confift of three parts: a *Propofition*, *Refolution*, and *Demonftration*.

In the Propofition is indicated the thing to be done.

In the *Refolution*, the feveral fteps are orderly rehearfed, whereby the thing propofed is performed.

Laftly, in the *Demonftration* it is fhewed, that the things enjoined by the refolution being done, that which was required in the propofition is effected. As often, therefore, as a problem is to be *demonftrated*, it is converted into a theorem; the refolution being the hypothefis, and the propofition the thefis: for the general tenor of all problems to be *demonftrated* is this, that the thing prefcribed in the refolution being performed, the thing required is done.

The fchool-men make two kinds of *Demonftration*: the one *Directa*, or, *prefter quod*; wherein an effect is proved by the next caufe: as when it is proved, that the moon is eclipsed, by reafon the earth is then between the fun and moon.—The fecond *Indirecta*, or, *quia*; wherein the caufe is proved from a remote effect: as when it is proved, that fire is hot, becaufe it burns; or that plants do not breathe, becaufe they are not animals.

Affirmative DEMONSTRATION, is that, which proceeding by affirmative and evident propofitions, dependent on each other, ends in the thing to be *demonftrated*.

Apagogical DEMONSTRATION, which does not prove the thing directly; but fhews the impoffibility and abfurdity which arifes from denying it.—Hence it is alfo called *reductio ad impoffibile*, *ad abfurdum*, from *απο*, from; and *αγω*, to carry.

Geometrical DEMONSTRATION, is that, framed of reasonings drawn from the clements of Euclid.

Mechanical DEMONSTRATION, is that, the reasonings whereof are drawn from the rules of mechanics.

DEMONSTRATION Apriori, is that, whereby an effect is proved from a caufe, either a next, or remote one; or a conclufion proved by fomething previous, whether it be a caufe, or only an antecedent.

DEMONSTRATION Apfteriori, is that, whereby either a caufe is proved from an effect; or a conclufion is proved by fomething pofterior, whether it be an effect, or only a confequent.

DEMONSTRATIVE, in rhetoric, one of the genera, or kinds of eloquence; being that which obtains in the compofing of panegyrics, invectives, &c.

Rhetoric is divided into three kinds; deliberative, *Demonftrative*, and judiciary. See RHETORIC.

DEMONSTRATIVE, in grammar, is applied to pronouns which ferve to fhew, point out, or indicate a thing; as, *This here*, *That there*, *Thofe yonder*, &c.

DEMURRAGE, in traffick, an allowance made to the mafter of a fhip, by the merchants, for ftaying in a port longer than the time firft appointed for his departure.

DEMURRER, in law, a kind of paufe, or ftop, put to the proceeding of any action, upon fome difficult point, which muft be determined by the court, before any further progrefs can be had therein.

In every action, the controversy is either as to fact, or as to law: the firft, decided by the jury; the fecond, by the judge. Now if any thing turn up in the caufe fo rare and difficult, that the judge cannot pronounce upon it; a *Demurrer*, or ftop is made, and a time taken, either for the court to confider and agree of it among themfelves; or otherwife for the judges, to meet in the Exchequer-Chamber, there, after hearing council on both fides, to determine what is law.—This *Demurrer* is expreffed in our records by, *Moratur in lege*.

In common law, the defendant fometimes *demurreth* to the plaintiff's count or declaration; and fometimes the plaintiff *demurreth* to the defendant's plea, by averring, that it is not a fufficient plea in law, &c.

In chancery, the defendant *demurreth* to the plaintiff's bill, averring it to be defective in fuch and fuch a point; and demands the judgment of the court thereupon, whether he fhall not be compelled to make any farther or other answer thereunto.

DENARIATUS Terræ *, in ancient law-books, as much land as is worth a penny by the year. See FARDING-deal.

* *Sibylla Bartholot tenet unam Acram, & 5 Denariatos Terræ in eodem Tenemento.* Du Cang.

DENARIUS in antiquity, the Roman penny; a filver coin equivalent to, from fix to feven-pence three farthings fterling. See COIN.

The Romans having for a long time ufed hras money, which they call *As*, quafi *Æs*; or *Libra* and *Pondus*, becaufe it was a

pound weight, began in the year of Rome 485 to coin filver; and coined firft the *Denarius*, which was marked with the letter X, becaufe it was worth ten affes, and divided into two quinarij, marked with V, which were fubdivided into two Seftertia, marked with thefe three letters, IIS.

The firft, or *confular Denarius*, was worth more than the after, or *imperial*. The firft weighed a juft drachm, or a 7th part of an ounce, and was worth about feven-pence three-fourths of our money. The fecond was only the 8th part of an ounce, and worth about fix-pence half-penny.

M. Tillemont obferves, that the *Denarius* was held fufficient to keep a perfon handfomely for a day; and upon the whole feems to intimate, that it was equal to twelve French fous, or eleven Englifh pence. But this is to over-rate it.

The impreffion on the firft *Denarius* was on one fide the winged head of Rome; and on the other a biga or quadriga. Whence the *Denarii* were denominated *Bigati*, and *Quadrigati*. Afterwards the reverse was a Caftor and Pollux, and fometimes a victory, driving a chariot with two, or four horfes.

DENARIUS * is alfo ufed in our law-books for an Englifh penny.

* *Denarius Angliæ qui nominatur fterlingus, rotundus fine toulura, ponderabit 32 grana fragmenti in medio fptica; & 20 Denarii faciunt unciam; & 12 uncie faciunt librari.* Stat. Edu. I. de Menfuris.

DENARIUS Dei *, denotes *Earnest-Money*; called alfo *Argentum Dei*, by the French *Deniers de Dieu*, and in fome parts of our country *Arles*.

* *Ita quod nuper mercatorum ab illo contractu poffit difcedere, vel refilire poffquam Denarius Dei inter perfonas contrahentes datus fuerit & receptus.* Charta Edwardi I.

DENATES, in antiquity, domeftic gods, more frequently called *Penates*. See PENATES.

Dionyfius Halicarnaffeus, Lib I. fpeaking of the Di Penates, tells us, that the hiftorian Timæus has wrote, that the figure, ftatue, or effigy of the *Denates*, or *Penates*, was nothing but a crooked iron, or copper rod, and a trojan vefel of potters ware: and that this was all *Aeneas* brought from Troy. But, for himfelf, he affures us, he had feen a temple at Rome, near the forum, where thofe gods were reprefented fitting, under the form of two young men, having each of them a dart in his hand: he adds, that the infcription was *DENATES*, for that the ancients, before the invention of the letter P, ufed a D inftead thereof: but Dionyfius might be miftaken: for the bottom of the P is frequently fo very fmall on medals, that there is no fenfible difference between a P and a D; which might be the caufe in the infcription that author mentions; for that the ancient inhabitants of Italy had no P, is a miftake fufficiently refuted by many proper names ftill remaining of the moft early ages, e. gr. Capys, Capetus, Picus, Pallas. Nor were the Trojans without the fame, witnefs Palinurus, Paris, Priamus, &c.

DENCHE', *DENCHEA*, or *ENDENCHE'*, in heraldry. See DANCHE'.

DENDRITIS, in natural hiftory, a fort of ftone, whereon are feen trees, flurks, and other ruffic figures, reprefented in miniature, in blackifh, or yellowifh figures.

Some rank the *Dendritis* in the clafs of Entrochi, which they wrongly call ftone-plants: but againft this it is urged, firft, that the branches of trees, &c. reprefented on the *Dendritis*, are never confounded together, nor fhoot acrofs each other, as thofe of Entrochi are ufually found to do.

Secondly, That the fire ftrips the *Dendritis* of all its figures, without deftroying the ftone, or reducing it to afhes; which does not hold of any Entrochus.

From hence it appears, that the figures of the *Dendritis* are accidental, and the effect of a colour applied on the ftone not artificially, but by nature. Two polished marbles being applied on each other with oil between; upon parting them again, the oil running into certain tracks, its impreffion exhibits divers figures like thofe on the *Dendritis*; the ramification always beginning on the fide on which the marbles are begun to be feperated. So that it appears, the figures of the *Dendritis* are formed by fome bituminous liquor infinuating between the beds, or frata of the ftones; and accordingly, we actually find, that the *Dendritis* being expofed to the fire, yields a bituminous fmell. This fame liquor fometimes alfo ouzes out of the ftone it felf, filtrating through its pores; it being, in all probability, the cold, and preffure of the upper beds, that forces it forth.

In fome *Dendrites*, the figures or fignatures penetrate quite through; in others they go but to the middle, and in others not fo deep. See Supplement, Article DENDRITÆ.

DENDROPHORIA *, in antiquity, the carrying of one or more trees, in ceremony, through a city, at certain feaft, and in honour of certain deities.

* The word is formed of *δένδρον*, tree, and *φορος*, I bear.

The *Dendrophoria* was performed at the facrifices of Bacchus, Cybele, and the god Sylvanus. Arnobius, Lib. V. makes mention of that performed in the facrifices of the mother of the gods. It confifted in carrying a pine in proceffion through

the city; which pine was afterwards planted in memory of that where-under Atys, the favourite of this goddess, mutilated himself. The branches of this tree they crowned, in memory of Cybele's doing the same; and they covered its trunk with wool, by reason the goddesses cover'd Atys's breast with the same Matter.

The persons who performed the office of carrying the tree, were called *Dendrophori*.

In the Roman history we find mention made of a company, or college of *Dendrophori*, who attended the army: and the critics have been in great pain to assign their office. Some hold, that they hewed and fashioned the wood for the tents: others, that they provided the wood necessary for the military works, machines of war, &c. Salmastius in his notes on the life of Caracalla by Spartian, owns this the general opinion of all the learned men of his time, but assures us with his usual modesty, that they were all mistaken, and that the *Dendrophori* of the army were the same with those of the feasts and sacrifices.

DENEB, an Arabic term, signifying *tail*; used by astronomers as a denomination of several fixed stars.

Thus *Deneb eleet*, signifies the bright star in the lion's tail; *Deneb adigege*, that in the swans tail, &c.

DENIER, the French penny; a small copper coin, twelve whereof make a sol, or French shilling.

The French *Denier* is now about the $\frac{2}{3}$ part of the English penny. It is subdivided into two mailles, and the maille into two oboles. Anciently, *Denier* was a general name for all sorts of moneys in France; as nummus for those in Rome.—

Thus, a piece of gold money, was called *Denier d'Or*; silver money, *Denier d'Argent*: after the same manner as the Romans said, *Nummus Aureus*, and *Nummus Argentus*.

There were two kinds of *Deniers*; the one Tournois, the other Parisis; whereof the latter was worth a fourth part more than the former, and was called *Monnoye Royale*, or *Porte Monnoye*, and sometimes *Denier d'Or*, and *Denier à Valeur d'Or*. See **MONEY**, &c.

DENIZEN, in law, an alien enfranchised in England by the king's charter, and donation; and thereby enabled, in many respects, to do as the king's native subjects do; namely, to purchase and possess lands, to hold any office or dignity, &c.

Denizenship is a right inferior to naturalization by parliament: for a stranger naturalized may inherit lands by descent; which a *Denizen* cannot.

Add, that, in the charter, whereby a person is made a *Denizen*, there is usually some clause, or other, which abridges him of that full benefit which natural subjects enjoy.

When a man is thus enfranchised, he is said to be, *ad fidem regis anglie*, or, *under the king's protection*; till such time his goods might be seized to the king's use.

DENOMINATION, a name imposed on any thing, usually expressing some quality predominant therein.

Hence, as the qualities and forms of things are of two kinds, *viz.* internal, and external; *Denomination* becomes twofold.

Internal DENOMINATION, is that founded on the intrinsic form; thus Peter is *denominated* learned, on account of his learning, which is something internal.

External DENOMINATION, is that founded, or arising from the external form. Thus, a wall is said to be seen, and known, from the vision, and cognition employed upon it; and thus Peter is *denominated*, honoured, by reason of honour, which is not in the person honoured, but in him that honours.

DENOMINATOR, in arithmetic, a term only used in speaking of fractions, or broken numbers. See **FRACTION**. The *Denominator* of a *Fraction* is the number or letter below the line; shewing into how many parts the integer is supposed to be divided by the fraction.

Thus in the fraction $\frac{12}{12}$, seven twelfths, the number 12 is the *Denominator*, and shews, that the integer is here divided into 12 parts. So in the fraction $\frac{a}{b}$, *b* is the *Denominator*.

The *Denominator* always represents an integer.

The number above the line 7, is called the *Numerator*.

DENOMINATOR of a Ratio, is the quotient arising from the division of the antecedent by the consequent.

Thus 6 is the *Denominator* of the Ratio 30: 5, because 5) 30 (6. The *Denominator* is what we otherwise call the *Exponent* of the Ratio.

DENSITY, that property, or habitude of bodies, whereby they contain such a quantity of matter, under such a bulk.

Accordingly, a body that contains more matter than another, under the same bulk, is said to be *denser* than the other. *Density* stands in opposition to *Rarity*.

Hence, since the mass is proportional to the gravity, a *denser* body is specifically heavier than a rarer; and a specifically heavier is *denser* than a specifically lighter.

The *Densities*, and bulks of bodies, are the two great points, whereon, all mechanics, or laws of motion turn: 'tis an axiom, that bodies of the same *Density* contain equal masses, under equal bulks. If the bulks of two bodies be equal, their

Densities are as their masses: consequently, the *Densities* of equal bodies, are as their gravities. If two bodies have the same *Density*, their masses are as their bulks: and hence; the gravities of bodies of the same *Density*, are in the Ratio of their bulks. The masses of two bodies are in a Ratio compounded of their *Densities*, and bulks; consequently, their gravities are in the same Ratio; and if their masses of gravities be equal, their *Densities* are reciprocally as their bulks. The *Densities* of any two bodies are in a Ratio compounded of the direct Ratio of their masses, and their reciprocal one of their bulks.

The Peripatetics define *Density* a secondary quality, whereby a body is full of it self; its parts cohering without any interstice. So that the form of *Density* consists in the immediate coherence of parts. Hence Porphyry in his predicaments defines a *dense* body, that whose parts are plac'd so near each other, that no other body can come between them; as gold.

The efficient cause of *Density* they usually attribute to cold: Scaliger, and some others, attribute it to moisture. Many of the moderns take the smallness of the parts of bodies, to contribute much to their *Density*; as by this means the pores are left the smaller: though it is added, that the *Density* of bodies does not only depend on the smallness of the pores, but also on their firmness; so far are we from having any body absolutely *dense* in the sense of the ancients, that gold itself, the *densest* and heaviest of all natural bodies, Sir Isaac Newton observes, contains a great deal more pore, or vacuity, than substance.

When the pressures of two liquids are equal, the quantities of matter in columns which have equal bases, do not differ; wherefore the bulks, that is, the heights of the columns are inversely as the *Densities*; whence may be deduced a method of comparing them together. For if in communicating tubes there be different fluids, and they remain at rest, their pressures are equal; and by measuring their altitudes the Ratio of their *Densities* is found.

The *Densities* of liquids are also compared together by immersing a solid into them; for if a solid lighter than the liquids to be compared together, be immerg'd successively into different liquids, the immerg'd parts will be inversely as the *Densities* of the liquids.—For, because the same solid is made use of, the portions of the different liquors, which in every case would fill the space taken up by the immerg'd parts, are of the same weight; therefore the bulks of those portions, that is the immerg'd parts themselves, are inversely as the *Densities*.

DENSITY of the Air, is a property that has much employed the later philosophers, since the discovery of the Torricellian experiment, and the air-pump.

It is demonstrat'd, that in the same vessel, or even in vessels communicating with each other, at the same distance from the centre, the air has every where the same *Density*.—The *Density of the Air* always increases in proportion to the compression, or the compressing powers.

And hence, the lower air is always *denser* than the upper: yet the *Density* of the lower air is not proportional to the weight of the atmosphere, by reason of heat and cold, which make notable alterations as to rarity, and *Density*. If the air be rendered *denser*, the weight of bodies therein is diminished; and if rarer, increased; by reason bodies lose more in heavier than in lighter mediums.

And hence, if the *Density of the Air* be sensibly alter'd, bodies, equally heavy in a lighter air, if their specific gravities be considerably different, will have their equilibrium taken away in a *denser* air, and the specifically heavier will preponderate; which is the foundation of the manoscope, an instrument for measuring the alterations in the *Density of the Air*. See **MANOSCOPE**.

DENTAL, DENTALS, is applied to certain letters, in the pronunciation whereof the teeth have a principal share.

Grammarians, and especially the Hebrew ones, distinguish the letters into *Dental, Labial, Guttural, Lingual, Palatal, &c.*

DENTALIS or **DENTALIUM**, is a kind of shell, which the apothecaries arerorderd to pulverize, and use in several medicaments, as an alcali.

The genuine *Dentalis*, described by M. Tournefort, is of a tubular, or conical form, about three inches long; of a shining, greenish white colour; hollow; light, and divided lengthwise by parallel lines, running from top to bottom. It is about the thickness of a quill, and bears some resemblance to a dog's tooth, whence its name.

It is very scarce; and therefore in lieu of it, they usually substitute a shell of diverse colours found among the sand when the sea is withdrawn; but not channeled, or fluted like the *Dentalis*.

Dr. Lister, in the *Philos. Transact.* makes mention of two species of *Dentalia*; the first commonly enough found about the island of Guernsey, &c. being a long, slender, white pipe, a little bending, and tapering, and open at both ends: The other properly called *Entalium*, longer and thicker than the former; and besides, streaked with ridges; whence the Italian term *Intaglia*. See **Supplement** articles *Dentalia* and *Entalia*.

DENTED, *indented, toothed*. See INDENTED.

DENTED *Verge*, among botanists, is applied to such leaves of plants as are notched, or jagged about the edge or rim: of these some are *fine dented*; others *large*, or *deep dented*, i. e. cut into the leaf. See LEAF.

DENTED *Wheel, Rota DENTATA*. See the article WHEEL.

DENTILES, in anatomy. See the article TOOTH.

DENTICLES, or DENTILS, in architecture, an ornament in corniches, bearing some resemblance to teeth; particularly affected in the Ionic and Corinthian orders; and of late also in the Doric.

They are cut on a little square member, properly called *Denticulus*; and the notches, or ornaments themselves, *Dentils*, by the Italians, *Dentelli*, and *Denticoli*, from *Dens*, tooth, as having the appearance of a set of teeth. — See *Tab. Archit. fig. 30. lit. b b.* and *fig. 28. lit. d d.*

Anciently, *Dentils* were scarce ever used but in the Ionic cornice: yet we find them in the remains of the theatre of Marcellus; and this is an argument with some, that Vitruvius had not the direction of that building. — Vitruvius prescribes the breadth of each *Dentil*, or tooth, to be half its height; and the metopa, or interval between each two, he orders to be $\frac{2}{3}$ of the breadth of the *Dentil*, L. III. c. 4.

The same author, c. 2. of his IVth book, observes, that the Greeks never used *Dentiles* underneath modillions; by reason modillions represent purlins; and *Dentils* represent ends of rafters, which can never be placed underneath purlins.

The Romans were not so scrupulous as to this decorum; excepting in the pantheon, where there are no *Dentils* under the modillions, neither in the portico, nor in the inside of the building.

DENTIFORMIS *Processus*, the same as *Pyrenoides*. See PYRENOIDES.

DENTIFRICE, in medicine, *tooth-powder*; a remedy to rub the teeth withal, in order to cleanse, or fasten them.

There are *Dentifrices* of diverse kinds and forms; some in form of a powder, composed of corals, pumice-stone, salt, alum, egg-shells, crabs-claws, hartshorn, cuttle-bone, tartar vitriolated, &c. Others in form of an electuary, consisting of the same powders, mixed up with honey.

There are others, prepared with roots boiled with alum, and dried in the oven. Others in form of a liquor, drawn by distillations from drying herbs, and astrigent medicines.

The Dutch hold butter the best *Dentifrice*, to keep the teeth white and sound; and the Spaniards, urine.

DENTITION, DENTITIO, the act of breeding, or cutting the teeth.

The time of *Dentition*, is usually from about 7 months old, to 17. The Incisors come first; then the Molares; after them the Canini; and lastly the Dentes Sapientiae.

Dentition, Hippocrates observes, is usually preceded with an itching of the gums, and with convulsions, fevers, and looseness; especially when the canine-teeth are cut.

Most of these symptoms Dr. Lister, on this passage of Hippocrates, observes, happen to birds upon moulting, or casting their feathers; on which occasion also they become mute, and sullen.

The germen, or seed of the tooth, says Doléus, is a tender mucous matter, like the white of an egg, contained in the cells, or alveoli of the jaw-bone, which grows harder and bigger every day, till it be fit to break through the gum. In this rupture the poor child is afflicted with terrible symptoms, inflammation of the jaws, gripes, waking, inquietude, terrors, dejections, vomiting, salivation, epilepsy, abscesses, and frequently death.

There are two terms, or periods of *Dentition*; the one, when the tooth, makes its first endeavour to get out of the maxillary bone, and wherein the outer, and upper part of the gum uses to be incomparted with a whitish circle. — The other, when the tooth, considerably enlarged in bulk, renders the gum tumid, and strives with all its force to break its way through the same. The remedies against the symptoms of *Dentition* are absorbents, and gentle purgatives. See Supplement article *Dentition*.

DENUNCIATION, a solemn publication, or promulgation of any thing.

All vessels of Enemies are lawful prize after *Denunciation*, or proclamation of war.

The design of the *Denunciation* of excommunicated persons, is, that the sentence may be the more fully executed; that the persons may be known, the entrance into the church refused them, and that other people may be warned not to have any communication with them.

DEOBSTRUENTS are such medicines as open obstructions.

There is something further intimated by *deobstruent*, than by *detergent*: for a medicine may be *deobstruent*, that is not in the strictest sense *detergent*; as, in effect, are most of those which are made of metalline substances; such as steel and mercury; which obtain the appellation *deobstruents* from their acting by their natural weight, whereby they increase the momentum of the circulating fluid, and make it strike against the secretory

outlets with greater force; because the momentum, or vis percussions of all projectiles, of which kind is a circulating fluid, is as their solidities, supposing their velocities equal. The more therefore the animal fluids are saturated with dense and solid particles; with the greater force they distend the vessels, and the more easily break through, where the structure favours their escape; and upon that account are medicines which add to these qualities in the fluids called *deobstruents*.

DEODAND, in our customs, a thing given, or forfeited, as it were, to God, for the pacification of his wrath in a case of misadventure, whereby a man or woman comes to a violent end, without the fault of any reasonable creature.

As, if a horse strike his keeper, and kill him: if a man, in driving a cart, falls so as the cart-wheel runs over him, and presses him to death: if one be felling a tree, and gives warning to the standers by, to look to themselves, yet a man is killed by the fall thereof: in the first place the horse; in the second, the cart-wheel, or the cart and horses; and in the third the tree is, *Deo dandus*, to be given to God, that is to the king, to be distributed to the poor by his almoner, for ex-piation of this unhappy event; though effected by unreasonable, nay senseless and dead creatures.

Omnia que movent ad mortem sunt Deodanda.

What moves to death; or kills him dead,

Is *Deodand*, and forfeited.

This law seems to be an imitation of that in Exodus, chap. XXI. *If an ox gore a man, or a woman with his barn, so as they die; the ox shall be stoned to death, and his flesh not be eat; so shall his owner be innocent.*

Fleta says, the *Deodand* is to be sold, and the price distributed to the poor, for the soul of the king, his ancestors, and all faithful people departed this life.

DEOPILATIVE, a remedy proper to soften, resolve, and remove obstructions. See OBSTRUCTION.

Deopilatives are the same with what we otherwise call *deobstruents*. See DEOBSTRUENT.

DEPART, a method of refining, or separating gold from silver by means of aqua fortis.

There are three ways of refining gold: the first by antimony; the second by sublimate; and the third, which is the most usual, by aqua fortis. — The two former, see under the article REFINING.

For the operation of the *Depart*, they take at the rate of one pound of impure gold, and two or three of silver; these they fuse together in a crucible, and when fused, cast them into cold water, where they become divided into grains of the bigness of peas. These grains taken out, and dried by the fire, are put in a *departing* vessel, which is a stone matras, and to the metal is added four pounds of aqua fortis. Then taking the vessel, they set it on the coals, and in about an hour's space, the refining is done. — For upon opening the vessel, they find nothing appear therein but the aqua fortis, and the gold reduced into a calx, or sand; the silver being all dissolved, and imbibed by the liquor.

To raise the gold to its due fineness, they usually give it the aqua fortis again and again; using for the first time half a pound; and for the second a quarter of a pound of the water, to eight ounces of metal. If the third water be found good and clear, the operation is ended: and the calx of the gold being washed in repeated waters, is melted down again in a crucible, first by a gentle, and afterwards a vehement fire, to be cast into ingots, or wedges.

It must be added, that the silver, with the impurities of the gold, are so thoroughly incorporated with the water, that to the eye there does not appear any thing beside the pure liquid; yet is not this silver lost. To recover it again out of the menstruum, they divide their stock of aqua fortis into several stone vessels, which they fill up with spring water, observing to put seven or eight times as much of this, as that. This done, in each vessel they put a quantity of copper; and leaving the whole for twenty-four hours, at the end thereof they find the spirits of the aqua fortis have quitted the silver, and are with the copper, leaving the former in form of a calx, or incorporated ashes at bottom. This calx being dried, is melted into an ingot, with a little salt-petre.

To husband the aqua fortis, and make it serve again for a second operation; they distil it in an earthen, or glass alembic; and when the distillation is about a third over, change the recipient. The water of the first recipient, serves for the first operation of *Departing*, and the rest for the subsequent ones.

If the aqua fortis, having quitted the silver, and being united with the copper, be then filtrated, it is called, *aqua secunda*; in which, if you steep an iron plate some hours, you will have another *Departure*: for the menstruum will let go the copper, and prey on the iron, leaving the copper in powder on the iron plate. And filtrating this dissolution, you may get the iron out of it, by laying in it a piece of lapis calaminaris; for the iron in that case will depart to the bottom, and the calamine be dissolved. And if you again filtrate this water, and pour on it the liquor of fixed nitre, you will have another *Depart*, the calamine precipitating to the bottom. And lastly, filtrating this

this water, as before, and evaporating part of it, you will have crystals of salt-petre.

DEPARTURE, or DEPARTER, in law, a term properly applied to a person, who first pleading one thing in bar of an action, and that being replied to, he waves it, and insists on something different from his first plea.

Or, it may be applied to a plaintiff, who in his replication shews a new matter from that in his declaration.—So if a man plead a general agreement in bar; and in his rejoinder alledge a special one; it shall be adjudged a *Departure* in pleading. The defendant hereupon demurreth, because it was a *Departure* from the declaration. Coke II. part, fol. 147.

DEPARTURE in desight of the court, is when the tenant, or defendant after appearing to the action brought against him, and having a day over in the same term; does not appear at the day, but makes a default.—This is a *Departure in desight of the court*, and therefore he shall be condemned.

The *Departure* is always on the part of the tenant, or defendant; and its entry is, *quod prædictus A, licet solemniter ex-actus, non revenit, sed in contemptum curiæ recessit.*

DEPARTURE, in navigation, is the casting, or westing of a ship, with respect to the meridian it departed, or sailed from. Or, it is the difference of longitude, either east or west, between the present meridian the ship is under, and that where the last reckoning or observation was made.

This *Departure* any where, but under the equator, must be accounted according to the number of miles in a degree proper to the parallel the ship is under.

DEPHLEGMATED, in chemistry, an epithet applied to spirits which are well cleared of water or phlegm.

To effect this, they rectify them, *i. e.* distill them over and over, till they be left quite pure.

DEPHLEGMATION, in chemistry, is the act of purifying, or clearing a fluid of its phlegm, or water.

This is performed by distilling the spirit, or other fluid again and again; by which means, the spirituous part all rises, and leaves the phlegm, or water behind.—When the spirit is thus disengaged of all its phlegm, or, at least, as much as it can be, it is called a *dephlegmated spirit*.

DEPILATORY, in medicine, a plaister, or medicine, applied on any hairy place, in order to bring off the hair.

* The word is formed of the participle *de*, and *pilus*, hair.

Depilatories are principally composed of lime and orpiment, which is a very caustic, and even a dangerous mineral.

DEPONENT, in the Latin grammar, a term applied to verbs which have active significations, but passive terminations, or conjugations, and want one of their participles passive.

Such is *minor*, I threaten, which has for participles, *minans, minaturus, and minatus*, but no *minandus*, which should be the participle passive.

They are called *Deponents*, as having *deposited*, or laid aside their passive signification.

DEPOPULATION, the act of wasting, destroying, desolating, or unpeopling a place. *Coke Instit. part III. fol. 204.* Hence *depopulatores agrorum*. Stat. 4. Hen. IV.

DEPORTATION, a sort of banishment in use among the Romans, whereby some island, or other place was allotted a criminal for the place of his abode, with a prohibition from stirring out of the same on pain of death.

Ulpian makes this difference between *Deportation*, and relegation, that the former confined the party to one certain place for ever; whereas relegation was frequently revoked, and allowed the exile a little more liberty.

By *Deportation* a person lost the rights of a Roman citizen.

DEPOSIT, DEPOSITUM, a thing put to the hands of another to be kept gratis.

The civilians divide *Depositum* into *simple* and *judiciary*.

Judiciary-DEPOSIT, is that whose property is contested between several persons, and *deposited* in the hands of some third person, by decree of a judge.

Simple-DEPOSIT is either voluntary, or necessary. Necessary is that done in case of hostility, shipwreck, fire, &c.

Inn-holders are responsible for the baggage brought to them, as being a *necessary Deposit*.

DEPOSITARY, in the French law, a person entrusted as keeper, or guardian of any thing.

Ordinary Depositaries are not to warrant the thing left with them, in case it be lost, or stolen. They are only to answer for a fraud, or breach of faith; not for negligence. But a *necessary Depositary*, as an inn-keeper, is accountable for a theft or robbery, if there have been any negligence in the case; and by the English law, even whether there were any negligence or not.

DEPOSITION, in law, a testimony given in court by a witness upon oath.

In chancery, *Deposition* is a testimony set down in writing, by way of answer to the interrogatories exhibited in chancery, where such witness is called *Deponent*.

DEPOSITION is also used for the sequestering, or depriving a person of his dignity and office.

This *Deposition* only differs from abdication, in that the latter is supposed voluntary, and the act of the dignity, or officer himself; and the former of compulsion, being the act of a superior power, whose authority extends thereto.—Some say the *Deposition*, and some the abdication of king James II. The pope pretends to a power of *deposing* kings. Gregory VII. we are assured by Ouphiprus Panvinius, and Otho de Frisinghen, was the first who attempted the *Deposition* of kings.

Deposition does not differ from deprivation: we say indifferently a *deposed*, or deprived bishop, official, &c.

Deposition differs from suspension, in that it absolutely and forever strips, or divests a priest, &c. of all dignity, office, &c. whereas suspension only prohibits, or restrains the exercise thereof.

Deposition only differs from degradation, in that the latter is more formal, and attended with a few more circumstances than the former; but in effect and substance they are the same; those additional circumstances being only matter of show, first set on foot out of zeal and indignation, and kept up by custom, but not warranted by the laws or canons. See **DEGRADATION**.

DEPRECATION, in rhetoric, a figure whereby the orator invokes the aid or assistance of some one; or prays for some great evil or punishment to befall him who speaks falsely; either himself, or his adversary.

DEPRECATORY, or DEPRECATIVE, in theology, a term applied to the manner of performing some ceremonies in the form of prayer.

Among the Greeks, the form of absolution is *deprecatory*; being conceived in these terms, *may God absolve you*: whereas in the Latin, and even in some of the reformed churches, it is in the declarative form, *I absolve you*.

DEPRESSION of Equations. See **EQUATION**.

DEPRESSION of the Pole.—So many degrees as you sail, or travel from the pole towards the equator; so many you are said to *depress* the pole, because it becomes, respectively, so much lower, or nearer to the horizon.

DEPRESSION of the visible horizon, denotes its sinking or dipping below the true horizontal plane; whether caused by some variation in the atmosphere, or by the different height of the observer's eye above the surface of the sea.

The eye being one foot above the surface of the sea, the visible horizon, or edge of the sea, will be thereby depressed one minute.—At the height of 3 feet, the dip will be 2 minutes;—at 7 feet, 3 minutes;—at 12 feet, 4 minutes;—at 18 feet, 5 minutes;—at 27 feet, 6 minutes.

DEPRESSOR, in anatomy, a name common to diverse muscles, from their office in lowering, or bringing down the parts they are fastened to.

DEPRESSOR labii superioris, is a muscle called also *constrictor alæ nasi*. See **CONSTRUCTOR alæ nasi**.

DEPRESSOR labii inferioris proprius, a muscle placed between the *depressores labiorum communes*, on the part called the *chin*. It appears to be but one muscle, ascending with a twofold order of fleshy fibres, and terminating in the lower lip. Its office is shewn by its name; it depresses the lower lip. See *Tab. Anat. (Myol.) fig. 1. n. 6.*

DEPRESSOR labiorum communis, by some called *depressor labii superioris*, is common to both lips. It arises with a broad origin from the lower margin of the under jaw, by the side of the chin, and is inserted with a narrow tail into each lip near their coalition; serving to draw them obliquely down. See *Tab. Anat. (Myol.) fig. 1. n. 7.*

DEPRESSOR maxillæ inferioris.

DEPRESSORES oculi, a pair of muscles springing from each corner of the eye, and answered by another pair of like figure and structure in the lower eye-lid. These are often considered together by anatomists as one orbicular muscle; the fibres environing the eye-lids, and being inserted into them, not unlike the sphincters of other parts.

DEPRIMENS, in anatomy, the same with *Depressor*. See **DEPRESSOR**.

DEPRIVATION, in the canon law, the act of bereaving, divesting, or taking away a spiritual promotion, or dignity.—As when a bishop, vicar, prebend, or the like, is *deposed*, or *deprived* of his preferment for some matter, or fault in fact, or in law. See **DEPOSITION**.

Deprivation is of two kinds, a *beneficio*, & *ab officio*.

DEPRIVATION a beneficio, is when for some great crime, a minister is wholly, and for ever *deprived* of his living, or preferment: which differs from suspension, in that the latter is only temporary.

DEPRIVATION *ab officio*, is when a minister is for ever deprived of his orders: which is the same in reality, with what we otherwise call *Deposition* and *Degradation*; and is usually for some heinous crime deserving death, and is performed by the bishop in a solemn manner. See **DEGRADATION**.

DEPTH, in geometry, &c. See **ALTITUDE**, **HEIGHT**, &c. **DEPTH** of a Squadron, or *Battalion*, is the number of men in a file; which in a Squadron is three, and in a Battalion generally six.

We say, the battalion was drawn up six deep; the enemies horse were drawn up five deep.

DEPURATION, in pharmacy, the same as clarification, or purification; *viz.* the purging a body of all the lees, faeces, and other crass, coarse and excrementitious parts contained therein.

Fermentation serves to *depurate* liquors: syrups, juices, &c. are depurated by passing them through the manica hippocratis, or straining-bag.

DEPUTATION, a mission of certain select persons out of a company, or body, to a prince, or assembly, to treat of matters in their name; or to prosecute some affair therein.

Deputations are more or less solemn, according to the quality of those who send them, and the business they are sent upon. *Deputation* is not properly applied where a single person sends another with such commission; but only where a body are concerned.—The parliament *deputed* the speaker, and six members, to present their address to his majesty. The chapter *deputed* two cannons to solicit their affair in council.

DEPUTY, a person sent, or *deputed* by some community, in their name and behalf.

The several provinces of the French dominions send *Deputies* to the king every year, to present him the Cayer des États: there are always three *Deputies*, one from each order. It is the *Deputy* of the first order, that makes the compliment to the king. In the cities of Turkey, there are always *Deputies* to treat with the grand signior's officers, as to taxes, and other concerns.—These *Deputies* are three or four of the richest, and most considerable among the burghers.

DEPUTY, is also frequently used among us, for an office, or employ; not a dignity: and stands indifferently for a vice, or lieutenant.

Among the ancients, **DEPUTATUS** was applied, first, to armouers, or workmen employed in the making of armour in the forges, &c. And secondly, to a sort of active people, who followed the army, and in engagements were trusted to bring off, and take care of the wounded.

DEPUTATUS, ΔΕΠΟΥΤΑΤΟΣ, was also an inferior officer in the church of Constantinople, whose business was to call persons of condition the patriarch had a mind to speak withal, and to keep off the crowd where that prelate walked.

This *Deputy* appears to have been a sort of usher, or tip-staff; but he had likewise the care of the sacred vestments; in which he approached the office of a sacristan.

DERELICTS, in the civil-law, are such goods as are wilfully thrown away, or relinquished by the owner.

DERELICT is also applied to such lands, as the sea receding from, leaves dry, and fit for cultivation.

DERIVATION, in grammar, the affinity one word has with another, by having been originally formed from it.

DERIVATION, in medicine, the act of diverting a humour which flows on some noble part, and drawing it to some other neighbouring part, where it is less dangerous.

Thus, in defluxions upon the eyes, or teeth, they apply a blister behind the neck to draw the matter thither: and in a quinsy, they prescribe bleeding in the ranula, or veins under the tongue, to divert the humour from falling on the throat.

DERIVATIVE, in grammar, a word which takes its origin from another word, called its *Primitive*.

Such is the word *Derivative* itself, which takes its origin from the primitive *Rivus*, a rivulet, or channel, out of which lesser streams are drawn; and thus *Manhood*, *Deity*, *Lawyer*, &c. are derived from *Man*, *Deus*, *Law*, &c.

DERMA, in anatomy, the cutis, or skin of an animal; or the tegument investing the whole body immediately under the cuticle, or scarf-skin.

* The word comes from the Greek *δερμης*, to *skin*, or *excoviate*. The *Derma* consists of two parts; the corpus reticulare, and papillæ pyramidales. See **SKIN**.

DERNIER Ressort. See the article **RESSORT**.

Whatever power is committed by the king to any other, the *Dernier Ressort* is still remaining in himself; so that he may fit in court, and take cognizance of all causes: except in treasons, and other cases, where he himself is a party.

DEROGATION, an act contrary to a preceding one, and that annuls, destroys, and revokes it, either in whole, or part. *Derogations*, in general terms, are not regarded in judicature; they must be in specific, and in formal terms. A new law imports a *Derogation* of a former one: a second testament is a *Derogation* of a first.

DEROGATORY, a clause importing *Derogation*.

By the French law, if a person own himself indebted in a certain sum; notwithstanding any quittance he has obtained for the same, the act is *derogatory*.

DERVIS, or **DERVICH**, a name given to a sort of monks among the Turks, who lead a very austere life, and profess extreme poverty; though they are allowed to marry.

* The word is originally Persian, *درویش*, signifying a beggar, or person who has nothing; and by reason the religious, and particularly the followers of Mevelava, profess not to possess any thing; they call both the religious in general, and the Mevelavites in particular, *Dervises*, or *Derviches*.

The *Dervises*, called also *Mevelavites*, are a Mahometan order of religious; the chief, or founder whereof was one *Mevelava*. They are now very numerous. Their chief monastery is that near Coigni in Natolia; where the general makes his residence; and where all the assemblies of the order are held: the other houses being all dependent on this; by a privilege granted to this monastery under Ottoman I.

The *Dervises* affect a great deal of modesty, patience, humility, and charity. They always go bare-legged, and open-breasted, and frequently burn themselves with hot irons, to inure themselves to patience. They always fast on Wednesdays, eating nothing on those days till after sun-set. Tuesdays and Fridays they hold meetings, at which the superior of the house presides. One of them plays all the while on a flute, and the rest dance, turning their bodies round and round with the greatest swiftness imaginable. Long custom to this exercise from their youth, has brought them to such a Habitude, that it does not discompose them at all. This practice they observe with great strictness, in memory of Mevelava their patriarch's turning miraculously round, as they pretend, for the space of four days, without any food or refreshment; his compassion Hamia playing all the while on the flute: after which he fell into an extasy, and therein received wonderful revelations for the establishment of his order. They believe the flute an instrument consecrated by Jacob, and the shepherds of the Old Testament; by reason they sang the praises of God thereon. They profess poverty, chastity, and obedience; and really observe them while they remain *Dervises*; but if they chuse to go out, and marry, they are always allowed.

The generality of *Dervises* are rank Mountebanks: some apply themselves to legerdemain, postures, &c. to amuse the people; others give into forcery and magic: but all of them, contrary to Mahomet's precept, are said to drink wine, brandy, and other strong liquors, to give them the degree of gaiety their order requires.

Beside their great saint Mevelava; there are particular saints honoured in some particular monasteries: as Kederle, greatly revered in the monasteries of Egypt, and held by some to be St. George; and by others, with more probability, the prophet Elias.

The *Dervises* are great travellers; and under pretence of preaching, and propagating their faith, are continually passing from one place to another: on which account they have been frequently used as spies.

There are also *Derviches* in Persia, called in that country *Abdals*, q. d. servants of God.—They lead a very penurious, austere life, and preach the Alcoran in the streets, coffee-houses, and wherever they can meet with auditors. The Persian *Derviches* retail little but fables to the people, and are in the last contempt among the men of sense, and letters.

DESART, or **DESERT**, a wild, uncultivated, uninhabited place or country: as the *Desarts* of Lybia, of the Thebaid, &c. Geographers use the word in the general for all countries little, or not at all, inhabited. In scripture, we find several places in the Holy Land, or places adjoining thereto, called *Desarts*. The *Desart*, or wilderness, absolutely so called, is that part of Arabia on the south of the Holy Land, wherein the Israelites wandered forty years, from the time of their evacuating Egypt to their entry into the promised land.

The *Desart* of Bearsheba was that part of the *Desart* just mentioned, which bordered on the Holy Land, running towards the Mediterranean. The *Desart* of Idumea, is Idumea itself, a barren, mountainous country. The *Desarts* of Betharen, Bethsaida, Cadesch, Damafcus, Dibon, Engaddi, Edom, Gibeon, Horeb, Jazer, Juda, Moab, Pharan, Sin, Sinai, Zur, Zin, &c. are so many dry, uncultivated, and in general mountainous places, like our downs, &c. where there are few or no habitations or inhabitants; whence the Hebrews call them by antiphrasis מורבך, which properly signifies *human word*, or *speech*, by reason there is none heard there.

DESART, in cookery. See the article **DESSERT**.

DESCANT in music, the art of composing in several parts. *Descant* is three-fold; *viz.* *Plain*, *Figurative*, and *Double*. *Plain Descant*, is the ground-work, or foundation of musical composition, and consists altogether in the orderly placing of many concords: answering to simple counterpoint.

Figurate, or *Florid Descant*, is that wherein discords are concerned as well, though not so much, as concords. This may be well termed the ornamental or rhetorical part of music; in regard that in this are introduced all the varieties of points,

points, figures, synopses, diversities of measures, and whatsoever else is capable of adorning the composition.

Double DESCANT, is when the parts are fo contrived, that the treble may be made the bass: and on the contrary, the bass the treble.

DESCENDANT, in genealogy, a term relative to *Ascendant*, and applied to a Person who is born or issued from some other referred to.

Adam infected all his *Descendants* with original sin. The *Descendants* from the brothers of the maid of Orleans, are confirmed in their exemption from all taxes, and imposts, by a regulation of the year 1634.

DESCENDING, something that falls, or moves from above, downwards.

There are *ascending* and *descending* stars; and *ascending* and *descending* degrees.

There are also *ascending* and *descending* veins springing out of the cava: and *ascending* and *descending* arteries rising out of the aorta.

DESCENDING Latitude, is the latitude of a planet in its return from the nodes to the equator.

DESCENSION, in astronomy, is either *right* or *oblique*.

Right DESCENSION of a *Star*, or *Sign*, is a point, or arch of the equator, which *descends* with the star, or sign below the horizon, in a right sphere.

Oblique DESCENSION, is a point or arch of the equator, which *descends* at the same time with a star, or sign below the horizon, in an oblique sphere.

Descensions, both *right*, and *oblique*, are accounted from the first point of aries, or the vernal intersection; according to the order of the signs; that is, from west to east. And as they are unequal, when it happens that they answer to equal arches of the ecliptic, as, *e. gr.* to the twelve signs of the zodiac, it follows, that sometimes a greater part of the equator rises, or *descends* with a sign, in which case the sign is said to *ascend*, or *descend* rightly: and sometimes again a less part of the equator rises, or sets with the same sign; in which case it is said to *ascend*, and *descend* obliquely. See **ASCENSION**.

Refraction of the DESCENSION, &c. See **REFRACTION**.

DESCENSIONAL Difference, is the difference between the *right*, and *oblique Descension* of the same star, or point of the heavens, &c.

DESCENT, or **DISCENT**, in law, an order, or manner wherein lands, and tenements are derived to any man from his ancestors.

Thus, to *make his Descent* from his ancestors, is to shew how, and by what particular degrees, the land in question came to a person from his ancestors.

Descent is either *lineal*, or *collateral*.

Lineal DESCENT, is that conveyed down in a right line from the grand-father to the father, and from the father to the son, from the son to the grand-son, &c.

Collateral DESCENT, is that springing out of the side of the line, or blood; as from a man to his brother, nephew, or the like.

If one dies seized of land, wherein another has right to enter, and it *descends* to his heir; such *Descent* shall take away the other's right of entry, and put him to his action for recovery thereof. Stat. 32. Hen. VIII.

DESCENT, in genealogy and heraldry, the order, or succession of *Descendants* in a line, or family.

We say, one *Descent*, two *Descents*, &c. A gentleman is of perfect blood, who has four *Descents* of gentility, both by his father, and mother's side, *i. e.* whose great-grand-father, grand-father, and father, on both sides, were all gentlemen.

DESCENT, is also used in heraldry, to express the coming down of any thing from above.

Thus a *Lion en Descent*, is a lion with his head towards one of the base points, and his heels towards one of the corners of the chief; as if he were leaping from some high place.

DESCENT, *Fall*, in mechanics, &c. is the motion, or tendency of a body towards the centre of the earth, either directly, or obliquely.

It is to be here observed, first, that a body cannot *descend*, unless it can divide, and separate the medium; which it cannot do, unless it be specifically heavier than the medium.

For since bodies cannot penetrate each other, one must give way before the other can move: and again, though a medium, *e. gr.* water be divisible, yet if it be specifically heavier than another, *e. gr.* wood, it is only heavier as it contains more particles of matter in the same bulk, all which have an impulse downwards; and consequently in water there is a greater impulse than in the same bulk of wood.

Secondly, The *descending* body loses as much of its weight, as is the weight of the medium, with the force of its cohesion.

Thirdly, The less the bulk of the *descending* body is, the more of its gravity does it lose in the same medium. For though the proportion of the specific gravity of the one to the other be still the same in a greater or lesser bulk, yet the less the body,

the more the surface, in proportion to the mass; and the more the surface, the more the friction or resistance.

The cause of this *Descent*, or tendency downwards, has been greatly controverted. There are two opposite hypotheses advanced; the one holding it to proceed from an internal, and the other from an external principle. The first maintained by the Peripatetics, and Epicureans, and by the Newtonians; and the latter by the Cartesians, and Gassendists.

The Peripatetics teach, that heavy bodies fall by certain motive power, flowing from their forms towards the centre of the earth, as their proper element, or place in the universe.

These powers they call *Impetus*; and will have them to have been impressed on the several parts of the earth at the creation; being a tendency of the parts to the whole. And they suppose, that it is by means hereof, that the whole is still preserved in its integral state. Adding, that if there were a perfect vacuum in any part of the air round us, a stone placed therein would not at all fall or tend towards the earth, as being no longer a part thereof, nor having the natural *Impetus*.

The ancient Epicureans, or Atomists, with the modern Newtonian philosophers, hold, that all bodies do naturally gravitate, or tend downwards; and that the more strongly, as they contain the more matter; consequently perfectly solid bodies, such as they suppose atoms or primitive corpuscles to be, the most of all.

The Cartesians ascribe the cause of the *Descent* of bodies to a circular motion of the æther, which they feign for this very purpose. According to them, all circular motion is unnatural; and therefore is continually endeavouring to recede from its centre, and to change into a rectilinear motion; consequently such as have the most motion, recede the most, and in receding depress, or thrust down such as have less motion. And thus the air being moved with the most vehement velocity, recedes more than solid bodies, and by that means drives them towards the centre.

The Gassendists account for the *Descent* of heavy bodies, by supposing certain magnetic rays proceeding out of the earth, and consisting of contiguous particles, which by their continual emission retain the rigidity of rods, or stretched cords.

These rays being diffused every way from the earth, as a centre, strike, or impinge on what solid bodies they meet withal in their progress, and penetrate the same, some directly, and others obliquely, and refractedly, after the manner of rays of light. These rays, say they, are a kind of arms; and the deflections, and curvatures of their extremes, as it were fingers, or hooks, which pull, or draw bodies from above towards the earth. And they add, that these rays being the more rare, as they are more remote from the centre; their effect is the more feeble; and the *Descent* of bodies is the more slow, in proportion as they are higher.

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Laws of the DESCENT of Bodies.—1. Heavy bodies in an unresisting medium fall with an uniformly accelerated motion. See the *Laws of uniformly accelerated Motion* under the articles **ACCELERATION**, and **MOTION**.

Hence, 1. The spaces *descended* are in the duplicate ratio of the times, and velocities; and increase according to the uneven numbers 1, 3, 5, 7, 9, &c. 2. The time, and velocities, are in a subduplicate ratio of the spaces. 3. The velocity of *descending* bodies, are proportionate to the times from the beginning of their falls. 4. The spaces described by a falling body, are as the squares of the times from the beginning of the fall.

A body specifically heavier *descends* in a fluid medium specifically lighter, (*e. gr.* the air,) with a force equal to the excess of the weight of the body above an unequal bulk of the medium. For a body only *descends* in a medium with the force remaining, after a part has been spent in overcoming the resistance of the medium. And this resistance is equal to the weight of an equal bulk of the medium: consequently the body only falls with the excess of its weight above that of an equal bulk of the medium.

Hence, the power that sustains a body in a specifically lighter medium, is equal to the excess of the absolute weight of the body above an equal bulk of the medium. Thus $47\frac{1}{2}$ pound of copper in water lose $5\frac{1}{2}$ of their weight.—A power, therefore, of 42 pounds is able to sustain them. In supposing heavy bodies to *descend* in an unresisting medium, we conceive them free of all external impediments, from what cause soever. So that we even set aside that oblique impulse given to bodies while in falling, by the rotation of the earth, though this produce no sensible irregularity in a little distance.

Galileo who first discovered the *Law of the Descent* of heavy bodies by reasoning, afterwards confirmed the same by experiments; the result of which, repeated an hundred times over, was, that the *Descent* was as the square of the times.

Grimaldi and Riccioli made experiments to the same effect, though in a different manner, by letting fall a number of balls, weighing eight ounces a piece, from the tops of several towers, and measuring the times of falling by a pendulum. These experiments are exhibited in the following table.

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Vibrations of the Pendulum.	Time.	Space at the End of the Time.	
		Rom. Foot.	Rom. Foot.
5	0 50	10	10
10	1 40	40	30
15	2 30	90	50
20	3 20	160	70
25	4 10	250	90
6	1 0	15	15
12	2 0	60	45
18	3 0	135	75
24	4 0	240	105

Since then the experiments of Riccioli, made in such considerable distances, agree so well to the theory, it is scarce worth taking notice of what is urged to the contrary by Dechaules, in his *Mund. Math.* who writes, that he had found by experiment, that heavy bodies in half a second of time, descend $4\frac{1}{2}$ feet; in two $16\frac{1}{2}$; in three 36; in four 60; in five 90; in six 123. It is sufficient, that he deduces the irregularity from the resistance of the air, which we suppose out of the question. II. If an heavy body descend in an unresisting medium through an interval not over-large, the space it describes is the subduplicate of that which it would describe in the same time with the velocity acquired at the end of the fall.

III. The time wherein a body falls from a given height being given, to determine the spaces it fell in the several parts of that time:

Suppose the given altitude = a , the time = t , and the space it fell in x part of time x : then

$$\frac{1}{x} : x = t^2 : a$$

$$\frac{t^2 x = a}{x = a : t^2}$$

Therefore the space passed over in the second part of time is $a : t^2$; consequently, that passed over in the second time = $3^2 : t^2$; that in the third = $5^2 : t^2$, &c.

E. gr. In the experiments of Riccioli above delivered; the ball fell 240 feet in four seconds. Therefore the space fallen the first second was = 240 : 16 = 15. The space in the second was = 15 . 3 = 45. That in the third = 15 . 5 = 75. And that in the fourth 15 . 7 = 105.

IV. The time wherein a body falls a given space being given; to determine the time wherein it will fall any other given space in the same medium:

Since the spaces are as the squares of the times: to the space which the body falls in the given time, the space in the question, and the square of the given time, find a fourth proportional, which will be the square of the time sought. The square-root, therefore, being extracted therefrom, the problem is solved.

For example, one of Riccioli's balls in four minutes time falling 240 foot, it is inquired in what time it would fall 135 foot? the answer will be found = $\sqrt{(135 : 16 : 240)} = \sqrt{(135 : 15)} = \sqrt{9} = 3$.

V. The space a body falls in a given time being given, to determine the space it will fall in any other given time:

To the square of the time wherein the body falls the given space, the square of the time wherein it should fall the space required, and the given space, seek a fourth proportional; this will be the space required.

For instance, Riccioli's ball falling 60 foot in 2 seconds, it is asked what space it will fall in 4 seconds? the answer is, 16 . 60 : 4 = 4 . 60 = 240.

For the *Laws of the DESCENT of Bodies on inclined Planes.* See *Inclined PLANE*.

For the *Laws of DESCENT in Cycloids.* See *CYCLOID*, and *PENDULUM*.

Line of swiftest DESCENT, is that which a body falling by the action of gravity describes in the shortest time; which is proved by geometricians to be the cycloid.

DESCENT into a Ditch, is a deep trench, or sap cut through the esplanade, and under the covert way; covered over-head with planks and hurdles; and loaded with earth against artificial fires. See *MOAT*.

In wet ditches the *Defect* is made even to the surface of the water: in dry ditches, it is carried to the bottom of the moat; where traverses are made to lodge and secure the miners.

DESCRIBENT, is a term in geometry, expressing some line or surface, which by its motion produces a plane figure, or a solid.

DESCRIPTION, an imperfect, or inaccurate definition of a thing, giving a sort of knowledge thereof from some accidents and circumstances peculiar to it, which determine it enough to give an idea that may distinguish it from other things; but without explaining its nature or essence.

Grammarians content themselves with *Descriptions*: philosophers require definitions of things. See *DEFINITION*.

A *Description* is an enumeration of diverse attributes of a thing most of which are only accidental: as when a Person is described by his deeds, his sayings, his writings, his honours, &c. A *Description*, as to its outward appearance, resembles a *Definition*; and is even convertible with the thing described; but does not explain it. For instead of bringing several things essential to the thing described, it only brings a number of accidents belonging thereto. *E. gr.* Peter is the tall young man who lives on the green, wears black cloaths, frequents the college, courts N—, &c. where it is evident, we do not give any explication of Peter, as not bringing things that are in Peter, but only circumstances or things about him, tall, young, living, wearing, frequenting, courting, &c. a *Description*, therefore, is no proper answer to the question, *quid est*, what is he? but to that, *quis est*, who is he?

Descriptions, in effect, are principally used for singulars, or individuals: for things of the same species do not differ in essence, but only as to *hic*, and *illc*, which difference contains nothing very notable, or distinguishable. But individuals of the same kind, differ much in accidents; *e. gr.* George is a king; and William a citizen; Charles is a male, and Anne a female; Henry is wife, and John a blockhead, &c. Thus; a *Description* is an accumulation of accidents, whereby things are notably distinguished from each other, though they scarce differ at all in essence.

Some authors call a *Description* a *Quasi-Definition*: as, body is a thing divisible, moveable, solid, extended, &c. which only wants of a definition in this, that instead of the form or essence of a thing, it gives one or more properties arising from the form or essence.

DESCRIPTIONS, in geometry.—To describe a circle, ellipsis, parabola, &c. is to construct, or form those figures, with ruler, compasses, &c.

DESERTER, in war, a soldier on the muster-roll, who quits the service without leave; or lifts himself under another officer, into a different regiment.

The punishment of *Desertion* is death.—All soldiers found half a league from a garrison, or army, going towards an enemy's country, or quarter, without a pass, are deemed, and treated as *Deserters*.

The ancient church excommunicated *Deserters*, as having violated their Oath.

*DESHABILLE**, a French term, naturalized of late. It properly signifies a night-gown, and other necessaries, made use of in dressing, or undressing. Mr. — is not to be spoke without; he is yet in his *Deshabille*, i. e. undressed, or in his night-gown.

* The word is a compound of the privative *de*, and *s'habiller*. to dress one's self.

DESHACHE', in heraldry, is when a beast has its limbs, separated from the body, so as they still remain on the escutcheon, with only a small separation from their natural places.

DESIGN, the plan, or representation of the order, general distribution and construction of a painting, poem, book, building, or the like.

This painter has shewn the first *Design* of his piece, in which the figures are well disposed. The *Design* of that poem, or book is artfully laid. Claudian never sees his whole *Design* together: when he composes a part, he thinks of nothing else; and works up every member, as if it were separate from all the rest.

In building, we use the term *ichnography*, when by *Design* is only meant the plan of a building, or a flat figure drawn on paper.

Orthography, when some face, or side of the building is raised from the ground.

And *scenography*, when both front and sides are seen in perspective.

DESIGN, in the weaving manufactories, expresses the figures wherewith the workman enriches his stuff; or silk; and which he copies after some painter.

In undertaking such kinds of figured stuffs, it is necessary, that before the first stroke of the shuttle, the whole *Design* be represented on the threads of the warp; we do not mean in colours, but with an infinite number of little packthreads, which being disposed so as to raise the threads of the warp, let the workman see from time to time what kind of silk is to be put in the eye of the shuttle, for woof.

This method of preparing the work, is called *reading the Design*, or reading the figure; which is performed after the following manner.

A paper is provided considerably broader than the stuff, and of a length proportionate to what is intended to be represented thereon. This they divide lengthwise by as many black lines as there are intended to be threads in the warp; and cross these lines by others drawn breadthwise; which with the former make little equal squares. On the paper thus squared, the painter designs his figures, and heightens them with colours as he sees fit. When the *Design* is finished, a workman reads it, while another lays it on the simblot.

Now, to read the *Design*, is to tell the person who manages the loom, the number of squares, or threads comprized in the

the space he is reading; intimating at the same time, whether it is ground, or figure.

To put what is read on the simblot, is to fasten little strings to the several packthreads, which are to raise the threads named. And thus they continue to do, till the whole *Design* is read.

Every piece being composed of several repetitions of the same *Design*; when the whole *Design* is drawn, the drawer to re-begin, as I may say, the *Design* afresh, has nothing to do, but to raise the little strings with slip-knots to the top of the simblot which he had let down to the bottom. And this he is to repeat as often as is necessary, till the whole be manufactured.

The ribbon-Weavers have likewise a *Design*, but much more simple than that now described. It is drawn on paper, with lines, and squares, representing the threads of the warp, and woof. But in lieu of lines, whereof the figures of the former consist, these only consist of points, or dots, placed in certain of the little squares, formed by the intersection of the lines. These points mark the threads of the warp that are to be raised; and the spaces left blank, denote the threads that are to keep their situation. The rest is managed as in the former.

DESIGN, is particularly used in painting, for the first idea of a large work drawn roughly, and in little; with intention to be executed, and finished in large.

In this sense, the *Design* is the simple contour, or outline of the figures, or things intended to be represented; or the lines that terminate, and circumscribe them.

Such a *Design* is sometimes drawn in crayons, or ink, without any shadows at all: sometimes it is hatched, that is, the shadows are expressed by sensible lines, usually drawn across each other with the pen, crayon, or graver. Sometimes, again, the shadows are done with the crayon rubbed, so as there do not appear any lines: sometimes, the grain, or strokes of the crayon appear, as not being rubbed: sometimes the *Design* is washed, that is, the shadows are done with a pencil, in Indian ink, or some other liquor: and sometimes the *Design* is coloured, that is, colours are laid on much like those intended for the grand work.

The qualities, or conditions required in a *Design*, are correctness, good taste, elegance, character, diversity, expression, and perspective.

Correctness depends principally on the justness of the proportions, and a knowledge of anatomy. Taste is an idea or manner of *designing*, which arises either from the complexion and natural disposition, or from education, one's master, studies, &c. Elegance gives the figures a kind of delicacy which strikes people of judgment, and a certain agreeableness which pleases every body. The character is what is peculiar to each thing; in which there must be a diversity; in as much as every thing has its particular character to distinguish it. The expression is the representation of an object according to its character, and the several circumstances it is supposed to be in. The perspective is the representation of the parts of a painting, or figure, according to the situation they are in with respect to the point of sight.

The *Design*, or *Draught*, is a part of the greatest import, and extent in painting. It is acquired chiefly by habit and application; rules being of less avail here than in any of the other branches of the art, as colouring, clair-obscur, expression, &c.

The principal rules that regard the *Design*, are: that novices accustom themselves to copy good originals at first sight: not to use squares in drawing; for fear of stinting and confining their judgment: to stay till they can *design* well after the life before they begin the practice of perspective rules: in *designing* after the life, to learn to adjust the bigness of their figures to the visual angle, and the distance of the eye from the model or object: to mark out all the parts of their *Design*, before they begin to shadow: to make their contours in great pieces, without taking notice of the little muscles, and other breaks: to make themselves masters of the rules of perspective: to observe every stroke as to its perpendicular parallel and distance; and particularly so to compare, and oppose the parts that meet upon, and traverse the perpendicular, as to form a kind of square in the mind; which is the great, and almost the only rule of *designing* justly: to have a regard not only to the model, but also to the part already *designed*; there being no such thing as *designing* with strict justness, but by comparing and proportioning every part to the first.

The rest relates to perspective: as, that those objects be seen at one view, whose rays meet in a point: that the eye and object be always conceived as immovable: that the space, or medium between them, be conceived transparent: and that the eye, object, and picture, be at a just distance; which is usually double the bigness of the subject or picture. See PERSPECTIVE.

DESIGNATION, the act of marking or indicating, and making a thing known.—The *Designation* of such an estate is made by the tenants, burthens, and boundings. Among the Romans there were *Designations* of the consuls, and other magistracies, some time before their election.

DESIGNATOR *, a Roman officer, who assigned and marked each person his place, and rank in public ceremonies, shows, processions, &c.

* The word is formed from the verb *designare*, to design.

The *Designator* was a kind of marshal, or master of the ceremonies, who regulated the seats, march, order, &c.

There were *Designators* at funeral solemnities, and at the games, theatres, and shows, who not only assigned every body his place, but also led him to it; as appears from the prologue to the *Pænulus* of Plautus.

Much of the same nature were the *agenetheta* of the Greeks.

DESIGNING, the art of delineating, or drawing the appearance of natural objects by lines, on a plain.

To *design* according to the rules of mathematics, makes the object of perspective.

To *design* by the Camera Obscura. See CAMERA Obscura.

Mechanical Method of DESIGNING Objects. Provide a square piece of glass fitted into a frame, ABCD, (*Tab. Perspective fig. 15.*) and wash, or smear it over with water, wherein a little gum has been dissolved. When it is well dried again, turn it towards the object, or objects to be *designed*, so that the whole thereof may be seen through a dioptra, or sight GH, fixed thereto. Then proceed to work; and applying the eye to the sight, with a pen and ink draw every thing on the glass, as you see it appear thereon. Having finished the draught, lay a fair, moist paper thereon; and pressing it pretty tight down, the whole will be transferred from the glass to the paper.—This method is very good, easy, and exact; and deserves to be more used by painters.

DESAVOHAMENTUM. See ADVOWING.

DESPOT, a title or quality given to the princes of Walachia, Servia, and some of the neighbouring countries.

The word in its first origin signified the same with the Latin *herus*, and the English *master*. But in time it underwent the same fate on medals, as, among the Latins, Cæsar did with regard to Augustus; BACIAETC, answering to Augustus, and ΔΕΣΠΟΤΗC, *Despotes*, to Cæsar. See CÆSAR.

Thus, Nicephorus, having ordered his son Stauracius to be crowned; the son, out of respect, would only take the name ΔΕΣΠΟΤΗC; leaving to his father that of BACIAETC. For it is to be noted, that it was just about the time that the emperors began to cease to use Latin inscriptions.

This delicacy, however, did not last long; for the following emperors preferred the quality of ΔΕΣΠΟΤΗC to that of BACIAETC, particularly Constantin, Michael Ducas, Nicephorus Botaniates, Romanus Diogenes, the Comneni, and some others.

In imitation of the princes, the princesses likewise assumed the title of ΔΕΣΠΟΙΝΑ

It was the emperor Alexius, surnamed the Angel, that created the dignity of *Despot*; and made it the first after that of emperor, above that of Augustus, or Sebastocrator, and Cæsar. See AUGUST.

The *Despotes* were usually the emperors sons, or sons in law, and their colleagues, or co-partners in the empire, as well as their presumptive heirs.—The *Despots* that were sons of the emperors, had more privileges and authority, than those that were only sons in law. Codin, p. 38. describes the habit, and ornaments of the *Despot*. See the notes of Fa. Goar on that author.

Under the successors of Constantine the Great, the title, *Despot of Sparta*, was given to the emperor's son, or brother, who had the city of Sparta, or Lacedæmon, by way of Appanage.

DESPOTISM, or **DESPOTIC Government**, a form of government wherein the prince is absolute and arbitrary, doing whatever he lists, without being checked by any other power. Such are most of the eastern governments, as those of the Mogol, Grand Signior, Sophi of Persia, &c.

DESPOUILLE, in heraldry, is the whole case, skin, or slough of a beast; with the head, feet, tail, and all appurtenances; so that being filled, or stuffed, it looks like the entire creature.

DESPUMATION, the clarification of any liquor, by throwing up its foulness in a froth, and taking that off.

DESEQUAMATION, expresses the flaking, or scaling of carious bones. See EXFOLIATION.

DESSERT, or **DESART**, the last service brought on the tables of people of quality; when the meats are all taken off.

The *Desart* consists of fruits, pastry-works, confections, &c.

DESSICATIVE, or **DESSICCATIVE**, in medicine, a remedy that has the virtue of drying up superfluous moisture; used to skin over old sores, &c.—We say, a *Desiccative* unguent, &c. pimpinella is held detergent, *desiccative*, and vulnerary. Lemery.

DESTILLATION, or *Distillation* in chemistry. See DISTILLATION.

DESTINIES, in mythology. See the article PARCÆ.

DESTINY, the order, disposition, or chain of second causes appointed by providence; and importing, or carrying with it a necessity of event.

According to many of the heathen philosphets, *Destiny* was a secret and invisible power, or virtue, which with incomprehensible wisdom, conducted what to us appears irregular, and fortuitous. This amounts to what we call *God*. The Stoics by *Destiny* understood a certain concatenation of things, which from all eternity follow each other of absolute necessity; there being no power able to interrupt their connexion. This answers in a great degree to our idea of providence.

But the Stoics made even the gods themselves subject to the necessity of this *Destiny*. The truth is, the Stoics rather define what the word *Destiny* should signify, than what it did signify in common language: for they had no distinct idea of this power to which they attributed those events. They had only a vague, confused idea of I know not what chimæra, or unknown cause, to which they referred that invariable disposition, and the eternal concatenation of all things. There is no real being that the name *Destiny* can agree to. The heathen philosphets, who had framed a notion thereof, supposed it to exist, without knowing precisely what they meant by it. But men, not daring on the one side, to impute to providence the evils and misfortunes that beset them, as they imagined undeservedly; and on the other side, not being willing to allow that it was their own fault; formed this phantom of *Destiny*, to bear the weight of all the evil.

DESTRUCTION, in metaphysics, is the corruption, or annihilation of something before existing. See **CORRUPTION**. A thing passes from *esse* to *non-esse*, either by corruption, when nothing of the substance is lost, but only the accidents, viz. the disposition of parts: or, by annihilation, when both substance and accidents are lost.

DESUDATION, expresses a profuse, and inordinate sweating; followed by the eruption of sudamina, or heat-pimples. See **SUDAMINA**.

DESULTOR, in antiquity, a vaulter, or leaper, who jumped off one horse upon another.

Among the Scythians, Indians, and Numidians, the cavaliers, or horsemen who served in the wars, were very expert *Desultores*; that is, they always carried with them at least two horses, and when that, they were mounted on, grew weary, or wanted breath, they leaped with great agility and address upon the other which they led in their hand.

The Greeks and Romans borrowed the same practice from those barbarous nations; but they only used it in their games, races, and funeral solemnities; and never, that we read of, in war.

The *Desultores*, therefore, were among the people of Asia, and Africa, soldiers; but among the Romans, &c. they were no more than tumblers, and posture-masters. Eustathius on *Homer's Iliad*, Lib. IV. assures us, that instead of two, they had sometimes four, or six horses, all abreast; and would jump from the first to the fourth, or sixth, which was the masterpiece of their art.

DETACHED Pieces, in fortification, are demi-lunes, ravelins, horn and crown-works, and even bastions when separated, or at a distance from the body of the place.

In painting, the figures are said to be well *detached*, or loosened, when they stand free, and disengaged from each other, are no where confounded together, but stand out with a strong relief from the ground, and from each other.

DETACHMENT, a military term, signifying a certain number of soldiers, taken out of several regiments or companies equally, to be employed in some particular enterprise; as to form a kind of flying camp, to relieve a party already engaged in battle, to join a separate army, to assist at the siege of a place, or to enter into some garrison.

DETENTION, the possession, or holding of lands, or the like, from some other claimant.

The word is chiefly used in an ill sense, for an unjust withholding, &c.

The canons condemn a person who has intruded into a benefice, to make restitution of all the fruits thereof, during the time of his unjust *Detention*.

DETERIORATION, an act whereby a thing is impaired or rendred worse.

When the *Deterioration* of a commodity, seized by an officer, arises from the fault of the keeper, he is answerable for the same.

J. Frederic Mayer, professor at Leipzig, printed a treatise of *Deterioration*, in the year 1695, under the title of *Traclatus de Deterioratione*.

DETERGENT, in medicine, is applied to remedies that cleanse, mundify, and carry off viscid, and glutinous humours. The plant buckshorn, *deterges*, and consolidates wounds. Rhaponticum is aperitive, and good against the gravel and stone; it also *deterges*, and expels poison.

Detergents are not only softening, and adhesive, but also, by a peculiar activity or disposition to motion, joined with a suitable configuration of parts, are apt to abrade, and carry along with them such particles as they lay hold of in their passage.

—All medicines of this intention are supposed to cleanse, and heal, that is, incarnate, or fill up with new flesh all ulcerations, and foulness occasioned thereby, whether internal, or external.

To do this, in all internal cases especially, the medicine must be supposed to maintain its primary properties, until it arrives at the place of action, and there it does what entitles it to the appellation of a *Detergent*, and a *vulnery*: first by its adhesive quality, which consists in the comparative largeness of surface, and flexibility of its component parts; by which it very readily falls into contact with, and adheres to, the slough of ulcerous exudations, which by their loose situations are easily carried along with the medicine; and when such matter is so carried away, which is the cleansing, and *deterging* part, what was instrumental in this office, will afterwards stick, and adhere to the cutaneous filaments, until by their addition, and the protrusion of proper nourishment *ab interno* to the same place, the waste is made up, that is, the ulcer is healed. **Quincy**.

After the like manner is the operation of *Detergents* to be accounted for in external application. By the warmth of their parts they rarify, and by their adhesive quality, they join with, and take off along with them, in every dressing, what is thrown upon the place to which they are applied; until a more convenient matter is brought thither by the circulating juices, which they assist in adhering to, and incarnating the eroded cavities. Only this may be taken notice of that internally, whatsoever of this kind is mixed with the animal fluids, by the known laws of circulation, will be first separated, and left behind. For all those parts, which are specifically heavier, will move nearest the axis of the canals, because their moments are the greatest, and will carry them as near as can be in straight lines; but the lighter parts will always be jostled to the sides, where they soonest meet with outlets to get quite off, or are struck into such cavities as we are here speaking of, in which they adhere, and make part of the substance.

This is understood of the milder sort of *Detergents*; and it is easy to conceive from hence, how an increase of those qualities of activity and adhesion conjointly, may make a medicine arise to the greatest efficacy in this respect. And it is upon this foot, that all those medicines operate, which are given to cleanse obstructions, or foulness in any of the viscera, or passages; and which may be increased in efficacy so far, as to fetch off even the membranes, and part of the capillary vessels. **DETERMINATE Problem**, is that which has but one, or at least but a certain number of solutions; in contra-distinction to an *indeterminate* problem, which admits of infinite solutions.

Such *e. gr.* is the problem, To describe an isosceles triangle on a given line, whose angles at the base shall be double that at the vertex: which has only one solution; as that which follows has two, viz. To find an isosceles triangle, whose area and perimeter are given.

A *determinate* problem may either be simple, or linear, plane, solid, or sursolid.

DETERMINATION, in physics, the disposition or tendency of a body towards one way, rather than another.

Heavy bodies have a *Determination* towards the centre of the earth.

DETERMINATION, is also used for the action whereby a cause or agent is limited, or restrained to act, or not act, this, or that, and in this, or in that manner.

Determinations, say the schoolmen, proceed either from an efficient cause; in which case the *Determination* is called *efficient*; as when an artist *determines* an instrument to a certain action: or from the form, as that *determines* the indifference of the matter; and thus our senses are said to be *Determinations* to have ideas upon the presence of external objects.

Of the *Determination* is from the matter or subject that receives the action; and thus, the heating of fire upon clay *determines* it to harden, upon wax to soften, &c. Or it is from the object; as when we say, Colour *determines* the visive power: or lastly, it is from the end, as the end *determines* the desire.

Determinations again are either *moral* or *physical*: a *moral Determination* is that proceeding from a cause which operates morally, *i. e.* by commanding, persuading, or advising some effect.

Physical Determination, is an act whereby God excites and applies a second cause to act, antecedently to all operation of the creature.—Such a *Determination*, the Thomists and Dominicans maintain necessary to all, and singular action of every creature. The Jesuits, on the contrary, deny that God thus *determines* even second causes; and hold, that God exerts no influence on second causes, but only with the second cause on the action. And thus they exclude a *physical Determination* both from natural causes, as supposing them already *determined* by nature to act; so that there needs no other external *Determination* from God to the several actions; and from free causes, as supposing such a *Predetermination* contrary to our natural liberty.

A *Determination* to be pleased with certain forms, or ideas, a late ingenious author calls, an *Internal Sense*; and a *Determination* to be pleased with virtuous actions, characters, manners, &c. a *Moral Sense*.

DETERSIVES, in medicine, the same with *Detergent*. See **DETERGENT**.

A clyster is a *deterfive* medicine which cleanses the lower venter. *Deterfive* unguents are also called *Mundificatives*. The leaves and fumets of the strawberry are *deterfive* and affringent.

DETINUE, a writ which lies against a man, who having goods or chattels delivered to keep, refuses to re-deliver them. *Detinue* answers, in great measure, to the *Actio Depositi* of the Civilians.—He takes his *Actio* of *Detinue*, to recover the thing *detained*, not the damages sustained by the *Detinue*.

DETONATION *, in chemistry, the noise which some minerals and other Bodies, make when they begin to heat in crucibles; by the volatile parts rushing out with impetuosity, and the humidity escaping.

* The word is formed of *de*, and *tono*, I thunder.

Detonation is much the same with *Decrepitation*, only its action is more forcible, and the noise is greater—*aurum fulminans* heated, &c. goes off with a violent crack, *i. e.* makes a great *Detonation*.

Detonation takes away the impure volatile sulphur from bodies. **DETONATION** denotes the act or operation of expelling the impure, volatile, and sulphureous part out of antimony, and leaving behind the fixed and internal parts.

This is chiefly performed by means of saltpetre, &c. See **ANTIMONY**.

DETRANCHE', among the French heralds, signifies a line bend-wise, which does not come from the very dexter angle, but either from some part of the upper edge, and thence falling athwart or diagonally; or from part of the dexter-side. They say, *Tranché, Detranché, and Retranché*, to denote, that there are two diagonal lines, making two partitions in the escutcheon, and coming from the angles, and a third from some of the other parts abovementioned. See **TRANCHE'**.

DEVASTAVERUNT, or **DEVASTAVIT**, *Bona Testatoris*, a writ lying against executors, and administrators, for paying legacies, and debts on simple contract without specialties, before debts on bonds and specialties.—In which case, the executors are as liable to actions, as if they had notoriously wasted the goods of the testator, or converted them to their own use; and are compellable to pay such debts by specialty out of their own goods.—

DEVENERUNT, a writ anciently directed to the escheator, on the death of the heir of a tenant of the king holding in capite, within age, and in the king's custody; commanding the escheator to enquire, upon the oaths of good and lawful men, what lands and tenements, by the death of the tenant come to the king.

DEVIATION, in the old astronomy, a motion of the deferent, or eccentric, whereby it advances to, or recedes from the ecliptic. See **DEFERENT**.

The greatest *Deviation* of Mercury is sixteen minutes; that of Venus is only ten.

DEVIL *, **DIABOLUS**, an evil angel; one of those celestial spirits cast down from heaven, for pretending to equal himself with God.

* The word is formed from the French *Diable*, of the Latin *Diabolus*, which comes from the Greek *Διαβολος*, *Accuser*, or *Calumniator*.

The *Æthiopians* paint the *Devil* white, to be even with the Europeans, who paint him black. *Ludolph*. We find no mention of the word *Devil* in the Old Testament, but only of Satan. Nor do we meet with the word *Devil* in any heathen authors, in the signification attached to it among Christians, that is, as a creature revolted from God; their theology went no farther than to evil Genii, or Demons who harassed and persecuted mankind. Thus, the Chaldeans, believed both a good principle, and an evil principle, which was an enemy of mankind.

The relations we have of the religion of the Americans, assure us of some idolatrous nations who worship the *Devil*: but the term *Devil* must not here be taken in the common sense: those people have an idea of two collateral independent beings, one whereof is good, and the other evil. And they place the earth under the guidance and direction of that evil being; which our authors, with some impropriety, call the *Devil*.

DEVISE, in heraldry, a name common to all figures, ciphers, characters, rebus's, motto's, &c. which, by their allusion to the names of persons or families, denote their qualities, nobility, or the like.

Devise, in this sense, is of a much older standing than heraldry it self; being that which gave the first rise to armories: thus, the Eagle was the *Devise* of the Roman empire; SPQR was the *Devise* of the Roman people; and still continues to be what they call the *escutcheon of the city of Rome*.

The first *Devises* were mere letters distributed on the borders of the liveries, housings, and banners, and at length on the shields. Thus the K was the *Devise* of the French kings of the name of Charles, from Charles V. to Charles IX.

There were also *Devises* by rebus's, equivocal, or allusions,

both to names and arms. The dukes of Guise took for their *Devise* an A in an O, to signify *chacun A son tour*, every one in his turn. And the house of Senefal, in *virtute & honore senescit*. Some that had towers in their arms, *turris mea Deus*, &c.

There are also ænigmatical *Devises*: as that of the Golden Fleece, with *Aure n'aurai*, intimating that Philip the Good, who instituted that order, renounced every other woman, but Isabella of Portugal, whom he then married.

Devises sometimes contain entire proverbs; as that of Cæsar Borgia, *aut Cæsar, aut Nihil*.

The word *Devise* is formed from the Latin *dividere*, and was applied to the things just mentioned, as well as those hereafter mentioned, by reason they served to divide, separate, and distinguish persons, parties, &c. Fa. Menetrier observes, that there are as many different kinds of *Devises*, as there are different manners of distinguishing one another, or as there are simple figures, or words, capable of expressing qualities, offices, virtues, actions, &c. of persons, and of notifying or distinguishing them from others.

DEVISE, is now taken in a more restrained sense for an emblem; or a representation of some natural body, with a motto, or sentence applied in a figurative sense to the advantage of some person.

In this sense, the figure, or image, is called the *Body*, and the motto the *Soul* of the *Devise*.

A *Devise* is a sort of metaphor, representing one object by another wherewith it has some resemblance. So that a *Devise* is only true, when it contains a metaphorical similitude, and may it self be reduced into a comparison. Lastly, it is a metaphor painted, and visible, and that strikes the eye. All these circumstances are required to a *Devise*; and without them, a figure only makes a hieroglyphic, and a motto only a sentence.

Fa. Bouhours gives an accurate explication of the word *Devise*, in an extract inserted in the *Memoires de Trevoux*. A *Devise*, says he, is a composition, or assemblage of figures drawn from nature and art, called the *Body*; and of a few words adapted to the figure, called the *Soul*. Such a compound, adds he, we make use of to denote our thought, or intention by comparison; for the essence of the *Devise* consists in a comparison taken from nature or art, and founded on a metaphor.

This he illustrates in the following instance: A young nobleman of great courage and ambition, bore for his *Devise*, in the last caroual at the court of France, a rocket mounted in the air, with this Italian motto, *poco duri purche m'inalzai*, may I last but a short time, provided I mount high; which seems to hold forth the following discourse: as the rocket rises a great pitch, though it only endures a little while, so it does not concern me to live long, provided I attain to glory and eminence; which is a just comparison.

On this footing, a *Devise*, to define it rightly, is a painted metaphor; or rather, an ænigma inverted: for, whereas ænigma's represent nature or art by the events of history, and the adventures of fables, a *Devise* is a representation of human qualities by natural or artificial bodies.

Thus, to express the character of Louis XIV. a sun was painted, which yet, luminous as it is, has more power than lustre. And the better to determine the sense of the painting to this signification, the Castilian motto is added, *ma virtut que lux*. The personal merit of Mary, Queen of Scots, was represented by a pomegranate, with these words, *mon prix n'est pas de ma couronne*; and the talent of an apostolical person, who became all things to all men, by a looking-glass, with those words of St. Paul, *omnibus omnia*.

Devises are used on coins, counters, seals, shields, triumphal arches, artificial fire-works, and other solemnities. They are a sort of images, very pertinently, and artfully representing the enterprizes and intrigues of war, love, piety, study, fortune, &c.

The French have distinguished themselves in this way, especially since the time of cardinal Mazarin, who had a wonderful fancy for *Devises*.

The Italians have reduced the making of *Devises* into an art, and laid down the laws and rules thereof. Some of the principal are, 1. That there be nothing monstrous or extravagant in the figures; and nothing contrary to the nature of things, or to the common opinion of mankind. 2. That figures be not joined which have no affinity or relation to each other; the metaphor being to be founded on something real, and not on hazard or imagination; excepting some whimsical combinations established in mythology, which custom, and the authority of the poets have made pass for natural. 3. That the human body be never taken into *Devises*; as this would be to compare a man with himself. 4. That there be a sort of unity in the figures which compose the body: we do not mean, that there must only be a simple figure; but that, if there be several, they must have a relation and subordination to each other: so that there be one principal figure whereon all the rest depend. Though still the fewer figures there are in the body of the *Devise*, and the less they are confused, the more

perfect and elegant is the *Devise*. 5. The motto, which is to animate the figure, must agree to accurately thereto, as that it could not serve for any other. 6. Nothing is to be named that appears to the eye, and which the bare inspection might notify. 7. The motto is not to have a compleat sense of it self, for being to make a compound with the figure, it must only be a part, and consequently must not signify the whole. If the words alone have a compleat signification, you have a full and distinct notion independently of the figure; whereas the signification should result from both. 8. The shorter the motto, the more beautiful: and a suspension of the sense, which leaves somewhat to guess, is one of the principal graces of the *Devise*. Lastly, it is accounted a happiness, where the words of a poet are applied in a sense which he never dreamed of, and yet so pertinently, that it should seem they had been intended for the fame.

DEVISE, or **DIVISE**, in common law, the act whereby a testator gives, or bequeaths, his lands, or goods, by his last will in writing.

He who makes the *Devise*, is called the *Devisor*, and he, to whom it is made, the *Devisee*.

The words of a will the law interprets in a larger, and more favourable sense than those of a deed: for if land be *devised* to a man to have to him for ever, or to have to him, and his assigns; in those cases the *Devisee* shall have a fee simple. Yet if given in the same manner be *seoffment*, he shall have but an estate for life.

So, if one *devise* land to an infant in his mother's belly; it is a good and valid *Devise*; though it is otherwise by *seoffment*, grant, or gift: for in those cases there ought to be one of ability to receive presently, otherwise it is void. See **WILL**, and **DEED**.

DEVUNX, a division of the Roman libra, or pound; containing 12 ounces; or eleven twelfths of any thing. See **AS**.

DEVOLVED, something acquired by right of *Devolution*. Such a right is *devolved* to the crown. Such an estate *devolved* on M_____ by the death of N_____.

The word is also used for a right acquired by a superior, of conferring a benefice, when the inferior, and ordinary collator, has neglected to confer, or has conferred it on an unqualified person.

If a patron neglects to present to a benefice in six months, the presentation lapses, or *devolves* upon the bishop, and from thence to the primate.

DEVOLUTION, in the French law, a right acquired by descent, or succession, from degree to degree.

Devolution, in general, is an impediment provided by the customs of several provinces, whereby the husband who survives his wife, or the wife surviving her husband, is prohibited to alienate the real, and immovable effects of the deceased; and obliged to preserve them for the children issued from that marriage. So that they may succeed thereto in exclusion of those born of a second marriage.

DEVOTION, a sincere, ardent worship of God. Monks, Jurists defines *Devotion* a softening, and yielding of heart, with an inward consolation, which the souls of believers feel in the exercises of piety.

Under the name of *Devotions* are usually understood certain religious practices, which a person makes it a rule to discharge regularly: and with reason, for this exactitude be founded on solid piety; otherwise it is vanity, or superstition.

DEVOTION, among the Romans, was a sort of sacrifice, or ceremony, whereby they consecrated themselves to the service of some person.

The ancients had a notion, that the life of one might be redeemed by the death of another: and hence were those *Devotions* so frequent for the lives of the emperors.

The *Devotion* of Decius, who, after *devoting* himself to his country, threw himself into the hands of his enemies, and was killed, is said to have gained the Romans the victory.

But *Devotion* to any particular person was not known till Augustus. The day after the title Augustus had been given Octavius; Pacuvius, a tribune of the People, began to say, he would *devote*, and consecrate himself to him, as was practised among the barbarous nations, to obey him even at the expence of life, if he were commanded. His example was immediately followed by all the rest; and it came at length to be established into a custom, never to go to salute the emperor, without declaring they were *devoted* to him. Augustus, though seeming to oppose this vile and infamous flattery, yet rewarded the author.

DEVOURING, in heraldry.—When fishes are born in an escutcheon, in a feeding posture, the heralds denominate it *devouring*; by reason fishes swallow all their food whole.

DEUTEROCANONICAL*, in the school-theology, an appellation given to certain books of holy scripture, which were added to the canon after the rest; either by reason they were not wrote till after the compilation of the canon, or by reason of some dispute as to their canonicity.

* The word is Greek, being compounded of δευτερος, second, and κανωνικος, canonical.

The Jews, it is certain, acknowledge several books in their canon, which were put there later than the rest. They say, that under Efdras, a great assembly of their doctors, which they call by way of eminence, the *Great Synagogue*, made the collection of the sacred books, which we now have in the Hebrew Old Testament. And they agree, that they put books therein which had not been so before the Babylonish captivity; such are those of Daniel, Ezekiel, Haggai, &c. and those of Efdras and Nehemiah.

And the Romish church has since added others to the canon, that were not, nor could not be in the canon of the Jews; by reason some of them were not composed till after. Such is the book of Ecclesiasticus; with several of the Apocryphal books, as that of the Maccabees, Wisdom, &c. Others were added still later, by reason their canonicity had not been yet examined: and till such examen, and judgment, they might be set aside at pleasure.

But since that church has pronounced as to the canonicity of these books, there is no more room now for her members to doubt of them, than there was for the Jews to doubt of those of the canon of Efdras. And the *Deuterocanonical* books are with them as canonical, as the proto-canonical. The only difference between them consisting in this, that the canonicity of the one was not generally known, examined, and settled so soon as that of the others.

The *Deuterocanonical* books in the modern canon, are the book of Esther, either the whole, or at least the seven last chapters thereof. The epistle to the Hebrews; that of James; and that of Jude; the second of St. Peter; the second, and third of St. John; and the Revelation. The *Deuterocanonical* parts of books, are, the hymn of the three Children; the prayer of Azariah; the histories of Susannah, of Bel, and the Dragon; the last chapter of St. Mark; the bloody sweat, and the appearance of the Angel, related in St. Luke, chapter xxii; and the history of the adulterous Woman in St. John, chapter viii.

DEUTERONOMY*, one of the sacred books of the old testament; being the last of those written by Moses.

* The word is Greek, compounded of δευτερος, second, and νομος, law.

It does not appear that Moses made any division of what he wrote into books; or that he gave different names and titles to the different parts of his work: nor do the Jews, even at this day, distinguish them in the copies they use in the synagogues; but write them all running as one single work, without any other distinction beside that of little and great parafches. It is true, in the other copies, used by private persons, they are divided into five parts, as among us; but they give them no other name, but the first word wherewith each division begins: much as we do in quoting a decree, or chapter of the canon-law.

Thus, the first part of Moses's work they call כְּרָאשִׁית *Bereschit*, because beginning with that word. The second they call שְׁמוֹת *Veelch Schemat*: the third וַיְקַרְבֵּנִי *Vajick-ara*; the fourth, וַיִּכְרַח *Vajickadabber*; and the fifth, אֵלֶּךָ *Ellech haddebarim*; which is one of the first words thereof. This custom is very ancient among the Rabbins, as appears from the ancient commentaries on those books, called, אֵלֶּךָ שְׁמוֹת הַרְבֵּי *Bereschit Rabba*, וַיִּכְרַח *Veelch Schemoth Rabba*, &c. and from the prologus galcaetus of St. Jerom.

It was the Greeks, when they first translated the law, that gave the five parts, into which it was divided, the names of Genesis, Exodus, Leviticus, Numbers, and *Deuteronomy*. Accordingly the names are Greek, excepting that of Leviticus, which is Hebrew; and they express what is contained in those books, or at least the most remarkable things contained therein: which is the usual Greek manner of giving titles.

The book of *Deuteronomy* was so called, because this last part of the work of Moses comprehends a repetition, or recapitulation, which that legislator made to the Israelites before his death, of the law he had before delivered them at large. And hence *Deuteronomy* is still called by the Rabbins מִשְׁנֵה מִשְׁנֵה *Mifsheneh*, repetition, אֵלֶּךָ תּוֹרָה *Repetition of the Law*, second Law. They likewise call it סֵפֶר הַחֻקִּים *the Books of Reprimands*, on account of the XXVIIIth chapter, which is full of blessings promised to such as keep the law, and of curses threatened to such as transgress it.

The Book of *Deuteronomy* was written the fortieth year after the delivery from Egypt, in the country of the Moabites beyond Jordan: Moses being then in the 120th year of his age. It contains in Hebrew, eleven parafches, though only ten in the edition of the Rabbins at Venice; XX chapters, and 955 verses. In the Greek, Latin, and other versions it contains XXXIV chapters. The last is not of Moses. Some say it was added by Joshua immediately after Moses's death; which is the most probable opinion. Others will have it added by Efdras.

DEW, *Ros*, a thin, light, insensible mist, or rain, falling while the sun is below the horizon.

Naturalists usually rank *Dew* among the number of meteors of the watery kind. Some define it a vapour liquified, and let fall in drops: others, a vapour having a like relation to frost, as rain has to snow, &c.—Among the dissertations of Mont Huet, is a letter to shew that *Dew* does not fall, but rises.

To us, *Dew* appears only to differ from rain as more, and less. Its origin, and matter, no doubt is from the vapours, and exhalations of the earth and water, raised as shewn under the article VAPOUR: The thin vesiculae, whereof vapours consist, being once detached from their bodies, we all know, keep rising in the atmosphere, till they arrive at such a stage of the air, as is of the same specific gravity with themselves: then their rise is stopped. Now, as it is the warmth, or fire, that, dilating the parts of water, forms the vesiculae specifically lighter than air, and capable of ascending therein; so when that heat declines, or is lost, as by the approach, or contiguity of any colder body, the vesiculae condense, become heavier, and descend. In the day-time, therefore, the sun warming the atmosphere by a continual influx of his rays, the vapours once raised, continue their progress, as meeting with nothing to increase their gravity, till such time as they are got out of the reach of the reflected warmth of the earth, in the middle region of the atmosphere. Here condensing, they form clouds; from which proceed rain, as shewn under CLOUDS and RAIN. But when the sun is below the horizon, the case is somewhat different: for the atmosphere then cooling, the vapours raised by the warmth of the earth, and that of the rays of the sun lodged therein during the preceding day, begin to condense apace, as soon as they are got into the air, spending their stock of fire and heat on the cold, moist air they pass through. Their ascent, therefore, becomes short; and by that time they are got a few fathoms high, being exhausted of their fire, and restored to the natural dimensions, and gravity of their constituent water; they precipitate, and fall back again in little spherules, or drops, as is the Case of rain.

From their principles the other phenomena of *Dews* are easily accounted for. Hence, *e. gr.* it is, that *Dews* are more copious in the spring, than in the other seasons; there being then a greater stock of vapour in readines, through the small expence thereof in the winter's cold and frost, than at other times. Hence, what Pliney relates of Egypt, that it abounds in *Dews* throughout all the heats of summer; for the air there being too hot to dissipate the vapours in the day-time, they never gather into clouds, and hence they have no rain; but we know that in climates where the days are excessive hot; the nights are remarkably cold; so that the vapours raised after sun-set, are readily condensed into *Dews*. Or, perhaps, that notable coldness is rather the effect, than the cause of the quantity of *Dews*. For a deal of vapour being raised by the great heat of the earth, and the stock of fire spent on it in the day-time, the influx of such a quantity of cold moisture must greatly chill the air.

May-Dew whitens linnen, and wax; the *Dew* of autumn is converted into a white frost. Out of *Dew* putrefied by the sun, arise diverse insects which change apace from one species into another: what remains is converted into a fine, white silt, with angles like those of salt-petre, after a number of evaporations, calcinations, and fixations.

There is a spirit drawn from *May-Dew*, which has wonderful virtues attributed to it. The method of collecting and preparing it, is prescribed by Hanemann, physician at Kiel. The *Dew* is to be gathered in clean linnen cloths, exposed to the sun in close vials; then distilled, and the spirit thrown upon the caput mortuum; this is to be repeated till the earth unite with the spirit, and become liquid; which happens about the seventh, or eighth coboration, or distillation. By such means you gain a very red, odoriferous spirit. Stollerfoht, a physician of Lubec, thinks *May-Dew* should be gathered in glass-plates, especially in still weather, and before sun-rise. And Etanuller is of the same opinion. It might likewise be collected with a glass funnel, exposed to the air, having a crooked neck to bring the *Dew* into a vial in a chamber. See *Philos. Transact.* N^o. 3. Hoffman, and others. It is apparently from the preparation of this *Dew*, that the brothers of the Rosy-Crooks took their denomination.

In the *Philosop. Transact.* we have an account of a very extraordinary kind of *Dew*. For a good part of the winter 1695, says the bishop of Cloyne, there fell in many parts of the provinces of Munster, and Leinster, a kind of thick *Dew*, which the country-people called *Butter*, from its consistency and colour; being soft, clammy, and of a dark yellow. It fell always in the night, and chiefly in low, moorish places, on the top of the grass, and oft on the thatch of cabins. It was seldom observed in the same place twice. It commonly lay on the earth a fortnight without changing colour, but then dried, and turned black. It fell in lumps; and had a strong smell like that of graves.—Mr. R. Vans, in the same transactions, gives an account of the like at the same time, in Limerick, and Tipperary; adding, that if one rubbed it with the hand, it melted; but laying it by the fire, it dried, and grew hard.

DEXTANS, in antiquity. See the article AS.

DEXTER, in heraldry, is applied to the right side, as *sinister* is to the left.

DEXTER-BASE, is the right side of the base.

DEXTER-CHIEF, the angle on the right hand of the chief.

DEXTER-POINT. See the article POINT.

The word is pure Latin, signifying right-handed; whence the word *Dexterity* for address, and ability in the performing of any thing.

DEXTROCHERE *, or **DESTROCHERE**, in heraldry is applied to the right arm, painted in a shield, sometimes naked, sometimes clothed, or adorned with a bracelet, and sometimes armed, or holding some moveable, or member used in the arms.

* The word is formed from the Latin *Dextrocherium*, which signifies a bracelet wore on the right wrist, mentioned in the acts of the martyrdom of St. Agnes, and the life of the emperor Maximus.

The *Dextrochere* is sometimes placed as the crest.

DEY, the title of the sovereign prince of the kingdom of Algiers.

The governors of the several provinces under him, are called *Beys*.

DIA, ΔΙΑ, the beginning of diverse terms in medicine, chirurgery, pharmacy, &c. Where these three letters commence the name of a remedy, unguent, plaister, cataplasm, &c. they signify composition, and mixture; as in *Diaplasma*, *Diachylon*, &c.

DIA is likewise the beginning of many terms in the other arts; as, *Diameter*, *Dialogue*, &c. on all which occasions, *Dia*, which is an inseparable particle, or preposition, is borrowed from the Greek ΔΙΑ, *ex*, or *cum*; which begins the same words in the Greek.

Indeed we have words wherein *Dia* is no preposition borrowed from a foreign language; though it is possible, the words themselves may: as in *Diamant*, *Dial*, &c.

DIABETES *, ΔΙΑΒΗΤΗΣ, in medicine, a hasty, and profuse evacuation of the drink by the urinary passages; accompanied with an ardent thirst, and leanness of the whole body.

* The word is derived from the Greek ΔΙΑΒΑΙΝΩ, to *pervade*, or *pass quick*.

The drink thus discharged, is usually a little altered from what it was when taken down, and turned chylous, and milky; but sometimes not at all.

The *Diabetes* seems owing to a too great laxity of the fibres of the arteries of the kidneys; or too great a quantity of sharp salts in the blood, which dissolve the mass of blood, or divide the parts thereof; so that the serosity is easily separated from the thicker parts.

According to Quincy, the evident, and most common cause of the *Diabetes* is the too great use of spirituous liquors, wherewith the serum becomes so impregnated, that it will not attract, and join with the cruor, or globules of the blood, but runs off through the kidneys sweet, or insipid.

There is another kind of *Diabetes*, wherein the person affected renders a great deal more by urine, than he drinks, nay, sometimes more than he both eats and drinks. Some physicians attribute this excessive quantity of liquor to the air he respire, which, they suppose, becomes converted into water; or, at least, the water in the air respired is here absorbed, and collected. But others, with more probability, attribute it to a colligation of the blood, fat, and even the solid parts of the body. See *Supplement*, Article DIABETES.

DIABETES, in hydraulics, is applied to a siphon, the two legs, or branches whereof are inclosed in one another; as in the glass described by Hero, which runs itself quite empty, without being inverted, as soon as the water is arrived at the height of the upper branch of the siphon.

DIABOTANUM, in pharmacy and chirurgery, denotes a plaister, wherewith wens, &c. are resolved, and discussed—The *Diabotanum* is sovereign for the hydatides.

DIABROSIS *, in medicine, a solution of the continuity of a part, caused by sharp, corrosive humours gnawing, and devouring the same.

* The word is Greek, compounded of ΔΙΑ, *per*, through; and ΒΡΩΣΗ, to eat.

DIACARTHAMI, in pharmacy, an electuary, composed of turbit, manna, scammony, hermodactyls, and other purgatives; with the addition of the pulp of the seed of the *Carthamus*, which gives it the denomination.

Diacarthami chiefly purges *pituita*. It is prescribed in diseases of the brain; and is frequently mixed in medicines along with other purgatives: It is now wholly out of use.

DIACARYON *, or **DIANUCUM**, in pharmacy. See **DIANUCUM**.

* The word is formed from ΔΙΑ, and *καρυα*, walnut.

Galen is said to have prepared his *Diacaryon* with the juice of walnuts, mixed with as much honey as sufficed to render it an agreeable composition.

DIACAUSTIC Curves, or *Causitic by refraction*, is a species of caustic curves, whose genesis may be thus conceived.

Imagine an infinite number of rays, as BA, BM, BD, &c. (*Tab. Geom. fig. 23.*) issuing from the same luminous point, B,

to

to be refracted from, or to the perpendicular MC, in the curve AMD; and so, as that CE, the sines of the angles of incidence CME be always to CG, the sines of the refracted angles CMG, in a given ratio: then the curve line, which touches all the refracted rays, is called the *Diacaustic*.

DIACHALCITIS, in chirurgery and pharmacy, a plaister which formerly used to be applied after the amputation of a cancer, and on many other occasions.

The *emplastrum Diachalcitidis* is composed of oil, axungia, and chalcitis; from the last of which drugs it derives its name.

DIACHYLON, in pharmacy, a name given to diverse plaisters, on account of the mucilages mixed therein, which are viscid juices, called by the Greeks *χυλοι*, drawn from certain plants. See **MUCILAGE**.

White, or simple DIACHYLON, should be compounded of common oil, litharge of gold, and mucilages drawn from marshmallow roots, fenugreek, and anniseeds. It is proper to soften, digest, ripen, and resolve.

The **DIACHYLON**, called *Ireatum*, has for its basis the common white *Diachylon*, with a pound of which, an ounce of powder of iris is mixed. This plaister digests, incises, and ripens with more force than the simple *Diachylon*.

There is also the *Great DIACHYLON*, *Diachylon magnum*, composed of litharge of gold, oils of orris, camomile, and dill, turpentine, resin of the pine, yellow wax, and mucilages of line and fenugreek, with new figs, raisins of Damascus, ichtuocolla, juices of orris, squills, and hyssop.

This *Diachylon* softens schirrus's, and resolves and dissipates tumours. It is called the *Great*, not only on account of its extraordinary virtues, but also because compounded of a greater number of ingredients than the rest.

The **DIACHYLON Gummatum**, or *Diachylon cum Gummi*, is the *great Diachylon* with the addition of gum ammoniac, galbanum, and sagapenum, dissolved with wine, and boiled to the consistence of honey. This plaister is the most powerful of all for digesting, ripening, and resolving.

DIACODIUM*, in pharmacy, a syrup prepared from poppy heads; called also the *syrupus de maccois*.

* The word is formed from the Greek *δια*, *per* and *κοδισα*, poppy-heads.

The Ancients had two kinds: *simple*, and *compound*. The *Simple DIACODIUM*, was a kind of opiate, made of the juice expressed from the heads of white poppies, and boiled up with sugar. See **OPIATE**.

It was prescribed to soften sharp, ferous humours, to appease coughs, and to provoke sleep.—This preparation was of great use among the ancients; but is now laid aside, since it has been found, that the syrup made of an infusion of white poppy heads, which is what we now call *Diacodium*, produces the same effect.

Compound DIACODIUM was made of the *simple*, with the addition of the troches of hamec, hypocistis, myrrh, saffron, and balsamites. It was used to stop, and soften catarrhs, hæmorrhoids, and fluxes of the belly.

DIACONISSA, and **DIACONATE**. See **DEACON**, and **DEACONRY**.

DIACONICON*, *Sacrificy*, a place adjoining to the ancient churches, where the sacred vestments, with the vessels, and other ornaments of the altar were preserved.

* The word is Greek, formed from *διακονω*, *Isterve*, *I minister*, by reason here was kept every thing belonging to divine service. It was also call'd *Ἀγασιον*, and in Latin *Salutatorium*; because it was here that the bishop received and saluted strangers.

Sometimes, too, it was called *Μητρώειον*, or *Metræeion*, *Mensa*, by reason of the tables kept therein, for disposing the sacred ornaments on; or rather from *Μητρώον*, a sort of inn, or house for the lodging of soldiers in.

The first council of Laodicea, in the 21st canon, forbids the priests living in the *Diaconicon*, *ἢ τῷ διακονιστῷ*, or touching the holy utensils. An ancient Latin version of those canons renders it, *in secretaria*: but the copy at Rome, as well as Dionysius Exiguus, retain the word *Diaconicon* in Latin. It is true Zonoras and Balsamon understand that expression in the 21st canon of the order of a deacon, and not of a building, to which opinion Leo Allatus also adheres in his treatise, *De Templis Græcorum*: but all the other interpreters are agreed as to its being a Sacrificy. Beside the ornaments of the priesthood and the altar, there were likewise here deposited the relics of the church.

DIACOUSTICS*, or **DIAPHONICS**, the consideration of the properties of sound refracted in passing through different mediums; that is, out of a denser into a more subtle, or out of a more subtle into a denser medium. See **SOUND**.

* The word is formed from the Greek *δια*, *per*, through, which intimates a passage; and *ακουω*, *I hear*, q. d. the consideration of the passage of the sounds we hear.

DIACRII, in antiquity, was the name of a party or faction at Athens.

That city, we read was divided into two parties: the one favourers of an oligarchy, who would only have a few persons employed in the government. The other consisted of such as were for a democratical, or popular government, wherein the whole people should have a share.—The first were called *Diacrii*, and the latter *Pediaci*; the latter inha-

biting the lower, and the former the upper quarter, or part of the city.

The laws of Solon imported, that Puffitratu should be chief of the *Diacrii*. Though the icholiast, on Aristophanes's comedy, *the Wasps*, affirms, that Pandion distributed the quarter of the *Diacrii* among his sons, and put Lycus at their head.

DIACYDONITES*, in pharmacy, is applied to things and remedies, wherein quinces are a principal ingredient.

* The word comes from *δια*, and *κυσινον*, *Quince*. *Confectio Diacydonites*, or *Diacydonium*, is marmalade, a confectio of quinces, or wherein quinces have a chief share.

DIADEM*, **ΔΙΑΔΗΜΑ**, in antiquity, a head-band, or fillet, wore by kings as a badge of their royalty; while the crown was left to the Gods.

* The word comes from the Latin *Diadema*, of the Greek *διαδωμα*, a little band encompassing the head, of the verb *διαδωω*, *cingo*, *I gird*.

The *Diadem* was a sort of ribbon, or fillet wove of silk, thread, or wool, more or less broad. It was tied round the temples, and forehead; the two ends being knotted behind and let fall on the neck.

It was usually white, and quite plain, though sometimes embroidered with gold, and set with pearls, and precious stones.—In later times it likewise came to be twined round crowns, laurels, &c. and even appears to have been wore on diverse parts of the body: thus Phavorinus observes, that Pompey was suspected of aspiring to the royalty, because of his wearing a white garter, which was no other than a ligature for an ulcer he had on his leg, but which the people construed a *Diadem*.

Pliny, lib. 7. c. 5. observes, that Bacchus was the first inventor of the *Diadem*: Athenæus assures us, that it was the copers, and good fellows, who first made use of it, to preserve themselves from the fumes of wine, by tying it tight round their heads; and that it long afterwards came to be a royal ornament.

The *Diadem* remained a long time the peculiar badge of kings; at length it was assumed by the Roman emperors, as the mark of imperial dignity.

Authors are not agreed about the time when the Roman emperors first assumed the *Diadem*. Some refer it to Caligula, others to Aurelian, and others to Constantine the Great. The younger Victor says positively, that Aurelian took the *Diadem*, which no emperor had dared to do before him. For though it should seem from the fame writer, that Caligula had done the like, yet Suetonius assures us, he had it only in view, and that he never executed it. Hellogabalus, indeed, took a *Diadem*; but it was only in the palace he wore it, and never appeared with it in public. Jornandes even goes as low as Dioclesian for the introduction of the *Diadem*; but it is certain, there is a medal of Aurelian, with a crown like one of our dual crowns, which is sustained by a border of pearls, that bears a very great affinity to a *Diadem*. And the authors, who have explained that medal, are all agreed that it is one. Mr. Spanheim also allows Aurelian to have taken it: his successors imitated him therein; and yet the ornament did not become common till the time of Constantine.—After him the emperres were allowed to wear it; accordingly we find them represented therewith on medals; though till then, we have no instance either of crown, or *Diadem* on a woman's head, in all the Roman empire.

An author of the fifth century, quoted by Bollandus, pretends that Constantine first wore the *Diadem*, and that he only took it to bind his hair, and keep it in order. But this is not very probable; and it is certain, that at least some emperors had wore it before him, as Aurelian, and Carinus. Eusebius gives it to Constantius Chlorus, when only Cæsar; which is confirmed by one of his medals, wherein he is represented with a *Diadem*, adorned with rays; though even after Constantine, when the *Diadem* was become the usual ornament of the Augusti, it was not always given to the Cæsars. Indeed, we see it on some of the medals of Julian, while only Cæsar; though it is pretty certain, he did not wear it till he became Augustus.—Du Cange will not assert, that Constantine first took the *Diadem*; but only, that he first made it into a kind of cask, or close-crown, as is seen in some of his medals, and those of his successors.

DIADEM, in heraldry, is applied to certain circles, or rims, serving to bind, or inclose the crowns of sovereign princes; and to bear the globe, and cross, or the flower de luces for their crest.

The crowns of sovereigns differ in this, that some are bound with a greater, and some with a less number of *Diadems*.

Prelates likewise appear to have anciently worn a sort of *Diadem*: thus Baronius writes, that St. James the Apostle wore a gold plate on his forehead, as a mark of his episcopal dignity.

In blazoning, the bandage about the heads of Moors, on shields, is sometimes also called *Diadem*.

DIÆRESIS*, in chirurgery, the operation of dividing, and separating parts whose union, and continuity were an obstacle to the cure; or which were joined, and conglutinated contrary to the order of nature.

* The word in its original Greek *διαίρεσις*, signifies *Division*.

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There are five manners of performing the *Diarefsis*, viz. by cutting, pricking, tearing, drawing, and burning.

DIÆRESIS, is also used in medicine for the destroying, or consuming of the vessels, or canals of an animal body: when, from some cutting, or obstructing Humour certain passages are made, which naturally ought not to have been, or certain natural passages are dilated beyond their ordinary dimensions; so that the juices which should have been contained therein, extravasate, or run out.

DIÆRESIS, in grammar, is a figure whereby a diphthong is divided into two syllables: as *Aulæ* into *Aulai*, *Piææ* into *Piæai*, *Aquæ* into *Aquai*.

DIÆRESIS, is also used in the general for any division of one syllable into two: as in that verse of Tibullus, *Stamina non ulli dissoluenda Deo, for dissoluenda*.

This is usually noted by two points placed over a letter, to shew that it is to be sounded by itself, and not joined with any other so as to make a diphthong: thus *Æra*, by the points over the *e*, is distinguished from *Æra*.

It is also a kind of metaplasm, or addition to a word, by dividing one syllable into two; as *Aulæ*, by a *Diarefsis*, is a word of three syllables, instead of *Aulæ*.

DIAGLYPHICE, the art of engraving, cutting, or otherwise working hollow, or concave figures, in metals; such as seals, intaglias, the matrices or coins for medals, &c. See **SCULPTURE**.

DIAGNOSTIC *, in medicine, a term applied to those signs, or symptoms, which indicate, or discover the present state of a disease, its nature, and cause.

* The word is compounded of the Greek, *δια*, per, through, or by; and *γνωσκω*, I know.

The physicians have *Diagnostic*, as well as *Prognostic*, signs; the first with regard to the present fate of the disease, and the patient; and the second to the future.

DIAGONAL, in geometry, a right line drawn a-cross a parallelogram, or other quadrilateral figure, from the vertex of one angle to that of another.

Such is the line PN (*Tab. Geometr. fig. 24.*) drawn from the angle P, to N.

Some authors call it *Diameter*, and others the *Diametral* of the figure.

It is demonstrated, 1. that every *Diagonal* divides a parallelogram into two equal parts: 2. two *Diagonals* drawn in any parallelogram, bisect each other: 3. the *Diagonal* of a square is incommensurable with one of its sides.

Add, 4. a very noble theorem in elementary geometry, first demonstrated by Mr. Lagny, in the *Memoires de l'Académie Royale des Sciences*, An. 1706. is that the sum of the squares of the two *Diagonals* of every parallelogram, is equal to the sum of the squares of the four sides.

It is evident, at first sight, that the famed 47th proposition of Euclid, so richly worth the hecatomb it cost its author, is only a particular case of this proposition: for if the parallelogram be rectangled, it follows of course, that the two *Diagonals* are equal; and, of consequence, that the square of a *Diagonal*, or, which is the same thing, the square of the hypotenuse of a right angle, is equal to the squares of the two sides. If a parallelogram be oblique-angled, and of consequence, the two *Diagonals* unequal, as is the more usual case; the proposition becomes of more extensive use.

The demonstration in oblique-angled parallelograms is thus: suppose the oblique-angled parallelogram ABCD, (*Tab. Geomet. fig. 25.*) whereof BD is the greater *Diagonal*, and AC the lesser: from the point A, of the obtuse angle DAB, let fall a perpendicular AE, to the side CD; and from the point B another perpendicular BF to the side DC. Then are the triangles ADE, BCF equal, and similar, as AD is equal to BC, and the angle ADE, BCF, as well as AED, BCF, are also equal; consequently DE is equal to CF. Now, by Euclid, *prop. 12. lib. 2.* in the obtuse-angled triangle BDC, the square of the side BD is equal to the sum of the squares of BC, and CD, and over and above, to double the rectangle of CF by CD; and by the 13th, *lib. 2.* in the triangle DAC, the square of the side AC is equal to the sum of the squares of AD, and CD, abating double the rectangle of the same CD, by DE, equal to CF. Consequently, the former exceeds precisely compensating this defect; the sum of the squares of the two *Diagonals* is equal to the sum of the squares of the four sides. Q. E. D.

Hence, in every rhombus, or lozange, knowing one side, and a *Diagonal*; the other *Diagonal* will likewise be known: for as the four sides are equal; subtracting the square of the given *Diagonal* from quadruple the square of the given side; the remainder is the square of the *Diagonal* required.

The proposition is likewise of great use in the theory of compound motions: for in an oblique-angled parallelogram, the greater *Diagonal* being the subtense of an obtuse; and the lesser, of an acute angle, which is the complement of the former; the greater will be the greater, and the less the less, as the

obtuse angle is the greater; so that if the obtuse angle be conceived to grow till it be infinitely great with regard to the acute one, or which amounts to the same thing, if the two contiguous sides of the parallelogram be extended directly, end to end in a right line; the great *Diagonal* becomes the sum of the two sides, and the lesser one, nothing. Now, two contiguous sides of a parallelogram being known, together with the angle they include, it is easy to find the subtense of that angle, i. e. one of the *Diagonals* of the parallelogram, in numbers; which done, Mr. de Lagny's proposition gives the other. Which second *Diagonal* thus found, is the line that would be described by a body impelled at the same time by two forces, which should have the same ratio to each other, as the contiguous sides have, and act in those two directions; which *Diagonal* the body would describe in the same time, as it would have described either of the contiguous sides in, if only impelled by the force corresponding thereto.

This is one of the great uses of the proposition: for the ratio of two forces, and the angle they make, being given, it is frequently necessary to determine, in numbers, the line a body impelled by the two forces would describe in a certain time.

All the sides of a rectilinear figure, as AB, BC, CD, DE, (*fig. 26.*) excepting one EA, and the angles O, and Y, being given; to find the *Diagonals*.

In the triangle ABE, the sides AB, and AE being given, the angle Q is easily found by trigonometry; and from this, the *Diagonal* BE. And after the like manner the triangle BCD is resolved, and the *Diagonal* BD found.

Since ichnographies, or plans, are best taken by having all the sides, and *Diagonals*; the use of this problem in planimetry is of some importance; especially to such as are willing to have their work accurate, though at the expence of calculation.

DIAGRAM, in geometry, &c. a scheme, for the explanation or demonstration of any figure, or the properties thereto belonging.

DIAGRAM, or **DIAGRAMMA**, in the ancient music, was what we call the *Scale*, or *Gammut*, in the modern.

The extent of the *Diagramma*, which they also called *Systema perfectum*, was a diatessaron, or two octaves in the ratio 1:4. In that space they had eighteen chords, though these had not all different sounds.

To explain it, they represent to us eighteen chords, or strings of an instrument, as the lyre, supposed to be tuned according to the proportions in any of the Genera, viz. Diatonic, Enharmonic, or Chromatic.

As the lyre was improved, and more chords added to it; so was the *Diagramma*: by such means it came from 4 chords to 7, then 8, then 10, then 14, and at last 18.

To each of these chords, or sounds, they gave a particular name, taken from its situation in the *Diagramma*, or the Lyre. Their names, and order, commencing from the lowest, are as follow: *Prostambanomenos*, *Hypate-Hypaton*, *Parlypate-Hypaton*, *Lychanos-Hypaton*, *Hypate-Meson*, *Parlypate-Meson*, *Lychanos-Meson*, *Mese*, *Trite-Synemmenon*, *Paranete-Synemmenon*, *Nete-Synemmenon*, *Para Mese*, *Trite-Diazeugmenon*, *Paranete-Diazeugmenon*, *Nete-Diazeugmenon*, *Hyperboleon*, *Paranete-Hyperboleon*, *Nete-Hyperboleon*.

Guido Aretime improved this scale, or *Diagram*, very greatly. Finding it of too small extent, he added five more chords, or notes to it; laid them all down on a staff of five lines; and instead of the long Greek names above-mentioned, named all his notes by Gregory's seven letters. See **NOTE**.

The first, or lowest note of his scale, he marked T, and called *Gamma*; whence the whole scale came to be denominated. See **GAMMUT**.

DIAGRYDIUM, in pharmacy, is scammony prepared or corrected for medicinal use.

The preparation is ordinarily performed by baking the scammony in a quince. Others make it receive the fumes of lighted sulphur, whence it is called, *sulphurated*, or *Diagrydium sulphuratum*. Some incorporate it with a quantity of spirit of vitriol rosat. sufficient to make a sort of liquid paste, which is afterwards set to dry in the sun, or by a gentle fire. And this preparation they call *Diagrydium Rosatum*.—The end of all these preparations is to correct the scammony; but the generality of authors now are of opinion, it has nothing that needs correction, and that it may be used in its natural state. See **SCAMMONY**.

DIAHEXAFLA, among farriers, a drink made for horses, denominated from the six Ingredients it consists of; viz. birth-worth, gentian roots, juniper berries, bayberries, myrrh, and ivory shavings.—It is esteemed a good stomachick, and cures bites of venomous beasts, colds, consumptions, &c.

DIAL *, or **Sun-DIAL**, an instrument serving to measure time, by means of the shadow of the sun.

* The word is formed from the Latin *dies*, day, because indicating the hour of the day. See **HOUR**.

The ancients also call it *sciathericum*, from its doing it by the shadow.

D I A

DIAL is more accurately defined, a draught, or description of certain lines on a plane, or surface of a body given, so contrived, as that the shadow of a style, or ray of the sun passed through a hole therein, shall touch certain points at certain hours.

The diversity of *Sun-Dials* arises from the different situation of the planes, and the different figure of the surfaces whereon they are described; whence they become denominated *equinoctial*, *horizontal*, *vertical*, *polar*, *direct*, *erect*, *declining*, *inclining*, *reclining*, *cylindrical*, &c.

Dials are sometimes distinguished into *primary*, and *secondary*.

Primary DIALS, are those either drawn on the plane of the horizon, called *horizontal Dials*; or perpendicular thereto, on the planes either of the meridian, or prime vertical, called *vertical Dials*: to which number are also usually added those drawn on the polar, and equinoctial planes, though neither horizontal, nor vertical.

Equinoctial DIALS, is that described on an equinoctial plane, or a plane representing that of the equinoctial.

A plane oblique to the horizon, either hangs over towards it, and makes an acute angle with the plane of the horizon; or it falls off backwards from it, and makes an obtuse angle therewith. This latter is called a *reclining plane*; which, if it recline back equal to the complement of the latitude of the place, then it lies in the plane of the equinoctial; and a *Dial* drawn thereon, is denominated an *equinoctial Dial*.

Equinoctial Dials are usually distinguished into *upper*, which look towards the Zenith, and *lower*, which respect the Nadir.

Now as the sun only illumines the upper surface of an equinoctial plane, while he is in our hemisphere, or on the northern side of the equator; an *upper equinoctial Dial* will only shew the hour, during the spring, and summer-season.

And again, as the sun only illumines the lower surface of an equinoctial plane, while he is in the southern hemisphere, or on the other side the equator; a *lower equinoctial Dial* will only shew the hour in autumn, and winter.

To have an *equinoctial Dial*, therefore, that shall serve all the year round, the *upper* and *lower* must be joined together; that is, it must be drawn on each side of the plane.

And since the sun shines on one side or on the other of an equinoctial plane the whole day; such a *Dial* will shew all the hours of an artificial day.

To describe an equinoctial Dial geometrically.—The *equinoctial* is the first, easiest, and most natural of all *Dials*: but the necessity of drawing it double, prevents its being much in use. However, as its structure shews the reason of the other kinds; and as it even furnishes a good mechanical method of drawing all the other kinds of *Dials*, it shall be here laid down.

First, then, *to describe an upper equinoctial Dial*: From a centre C (*Tab. Dialling, fig. 4.*) describe a circle ABDE, and by two diameters AD, and BE, intersecting each other at right angles, divide it into quadrants AB, BD, DE, and EA. Subdivide each quadrant into six equal parts by the right lines C₁, C₂, C₃, &c. which lines will be hour-lines. Through the centre C drive a style, or pin, perpendicular to the plane ABDE.

The *Dial* thus described, being raised so as to be in the plane of the equator, the line C 12, in the plane of the meridian, and the point A looking towards the south; the shadow of the style will shew the hours both of the forenoon and afternoon.

For, horary circles include arches of the equator of fifteen degrees each. Consequently the plane ABDE being supposed in the plane of the equator, the horary circles will likewise include arches of 15 degrees of the circle ABDE. Wherefore, since the angles 12 C 11, 11 C 10, 10 C 9, &c. are each here supposed 15 degrees, the lines C 12, C 11, C 10, C 9, &c. are intersections of horary circles, with the plane of the equinoctial. Again, since the style passing through the centre C, represents the axis of the world; its distance from the centre of the earth being inconsiderable, and it being the common diameter of the horary circles; its shadow will cover the hour-line C 12, when the sun is in the meridian, or circle of 12 a-clock; C 11, when in the circle of 11 a clock; C 10, when in the circle of 10 a-clock, &c.

Secondly, *To describe a lower equinoctial Dial*: The method is the same as that for the *upper Dial* already described; except that no hour-lines are to be drawn beyond that of 6 a-clock.

Thirdly, *To describe an universal equinoctial Dial*: Join two metal, or ivory planes ABCD, and CDEF (*fig. 5.*) so as to be moveable at the joint. On the upper surface of the plane ABCD, describe an *upper equinoctial Dial*, and upon the lower a *lower*, as already directed; and through the centre I drive a style. In the plane DEFC cut a box, and put a magnetical needle G therein; fit on the same plane a brass quadrant nicely graduated, and passing through a hole cut in the plane ABCD. Now, since this may be so placed, by means of the needle, as that the line I 12, shall be in the plane of the me-

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ridian; and, by means of the quadrant, may be so raised, as that the angle BCE shall be equal to the elevation of the equal tor; it will serve as a *Dial* in any part of the world.

Horizontal DIAL, is that described on a horizontal plane, or a plane parallel to the horizon.

Since the sun may illumine a horizontal plane at all times of the year, while he is above the horizon; a *horizontal Dial* may shew all the hours of the artificial day, throughout the year: so that a more perfect *Dial* than this kind cannot be required.

To describe an horizontal Dial geometrically. Draw a meridian line AB, (*fig. 6.*) on the given immovable plane; or assume it, at pleasure, on a moveable one. See **MERIDIAN LINE**.

From a point taken at pleasure, as C, erect a perpendicular CD, and make the angle CAD equal to the elevation of the pole. In D make another angle CDE equal likewise to the elevation of the pole, and draw the right line DE meeting AB in E. Then make EB equal to ED, and from the centre B with the radius EB, describe a quadrant EBF, which divide into six equal parts. Through E draw the right line GH, cutting AB at right angles. From the centre B through the several divisions of the quadrant EF draw right lines B₁, B₂, B₃, B₄, B₅, B₆, B₇, B₈, B₉, meeting the line GH, in the points a b c d h.

From E upon the right line EG fet off the intervals Ea, Eb, &c. *viz.* Ea from E to e, Eb from E to f, Ec from E to g, &c. From the centre A describe a little circle, and applying a little ruler to A, and the several points of division a, b, c, d, h, and e, f, g, h, G, draw the lines A 1, A 10, A 9, A 8, A 7, and A 1, A 2, A 3, A 4, A 5. Through A draw a right line 6, 6 perpendicular to AB. Continue the right line A 7, beyond the little circle to 7, A 8 to 8, A 5 to 5, and A 4 to 4. Round the whole scheme draw a square, circle, or oval figure. And lastly in A fix an index, making an angle DAC with the meridian AB equal to the elevation of the pole: or in C erect a perpendicular style equal to CD; or at A E fix a triangular plate ADE perpendicular to the plane of the *Dial*.

In this case, the lines A 11, A 10, A 9, &c. are the hour-lines of the forenoon; and A 1, A 2, A 3, &c. those of the afternoon: and the shadows of any of the gnomons, or styles above-mentioned, at the several hours, will fall on the respective hour-lines.

To describe a horizontal Dial, trigonometrically. In large *Dials*, where the utmost accuracy is required, geometrical lines are best set aside; and in lieu thereof, the lines of the *Dial* are to be determined by trigonometrical calculation. M. Clapius, in the *Memoires de l'Académie Royale des Sciences, An. 1707*, has done the World good service herein; having rendered the calculation of the hour-lines, which before had been operose enough, exceeding easy and expeditious: his canons, or analogies we shall lay down under the respective kinds of *Dials*.

And, first, for a *horizontal Dial*: the elevation of the pole of the place being given, to find the angles, which the hour-lines make with the meridian, in the centre of the *Dial*.

The *analogy, or canon*, is thus: As the whole sine is to the sine of the elevation of the pole of the place; so is the tangent of the sun's distance from the meridian, for the hour required; to the tangent of the angle required. That is, as the side AC, (*fig. 7.*) is to DC: so is the tangent of DC, to the tangent FC, of the angle FAC. See **TANGENT**, &c.

Vertical DIAL, is that drawn on the plane of a vertical circle. See **VERTICAL**.

Of these there are several varieties, according to the vertical pitched upon. The verticals chiefly used are the prime vertical, and the meridian; from which respectively arise *south*, *north*, *east*, and *west Dials*.

Dials which respect the cardinal points of the horizon, are particularly called *direct Dials*. See **DIRECT**.

If any other vertical be chose, the *Dial* is said to *decline*.

Further, if the circle, whose plane is used, be perpendicular to the horizon, as is supposed to be the case in all those now mentioned; the *Dials* are particularly denominated *erect*. E. gr. *erect*, *south*, *erect north*, &c.

Otherwise, the plane being oblique to the horizon, they are said either to *incline*, or *recline*.

South DIAL, or more particular an *erect direct south DIAL*, is that described on the surface of the prime vertical circle looking towards the south.

Since the sun then illumines the plane of the prime vertical looking to the south, when, in its progress he passes from the prime vertical to the meridian, or returns back from this to that; in which he is employed six hours before, and six after noon; a *south Dial* shews the hours from six in the morning to six at night.

To draw a vertical south Dial. On the plane of the prime vertical looking southwards, draw a meridian line AB, (*fig. 8.*) and taking the interval AC at pleasure for the magnitude of the future *Dial*; in C erect a perpendicular of an indefinite length CD, and making an angle CAD equal to the elevation of the equator, draw a right line AD meeting the perpendicular

DIAL

dicular CD in D. Then in the point D make the angle CDE likewise equal to the elevation of the equator, and draw the right line DE cutting the meridian in E. Through E draw the right line GH, cutting the meridian AB at right angles. Take EB equal to ED, and with this radius describe a quadrant EF.—The rest is performed as in a *horizontal Dial*, except that the hours of the afternoon are to be wrote on the right hand, and those of the forenoon on the left; as may be conceived from the figure. Lastly, in the point A fix an oblique style in an angle equal to the elevation of the equator: or in C erect a perpendicular style equal to CD: or, lastly, a triangular plate ADE upon AE, so as to be perpendicular to the plane of the *Dial*. Then will the shadow of any of these indexes touch the several hour-lines at their respective hours.

North Dial, or *erect direct north Dial*, is that described on the surface of the prime vertical looking northward.

Since the sun only illumines this surface, while he advances from the east to the prime vertical, and proceeds from the same vertical to the west; and since he is in the prime vertical at six a-clock in the morning, and at six in the evening; a *north Dial* shews the hours before six in the morning, and those after six in the evening. And hence, as in autumn and winter-time, the sun does not rise before six, and sets before six in the evening; a *north Dial* is of no use all that time: but this being joined with a *south Dial*, it supplies the defects thereof.

To describe a vertical north Dial. Draw a meridian line EB, (fig. 9.) and from A describe a little circle at pleasure. At A make the angle DAC equal to the elevation of the equator, and from the point C taken at pleasure, erect a perpendicular CD meeting AD in D. Make another angle CDE likewise equal to the elevation of the equator, and draw likewise a line DE meeting AE in E. Then take IB equal to ED. And through I draw GH, cutting SB at right angles. And from the centre B with the radius IB describe a quadrant; which divide into six equal parts. Through the two extreme divisions draw lines from the centre B, viz. Bd, and BH, meeting GH in d, and H, and make I h equal to Id, and IG equal to IH. Then applying a ruler to A and d, and H; and again to A and h, and G, draw the right lines A5, A4, A7, and A8. Lastly, in A fix an oblique index AD, making an angle DAE with the meridian line in the plane of the meridian, equal to the elevation of the equator: or a perpendicular index in C equal to CD: or, instead of an index, a triangular plate EDA on the meridian line EA, perpendicular to the plane of the *Dial*.

Then will A4, A5, A6, be the hours of the forenoon; and A6, A7, and A8, those of the afternoon; and accordingly will be pointed out by the shadow of the several indexes. Or thus: in a *south Dial*, (fig. 8.) if the hour-lines 4 and 5, as also 7 and 8, be continued beyond the line 6 A 6; and the triangle ADE turned about its pole A till AE fall directly against A 12; it is evident, a *north Dial* is hereby had: only observing what has been said about writing the hours.

To draw a vertical north, or south Dial trigonometrically. These only differ from the *horizontal Dial*, in that the angle CAB is equal to the complement of the elevation of the pole of the place; so that the same analogy serves as for the horizontal one: only making the second term the complement of the elevation of the pole of the place.

East Dial, or *erect direct east Dial*, is that drawn on the plane of the meridian, looking to the east. Since the sun only illumines the plane of the meridian looking eastward, before noon; an *east Dial* can only shew the hours till twelve o'clock.

To describe an east Dial. On the eastern side of the plane of the meridian draw a right line AB, (fig. 11.) parallel to the horizon, and to this join AK, making with it an angle KAB, equal to the elevation of the equator. Then with the radius DE describe a circle, and through the centre D draw EC perpendicular to AK; by which means the circle will be divided into 4 quadrants. Each of these quadrants sub-divide into six equal parts. And from the centre D through the several divisions draw right lines, D4, D5, D6, D7, D8, D9, D10, D11. Lastly, in D erect a style equal to the radius DE, perpendicular to the plane; or, on two little pieces perpendicularly fixed in EC, and equal to the same radius DE, fit an iron rod parallel to EC.

Thus will each index at the several hours project a shadow to the respective hour-lines 4, 5, 6, 6, &c.

West Dial, or *erect direct west Dial*, is that described on the western side of the meridian.

As the sun only illumines that side of the plane of the meridian, looking to the west after noon, a *West Dial* can only shew the hours from noon to night.

This, therefore, joined with an *East Dial*, shews all hours of the day.

To draw a west Dial. The construction is perfectly the same as that of an *east Dial*: only that its situation is inverted, and the hours are wrote accordingly.

DIAL

Polar Dial, is that described on a plane passing through the poles of the world, and the east, and west points of the horizon.

It is of two kinds: the first looking up towards the zenith, and called *upper*; the latter down to the nadir, called *lower*. The *polar Dial*, therefore, is inclined to the horizon in an angle equal to the elevation of the pole.

Since the polar plane POQS (fig. 12.) passes through the east and west points O and S, a quadrant of the equator is intercepted between it, and the meridian: consequently the upper surface is illumined by the sun from six in the morning to six at night; and the lower from the sun's rise to six in the morning, and from six in the evening to sun-set. A *lower polar Dial*, therefore, shews the hour of the morning from sun-rise to six a-clock, and that of the evening from six to sun-set; and an *upper*, the hours from six in the morning to six in the evening.

To draw an upper polar Dial. Draw a right line AB (fig. 13.) parallel to the horizon, and if the plane be immoveable, find the meridian line CE. Divide CE into two equal parts, and through C draw a right line FG parallel to AB. Then from the centre D with the interval DE, describe a quadrant, which divide into six equal parts. And from the same centre D through the several points of division draw right lines D 1, D 2, D 3, D 4, D 5; and the intervals E 1, E 2, E 3, E 4, E 5, set off the contrary way, viz. E 11, 10, 9, 8, and 7. From the points 5, 4, 3, 2, 1, &c. raise perpendiculars meeting the line FG in the correspondent points. Lastly, in D erect a perpendicular style equal to DE; or on two equal pieces E and C, fix a cross iron rod. Then will 12, 12, 11, 22, 33, &c. be hour-lines, to be pointed out at the proper times by the shadow of the indices.

An *upper polar Dial* only differs in situation, and the manner of writing the hours, from *east*, and *west Dials* joined together in the line of six a-clock.

A *lower polar Dial* is had by putting out the hours of the forenoon 9, 10, and 11, and those of the afternoon 1, 2, and 3, with the noon-hour 12 itself: and only leaving the hours 7 and 8 of the morning, and 4 and 5 in the evening.

To draw all the primary DIALS on the same block, or post. 1. Let the plane ABCD (fig. 14.) in the proper position of the block be supposed horizontal; and thereon describe a *Horizontal Dial*. See *Horizontal Dial*.

2. Draw the right lines EM, and FL parallel to DC, which accordingly, in the proper position of the block, will be parallel to the horizon. Then let the plane BNM C make an angle with EM, equal to the elevation of the pole, CMB: and thereon describe an *upper polar Dial*.

3. Let the opposite plane ADE make with EM an angle DEM, equal to the elevation of the equator: and on this draw an *upper equinoctial Dial*.

4. Let the plane KLHI make with FL an angle HLF equal to the elevation of the equator: and on this describe a *lower equinoctial Dial*.

5. Let the opposite plane FG make with FL an angle GFL equal to the elevation of the pole: and here draw a *lower polar Dial*.

6. Let the plane MNKL, and the opposite one EF be perpendicular to FL; and on that draw a *south Dial*, and on this a *north Dial*.

7. On the plane EMLF describe a *west Dial*; and on the opposite plane an *east Dial*.

If then the block be so placed, as that the plane MNKL looks to the south, and the plane of the meridian affect it in the line of 12 a-clock in the *horizontal Dial* ABCD, and *south Dial* MNKL; all the hours of the day will be indicated by several planes at once.

Secondary DIALS are all those drawn on the planes of other circles, beside the horizon, prime vertical, equinoctial, and polar circles: or those, which either *decline*, *incline*, *recline* or *decline*.

Declining DIALS are erect, or vertical *Dials*, which *decline* from any of the cardinal points; or, they are such as cut either the plane of the prime vertical, or of the horizon at oblique angles. The use of *declining Dials* is very frequent; as the walls of houses, whereon *Dials* are usually drawn, commonly deviate from the cardinal points.

Of *declining Dials* there are several kinds, which are denominated from the cardinal points, which they seem most to respect, but from which they have a real declination: *decliners from the south*, and *from the north*, and even *from the zenith*.

To draw a vertical declining Dial trigonometrically.

The declination of the plane, and the elevation of the pole of the place, being given: to find the angle formed in the centre of the *Dial*, by the meridian and substyle.

Canon: As the whole sine is to the tangent of the complement of the height of the pole of the place GF; (fig. 15.) so is the sine of the angle of the declination of the plane GFD to the tangent GD, of the angle required, GAD.

2. The declination of the plane being given, and the elevation of the pole of the place; to find the angle formed in the centre of a *vertical declining Dial*, by the substyle and axis.

Canon: As the whole sine is to the sine of the complement

of the elevation of the pole GF; so is the sine of the complement of the declination of the plane DGF, to the side DF, the sine of the angle DAB required.

3. The declination of the plane, and the elevation of the pole, given; to find the difference of longitudes, that is, the arch of the equator comprehended between the meridian of the place, and the meridian of the plane.

Canon: As the whole sine is to the sine of the height of the pole of the place; so is the tangent of the complement of the Declination of the plane, to the tangent of the complement of the difference of longitudes.

4. The angle of the difference of longitudes, and that of the axis, with the substyle, being given; to find the angles formed in the centre of a vertical declining Dial, between the substyle and hour-lines.

This problem admits of three cases. For the hour-lines, whose angles are sought, may be either, 1. Between the meridian, and substyle; or, 2. Beyond the substyle; or, 3. On that side the meridian where the substyle is not. In the two first cases, the difference is to be taken between the sun's distance from the meridian that hour, and the angle of the difference of longitudes found by the last problem: and in the third case, the sum of those two angles is to be taken; and the following canon used.

Canon: As the whole sine is to the sine of the angle between the axis and substyle; so is the tangent of the difference of the sun's distance from the meridian, and the difference of longitudes, or of the sum of those two angles; to the tangent of the angle required.

5. The angle formed by the substyle, with the hour-lines, and that of the substyle, with the meridian, given; to find the angles formed between the meridian, and hour-lines in the centre of vertical declining Dials.

1. The angles of the hour-lines between the meridian, and substyle, are found by subtracting the angle formed by the substyle, with the hour-line, from the angle formed by the substyle, with the meridian.

2. The angles beyond the substyle, and on the side opposite to that of the meridian, are found by adding those two angles.

3. Those on the other side the meridian, are found by taking their difference.

To describe a vertical DIAL, declining from the south to the east, or west, geometrically. Find the declination of the plane, as already taught under the article DECLINATION, and DECLINATOR. Then draw upon a paper a horizontal Dial, supposing the line of contingency of the horizontal, with the equinoctial plane to be GH, (fig. 16.) Through the point E, wherein the meridian line AE cuts the same, draw a right line IK, making with GH an angle HEK equal to the declination of the given plane. Thus, as GH represents the intersection of the prime vertical, with the horizon; IK will be the intersection of the inclining plane, and the horizon; whence we also conceive, that the part IE must be raised above GE, in case the given plane decline to the west; or it must be depressed below the same GE, in case it decline to the east. Draw a right line parallel to the horizon on the given plane, or wall, to answer to IK, and assuming a point therein, answering to E set off from the right line IK on the paper, the several horary distances E 1, E 2, E 3, &c. Then from the point E erect a perpendicular EC, equal to the distance of the centre of the horizontal Dial, from its line of contingency. Draw lines thence to the several points of the hour lines E 1, E 2, E 3, &c. let fall a perpendicular AD from the centre of the horizontal Dial A to the line of contingency IK, and transfer the distance ED from the point E upon the wall; then will CD be the substylar line.

Wherefore, joining AD and DC at right angles; the hypothenuse AC will be an oblique index to be fastened on the wall in the point C, according to the angle DCA.

To draw a vertical DIAL declining from the north towards the east and west. Take the declination of the plane, as already taught; then, as north Dials are only south Dials inverted, draw a vertical Dial declining from the south, and invert it in such manner, as that the centre C look to the horizon, and the point E to the zenith; and the hours on the right hand set off towards the left, and contrarywise; omitting all hour-lines, which in such a plane cannot be shewn.

For the practice the best way is, after drawing a south decliner upon paper, to prick the several points thereof through with a pin; then applying the face of the paper to the wall, the back-side thereof will shew you all the points necessary for the north declining Dial.

Inclined DIALS, are those drawn on planes not erect, but inclining, or leaning forward towards the south, or southern side of the horizon, in an angle, either greater or less than the equinoctial plane.

Such an inclined plane may be conceived by supposing one part of the plane of the equator lifted up toward the zenith, and the other depressed toward the nadir; and thus to revolve upon a line drawn from the east to the west points of the horizon.

To draw an inclined DIAL. 1. The inclination of the plane, as DC (fig. 17.) being found by a declinator, as taught under DECLINATOR; if it fall between the equinoctial plane CE, and the vertical one CB, in such manner, as that the angle of inclination DCA is greater than the elevation of the equator ECA: on the upper side draw a north Dial; and on the lower a south Dial to an elevation of the equator, which is equal to the aggregate of the elevation of the equator of the given place, and the complement of the inclination to a quadrant.

2. If the inclined plane GF fall between the horizontal one CA, and the equinoctial CE, so as that the angle of inclination FCA is less than the elevation of the equator ECA: describe an horizontal Dial to an elevation of the pole, equal to the aggregate of the elevation of the pole of the given place, and the inclination of the plane.

Dials thus inclined, are drawn after the same manner as primary Dials, except, that the index in the former case must be fitted under the angle ADC, and in the latter under the angle DFC: and that the distance of the centre of the Dial from the line of contingency in the former case is DC, and in the latter FC.

Reclining DIALS, are those drawn on planes not erect, but reclined, or leaning backwards from the zenith towards the north, in an angle greater, or less than the polar plane.

A reclined plane may be conceived by supposing one part of the polar plane raised towards the zenith, and the other depressed towards the nadir: and thus revolving about a line drawn from east to west. — To find the reclination of a plane. See RECLINATION.

To draw a reclining DIAL. 1. If the reclined plane HC fall between the vertical plane BC, and the polar plane IC; so as that the angle of reclination BCH is less than the distance of the pole from the zenith BCI: describe two vertical south and north Dials to an elevation of the equator, equal to the difference between the elevation of the equator of the given place, and the angle of reclination.

2. If the reclined plane, as KC fall between the polar plane IC, and the horizontal one CL; so as that the angle of reclination BCK is greater than the distance of the pole from the zenith ICB: describe a horizontal Dial thereon to an elevation of the pole, equal to the difference between the angle of reclination, and the elevation of the equator of the given place.

To draw inclining, and reclining DIALS trigonometrically. The inclination, or reclination of the plane, and the elevation of the pole being known; to find the angles made in the centre of an inclining, or reclining Dial, by the meridian, and hour-lines.

Such Dial is properly a horizontal Dial, for a latitude equal to the particular elevation of the pole on the plane of the Dial. Its angles, therefore, are found by the canon laid down for horizontal Dials.

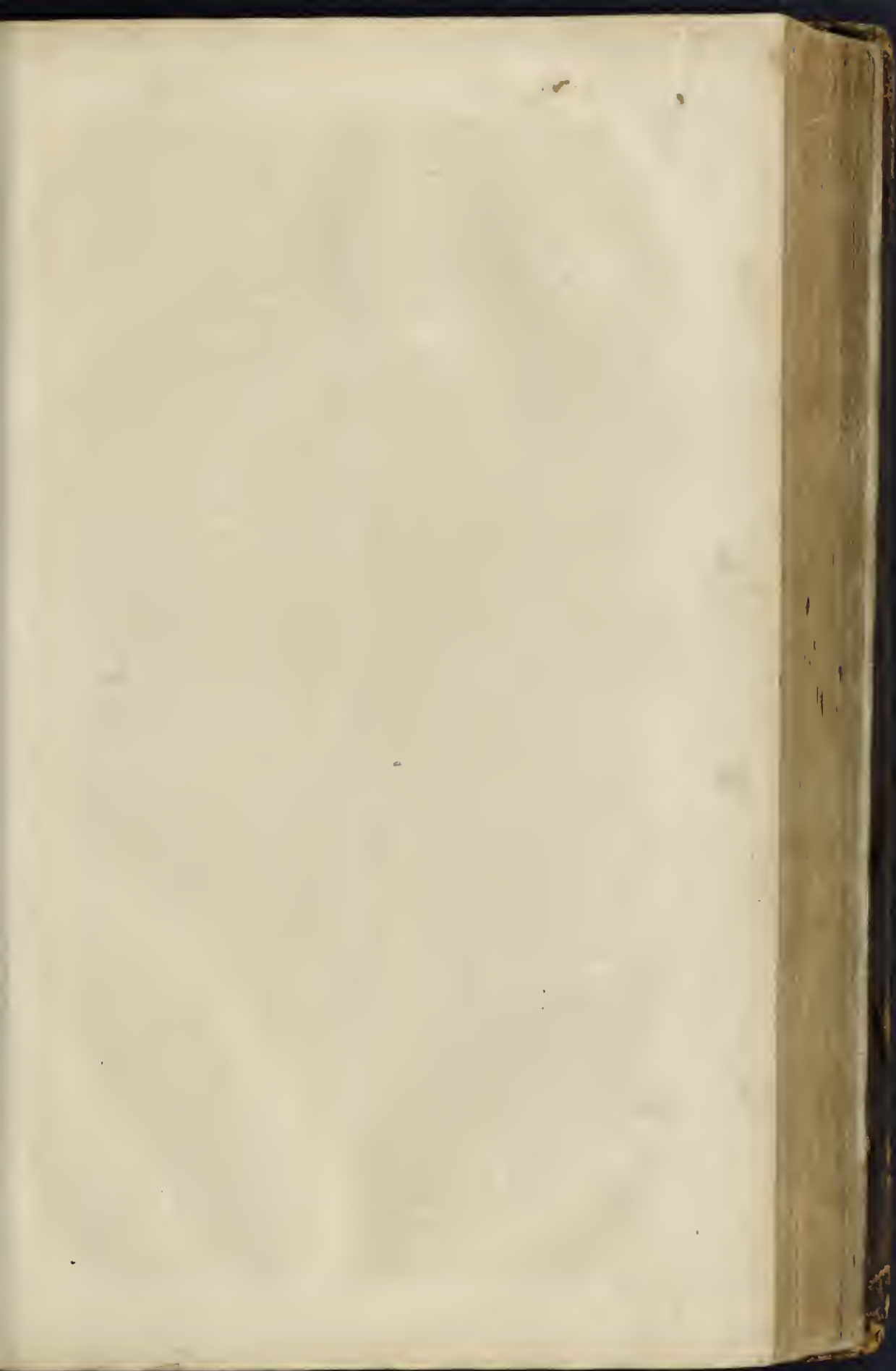
As to the elevation of the pole, on the Dial plane, it is thus found: the plane being inclined; either its inclination is greater than the elevation of the pole of the place; or less; or it is equal thereto. In the two first cases, for upper south, or lower north Dials, the particular elevation of the pole on the plane, is had by taking the difference between the elevation of the pole of the place, and the inclination of the plane: and in the latter case, the Dial is a polar Dial, wherein the hour-lines will be parallel, by reason that the plane being placed on the axis of the world, neither of the poles can be represented thereon.

For upper north, and lower south Dials: 1. If the inclination be greater than the complement of the elevation, the complement of the inclination must be added to the complement of the elevation. 2. If it be less, the inclination must be added to the elevation. 3. If it be equal, the Dial will be an equinoctial Dial, wherein the angles at the centre will be equal to the sun's distance from the meridian.

Deinclined DIALS, are those which both decline, and incline, or recline. See DEINCLINED.

The use of inclined, reclined, and especially deinclined Dials, is very rare; the geometrical, and trigonometrical construction of these last, therefore, as being somewhat intricate withal, we here chuse to omit, and refer such as may have a fancy for such a Dial, to an universal mechanical method of drawing all kinds of Dials here subjoined.

An easy method to describe a DIAL, on any kind of plane, by means of an equinoctial Dial or circle. Suppose e. gr. a Dial required on a horizontal plane: if the plane be immoveable, as ABDC (fig. 18.) find a meridian line GF: or if moveable, assume the meridian at pleasure. Then by means of the triangle KEF, whose base is applied on the meridian line, raise the equinoctial Dial H, till the index GI becomes parallel to the axis of the world, (which is had, if the angle KEF be equal to the elevation of the pole) and the 12 o'clock line on the Dial hang over the meridian line of the plane, or the base of the triangle. If then in the nighttime a lighted candle being successively applied to the axis GI, so as the shadow of the index, or style GF fall upon one hour-



TAB. DIALLING.

Fig. 4. Equinoctial Dial

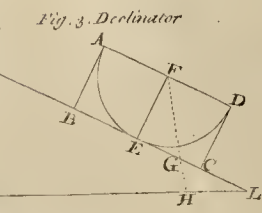
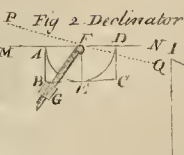
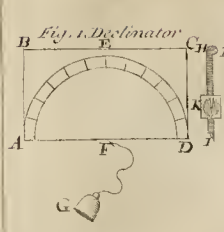
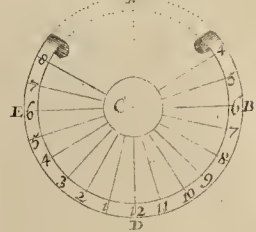


Fig. 5. Equinoctial Dial

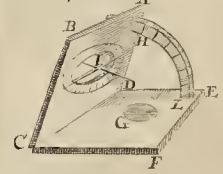


Fig. 6. Horizontal Dial



Fig. 7. Horizontal Dial Trigonometrically

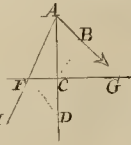


Fig. 7. Ring Dial



Fig. 8. Vertical South Dial

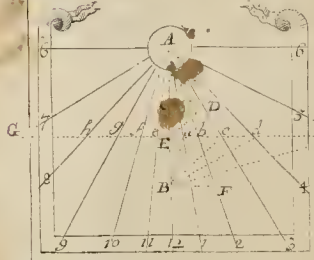


Fig. 9. Vertical North Dial

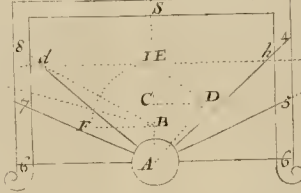


Fig. 11. First Dial

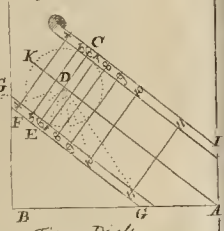


Fig. 14. Diata.

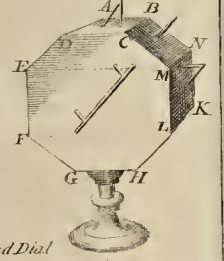


Fig. 12. Polar Dial

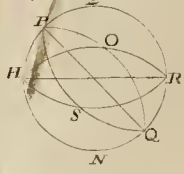


Fig. 13. Polar Dial

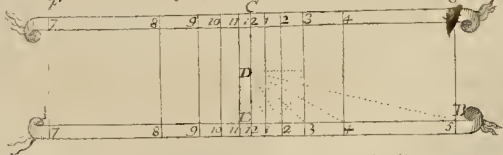


Fig. 15. Vertical Declining Dial Trigonometrically



Fig. 16. Vertical Declining Dial Geometrically

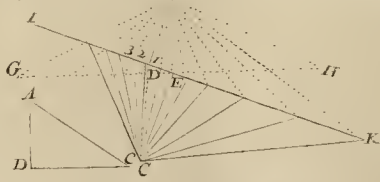


Fig. 17. Inclined Dial

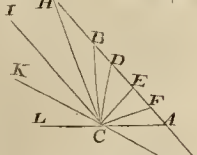


Fig. 18. Universal Mechanical Dial

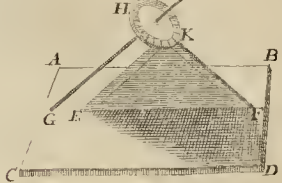


Fig. 19. Moon Dial

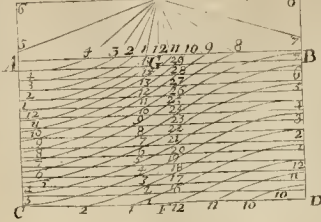
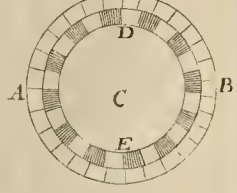


Fig. 20. Moon Dial



line after another; the same shadow will mark out the several hour-lines on the plane ABCD.

Noting the points, therefore, on the shadow, draw lines through them to G: then an index being fixed in G, according to the angle IGF, its shadow will point out the several hours by the light of the sun.

If a *Dial* were required on a vertical plane; having raised the equinoctial circle, as above directed, push forward the index GI, till the tip thereof I, touch the plane.

If the plane be inclined to the horizon, the elevation of the pole should be found on the same; and the angle of the triangle KEF should be made equal thereto.

Note, Beside the several species of *Dials*, above mentioned, which are said to be with centres; there are others, called *Dials without centres*.

Dials without Centres, are those whose hour-lines do really converge, but so slowly that the centre they converge towards, cannot be expressed on the given plane.

Horizontal Dials without Centres are to be made for places, the elevation of whose pole is either very small; or very great.

Vertical Dials without Centres are for places, the elevation of whose pole is very great.

For the Furniture of *DIALS*. See FURNITURE.

Ring-DIAL. }
 Portable-DIAL. } See RING Dial.
 Quadrantal-DIAL. } Heroditic QUADRANT.
 Reflecting-DIAL. } REFLECTING Dial.

Nocturnal, or *Night-DIAL*, is that which shews the hours of the night.

Of this there are two kinds, *Lunar*, and *Siderial*.

Moon-DIAL, or *Lunar-DIAL*, is that which shews the hour of the night, by means of the light, or shadow of the moon projected thereon from an index.

To describe a *Moon-DIAL*. Suppose, e. gr. a horizontal *Moon-Dial* required: draw first a horizontal *Sun-Dial*: then erect two perpendiculars AB, and CD, (fig. 19.) to the line of 12 a-clock, and dividing the interval GF into 12 equal parts; through the several points of division draw lines parallel thereto. Now, appropriating the first line CD to the day of the new moon, and the second to the day when the moon comes an hour later to the meridian than the sun, their interfections with the hour-lines will give points, through which to draw a curve line 12, 12, for the meridian line of the moon. After the like manner determine the other hour-lines 1, 1, 2, 2, 3, 3, &c. which the shadow of the moon projected from the style of the *Dial* intersects at the respective hours. Then blot out the hour-lines of the *Sun-Dial*, together with the perpendiculars, whereby the lunar-hours were drawn, and divide the interval GF, by other parallel lines into 15 equal parts, answering to the 15 days between new and full moon. Lastly, to these lines write the several days of the moon's age.

Now, the moon's age being learnt from a calendar, the interfection of the line of the moon's age, with the lunar hour-lines, will give the hour of the night.

After the same manner may any other *Sun-Dial* be converted into a *Moon-Dial*.

To draw a *Portable Moon-DIAL*. On a plane that may be raised according to the elevation of the equator describe a circle AB (fig. 20.) and divide its circumference into 20 equal parts. From the same centre C describe another moveable circle DE, which divide into 24 equal parts, or hours. In the centre C erect an index, as for an equinoctial *Dial*.

This *Dial* being duly placed after the manner of an equinoctial *Dial*, and the 12 a-clock line brought to the day of the moon's age: the shadow of the index will give the hour.

To use a *Solar*, as a *Lunar-DIAL*, i. e. to find the hour of the night by a *Sun-Dial*.—Observe the hour which the shadow of the index points at by moon-light: find the moon's age in the calendar, and multiply the number of days by $\frac{1}{2}$, the product is the number of hours to be added to the hour shewn by the shadow, to give the hour required.

DIALECT, ΔΙΑΛΕΚΤΟΣ, the peculiar language of some province; or part of a nation, formed by corruption of the general, or national language.

Homer could speak five different languages in one verse, i. e. five *Dialects*, viz. the *Attic*, *Ionic*, *Eolic*, the *Doric*, and the common *Dialect* of the Greeks.

The *Bolognese*, *Bergamasque*, *Toscan*, &c. are the *Dialects* of the Italian. The *Gascon*, and *Picard*, are *Dialects* of the French.

DIALECTICA *, **DIALECTICS**, ΔΙΑΛΕΚΤΙΚΗ, the art of reasoning and disputing justly.

* The word comes from the Greek διαλέγομαι, I discourse; formed of δια, and λέγω, dico, I say.

Zeno Eleates was the first who discovered the natural series of principles, and conclusions, observed in reasoning, and formed an art thereof, in form of a dialogue, which for this reason was called *Dialectica*.

The *Dialectica* of the ancients is usually divided into several

kinds: the first was *Eleatica*, that of Zeno Eleates, which was threefold: viz. *Consecutionum*, *Colloquutionum*, and *Contentionum*.—The first consisting of rules for deducing, or drawing conclusions: the second, the art of dialogue, which became of such universal use in philosophy, that all reasoning was called *Interrogation*. Then, syllogism being laid aside, the philosophers did all by dialogue; it lying on the respondent, to conclude, and argue from the several concessions made.

The last part of Zeno's *Dialectics*, *Ελετικη*, was contentious, or the art of disputing, and contradicting; though some, particularly Laertius, ascribe this part to Protagoras, a disciple of Zeno.

The second is the *Dialectica Megarica*, whose author is Euclid, not the mathematician, but another, of Megara. He gave much into the method of Zeno, and Protagoras: Though there are two things appropriated to him: the first, that he impugned the demonstrations of others, not by assumptions, but conclusions; continually making illations, and throwing in *Ergo*, *Ergo*, *Ergo*. The second, that he set aside all arguments drawn from comparison, or similitude, as invalid.

He was succeeded by Eubulides, from whom the sophistic way of reasoning is said to be derived. In his time the art is described as manifold: *Mentium*, *Fallens*, *Electra*, *Obvelata*, *Aerualis*, *Corrupta*, and *Calva*. See SOPHISM.

The third is the *Dialectics* of Plato, which he proposes as a kind of analysis, to direct the human mind, by dividing, defining, and bringing things to the first truth; where being arrived, and stopping there a little, it applies it self to explain sensible things; but with a view to return to the first truth, where alone it can rest. Such is the idea of Plato's analysis.

The fourth is Aristotle's *Dialectics*, containing the doctrine of simple words, delivered in his book of *Predicaments*: the doctrine of propositions, in his book, *de Interpretatione*: and that of the several kinds of syllogism, in his books of analytics, topics, and elenchus's.

The fifth is the *Dialectics* of the Stoics, which they call a part of philosophy, and divide into rhetoric, and *Dialectic*: to which some add oric, or definitive, whereby things are justly defined; comprehending likewise the canons, or criterions of truth.

The Stoics, before they come to treat of syllogisms, have two principal places, the one about the word signifying; the other about the thing signified. On occasion of the first, they consider abundance of things belonging to the grammarians province, what, and how many letters, what is a word, diction, speech, &c. On occasion of the latter, they consider things themselves, not as without the mind, but as in it, received in by means of the senses. Accordingly, they first teach, that *nil fit in intellectu, quod non prius fuerit in sensu*, whatever is in the mind, came thither by the senses: and that, *aut incurfione fit*, as Plato, who meets the fight; *aut similitudine*, as Cæsar by his effigy; *aut proportione*, either by enlarging, as a giant, or by diminishing, as a pigmy; *aut translatione*, as a cyclops; *aut compositione*, as a centaur; *aut contrario*, as death; *aut privatione*, as a blind man.

The sixth is Epicurus's *Dialectics*. For though he seems to have despised *Dialectic*, he cultivated it with vigour: he was only averse to that of the Stoics, who, he thought, attributed too much thereto; as pronouncing him alone wise, who was well versed in *Dialectics*. For this reason Epicurus seeming to set aside the common *Dialectics*, had recourse to another way, viz. to certain canons, which he substituted in their stead, the collection whereof he called *Canonica*. And as all questions in philosophy are either, *de re*, or *de voce*; he gave separate rules for each.

DIALECTICAL Arguments, in logic, are such as are only probable, and do not convince, or determine the mind absolutely to either side of the question.

DIALLING, the art of drawing sun, moon, and star-dials, on any given plane, or on the surface of any given body. See **DIAE**.

The Greeks and Latins call this art *Gnomonica*, and *Sciatherica*, by reason it distinguishes the hours by the shadow of a gnomon. Some call it *Photo-sciatherica*, by reason the hours are sometimes shewn by the light of the sun. Lastly, other call it *Horologigraphy*.

The antiquity of dials is beyond doubt. Some attribute their invention to Anaximenes Milesius; and others to Thales. Vitruvius mentions one made by the ancient Chaldee historian Berofus, on a reclining plane, almost parallel to the equinoctial. Aristarchus Samius invented the hemispherical dial. And there were at the same time some spherical ones, with a needle for a gnomon. The dials of Aristarchus, was an horizontal dial, with its limb raised up all around, to prevent the shadow stretching too far.

But it was late ere the Romans became acquainted with dials. The first sun dial at Rome was set up by Papyrus Curfor, about the year of the city 460, before which time,

says Pliny, there is no mention of any account of time but by the sun's rising, and setting: The first Dial was set up at or near the temple of Quirinus, but it went ill: about 30 years after, M. Valerius Messala being consul, brought out of Sicily another dial, which he set up on a pillar near the rostrum; but for want of its being made for that latitude, it could not go true. They made use of it 99 years; till Martius Philippus set up another more exact.

But there seem to have been dials among the Jews much earlier than any of these. Witness the dial of Ahaz, who began to reign 400 years before Alexander, and within 12 years of the building of Rome; mentioned by Isaiah, chap. XXXVIII, verse 8.

Dialling is wholly founded on the first motion of the heavenly bodies, and chiefly the sun; or rather on the diurnal rotation of the earth; so that the elements of spherics, and the spherical astronomy should be mastered, ere a person advances to the doctrine of *dialling*. The doctrine, or theory, we say, for as to the practice, or the operations themselves distinct from the demonstrations, nothing is more easy, and obvious.

The first professed writer on *dialling*, is Clavius; who demonstrates all, both the theory, and the operations, after the rigid manner of the ancient mathematicians; but so intricately, that probably no body, ever read them all. Dechales, and Ozanam, give much easier in their *Coursjes*, and Wolfius in his *Elements*. M. Picard has given a new method of making large dials, by calculating the hour-lines; and Mr. de la Hire, in his *dialling*, printed in 1683, a geometrical method of drawing hour-lines from certain points, determined by observation. Eberhardus Walperus, in 1625, published his *dialling*, wherein he lays down a method of drawing the primary dials on a very easy foundation. The same foundation is described at length by Sebastian Munster, in his *Rudimenta Mathematica*, published in 1551. Sturmius, in 1672, published a new edition of Walperus's *dialling*, with the addition of a whole second part, about inclining, and declining dials, &c. In 1708, the same work, with Sturmius's additions, was republished with the addition of a fourth part, containing Picard's, and de la Hire's methods of drawing large Dials, which makes much the best, and fullest book on the subject. Peterfon, Michael, and Muller, have each wrote on *dialling*, in the German tongue; Coetfius in his *Horologigraphia plana*, printed in 1689; Gauppenius, in his *Gnomonica Mechanica*, and Bion, in his *Use of Mathematical Instruments*.

DIALLING-GLOBE, is an instrument made of brass, or wood, with a plane fitted to the horizon, and an index; particularly contrived to draw all sorts of dials, and to give a clear exhibition of the principles of that art.

DIALLING-SPHERE, is an instrument made of brass, with several semi-circles sliding over one another, on a moving horizon, to demonstrate the nature of the doctrine of spherical triangles, and to give a true idea of the drawing of dials on all manner of planes.

DIALLING-LINES, or Scales, are graduated lines, placed on rules, or the edges of quadrants, and other instruments, to expedite the construction of dials.

The principal of these lines are, 1. A scale of six hours, which is only a double tangent, or two lines of tangents each of 45 degrees, joined together in the middle, and equal to the whole line of sines, with the declination set against the meridian altitudes in the latitude of London, suppose, or whatever place it is made for. The radius of which line of sines is equal to the *dialling* scale of six hours. 2. A line of latitudes, which is fitted to the hour-scale, and is made by this canon; as the radius is to the chord of 90 degrees: so are the tangents of each respective degree of the line of latitudes, to the tangents of other arches. And then the natural sines of those arches are the numbers, which taken from a diagonal scale of equal parts, will graduate the divisions of the line of latitude to any radius. The line of hours, and latitudes is general for pricking down all dials with centres.

DIALLING, in a mine, called also *Plumming*, is the using of a compass, (which they call *Dial*) and a long line, to know which way the load, or vein of ore inclines, or where to shift an air shaft, or bring an adit to a desired place. See **MINE**.

See Supplement Article *Plumming*.

DIALIA, in antiquity, sacrifices performed by the flamen *Dialis*, or priest of Jupiter.

It was not, however, of such absolute necessity, that the *Dialia* were performed by the flamen *Dialis*; but that others might officiate. We find in Tacitus, *Annal.* Lib. III, cap. 58. that if he were sick, or detained by any other public employ, the pontifices took his place.

DIALIS *, in antiquity, a Latin term, signifying somewhat that belongs to Jupiter.

* The word is formed from *Διος*, the genitive of *Ζεϋς*, Jupiter. **Flamen DIALIS**. See the article **FLAMEN**.

DIALOGUE *, a conversation of two, or more persons, either by word of mouth, or in writing.

* The word is formed from the Latin *Dialogus*, of the Greek *Διαλογος*, which signifies the same.

Dialogue, is greatly recommended by many authors, and is

the most ancient form of writing; and that wherein the first authors wrote most of their pieces. The archbishop of Cambray gives a fine account of the advantages of *Dialogue*, at the head of his pastoral instruction. — The holy Spirit himself has not disdain'd to teach us in *Dialogue*, viz. patience, in the book of Job, and love of God, in the Canticles. Justin Martyr opened this way, in his controversy against the Jews; and Minutius Felix followed it in his against the idolaters. It is in this form, that Origen judg'd he could best refute the error of Marcion. The great Athanasius thought it no diminution to the majesty of mysteries of faith, to maintain them by the familiarity of *Dialogue*. This way of writing St. Basil also chose as the most proper to convey those rules, which have since illumined all the east. The arts of *Dialogue* were admirably put in practice by Gregory Nazianzen, and his brother Cæsarius, for conveying the sublimest truths. Sulpitius Severus could not do better, than publish the wonders of solitude in a kind of conversations. A volume of St. Cyril of Alexandria, is almost filled with *Dialogues*, wherein he explains the most dogmatical truths, relating to the incarnation. The mystery of Jesus Christ is treated of in the same manner by the learned Theodoret. St. Chrysostom found no method more promising to express the eminence, and danger of the priesthood. Who is not acquainted with the beautiful *Dialogue* of St. Jerom, wherein he refutes the Luciferians? who does not admire St. Augustine's *Dialogues*, and especially those on free will, where he goes back to the origin of sin; against the Manichees? The tradition of the solitaires in the desert, is finely illustrated in the conferences of Cassian, which have spread the same light through the west, that the east received from St. Basil. Gregory the Great deem'd *Dialogue* worthy the gravity of the apostolic see. The *Dialogues* of St. Maximus, on the subject of the trinity, are famous throughout all the church. St. Anselm shew'd the force of his genius in his *Dialogues* on the fundamentals of religion. — Profane antiquity likewise made use of the art of *Dialogue*, and that, not only on humorous, and comical subjects, as Lucian did, but also on the most serious and abstract; such are the *Dialogues* of Plato, and those of Cicero, which turn altogether on subjects of philosophy, or politics. Among the moderns, the principal *Dialogists*, are M. de Fenelon, archbishop of Cambray, M. Pascal, in his *Provincial Letters*; F. Bohours, in his *Entretiens d'Ariste, & d'Eugene*; M. Fontenelle, in his *Dialogues of the dead*, and plurality of worlds, &c.

DIALOGUE, in music, is a composition for at least two voices, or two instruments, which answer each other, and which frequently uniting at the close, make a trio with the thorough-bass.

Such are many of the scenes in the Italian and French opera's. **DIALTHÆA**, in pharmacy, an unguent thus called from its basis, which is root of the *althæa*, or marshmallow.

It consists of mucilages drawn from that root, and from linseed and fenugreek seed. The other ingredients are common oil, wax, resin, and turpentine.

It is esteem'd proper to soften, and dissolve; assuage pains of the side, soften callus's, and strengthen the nerves. — It is applied, by rubbing it on the part affected.

DIALYSIS, in grammar, a character, consisting of two points placed over two vowels of a word, which would otherwise make a diphthong; but are hereby parted into two syllables. As in, *Mosaic*. See **DIERESIS**.

DIAMARGARITON, in pharmacy, a medicine denominated from pearls, called in Latin *margarite*; which are a principal ingredient therein.

There are two kinds: the *hot* and the *cold*, but both are diffus'd at this time.

Hot DIAMARGARITON, is a powder composed of pearls, peltitory, ginger, nutmeg, cinnamon, and diverse other hot ingredients — It is reputed bisteric, it strengthens the womb, promotes the menses, and assists digestion.

Cold DIAMARGARITON, is a solid electuary, composed of pearls ground fine, and white sugar dissolved in rose water, or that of hughlofs, and boiled to a consistence. — It strengthens the stomach, moderates the too abundant acids, stops the spitting of blood, and loosens of the belly.

Compound cold DIAMARGARITON, is a powder made of pearls, red roses, flowers of nenuphar, and violet, lignum aloes, red and citron fatal, tormentil root, seeds of melon, endive, &c. — It is cardiac and strengthening, facilitates respiration, and corrects malignant humours.

DIAMASTIGOSIS, in antiquity. — It was a custom among the Lacedæmonians, for the children of the most distinguished families, to slash and tear each others bodies with rods before the altars of the gods; the fathers, and mothers, who were present at the spectacle, animating and exciting them all the while, not to give the least sign of pain, or concern. This practice they call'd *Diamastigosis*, a Greek term, derived from *διαμαστιγος*, *I whip, scourge*.

The design hereof, apparently, was no other than to harden their youth, and inure them betimes to blows, wounds, &c. that they might despise them when they came to war.

DIÁ

DIAMETER, in geometry, a right line passing through the centre of a circle, and terminated on each side by the circumference thereof.

Or, *Diameter* may be defined a chord passing through the centre of a circle.—Such is the line AE (*Tab. Geometry, fig. 27.*) passing through the centre C.

Half a *Diameter*, as CD, drawn from the centre C to the circumference, is called the *Semi-Diameter*, or *Radius*.

The *Diameter* divides the circumference into equal parts.—And hence we have a method of describing a semi-circle upon any line; assuming a point therein for the centre. The *Diameter* is the greatest of all the chords.

To find the ratio of the *DIAMETER* to the circumference.—This has been greatly sought for by the mathematicians: and no wonder; in as much as if this were justly given, the quadrature of the circle were achieved.

Archimedes first proposed a method of finding it, by regular polygons inscribed in a circle, till arriving at a side subtending an exceeding small arch, and then seeking a side of similar polygon circumscribed: each of these being multiplied by the number of sides of the polygon, give the perimeter of the polygon both inscribed, and circumscribed. In which case, the ratio of the *Diameter* to the circumference of the circle, is greater than that of the same *Diameter* to the perimeter of the circumscribed polygon, but less than that of the *Diameter* to the perimeter of the polygon inscribed. The difference between both gives the ratio of the *Diameter* to the circumference in numbers nearly true.

That divine author, as already observed, by polygons of 96 sides, found the ratio of the *Diameter* to the circumference to be as 7 to 22; viz. supposing the *Diameter* 1, the perimeter of the inscribed polygon is found $3\frac{7}{8}$, and that of the circumscribed $3\frac{1}{2}$.

After his example, later Authors have found out ratios yet nearer truth; but none spent so much time on it as Van Ceulen, who, after immense pains, found, that supposing the *Diameter* 1, the circumference is less than 3.14159265358979323846264338387950, and yet greater than the same number with only the last figure 0 changed into 1. But as such prolix numbers are too unwieldy for practice, many of our present practical geometers assume the *Diameter* to be to the circumference as 100 to 314; or in greater circles as 10000 to 31415; in which proportion Ptolemy, Vieta, and Huygens agree with Van Ceulen.

Ad. Metius gives us the ratio 113 to 355, which is the most accurate of all those expressed in small numbers; as not erring 3 in 1000000.

The *DIAMETER* of a circle being given, to find the circumference, and area; and the circumference being given, to find the *Diameter*.—The ratio of the *Diameter* to the circumference being had, as in the last article, that of the circumference to the *Diameter* is had likewise. Then the circumference being multiplied into the fourth part of the *Diameter*, gives the area of the circle.—Thus, if the *Diameter* be 100, the circumference will be 314, and the area of the circle 7850. But the square of the *Diameter* is 10000: therefore, this is to the area of the circle as 10000 to 7850, that is as 1000 to 785 nearly.

The area of a circle being given, to find the *DIAMETER*.—To 785, 1000, and the given area of the circle 246176, find a fourth proportional, viz. 311360, which is the square of the *Diameter*. Out of this extract the square-root, and it is the *Diameter* itself.

DIAMETER of a conic section, is a right line, as AD, (*Tab. Conics, fig. 5.*) bisecting all the ordinates MM, &c. in P, &c. See CONIC.

This, when it cuts the said lines at right angles, is more particularly called the *axis* of the curve, or *section*.

Transverse DIAMETER, is a right line, as AB (*Tab. Conics, fig. 6. N^o 2.*) which being continued each way between two curves, bisects parallel right lines between the same, as MM.

Conjugate DIAMETER, is a right line, bisecting lines drawn parallel to the transverse *Diameter*. See CONJUGATE.

DIAMETER of a sphere, is the *Diameter* of the semi-circle by whose rotation the sphere is generated; called also the *axis* of the sphere.

DIAMETER of gravity, is a right line passing through the centre of gravity.

DIAMETER, in astronomy.—The *Diameters* of the heavenly bodies, are either *apparent*, i. e. such as they appear to the eye; or *real*, i. e. such as they are in themselves.

The *apparent DIAMETERS* measured with a micrometer, are found different, in different circumstances and parts of their orbits.

DIÁ

	Greatest	Mean	Least
<i>Appar. DIAM. of the Sun accord. to Ptolemy.</i>	33 20	32 18	31 20
<i>to Tycho</i>	32 0	31 0	30 0
<i>Kepler</i>	31 4	30 30	30 0
<i>Riccioli</i>	32 8	31 40	31 0
<i>Cassini</i>	32 10	31 40	31 8
<i>de la Hire</i>	32 43	32 10	31 38
<i>of the Moon accord. to Ptolemy</i>	35 20	—	31 20
<i>Tycho in the Conjunction</i>	28 48	—	25 36
<i>in the Oppos.</i>	36 0	—	32 0
<i>Kepler</i>	32 44	—	30 0
<i>de la Hire</i>	33 30	—	29 30
<i>of Saturn according to Tycho</i>	2 12	1 50	1 34
<i>Hewelius</i>	0 19	0 16	0 14
<i>Huygens</i>	—	—	30 0
<i>of Jupiter according to Tycho</i>	3 59	2 45	2 14
<i>Hewelius</i>	0 24	0 18	0 14
<i>Huygens</i>	—	—	1 4
<i>of Mars according to Tycho</i>	6 46	1 40	0 57
<i>Hewelius</i>	0 20	0 5	0 2
<i>Huygens</i>	—	—	0 30
<i>of Venus according to Tycho</i>	4 40	3 15	1 52
<i>Hewelius</i>	1 5	0 16	0 9
<i>Huygens</i>	—	—	1 25
<i>of Mercury accord. to Tycho</i>	3 57	2 10	1 29
<i>Hewelius</i>	0 11	0 6	0 4

The great difference between Tycho, and the other two astronomers, is owing to this, that Tycho, in imitation of the ancients, measured the *Diameters*, as they appear to the naked eye; whereas Hevelius and Huygens used telescopes, whereby a deal of spurious lustre, which otherwise makes them appear bigger than they are, is taken off.

For the true *DIAMETERS* of the sun, and planets, and their proportion to each other. See SEMIDIAMETER.

DIAMETER of a Column, is its thickness just above the base. From this the module is taken, which measures all the other parts of the column.

DIAMETER of the Diminution, is that taken from the top of the shaft. See DIMINUTION.

DIAMETER of the Swelling, is that taken at the height of one third from the base.

DIAMOND in natural history, by the ancients called *Adamant*, a precious stone, the first in rank, value, hardness, and lustre, of all gems.

The goodness of *Diamonds* consist in their water, or colour, lustre, and weight: the most perfect colour is the white. Their defects are veins, flaws, specks of red or black sand, and a bluish or yellowish cast.

In Europe, the lapidaries examine the goodness of their rough *Diamonds*, their water, points, &c. by day-light: in the Indies, they do it by night; in order to which, a hole is made in a wall a foot square, and therein a lamp is placed, with a thick wick, by the light whereof they judge of the stone, holding it in their fingers.

The water, called *Cælestis*, is the worst of all, and yet is somewhat difficult to discover in a rough *Diamond*. The only infallible way is to examine it in the shade of some tufed tree. As to the distinguishing of *Diamonds* from other stones, Dr. Wall, in the *Philosophical Transactions*, seems to have found an infallible method: a *Diamond*, with an easy, slight friction in the dark, with any soft, animal substance, as the finger, woollen, silk, or the like appears luminous in its whole body: nay, if you keep rubbing for some time, and then expose it to the eye, it will remain so for some time. If the sun be 18 degrees below the horizon; holding up a piece of bays, or flannel stretched tight between both hands, at some distance from the eye; and another rubbing the other side of the bays, or flannel, pretty briskly with a *Diamond*; the light is much more vivid and pleasant than any other way. But what Dr. Wall judges most surprizing is, that a *Diamond*, being exposed to the open air, in view of the sky, gives almost the same light of itself, without rubbing, as if rubbed in a dark room: but, if in the open air, you put the hand, or any thing a little over it, to prevent its immediate communication with the sky; it gives no light; which is a distinguishing criterion of a *Diamond*.

Rough DIAMOND, is that not yet cut, but just as it comes out of the mine.

Brilliant DIAMOND, is that cut in faces both a-top, and bottom, and whose table, or principal face a-top is flat.

Rose DIAMOND, is that quite flat underneath, but its upper part cut in diverse little faces, usually triangles, the uppermost whereof terminate in a point.

Table DIAMOND, is that which has a large square face a-top, encompassed with four lesser.

Diamonds are found in the East-Indies, and that principally in the kingdoms of Golconda, Visapour, Bengale, and the island of Borneo. There are four mines, or rather two mines, and two rivers, whence *Diamonds* are drawn.—The mines are, 1. that of Raolconda, in the province of Carnatica, five days journey from Golconda, and eight from Visapour. It has been discovered about 200 years. 2. That of Gani, or Coulour, seven days journey from Golconda, eastwardly. It was discovered

tered 120 years ago by a peasant, who digging in the ground found a natural fragment of 25 carats. 3. That of Soumelpour, a large town in the kingdom of Bengale, near the *Diamond-mine*. This is the most ancient of them all: it should rather be called that of Goual, which is the name of the river, in the sand whereof these stones are found. Lastly, the fourth mine, or rather the second river, is that of Succudan, in the island of Bornio.

DIAMOND-mine of Raolconda.—In the neighbourhood of this mine the earth is sandy, and full of rocks, and cople. In these rocks are found several little veins, of half, and sometimes a whole inch broad, out of which the miners, with a kind of hooked irons, draw the sand, or earth, wherein the *Diamonds* are; breaking the rocks when the vein terminates, that the track may be found again, and continued. When a sufficient quantity of earth, or sand is drawn forth, they wash it two or three times, to separate the stones therefrom. The miners work quite naked, except for a thin linnen cloth before them; and besides this precaution, they have likewise inspectors, to prevent their concealing of stones: which, however, in spite of all this care, they frequently find means to do, by watching opportunities when they are not observed, and swallowing them down.

DIAMOND-mine of Gani, or Coulor.—In this mine are found a great number of stones from 10 to 40 carats, and even more; and it was there that the famous *Diamond* of Aureng-Zeb, the Great Mogul, which before it was cut, weighed 793 carats, was found. The stones of this mine are not very clear; their water is usually tinged with the quality of the soil; being black where that is marshy, red where it partakes of red, and sometimes green, and yellow, if the ground happen to be of those colours.—Another defect of some consequence is a kind of greatness appearing on these *Diamonds*, when cut, which takes off part of their lustre.—There are usually no less than 60000 persons, men, women, and children at work in this mine.

When the miners have found a place where they intend to dig, they level another somewhat bigger in the neighbourhood thereof, and inclose it with walls about two foot high, only leaving apertures from space to space, to give passage to the water. After a few superstitious ceremonies, and a kind of fast, which the master of the mine makes the workmen, to encourage them, every one goes to his business, the men digging the earth in the place first discovered, and the women and children carrying it off into the other walled round. They dig 12 or 14 feet deep, and till such time as they find water. Then they cease digging, and the water thus found serves to wash the earth two or three times, after which it is let out at an aperture reserved for that purpose. This earth being well washed, and well dried, they sift it in a kind of open sieve, or riddle, much as we do corn in Europe; then they thrash it, and sift it afresh; and lastly, they search it well with the hands to find the *Diamonds*. They work naked here, as in the mine of Raolconda, and are watched after the like manner by inspectors.

DIAMOND-mine of Soumelpour, or river Goual.—Soumelpour is a large town built all of earth, and covered with branches of cacao-trees: the river Goual runs by the foot thereof, in its passing from the high mountains towards the south to the Ganges, where it loses its name. It is from this river that are brought all our fine *Diamond* points, or sparks, called *natural sparks*. They never begin to seek for *Diamonds* in this river till after the great rains are over, that is, after the month of December; and they usually even wait till the water is grown clear, which is not before January. The season at hand, eight, or ten thousand persons of all ages, and sexes, come out of Soumelpour, and the neighbouring villages. The most experienced among them search, and examine the sand of the river, going up it from Soumelpour to the very mountain whence it springs. A great sign that there are *Diamonds* near, is, the finding of those stones which we Europeans call thunderstones. When all the sand of the river, which at that time is very low, has been well examined, they proceed to take up that wherein they judge *Diamonds* likely to be found; which is done after the following manner: they dam the place round with stones, earth, and fascines, and lading out the water, dig about two feet deep: the sand thus got is carried into a place walled round on the bank of the river.—The rest is performed after the same manner as at Coulor, and the workmen are watched with equal strictness.

DIAMOND-mine in the island of Bornio, or river of Succudan.—We are but little acquainted with this mine; the queen who reigns in that part of the island not allowing strangers to have any commerce in these stones: though there are very fine ones to be bought at Batavia, brought thither by stealth. They were anciently imagined to be softer than those of the other mines, but experience shews, they are in no respect inferior to them.

Beside these four *Diamond* mines, there have been two other discovered: one of them between Coulor and Raolconda, and the other in the province of Carnatica; but they were both closed up almost as soon as discovered: that of Carnatica, by reason the water of the *Diamonds* was always either black, or yellow; and the other, on account of their cracking, and flying in pieces when cut and ground.

The *Diamond*, we have already observed, is the hardest of all

precious stones. It can only be cut, and ground by it self, and its own substance. To bring it to that perfection which augments its price so considerably, they begin by rubbing several against each other, while rough; after having first glued them to the ends of two wooden blocks, thick enough to be held in the hand. It is the powder thus rubbed off the stones, and received in a little box for the purpose, that serves to grind and polish the others.

Diamonds are cut, and polished by means of a mill, which turns a wheel of soft iron sprinkled over with *Diamond* dust mixed with oil of olives. The same dust, well ground, and diluted with water and vinegar, is used in the sawing of *Diamonds*; which is performed with an iron, or bra's wire, as fine as a hair. Sometimes in lieu of sawing the *Diamonds*, they cleave them, especially if there be any visible plates in them. But the Europeans are not usually daring, or expert enough to run the risque of cleaving, for fear of breaking.

A rough *Diamond* must be chosen uniform, of a good shape, transparent, not quite white, and free of flaws, and shivers. Black, rugged, dirty, flawey, veiny stones, and all such as are not fit for cutting, they use to pound in a steel mortar made for that purpose; and when pulverized, they serve to saw, cut, and polish the rest. Shivers are occasioned in *Diamonds* by this, that the miners, to get them more easily out of the vein, which winds between two rocks, are often forced to break the rocks with huge iron wedges, which shakes, and fills the stone with cracks and shivers. The ancients had two mistaken notions with regard to the *Diamond*: the first, that it became soft, by steeping it in hot goat's blood. And the second, that it was malleable, or bore the hammer. Experience shews us the contrary; there being nothing capable of mollifying the hardness of this stone; though its hardness be not such, that it will endure being struck at pleasure with the hammer.

The finest *Diamonds* now in the world are that of the Great Mogul, weighing 279 carats; that of the great duke of Tuscany, weighing 139 carats; and that known in France under the name of *grand fancy*, which is one of the crown jewels, weighing 106 carats, whence its name *Sancy*, which is a corruption of *cut six*, that is 106. Tavernier, by a rule which he had made for estimating the value of *Diamonds*, computes that of the Great Mogul at 11723278 French livres, equivalent to 770244 pound sterling; and that of the duke of Tuscany, at 2608335 livres, or 105374 pound sterling. The following is a rate, or manner of estimating the value of *Diamonds*, drawn up by a person well versed in such matters, and which, for its curiosity, as well as the use it may be of to persons who deal in precious stones, we judge, will not be unacceptable.

Table DIAMONDS.

		Dutch Cut.			
A <i>Diamond</i> weighing	Lib. Sh.	Lib.	Sh.	Sh. Sterl.	
1. Grain, is worth from	1.	0.	to 1.	1.	
1½	1.	16.	to 1.	17.	
2.	2.	15.	to 3.	0.	
2½	3.	12.	to 3.	15.	
3.	4.	15.	to 5.	0.	
4.	7.	17.	to 8.	0.	
5.	15.	0.	to 15.	15.	
6.	22.	0.	to 25.	0.	
7.	30.	0.	to 34.	0.	
8.	42.	0.	to 45.	0.	
9.	60.	0.	--	--	
10.	75.	0.	--	--	
12.	112.	0.	to 120.	0.	
15.	187.	0.	to 220.	--	
19.	330.	0.	to 380.	0.	
24.	450.	0.	---	0.	
30.	700.	0.	to 735.	0.	
40.	1500.	0.	to 1800.	0.	
50.	3500.	0.	to 4500.	0.	
60.	4500.	0.	to 5620.	0.	

Antwerp Cut.

A <i>Diamond</i> weighing	Lib. Sh.	Lib.	Sh. Sterl.
1. Grain, is worth from	0	15.	to 0 18.
1½	1.	6.	to 1. 10.
2.	2.	2.	to 2. 5.
3.	3.	12.	to 3. 15.
4.	6.	0.	to 6. 7.
5.	10.	10.	to 11. 5.
6.	13.	10.	to 15. 0.
7.	18.	15.	to 22. 10.
8.	24.	0.	to 26. 0.
9.	33.	15.	---
10.	37.	0.	to 40. 0.
12.	55.	0.	to 58. 0.
15.	112.	0.	to 130. 0.
18.	247.	0.	---
24.	315.	0.	---
40.	900.	0.	to 970. 0.
50.	2200.	0.	to 2300. 0.
60.	3500.	0.	to 4500. 0.

It must be observed, however, that defects in the water, or shape; red, or black spots; shivers, and other failings, frequently found in these stones, reduce the price by one third, and sometimes more.

As to *Brilliant DIAMONDS* of very small cut, the price is always less by one third, than that of *Diamonds* of a larger cut; though the weights be the same: the reason is, that the latter shew themselves a great deal more when set in their collets, than the former.

Attempts have been made to produce *artificial Diamonds*, but with no great success.

The *falsitious Diamond*: made in France, called *Temple-Diamonds*, on account of the temple at Paris, where the best of them are made, fall vastly short of the genuine ones; accordingly they are but little valued, though the consumption thereof is pretty considerable for the habits of the actors on the stage, &c. See *Supplement*, Articles *DIAMOND* and *PASTES*.

DIAMOND is an instrument of considerable use in the glass-manufactory, for squaring the large plates, or pieces; and among glaziers, for cutting their glass.

These *Diamonds* are differently fitted up. That used for looking-glasses, and other large pieces, is set in an iron ferril two inches long, and a quarter of an inch in diameter. The rest of the cavity of the ferril is filled with melted lead, which keeps the *Diamond* firm in its place.

The glaziers have a handle of box, or ebony, fitted into the ferril to hold it by. In the former there is a little piece of box crossing the ferril, in form of a little plane, covered at bottom with a thin copper-plate.

DIAMOND, in heraldry, is used to express the black colour in the achievements of noblemen.

Gwidim dislikes the way of blazoning the coats of peers by precious stones, instead of metals, or colour. But the English practice allows it. See *COLOUR*.

DIAMOND Glass. See the article *GLASS*.

DIAMORUM, ΔΙΑΜΟΡΟΝ, a composition in pharmacy, of which there are two kinds; *simple*, and *compound*.—

Simple DIAMORUM, is the common syrup of mulberries, made of the juice of that fruit, boiled up with sugar.—It is good against diseases of the throat, and to stop dysenteries.

There is also a sort of *simple Diamorum* made of mulberry juice and honey, otherwise called *Mulberry Rob.*—

Compound DIAMORUM, is made with mulberry juice, verjuice, myrrh, and saffron.—It is used to deterge phlegm from the stomach, and breast, and to ease respiration.

DIANA'S Tree, Arbor Dianae. See the article *ARBOR*.

DIANUCUM *, in pharmacy, a kind of rob, made of the juice of green walnuts, and figs, boiled together by a moderate fire, to the consistence of honey.

* The word is formed from *dia*, and *nux, nuclei*, nut.

It is good to strengthen the stomach, promote sweat, and resist poison.

DIAPALMA, in pharmacy, a desiccative, or drying plaister, said to be so denominated from the wood of the palm-tree, whereof the spatula is to be made, that is to stir it while boiling. It is composed of common oil, hog's fat, and lard of gold.—It is good to dry, resolve, dege, and cicatrize: and is the plaister most used for wounds, and ulcers.

DIAPASMA *, a common name for all powders sprinkled on the body; whether as perfumes or otherwise.

* The word comes from the Greek *διαπασσεν*, *inspergere*, to sprinkle.

DIAPASON, in music, a musical interval, otherwise called *Octave*.

The *Diapason* is the first, and most perfect of the concords: if considered *simply*, it is but one harmonical interval; though if considered *diatonically*, by tones, and semi-tones, it contains seven degrees, *viz.* three greater tones, two lesser tones, and two greater semi-tones.

The interval of a *Diapason*, that is, the proportion of its grave found to its acute, is as 2 to 1.

DIAPASON, among musical instrument-makers, is a kind of rule, or scale, whereby they adjust the pipes of their organs, and cut the holes of their flutes, haut-bois, &c. in due proportion, for performing the tones, semi-tones, and concords justly. A square being divided into eight equal parallelograms; the points wherein a diagonal intersects all these parallelograms, expresses all the usual intervals in music: and on this principle it is, that the *Diapason* is founded.

There is a particular kind of *Diapason* for trumpets; serving as a standard, or measure, for the different magnitudes they must have to perform the four parts of music.

There is another for sack-buts, and serpents, shewing how far they are to be lengthened, or shortened, to rise or fall from one tone or interval to another.

The bell-founders have likewise a *Diapason*, or scale, serving to regulate the size, thickness, weight, &c. of their bells.

DIAPASONDIAEX, in music, a kind of compound concord; whereof there are two sorts: the *greater*, which is in the ratio of 10 to 3; and the *less*, in that of 16 to 5.

DIAPASONDIAPENTE, in music, a compound consonance, in the ratio of triple of 9 to 3.

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*The *Diapason-diapente* is a symphony made when the voice proceeds from the 1st to the 12th tone. The word is properly a term in the Greek music: we should now call it a *twelfth*. *DIAPASONDIA TESSARON*, in music, a compound concord, in the ratio of 8 to 3.

The *Diapason-diatessaron* is a symphony wherein the voice proceeds from the first tone to the eleventh.—This the moderns would rather call an *eleventh*.

DIAPASONDITONE, in music, a compound concord, in the proportion of 10 to 4, or 5 to 2.

DIAPASONSEMITONE, a compound concord, whose terms are in the proportion of 12 to 5.

DIAPAEDESIS *, ΔΙΑΠΗΔΗΣΙΣ, in medicine, an oozing of blood through the coats of the veins, or arteries; occasioned either by the blood's becoming too much dissolved, or attenuated; or by the pores of the vessels becoming too patent, and open.

* The word is compounded of *δια*, through; and *πηδαι*, I leap.

There are some able physicians who deny there can be any such tenuity of blood, as that it shall exude through the vessels, without any aperture made therein.

DIAPENTE *, in the ancient music, an interval making the second of the perfect concords; answering to what in the modern music which we more usually call a *perfect fifth*.

* The word is formed of *δια*, and *πεντε*, five.

The *Diapente* is a simple concord; yet if considered diatonically, it contains four terms, *viz.* two greater tones, a lesser tone, and a greater semi-tone. The *Diapente* is the greater part of the diapason, or octave, harmonically divided. It is produced when the voice passes from its first tone to its fifth.

DIAPENTE, is also used in pharmacy, for a compound of five several drugs, or ingredients.

DIAPHANOUS *, in philosophy, a thing transparent, or that gives passage to the rays of light; as water, air, glass, talc, fine porcelain, &c. See *TRANSPARENT*.

* The word is formed of *δια*, through, and *φανω*, I shew.

DIAPHANEITY, in the schools, the quality of a transparent body; or that which denominates it such. See *TRANSPARENCY*.

The Cartesians hold the *Diaphaneity* of a body to consist in the rectitude of its pores; that is, in their being situate in right lines; so as that there is no intermediate substance to prevent the passage of the rays; and hence they argue, that the rendring glass malleable is an impossibility: for as soon as it becomes malleable, its pores will cease to be situate directly against each other; and of consequence it will lose its *Diaphaneity*, the principal character of glass.

Sir Isaac Newton accounts for *Diaphaneity* from another principle, *viz.* from the homogeneity, and similarity between the medium, wherewith the pores are filled, and the matter of the body itself.—For the refractions the rays undergo in passing thus out of the matter into the pores, *i. e.* out of one medium into another, being but small, the progress of the ray is not so much interrupted, but that it can make its way through the body.

DIAPHOENIC, *DIAPHOENICUM*, in pharmacy, a soft, purgative electuary; thus called from the Dates, which make its basis; the palm-tree, whose fruit they are, being called by Greeks *φοειν*. See *DATE*.

The other ingredients are penidies, almonds, turbit, ginger, white pepper, mace, cinnamon, rice, fennel, and carrot seeds, and honey.

The *Electuarium Diaphoenicum* purges chiefly serosities, and excites the menses.—It is also used in dropsies, lethargies, apoplexies, and palsies.

DIAPHORESIS, ΔΙΑΦΟΡΗΣΙΣ, in medicine, includes all discharges made through the skin; both sensible, and insensible: whence *Diaphoretic*, &c. See *PERSPIRATION*.

DIAPHORETIC, in medicine, is applied to remedies that promote the expulsion of humours by insensible perspiration.

Diaphoretic is much of the same import as *Sudorific*: except that the latter promotes sensible, and the former insensible perspiration.—Their only difference, therefore, is in the degree of activity.

DIAPHORETIC Antimony, or *mineral Diaphoretic*, is a preparation of antimony, the process whereof see under the article *ANTIMONY*.

DIAPHRAGM *, *DIAPHRAGMA*, in anatomy, a part, popularly called the *Midriff*, and by anatomists, *Septum Transversum*, it is a nervous muscle, separating the breast, or thorax, from the abdomen, or lower venter; and serving as a partition between the natural, and the vital parts as they are called.

* It was Plato, as Galen informs us, that first called it *Diaphragm*, from the verb *διαφρασσειν*, to separate, or be between two. Till his time it had been called *egges*, *understanding*; from a notion, that an inflammation of this part produced frenzy; which is not at all warranted by experience, no more than that other tradition, that a transverse section of the *Diaphragm* with a sword causes the patient to die laughing.

Its figure is round, resembling a rayfish, or thornback. It consists of two circles, the one membranous, the other fleshy; though

though others will have both of them muscular : of two arteries ; and two veins, called *Phrenicæ* ; and several branches of nerves.

The first, or superior circle arises from the sternum, and the ends of the last ribs : the second, or inferior, comes from the vertebrae of the loins. The upper is covered a-top with a membrane derived from the pleura ; and the lower is lined at bottom with another from the peritonæum.

Its situation is oblique, being extended from the cartilago xiphoides, by the extremes of the ribs, to the region of the loins. It is pierced in the middle for the passage of the vena cava ; and in its lower part for the œsophagus ; and between the productions of the inferior circle pass the aorta, thoracic duct, and vena azygos. In its natural disposition it is convex on the upper side towards the breast, and concave on the lower towards the belly. Hence it has two motions ; the one of contraction, the other of relaxation.

By the contraction, or swelling of the fibres, the *Diaphragm* becomes flat on each side ; the consequence of which is, that the cavity of the breast is enlarged, to give liberty for the lungs to receive the air in inspiration ; and the cavity of the abdomen is lessened, and consequently the stomach and intestines pressed, for the distribution of the chyle. In its relaxation, whereby it resumes its natural situation, the cavity of the breast is diminished, and the lungs pressed for the expulsion of the air in expiration.

On the *Diaphragm*, also, in great measure, depend the actions of coughing, sneezing, yawning, laughing, the hiccup, &c. between which motions there is some connection caused by the communication of the nerves of different parts, which meet in the *Diaphragm*.

Dr. Hook observes, that an animal may be kept alive, without thorax, or *Diaphragm*, by blowing air into the lungs with a bellows ; of which he had made the experiment.

DIAPHRAGM is also a general name, given to all partitions, or separations between two parts of a thing ; as the little perforated partitions in the tubes of long telescopes.

DIAPHRAGMATIC, is applied to the arteries, veins, and nerves distributed through the diaphragm.

They are also called *Phrenicæ*, or *Phreneticæ*.

DIAPRE, or **DIAPERD**, in heraldry, a dividing of a field into planes, or compartments, in the manner of fret-work ; and filling the same with variety of figures.

This chiefly obtains on bordures, which are *diapered*, or fretted over, and the frets charged with things proper to bordures : as in *Tab. Herald. fig. 18*.

DIAPRUNUM, in pharmacy, a soft, purgative electuary, thus called from the pulp of Damascus *prunes*, which make its base.

Diaprunum, is either *simple*, or *compound*.

Simple, or *lenitive DIAPRUNUM*, consists of the pulp aforementioned, with cassia, tamarins, rhubarb, red roses, violet seeds, saunders wood, both red and citron, scrapings of ivory, liquorice juice, and the four cold seeds. It is good to prepare, and soften the humours.

Compound, or *solutive DIAPRUNUM*, is only the simple, with the addition of half an ounce of scammony to every pound of the electuary, to render it more purgative.

DIARRHODON *, **ΔΙΑΡΡΟΔΟΝ**, in pharmacy, a name given to diverse compositions, wherein roses are a principal ingredient.

* The word is formed of *στα*, and *ρῶδον*, *Rose*.

DIARRHODON *Abbatis*, is a cordial powder, so denominated from the abbot who invented it. It consists of red roses, red, and citron saunders, lignum aloes, cinnamon, rhaponticum, spike-nard, ivory, harts-horn, saffron, mastic, pearls, amber-gris, musk, &c. It is used to strengthen the heart, stomach, and liver, to assist in digestion, and to prevent vomiting.

There are also *Trochisci DIARRHODON*, composed of red roses, shavings of ivory, the saunders, liquorice, mastic, saffron, camphor, and rose-water. They are good to fortify the heart, stomach, and liver, and to stop dysenteries, and other fluxes of the belly.

Pillule DIARRHODON are composed of aloes, Trochisci Diarrhodon, wormwood leaves, mastic, and rock-salt. They first purge, then fortify the stomach, promote digestion, and prevent a stinking breath. But all these compositions are out of use at present.

DIARRHOEA *, **ΔΙΑΡΡΟΙΑ**, in medicine, a looseness, or flux of the belly ; or a profuse evacuation of liquid excrements by stool.

* The word is formed of the Greek *στα*, *through*, and *ρῆεν*, *to flow*.

The word, in the general, is used for any kind of flux of the belly ; but properly for that wherein the humour, or excrement flows out either pure, or mixed with, or without pain, in a fluid state.

Diarrhoea's are of diverse kinds, distinguished by the diversity of the excrements : some being bilious ; some serous ; some pituitous ; and some purulent.

The purulent always arise from some abscess burst in the body ; the rest either from morbid humours irritating the intestines, and expressing the juices out of the adjacent parts ;

or from a laxness of the intestinal fibres ; or an extraordinary fermentation in the blood, whereby it discharges its excrements into the intestines.

There are also *Diarrhoea's* arising from unwholesome foods, and the stoppage of the other excretions, particularly perspiration. It is a standing observation, that such as perspire but little, are ever subject to a *Diarrhoea* ; and on the contrary, people who perspire much, are commonly costive.

Baglivi mentions *Diarrhoea's* as one usual great effect of grief ; as likewise of immoderate anger ; without which a fever would, in these cases, be produced.

In the cure of *Diarrhoea's*, from whatever cause they arise, the stomach must be corroborated, and sudorifics are to be mixed with absorbents. The patient is to drink sparingly. Quince and wine burnt with aromatics is good. Wainwright observes, that a flannel shirt contributes much to the cure of an habitual *Diarrhoea*.

Stolterfoht, a physician of Lubbeck, relates, that a mechanic of that city had a continual *Diarrhoea* from 30, to the age of 65 years, which always gave him five or six stools a day, yet he was in good health all the while, having a good appetite, and sufficient strength and vigour. But in his 65th year taking some astrigent medicines, he stopped his flux ; upon which he was immediately seized with a violent pain in the kidneys, difficulty of breathing, and loss of digestion ; he threw up his food as he took it, grew cold at the extremities of the body, swelled in the thighs, had an insupportable thirst, and more appetite, and urined, with much difficulty, a thin watery humour, destitute of all sulphur. See *Supplement Article Diarrhoea*.

DIARTHROSIS *, in anatomy, a kind of articulation, or juncture of the bones which being pretty lax, affords room for a manifest motion. See **ARTICULATION**.

* The word comes from *στα*, and *αρθρον*, *Juncture, Assemblage*.

It is opposed to **Synarthrosis**, wherein the articulation is so close, that there is no sensible motion at all.

Diarthrosis is of three kinds : 1. When the head of the bone is big, and long, and the cavity that receives it, deep ; it is called *Enarthrosis* : such is that of the thigh, with the hip.

2. When the head of the bone is flat, and the cavity that receives it superficial, it is called *Artbrodia* : such is that of the jaws, with the bones of the temples. 3. When two bones receive each other reciprocally, and are moveable in each other, it is called *Ginglymus* : thus the cubitus receives the radius, at the same time that the radius receives the cubitus.

DIARTHROSIS *Synarthroidalis*, called also *Amphiarthrosis*, is a kind of neutral, or dubious articulation ; being neither absolutely *Diarthrosis*, as not having a manifest motion ; nor absolutely *Synarthrosis*, as not being quite immovable.

Thus the articulations of the ribs, with the vertebrae, and those of the bones of the carpus, and tarsus, among each other, are *Synarthroidal Diarthroses*.

DIARY *Fever*, is a Fever of one day. See **EPHEMERA**.

DIASCORDIUM, in pharmacy, a kind of electuary, first described by Fracastorius, and denominated from *scordium*, which is a chief ingredient therein.

The other ingredients are red roses, bole, storax, cinnamon, cassia, lignea, dittany, tormentile roots, bistort, gentian, galbanum, amber, terra sigillata, opium, long pepper, ginger, mel rosatum, and malmsey wine.

It is an astrigent, and is used against malignant fevers, the plague, worms, the colic, and to provoke sleep, and resist putrefaction.

DIASEBESTEN, in pharmacy, a soft, purgative electuary, whereof sebescens are the basis.

The other ingredients are prunes, tamarinds, juices of iris, anguria, and mercurialis, penides, simple diaprunum, violet seed, the four cold seeds, and diagyrium. It is good in intermitting, and continued fevers, appeases thirst, promotes sleep, and expels the morbid humours by urine.

DIASENNA, in pharmacy, a soft, purgative electuary, thus called from *senna*, which is its base.

The other ingredients are sugar candy, cinnamon, lapis lazuli, silk, cloves, galanga minor, black pepper, nardus indica, seed of basilicum, flowers of cloves, cardamoms, saffron, ginger, zedoary, rosemary flowers, long pepper, lapis armenus, and honey. *Diaseenna* eases and comforts the melancholic, and splenetic ; and is good against all diseases arising from an atrabilis.

DIASTEM, **DIASTEMA**, in music, a name the ancients gave to a simple interval ; in contradistinction to a compound interval, which they called a *Sytem*.

Musicians divide intervals into two kinds : one of them called *Sytem*, which is to contain at least two intervals in any kind of music whatever ; but many, contain more.

The other, called *Diastem*, is a mere, or single interval ; the proper signification of the Greek *διαστημα*, being *interval*.

DIASTOLE *, in anatomy, expresses that motion of the heart, and arteries, whereby those parts dilate, or distend themselves : the other opposite motion being called the *Systole* of the heart, and arteries ; wherein they contract themselves. See **HEART**, and **ARTERY**.

* The word is Greek, formed from the verb *διαστέλλειν*, *to separate, open, dilate*.

The *Diastole* of the heart is properly the recess of the parietes of the two ventricles from each other; or the enlargement of their cavities and diminution of their lengths, and their approximation to a spherical form.

The *Diastole*, or dilatation of the heart, arises from the blood being brought, by the veins, into its ventricles; and that of the arteries, from the blood being thrown into their cavities by the contraction of the heart. So that the *Diastole* of the heart, and arteries, is not affected at the same time; the *Diastole* of the heart happening when the arteries are contracted, and that of the arteries when the heart is contracted.

What we call the beating of the pulse, is only the *Diastole* of the arteries.

The lungs and breast have likewise their *fyttole*, and *Diastole*; so has the brain.

The true cause of the *Diastole* of the heart was but lamely accounted for before Dr. Drake: that the heart is a muscle, is made evident beyond all doubt by Dr. Lower; and that the motion of all muscles consists in contraction, is not to be doubted.—By such means the *fyttole* is easily accounted for.

But in as much as the heart has no antagonistic muscle, the *Diastole* has puzzled the greatest wits. Dr. Lower unhappily attributes it to a motion of restitution. As the motion of the heart, says he, is performed by contraction; and as the fibres of the heart are alone formed for contraction; it is evident, all the motion of the heart lies in its *fyttole*; and that the fibres, in the several contractions, being stretched beyond their tone, as soon as the visus is over, the heart relaxes again by a motion of restitution; *a nullo enim cordis motu, nisi tensionem ejus remittente, & ab irridente sanguine, Dialtole, ejus libratu vicibus succedit.* de Corde, p. 75.

Mr. Cooper accounts for the *Diastole* from the analogy the heart of an animal bears to the pendulums of those artificial automata, clocks and watches: its motion, he says, is performed like that of other muscles, the blood doing the office of a pondus, or weight.—Both these notions Dr. Drake refuses; and with great reason and probability maintains the weight of the atmosphere to be the pondus, or counterpoise to the contractile force of the heart.

It has long been known, that the dura mater has a *fyttole* and *Diastole*, exactly corresponding to those of the heart. But its cause was not so well known: Dr. Ridley, in the *Philosoph. Transact.* having bored a hole in the upper part of the bregma of a dog, first perceived the alternate vibrations of the dura mater; then, continuing the hole to the brain, he found both by his eyes, and even afterwards by touch, very sensibly, that there was a like brisk *fyttole* and *Diastole* of the brain. See BRAIN, and DURA-MATER.

DIASTOLE, in grammar, a figure whereby a syllable naturally short, is made long.

Thus it is, that Virgil begins a verse with the word *Italus*, the first syllable whereof is naturally short.

DIATYLE, in the ancient architecture, an edifice, where the columns stand at such a distance one from another, that three diameters, or six modules, are allowed for the intercolumniation.—See *Tab. Archit. fig. 47.*

DIASYRMUS, ΔΙΑΣΥΡΜΟΣ, in rhetoric, a figure whereby we shortly answer, or rather evade, a thing which it would be tedious to reply to inform.—

E. gr. What matters it to reply to an argument foreign to the purpose.

DIATESSARON *, in pharmacy, a sort of theriaca, thus called because consisting of four ingredients, which are roots of aristolochia, and gentian, bay-berries, and myrrh.

* The word is Greek, compounded of *δία*, and *τεσσαρά*, four, q. d. a composition of four drugs.

It is also called *Theriaca Pauperum*, because made at a very easy expence, and in a short time. It is good against stings of venomous beasts, epilepsies, convulsions, colics, to strengthen the stomach, and promote the menses.

DIATESSARON, in the ancient music a concord or harmonical interval, composed of one greater tone, one lesser, and one greater semi-tone; its proportion being as 4 to 3.

In the modern music, it is called a perfect fourth.

DIATHESIS, a term used by some writers, in the same sense with configuration.

DIATONIC, an epithet given to the common music, as it proceeds by tones, or degrees, both ascending, and descending.

Authors divide the genera or kinds of music into *Diatonic*, *Chromatic*, and *Enharmonic*.

Diatonic music only allows of three degrees; the greater and lesser tone, and the greater semi-tone.

Hence *Diatonic* music appears the most natural, and of consequence is the most ancient.

In the *Diatonic* music there is a tone between every two notes, except between *mi* and *fa*, and *si* and *ut*, where there is only a greater semi-tone.

DIATRAGACANTH, in pharmacy, is a name applied to certain powders, whereof gum tragacanth is the base.—There are two kinds, cold and hot.

Powder of cold *Diatragakanth* is composed of the gums adra-

gant and arabic, liquorice, starch, white poppy seed, and the four great cold seeds. It is good to thicken and soften the too sharp, and subtil ferous humours falling on the breast, to assuage coughs; and to promote spitting.

Powder of hot *Diatragakanth* is composed of gum adraganth, cinnamon, hyssop, almonds, linseed, and fenugreek, liquorice, and ginger. It is good against asthma's, to promote expectoration, strengthen the stomach, and assist digestion.

DIAZEUCTIC Tone, in the ancient Greek music, was that which disjoined two fourths, one on each side of it, and which being joined to either, made a fifth.

This in their music was from *mesé* to *paramésé*; that is, in ours, from A to B: supposing *mi* to stand in *be-fa-be-mi*.

They allowed to this *Diazeuctic Tone*, which is our *la, mi*, the proportion of 9 to 8, as being the unalterable difference of diapente and diatessaron.

DICHOTOMY *, *Bifurcation*, a term used by astronomers for that phasis, or appearance of the moon, wherein she is bisected, or shews just half her disk, or circle.

* The word is Greek, formed of *διχοτόμος*, *I bisecti*, or cut in two, of *δύο*, twice; and *τέμνω*, *I cut*.

The time of the moon's *Dichotomy*, is of considerable use in fixing the sun's distance from the earth. But it is very difficult to fix the precise moment when the moon is bisected, or in her true *Dichotomy*. Observation informs us, that when she is 30 minutes distant from the quadratures, she appears bisected; but she appears so too in the quadratures themselves, and some time afterwards, as Ricciolus acknowledges in his *Almagest*. So that she appears *dichotomized* at least for the space of a whole hour: in which time, any moment may be taken for the true point of the *Dichotomy*, as well as any other. But the infinite number of moments of time give an infinite diversity of distances. The moment in which the true *Dichotomy* happens, being thus uncertain; but it being granted withal that it happens before the quadrature Ricciolus takes the middle point between the quadrature, and the time when it is first dubious, whether the moon be *dichotomized*, or not, for the true *Dichotomy*. Keil.

DICHOTOMY, in botany a term us'd to express that division of the branches, which we see in mistletoe, and in the greater part of the sea fucus's, in which each branch is divided into two.

DICTAMNUM, DITTANY, a medicinal plant, much valued among the ancients, and particularly applauded by their poets. It was esteemed a specific for wounds of arrows, which it drew out with wonderful ease, and according to them, only grew in the island of Crete, and even only in a little obscure corner thereof; whence its appellation *Dictamnus Creticus*. It is still found in that island.—M. Tournefort, who was in Crete describes the place where it grows, and says it flourishes there almost all the year.

The modern *Dictamnus albus*, called also *White Dittany*, or *Frasinella*, from its leaves, which resemble those of the ash, called by the Latins *Fraxinus*, is scarce in less esteem than that of the ancients. Its root, wherein all its virtue is lodged, is about the thickness of a finger, and is frequently divided into a number of little branches; its colour is white, its taste bitter, its smell strong, somewhat like that of a he-goat, its stem is about two foot high, reddish, and full of leaves; at the top of the stem is a flower not unlike a spike or ear; in the middle of the flower is a pistil with five little pieces at the bottom wherein the seed is contained, which is black, shining, and oval. (See Supplement article Flaxinella.) The root is excellent against the bite of venomous beasts, as also against worms, the colic, &c. It must be chosen white, both inside and outside, not fibrous, and well cleaned.

There are several other kinds of dittany, but all of less value; as the *bastard dittany*, whose leaves are much less; and the *wild dittany*, which some say neither bears flowers, nor fruit. The ancients have a tradition, that the wounded deer first discovered the virtue of the *Dictamnus Creticus*, which being eaten, presently forc'd out the arrows sticking in them. Thus Pliny Lib. VIII. c. 27. And the like account we have from Cicero de Natur. Dear. Lib. II. Virgil. *Æneid*. Lib. XII. v. 412. Tertull. de Penit. c. 11. Though Cicero, more prudent and reserved than Pliny, is contented to speak of it as by hearsay. Aristotle Lib. de Mirabilib. *Auscult.* relates it of the roe-buck. Pliny says expressly, that the juice of this plant taken inwardly, expels arrows, and cures wounds made with other weapons: he adds, that it stops suppurations, provokes the menses, and delivery, and is good in frictions and fumigations.

DICTATE, DICTAMEN, in the schools, a suggestion, motion, or sentiment of a man's conscience. See CONSCIENCE. A good action becomes evil if done contrary to the *Dictates* of one's own conscience.

DICTATE, DICTATA, is likewise used in the schools for a lesson, or exercise, wherein the master reading, or speaking something, the scholars take it down in writing after him.—Here the act of the master is likewise called *dictating*.

DICTATOR, a Roman magistrate, created by the senate, or people, on some extraordinary, and eminent occasion, to command, with sovereign authority, for a certain time, or

dinarly

dinarily limited to six months; though the office was sometimes continued to twelve.

Recourse was never had to such an officer, but in dangerous, and difficult times; as in sudden wars, popular factions, &c. He had absolute, and monarchic power while his *Dictatorship* lasted: and some will even have it, his power went beyond that of the kings. He was arbiter of peace and war, and had command of life and death, without any appeals lying to the people. Twenty four axes were born before him, whereas only twelve before the consuls.

The origin of this office was unknown even in Livy's time; though some ancient authors speak of T. Lartius Flavius as the first *Dictator*, who was appointed in the year of Rome 255*. Sylla was the first perpetual *Dictator*, and Cæsar the next. After Cæsar there were no more *Dictators*. The first *Dictator* chose from among the people, was Marcus Rutilius, in 399.

* *Sed nec anno, nec quibus consulibus—nec quis primus dictator creatus sit, satis constat: Apud veterimos tamen auctores, T. Lartium Dictatorem primum, Sp. Cassium magistrum equitum creatos invenio. Consulares leges. Liv. lib. 2.*

Dionysius Halicarnassicus derives the word *ab edicendo*, because they ordained, and appointed what they pleased. But Varro will have the word taken hence, that the consul named him, which the Latins call *dicere*. Lib. IV. *de lingua Latina*. *Dictator quod a consule dicebatur, cujus dicto audientes omnes essent.*

DICTION, the phrase, elocution, or style of a writer, or speaker.

The *Dictation* or language of an orator should be pure, proper to the subject, rich without affectation, strong and close without dryness, and suitable to the person, time, place, and audience.

The *Dictation* of tragedy is accounted the fourth of the essential parts thereof: it is of the least importance of any; yet most peculiar care be taken herein to make every passion speak its proper language.

DICTIONARY, a collection, or catalogue of all the words of a language, or art, with their significations; ranged in the order of the alphabet.

What the Latins, and we after them, call *Dictionary*; the Greeks call *Lexicon*.

For the proper character, nature, office, &c. of a *Dictionary*, see the preface to this work. See also the article **VOCABULARY**.

The most ancient *Dictionaries* for the Latin Tongue, are, that called *Papias*, compiled by Solomon, abbot of St. Gall, bishop of Constance, who lived about the year 1409; another made in 1496, called *Gemma Vocabulorum*: a third in 1502, called *Gemma Gemmarum*: and a fourth by Dionysius Nestor, a cordelier.

The most celebrated old Latin *Dictionary* is that of Ambrose Calepine, a hermit of St. Augustin at Bergamo, and son of the count of Calegin. Conrad Gesner is said to have augmented this with four thousand words. Paulus Manutius increased it still more; and Passerat after him; and yet Matthias Martinus made two volumes of their omissions.

There is another noted Latin *Dictionary* of Crispinus: to say nothing of Cowper, Holyoake, Gouldman, Littleton, Cole, and numerous others of less consideration.

For the Greek, we have those of Henry Stephens, and Scapula: for the Spanish, that of Covarruvias: for the Italian, that of the Academy della Crusca: for the French, those of Nicod, Fa. Monet, Fa. Gaudin, Furetiere, Richelet, Tre-voux, and that of the French academy: for the English, we have yet scarce any worth the mentioning; unless, perhaps, those of Loyd, Phillips, Kerley, and Bailly; but a very complete and accurate one is expected daily from Mr. Johnson.

Junius has a *Dictionary*, or alphabet of the Gothic, Runic, and Anglo-Saxon. There is another in the Malayan, which is a dead language, famous throughout the East Indies; where it stands in stead of the Latin among us.

There are also historical, and geographical *Dictionaries*: as that of Charles Stephens, which is translated into French, and augmented by Morery: another of Hofmann, printed at Bailil in 1677, in two volumes folio; which were followed by a continuation of as many volumes in 1683; another of Mr. Bayle, under the title of historical and critical *Dictionary*, first printed at Rotterdam in 1697, in two large volumes: a philosophical *Dictionary*, by Mr. Chauvin of Berlin: besides several law *Dictionaries*, physical *Dictionaries*, family *Dictionaries*, *Dictionaries* of arts, of commerce, &c.

DIDACTIC*, in the schools, signifies the manner of speaking, or writing adapted to teach, or explain the nature of things.

* The word is formed from the Greek *διδασκαω*, *doceo*, I teach. There are many words that are only used in the *Didactic*, and dogmatic way.

DIDYMI, ΔΙΔΥΜΟΙ, the same with Gemelli, or Twins.

DIEM clausit extremam, a writ issued out of chancery to the executor of the county, upon the death of any of the king's tenants in capite, to enquire by a jury of what lands he died seized, and of what value, and who was the next heir to him.

DIES. See the article **DAY**.

DIES, in common law. There are two kinds of *days*: *juridici*, & *non juridici*.

DIES juridici, or *festi*, are all days wherein justice is administered in court.

DIES non juridici, or *nefasti*, are all sundays in the year: and in easter term, the feast of the ascension of our Lord: in trinity term, the nativity of St. John the baptist: in michaelmas term, the feast of all saints, and all souls: and in hillary term, the purification of the blessed virgin.

The same distinction holds not only as to legal proceedings in court, &c. but also as to contracts.

DIES, in some ancient authors, is also used for daily provision. *Et reddebat dimidium diem mellis*, q. d. as much honey as served the king's family half a day.

DIES datus, is a day, or time of respite given to the tenant, or defendant by the court.

DIESIS, in music, a division of a tone, lesser than a semi-tone; or an interval consisting of a leffer, or imperfect semi-tone.

The *Diesis* is the smallest, and softest change, or inflexion of the voice imaginable. It is also called a *Feint*, and is expressed by a St. Andrew's cross, or saltier.

Aristotle call *Dieses* the elements of voice, as letters are those of discourse. Indeed, Aristotle's *Dieses* were apparently different from ours: And we find Vitruvius expressly making the *Dieses* a fourth part of the tone. But the Pythagoreans, who are held the inventors of the name *Diesis*, did not make it so small: they only divided the tone into two unequal parts, and called the leffer, *Diesis*, which we call the leffer semi-tone; and the greater, which we call the greater semi-tone, they called *Anatome*.

But in after-times, when the tone came to be divided into three and four parts, the name *Diesis* was retained to them all. And hence those different accounts, we meet withal in authors, of the quantity of the *Diesis*.

Enharmonic DIESIS, is the difference between a greater, and leffer semi-tone. See **TONE**, **GENUS**, **DEGREE**, **SCALE**, &c. *Dieses* are divided into three kinds: the *leffer enharmonic Diesis*, or *simple Diesis*, denoted by a single cross, raises the note following by two comma's, or about $\frac{1}{2}$ of a tone: the *chromatic*, or *double Diesis*, denoted by a double cross, raises the following note by a leffer semi-tone, or about four comma's; which is the common *Diesis*: The *greater enharmonic Diesis*, denoted by a triple cross, raises the note by six or seven comma's, or about $\frac{1}{2}$ of a tone. None but the *double Diesis* is used in music. A flat is frequently used to take away the *Diesis*, and a *Diesis* to take away a flat.

When semi-tones are placed where regular tones should be; or a tone where there should be a semi-tone; it is called a *Diesis*, or *Feint*.

DIESPITER*, in antiquity, a name given to *Jupiter*.

* Some authors will have it the same with *Dias pater*, *Jupiter* father: *Jupiter* being called in Greek, *Zeus*, or *Δεω* whence the oblique case *Δεω*, &c. Others hold *Diespiter* to signify *Diti pater*, father of the day. St. Augustin derives the name from *Dies*, day, and *pater*, production, bringing forth; it being *Jupiter* that brings forth the day. Of which sentiment were Servius, and Macrobius: the former adding, that in the language of the Osci, they called him *Lucentius*, as *Diespiter* in Latin.

Stravins Antiq. Rom. Synt. C. I. seems to intimate, that *Diespiter* signified *Phos*: But, if that be his meaning, he is apparently mistaken. For both in Cicero, and in the inscription he quotes from Gruter XXI. 8. we have only *Dias pater*, and not *Diespiter*.

DIET*, ΔΙΕΤΑ, in medicine, &c. a regimen, or course of lying, proper in regard to health.

* The word *Diet*, in this sense, comes from *Dieta*, which signified anciently a banquetting room; and at length an assembly of the states, by reason the Germans held most of their councils at table.

A *spare Diet* is a sovereign remedy against all diseases arising from repletion.

It is founded on this, that nature ought not to be busied, and distracted in the concocting of food; but left wholly to her work of digesting, and expelling the morbid matter.

The word is formed from the Greek *διαιτα*, which signifies *regimen*, or *rule of life*, prescribed by physicians. And as the physicians usually order a *spare*, scanty modicum, less than is usually taken; *Diet* has with many passed into a name for this retrenchment, or diminution of the ordinary quantity of food, whether it be by advice of a physician, or by a person's own choice: provided it be to remove, or prevent some disorder.

For the advantages of a *spare simple Diet*, see **ABSTINENCE**.

Dr. Cheyne shews, how one may supply the place of medicines by *Diet*: any one, says he, may in effect lose a pound of blood, take a purge, or a sweat, by dropping the great meal, or abstaining from animal food, and strong liquors for four or five days, in chronical cases, as effectually as by opening a vein,

swallowing a dose of pills, or taking a sudorific bolus. He advises therefore all gentlemen of a sedentary life, and of learned professions, to use as much abstinence as possibly they can, consistently with the preservation of their strength, and the freedom of spirits. This they ought to have recourse to, as soon as they find any heaviness, inquietudes, restless nights, or aversion to application: either by lessening one half their usual quantity of animal food, and strong liquors, till such time as they regain their wonted freedom, or by living a due time wholly on *vegetable Diets*, as sago, rice, puddings, and the like, and drinking only wine and water.

DIET, or *Dyet*, is also used for an assembly of the states, or circles of the empire, or Poland, to deliberate, and concert measures for the publick good.

The *Diets* of the empire are ordinarily held at Ratisbon.

The general *Diet* of Poland is by the laws only to be held every two years. But pressing occasions convene them every year. The laws also confine their sitting to 15 days; but they frequently protract it to six weeks. The usual place is at Warsaw, the capital of the kingdom; though it has been often held at other places: in effect, as by the laws every third *Diet* is to be convened at Grodno, in Lithuania; whenever for particular reasons it is judged meet to baulk the turn, and hold it elsewhere, the nobility of the grand dutchy must consent to it. It is the king who fixes the time, and summons it by circular letters sent to all the palatinates. In an interregnum, the archbishop of Gnesna calls the *Diet*.

The several particular *Diets* which are held six weeks before the general one, do each send three deputies chose out of the members thereof.

In Poland there are likewise *Diets* on horseback, held in the campagne, or country. Such are those wherein they chuse their king. They are called *Pospolites*.

There are likewise *Diets* held in Switzerland: *Diets* of the protestant cantons; *Diets* of the catholic cantons; and general *Diets*. They first assemble at Araw, and are convoked by the canton of Zurich: the second at Lucern, convoked by the canton of that name. The third, composed of the deputies of all the cantons, both protestant and catholic, is held twice a year, at the end of June, and the beginning of December, and meets at Baden. It is the canton of Zurich which has the right of convening it.

DIETA, in our old law-books, denotes a days-journey—*omnis rationabilis Dieta constat ex viginti miliaribus*. *Pieta*.

DIETETIC, **DIÆTETICA**, that part of physic, which considers the way of living with relation to food, suitable to particular cases. See **DIET**.

DIEU & *mon droit*, q. d. *God and my right*, the motto of the arms of England, first given by king Richard I. to intimate, that he held not his empire in vassalage of any mortal. It was afterwards taken up by Edward III. when he first claimed the crown of France; and was continued without interruption to the time of king William III. who used the motto, *je maintiendray*; though he commanded the former to be retained on the great seal. The fame is to be understood of the late queen Anne, who used the motto, *semper eadem*; which had been before used by queen Elizabeth.

DIFFAMATORY, a term chiefly used in the phrase *diffamatory libel*, signifying a writing intended to scandalize, or discredit a person, &c.

By the Roman law, and the ancient ordinances of France, the authors of *diffamatory* libels were punished with death. See *Baldwin Comment. ad Leges de Libellis famosis*.

But the historian tells us, that cardinal Ximenes was insensible to all *diffamatory* libels: he found it not reasonable, to leave inferiors the liberty of venting their grief by writings, which only live while the person is offended at them, and lose all their spirit and malignity when despised, or disregarded.

DIFFARRATION *, among the Romans, a ceremony whereby the divorce of their priests was solemnized.

* The word comes from the preposition, *dis*, which is used in composition for division, or separation; and *farreatio*, a ceremony with wheat; of *far*, wheat.

Diffarration was properly the dissolving of marriages contracted by consarration; which were those of the pontifices, or priests. Festus says, it was performed with a wheaten cake. Vigenere will have consarration and *Diffarration* to be the same thing.

DIFFERENCE, in logic, an essential attribute belonging to some species, and not found in the genus; being the idea that defines the species.

Thus, body and spirit are the two species of substance, which in their ideas include something more than is included in the idea of substance. In body, for instance, is found impenetrability, and extension; in spirit, a power of thinking, and reasoning. So that the *Difference* of body is impenetrable extension; and the *Difference* of spirit is cogitation.

DIFFERENCE, in mathematics, the excess of one quantity above another.

This angle is 60 degrees, and that 90; their *Difference* is 30. When a less quantity is subtracted from a greater, what remains is called the *Difference*.

DIFFERENCE of longitude of two places, is an arch of the equator intercepted between the meridians of the places.

ASCENSIONAL DIFFERENCE, in astronomy. See **ASCENSIONAL**.

DIFFERENCES *, in heraldry, certain additaments to coat-armour, whereby something is altered, or added, to distinguish the younger families from the elder, or to show how far they are removed from the principal house.

* They are called in Latin *Diminutiones*, and *Discarnicula Armorum*, and by the French *Brisures*.

Of these *Differences* Sylv. Morgan gives us nine, which obtain principally among us: *viz.* the *label*, which denotes the first and eldest son: the *cresecent*: the *mullet*: the *third*: the *martlet*: the *fourth*: the *annulet*: the *fifth*: the *flower de lis*: the *sixth*: the *rose*: the *seventh*: the *eight fail*: the *eighth*: and the *cross moline*: the *ninth*. See each under its proper article, **LABEL**, &c.

Again, as the first *Differences* are single for the sons of the first house, or descent; the sons of the younger houses are differed by combined or putting the said *Differences* upon each other. As the first *Differences* are the *label*, *cresecent*, &c. for the first house; the *Difference* for the second house is the *label* on a *cresecent*, for the first of that house: for the third brother of the second house a *mullet* on a *cresecent*, &c.

The original of *Differences* is controverted. Camden will have them to have begun about the time of king Richard. Paradin assigns *Differences* wore as early as the year 870.

The president Fauchet observes *Differences* to have been hereditary in the French families before the time of Louis le Gros, who came to the crown in the year 1110. Moreau refers them to the time of St. Louis, and Lallouette, Belle-forest, &c. to that of Philip Augustus.—The occasion of their rise is well accounted for by Colombiere.

All nations, says he, prefer the eldest brothers to the younger; whence those, in a direct line, succeeding to their fathers, and becoming masters of their lands, took on them their coat-armour, without any change, or alteration; and transmitted the same again to their eldest sons: the younger brothers, or bastards not being allowed to bear the same arms, without some additional mark, to distinguish them from the elder. Hence some heralds, he goes on, have endeavoured to confine them to certain fixed, and determinate figures, for distinguishing the second from the first, the third from the second; and so on to the sixth: assigning the second a *label*, the third a *bordure*, the fourth an *orle*, the fifth a *battoon*, and the sixth a *bend*, or *cutice*.

And the descendants of these to bear double *Differences*, or *Differences* charged on one another, *viz.* the eldest son of the second son to retain his paternal coat, with the *Difference* of the *label* of three points; the second the *label* of four points; the third such a *label* on a chief; the fourth a *label* charged with certain figures, as *eaglets*, *lioncels*, *martlets*, *cresecents*, *roses*, &c. And for the same reason, the second son of the third son shall bear a *bordure* engrailed, the third a *bordure* charged with bezants, or *tourteaux*, &c.

But the same author judges the fixing any certain invariable *Differences* at all an abuse; by reason they may happen not to be agreeable to the paternal coat, but very much deface, and blemish it. He adds, that many other figures beside those abovementioned, may be used as *Differences*; as shells, bezants, cinque-foils, and a thousand more. Some younger families have made the *Difference* in their arms by only diminishing the ordinaries, or changing the posture; and others by only changing the metal, or colour.

It must be added, that the *Difference* may be of metal on metal, or colour on colour; which in other cases is false heraldry.

DIFFERENTIAL, **DIFFERENTIALE**, in the higher geometry, an infinitely small quantity, or a particle of quantity so small as to be less than any assignable one.

It is called a *differential*, or *differential quantity*, because frequently considered as the difference of two quantities; and as such it is the foundation of the *differential calculus*: Sir Isaac Newton, and the English, call it a *Moment*, as being considered as the momentary increase of quantity. Mr. Leibnitz, and others, call it also an *Infinitesimal*. See **INFINITESIMAL**.

DIFFERENTIAL, of the first, second, &c. Degree. See **DIFFERENTIO-DIFFERENTIAL**.

DIFFERENTIAL calculus, or *method*, is a method of differencing quantities; that is, of finding a *differential*, or infinitely small quantity, which taken an infinite number of times, is equal to a given quantity.

This method is one of the finest, and subtlest in all mathematics; Mr. Leibnitz, who claims the invention thereof to him-

himself, calls it *differentialis calculus*, as considering the infinitely small quantities found hereby as the differences of the quantities; and accordingly expressing them by the letter *d* prefixed; as the *differential of x* by *dx*; that of *y* by *dy*, &c. Sir Isaac Newton, who has a better title to the discovery, calls it the *method of fluxions*, as considering the infinitely little quantities rather as fluxions, or momentary increments, *e. gr.* of a line, generated by the fluxion of a point; of a surface, by the flux of a line; or a solid, by the flux of a surface; and instead of *d* notes them by a *dot*; *e. gr.* the fluxion of *x*, he writes \dot{x} ; that of *y*, \dot{y} , &c. which is the only difference between the *differential calculus*, and the *method of fluxions*.—For the history, doctrine, use, &c. thereof, see *FLUXIONS*.

DIFFERENTIO-DIFFERENTIAL Calculus, is a method of differencing *differential* quantities.

As the sign of a *Differential* is the letter *d*; that of a *Differential of dx*, is *ddx*, and the *Differential of ddx*, *ddd*, or *d²x*, *d³x*, &c. or *x*, *x*, &c.

Thus, we have powers, or degrees of *Differentials*.

The *Differential* of an ordinary quantity is called a *Differential of the first power*, or *degree*; as *dx*.

DIFFERENTIAL of the second power, or *degree*, is an infinitesimal of a *differential* quantity of the first degree; as *ddx*, or *d²x*, or *d²y*, &c.

DIFFERENTIAL of the third Degree, is an infinitesimal of a *differential* quantity of the second degree; *ddd*, *d³x*, *d³y*, &c. and so on.

The *powers of Differentials*, as *dx²*, are differenced after the same manner, as the powers of ordinary quantities. And again, as compound *Differentials* either multiply, or divide each other, or are powers of *Differentials* of the first degree; *Differentials* are differenced after the same manner as ordinary quantities. And, therefore, the *Differenio-Differential Calculus*, is the same in effect, with the *Differential*.

DIFFERENTIAL, in the doctrine of logarithms. Kepler calls the logarithms of *Tangents*, *Differentialiales*; which we usually call *artificial tangents*. See *LOGARITHM* and *TANGENT*.

DIFFORM, is a word used in opposition to *Uniform*, and signifies, that there is no regularity in the form, or appearance of a thing.

The botanists use it as a distinction of the flowers of several species of plants.

DIFFUSE, DIFFUSIVE, is chiefly used for a prolix manner of writing, &c.

A dictionary cannot well be too *diffusive*: for a man is never too much informed of the word he wanted; and he is not obliged to read that part of the explication which does not concern him.

A *diffusive* style is proper for discourses in the demonstrative kind. Demosthenes is close, and concise; Cicero on the contrary is *diffusive*.

DIFFUSION, the act whereby a body is spread, or stretched out, so as to take up more space.

The school-men make three kinds of *Diffusion*: the first that whereby a pure quality is *diffused*; as cold, force, &c. This they distinguish into *equal*, whereby equal portions, or degrees of the quality are distributed upon equal parts of the medium; thus, when a direct motion is impressed on a moveable, all the parts of the moveable receive an equal impetus: and *unequal*, when unequal degrees of the quality are distributed on different parts of the subject; thus it is, that force is impressed on a lever, and cold propagated through a medium.

The second kind of *Diffusion* is that performed by the motion of bodies; such is the *Diffusion* of light, sound, smell, magnetic, electric virtues, &c.

The third is performed partly by the motion of corpuscles, and partly by the *Diffusion* of a quality; and thus they hold fire to be *diffused*.

But the modern philosophers reject the notion of qualities, and their *Diffusion*. According to them, there is no other *Diffusion*, but that of corporeal substance, emitted in minute effluvia, or particles, into a kind of atmosphere all around the body; which *Diffusion* of corpuscles some call *atmosphærical*, as being supposed to be terminated by a circle, whereof the *diffusing* body is the centre. Every body, it is now proved, has its sphere of activity, or *diffusion*, within which the particles, or corpuscles, torn from it, and flying away, have a sensible effect, as we see in odorous, sonorous, &c. bodies. See *QUALITY*; where the physical law of the *Diffusion* of qualities is laid down.

DIGAMMA. See *F*.

DIGAMY, the same with *Bigamy*. See *BIGAMY*.

DIGASTRICUS*, in anatomy, a muscle of the lower jaw, thus called, as having a double belly.—(See *Tab. Anat. Myol.*) *fig. 1.*

* The word is formed from *dis*, twice; and *γαστήρ*, belly.

It arises fleshy from the upper part of the process mastoideus, and descending, contracts into a round tendon, which passes through the stilo-hyoideus, and an annular ligament, which is fastened to the os hyoides; then it grows fleshy again, and ascends towards the middle of the edge of the lower jaw,

where it is inserted. When it acts, it pulleth the lower jaw down, by the help of an annular pully, which alters its direction.

DIGEST, DIGESTUM, a collection of the Roman laws, ranged and *digested* under proper titles, by order of the emperor Justinian.

That prince gave his chancellor Tribonianus a commission for this purpose; who, in consequence thereof, chose fifteen juriconsulti, or lawyers, to work upon the same. These, accordingly, took out the best, and finest decisions from the two thousand volumes of the ancient juriconsulti, and reduced them all into one body; which was published in the year 529, under the name of the *Digest*. To this the emperor gave the force of a law, by a letter at the head of the work, which serves it as a preface.

The *Digest* makes the first part of the Roman law, and the first volume of the corpus, or body of the civil law.

It was translated into Greek under the same emperor, and called *Pandetta*.

The usual method of quoting it is by a double *ff.* on account of the Greek name *Pandetta*, which being first abbreviated by a figure of two IIII; to abbreviate it yet further, the two characters were joined into one III, which the Latin copists mistook for *ff.*

Cujas says, that *Digest* is a common name for all books disposed in a good order and oeconomy: and hence it is, that Tertullian calls the gospel of St. Luke, a *Digest*.

DIGESTOR, or DIGESTER, an artificial means, or instrument, serving to *digest*, or dissolve meats out of the stomach, by a way analogous to that of animal digestion.

Mr. Leigh, in the *Philosoph. Transact.* gives us an artificial *Digester*, to illustrate the natural one: it is prepared from spirit of sulphur, spirit of harts-horn, the chyle of a dog, and its saliva. A piece of veal, mutton, beef, or the like, of the bigness of a nut, being put in a dram of this preparation, and set on a *digesting* furnace two hours; it drew from the flesh a juice, that had the colour and taste of chyle, and left the meat light, dry, and insipid.

Dr. Havers prepares a *Digester* of oil of turpentine, mixed with oil of vitriol; in which, raw flesh, and crumbs of bread being put, and the whole committed for four hours to *digest* in balneo marie, the meat is found dissolved, and the whole together forms a thickish pulp: hence, those authors, each of them, conclude the food in the stomach to be *digested* by some such menstrua.

But the most celebrated *Digester*, is an instrument of that name, invented by Papin, the effect whereof bears a more near resemblance to the operation of the stomach. It is a sort of vessel, wherein meat being put, together with so much water as serves exactly to fill it, a lid is screwed close on, so as to admit of no external air. Then, by the application of two or three lighted charcoals, or even a single small lamp-flame, the meat is in a few minutes (six or eight) reduced into a perfect pulp, or rather liquor. By a little increase of the fire, or the addition of a few minutes in time, the hardest bones themselves are brought into a pulp or jelly. The effect is accounted for from the strict closure of the engine, which excluding the intrusion, or escape of air, the succussions occasioned by the expansions, and oscillations of the air included in the flesh, are equable and strong, and so resolve the whole into one seemingly homogeneous body, and mix the aqueous, saline, oleous, and other particles, so strongly together, as scarce to be separable, but while hot, to appear one liquor, and when a cold jelly, of a strength proportionate to the quantity of flesh or bones dissolved in the water. This experiment seems to hold a close analogy with the operation of the stomach. For though the stomach do not ordinarily dissolve, either so strongly, or so quick; yet in proportion to its heat and constriction, Dr. Drake takes it to do the same thing: thereby breaking and resolving into small, the bodies which it included, so mixed, *inter minima*, with its humours.—These, thus reduced into a fluor, and intimately mixed with the liquids of the drink, and juices of the stomach, compose that lactescent liquor, called *Chyle*, or *Chyme*. See *CHYLE*.

DIGESTION, in medicine, that change of the food taken in at the mouth, which it undergoes in the stomach, in order to afford fit matter to compose, or increase an animal, till it arrives at its destined bulk; and to repair the loss of those particles, which the body, in its natural state, necessarily undergoes.

The operation of *Digestion* succeeds to mastication, and deglutition.

It includes chylification, and is succeeded by sanguification, and nutrition.

The cause, manner, and means of *Digestion*, have been infinitely controverted: it would be tedious to enter into all the systems, and hypotheses, that have been framed by philosophers and physicians, to account for this important operation. Some contend, that it is done by a kind of elixation, or boiling of the solid, and grosser parts of the food, in the liquid, by the heat of the stomach, and of the adjacent parts, the liver, spleen, &c.

Others will have it done by attrition; as if the stomach by those repeated motions, which are the effects of respiration, rubbed, or ground off the minute particles from the grosser matters; and agitating, and driving the rest against each other, attenuated, and dissolved them.

Others think the bilious juice; others the spirits, &c. chiefly concerned in the affair.

Others will have the food dissolved by a menstruum, or dissolvent: but these are greatly divided as to the nature and origin of this menstruum; some supposing it an acid, furnished by the glands of the stomach; others a nitroaereous spirit, which by penetrating the mass of food, breaks the connexion of the most solid parts; and others, a saline juice, which divides and volatilizes the parts of the food.

Others again suppose *Digestion* to be performed by means of a ferment, or leaven; which, mixing with the aliment, excites an intestine motion in the parts thereof, by whose mutual collisions, the parts are attenuated and dissolved.

But these, too, differ in their opinions of this ferment; some taking it to be the remains of the food last *digested*, which by its continuance in the stomach, has contracted an acid quality, which renders it a ferment: others take the ferment, or principles of fermentation to be contained in the aliment itself; which when inclosed in the stomach, and heated thereby, being put in motion, enters on its office of fermentation: but these, too, are divided; some taking it to be the spirituous part; and some the air in foods.

Others suppose the matter of this ferment supplied by the glands of the stomach: and lastly, others contend for the saliva, and make that the ferment serving principally for the *Digestion* of the food.

All these systems are now reduced to three principal ones; which we still find explained, and defended in the several later writings on that subject: the first holding *Digestion* to be performed by fermentation; the second by trituration; and the third by fermentation and trituration together.

The first opinion was for a long time the only one. The retainers of it hold, that the food, after it is received into the stomach is there impregnated with certain menstruous juices, which being assisted by the natural heat of the stomach, raise a fermentation in the foods, which dissolves, attenuates, and converts them into chyle.

This was originally the system of the ancients; who, though they only express themselves in general terms, as dissolving, softening, subduing, concretion, qualities, &c. yet seem to have the notion of what we call *Fermentation*. Thus Empedocles and Hippocrates teach, that *Digestion* is performed by a putrefaction of the foods, after the like manner as the same Empedocles holds water to be converted by putrefaction into wine. Hippocrates and Aristotle use the term *Concoction*, which we likewise find in Erotian, Plutarch, and Actuarius, to express the manner of fruits ripening, the mull's changing into wine, and paste's rising. Hippocrates expressly names *Efferescence*, and *Fermentation*, *de veteri medicina*, c. 5. and Galen likewise, *L. de Confectudinibus*, c. 2. And in another place he asserts, that a certain ferous juice of the stomach concurs with the bile and spirits to effect *Digestion*. To say nothing of Cicero, who, according to the prevailing opinion of his time, attributes *Digestion* to the heat of the stomach. *Lib. II. de Nat. Deor.*

The juices, or ferments in the stomach, to whose action *Digestion* is supposed owing, are, the saliva, bile, and pancreatic juice. This is so true, that in certain voracious animals, which eat, and *digest* fast, particularly wolves, ottriches, and porcupines, the bile discharges it self immediately into the cavity of the stomach; and we have observed a disposition analogous thereto in a man that had been a great eater.

There are only three marks to know the fermentation of dough and must by: first, in that the dough rises, and swells; and the must bubbles and rarifies. Secondly, In that the bread and wine made by these fermentations, have different tastes and qualities from those the flower and must had before. Thirdly, In that the bread and wine, by distillation, yield principles that differ in many respects from those drawn from flower and must. Now, all these characters are found in the change made in the food by *Digestion*.

Against this system it is objected by Mr. Hecquet, and others, that in every 24 hours there is prepared a pound of saliva, half a pound of bile, and at least two ounces of pancreatic juice; to which is to be added the stomach-liquor, resembling saliva; the whole amounting to about two pounds, or 13824 grains of leaven. Now, say they, it is allowed by the chemists, that one grain of ferment is sufficient for 800 grains of matter to be fermented; consequently 2 pounds of ferment would suffice for 1200 pounds of food: whereas a man ordinarily does not take above 4 pounds in a day.

Now, say they, is an argument, that fermentation is not the only, or principal intention of these juices; since, if it had, they would have been better proportioned to the occasion. And, further, it furnishes an objection, since such a quantity of saline, menstruous humour, having so little business to employ it in fermenting the food, must act on the

stomach, corrode and destroy the fine membrane it is lined withal, and do many other mischiefs.

But to this it is answered, 1. That, according to Mr. Hecquet himself, the faculty of fermenting only belongs to the salts; and that, by his own computation, half a pound of bile only contains 30 grains of salt; and a pound of saliva, with two ounces of pancreatic juice, and the stomach-liquor, contain but 14 grains more: so that the real saline ferment of the stomach produced each day, only amounts to about 44 grains; which seems scarce enough for two pounds of food. But Mr. Hecquet diminishes the quantity of these salts too much, which Verheyen, and others, make a great deal more. To which is also to be added the volatile salt, mixed with the phlegm and spirits. 2. It is not true, that there is always required a grain, and only a grain of leaven for 800 grains of matter. Experience contradicts this rule. In some fermentations there is no need of any leaven at all, and in others a deal less will serve. As to the ferments acting on the membranes of the stomach; it is certain, it does act on, and vellicate the same, when there is no food to employ it; and this it is, that occasions the sensation of hunger. But as fast as these are corroded, they are repaired again by the nourishment proper to them. The stomach is sometimes gnawed, and incommoded by the menstruum; but ordinarily it is preserved by a viscid matter, wherewith its inner coat is lined.

Another objection against this doctrine, is, that the chyle yields no inflammable spirit; which it should, were it the effect of fermentation: but M. Astruc answers, that all fermentations do not produce any such spirit: that of dough, for instance, affords none, nor that of rotten fruits, nor of acids, or pure alkalis. The inflammable spirit, in effect, requires a fine attenuated sulphur, which is not found in all fermentations.

The second system was invented, or at least renewed in the present age; and has been maintained with a deal of zeal and vivacity, as is commonly the case in any thing that has the appearance of novelty. Those who espouse this opinion, contend, that it is a mere continual attrition, or grinding, that breaks, attenuates, and reduces the food, and with the addition of a proper fluid, forms it into that whitish substance, called *Chyle*; much as corn is ground between the stones of a mill. Which opinion seems to be confirmed by something observed in birds: their gizzard, or crop, is composed of two strong, solid, compact muscles, which rubbing against each other, and being assisted by little angular stones, or grains of sand swallowed by the birds, break and grind the dry food those animals live on: and when the sand is grown smooth, they cast them off with the other excrements, and swallow fresh grains. This sentiment is thus explained by an able assertor thereof, Mr. Hecquet, in his treatise of *Digestion*. Every thing in the body is vascular: consequently, every thing therein is hollow: every thing therein lives after its manner; consequently, every thing is in motion: animal life being nothing but motion; and consequently, all the vessels are in motion. Now the parts of a body, that are to move, will move most readily towards those sides, where they find the least resistance. But the place of the least resistance in tubes is the cavity; consequently, the motion of the parts of vessels is towards their axes. The parts of vessels that are to move, are the parietes, or sides, because flexible and elastic; and this motion can only be effected by an approximation of those parts; consequently, the motion of the vessels consist in an approximation of their parietes: it is, therefore, a sort of contraction, pression, or coarctation. Hence, as all the parts of the body are only vessels, they all undergo a systole, pression, or contraction.

Further, all these vessels contain juices in their cavities; and, therefore, all the juices, or liquids in the body, are continually compressed. This pression is the action of an elastic force; consequently, the pression will be such as is the force; and, therefore, alternative: consequently, it is a pulse, or palpitation; and therefore the juices are continually beaten.—Now, these juices are exceedingly divisible; and consequently they are continually attenuated, and divided: and a division effected by a pulsation, or beating, is a trituration; and consequently, the juices in the body are continually triturated, or ground.—The reason why the compressive force should be alternative, is, that the membranes, which compose the vessels, consist of two plans, or series of fibres; the one longitudinal, the other circular, cutting the longitudinal, at right angles: the longitudinal are tendinous, and elastic; the circular are muscular, or motive, like sphincters, which compress: the circular are over the longitudinal, and embrace, or gird them round: the former, we have already observed, are elastic; and their elasticity opposes the compression of the latter. From this opposition, or resistance, arises a reciprocal action, and re-action, which is the alternative grinding force required. See TRITURATION.

To such an account for *Digestion* from a ferment, those philosophers object, that *Digestion* is a dissolution; that to prepare the matters for this dissolution, they must be softened; that the proper effect of acid ferments, is, to gnaw, or tear the hardest matters, and to harden the softer, to thicken the fluid, fix the fat, and coagulate the milky; consequently, that an acid

acid ferment should rather impede, than promote *Digestion*. Add, that beside the force to grind the juices, and the vessels to compress them, there are likewise liquors to dilute and temper them, viz. the saliva, and stomach-liquor. And mineral matters, which the stomach-liquor cannot dissolve, are found to be worn, and polished after having stayed some time in the stomach. Now polishing is the effect of triture, or grinding, not of corrosion. Accordingly we find pellets, or balls of hairs, or threads in the stomach of cattle, very smooth and shining, and far from having any marks of corrosion.

The authors who are for the trituration require three things for *Digestion* to proceed: a liquor, to wet and dilute the food, which they find in the saliva, and stomach-liquor: a vessel, which is the stomach: and a moving power to grind, which they imagine to have found in the muscles of the stomach, diaphragm, and abdomen. The moving force in the muscles of the stomach they maintain to be equivalent to the weight of 248235 pounds; and the force of the stomach alone, to a weight of 12951 pounds: a power more than equal to that of one of the ablest mill-stones. See *Traité de la Digestion par M. Hecquet*.

Borelli, on the footing of the equilibrium of fluids, has demonstrated, that the force of the flexor of the last articulation of the thumb is equal to 3720 pounds: whence Pitcairn deduces, that the force of the fibres of the stomach is equal to 12951, and that of the diaphragm, and muscles of the lower venter, to 248235 pounds. His way of estimating is this: The flexor only weighs 122 grains, and yet may sustain 3720 pounds: consequently, the fibres of the stomach weighing 8 ounces, and the diaphragm with the muscles of the lower venter, weighing together 8223 grains, have the force abovementioned.—But this argumentation seems founded on a mistake; for it is not in virtue of its weight of 122 grains, that the flexor muscle is equivalent to 3720 pounds: besides that it would follow hence, that the heavier the muscles of the stomach, diaphragm, and abdomen, are; the more force they would have, and consequently, the more easy, and expeditious would the *Digestion* be: which is false.

The patrons of this system compare the brain to the arbor, or screw of a press, the heart to a piston, the lungs to bellows, the mouth to a mill-stone, or a pestle, the stomach to a press, and the intestines to a receiver, or vat. They contend, that Castellus, a physician of Messina, was the first of the moderns, who expressly espoused the system of ferments, and that he was followed by Van Helmont, and Willis.

But even the partisans of trituration are not perfectly agreed amongst themselves: Pitcairn will have it performed by a total contraction of the stomach: and Mr. Hecquet, by a successive peristaltic, or vermicular contraction.

Attrac, in his treatise, *de la Cause de la Digestion*, refutes this system of trituration at large. He makes a strong opposition to the calculus, which raises the moving force of the stomach, &c. so very high. The contraction of the fibres of the stomach, to compress the food, he shews, cannot exceed three ounces; and it is even gratis that he allows so much: that of the diaphragm and abdomen, he computes at about 4 pounds. He observes, that Pitcairn, surprized in all probability, with what he had asserted of this force, durst not pursue the proportion whereon his calculus was founded, and according to which, one of the forces would have been found equivalent to 117883 pounds, and the other to 250734; which together make 367822 pounds.

The diaphragm in its motion has two powers; the one direct, which is that whereby its muscles draw from the centre towards the circumference; the other lateral, whereby it rests, or presses on the stomach: the latter is very small in comparison of the former. Now, what seems to have deceived Pitcairn, and Hecquet, is, their taking the direct for the lateral force; the contraction of the fibres for their pressure on the stomach. And the same oversight they are guilty of in the muscles of the abdomen, whose pressure against the abdomen is only lateral. Add, that there are voracious animals without any diaphragm at all; as fishes, which respire through their gills: and others that have only a single membrane; as birds, in whom the muscles of the lower venter are very small and feeble and in a situation that incapacitates them from acting at all on the stomach.

The membranes of the stomach being very soft, and having only a slender motion, seem very unfit for the office of a mill stone. It is true, in certain fowls, the stomach consists of a close, compact, fleshy muscle, exceeding strong, so as to break little stones and bits of glass. But to this it is urged, that it is no *Digestion*, which in these animals is effected in the intestines. And the structure of our stomach compared with the gizzard or crop of granivorous birds, does on the contrary, furnish a very cogent argument against trituration. The gizzard, is provided on the out-side with four fleshy muscles, the tendons whereof meet in two opposite points: the inside is lined with a hard, thick, cartilagenous membrane; especially in the places where the tendons meet. By this mechanism nature plainly intimates the office of the gizzard to be the grinding of the grain by the friction of its parties, or sides: whereas, the membrane in the stomach of a

man is exceedingly thin and fine, furnished with few fleshy fibres, covered with a tender, sensible kind of villi; and the stomach itself is of a great capacity. And the stomach in rapacious birds, who devour huge pieces of raw flesh without chewing, is still a finer membrane. Lastly, on the foot of the system of trituration there seems no accounting for hunger, nausea, indigestions, crudities, &c.

In the system of trituration it seems impossible to explain why certain things easy to grind, e.g. cabbage-leaves cannot be *digested* in certain stomachs, which yet find no difficulty in *digesting* more hard, and solid meats, as beef and mutton: whereas the difference of dissolvents gives a natural and easy solution. Hydropic people continue to *digest*, notwithstanding the fibres of the stomach, as well as the rest of the body, are extremely relaxed through the redundancy of moisture. And the total, prompt change of nature induced in foods, can be the effect of nothing else but fermentation; which even discovers it self by belches, &c. while it goes on. The iron, needles, pins, &c. sometimes found undissolved in the stomach, are no objection to the system of fermentation; it being notorious, that no dissolvent dissolves all bodies.

In birds, which feed on grain, the fermentation is manifest, first in the crop, where the grain is prepared for *Digestion*, by being macerated in a liquor like the saliva; and afterwards in the gizzard, where the *Digestion* is perfected by a dissolvent poured into it by a conglomerate gland.—But the thing is still more apparent in ruminating animals, which are provided with four stomachs, the two first whereof, though formed of a nervous membrane, make but little alteration in the aliment, for want of a ferment, or menstruum; so that it returns to be chewed again; and only becomes well *digested* in the fourth stomach, whether a dissolvent is poured from a conglomerate gland.

The partisans of the third opinion allow it incontestable, that there are acids in the stomach, which mix with the foods, and act on them; and they hold likewise, that their action is aided, and promoted by the motion of systole, and diastole in the viscera: they add, that the acids produce a fermentation; and the oscillatory motion of the viscera a trituration; and that thus *Digestion* is the effect of fermentation, and trituration at the same time.

Be it as it will with each of the three systems, thus much we may venture to lay down from them all, as the real process of *Digestion*: the end of this operation being to prepare the foods, so as that they may serve for nutrition; those foods must be considered from the time the man takes them in, till being converted into chyle, they mix with the blood, which conveys them into all parts of the body. The foods then we take, are either crude, as oysters, fruits, certain pulse, &c. or dressed, as flesh, and fish, which are roasted, boiled, fried, &c. and seasoned a thousand diverse ways with salt, pepper, and other spices, vinegar, wine, &c. this is done to heighten and enrich the taste, as much as to assist *Digestion*.

Further, there are some foods we swallow without chewing, as liquids; and others, which we break and communicate by chewing, as bread, flesh, &c. It is of these last we shall here speak, as undergoing more preparations, and more changes to fit them for nutrition, than the others.

The food, then, is first broke, and divided by the teeth, and, at the same time, moistened with a liquor supplied by the salivary glands, and thus is formed into a kind of paste.

Thus prepared, it is passed through the oesophagus into the stomach, there to ferment. This fermentation is caused, 1. By the salivary juice, which is a ferment, and has the same effect on the aliment, that leaven, or yeast has on paste. 2. By the heat of the stomach, viscera of the abdomen, and even excrements; which here has nearly the same effect on foods, as a dunghill has on matters laid by the chemists to *digest* therein. 3. By the remains of foods left adhering in the rugae, or folds of the stomach, and there turned sour, and acrimonious. 4. By the compression of the muscles of the abdomen, and diaphragm. 5. By the liquor which the repeated compression of those muscles occasions to drip from the glands of the stomach. And 6. According to the sentiment of some modern physicians, by the air it self, which being mixed, and embarrassed in the aliments, dilates by the heat of the stomach, and separates the parts of the foods. These causes all contribute to attenuate, and divide the food, so as to convert it into a ciceritious matter, called *Chyle*.

From the stomach the chyle descends into the duodenum, where it is further perfected by the pancreatic juice, and the bile, which thin it, precipitate its grosser parts, and render it more fluid. The chyle thus perfected and attenuated, enters the lacteal veins, which convey it into the receptaculum chyli, where it is further diluted by the lymph, which is brought hither in abundance. Hence it arises into the thoracic duct, and enters the subclavian vein; where being taken up by the ascending cava, it is pour'd into the right ventricle of the heart. The chyle thus mixing with the blood, embarrasses the globules thereof, and thus abates its motion: and hence that inclination to go to sleep after meals. But, by degrees, the blood

communicates its motion to the chyle; and by its volatile, and exalted parts, together with the saline and nitrous parts of the air, subtilizes, and gives it its last perfection. Then the *Digestion* is finished: and the foods being by so many changes rendered the immediate matter of nutrition, are carried by the blood into all parts of the body, to repair and fill the vacancies of such as are continually dissipating, and exhaling; or even to add new ones.

As to the grosser parts of the foods separated from the chyle by the bile and pancreatic juice, they assume the colour of excrements from the bile; and their rank smell they derive from the coarser sulphurs thereof. These sulphurs, and salts of the excrements, serve, after they have passed through the intestines, and are arrived at the last, which is the rectum, to vellitate the muscles thereof, and dispose them to relax, and thus to apprise nature of a necessity to discharge.

The separation of the urine from the blood may be esteemed a part of perfect *Digestion*; the design of such separation being to render the blood more pure and balsamic, and of consequence more fit for nutrition; which the salts, the urine abounds withal, greatly prevented. This separation is thus performed: the branches of the emulgent arteries, which terminate in the glands, whereof the substance of the kidneys is composed, carry the blood thither; where a serosity is separated from the blood, by means of the pores in the glands of the kidneys: those pores representing the holes in a sieve, which only let pass such things as are of a less diameter than themselves. This serosity, called urine, is discharged hence into several little tubes, which, joining into a kind of pyramids, yield their humour into the pelvis, whence it runs through the ureters into the bladder.

DIGESTION, in chemistry, is a preparation of plants, minerals, metals, or other bodies, by putting them with some proper fluid in a vessel, and heating them gradually over a gentle fire, like the heat of an animal body.

Digestion is a previous kind of disposition to a perfect dissolution of a body, made by means of fire, or fiery particles, striking against and loosening the pores of the body, and attenuating the parts of their fluids, that their connexion with the harder matter may be more easily and perfectly dissolved. Bohnius seems to describe it pretty adequately by an insensible action and reaction of the particles of a mass moved together by some subtle, ambient fluid, to which it is exposed for *Digestion*. By calling *Digestion* a reciprocal action, their motion is intimated, by means whereof they are torn from the contiguous ones; and in a word, differently modified: so that the motion ended, the digested mass differs either wholly, or in part, from the same mass before *Digestion*; sometimes in colour, sometimes in smell, sometimes in transparency, sometimes in taste, sometimes in consistence, and other affections.

That *Digestion* is effected by motion, is evident from an observation of Dr. Grew; who, bringing a mixture of salt of tartar, and oil of turpentine, several days journey with him in a coach to London, found it had undergone a more intimate mixture, than if it had been exposed to a long *Digestion*.

Digestion is ordinarily confounded with maceration; but the two things differ, in that there is heat required to *Digestion*; whereas maceration is done in the cold.

Digestion is usually performed with the addition of some menstruum suitable to the matter: thus, roses and poppies heads are put to digest in oil, or water, to make unguents, or syrups: calcined lead, and cerufs, and digested in distilled vinegar, to make the magistery thereof, or the sal tartari.—Hence Dr. Friend defines *Digestion* to be the solution of bodies, made by menstrooms, with the assistance of fire.

The use of *Digestion*, in pharmacy, is to extract the more volatile particles, and mix them intimately with the menstruum. To this end a gentle fire is commonly used, that the corpuscles, which are most volatile, may separate as it were of their own accord: for a fierce fire forces out the faces, as well as the finer particles; and if it does not abate the strength of the liquor, as is often the case, it will not fail of spoiling its clearness.

To conceive the nature of chemical *Digestion*, it may be necessary to shew how the particles of bodies can, by this process, be diffused every way, and sustained in the menstruum; which deserves the more to be accounted for, because those solid particles have not the same specific gravity, as the liquors have in which they swim. Though the nature of a perfectly fluid body be such, as that the particles, which constitute it, do very readily give way upon the smallest impulse, and recede from one another; yet there is found in most liquors some degree of tenacity: and from hence arises such a cohesion of parts, as cannot be broken without some force. And though, indeed, this force of cohesion in liquors seems to be but little, or almost none at all, when compared with what we experience in solids; yet we find it can make some resistance. And, as the force in liquors is either stronger or weaker, so it produces a variety of effects, differing more or less from

the phenomena, which would naturally flow from a perfect fluid: so that, though by the laws of hydrostatics, every corpuscle, how subtil soever, if put into a fluid which is specifically lighter, must necessarily sink to the bottom; yet we find that some heavy bodies, such as gold, &c. when reduced into thin plates, will be sustained in spirit of wine. This force, therefore, of tenacity, which resists the motion of bodies in a fluid, is proportional to the number of parts which are to be separated, or to the surface of the body which we would have move in the fluid. Hence it is, that since the surface of a body may be enlarged, without altering any thing of its gravity; the resistance of a fluid may be so augmented, as to equal the force of gravity which carries the body downwards. And a body, though specifically heavier than a fluid in which it is immersed, may be very well sustained in that fluid, provided it is reduced into very small particles: because the gravity of a body, thus reduced into small particles, decreases in a much greater proportion than the surface does, or, which is proportional to it, the resistance of the fluid: so that at length the resistance, arising from its tenacity, will be equal to the gravity of the particle, and so will hinder its descent. And, therefore, both in solution and digestion, it is a general rule, that if the gravity of a body be to the tenacity of the fluid, as P to 1; and if the body be then subdivided, so that the diameters of the parts be to that of the whole, as 1 to P; the resistance, which the particles will meet with in their descent, will be equal to their gravity: for, since their weight is $\frac{1}{P^3}$, but their surface $\frac{1}{P^2}$, the gravity will be to the resistance as $\frac{1}{P^3}$ to $\frac{1}{P^2}$ or as 1 to P. So that by this we may understand how the corpuscles of metals swim in menstrooms which are specifically lighter; as gold, in the spirit of nitre, which is drawn off from bezoar mineral, though the gravity of gold be fifteen times greater. And, in the same manner, we may understand how corpuscles, specifically heavier, are suspended in any other menstruum. And it is for the same reason, that such as are lighter cannot rise up to the surface: for the pressure of fluids being equal every way, the superior parts act reciprocally on the inferior; so that the same force, which keeps the heavy particles from sinking, will not permit those which are lighter to ascend.

DIGESTION, in chirurgery, expresses a disposition in abscesses, to ripen, and come to suppuration.

Tumours, arising on the parotides of children, are of easy *Digestion*: They ripen in a little time. Dionis.

DIGESTION is also used for maturation, or that state of a disease, wherein the moribific matter is so changed in bulk, figure, cohesion, mobility, &c. by the use of proper medicines, or even by the force of nature, as to be less noxious and hurtful, and consequently to abate the violence of the distemper.

The Greeks call it $\alpha\pi\alpha\sigma\mu\omicron\varsigma$. The matter of the disease so far digested, as to become next a-kin to salubrious, or healthy matter, is said to be resolved.

DIGESTIVE faculty. The ancient philosophers admitted a *digestive faculty*, or quality in the human body; as not knowing how otherwise to account for the act of *Digestion*.

DIGESTIVE is also used in medicine for such remedies as strengthen, and increase the tone of the stomach, and assist in the *Digestion* of foods.—To this class belong all stomachics, and strengtheners, or corroborants.

DIGESTIVE, in chirurgery, denotes a sort of unguent, plaister, or the like, that ripens, and prepares the matter of wounds, &c. for suppuration.

The common *Digestive* is composed of turpentine, yolk of eggs, oil of St. John's wort, unguentum, basilicum, and tincture of aloes.

The wound must be dressed the first day with a *Digestive*, to bring it to suppuration.

DIGITATED, among botanists, is a term applied to the leaf of a plant, which either consists of many simple leaves set together upon one foot-stalk; as in the cinque-foil, vetches, &c. or else when there are many deep gashes, or cuts in the leaf; as in those of Dragons, hops, &c.

DIGIT, **DIGITUS**, in anatomy. See the article **FINGER**.

DIGIT, in astronomy, is the measure whereby we estimate eclipses; amounting to the 12th part of the diameter of the luminary eclipsed.

The diameter of the body, or disk of the sun, or moon, is divided into twelve parts, called *Digits*; and an eclipse is said to be of ten *Digits*, when ten of those parts are hid.

These *Digits*, Wolfius, and some others call *Digiti Ecliptici*.

DIGIT, in arithmetick, signifies any integer, or number under ten; as 1, 2, 3, 4, 5, 6, 7, 8, 9.

DIGIT, is also a measure taken from the breadth of the finger.

A *Digit* is properly 3 fourths of an inch, and equivalent to 4 grains of barley, laid breadth-wise so as to touch each other.

DIGLYPH, a kind of imperfect triglyph, console, or the like, with only two channels, or engravings, instead of three. See **TRIGLYPH**.

DIGNITARY, in the canon law, a person who holds a *Dignity*, that is, a benefice which gives him some pre-eminence in the choir, above mere priests, and canons.

Such is a dean, and arch-deacon; though the word is now abusively applied to a mere prebendary, or canon.

Dignities are sometimes simple, sometimes with cure of souls, and sometimes with jurisdiction and administration of sacred things. The canons even define *dignity*, *administratio cum jurisdictione & potestate conjuncta*. If the *Dignity* have no contentious, or exterior jurisdiction, it is a simple parsonage, and only gives pre-eminence. See **BENEFICE**, **PARSONAGE**, &c. Of *Dignities*, including prebends, Camden reckons in England 544 in number.

DIGNITY, a quality that denotes a man (*dignus*) worthy.

DIHELIOS, in the elliptical astronomy, a name which Kepler gives to that ordinate of the ellipse, which passes through the focus, wherein the sun is supposed to be placed.

DIKE *, a *Ditch*, or *Drain*, made for the passage of waters.

* The word seems formed from the verb, to *Dig*: though others chuse to derive it from the Dutch, *Dijk*, a dam, sea-bank, or wall.

DIKE *, or *Dyke*, also denotes a work of stone, timber, or fascines, raised to oppose the entrance, or passage of the waters of the sea, a river, lake, or the like.

* The word comes from the Flemish *Dyk*, or *Dijk*, a heap of earth to bound, or stem the water. Janius and Menage take the Flemish to have borrowed their word from the Greek *τερυξ*, or *wall*. Guichard derives it from the Hebrew *Digbab*.

These *Dikes* are usually elevations of earth, with hurdles of stakes, stones, and other matters.

The *Dike* of Rochel is made with vessels fastened to the bottom. The *Dikes* of Holland are frequently broke through, and large tracts of land are then drowned.

DILAPIDATION, a wastful destroying, or letting buildings, especially parsonage houses, run to ruin and decay, for want of necessary reparation.

The money recovered for *Dilapidations*, by 14 Eliz. 11. must be employed in the repair of the same houses.

DILATATION, in physics, a motion of the parts of a body, whereby it expands, or opens itself so as to occupy a greater space.

The generality of authors confound *Dilatation* with rarefaction; but the more accurate, especially foreigners, distinguish between them: defining *Dilatation* to be the expansion of a body, into a greater bulk, by its own elastic power: and rarefaction, the like expansion produced by means of heat.

The moderns have observed, that bodies, which, after being compressed, and again left at liberty, restore themselves perfectly, do endeavour to *dilate* themselves with the same force whereby they are compressed; and accordingly, they sustain a force, and raise a weight equal to that whereby they are compressed.

Again, bodies, in *dilating* by their elastic power, exert a greater force at the beginning of their *Dilatation*, than towards the end; as being at first more compressed: and the greater the compression, the greater the elastic power, and endeavour to *dilate*. So that these three, the compressing power, the compression, and the elastic power, are always equal.

Again, the motion, whereby compressed bodies restore themselves, is usually accelerated: thus, when compressed air begins to restore it self, and *dilate* into a greater space, it is still compressed; and consequently, a new impetus is impressed thereon, from the *dilatative* cause; and the former remaining, with the increase of the cause, the effect, that is, the motion and velocity must be increased likewise: thus an arrow shot from a bow does not quit the string, till after that be perfectly restored to its natural state; nor does the arrow move a whit swifter than the string: and if the string, before it have perfectly restored it self to its right line, be stopped, the arrow will not go its full length; which is a proof, that it is continually acquiring a new impetus from the string. And since projects, at the beginning of their motion, are little or nothing retarded, but rather accelerated, it is evident, that the motion of a string restoring it self, is likewise accelerated. Indeed, it may happen, that where the compression is only partial, the motion of *Dilatation* shall not be accelerated, but retarded. As is evident in the compression of a sponge, soft bread, gawze, &c.

DILATATION, in medicine, &c. denotes the laying open any orifice, or the lips of a wound wider; or the extension of any vessel, or the like.

DILATATORES *Alæ Nasi*, in anatomy a pair of muscles common to the *Alæ Nasi*, and upper lip. They arise thin, broad, and fleshy, from the cheek-bones under the orbits of the eyes, and descend obliquely with a two-fold order of fleshy fibres in each muscle; which partly terminate in the upper lip, and partly in the *alæ nasi*.—They

draw the *alæ* from each other, and widen the external openings of the nostrils.

DILEMMA *, ΔΙΑΛΗΜΜΑ, in logic, an argument consisting of two, or more propositions, so disposed, that grant which you will of them, you will be pressed by the conclusion.

* The word is formed from the Greek *δις*, *bis*, twice; and *λημμα*, *sumptis*.

A *Dilemma* is an argument consisting of two contrary parts, or sides, either of which catches the adversary. And hence it is also called *sylllegimus cornutus*, a horned syllogism, its horns being so disposed, that if you avoid the one, you run upon the other.

It is also called *crocodillus*, by reason that as the crocodile leads such as follow it, into the water, and pursues such as fly it, to destroy them; so, whatever the adversary either affirms, or denies in this kind of syllogism, is turned to his disadvantage.

For an example: A philosopher once dissuaded a man from marrying, by this argument: Either the woman you inarty will be handsome, or ugly: if handsome, she will give you jealousy; if ugly, displeasure.

Cicero uses this fine *Dilemma*, to prove, that all pain is to be bore with patience: *omnis dolor aut est vehemens, aut levis: si levis, facile feretur; si vehemens, certe brevis futurus est*.

The same orator, by another *Dilemma*, proves that no messengers shall be sent to Anthony: *legatos decernitis; si ut deprecetur, contemnet: si ut imperetis, non audiet*.

Nor must we here omit that beautiful *Dilemma* of Tertullian, whereby he clears the christians, and accuses Trajan, who had forbid the seeking them out, and yet ordered them to be punished when found: *O sententiam necessitate confusam! inquit inquirendas, ut innocentes; & mandat puniendos, ut nocentes: parit & sevit, immulat & animadvertit! quid temeritissimam censura circumvenit? si damnas, cur non & inquiris? si non inquiris, cur non & absoltis*.

For a *Dilemma* to be legitimate, there are two things required:

1. A full enumeration of parts: thus that of Aristippus above-mentioned, whereby he dissuades from marriage, is invalid, as being defective in the enumeration; there being a middle degree, or form between *handsome* and *ugly*.

2. That the *Dilemma* press the adversary alone, and that the person who makes it, be not liable to have it retorted upon him. This was the case in that celebrated *Dilemma* of the sophist Protagoras, which the Aæpepagites, with all their wisdom, were not able to resolve.

A youth named Evathlus, put himself to Protagoras, to learn dialectics, upon the condition, that he should pay him a large sum of money, the first cause he pleaded, in case he gained the fame. Evathlus, when fully instructed, refusing to pay the condition; Protagoras brings his action, arguing thus: You must pay the money, however, the cause go; for if I gain, you must pay in consequence of the sentence, as being cast in the cause: and if you gain it, you must pay in pursuance of our covenant. Nay, retorts Evathlus, which way soever the cause go, you will have nothing: for if I prevail, the sentence gives it, that nothing is due to you; and if I lose, then there is nothing due by the covenant.

After the like manner, an ancient priestess dissuading her son from haranguing the people, by this *Dilemma*: *nam si injusta fueris, says she, habebis Deos irratos: sin vero justa, iratos habebis homines*: the youth thus returned the *Dilemma* on his mother; *ima, says he, expedit ad populum verba facere, nam si justa dixerò Di me amabunt; si injusta homines*.

DILUTE—To *dilute* a body, is to render it liquid; or, if it were liquid before, to render it more so, by the addition of a thinner thereto.

Those things thus added, are called *Diluents*, or *Dilutors*; such are common wheys, pissans, and juleps, which in respect of the blood in a state of viscosity are thinner, and therefore are said to thin, or *dilute* it.—Flower must be well *diluted*, to make it into paste. Oker is *diluted* with oil, to paint beams, doors, &c.

DIMENSION, the extension of a body, considered as measurable.

Hence, as we conceive a body extended, and measureable both in length, breadth, and depth; we conceive a *trine Dimension*, viz. length, breadth, and thickness.—The first called a *Line*, the second a *Surface*, the third a *Solid*.

DIMENSION, is particularly used with regard to the powers of the roots, or values of the unknown quantities of equations, which are called the *Dimensions* of those roots. See **ROOT**.

Thus in a simple equation, the unknown quantity is only of *one Dimension*, as $x = a + b$: 2. In a quadratic equation it is of *two Dimensions*, as $x^2 = a^2 + b^2$. In a cubic, of *three*, as $x^3 + a^3 = b^3$, &c.

DIMINISHED Column, in architecture. See **COLUMN**.

DIMINISHED Interval, in music, is a defective interval, or an interval which is short of its just quantity by a lesser semitone. See **INTERVAL**.

DIMINUTION, in rhetoric, the augmenting, and exaggerating what you have to say, by an expression that seems to weaken, and *diminish* it.

As, for instance, when a man says with a certain Tone, This woman is not ugly; meaning, she is very handsome.

Some authors take *Diminution* in a stricter sense, *viz.* for saying less than a man really means; as, You are not indeed to be commended; where a greater reproach is secretly meant.

DIMINUTION, in music, is when there are a number of words which are to make tones, and several hasty motions in the space of a cadence; several quavers, and semi-quavers, corresponding to a crotchet, or minim.

DIMINUTIO, in heraldry, a term used by Latin writers, for what we more usually call *Differences*, and the French *Brisures*. See **DIFFERENCE**.

DIMINUTION, in architecture, a contraction of the upper part of a column, whereby its diameter is made less than that of the lower part.—See *Tab. Archit. fig. 39*.

To attain these two important points in architecture, strength, and the appearance of strength, all architects have made their columns lesser above than below; which is called their *Diminution*. Some have likewise made them a little bigger towards the middle than at the bottom, which is called their *Swelling*. The Gothic architects, indeed, observe neither *Diminution*, nor swelling: their columns are perfectly cylindrical; for which reason they are properly called *Pillars*, in contra-distinction to columns.

The *Diminution* generally commences from one third of the height of the column. Some make it begin from the very basis, and hold tapering to the capital; but that has not so good an effect. Vitruvius would have the *Diminution* of columns differ according to their height, and not according to their diameter. Thus, a column of 15 foot high, he *diminishes* a sixth part of its diameter, and another of 50 foot, only an eighth part; but we do not find this rule observed in the antique.

The difference of orders, Mr. Perrault observes, does not infer a difference of *Diminution*; there being small and great *Diminutions* in different works of the same order: excepting, however, the Tuscan, which Vitruvius *diminishes* by a fourth part; though Vignola only makes it a fifth, and the Trajan column a ninth. The *Diminutions* are very differently adjusted in the different antique buildings, as well as by the different modern authors.

DIMINUTIVE, in grammar, a word formed from some other, to soften, or *diminish* the force, and effect thereof: or to signify a thing that is little in its kind.

Thus *cellule* is a diminutive of *cell*, *globule* of *globe*, *hillock*, of *hill*, &c.

The Italians abound in *Diminutives*, every author being at liberty to make as many as he pleases. The French are a good deal more reserved in that respect; though their old authors were very whit as licentious as the Italians, witness Belleau, &c.

In English we have very few; not that, as some have said of the French, our language is hard, and incapable of the softest expressions, but by reason we lay all our tenderness in our sentiments; or rather, our language is tender like a person of discretion, who always speaks sense, even in speaking of his passion.

In Latin, Italian, English, and most other tongues, *Diminutives* are formed from primitives, by the addition of a few letters, or syllables: in French, the case is frequently otherwise, the *Diminutive* being sometimes shorter than the primitive, sometimes of the same length.

Some grammarians call at least a *diminutive* conjunction, as serving to lessen, or *diminish* the force of what went before.

DIMISSORY Letters, *Litteræ Dimissoriae*, in the canon law, a letter given by a bishop to a candidate for holy orders, having a title in his diocese; directed to some other bishop, and giving leave for the bearer to be ordained by him.

When a person produces letters of ordination, or tonsure conferred by any other than his own diocesan, he must at the same time produce the *Letters Dimissory* given by his own bishop, on pain of nullity.—

Letters Dimissory cannot be given by the chapter, *sede vacante*; this being deemed an act of voluntary jurisdiction, which ought to be reserved to the successor.

DIMOERITÆ *, a name given the Apollinarists, who, at first held, that the word only assumed a human body, without taking a reasonable soul like ours: but being at length convinced by formal texts of scripture, they allowed, that he did assume a soul, but without understanding; the word supplying the want of that faculty.

* From this way of separating the understanding from the soul, they became denominated *Dimoerites*, q. d. dividers, separators of *Div*, and *moeris*, I divide.

DINNER *, the great meal, or that taken about the middle of the day.

* The word is formed from the French *Diner*, which du Cange derives from the barbarous Latin *dinare*. Henry Stephens derives it from the Greek *διναν*; and will have it wrote *Dip-*

ner. Menage deduces it from the Italian *dinare*, to dine; and that from the Latin *dinere*, to leave off work.

Monks are said to *dine* at eleven o'clock, the common people at twelve, and the men of business at two. The Grand Tartar, emperor of China, after he has *dined*, makes publication by his heralds, that he gives leave to all the other kings and potentates of the earth, to go to *Dinner*; as if they waited for his leave.

In the general, it is agreed to be the most salutary, to make a spare supper, and to eat the more plentifully at *Dinner*; especially for tender, valetudinary people. This is the sentiment of the *Sebola Salernitanata*:

Ex magna cena ston acbo fit maxima pana:
Ut sis nocte levis, fit tibi cena brevis.

Yet Bernardinus Paternus, an eminent Italian physician, maintains the contrary in a treatise expressly on the subject. The Romans, we are assur'd, never minded *Dinner*; but deferred their good cheer to the evening, which they made their grand meal.

DIOCESE *, or **DIOCESS**, the circuit, or extent of the jurisdiction of a bishop. See **BISHOP**.

* The word is formed from the Greek *διοικησις*, Government, Administration, formed of *διοικω*, which the ancient glossaries render *administro*, *modero*, *ordino*; hence *διοικησις της πολιως*, the Administration, or Government of a city.

DIOCESS, is also used in ancient authors, &c. for the province of a metropolitan. See **PROVINCE**, and **METROPOLITAN**.

Dioceps, *διοκεψ*, was originally a civil government, or præfecture composed of diverse provinces.

The first division of the empire into *Dioceces* is ordinarily ascribed to Constantine; who distributed the whole Roman state into four, *viz.* the *Dioceps* of Italy, the *Dioceps* of Illyria, that of the East, and that of Africa. And yet long time before Constantine, Strabo, who wrote under Tiberius, takes notice, Lib. XIII. p. 432. that the Romans had divided Asia into *Dioceces*, and complains of the confusion such a division occasioned in geography, Asia being no longer divided by people, but by *Dioceces*, each whereof had a tribunal, or court, where justice was administered. Constantine, then, was only the institutor of those large *Dioceces*, which comprehended several metropolises, and governments; the former *Dioceces* only comprehending one jurisdiction, or district, or the country that had resort to one judge, as appears from this passage in Strabo, and before Strabo, from Cicero himself, Lib. III. *epist. ad famil. ep. 9.* and Lib. XIII. *ep. 67.*

Thus, at first, a province included diverse *Dioceces*; and afterwards a *Dioceps* came to comprize diverse provinces. In after-times the Roman empire became divided into XIII *Dioceces*, or præfectures; though including Rome, and the suburbicary regions, there were XIV. These XIV *Dioceces* comprehended 120 provinces: each province had a pro-consul, who resided in the capital or metropolis; and each *Dioceps* of the empire had a consul, who resided in the principal city of the district. On this civil constitution, the ecclesiastical one was afterwards regulated: each *Dioceps* had an ecclesiastical vicar or primate, who judged finally of all the concerns of the church within his territory.

At present there is some further alteration: for *Dioceps* does not now signify an assemblage of diverse provinces; but is limited to a single province under a metropolitan, or even to the single jurisdiction of a bishop.

Gul. Brito affirms *Dioceps* to be properly the territory, and extent of a baptismal, or parochial church; whence diverse authors use the word to signify a simple parish.

DIOCLETIAN Epocha. See the article ΕΠΟΧΗ.

DIONYSIA *, or **DIONYSIACA**, solemn feasts held among the ancients in honour of Bacchus.

* The word is formed from the Greek *διονυσια*, of *διονυσος*, Bacchus; and that of *διος*, the genitive of *Zeus*, Jupiter, and *Nysa*, a city in Egypt on the frontiers of Arabia, where Bacchus is said to have been educated by the nymphs.

The *Dionysia* are the same with what are otherwise called *Orgia*, and by the Romans *Bacchanalia* and *Liberalia*. There were diverse festivals under the denomination of *διονυσια*, *Dionysia*, but the chief were two: *viz.* 1st, the ancient *Αρχαιωτερα*, probably the same with *μεγαλα*, or the greater *Dionysia*, sometimes also called by way of eminence *διονυσια*, without any other addition, as being the most celebrated of all Bacchus's festivals at Athens, where it was held in the month Elaphebolion. 2^{dy}, The New, *Νεωτερα*, probably the same with *μικρα*, or the lesser *Dionysia*, held in autumn as a sort of preparation to the greater. Some will have this the same with *διονυσια λυαια*, so called from *λυρος*, a wine-press, and place it in the month Lenæon.

DIONYSIAN Period. See the article PERIOD.

DIOPTER, or **DIOPTRA**, in writers of astronomy, is frequently used for the hole or index pierced in the pinnula, or sight of an alidade. See **SIGHTS**.

DIOPTRA, among surgeons, denotes an instrument whereby to dilate the matrix, or anus, and inspect any ulcers therein, called also *Speculum Matricis*, and *Dilatatorium*.

DIOPTRICS *, the doctrine of refracted vision, called also *Anaclastics*.

* The word is originally Greek, formed of *διὰ*, *per*, through, and *οπτικός*, *I see*.

Dioptrics is properly the third branch of optics; its office being to consider, and explain the effects of light refracted by passing through different mediums, as air, water, glass, &c. and especially lenses.

The laws of *Dioptrics*, see delivered under the articles **REFRACTION**, **LENS**, &c. and the application thereof, in the construction of telescopes, microscopes, and other *dioptrical* instruments, under the articles **TELESCOPES**, and **MICROSCOPE**.

DIPHRYGES *, or **DIPHRYX**, in the ancient pharmacy, the scoria, or calx of melted copper gathered in the furnace, when the metal was run out.

* The word is formed from the Greek *δις*, *twice*; and *φρυγών*, *to roast*.

Dioscorides distinguishes three very different kinds of *Diphryges*: one made of a kind of clay, or bole dried in the sun; another made of marcasite, or pyrites burnt; and a third that of the faeces of copper.

The last is moderately sharp, and astringent, and is reputed good for ulcers that cicatrize with difficulty.

DIPHTHONG, ΔΙΘΘΙΣΜΟΣ, in grammar, a double vowel, or the union, or mixture of two vowels pronounced together, so as only to make one syllable: as (1) the Latin *ae*, or *e*, *oe*, or *æ* (2); the Greek *αι*, *ου* (3), the English, *ai*, *au*, &c. See **VOWEL**, and **SYLLABLE**.

(1) The word is Greek; and is compounded of *δις*, *twice*; and *φθῶγος*, *sound*.

(2) *Æ* answers to *ai*, the proper; and *æ* the improper *Diphthong* of the Greeks, *e. g.* *Αἰεταί*, *Ευαί*; *αἰαία*, *σφαίρα*, &c. —And, on the contrary, the Romans, when they had occasion to divide their *ae*, changed it into the Greek, *ai*: *e. g.* *αἰαί*, for *αιαί*, &c.

(3) *Ai*, by some, is made a Latin *Diphthong*, as in *ais*, *Calus*, &c. —But in *ais*, and *ait*, *i* manifestly belongs to the latter syllable: and the Greeks write not *Ταιος*, but *Ταιος*: whence it seems plain that *ai*, in the Latin tongue, is not a *Diphthong*, as in the Greek.

The Latins pronounced the two vowels in their *Diphthongs* much as we do; with this exception, that the two were not heard equally, but the one was somewhat weaker than the other, though the division was made with all the delicacy imaginable. Among us, most of the Latin *Diphthongs* are lost in the pronunciation: their *æ* and *œ* are only spoke as *e*'s; so also the English *ae*, *oa*, &c. though wrote with two characters, are pronounced as simple sounds.

In English, French, and diverse other languages, one may distinguish *Diphthongs* with regard to the eye, from *Diphthongs* with regard to the ear.

A *Diphthong* with regard to the eye, is formed of two vowels meeting in the same syllable, whether the particular sound of each of them be heard in the pronunciation, or whether the sound of one of them be drowned; or lastly, whether a new sound different from either of them result from both. In the two latter cases, it is with some impropriety, that we call them *Diphthongs*. The first only are real *Diphthongs*, as being such both to the eye and ear.

Diphthongs, with regard to the ear, are either formed of two vowels, meeting in the same syllable, whose sounds are severally heard; or of three vowels in the same syllable, which only afford two sounds in the pronunciation.

On this last occasion, *Diphthongs*, with regard to the ear, are triphthongs with regard to the eye.

English *Diphthongs*, with regard both to the eye and ear, called proper *Diphthongs*, are *ai*, as in *fair*; *au*, in *law*; *ee*, in *bleed*; *oi*, in *void*; *oo*, in *food*; and *ou*, in *house*.

English improper *Diphthongs*, or *Diphthongs* with regard to the eye, are *aa*, pronounced only like *a*, as in *Aaron*; *ea*, like *a* as in *feaver*, *heart*; or like *e*, as *already*; or like *ee*, as *veal*: *eo*, like *e*, in *seoffe*; or like *o*, in *George*: *eu*, or *ew*, like *u*, as *Deuteronomy*: *ie*, like *e*, as *cieling*, *field*: *ei*, like *a*, in *feign*; or like *e*, in *deceit*: *oa*, as in *cloak*, *boat*: *oe* as in *doe*, *oecomy*: *ue*, as in *guess*: and *ui*, as in *guile*, *recruit*.

DIPLOE, in anatomy, a spongy, medullary substance, separating the two tables of the cranium, and together with them constituting the skull.

The substance of the *Diploe*, being spongy, easily imbibes the blood, and is found separated into an infinite number of little cells of different magnitudes, which receive little branches of arteries from the brain, and give passage to the little veins that proceed to the sinus's of the dura mater.

DIPLOMA, an instrument given by some colleges, and societies, on taking a degree, or passing examination; as a proof of qualification for any advancement to title, or prebeminence.

DIPPING-NEEDLE, or *Inclinator*-*Needle*, a magnetical needle, so hung, as that instead of playing horizontally, and pointing out north and south, one end *dips*, or inclines to the horizon, and the other points to a certain degree of elevation above it.

Or, a *Dipping-Needle* may be defined with Mr. Whiston, to be a long straight piece of steel, (represented *Tab. Navigation fig.*

11.) every way equally poised on its centre, and afterwards touched with a load stone; but so contrived, as not to play on the point of a pin, as does the common horizontal-needle, but to swing in a vertical plane, about an axis parallel to the horizon: and this in order to discover the exact tendency of the power of magnetism.

The inventor of the *Dipping-Needle*, Mr. Whiston observes, was, without all question, an Englishman, Robert Norman by name, a compass-maker at Wapping, about the year 1576; this is not only testified by his own account, in his *New Attractive*; but was allowed by Dr. Gilbert, and other writers of that time. The occasion of the discovery he himself relates: *viz.* that it being his custom to finish, and hang the needles of his compasses, before he touched them; he always found, that immediately after the touch, the north-point would bend, or decline downward, under the horizon; inasmuch, that to balance the needle again, he was always forced to put a piece of wax on the south-end, as a counterpoise.

The constancy of this effect led him at length to observe the precise quantity of the *Dip*, or to measure the greatest angle which the needle would make with the horizon.

This in the year 1576 he found at London to be $71^{\circ} 50'$. But the *Dip* varies as well as the horizontal direction; and is now found at the same place, to be $75^{\circ} 10'$.

Burrows, Gilbert, Ridley, Bond, &c. endeavoured to apply this discovery of the *Dip*, to the finding of the latitude; and the last author, going further, likewise proposed the finding of the longitude thereby: but for want of observations, and experiments, he could go no length.

Mr. Whiston, being furnished with the further observations of Col. Windham, Dr. Halley, Mr. Pound, Mr. Cunningham, Per Noel, Pere Feuille, and his own, has improved very much on the doctrine, and use of the *Dipping-Needle*, brought it to more certain rules, and endeavoured in good earnest to find the longitude thereby.

In order to this, he observes, *1st*, That the true tendency of the north, or south end of every magnetic needle is not to that point in the horizon to which the horizontal needle points, but towards another directly under it, in the same vertical, and in different degrees under it, in different ages, and at different places.

2^{dly}, That the power by which a horizontal needle is governed, and all our navigation ordinarily directed, is proved to be but one quarter of the power, by which the *Dipping-Needle* is moved; which should render the latter far the more effectual and accurate instrument.

3^{dly}, That a *Dipping-Needle* a foot long, will plainly shew an alteration of the angle of inclination in these parts of the world in half a quarter of a degree, or $7\frac{1}{2}$ geographical miles; *i. e.* supposing that distance taken along, or near a meridian. And a needle of four foot, in two or three miles.

4^{thly}, A *Dipping-Needle* four foot long, in these parts of the world, will shew an equal alteration along a parallel; as one of a foot long, will shew along a meridian, *i. e.* this will with equal exactness shew the longitude, as that the latitude. This depends on the position of the lines of equal *Dip*, in these parts of the world, which are found to lie about 14 or 15 degrees from the parallels.

Hence he argues, that as we can have needles of 5, 6, 7, 8, or more feet long, which will move with strength sufficient for exact observation; and since microscopes may be applied to the viewing the smallest divisions of degrees on the limb of the instrument, it is evident, the longitude at land may be found thereby to less than four miles.

And as there have been many observations made at sea with the same instrument by Noel, Feuille, &c. which have determined the *Dip* usually within a degree, sometimes within $\frac{1}{2}$ or $\frac{1}{3}$ of a degree, and this with small needles of 5, or 6, or at the most 9 inches long; it is evident, the longitude may be found even at sea, to less than half a quarter of a degree.

Thus much premised, the observation it self follows.

To find the longitude, or latitude by the DIPPING-NEEDLE.—If the lines of equal *Dip* below the horizon be drawn on maps, or sea-charts, from good observations, it will be easy from the longitude known to find the latitude; and from the latitude known to find the longitude, either at sea, or land.

Suppose, *e. gr.* you were travelling, or sailing along the meridian of London, and found the angle of *Dip*, with a needle of one foot to be 75° ; the chart will shew, that this meridian, and the line of *Dip* meet in the latitude of $53^{\circ} 11'$; which, therefore, is the latitude sought. See **LATITUDE**.

Or, suppose you were travelling, or sailing along the parallel of London, *i. e.* in $51^{\circ} 32'$ north latitude, and you find the angle of *Dip* to be 74° . This parallel, and the line of this *Dip* will meet in the map in $1^{\circ} 46'$ of east longitude from London; which is, therefore, the longitude sought.

DIPTERE *, or **DIPTERON**, in the ancient architecture, a temple surrounded with a double row of columns, which form a sort of portico's, called *Wings*, or *Iles*.

* The word is Greek, formed from *δις*, *twice*; and *πτερον*, *ala*, wing.

DIPTOTES, in grammar, a kind of irregular nouns, having only two cases; as, *forti, forte*.

DIPTYCHA *, in antiquity, a public register, wherein were wrote the names of the consuls, and other magistrats, among the heathens; and of bishops, and defunct, as well as surviving, brethren among the christians.

* The word *Diptycha* is formed from the Greek *διπλῶν*, or *διπλῶνα*, and that from *διπλῶς*, a masculine noun derived from *πρῶτον*, *fold*, or *plat*. From its future *πρῶτος* is formed *πρῶτῶς*, a *fold*, or *Plait*, to which adding, *δις*, *twice*, we have *διπλῶς*, in the genitive *διπλῶν*, whence the nominative neuter *διπλῶνα*, q. d. *a Book folded in two leaves*: though there were some in three, and others in four, or five leaves.—An ingenious author imagines this name to have been first given them to distinguish them from the books that were rolled, called *Volumina*. See **VOLUME** and **BOOK**.

Justinian, offended at pope Vigili, for refusing to subscribe the condemnation of the three chapters, gave orders for his name to be erased out of the *Diptycha*. Du Pin. The emperor commanded the name of the new patriarch to be entered in the *Diptycha Sacra*.

It is certain, there were prophane *Diptycha* in the Greek empire, as well as sacred ones in the Greek church. The former were the matricula, or register, wherein the names of the magistrats were entered: in which sense *Diptycha* is a term in the Greek chancery.

SACRED DIPTYCHA. The word is plural; *Diptycha* being a double catalogue, in one whereof was wrote the names of the living, and in the other those of the dead, which were to be rehearsed during the office. We meet with something not unlike the *sacred Diptychs* of the Greeks, in the canon of the mass, according to the Latin usage; where the people are enjoined to pray once for the living, and once for the dead; several saints are invoked in different times, &c.

Gentian Hervet explains the word *Diptychs*, *διπλῶνα*, by *altar-cloths*: Meursius, by that *libelli ecclesiastici*, church-books; but neither of those authors, though in other respects of great abilities, and well versed in the Greek antiquity, has given the genuine signification of the word. The *Diptycha* were neither altar-cloths, nor church-books, but a sort of tables, or tablets, alike in figure to the two tables of stone given to Moses; on one of these tables was wrote the names of the deceased, and on the other those of the living, for whom prayers were to be offered; which the deacon read over, when mass was celebrated.

In these *Diptycha* were entered the names of bishops, who had governed their flocks aright; and these were never expunged out of the same, unless they were convicted of heresy, or some other gross crime. In the *Diptycha* were likewise entered the names of such as had done any signal service to the church, whether they were living or dead, and mention was made of them in the celebration of the liturgy.

The jesuite Rosweyd affirms, that few names were entered in the *sacred Diptychs*, but those of bishops and patriarchs; and doubts very much, whether the sacred Delta, mentioned by the pretended St. Dionysius, *Eccles. Hierarchy*. c. 2. wherein were entered the names of the new baptized, with their god-fathers and god-mothers, were the same with the *Diptycha*. He allows, however, that the names of the emperors, and other great persons, distinguished by their faith; and their merits, or benefactions to the church, were used to be entered.

Meursius, in his *Glossarium Græco-Barbarum*, imagines them to have wrote the term, *Diptycha*, by reason there were two books, in one of which were wrote the living, and in the other the dead. But Fa. Rosweyd shews, he is mistaken: For in effect, there was usually but one, the living being entered on one side thereof, and the dead on the other. And that if the living, and dead, were each wrote in a several book, each of them was called *Diptycha*, and not both together.

Casaubon in his observations on Athenæus, Lib. VI. c. 14. supposes the christians to have borrowed the custom of writing names in a book, and rehearsing them at mass, from the heathens, who entered the names of persons they would do any signal honour to, in the verses of the Sali; as was done to Germanicus, and Verus, sons of the emperor Marcus Aurelius, and long time before, during the age of the republic, to Manucius Veturius, and Lucia Volumina, as we are told by Tacitus, Lib. II. Spartian, Ovid, Festus, Plutarch, &c. But Fa. Rosweyd does not approve this notion of Casaubon. The pretended St. Dionysius, a very ancient author, says the contrary, and asserts the first establishment of this usage to have been founded on scripture, 2 Tim. II. 19. Psalm CXVI. 15. Rosweyd adds Ecclesiastic, XLIV. 1. and takes these to have been the passages the ancient church had a view to, rather than the Salian verses.

The *prophane Diptycha* were frequently sent as presents to princes, &c. On which occasion they were finely gilt, and embellished; as appears from Symmachus, Lib. II. Ep. 81. Those presents were usually of ivory. The first law, de *Expens. Ludor. C. Theod.* forbids all magistrats below consuls, to make presents of *Diptycha* of ivory in the public ceremonies.

Fa. Rosweyd owns himself at a loss for the origin of this custom of making presents of *Diptychs*. Lud. Carrion, Lib. II. *Emendat.* c. 6. supposes it to have arose hence, that such presents were at first made to the persons who had been nominated *Questors*, to whom they were to be of use. Many imagine the *Diptycha* to have originally been a kind of table-books used by lovers. In effect Papias defines them, *tabellæ in quibus amores scribebantur*.

DIRECT, in optics.—**DIRECT Vision** is that performed by *direct* rays; in contra-distinction to vision by refracted, or reflected rays.

Direct Vision, is the subject of optics, which prescribes the laws, and rules thereof.

DIRECT Rays, are those which pass in right lines from the luminary to the eye, without being turned out of their rectilinear direction by any intermediate body, or either opaque or pellucid. See **RAY**.

DIRECT, in arithmetic. The *Rule of three DIRECT* is that opposite to the inverse. See **RULE of Proportion**.

DIRECT, in astronomy. We consider the planets in three states, viz. *direct*, *stationary*, and *retrograde*. See **PLANET**. They are said to be *direct*, when they appear to move forward, according to the succession of the signs; and *retrograde*, when they go the contrary way.

DIRECT, in matters of genealogy, is understood of the principal line, or the line of ascendants, and descendants; in contra-distinction to the collateral-line.

Thus the house of Bourbon is said to descend in a *direct* line from St. Louis.—The heirs in a *direct* line always precede those in the collateral lines.

A very good historian uses the phrase **DIRECT Speech**, or *Harangue*, when he introduces any one speaking, or haranguing of himself: when the historian speaks, and only rehearces the chief points of what was delivered by the speaker; it is called an *indirect Speech*.

DIRECT { *East*
 { *West* } *Dials* are those whose planes lye directly

open to the east, or west points of the heavens, or parallel to the meridian of the place. See **DIAL**.

DIRECT South, or **North** { *Inclining*
 { *Reclining* } *Dials*. See **DIAL**.

DIRECT Sphere. See the article **RIGHT Sphere**.

DIRECTION, in astronomy, the motion, and other phenomena of a planet, when *direct*. See **PLANET**.

DIRECTION, in astrology, is a kind of calculus, whereby they pretend to find the time wherein any notable accident shall befall the person whose horoscope is drawn.

For instance, having established the sun, moon, or ascendant; as masters, or signifiers of life; and Mars, or Saturn, as promoters, or portenders of death; the *Direction* is a calculation of the time wherein the signifier shall meet the portender.

The signifier they likewise call *Apotea*, or giver of life; and the promoter, *Anereta*, *Pramissor*, or giver of death.

They work the *Directions* of all the principal points of the heavens, and stars, as the ascendant, mid heaven, sun, moon, and part of fortune. The like is done for the planets, and fixed stars, but all differently, according to the different authors.

DIRECTION, or *line of DIRECTION*, in mechanics, is particularly used for a line passing from the centre of the earth through the centre of gravity of a body, and the support or fulcrum that bears it.

A man must necessarily fall down as soon as the centre of his gravity is out of the *line of Direction*.

Line of DIRECTION, in mechanics, also denotes that wherein a body moves, or endeavours to proceed.

Angle of DIRECTION, in mechanics, is that comprehended between the lines of *Direction* of two conspiring powers;

DIRECTION of the load-stone, that property whereby the magnet, or a needle touched by it, always presents one of its ends towards one of the poles of the world, and the opposite end to the other pole.

The attractive property of the magnet was known long before its *Directive*; and the *Directive* long before the inclinatory.

DIRECTION magnetical, is also used in the general for the tendency, or turning of our earth, and all magnetical bodies to certain points.

The situation of the earth, we know, is such, that its axis is in the axis of the universe; and therefore its poles, and cardinal points, exactly correspond to those thereof. This situation some account for hence, that it is the most commodious with regard to the aspects, and influences of the heavenly bodies, and renders it the fittest habitation for man. Others hold this position of the earth an effect of a magnetic virtue; and suppose a celestial pole, endued with a like magnetic virtue; which extending as far as our earth, draws the correspondent part thereof, the pole, towards it self.

DIRECTLY. In geometry, we say, two lines lye *directly* against each other, when they are parts of the same right line.

in mechanics, a body is said to strike, or impinge *directly* against another, if it strike in a right line perpendicular to the point of contact.

A sphere, particularly, strikes *directly* against another, when the line of *Direction* passes through both their centres. See PERCUSSION.

DIRECTOR Penis, in anatomy, a muscle of the penis, called more usually *Erector*.—See *Tab. Anat.* (Splanch.) *fig. 15. lit. ee*, see also the article *ERECTOR*.

DIRIGENT, a term in geometry, expressing the line of motion, along with a describer line, or surface is carried in the genesis of any plane, or solid figure.

Thus, if the line AB (*Tab. Geometry, fig. 33.*) move parallel to it self, and along the line AC, so that the point A always keeps in the line AC, a parallelogram, as ABCD, will be formed, of which the side AB is the describer, and the line AC the *Dirigent*.—So also, if the surface ABCD be supposed to be carried along the line CE, in a position always parallel to itself in its first situation, the solid ADEH will be formed, where the surface AD is the describer, and the line CE, is the *Dirigent*.

DIS, an inseparable particle prefixed to diverse words; the effect whereof is, either to give them a signification contrary to what the simple words had: as in *Disgrace, Disparity, Disproportion, &c.* Or to intimate a separation, detachment, distribution, &c. as in *discerning, discoursing, distracting, disposing, &c.*

DISABILITY, in law, is when a man is made incapable to inherit lands, or take any benefit, which otherwise he might do; which may happen four ways, *viz.* by the act of the ancestor; by the act of the party; by the act of law; and by the act of God.

DISABILITY by the act of the ancestor, is, where a man is attained of treason, or felony: by which attainder his blood is corrupted, and thereby himself and his children are *disabled* to inherit.

DISABILITY by the act of the party himself, is where a man binds himself by obligation, that upon a surrender of a lease he will grant a new estate to the lessee: and afterwards he grants the reversion to another, which puts it out of his power to perform it.

DISABILITY by the act of the law, is when a man by the sole act of law, without any thing by him done, is rendered incapable of the benefit of the law: as, an alien born; so that, if a man born out of the king's liegeance, will sue an action, the tenant, or defendant, may say, he was born in such a country out of the king's liegeance, and demand judgment, if he shall be answered; for the law is our birth-right, to which an alien is a stranger, and therefore *disabled* from taking any benefit thereby.

DISABILITY by the act of God, as when the party is *non compos mentis*, or, *non sanæ memoriæ*, which *disables* him, that in all cases, where he gives, or passes any thing, or estate from him, after his death it may be disannulled, and voided.

DISARMING, the act of depriving a person of the use or possession of arms. See *ARMS*.

On the conclusion of a peace, it is usual for both sides to *disarm*. We have diverse laws for *Disarming* papists, and all recusants. Under K. George I. a law was made for *Disarming* the Highlanders; none of whom, except peers, or gentlemen of 400 *l. per ann.* are to wear any *arms*, in the field, on the road, or at market. 1. G. I. stat. 2. c. 54. The game law has, in effect, *disarmed* all the common people of England, having under 100 *l.* a year in landed estate, except the servants of lords of manors.—Yet by the ancient policy of England, the whole nation was obliged to bear arms.

DISC, or **DISK**, **DISCUS**, in antiquity, a kind of round quoit, or a piece of stone, or metal, about a foot over, used by the ancients in their exercises.

The *Discus* of the ancients was flat and round, resembling the apparent figure of the sun.

The exercise of the *Discus* was one of those practised in the solemnities of their public games: it consisted in pitching, or throwing a *Discus* either upward, or straight forward; and he who threw it highest, or furthest, bore away the prize. Those who practised at this game, were called *Discoboli, i. e.* throwers of the *Discus*.

The Poets tell us, that Hyacinth, a favourite of Apollo, playing in the *Discus* with that god, was killed by a blow of Apollo's *Discus*, which his rival Zephyrus diverted from its course, and cast on the boy's head.

The *Discus* was thrown by means of a little cord made of hair, as appears from Claudian Lib. II. in *Eutrop. Carm.* 20, v. 359. & *seq.* Ovid describes this sport *Metam. Lib. X. v. 175.*

The Romans learnt the game of the *Discus* of the Greeks, and practised it among themselves. Dempster, *Parallip. in Rasin Antiq. Rom. L. V. c. 1.* and Pet. Faber, *Agonisticon, L. II. c. 1.* treat of the diversion of the *Discus*.

DISC, or **DISK**, in astronomy, the body, or face of the sun, or moon; such as it appears to us.

The *Disc* is conceived to be divided into twelve equal parts, called *Digits*; by means whereof it is, that the magnitude of an eclipse is measured, or estimated. Such an eclipse was

to many digits, or parts of the sun, or moon's *Disk*. Mercury and Venus are sometimes seen in the sun's *Disk*, transiting the sun's *Disk*.

In a total eclipse of either of those luminaries, the whole *Disk* is obscured, or darkened; in a partial eclipse, only part of them. See *ECLIPSE*.—Half the moon's *Disk* was immersed in the shadow of the earth in such an eclipse.

DISC, in optics, the magnitude of a telescope glass; or the width of its aperture, whatever its figure be, whether a plain, convex, meniscus, or the like.

DISC, **DISCUS**, in botany, is applied to the central, or middle part of radiated flowers; as being round, and plain like a quoit.

This is sometimes also called the *Pelvis*, or *Basin*.—The *Disc* is composed of several flosculi perpendicularly placed.

DISC, in the Greek liturgy, is nearly the same thing with the *Patena* in the Latin. See *PATENA*.

In the Greek church the consecrated bread is laid on a *Discus*, as in the Latin church it is on a *Patena*. The *Discus* only differs from the *Patena*, in that it is bigger, and deeper, as resembling a plate, which was the proper signification of the word *Discus* among the ancients.

DISCENT. See the article *DESCENT*.

DISCERNING, an act of the mind whereby it distinguishes between ideas.

On this faculty of *Discerning*, depends the evidence and certainty of several, even general propositions, which pass for innate truths; and which in reality flow from this clear *discerning* faculty of the mind, whereby it perceives two ideas to be the same, or to be different.

In being able nicely to distinguish one thing from another, where there is the least difference, consists in great measure that exactness of judgment, and clearness of reason, which is to be observed in one man above another; which is quite opposite to wit, this consists most in the assemblage of ideas, and putting those together with quickness and variety, which have the least resemblance, to form agreeable visions; whereas judgment separates carefully those ideas, wherein can be found the least difference, to prevent error, and delusion. To the well-distinguishing our ideas, it chiefly contributes, that they be clear, and determinate, and when they are so, there will not arise any confusion, or mistake about them, though the senses should convey them from the same object differently on different occasions. See *JUDGMENT*.

DISCIPLINE, primarily signifies instruction, and government; but the word is figuratively applied to a stated method of living, according to the rules of some profession.

We say the *military Discipline*, the *ecclesiastic*, or *church Discipline*, the *regular*, or *monastic Discipline*, &c.

We do not say *civil Discipline*, but instead thereof *policy*.

DISCIPLINE, is also used in a peculiar sense, for the chastisement, or bodily punishment inflicted on a religious, who has been caught delinquent; or even for that which the religious voluntarily undergo, or inflict on themselves by way of mortification.

Among all the austerities practised by the ancient monks and solitary, Dupin observes, there is no mention made of *Discipline*: in effect, it does not appear to have been in use in antiquity, unless to punish the monks, who had been taken tripping. It is commonly said to be St. Dominic, and Peter Damian, who first introduced the use of *Discipline*: but Fa. Mabillon notes, that Guy, abbot of Pomposa, and others, had practised it before them. It is pretty certain, the practice was first established in the eleventh century, with design to redeem the penances the canons imposed on diverse offences; and at length, they came not only to redeem for themselves, but also for others. See Fa. Mabillon.

DISCIPLINE, is also frequently used for the instrument, where-with a monk chafifies, or mortifies himself; which is usually made of ropes, knotted hair, or twisted parchment; sometimes of broken rods. St. Jerom is tainted with *Disciplines* of iron chains, armed with spur rowels, &c. See *FLAGELLATION*.

DISCLAIMER, in law, a plea, containing an express denial, renouncing, or *disclaiming* of a thing alleged.

As, if the tenant sue a replevin upon a distress taken by the lord, and the lord avoid the taking, saying, that he holds of him as his lord, and that he distrained for rent not paid, or service not performed; then the tenant denying to hold of such lord, is said to *disclaim*: and the lord proving the tenant to hold of him, the tenant loses his land.

Also a man denying himself to be of the blood, or kindred of another in his plea, is said to *disclaim* his blood. If a man arraigned of felony, *disclaim* goods; being cleared, he loses them.

DISCONTINUANCE, an interruption, intermission, or cessation of the course of a thing: as, *Discontinuance* of possession, of a plea, process, &c.

The effect of a *Discontinuance of possession*, is, that a man may not enter on his own land, or tenement alienated, whatever his right be to it, of himself, or by his own authority; but must bring his writ, and seek to recover possession by law. As if a man alien the lands he holdeth in right of his wife;

or a tenant in tail make any feoffment, or lease for life not warranted by the Stat. 32 Hen. VIII. by fine, or livery of seisin; such alienations are called *Discontinuances*.

The effect of *Discontinuance of plea*, is, that the opportunity of prosecution is lost, and not recoverable, but by beginning a new suit. For to be *discontinued*, and to be put off without a day, are the same thing; and are nothing less than to be finally dismissed the court.

If a justice seat be *discontinued* by the not coming of the justices, the King commonly renews the same by his writ, &c.

DISCORD, in music, the relation of two sounds, which are always, and of themselves, disagreeable, whether applied in succession or consonance.

If two simple sounds be in such a relation of tune, that is, have such a difference of tunes; as that being sounded together, they make a mixture, or compound sound, which the ear receives with displeasure; it is called a *Discord*: as, on the contrary, if it receive it with pleasure, it is called a *Concord*: And whatever two sounds make an agreeable, or disagreeable compound, they will have the same effects respectively, if they be applied in succession.

As concords are denominated harmonical intervals; so may *Discords* be denominated unharmonical intervals.

Discords are distinguished into *concinuous*, and *inconcinuous* intervals.

Concinuous DISCORDS, by the ancients called *Emmeli*, are such as are apt, or fit for music, next to, and in combination with concords. These are relations, which in themselves are neither very agreeable, nor very disagreeable; and have only a good effect in music by their opposition, as they heighten, and illustrate the more natural and essential principles of the pleasure we seek for; or, as by their mixture, and combination with them, they produce a variety necessary to our being better pleased. Notwithstanding this, they are still called *Discords*; as the bitterness of some things may help to set off the sweetness of others, and yet they may still be bitter.

Inconcinuous DISCORDS, by the ancients called *Eemeli*, are such as are never chosen in music; as having too great a harshness in them, though even the greatest *Discord* is not without its use.

The essential principals of harmony, harmonical intervals, or concords, are but few, in number only eight; the indefinite number of other ratios are all *Discords*. Hence Mr. Malcoln shews the necessity of taking some of the less untoward of these *Discords* into the system of music: In order to this, he considers the effect of having none but harmonical intervals in the system of music.

1. With respect to a single voice: if that should move always from one degree of tune to another, so as every note, or sound to the next; were in the ratio of some concord; the variety, which is the life of music, would soon be exhausted. For to move by no other, than harmonical intervals, would not only want variety, and so weary us with a tedious repetition of the same things, but the very perfection of such relations of sounds would cloy the ear, in the same manner as sweet and luscious things do the taste; which for that reason, are artfully seasoned with the mixture of lower and bitter.

2. With respect to music in parts, *i. e.* when two or more voices join in consonance, the general rule is, that the successive sounds of each be so ordered, that the several voices shall be all concords. Now there ought to be a variety in the choice of these successive concords, and also in the method of their successions; all which depends on the movement of the single parts. So that, if these could only move in an agreeable manner by harmonical distances, there are but a few different ways wherein they could move from concord to concord; and hereby we should lose much of the ravishment of sounds in consonance. As to this part then, the thing demand'd is a variety of ways whereby each single voice, or more in consonance, may move agreeably in the successive sounds, so as to pass from concord to concord, and meet at every note in the same, or a different concord, from what they stood in at the last note.

In what cases, and for what reasons *Discords* are allowed, the rules of composition must teach: but only joining these two considerations, &c. we see how imperfect music would be without any other intervals than concords.

Beside the *concinuous Discords*, used designedly in music, there are several other *Discord* relations, which happen unavoidably, in a kind of accidental and indirect manner. Thus, in the succession of several notes, there are to be considered not only the relations of those which succeed others immediately, but also of those betwixt which each other notes intervene. Now the immediate succession may be conducted so as to produce good melody, yet among the distant notes there may be very gross *Discords*, that would not be tolerable in immediate succession, and far less in consonance. And such *Discords* are actually contained in the scale of music. Thus, taking any one species, *e. gr.* that with the greater third, and marking the degrees betwixt each term and the next; though the pro-

gression be melodious, as the terms refer to one common fundamental, yet there are several *Discords* among the mutual relations of the terms, *e. gr.* from 4th to 7th *g.* is 32 : 45; and from 2d *g.* to 6th *g.* is 27 : 40; and from 2d *g.* to 4th, is 27 : 32; all *Discords*.

The species of counterpoint, wherein there is a mixture of *Discords*; is called *figurative counterpoint*; of which there are two kinds: That wherein the *Discords* are introduced occasionally, to serve as transitions from concord to concord; and that wherein the *Discord* bears a chief part in the harmony.

Upon the unaccented parts of the measure, *Discords* may transiently pass without any offence to the ear: This is called *Supposition*, by reason the transient *Discord* supposes a concord immediately following.

The harmony of *Discords* is that wherein the *Discords* are made use of as a solid and substantial part of the harmony. For, by a proper interposition of a *Discord*, the succeeding concords receive an additional lustre. Thus the *Discords* are in music what the strong shades are in painting.

The *Discords* are the 5th when joined with the 6th; the 4th joined with the 5th; the 9th is of its own nature a *Discord*; so is the 7th.

These *Discords* are always to be introduced into the harmony with due preparation, and must be succeeded by concords: which is commonly called the *resolution of the Discord*. The *Discord* is prepared by subsisting first in the harmony in quality of a concord; that is, the same note, which becomes the *Discord*, is first a concord to the bass-note immediately preceding that to which it is a *Discord*.

The *Discord* is resolved by being immediately succeeded by a concord descending from it by the distance only of greater 2d, or lesser 2d.

Apple of DISCORD, *Pomum Discordia*, a phrase used to signify the subject, or occasion of some misunderstanding in a society. It is borrowed from the heathen mythology: The poets feign, that at the marriage of Thetis and Peleus, the goddess of *Discord* threw a golden apple, whereon were wrote these words, *to the fairest*; which immediately stirred up a dissension between Juno, Pallas, and Venus, each pretending a title to the apple.

DISCOVERY, in dramatic poetry, a manner of unravelling a plot, or fable, very frequent in tragedies, comedies, and romances; wherein, by some unforeseen accident, a *Discovery* is made of the name, fortune, quality, and other circumstances of a principal person, which were before unknown. A late author defines the *Discovery* a change, which bringing us from ignorance to knowledge, produces either love or hatred in those whom the poet has a design to make either happy, or miserable.—For a *Discovery* should never be in vain, by leaving those who thus discover one another in the same situation and sentiments they were in before: in effect, those *Discoveries*, which are immediately followed by a perpetua, or change of fortune of some principal character, whereon the unravelling depends, are always the most beautiful.

One of the finest *Discoveries* ever brought upon the stage, is that of Oedipus in Sophocles; for the minute he finds himself the son of that Jocaista, who was then his wife, he becomes of the most happy, the most miserable of all men.

There are three sorts of *Discoveries*: The first by certain marks in the body, either natural, or accidental: such is that of Ulysses, who having received a wound in the thigh by a boar, before the Trojan war, is discovered by the old nurse, upon washing his legs after his return home Iocognito.

The second by tokens: as the casket of things, which the priests found with Ion when he was exposed, discovers Creusa, whom he was a going to kill, to be his mother.

The third is made by remembrance: that is, when the sight, or hearing of any thing occasions us to recollect our mistunes. Thus, when Ulysses heard Demodocus sing his actions at Troy, the memory of them struck him, and drew tears from his eyes, which discovered him to Alcinoüs.

But the finest sort is, that which arises from the subject, or incidents of the fable; as that of Oedipus from his excessive curiosity, and the letter that Iphigenia sent by Pyliades.

DISCOUNT, in commerce, a sum deducted, or retained in hand, upon paying a greater. See **DEDUCTION**.

The term is much used among mechanics, and manufacturers, who keep workmen, journeymen, labourers, &c. for the sums advanced them before hand, which are discounted when the payments are made in course.

DISCOUNT, is more particularly used for an allowance made on a bill of exchange, or any other debt not yet become due; to induce the acceptor, or debtor, to advance the money.

Discounts are also frequently given for the payment of dubious, or bad debts.

DISCOUNT, is also used among merchants when they buy commodities on trust, with a condition, that the seller shall discount so much with him *per cent.* for each payment made before the time expired. See **PROMPT Payment**.

The

The *Sieur de la Porte* distinguishes between these two kinds of *Discount*: The first, or that upon bills of exchange, is reckoned like the exchange, at the rate of so much *per cent*. *E. gr.* at 2 *per cent*. *Discount* on an hundred pounds, there is only ninety-eight pounds to pay: whereas that on commodities, is not only laid on the hundred pound, but on the hundred and *Discount* added together. So that *discounting* for goods at 10 *per cent*. there is only eight abated on an hundred and eight, and not on the hundred. This last, he says, is the true *Discount*.

DISCOUNT, is also used with less propriety for the tare, or waste of any commodity, sum, &c. There are 12 shillings *Discount* in this bag.

The cag of oil sent me from Spain leaks; there are fifty pints *Discount*.

DISCOURSE, an operation of the human mind, whereby it passes, or proceeds from one thing to another, that is, from a known thing to an unknown.

The school-men define it in an act of cognition, whereby the mind deduces one thing from another: this it does, when in consequence of an assent given to one proposition, it yields assent to another: so that *Discourse* consists in a dependancy of assents; and supposes such an order between the acts, that that belonging to the consequent arises from that belonging to the antecedent. So that the intellect is then said, *discurrere*, to *Discourse*; when, from an assent to one, or more propositions, it infers, or draws an assent to another.

The object of *Discourse*, therefore, or that about which the intellect is employed in *discoursing*, is the connexion of extremes considered with regard to some third, or medium: thus, when it judges, that every reasonable animal is risible, affirming, that there is a connexion between risibility, and rationality; and then finds, there is likewise a connexion between man and reasonable animal: and afterwards gathering from the connexion found between risible and man, with rational, that man and risible have likewise a connexion, as both are connected with rational: it is said to *Discourse*. Hence it appears, that *Discourse*, whereon men use to value themselves, does really betray the infirmity of the human understanding; as it denotes a chain or scale of several successive acts of cognition necessary to arrive at a truth. So that there is no *Discourse* in God, who understands all things originally and truly.

DISCOUS Flower. Botanists reckon two classes of plants with a *Discous Flower*. 1. Such as have the flower compounded, and the seed pappous, but the leaves and stalks not milky when broken. 2. The corymbiferous plants, whose flowers are compounded into a *Discous* figure, but their seeds not pappous.—Of the former kind are the daisies, chamomile, groundfels, &c. and of the latter, are dandelions, ragweeds, tansy, wormwood, &c. These are distinctions founded by Mr. Ray, but not regarded by the later Botanists.

DISCRETE, or **DISJUNCT**, *Proportion*, is, when the ratio between two or more pairs of numbers, or quantities is the same, and yet there is not the same proportion between all the four numbers.

Thus, if the numbers 6 : 8 : 3 : 4, be consider'd; the ratio between the first pair, 6 and 8, is the same as that between 3 and 4, and therefore these numbers are proportional; but it is only *discretely*, or *disjunctly*, for 6 is not to 8, as 8 to 3; that is, the proportion is broken off between 8 and 3, and is not continued all along, as it is in these following, which are called *Continual Proportionals*, viz. 3 : 6 : 12 : 24.

DISCRETE Quantity, is such as is not continued and joined together.

Such is a number, whose parts being distinct units, cannot be united into one continuum; for in a continuum there are no actual determinate parts before division, but they are potentially infinite; wherefore it is usually and truly said, that continued quantity is divisible in infinitum. See **CONTINUITY**.

DISCRETIVE Propositions, are those where various judgments are made, and denoted by the particles, *but*, *nevertheless*, or by words of the like nature either expressed, or understood. Thus, fortune may deprive me of my wealth, *but* not of my virtue: they, who cross the seas, change their climate, *but* not their disposition, are called *Discretive Propositions*.

DISCUS, among the ancients, a name given to a round shield, consecrated to the memory of some famous hero; and hung up in the temples of their gods, as a trophy of some great action.

From the figure of this *Discus*, or rather of that which the Greeks and Romans used to divert themselves with, especially at their public games, and which was a round quoit of brass, comes the word so much in use among astronomers, viz. the *Disk* of the sun, or moon. See **DISK**.

DISCUSSION, in matters of literature, signifies a clear treating, or handling of any point, or problem. The word imports a shaking off, or dispelling the difficulties and obscurities with which a thing was embarrassed. We say, such a

point was well *discussed*, when it was well treated of, and cleared up.

DISCUSSION is also used, in a medicinal sense, for a dispersing the matter of any tumor, or swelling through the pores of the body; or an evacuation of some thin matter gathered in any part, by infensible perspiration.

DISCUTIENTS, in medicine, either repellers or remedies proper to open the pores, and evacuate the redundant or peccant humours of the body by infensible perspiration or otherwise.

Discutients are in this last sense the same with what we otherwise call *Diaphoretics*.

DISDIAPASON, in music, a compound concord, in the quadruple ratio of 4 to 1, or of 8 to 2.

The *Disdiapason* is produced when the voice goes from the first tone to the 15th, and may be called a *Fifteenth*.

The voice ordinarily does not go further than from its first tone to the *Disdiapason*; i. e. it does not go beyond the compass of a double octave, for the *Disdiapason* is an octave doubled. It may sometimes rise several tones above a *Disdiapason*, but the effort or struggle disfigures it, and makes it false. In reality, the ancient scale, or diatagma, only extended to a *Disdiapason*.

DISDIAPASON-Diapente, in music, a concord in a sextuple ratio, of 1 to 6.

DISDIAPASON-Diatessaron, a compound concord in the proportion of 16 to 3.

DISDIAPASON-Ditone, a compound consonance in the proportion of 10 to 2.

DISDIAPASON-Semi-ditone, a compound concord in the proportion of 24 to 5.

DISEASE, in medicine, that state of a living body, wherein it is prevented the exercise of any of its functions, whether vital, natural, or animal.

Or, *Disease* is an indisposition contrary to nature, whereby the action of some part is immediately injured.

Or, *Disease* is a depraved, and disorderly state of the solid, and fluid parts; whereby all, or some of the functions either of the body, or mind, or both, are either abolished, or impaired.

An ingenious author of a late Latin treatise, *de purgatione*, holds the essence of a *Disease* to consist in a want of that equilibrium between the solid and fluid parts, which is necessary to the maintenance of health: others add, that all *Diseases* arise either from too lax, or too strict a tension of the fibres.

Of all animals, man is subject to the most *Diseases*; and of men, the studious and speculative are most exposed thereto. Other animals have their *Diseases*; but they are in small number: nor are plants without them; though their maladies scarce exceed half a score. The ancients deified their *Diseases*: Vossius *de Idolol.* Lib. VIII. C. V.

Several authors have given us very compendious theories of *Diseases*; reducing them all to some one general disaffection: Bontecuo deduces all the *Diseases* of the human frame from the Scorbutus; Musgrave from the Arthritis; Dr. Woodward from the Bile: others imagine all *Diseases* the effects of a virus, which has lurked in the seed ever since the sin of Adam; Helmont, and Serenus the Dane, take them to depend on some extraneous ferment, formed in or out of us: lastly, it appearing from the observations of Pliny, Kercher, Langius, and Bonomo, that there are little worms in severish blood, pustules, carbo's, and the itch; divers physicians have took occasion to suspect, that all *Diseases* arise from insects.

Some *Diseases* only impair the use of the part, as the ophthalmia, gout, &c. Others destroy it entirely, as the gutta serena, palsy, &c. Some effect of the whole body, as the fever, apoplexy, epilepsy, &c. Others only impair a part, as the Asthma, colic, dropsy, &c. Some only affect the body, as the gout: Others disturb the mind, as melancholy, delirium, &c. Lastly, others affect both the body and mind, as the mania, phrenzy, &c.

As the actions, or conditions of the body, so also the *Diseases*, or defects thereof, may be reduced to three general heads, viz. 1. *Diseases* of the solid parts. 2. Those of the fluid parts. And, 3. *Diseases* compounded of both.

A popular syllabus of *Diseases* may be given, as follows: the solid parts, i. e. the bones, and flesh, may be disorder'd five ways, viz. They may be rendered turgid by tumors; cut with wounds; corroded by ulcers, or caries; removed out of their places, as in hernia's, prolapsus's, and dislocations; or discontinued by fractures, and contusions.

Diseases of the fluids are either in the mass of the blood, or the spirits: those of the blood are reducible to two kinds; those that thicken, and inspissate, or which amounts to the same, retard its motion; and those which attenuate, and dissolve, and of consequence accelerate it.

To this latter kind belong fevers, and severish affections alone: all the other *Diseases* of the blood belong to the former.

In too thick a state of the blood, its principles are too crass, and its molecules too big, whence a lensor, lazy motion, and even stoppage, particularly in the sinuous passages of the glands: and hence obstructions, inflammations, scirrhus's, sarcoma's, verrucae, pustules, oedemata, impetigines, and other tumors, and congestions both in the viscera, and habit of the body: and hence again, drowsiness, melancholy, hypochondriacal affections, &c. If this thick blood be too much replete with sharp acid salts, it will destroy the texture of the parts, and break out in ulcers, as in phthisical, scrophulous, scorbutic, and venereal diseases, gangrenes, carbos's, cancers, and other erosive tumours, according to the quality and degree of saltness and acrimony. And from the same source arise cephalalgia's, cardialgia's, colics, gouts, rheumatism's, pleuritis, &c. which by abrading the solid substance, frequently emaciate the body.

The *Diseases* of the animal spirits, arise either, 1. from an intermission, or retardation of their motion; or a diminution of their quantity: or, 2. from a disorder in their crasis, or quality.

To the first class are reduced the catalepsis, apoplexy, coma, carus, palsy, stupor, tremor, &c. To the second belong the mania, phrensy, delirium, foolishness, melancholy, vertigo, spasms, epilepsy, hysterical affections, horror, &c. Add, that as all *Diseases* of the blood arise from external causes, viz. some one or more of the non-naturals, as food, air, evacuation, &c. so those of the spirits generally proceed from disorders of the blood.

Lastly, the *Diseases* of the fluids, whether those in the blood, or spirits, are seldom confined long thereto; but they presently come to disturb, and impede some of the functions of the solid parts, and at last corrupt the substance of the solids themselves. Hence compound, or complicated *Diseases*; which are infinitely various.

The learned Boerhaave furnishes us a much more accurate, and scientific division of *Diseases*, into those of the *Solids*, and *Fluids*.

DISEASES of the Solids, he considers either as of the simple, and similar parts, or of the organical.

Similar DISEASES, are, 1. Those of the last, and smallest fibres; which are reducible to too great tension, and laxness, too great strength, or weakness, and a solution of their continuity.

2. Those of the membranes, which being only assemblages of the fibres just mentioned, are subject to the same disorders.

3. Those of the last, and smallest canals, which are formed of such membranes.

4. Of the membranes composed of such canals.

5. Of canals composed of such membranes, which are all the greater vessels of the body.

6. Of the solid parts, which are composed of canals compressed, and grown together, so as to be void of humour to defend them; or canals growing into one consistent part, the humour hardening together with the vessel that contained it.

Lastly, supposing these parts all sound, *Diseases* may befall them with respect to their structure, from a vice, or vicious application of the matter of nutrition.

Organical DISEASES—An organical part, consisting of the several simple parts above-mentioned, and fitted to perform any office by means of some humour contained in it: may be considered, either in it self, as a solid part, or with respect to the humour it contains: in the first view, *organical Diseases* are reducible to four classes.

1. Disorders in the figure, and the circumstances thereof, as roughness, solidity, cavity, &c. To this belong the *Avarsomosis*, when one vessel opens into another; the *Διαπνοσις*, when a rupture is made; *Διαρραξις*, when a breach is occasioned by corrosion; the *Ευραξίς*, which is a total obstruction of the cavity, by a viscous, grumous matter; the *Στενωσις*, or narrowness of the passage; the *Θαλαξις*, or compression of the sides of the cavity; *Συμπίεσις*, when the sides are quite join'd; and *Συρτήσις*, when the vessel is so emptied, that the sides falling together, the cavity is lost. See *DIAPYCNOSIS*, *DIÆRESIS*, &c.

2. In the number, where it is either deficient or redundant: but the parts seldom err in this respect, so as to occasion a *Disease*.

3. In magnitude; to which belong *Nodes*, *Exostoses*, and *Callus*'s.

4. In the situation, and connexion; as when the ligaments are too long, or too short, when broke, or depraved; also distortions, luxations, subluxations, hernie, or ruptures in the groin, scrotum, bladder; proclivitas of the womb, bladder, and rectum; disorders of the tendons, and muscles, particularly their flying out of their places; the relaxation, or rupture of the membranous ligament that should retain them. Lastly, there is a *Disease* common both to similar and organical parts, called *solution of continuity*.

DISEASES of the fluids, considering those fluids simply, and in themselves, may be reduced to disorders in respect of quantity and quality: but considering them as contained in solids, they may err, too, in place, and proportion.

As to the first, such an abundance of the humours, as disturbs the animal functions, is called a *Plethora*: As to *Diseases* from the defect of humours, we scarce know of any.

As to the second, such quality of the humours, as disturbs the animal functions, is called *Cacoehymia*. Now, this is either in the fluids considered in themselves, their own parts, and composition; or considered as they concur towards constituting some part of the body.

If the morbid quality be considered in the particles of the humour, it must either consist in an augmentation of bulk, whence the emphraxis, atrophy, symphysis, and synechosis; or, in the diminution thereof, as in the diapnoe, and ceneangia; or in an increase of solidity, whence too great an attenuation; or a decay thereof, whence a lensor, stagnation, and cohesion; or in the figure, as when of spherical it becomes angular, and consequently, with respect to the part it is applied to, sharp; whence acrimonies, both acid, alkaline, muriatic, ammoniac, saponaceous, vitriolic, &c. and oleosities; or in rigidity, and flexibility; or in elasticity; or in cohesion, and divisibility. See *ATROPHY*, &c.

Again, all the juices being considered together, the principal disorders they are subject too, are too great fluidity, or tenacity; or too much velocity in their vessels, or too little.

Lastly, considering the fluids as contained in the solids, there arise diverse *Diseases* merely from their changing of place; these may be reduced to two classes, viz. the grosser humours intruding themselves into the finer canals; and the humours extravasating, or getting out among the solid parts; whence inflammations, aneurysma's, varices, enchyloses, oedema's, pustules, dropsy, spongy swellings of the head, breast, abdomen, and uterus; and emphysema's.

Add, that the humours collected, and stagnating among the parts, grow putrid, purulent, ichorous, erosive, and sharp; and thus destroy the tender stamina, or solids; whence sinus's, ulcers, gangrenes, sphacelus's, cancers, and the like.

These are the prime differences of the *Diseases* of the body; and from these arise most of the rest: so that they may be regarded, not only as *Diseases*, but as the causes of *Diseases*. See each further explained under its respective article in this work.

There is also another division of *Diseases*, in use among physicians, taken from certain external accidents, which are common to a great many different *Diseases*: which distinction, too, has its use; though they generally run it too far. *Diseases*, are by this distinguished, 1. With respect to their cause, into idioopathy, sympathy, protopathy, deuteroopathy; hereditary, connate, and acquired. 2. With respect to their subject, into *Diseases* of old age, children, adults, men, women, maids, pregnant, parturient, and into endemical, epidemical, &c. 3. With respect to duration, into most acute, which terminate in four days; acute in twenty; and chronic, which are all those of longer continuance. 4. With respect to seasons, into vernal, autumnal, continued, and intermitting. 5. With respect to their effects, into benign, malignant, curable, incurable, mortal, and contagious. And, 6. With respect to their state, into beginning, progress, state, declension, and end.

DISEASES of plants. M. Tournesfort, in an express dissertation on this subject, in the *memoires de l'Academie des sciences*, refers all the *Diseases* of plants to the following causes.

1. The too great abundance of the nutritious juice. 2. The defect, or want of this juice. 3. Some ill qualities it acquires. 4. Its unequal distribution in different parts of the plant. And, 5. External accidents.

The *Diseases* principally observed by our gardeners, are, 1. barrenness, when the tree, though seeming fresh and healthy, bears no blossoms; or if it does, they soon fall; or if they fet, the fruit drops before it comes to maturity.

2. Blasting of the buds, occasioned by a frost happening when the leaves and blossoms are wet. By this means the pores are shut, and the vital juices suffocated; when, if the sun break out on a sudden, they turn yellow, with round fiery specks growing on them; whence frequently proceed fiery specks like warts, which rotting, grow full of maggots. Mr. Mortimer adds, that the want or rain at blossoming time, often occasions the dropping off of the blossoms for want of sap: he therefore, recommends the watering them.

3. Consumption, proceeding from a want of sustenance, through the failure of the nourishing juices; or from obstructions of the veins and roots; or ill digestion, and secretion of humours, &c.

4. The moss; an account of which, see under the article Moss.

5. The jaundice, which though it does not hinder the tree from appearing sound, yet when it begins to sprout, the leaves

become of a whitish green, and, as they grow bigger, turn yellow. This frequently arises from external causes, as the mildew; but chiefly from a stony, or chalky soil, impregnated with an acid salt.

6. Mildew, a kind of epidemical *Disease*, most frequent and fatal in the spring season. It is properly a corrosive, and nipping dew, proceeding from pent up vapours now exhaled, and returned back on the tender opening buds, which infects them by its acrimony, and obstructs the circulation of the nutritive juices. By which means the leaves begin to fade and wither, and both the blossoms and fruit are much prejudiced.

7. A thick fog, or too abundant dew, Agricola assures us, occasion the same *Diseases* as the mildew, only in a less degree.

8. Falling of the leaves, which happens when the trees sprouting too soon, are either surprized by excessive heat, or violent cold.

9. Uredo, or scorching, of which there are two kinds; the first happening upon the fall of a subtil dew, or small rain, immediately followed by the piercing beams of the sun, which suddenly closes the pores before dilated, and burns up the leaves: the second happening from the like fervour in the internal parts of the tree, viz. in the pith; occasioned by some inward failing. Agricola imputes it to the fault of the gardeners, who, in transplanting trees, frequently cut of the lesser filaments, and roots, as also the greater roots, without covering the wounds with wax, or the like.

10. Scurf, or leprosy, a *Disease* chiefly of the bark, caused by a too great dilatation of the pores, whereby too much perspirable matter transuding, it hangs and hardens on the bark, which by this means chaps, and cracks; and thus a sort of lepra is formed, perspiration is obstructed, &c. Add, that this scurfy skin proves a harbour for vermin, which live both on the bark and tree.

11. The worm, a little animal generated in the corrupted substance of the bark, blossoms, fruit-leaves, pith, and roots. M. Gentil mentions another kind, called *cochechaffers*, which stick to the roots of young tender trees and bark, and kill them. There is a third sort, called *brezoes*, or gad-flies, which gnaw the bark.—The worm is a very frequent *Disease*; whereby young hopeful trees are all of a sudden brought to languish, and decay.

12. Rotten roots, occasioned chiefly by their being planted too deep. This *Disease* is incurable.

13. Blights. A particular account whereof, see under the article BRIGHT.

DISEMBOGUE. When a ship passes out of the mouth of some great gulph, or bay, they call it *disemboguing*—They say also of a river, that at such a place, or after it has run so many leagues, it *disembogues* it self into the sea.

DISFRANCHISING, the taking away one's freedom, or privilege.

DISHERISON, an old word of the same import as *disinheritance*—Our lord the king considering his own damage, and *Disherison* of the crown, &c. Stat. 8. Richard II. Henry IV.

DISHERITOR, a person who *disherits*, or puts another out of his inheritance—The sheriff shall forthwith be punished as a *Disheritor* of our lord the king, and his crown. Stat. 3. Edw. I.

DISJUNCT *Proportion*. See **DISCRETE** *Proportion*.

DISJUNCTIVE, something that separates, or disjoins.

Thus *or*, *neither*, &c. are called *disjunctive conjunctions*; which, in connecting a discourse, do yet separate the parts thereof. *E. gr.* aut *Cæsar*, aut *nullus*; either *Cæsar* or nothing. He *neither* advanced, *nor* gave back.

Disjunctive Conjunctions may also be called *partitive*, *distributive*, and *alternative*.

DISJUNCTIVE Propositions, in logic, are compound propositions consisting of two members, or parts, connected by a disjunctive conjunction.

The first proposition of a dilemma is usually a *disjunctive* proposition:

You must either obey the king, or be a rebel.

But you must not be a rebel.

Therefore you must obey the king.

DISK. See the articles **DISC**, and **DISCUS**.

DISLOCATION, the putting a bone out of joint, by some violence; usually called by physicians, *Luxation*. See **LUXATION**.

DISMEMBERED, in heraldry, is applied to birds that have neither feet, nor legs: as also to lions, and other animals, whose members are separated. See **MEMBERED**.

DISMES, *Decimæ*, in our law-books, tiths. See the article **TITH**.

DISMOUNTING, in the military art, the act of unhorsing—Thus, to *dismount* the cavalry, the dragoons, or the like, is to make them light.

To **DISMOUNT** the *Canon*, is to break their carriages, wheels, and axletrees, whereby to render them unserviceable.

Horses are also *dismounted* when they are rendered unfit for service.

DISORIENTATED, a term applied to a thing that is turned or removed from the east, to which it was originally directed.

The dials drawn on this stone do not go well, by reason it has been moved and *disorientated*: it no longer looks east and west.

But the word is most frequently used in a figurative sense, for the disconcerting, or putting a man out of his way, or element. Speak of law to a physician, or of physic to a lawyer, and they will both be *disorientated*.

And Marvel uses the word *dissoccidentated*, instead of *disorientated*: Geneva had *dissoccidentated* our geographer.

DISPARAGEMENT*, is properly used for the matching an heir, &c. in marriage, below his, or her degree, or condition; or against the rules of decency.

* The word is a compound of the private particle *Dis*; and *Par*, equal.

DISPATCH, a letter on some affair of state, or other business of importance, sent, with care and expedition, by a courier exprès.

The business of *Dispatches* lies on the secretaries of state, and their clerks. The king gives directions to his ministers abroad by *Dispatches*.

The word is also used for the packet, or mail containing such letters. The courier has delivered his *Dispatches*.

The French, during the reign of Louis XIV. had a *Conseil des Depesches*, Council of *Dispatches*, held in the king's presence, at which the Dauphin, the duke of Orleans, the chancellor, and four secretaries of state assisted.

DISPAUPER. When any state, by reason of his poverty (attested by his own oath of not being worth five pounds, his debts being paid) is admitted to sue in *forma pauperis*: if afterwards, before the suit be ended, the same party have any land, or personal estate fall to him; or that the court, where in his suit is depending, thinks fit for that, or other reason, to take away the privilege from him; he is then said to be *dyspaupered*.

DISPENSARY, or **DISPENSATORY**, a name given to divers collections of recipes for compound medicines, wherein are specified the ingredients, proportions, and chief circumstances of the preparation and mixture: the same with what we otherwise call a *pharmacoœpia*, or *antidatory*.

Such are the *Dispensaries* of Mesue, Cordus, that of the college of physicians at London, Quincy, &c.

The apothecaries in and about London, are obliged to make up their compound medicines according to the formulas prescribed in the *collegè Dispensary*; and are enjoined to keep always ready in their shops all the medicines there enumerated.

DISPENSARY, is likewise used for a magazine, or office of medicines kept ready to be *dispensed* at the prime cost of the ingredients, for the benefit of the sick poor.

Of which kind we have had two, or three in London maintained by the college of physicians. One at the college it self, first begun in the year 1606: another in St. Peter's alley, Cornhill: and a third near Covent-garden: where the best medicines were sold for their intrinsic value, and patients were advised every day, but sunday, at one of the three places.

DISPENSATION, in law, &c. a permission to do something contrary to the standing laws; or a relaxation, or suspension of a law on some just occasion.

Some confound *Dispensation* with equity; but they are very different things: For equity is only the correction, or modification of a law, which is too general; but a *Dispensation* suspends the obligation of the law it self, and can, therefore, be only given by the legislative power.

The king of France grants *Dispensations* of age to some officers to be admitted before the legal age. But the greatest dealer in *Dispensations* is the pope, who claims the office *jure divino*, and extends it to every thing. Indeed, the more sober of the Romanists themselves deny, that he can give a *Dispensation* for a thing contrary either to the divine law, or the law of nature; and confine him to what is contrary to positive laws, as to things relating to fasts, marriages, holding several benefices, &c. And even in these things they put bounds: Thus, say they, a *Dispensation* in the fifth degree of affinity, as of father and daughter, brother and sister, would be abusive, and null. But it is certain, the papal see does not apprehend it self under any such severe restrictions.

The right of giving *Dispensations*, they thus prove: it is certain the church has power to make laws; a power which the apostles themselves exercised, and which their successors have continued to exercise after them. Whoever can make a law, can annul it; and much more can he *dispense* with it in certain cases: the church then may *dispense* with the laws it self has made; and we find it to have done accordingly in all ages. In the primitive times it was left to the judgment of the bishops to *dispense* with the length of the penance enjoined by the canons; and the IVth council of Carthage allows of the

tran-

translation of bishops, and priests, when the churches occasions should require it.

The author of a treatise of *Dispensations*, printed in 1713, reduces all the causes of *Dispensation* to the necessity and public service of the church, and not to the private advantages of the persons who solicit the *Dispensation*; otherwise, causes he observes will never be wanting.

The same author maintains, that all *Dispensations*, should be dispatched *gratis*: Marcellus II. he observes, was resolved to have it so. That pope used to say, that if *Dispensations* were just, they should be granted *gratis*; and if unjust, they were to be refused. And pope Pius V. refused a large sum of money offered by a Spanish lord for a *Dispensation*, which that pope granted, because he judged it just. The nine prelates, whom Paul III. consulted for the reformation of the court of Rome, recommended the same thing; except for *Dispensations* of marriages contracted malgré some known impediment.

DISPENSATION, in pharmacy, the disposition and arrangement of several medicines, either simple or compound, all weighed in their proper doses, or quantities; in order to be employed in the making a composition.

DISPERSION, in dioptrics.—*Point of DISPERSION*, is a point from which refracted rays begin to diverge, when their refraction renders them divergent.

It is called *Point of Dispersion*, in opposition to the *Point of Concourse*, which is the point wherein converging rays concur after refraction.

But the latter is more usually called *Focus*, and the former, *Virtual Focus*.

DISPLAYED, in heraldry, is understood of the position of an eagle, or other bird, when it is erect, with its wings expanded, or spread forth.

DISPONDEE, in the Greek, and Latin poetry, a double spondee; or a foot consisting of four long syllables: as *ἵερᾶμένημιν*, *Δεξιᾶνῆς*, *Ὁαυμᾶντων*.

DISPOSITION, in rhetoric, is defined by Cicero, the act of distributing the things, or arguments invented, or found out, into a proper order; or a due placing, or ranging the several parts of a speech, or discourse.

The *Disposition* makes one of the great branches, or divisions of rhetoric.

The *Disposition* is of the same necessity in oratory, as the marshalling of an army, in order to a battle; or a beautiful composition in architecture, painting, &c. Horace enjoins it expressly in poetry: *singula quæque locum teneant sortita decenter*.

The *Disposition*, then, is the order, or arrangements of the parts of an oration: which parts are usually reckoned four, viz. the *exordium*, or beginning; the *narration*; the *confirmation*; and the *peroration*, or conclusion. Though some make them six: viz. the *exordium*, *division*, *narration*, *confirmation*, *confutation*, and *peroration*; as indicated in that popular verse.

Exorsus, narro, scvo, firmo, refuto, peroro.

But the division is more naturally referred to the *exordium*; and the *confutation* to the *confirmation*.

The *Disposition* is either *natural*, or *artificial*. *Natural*, is the order the parts are above rehearsed in. *Artificial*, is, when for some particular reason we recede from the order of nature.

See each part under its proper article, *EXORDIUM*, &c.

DISPOSITION, in architecture, is the just placing of all the several parts of an edifice, according to their proper nature and office. See **BUILDING**.

DISPROPORTION, a term of relation, implying a want of proportion, or suitableness.

DISPUTE, or **DISPUTATION**, in the schools, &c. a contest, or combat, either by word or writing, on some point of learning, or religion, for a degree, prize, exercise, or even for the mere sake of truth, or advantage of a party, or the honour of a triumph. See **THESES**.

The Port Royalists take occasion to observe, that nothing gives so many different lights, and openings for discovering the truth, as *Disputation*. The movements of a mind employed singly in the examination of any subject, are usually too cool, and languid: the mind needs a certain degree of heat, to awake its ideas. Now, by the oppositions in a *Dispute*, we come to find wherein the difficulty lies, and the impetus the mind has acquired, enables us to surmount it.

DISQUISITION, an enquiry into the nature, kinds, and circumstances of any problem, question, or topic; in order to gain a right notion of it, and to discourse clearly about it.

DISSECTION, in anatomy, the operation of cutting, and dividing the parts of an animal body, with a knife, scissars, &c. in order to see, and consider each of them a-part.

The ancients made *Dissections* of living men; as we read of Herophilus, and Erasistratus, and in our own times, of Carpus, and Vesalius.

Yet, le Gendre observes, that the *Dissection* of a human body, even dead, was held a sacrilege till the time of Francis I. and the same author assures us, he has seen a consultation held by the divines of Salamanca, at the request of Charles V. to settle the question whether or no it were lawful, in point

of conscience, to *disssect* a human body, in order to learn the structure thereof?

DISSEISIN, in law, an unlawful dispossessing a man of his land, tenement, or other immovable, and incorporeal right. *Disseisin* is of three sorts; viz. *simple Disseisin*, committed by day, without force, and arms; and *Disseisin by force*; for which see **DEFORCEOR**; and **FRESH Disseisin**. See also **RE-DISSEISIN**, and **POST-DISSEISIN**. *Wrongsul Force* makes no descent in law.

Affises are called *Writs of Disseisin*, which lie against *Disseisors* in any case: whereof some are termed *little writs of Disseisin*, as being vicontial, that is, suable before the sheriff in the county court, because determinable by him without assise.

DISSEISOR, he who *disseiseth*, or puts another out of his land: as *Disseisor*, is he who is so put out.

For the difference between *Disseisor*, and intruder, and deforcor.

DISSEMINATE Vacuum. See **VACUUM Disseminatam**. **DISSENTERS**, a general denomination of equal import with **Non-conformists**.

It expresses certain sects, or parties in England, who in matters of religion, church discipline, and ceremonies, *dissent* from, or disagree with, the church of England, and have a toleration by law for the same.

Such, particularly, are the presbyterians, independents, anabaptists, and Quakers. See **PREBYTERIANS**.

DISSIMILAR Leaves, denote the two first leaves of any plant at its first shooting out of the ground.

They are thus called, because they usually are of a different form from the common leaves of the grown plant.

These Dr. Grew observes to be nothing but the very lobes of the seed thus expanded, and thus advanced.

Their use is for the protection of the plumage; which, being young, and tender, is thus guarded on each side, and has also some rain, and dew gradually conveyed down to it by this means. See **PLUME**.

DISSIMILAR, in anatomy.—Authors divide the parts of the body into *similar*, and *dissimilar*.

Dissimilar parts, by some called also *compound*, and *organical* parts, are such as may be divided into various parts of different structure, &c. Thus the hand is divisible into veins, muscles, bones, &c. whose sub-divisions are neither of the same nature, nor denomination.

DISSIMILITUDE, in geometry, &c. See **SIMILITUDE**.

DISSIMILITUDE, or **DISSIMILI**, in rhetoric, &c. an argument, wherein, from *dissimilar*, or unlike things, other *dissimilars* are deduced.

Thus Cicero, *si barbarorum est in diem vivere; nostra concilia sempiternum tempus stultare debent*. Catullus furnishes a very beautiful argument from *Dissimilitude*:

*Soles occidere & redire possunt,
Nobis cum senel accidit brevis lux,
Nox est perpetua una dormientia.*

DISSIPATION, in physics, an insensible loss, or consumption of the minute parts of a body; or, more properly, that flux whereby they fly off, and are lost. See **EFFLUVIA**.

We do not say *Dissipation*, but loss of blood, in speaking of the blood discharged at a wound, or in any other sensible manner; on the contrary, we say *Dissipation* or exence of spirits: this is more copious than that of the solid parts, and consequently the reparation thereof ought to be more copious.

DISSOLVENT, something that *dissolves*, i. e. divides, and reduces a body into its smallest parts. See **DISSOLUTION**.

Thus, aqua regia is the *Dissolvent* of gold; aqua fortis of silver, and other metals; water, of salts and gums; spirit of wine, of resins; spirit of vinegar, of pearls, corals, &c.

Sea-salt is found the proper *Dissolvent* of gold: this, in almost any form, whether as a fluid, or a solid, or a spirit, does the business: accordingly, this is the basis, or fundamental ingredient of aqua regia.

So nitre is the proper *Dissolvent* of silver; and has that effect, in whatever form it is applied: and accordingly it is the basis of aqua fortis.

Spirit of nitre added to that of sea-salt, makes it *dissolve* gold the better: but spirit of sea-salt added to spirit of nitre, disables it from having any effect on silver. Yet Mr. Homburg furnishes an instance of a *Dissolution* of silver, made by the *Dissolvent* of gold. An aqua regia may be composed of spirit of salt, and spirit of nitre, only in such small quantity each, that they may float separately in a third liquor, and not meet often enough to unite, at least not in any quantity. This water may be made so weak, as not to *dissolve* gold, but only extract a slight yellow tincture from it, that scarce takes off any thing of the weight of the metal: nor will it *dissolve* silver; as being too-weak: so that both metals are safe from it. But this aqua regia, after it has *dissolved* gold as far as it can do, that is, after it has extracted a yellowish tincture from it, is still in a condition to *dissolve* silver.

This phenomenon Mr. Homburg accounts for hence: that spirit of salt, whether alone, or joined with spirit of nitre, being

being employed in keeping those few particles of gold dissolved, will not meddle with the silver: which, by this means, receiving the impression of the greater quantity of spirit of nitre alone, is dissolved thereby. But the experiment cannot be inverted, *i. e.* aqua regia cannot begin with dissolving silver lightly first, and afterwards dissolve gold; by reason spirit of nitre does not hinder spirit of salt from acting on gold; as spirit of salt does spirit of nitre from acting on silver.

Dissolvents are usually called by the chemists *Menstruums*. *Universal DISSOLVENT*. See the article *ALCAHEMIST*.

DISSOLUTION, in physics, a discontinuation, or analysis of the structure of a mixt body; whereby, what was one, and contiguous, is divided into little parts, either homogeneous, or heterogeneous. See *ANALYSIS*, and *DIVISION*.

Dissolution, then, is a general name for all reductions of concrete bodies into their smallest parts, without any regard either to solidity, or fluidity; though in the usual acceptation of the word among authors, it is restrained to the reduction of solid bodies into a state of fluidity; which is more properly expressed by *Solution*, as a branch of *Dissolution*.

According to the opinion of Fr. Tertius de Lanis, now confirmed by that of the learned Boerhaave, in his chemistry, the power, or faculty of *dissolving*, is lodged in fire alone.

Other fluids, commonly supposed *Dissolvents*, only produce their effect by means of the fiery spicula they abound withal. Even air, which is judged a powerful menstruum, owes all its force to the rays of light diffused therein.

Sir Isaac Newton accounts for all *Dissolutions*, and the several phenomena thereof, from the great principle of attraction; and, in effect, the phenomena of *Dissolution* furnish a great part of the arguments, and considerations, whereby he proves the reality of that principle.

A specimen of that great author's way of philosophizing on the subject of *Dissolution* take as follows:

When salt of tartar dissolves by lying in a moist place, is not this done by an attraction between the particles of the salt of tartar, and those of the water which float in the air in form of vapours? and why does not common salt, or saltpetre, or vitriol do the like; but for want of such an attraction? and when aqua fortis, or spirit of vitriol, poured on steel-slings, dissolve the filings, with a great heat, and ebullition; is not this heat and ebullition effected by a violent motion of the parts? and does not that motion argue, that the acid parts of the liquor rush towards the parts of the metal with violence, and run forcibly into its pores; till getting between the outermost particles, and the main mass of metal, they loosen them therefrom, and set them at liberty to float off into the water? when a solution of iron in aqua fortis dissolves lapis calaminaris, and lets go the iron; or a solution of copper dissolves iron immersed in, and lets go the copper; or a solution of mercury in aqua fortis poured on iron, copper, tin, or lead, dissolves the metal, and lets go the mercury; does not this argue, that the acid particles of the aqua fortis are attracted more strongly by the lapis calaminaris than by iron; by iron than by copper; by copper than by silver; and by iron, copper, tin, and lead, than by mercury? and is it not for the same reason, that iron requires more aqua fortis to dissolve it than copper; and copper more than the other metals; and that of all metals iron is dissolved most easily, and is most apt to rust; and next after iron, copper? when aqua fortis dissolves silver, and not gold; and aqua regia dissolves gold, and not silver; may it not be said, that aqua fortis is subtle enough to penetrate the pores of gold as well as of silver, but it wants the attractive force to give it entrance: and the same of aqua regia, and silver? and when metals are dissolved in acid menstruums, and the acids in conjunction with the metal, act after a different manner; so as that the taste of the compound is milder than that of the simples, and sometimes a sweet one; is it not because the acids adhere to the metallic particles, and thereby lose much of their activity? and if the acid be in two small a proportion to make the compound dissolvable in water; will it not, by adhering strongly to the metal, become unactive, and lose its taste; and the compound become a tasteless earth? for such things as are not dissolvable by the moisture of the tongue, are insipid. *Newt. Opt. in Calc.*

M. Geoffroy furnishes some curious experiments on cold *Dissolutions*: it is nothing surprizing, that a simple *Dissolution* should be cold; that common water, for instance, wherein sea-salt, or sal-ammoniac, or vitriol, has been cast, should become the colder, by the mixture of such salts; it being obvious, that the salts, being of themselves destitute of motion, and coming to share that which the fluidity gives the water, must diminish it, when they become intimately mixed therewith by *Dissolution*; and it is generally agreed among philosophers, that heat is a motion, and cold a cessation, or at least a diminution of motion.

Yet, notwithstanding this general principle, it is no great wonder all *Dissolutions* are not cold, as those are of all volatile

alcalies in common water; but that some are hot, as those of all fixed alcalies. This difference may be accounted for hence, that all fixed alcalies having been calcined by a vehement fire, they have imprinted, and retained in their pores some of the particles thereof.

But it is surprizing, that *Dissolutions* accompanied with fermentation, *i. e.* where the matters boil, and swell, and that with a great noise, should be cold, and make the thermometer fall, when immerged therein.

This coldness, with so considerable an augmentation of motion, is somewhat extraordinary. But this is not all: for of these cold fermentations, there are some that emit hot vapours. Thus it is with a mixture of oil of vitriol, and sal ammoniac; for a thermometer being plunged in the mixture, and another a little higher, to receive only the fumes thereof; the first thermometer is seen to fall very hastily, through the coldness of the fermentation, and the latter to rise through the heat of the vapours. M. Geoffroy adds an experiment, shewing that cold water is rendered still colder for a few moments, by throwing a large quantity of live coals therein.

DISSOLUTION, in chemistry, pharmacy, &c. denotes the reduction of a compact, hard, or solid body into a fluid state, by the action of some fluid menstruum, or *Dissolvent*.

Dr. Friend gives us a mechanical account of *Dissolution*, in the instance of salt dissolved in water, which is the most simple operation that falls under this head. This motion he ascribes to that attractive force, which is so very extensive in natural philosophy, that there is no kind of matter, but what is under its influence. It may be observed, he says, that the corpuscles of salts, which are the most simple of any, are withal very minute, and for their bulk very solid, and, therefore they exert a very strong attractive force, which, *ceteris paribus*, is proportional to the quantity of matter. Hence it comes to pass, that the particles of water are more strongly attracted by the saline particles, than they are by one another: the particles of water, therefore, cohering but loosely, and being easily moveable, approach the corpuscles of salts, and run, as it were, into their embraces; and the motion of them is quicker, or slower, according to their less, or greater distances; the attractive force in all bodies being strongest, at the point of contact. Therefore, if salt be thrown into the middle of a dish full of water, we shall find the aqueous particles, which are in the middle of the dish, sharp, and pungent to the taste; but the water upon the sides of the vessel almost insipid; so that, when such a motion once arises, the aqueous particles are carried with the same force towards the salts; and the moment of them is to be estimated from the ratio of their weight, and celerity, conjunctly. By the force of this impulse, they open to themselves a passage into the pores of the salts, which are very numerous; and at length they so break, and divide its texture, that all cohesion of the parts is destroyed: hereupon, being separated, and removed to a convenient distance from one another, they are dispersed, and float here and there about the water.

DISSOLUTION of metals, &c. by fire, is particularly called *Fusion*.

DISSOLUTION of the blood, is an affection of that humour, directly opposite to coagulation.

The *Dissolution* is such a comminution of the fibrous parts of the blood, as indisposes it for that separation of the crassamentum from the serous part, which always ensues in healthy blood on its cooling out of the body.

This *Dissolution* is frequently the consequence of malignant, and pestilential fevers, and shews itself in petechiæ, or purple spots; also of certain poisons, particularly the bites of venomous beasts, &c.

DISSOLUTION of parliament. See *PARLIAMENT*.

DISSONANCE, or **DISCORD**, in music, a false consonance, or concord.

A *Dissonance* is properly the result of a mixture, or meeting of two sounds, which are disagreeable to the ear: such are *Ditones*, *Tritones*, *False Fifths*, *redundant Fourths*, *Sevenths*, &c. *Dissonances* are sometimes used in music, and have a good effect therein; though it be only occasionally. See *DISCORD*.

DISSYLLABLE, a word of two syllables; as *Fortune*, *lament*, &c.

The *Spondees*, *Trochees*, *Iambus*, and *Pyrrhichius*, are *dissyllable* feet. See *STRONDEE*, &c.

DISTANCE, properly denotes the shortest line between two points, objects, &c.

The word is also used figuratively for an interval, not only in respect of place, but also of time, or quality.

Thus, we say the *Distance* of the creation of the world from the nativity of Jesus Christ is upwards of 4000 years: the *Distance* between the Creator and creature, is infinite.

For the *Vision* of *DISTANCE*, or the manner wherein we come by the idea of *Distance* in objects, see *VISION*.

DISTANCES,

DISTANCES, in geometry, are measured by the chain, decem-peda, and the like. See CHAIN, &c.

Inaccessible DISTANCES are found by taking bearings thereto from the two extremes of a line whose length is given. See PLAIN-TABLE, THEODOLITE, &c.

DISTANCE, in geography, is the arch of a great circle intersected between two places.

To find the Distance of two places A and B, (Tab. Geograph. fig. 4.) far remote from each other: assume two stations C and D, from which both the places A and B may be seen, and with a proper instrument find the angles ADC, CDB, ACD, and DCB; and measure the Distance CD.

Then in the triangle ACD we have two angles given ACD and ADC, together with a side, from which, by an easy rule in trigonometry, delivered under the article TRIANGLE, we find AD.

So also in the triangle CBD the base DC, and the angles at the same being given, DB is found.

Lastly, in the triangle ADB, having the sides AD and DB, together with the included angle ADB, the Distance required AB is found by the rules given for the resolution of triangles.

The height of a remote object being known, to find its Distance, when the eye first descends it; and again, the height of the eye given, to find the Distance to which the eye can reach on the surface of the sea, or land: Add the height of the eye AB, (fig. 9.) to the semi-diameter of the earth BC, by which you have AC: and since in the right-angled triangle ADC, the sides AC and DC are given, the angle DCA is found by the common rule for resolution of triangles; and the quantity of which angle forms the arch DB; which arch converted into feet, or the like, gives the Distance required.

Suppose, e. gr. the height of the eye AB five foot; which is somewhat less than in a man of ordinary stature. Since BC is 19695539, AC will be 19695544, and the angle DAB will be found 89° 57' minutes, 43 seconds. Consequently DCB, or the arch DB is 2' 17" or 137'. And therefore, since 1° or 3600" make 343752 Paris feet, DB is 130817 feet.

After the same manner we find the Distance AB, to which an object of a given altitude DB may be seen; and consequently we know what Distance we are off from an object of a given altitude, when we first discover the top thereof.

DISTANCE, in navigation, is the number of miles, or leagues, that a ship has sailed from any point. See SAILING.

DISTANCE, in astronomy—The Distance of the sun, planets, and comets, is found from their parallaxes.

That of the fixed stars, as having no sensible parallax, we can do little more than guess at.

The Distances of the planets from the sun and earth, in semi-diameters of the earth, supposing the greatest horizontal parallax 6"; and the dimensions of the orbits, as assigned by Kepler, are as follow:

Table with 8 columns: Planet, Dist. from the Sun, Great-est. dist., Mean. dist., Least. dist., Planet, Dist. from the Earth, Great-est. dist., Mean. dist., Least. dist. Rows include Jupiter, Saturn, Mars, Earth, Venus, and Mercury.

Mr. Cassini makes the Distances somewhat less; as supposing the sun's parallax a greater.

Table with 8 columns: Planet, Dist. from the Earth, Great-est. dist., Mean. dist., Least. dist., Planet, Dist. from the Earth, Great-est. dist., Mean. dist., Least. dist. Rows include Jupiter, Saturn, Mars, Sun, Venus, Mercury, and Moon.

Dr. Hook, by exact observation with a telescope of 16 foot perpendicularly placed, first discovered, that the Distances of the stars from the zenith is not the same at all times of the year; particularly the bright star in the dragon's-head he found 27, or 30 seconds near the zenith of Gresham college, in the brumal solstice, than in the equinal. And after him Mr. Flamsteed observed the like variations in the Pleiades.

DISTANCE of the sun from the moon's node, or apogee, is an arch of the ecliptic, intercepted between the sun's true place, and the moon's node, or apogee. See NODE.

Curtate DISTANCE, is the Distance of the planets place from the sun, reduced to the ecliptic. See CURTATE.

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Line of DISTANCE, in perspective, is a right line drawn from the eye to the principal point: such is the line OF. (Tab. Perspective fig. 12.) drawn between the eye O, and the principal point F.

This, as it is perpendicular to the plane, or table, can only be the Distance of the eye from the table.

Point of DISTANCE, in perspective, is a point in the horizontal line at such Distance from the principal point, as is that of the eye from the same.

Such is the point P, and Q, (Tab. Perspective, fig. 12.) in the horizontal line PQ; whose Distance from the principal point F, is equal to that of the eye from the same F.

DISTANCE of the Bastions, in fortification, is the side of the exterior polygon.

DISTASTE, or DISGUST, a loss of appetite, or an aversion, or repugnance to foods which are commonly eaten.

Distaste is held by physicians one of the principal disorders of the stomach. It arises from a want of sensation in the upper orifice of the ventricle; which may be occasioned various ways: as, by a too great abundance of food; thick, heavy humours in the stomach; fat, viscid aliment; obstructions of the lacteals; suppressions of the usual evacuations; intermissions of the ordinary exercises; a defect in the nerves, in having their natural faculty abolished, or suspended, as in a lethargy, and apoplexy; and, according to Sylvius, by a gross viscid saliva, or a thick bile, ascending out of the small guts into the stomach.

DISTEMPER, in medicine. See the article DISEASE.

DISTEMPER, is also used in painting, for the working up of colours with something else besides bare water, or oil.

If the colours be prepared with the former of these, that kind of painting is called Limning; and if with oil, it is called Painting in Oil, or simply Painting.

If the colours be mixed with size, whites of eggs, or any such proper glutinous, or unctuous substance, and not with oil; they then say, it is done in Distemper; as those of the admirable cartoons at Hampton-court.

DISTENSION, the act of stretching a thing; also the state of a thing violently stretched, and distended. See TENSION.

The calculus is a hard, solid body, causing a stupor, obstructions, and distensions. Degori.

DISTICH, ΔΙΣΤΙΧΟΝ, a couplet of verses; or a piece of poetry, the sense whereof is comprehended in two lines.

There are excellent morals in Cato's Distichs. See Vigneul de Marville on the Distichs of Cato, T. 1. p. 54, 55.

Hexameter, and Pentameter verses, or otherwise called elegiacs, are disposed in Distichs.

DISTICHIASIS*, in medicine, a disorder of the eye-lids, wherein, instead of one, they have two rows of cilia, or hairs.

* The word is formed of δις, twice, and σιχη, or σιχη, Order, Rank.

In the Distichiasis, over the common, and natural hairs, there grows another extraordinary row, which frequently eradicates, and tears up the former, and pricking the membrane immediately investing the eye, occasions pain, and draws defluxions upon it.

It is cured, by plucking up the second rows of hairs with nippers, and cauterizing the pores, out of which they issued.

DISTILLATION, or DESTILLATION, in chemistry and pharmacy, the art, or act of separating, or drawing off the spirituous, aqueous, oleaginous, or saline parts of a mixed body from the grosser, and more terrestrial parts, by means of fire; and collecting, and condensing them again by cold.

The use of Distillation is very great; it being by means hereof, that waters, spirits, essences, and extracts are chiefly made. Distillation is usually performed by means of fire raised to a greater, or lesser degree, as circumstances require.

The fire is either applied immediately to the vessels wherein the matters are to be distilled; or it is applied mediately, by means of water, sand, iron-slings, &c. These different methods of applying the fire, are called Baths, Balnea; Balneum Marie, or Maris, Balneum Arenosum, &c. They are also called Heats; as sand-heat, water-heat, &c.

Distillation is two-fold, 1°. per ascensum, by ascent; when the matter to be distilled is above the fire, and the spirit, or other principle, is raised from it.

2°. per descensum, by descent; when the matter which is to be distilled is below the fire, and the vapour drawn from it, is precipitated to the bottom of the vessel.

DISTILLATION by ascent, is either right, or oblique. Right DISTILLATION, is performed with a common alembic, or cucurbit, wherein the liquor is raised, and descends again, in form of drops, into a receiver: this is chiefly used when the texture of the body is such as allows of an easy ascent, as in vegetables.

Oblique DISTILLATION, is performed side-ways, and in crooked vessels, as retorts. Its use is for such bodies as consist of heavier particles, and which cannot be raised without a strong impulse

impulse, nor even by the strongest so high as the top of the alembick; of which kind are almost all minerals, and metals.

DISTILLATION by descent, is where the fire is applied on the top, and all around the vessel, whose orifice is at the bottom; and consequently, the vapour not being able to rise upwards, it is forced to precipitate, and *distil* down to the bottom.

There is a second kind of *Distillation* by descent, called *Per Deliquium*; which is a natural liquifying, or retolving of salts into a liquor, by means of moisture.

In the resolution of simples, an excellent method to preserve their virtues, is, in lieu of fire, or any other foreign heat, which might alter, or destroy these virtues, to make use of the heat of a dunghill made of putrefied herbs.

The process, and measures of *Distillation*, are very different according to the different subjects to be *distilled*.

Acid spirits are usually drawn in a reverberatory furnace, and with a vehement fire: ponderous woods, as guaiacum, box, &c. are *distilled* in a retort, after the same manner. In these, first comes a little phlegm, and then, the fire increasing, the spirits fly out in white clouds. When they cease to come, the matter in the receiver is filtrated through a tunnel, which lets pass the spirits, leaving a black fetid oil behind.

Odoriferous plants, as balm, wormwood, sage, hyssop, &c. are *distilled* by the cucurbit, or vesica; first pouring a strong decoction of the same plant hot, upon the plant it self bruised, or adding common water to the plant, whether dry or fresh, cut with sheers into small pieces, and letting the whole digest in a close vessel two days. Then about half the water, or spirit is drawn away by *Distillation*; and what remains, being pressed, filtrated, and evaporated to the consistence of honey, is the extract of the plant. Lastly, drying what remained in the cloth after expression, and burning it, they make a lixivium of its ashes; which being filtrated and evaporated to dryness, what remains is the fixed salt of the plant.

Plants not odoriferous, are sometimes managed thus: The plant being pounded, and two thirds of the alembick, or retort filled with it, they pour a good quantity of the expressed juice of the same plant upon it, so as the bruised matter may float therein, without sticking any where to the vessel. Then they draw off about half as much water, as there was juice, which is the *distilled* water of that plant. What remains, being pressed in a cloth, and the juice settled, they filtrate, and evaporate it to two thirds, and setting it in a cool place, the essential salt shoots into crystals.

There is a method of **DISTILLING** cold; which is thus performed: They take, for instance, four pounds of flowers, more or less, and put them in three or four pints of water, and put the whole in a limbec, which they lute exactly; then place it in a vessel half filled with ice, beaten and salted, as if they meant to freeze the water; then fit on a receiver, and lute it well; then wetting a linnen cloth in hot water, they cover the limbec head therewith, repeating this several times; by which means the finest parts are raised from the flowers. But care must be taken, that all the superfluous water have been first emptied out of the limbec.

Dr. Beal, in the *Philosophical Transactions*, mentions an extraordinary kind of cold *Distillations*, viz. made by frost and cold air: His thermometer being exposed out of doors, during the severe frosts of 1665; fine clear drops, like dew, ascended to the top of the tube, which afterwards, in time, redescended into the stem, and filled the space of half an inch; and, though the spirit of wine it self was tinged very deep, yet this second spirit was clearer and brighter than any crystal. The like he did by exposing his thermometer to the hot air in the middle of summer. And hence takes occasion to recommend a further prosecution of this psychro-technia.

The ascent of fluids, we are taught by philosophy, is effected two ways: 1. On account of their specific gravity; and, 2. By impulse.

The first way of elevation is manifest from this lemma, viz. that particles of bodies which swim in any fluid, if they be specifically lighter, must be born upwards by that fluid. Hence, as *distilled* liquors are carried upwards through the air, it is to be inquired, how they come to be specifically lighter than air.

Now, a fluid will be specifically lighter than another, when, under a larger surface, it has an equal, or a less gravity: according to this proportion, the bulk of the fluid ought to be increased in *Distillation*; and how easily, by the help of fire, it may be increased, or, which is the same thing, rarified, will appear from what we have said under the articles RAREFACTION, and HEAT.

It is known by computation, that the proportion of the specific gravity of water to that of air, is something more than as eight hundred to one. Since, therefore, simular spheres, or solids are as the cubes of their diameters, and the specific gravity decreases reciprocally, in the very same proportion, as the cubes of their diameters increase: In order to make a particle

of water lighter than a particle of air, no more is necessary than to rarify it, till its diameter becomes ten times greater, which in this case is but a very small degree of rarefaction: for the cube of the diameter in a particle so rarefied, is one thousand. If the diameter be made eleven times greater, the cube will be 1331; and if twelve, 1728. So that water, when rarefied but twelve degrees, will be above doubly lighter than air. And, if the rarefaction be carried on farther, it may easily be collected from the increase of the numbers, that a particle of water may be rendered almost infinitely lighter than air. Now, the elevation of bodies equally fluid, and heavy, is always proportionable to their different aptitude to be rarefied; that is, they ascend quicker, upon the application of any force, the more susceptible they are of rarefaction: but in bodies, whose aptitude to rarely is equal, the time of ascent is to be determined by their specific gravity.

But it is not only specific gravity that serves to elevate bodies in *Distillation*, but an external impulse may also cause their ascent: the impulse, we have here to do with, comes from the fire, whose particles, though extremely small and light, yet may raise bodies much heavier than themselves, by acting upon them with a certain degree of force: For since the moment of a body, or that force, by which it acts upon another, is in a compound ratio of the quantity of matter, and celerity; the celerity may be so increased, as to give a sufficient force to the body, though the quantity of matter in it be ever so small. Let some heavy body, therefore, be supposed to descend, with no other motion than that it receives from its own gravity; in this case then, the air, which is much lighter, may be moved with such celerity, as not only to sustain that body, but to mount it up higher; and the more rapid the impetus of the air is, or the surface of the body more diffused, the higher and swifter will the elevation be.

So fire, though it be a body of the minutest size, may be moved with that rapidity, as to acquire, and communicate what force can be desired towards removing any obstacles. When, therefore, the moment of fire is augmented in the manner explained, so as to exceed the force of the *distilled* body, it will remove it from its former situation; or what is here the same thing, because the direction of its motion tends upwards, it will carry it up. And thus, particles specifically heavier than the air contained in the retort, as those of acid spirits are, ascend by a more violent impulse of the fire used in *Distillation*.

Another thing to be noted, is, that the same quantity of matter is elevated so much the easier, in proportion, as the surface is enlarged; for the more this is diffused, the more particles of fire it receives: having, therefore, this united force to drive it up, it more easily ascends; so that, by the same degree of fire, bodies will not equally arise, though they are equally heavy, if there be that difference in their surfaces already supposed.

The air also has no small share in the business of an impulse: for being rarefied by the fire, it is not only impelled upwards it self, but it carries other particles up with it: and it may be learned by many very familiar experiments, what impetus bodies so rarefied exert. Whosoever, therefore, well considers these three things, viz. specific levity; an impelling force; and the extent of surface; and what may be effected by them, and how many ways, and in what proportions all of them may be changed, will very easily account for all the variety, which is found in the several processes of *Distillation*.

DISTINCT *Notion*, or *Idea*, according to Mr. Leibnitz, is, when we can enumerate marks and characters enough whereby to recollect a thing.

Such, e. gr. is this, that a circle is a figure bounded with a curve line that returns into it self; all the points whereof are equally distant from one middle part.

DISTINCT *Base*, in optics, is that distance from the pole of a convex glass, in which objects, beheld through it, appear *distinct*, and well defined: so that the *distinct base* coincides with what we otherwise call the focus.

The *distinct base*, is caused by the collection of the rays proceeding from a single point in the object, into a single point in the representation; and therefore, concave glasses, which do not unite, but scatter, and dissipate the rays, can have no real *distinct base*.

DISTINCTION, a diversity in things, or conceptions. Logicians define *Distinction*, an assemblage of two or more words, whereby disparate things, or their conceptions, are denoted.

There are three kinds of *Distinctions* taken from the three different modes of existence; the first *real*, the second *modal*, and the last *rational*.

Real *DISTINCTION*, is that between things which may exist, or be conceived to exist a-part from each other; such is that between two substances, or the modes of two substances.

Modal *DISTINCTION*, is that between several things, one whereof may exist without the other, but not *vice versa*, the other

other without that: such is that between the mind, and an act of will; between wax, and its hardness; water, and its freezing, &c.

DISTINCTIO rationis, or **rational DISTINCTION**, is that between several things, which are really one and the same, and whereof one cannot exist without the other, nor *vice versa* the other without this: such is that between a thing, and its essence; between the essence, and properties, &c.

Of this *Distinction* some authors admit two kinds; the one barbarously called *rationalis ratiocinatae*, having some foundation in things; as when we *distinguish* the justice of God from his mercy: the other called *rationalis ratiocinantis*, which has no foundation at all, and therefore is by many quite rejected.

Though others contend, that there is no *Distinction rationis*, but is at the same time a *real Distinction*: thus, say they; God, and just God, are to each other as milk and white milk; and a just God, and merciful God, as white milk and sweet milk. But when I say, milk is distinguished from white milk, or white milk from sweet milk, the *Distinction* falls between whiteness and sweetness, which is a *real Distinction*.

Metaphysical DISTINCTION, called also by the schoolmen *Alicuius, Alterius, et Diversitas*, is a non-agreement of being, whereby this entity is not that, or one thing is not another.

DISTINCTIO, or **DISTINGUO**, in the schools, an expedient to evade an argument, or to clear up, and unfold an ambiguous proposition, which may be true in one sense, and false in another. The respondent was hard pressed, but he disengaged himself by a *Distinguo*. Moliere makes T. D. say to his mistress who had told him, he must submit to the will of a person he loved: *Distinguo, Mademoiselle; pour l'intérêt de son amour, Concedo: contre sa passion, Nego.*

DISTORTION, in medicine. **DISTORTIO Oris**, or **DISTORTION of the mouth**, is a contraction, or shortening of one side of the mouth, occasioned by a convulsion, or a palsy of the muscles of one side of the face.

When the *Distortion* arises from a convulsion, it is on the same side with the convulsion, the force of the convulsed part being superior to that of the sound part: on the contrary, when it arises from a palsy, it is on the opposite side, the paralytic part being here surmounted by the sound.

In a *Distortion of the mouth* the patient can only spit on one side; and if you make him laugh, or oblige him to pronounce the letter O, you will easily perceive, that he only moves one side of his mouth.

The Greeks call this disorder *σπασμος κυνικος*, spasmus cynicus. **DISTORTION of the eye**, called also *squinting*, or *strabismus*. See STRABISMUS.

DISTORTOR Oris, in anatomy, a muscle of the mouth, called also *Zygomatikus*. See ZYGOMATICUS.

DISTRACTION, in medicine, sometimes denotes the act of pulling a fibre, membrane, or the like, beyond its natural extent; and what is capable of this enlargement, is said to be *distractable*.

DISTRAIN, in law.—To **DISTRRAIN** is to attach, or seize on one's goods, for the satisfaction of a debt.

DISTRESS, in law, a compulsion had recourse to in certain real actions, for bringing a man to appear in court, or to pay rent, or other duty denied.

Distress is divided by Briton into *real*, and *personal*.

Personal DISTRESS is made by *distraining* a man's moveable goods, and seizing all the profits of his lands, and tenements, from the teste, or date of the writ, for the defendant's contempt in not appearing to an action brought against him when he was summoned, or attached: and the issues so returned by the sheriffs, are forfeited to the king, and estreated into the exchequer.

Real DISTRESS is made on immoveable goods. It differs from an attachment in this, that it cannot be taken by any common person, without the compass of his own fee; except it be presently after the cattle, or other things, are driven, or bore off the ground, on purpose to avoid *Distress*.

Distress is also divided to *finite*, and *infinite*.

Finite DISTRESS, is that limited by law, how often it shall be made to bring the party to trial of the action: *viz.* once, twice, &c.

Infinite DISTRESS, is, without limitation, till the party come; as against a jury, which refuses to appear upon certificate of assize, the process is *venire facias, habere corpus*, and *Distress infinite*.

Lastly, *Distress* is again divided into *grand Distress*, by Fitzherbert called *magna Districtio*, and *ordinary Distress*.

Grand DISTRESS, is that made of all the goods and chattels the party hath within the county.

The usual effect of *Distress* is to drive the party *distrained* to replevy the *Distress*, and so take his action of trespass against the *Distrainer*; or else to compound with him for the debt, or duty, for which *Distress* was made.

There are several things not *distrainable*: for a *Distress* must be of a thing, whereof a valuable property is in some body; and, therefore, dogs, bucks, coney, &c. that are *feræ naturæ*, cannot be *distrained*.

Again, although it be of a valuable property, as a horse, (yea when a man, or woman is riding on him) or an ax (in a man's hand cutting wood) and the like, are for that time privileged, and cannot be *distrained*.

Again, valuable things shall not be *distrained* for rent, which are for the benefit, and maintenance of trades, and which, by consequence, are for the common-wealth, and are by authority of the law there; as an horse in a smith's shop; materials in the weaver's shop for making cloth; cloth, or garments in the tailor's shop; sacks of corn, or meal in a mill, or a market; nor any thing *distrained* for damage-tenant, for it is in *custodia legis*.

Again, nothing shall be *distrained* for rent, which cannot be rendered again in as good a plight, as it was at the time of the *Distress* taken; as sheaves, or flocks of corn cannot be *distrained* for rent, but for damage-tenant they may. Again, beasts belonging to the plough shall not be *distrained*.

Lastly, furnaces, cauldrons, or the like, fixed to the freeholds, or doors, or windows of an house, or the like, cannot be *distrained*: when a *Distress* is taken that has life in it, it must be brought into the common pound, or kept in an open place, where the owner may give it food.

DISTRIBUTION, the act of dividing a thing into several parts, in order to the disposing each in its proper place. See DIVISION.

A dramatic poet should have *distributed* his subject into acts and scenes, before he proceed to the verification, &c. See ACT, &c. Orators *distribute* their harangues into exordium, narration, confirmation, &c.

The Jewish nation was *distributed* into 12 tribes: The digest is *distributed* into 50 books.

The *Distribution* of the food throughout all the parts of the body, is one of the greatest wonders in nature.

Manual, and quotidian DISTRIBUTIONS, denote certain small sums of money, appointed by the donors, or founders thereof, to be *distributed* to such of the canons of a chapter as are actually present, and assistant at certain offices.

DISTRIBUTION, in rhetoric, is a kind of description; or a figure whereby an orderly division, and enumeration is made of the principal qualities of a subject.

For example, He has understanding to see our faults, justice to restrain them, and authority to punish them. Their throat is an open sepulchre, they flatter with their tongues; the poison of asps is under their lips; their mouth is full of cursing, and lyes; and their feet are swift to shed blood.

DISTRIBUTION, in printing, the taking a form asunder, separating the letters, and disposing them in the cases again, each in its proper cell.

DISTRIBUTION, in architecture. **DISTRIBUTION of the plan**, denotes the dividing, and dispensing the several parts, and members, which compose the plan of a building.

DISTRIBUTION of ornaments, is an equal, orderly placing of the ornaments in any member, or composition of architecture. See ORNAMENT.

DISTRIBUTIVE, that *Distributes*, from *dis*, asunder; and *tribuere*, to give.

DISTRIBUTIVE Justice, is that whereby we give every person what belongs to him. See JUSTICE.

DISTRIBUTIVES, in grammar. See NUMERALS.

DISTRIC, the territory, or extent of jurisdiction of a judge.

A judge or officer cannot act out of his own *District*. See JUDGE.

DISTRIC, in law, properly denotes the place wherein a man has the power of distraining; or, the circuit, or territory, wherein one may be compelled to appear.—Where we say, *hors de son fée*; others say, *extra Districtum suum*.

DISTRINGAS, a writ directed to the sheriff, or other officer, commanding him to distrain one for a debt to the king; or for his appearance at a certain day. See DISTRESS.

DISVELLOPED, in heraldry, is used much in the same sense with displayed.—Thus colours, laid in an army to be flying, are in heraldry said to be *disvelloped*.

DITCH, in fortification, called also *Foss*, and *Moat*, a trench dug round the rampart, or wall of a fortified place, between the scarp, and counter-scarp.—See Tab. Fortif. fig. 21. lit. h h h, &c.

Some *Ditches* are dry; others full of water: each whereof have their advantage.—The earth dug out of the *Ditch* serves to form the rampart.

The *Ditch* would be of such breadth as that the tallest-tree may not reach over it, *i. e.* from 15 to 20 fathoms; though the rule others give for the dimensions of the *Ditch*, is, that it afford earth enough to build the rampart of due magnitude.

The space between the rampart and *Ditch*, being about 6 feet, is called the *Berm*, or *List*.

DITHYRAMBIC, (something that relates to the *Dithyrambus*. We say, a *dithyrambic verse*, *dithyrambic poet*, *dithyrambic heat*, &c.—a compound *dithyrambic* word, Mr. Dacier observes, has sometimes its beauty and force. Some moderns call compositions in the taste of the odes, only not distinguished

into strophes, and consisting of all kinds of verse indifferently, *dithyrambic* odes.

Dithyrambic poetry owes its birth to Greece, and the transports of wine. It favours strongly of its original; as admitting of no rules, but the fallies of a fiery imagination. And yet art is not quite excluded; but delicately applied, to guide and restrain the *Dithyrambic* impetuosity, and only indulge it in flights that are pleasing. In effect, what our poets say of the ode, is more true of the *Dithyrambic*, than of the ode, that its disorder is an effect of art.

DITHYRAMBUS, ΔΙΘΥΡΑΜΒΟΣ, in the ancient poetry, a hymn in honour of Bacchus, full of transport, and poetical rage.

The measure, which is what distinguishes this kind of poetry, is said to have been invented by *Dithyrambus*, a Theban; but Pindar attributes it to the Corinthians; and the modern etymologists furnish us with another origin of the word.

In effect, the verse might be called thus from the god it was consecrated to, who himself was brought twice into the world, according to the fable of Semelè and Jupiter, or by reason of his having triumphed twice: from *dis*, twice; and *τραυλος*, triumph. Be this as it will, the ancients, we are told by Aristotle and Horace, gave the appellation *Dithyrambus* to those verses wherein none of the common rules, or measures were observed; much like those called by the French *Vers Libres*, by the Italians *Versi Sciolti*, and by the modern Greeks *Politici*, a name they give to prose, which these verses resemble more than poetry.

We have now no remains of the *Dithyrambi* of the ancient poets, so that we cannot say precisely what their measure was: all we know is, that it was very bold, and irregular. The poets not only took the liberty to forge new words for the purpose, but they made double, and compound words, which contributed very much to the magnificence of the *Dithyrambus*.

Horace has sometimes imitated them. Dacier, Fa. Commire, and some other modern writers, have composed Latin pieces of all kinds of verse indifferently, according as the subject and words presented themselves, without any order, or distribution into strophes, and call them *Dithyrambi*. See PINDARICK.

DITONE *, ΔΙΤΟΝΟΥΜ, in music, an interval comprehending two tones, a greater and a less. See INTERVAL, and TONE.

* The word is formed of *dis*, twice; and *trois*, tone.

The ratio of the sounds that form the *Ditone* is of 4 to 5; and that of the *Semi-ditone*, of 5 to 6. Fa. Parran makes the *Ditone* the fourth kind of simple concords: others make it the first discord, dividing the *Ditone* into 18 equal parts, or comma's, the nine on the acute side go to the greater tone. Salomon de Caux.

DITRIGLYPH, in architecture, the space between two triglyphs. See TRIGLYPH.

DITTO *, in books of accounts, wrote contracted D^o. signifies the same, viz. as the preceding article.

* The word is corrupted from the Italian *detto*, the said: as in our law-phrase "the said premises," meaning the same as were aforementioned.

DIVAL, in heraldry, the herb night-shade, used by such as blazon with flowers and herbs instead of colours and metals, for sable, or black. See SABLE.

DIVALIA *, in antiquity, a feast held among the ancient Romans on the 21st of December, in honour of the goddess Angerona; whence it is also called *Angeronalia*.

* This feast was established on occasion of a disease which destroyed man, and beast: that disease was a kind of squinancy, or inflammation and swelling of the throat, called in Latin *Angina*; whence the appellation *Angeronalia*, as Macrobius relates Lib. I. Saturn. c. 12.

On the day of this feast, the pontifics performed sacrifice in the temple of Voluptia, or the goddess of joy and pleasure, who, some say, was the same with Angerona; and supposed to drive away all the sorrows and chagrins of life.

DIVAN *, a council-chamber, or court wherein justice is administered, in the eastern nations, particularly among the Turks.

* *Divan* is an Arabic word, signifying the same with *Sessa* in the Turkish dialect.

The word is also used for a hall, in the private houses of the orientals.—The custom of China does not allow the receiving of visits in the inner parts of the house, but only at the entry, in a *Divan* contrived on purpose for ceremonies. Le Compte. Travellers relate wonders of the silence, and expedition of the *Divans* of the east.—We say, the Grand Vizir has held a *Divan*; meaning, that he has assembled the grandees of the port, to deliberate of the affairs of the empire.

DIVAN-BEGHI, the appellation of one of the ministers of state in Persia.

The *Divan-Beghi* is the superintendent of justice: his place is the last of the six ministers of the second rank, who are all under the athemadauler, or first minister.

To the tribunal of the *Divan-Beghi* appeals lie from sentences passed by the governors. He has a fixed stipend, or appoint-

ment of 50000 crowns, that he may render justice gratis. All the serjeants, officers, &c. of the court, are in the service of the *Divan-Beghi*. He takes cognizance of the criminal causes of the chahs, governors, and other great lords of Persia, when accused of any fault, and receives appeals from the daruga.

There are *Divan-Beghi*'s not only at court, and in the capital, but also in the provinces, and other cities of the empire.

This officer is not confined by any other law, or rule in the administration of justice, but the Alcoran; which, also he interprets at pleasure. He takes no cognizance of civil causes.

DIVERGENT, or **DIVERGING** Lines, in geometry, are such whose distance is continually increasing. See LINE.

Lines which converge one way, *diverge* the opposite way. **DIVERGENT**, or **DIVERGING**, in optics, is particularly applied to rays, which issuing from a radiant point, or having in their passage undergone a refraction or reflection, do continually recede further from each other.

In which sense the word is opposed to *Convergent*, which implies the rays to approach each other; or to tend to a centre, where being arrived, they intersect, and if continued further, become *diverging*.

Concave glasses render the rays *diverging*; and convex ones, converging.

Concave mirrors make the rays converge; and convex ones, *diverge*.

It is demonstrated, in optics, that as the diameter of a pretty large pupil does not exceed $\frac{1}{2}$ of a digit; *diverging* rays, flowing from a radiant point, will enter the pupil, parallel, to all intents and purposes, if the distance of the radiant from the eye be 40000 feet. See LIGHT and VISION.

DIVERGING Hyperbola, is one whose legs turn their convexities towards one another, and run towards quite contrary ways.

DIVERSION, in war, the act of attacking an enemy in one place, where he is weak, and unprovided, with design to make him call his forces from another place, where he was going to make an irruption, or is to be attached with more force.

The Romans had no way to drive Hannibal out of Italy, but to make a *Diversion*, by attacking Carthage.

DIVERSION, in medicine, the turning of the course, or flux of humours from one part to another, by proper applications.

DIVERSITY, this differs from distinction in this, that the latter is the work of the mind; but the former is in things themselves, antecedent to any operation of the mind. For things that are several, are different; even though I do not conceive them. See DISTINCTION.

The *Diversity*, or difference of things, therefore, arises from their essential attributes.

DIVESTING, properly signifies undressing, or stripping off one's garment, in contra-distinction to *investing*.

In law, it is used for the act of surrendering, or relinquishing one's effects. By a contract of donation, or sale, the donor, or seller are said to be *divested*, and *divested* of their property in such a commodity, and the donee, or purchaser becomes *invested* therewith.

A demise is a general *Divestiture*, which the fathers and mothers make of all their effects, in favour of their children.

DIVIDEND, in arithmetic, the number given to be divided; or that whereof the *Division* is made.

The *Dividend* must always be greater than the divisor. The quotient always contains as many unites, as the *Dividend* contains the divisor times.

DIVINATION, the act, or art of foretelling future events, See PROPHECY, ENTHUSIASM, &c.

Divination is divided by the ancients into *artificial*, and *natural*.

Artificial DIVINATION, is that, which proceeds by reasoning upon certain external signs, considered as indications of futurity.

Natural DIVINATION, is that, which presages things from a mere internal sense, and persuasion of the mind, without any assistance of signs.

Natural Divination, again, is of two kinds; the one *native*, the other by *influx*.

The first is founded on this supposition, that the soul, collected within it self, and not diffused, or divided among the organs of the body, has, from its own nature and essence some fore-knowledge of future things: witness what is seen in dreams, extasies, the confines of death, &c.

The second is founded on this, that the soul receives, after the manner of a mirror, some secondary illumination from the presence of God, and other spirits.

Artificial Divination is also of two kinds: the one arguing from *natural causes*: such are the predictions of physicians about the events of diseases, from the pulse, urine, &c. such also are those of the politician, *Ob venalem urbem, & mox perituram si emptorem invenieris!*

The second proceeds from experiments, and observations arbitrarily instituted; and is mostly superstitious.

Infinite are the systems of *Divination* reducible to this head: by birds, the entrails of beasts, dreams, lines of the hand,

points marked at random, numbers, names, the motion of a sieve, the air, fire, the fortes pranestinae, Virgilianae and Homericae; with numerous others, the principal species whereof, and their names, are:

Psychomancy, or Sciomancy, which consists in calling up the souls, or shades of the deceased, to learn of them something required. Dactyliomancy, performed by means of one, or more rings. Hydromancy, performed with sea-water. Pegomancy, with spring-water. Ornithomancy, or divining by the flight of birds, which was the business of the augurs. Clidomancy performed with keys. Cosinomancy, with a riddle, or sieve. Cledonism, by words, or voice. Extispicina, by the entrails of victims. Alphitomancy, or Aleuromancy, by flower. Keratocopia, by the consideration of thunder. Capnomancy, by smoke. Alecetrymancy, by cocks. Pyromancy, by fire. Lithomancy, by stones. Lychnomancy, by lamps. Necromancy, by the dead, or their bones, &c. Onirocritica, by dreams. Ooscopy, by eggs. Lecanomancy, by a basin of water. Gastromancy, by the belly, or by vials. Palpitation, Salifatio, Πλασθη, by the pulsation, or motion of some member. Axinomancy, by a hatchet, or cleaver. Catopromancy, or Crystallomancy, by a mirror. Chirromancy, by the lines of the hand. Geomancy, by the earth. Ceromancy, by figures of wax. Arithmomancy, by numbers. Belomancy, by arrows. Sycomancy, &c. all described by Cardan, in his IVth book, *de Sapiaentia*; and under their proper articles in this *Dictionary*.

All these kinds of *Divination* have been condemned by the fathers, and councils, as supposing some compact with the devil. Fludd has several treatises on the several species of *Divination*: And Cicero has two books of the *Divination* of the ancients, wherein he refutes the whole system.

In Holy Scripture we find mention made of nine different kinds of *Divination*: the first performed by the inspection of planets, stars, and clouds: it is supposed to be the practicers of this, whom Moses calls מַעֲוֵן *Meonen*, of אֲנָן *anan*, cloud, Deuter. c. XVIII. v. 10. 2. Those, whom the prophet calls in the same place מְנַחֵם *Menachem*, which the vulgate, and generality of interpreters render *Augur*. 3. Those, who in the same place are called מְכַשְׁפִּים *Mecscheph*, which the septuagint, and vulgate translate, *a man given to ill practices*. 4. Such authors, whom Moses in the same chapter, v. 11. calls הַכֹּהֲנִים *Haber*. 5. Those, who consult the spirits called *Python*; or, as Moses expresses it in the same book, שְׂאֵל אִיִּם *Sael Aïm*, those who ask questions of *Python*. 6. Witches, or magicians whom Moses calls יְרֵמֵי *Judeim*. 7. Those, who consult the dead, *Necromancers*. 8. The prophet Hoseah, c. IV. 12. mentions such as consult slaves, שְׂאֵל מִקְּנִי *Sael Miqueni*, which kind of *Divination* may be called *Rhabdomancy*. 2. The last kind of *Divination* mentioned in scripture, is *Hepatoscopy*, or the consideration of the liver. See *RHABDOMANCY*, &c.

DIVINE, something that comes from, or relates to, God. See *God*.

The word is also used figuratively, for any thing that is excellent, extraordinary, and that seems to go beyond the power of nature, and the capacity of mankind.

In which sense, the compass, telescope, clocks, &c. are said to be *divine* inventions: Plato is called the *divine Author*, the *divine Plato*; and the same appellation is given to Seneca: Hippocrates is called, *the divine old man*, *divinus senex*, &c. The Arabs give the appellation, *Divine*, אֱלֹהִים *Elahoum*, to their second sect of philosophers, * consisting of such as admit a first mover of all things, a spiritual substance free from all kind of matter, in a word, a God. By this name they distinguish them from their first sect, whom they call *Deberion*, or *Thabaioun*, i. e. worldlings, and naturalists, as admitting of no principles beyond the material world, and nature.

* The word אֱלֹהִים *Elahoum*, is derived from אָלָא *Alla*, God: so that the *Elahoum* are the *Divines*, or theologues, as Caltellus renders it; or, such as own a God.

DIVING, the art, or act of descending under water to considerable depths, and abiding there a competent time.

The uses of *Diving* are very considerable, particularly in the fishing for pearls, corals, sponges, &c. See *PEARL-FISHING*. There have been diverse methods proposed, and engines contrived, to render the business of *Diving* more safe and easy. The great point in all these is to furnish the *Diver* with fresh air, without which, he must either make but a short stay, or perish.

Those who *dive* for sponges in the Mediterranean, help themselves by carrying down sponges dipt in oil in their mouths. But considering the small quantity of air that can be contained in the pores of a sponge, and how much that little will be contracted by the pressure of the incumbent air, such a supply cannot long subsist the *Diver*. For it is found by experiment, that a gallon of air included in a bladder, and by a pipe reciprocally inspired and expired by the lungs, becomes unfit for respiration in little more than one minute of time. For though its elasticity be but little altered in passing the lungs, yet it loses its vivifying spirit, and is rendered effect.

In effect, a naked *Diver*, Dr. Halley assures us, without a sponge, cannot remain above two minutes enclosed in water; nor much longer with one, without suffocating; nor, without long practice, near so long; ordinary persons beginning to be suffocated in about half a minute. Besides, that if the depth be considerable, the pressure of the water in the vessels makes the eyes blood-shot, and frequently occasions a spitting of blood.

Hence, where there has been occasion to continue long at the bottom, some have contrived double flexible pipes, to circulate air down into a cavity enclosing the *Diver*, as with armour, both to furnish air, and to bear off the pressure of the water, and give leave to his breast to dilate upon inspiration; the fresh air being forced down one of the pipes with bellows, and returning by the other of them, not unlike to an artery, and vein.

But this method is impracticable when the depth surpasses three fathoms; the water embracing the bare limbs so closely as to obstruct the circulation of the blood in them; and withal pressing so strongly on all the junctures where the armour is made tight with leather; that if there be the least defect in any of them, the water rushes in, and instantly fills the whole engine, to the great danger of the *Diver's* life.

The *DIVING-BELL*, is a machine contrived to remedy all these inconveniences. In this the *Diver* is safely conveyed to any reasonable depth, and may stay more or less time under the water, as the bell is greater or less.

It is most conveniently made in form of a truncated cone, the smallest base being closed, and the larger open. It is to be poised with lead, and so suspended, that it may sink full of air, with its open base downward, and as near as may be in a situation parallel to the horizon, so as to close with the surface of the water all at once.

Under this coverle the *Diver* sitting, sinks down with the included air to the depth desired: and if the cavity of the vessel can contain a tun of water, a single man may remain a full hour, without much inconvenience, at five or six fathoms deep.

But the lower you go, still the more the included air contracts itself, according to the weight of the water that compresses it; so as at 33 feet deep, the bell becomes half full of water; the pressure of the incumbent water being then equal to that of the atmosphere: and at all other depths the space occupied by the compressed air in the upper part of the bell will be to the under part of its capacity filled with water, as 33 feet to the depth of the surface of the water in the bell below the common surface thereof. And this condensed air being taken in with the breath soon insinuates it self into all the cavities of the body, and has no ill effect, provided the bell be permitted to descend so slowly as to allow time for that purpose.

One inconvenience that attends it, is found in the ears, within which there are cavities which open only outwards, and that by pores so small as not to give admission even to the air it self, unless they be dilated, and distended by a considerable force. Hence, on the first descent of the bell, a pressure begins to be felt on each ear, which, by degrees, grows painful till the force overcoming the obstacle, what contrivings these pores, yields to the pressure, and letting some condensed air slip in, presently ease ensues. The bell descending lower, the pain is renewed, and afterwards it is again eased in the same manner.

But the greatest inconvenience of this engine, is, that the water entering it, contracts the bulk of air into so small a compass, that it soon heats and becomes unfit for respiration; so that there is a necessity for its being drawn up to recruit it; besides the uncomfortable abiding of the *Diver* who is almost covered with water.

To obviate the difficulties of the *Diving-Bell*, Dr. Halley, to whom we owe the preceding account, contrived some further apparatus, whereby not only to recruit and refresh the air from time to time, but also to keep the water wholly out of it at any depth: which he effected after the following manner:

His *Diving-Bell* was of wood about 60 cubic feet in its concavity, coated externally with lead so heavy that it would sink empty; a particular weight being distributed about its bottom, to make it descend perpendicularly, and no otherwise. In the top was fixed a glass like a window, to let in light from above; with a cock, to let out the hot air: and, below, about a yard under the *Bell*, was a stage suspended from it by three ropes, each charged with an hundred weight, to keep it steady.

To supply air to this *Bell* when under water, he had a couple of barrels, holding 36 gallons a-piece, cased with lead, so as to sink empty, each having a bung-hole at bottom to let in the water as they descended, and let it out again as they were drawn up again. In the top of the barrels was another hole, to which was fixed a leathern pipe, or hose, long enough to hang below the hung hole; being kept down by a weight appended. So that the air driven to the upper part of the barrel by the encroachment of the water, in the descent, could not escape up this pipe, unless the lower end were lifted up.

These air-barrels were fitted with tackle, to make them rise and fall alternately, like two buckets; being directed in their descent by lines fastened to the under edge of the *Bell*: so that they came readily to the hand of a man placed on the stages, to receive them; and who taking up the ends of the pipes, as soon as they came above the surface of the water in the barrels, all the air included in the upper part thereof was blown forcibly into the *Bell*; the water taking its place. One barrel thus received, and emptied; upon a signal given, it was drawn up, and at the same time the other let down: by which alternate succession fresh air was furnished so plentifully, that the learned doctor himself was one of five, who were all together in 9 or 10 fathoms deep of water for above an hour and a half, without the least inconvenience; the whole cavity of the *Bell* being perfectly dry.

All the precaution he observed, was to be let down gradually about 12 foot at a time, and then to stop, and drive out the water that had entered by taking in four or five barrels of fresh air before he descended further. And being arrived at the depth intended, he let out as much of the hot air that had been breathed, as each barrel would replace with cold, by means of the cock at the top of the bell, through whose aperture, though very small, the air would rush with so much violence, as to make the surface of the sea boil.

Thus, he found, any thing could be done that was required to be done underneath. And by taking off the stage, he could, for a space as wide as the circuit of the bell, lay the bottom of the sea so far dry as not to be over shoes therein. Besides, that by the glass window so much light was transmitted, that, when the sea was clear, and especially when the sun shone, he could see perfectly well to write, or read, much more to fasten, or lay hold of any thing under him that was to be taken up. And by the return of the air barrels he often sent up orders written with an iron pen on a plate of lead, directing how he would be moved from place to place.

At other times, when the water was troubled and thick, it would be as dark as night below; but in such cases he was able to keep a candle burning in the *Bell*.

The same author intimates, that by an additional contrivance, he has found it practicable for a *Diver* to go out of the *Bell* to a good distance from it; the air being conveyed to him in a continued stream by small flexible pipes, which serve him as a clew to direct him back again to the *Bell*. So that there seems little further wanting to the perfection of *Diving*.

Yet, the famous Corn. Drebell, had an expedient in some respects superior even to this; if what is related of it be true. He contrived not only a vessel to be rowed under water, but also a liquor to be carried in the vessel, which supplied the place of fresh air.

The vessel was made for king James I. carrying twelve rowers, beside the passengers. It was tried in the river Thames, and one of the persons in that submarine navigation, then living, told it one from whom Mr. Boyle had the relation.

As to the liquor, Mr. Boyle assures us, he discovered by a physician, who married Drebell's daughter, that it was used from time to time, when the air in the submarine boat was clogged by the breath of the company, and unfitted for respiration: at which time, by unstopping the vessel full of this liquor, he could speedily restore to the troubled air such a proportion of vital parts, as would make it serve again a good while. The secret of this liquor Drebell would never disclose to above one person, who himself assured Mr. Boyle what it was. *Boyl. Exp. Phys. Mech. of the Spring of the air.*

DIVINITY, the quality, nature, and essence of God.

Divinity and *humanity* are joined together in Jesus Christ. It is false, that the atheists hold the notion of a *Divinity* to be a political invention of the ancient legislators, to secure and enforce the observation of their laws: on the contrary, it is certain, the legislators made use of that opinion, which they found already impressed on the minds of the people.

The *heathen Divinities* may be reduced to three classes: the first, *theological*, representing the *divine* nature under diverse attributes; thus Jupiter denotes the absolute power of God, Juno his justice, &c.

The second class of *Divinities* are *physical*: Thus *Æolus* is that power in nature, whereby vapours and exhalations are collected to form winds, &c.

The last are *moral Divinities*. Thus the furies are only the secret reproaches and stings of conscience.

DIVINITY is also used in the same sense with *theology*.

DIVISIBILITY, a passive power, or property in quantity, whereby it becomes separable into parts; either actually, or at least mentally.

The school-men define *Divisibility*, *Capacitas coextensionis cum pluribus*; a capacity of being coextended with several things: thus, a staff 4 feet long is *divisible*, because it may be coextended with 4 feet, or 48 inches, &c.

This, the Peripatetics, and Cartesians, universally hold an affection, or property of all matter, or body: the Cartesians, as holding the essence of matter to consist in extension; for

every part, or corpuscle of the body being extended, has parts without parts, and consequently is *divisible*.

The Epicureans, again, hold *Divisibility* to agree to every physical continuum, as, without parts adjacent to parts, there can be no continuity; and wherever there are parts so adjacent, there must be *Divisibility*. But they deny, that this affection agrees to all bodies: for the primary corpuscles, or atoms they hold perfectly inseparable, and indivisible.

The principal argument they alledge, is, that from the *Divisibility* of all body, and of every assignable particle of body, even after any repeated number of divisions, it follows, that the smallest corpuscle is infinitely *divisible*, which with them is an absurdity. For a body can only be divided into such parts as it actually contains. But to suppose infinite parts in the smallest corpuscle, say they, is to suppose it infinitely extended: for infinite parts placed externally to each other, as the parts of bodies doubleless are, must make an infinite extension.

They add, that there is a world of difference between the *Divisibility* of physical, and mathematical quantities. For every mathematical quantity, or dimension, they grant, may be increased and diminished infinitely: but physical quantity, neither the one nor the other.

An artist, dividing a continued body, arrives at certain minute parts, beyond which he cannot go; these we may call *minima artis*. In like manner, nature, which may begin where art ends, will find bounds; which we may call *minima nature*: And God, whose power is infinite, beginning where nature ends, may subdivide the *minima nature*, but he will at length come at certain parts, to which there being no other parts continuous, they cannot be taken away. These minute parts are *ATOMS*.

All we can say to the point, is, that on the one hand it is certain, every extended corpuscle must have two sides, and consequently is *divisible*; for, if it had not two sides, it were not extended; and, if it had no extension, an assemblage of diverse such corpuscles would not compose a body. And on the other hand, the infinite *Divisibility* supposes an infinity of parts in the minutest corpuscle: whence it follows, that there is no body, how small soever, but may furnish as many surfaces, or parts, as the whole globe of the earth can; nay, and infinitely more; which, to say no worse, is a violent paradox.

The infinite *Divisibility* of mathematical quantity is thus proved, and illustrated by the mathematicians: suppose a line *A D* (*Tab. Geometry, fig. 35.*) perpendicular to *B F*; another, as *G H*, at a small distance from *A*, also perpendicular to the same line; with the centres *C, C, C, C, &c.* and distances *C A, C A, &c.* describe circles cutting the line *G H* in the points *e, e, &c.* Now, the greater the radius *A C* is, the less is the part *e G*: but the radius may be augmented in *infinitum*, and therefore the part *e G* may be diminished in the same manner; and yet it can never be reduced to nothing; because the circle can never coincide with the right line *B F*. Consequently, the parts of any magnitude may be diminished in *infinitum*.

The chief objections against the doctrine, are: That an infinite cannot be contained by a finite; and that it follows: from a *Divisibility* in *infinitum*, either that all bodies are equal, or, that one infinite is greater than another:—To which it is answered, that to an infinite may be attributed the properties of a finite, and determined quantity: And who has ever proved, that there could not be an infinite number of parts infinitely small in a finite quantity; or that all infinities are equal? the contrary is demonstrated by mathematicians in innumerable instances. We are not here contending for the possibility of an actual division in *infinitum*, we only assert, that however small a body is, it may be still farther divided; which we imagine may be called a division in *infinitum*, because what has no limits, is called *infinitum*.

It is true, that there are no such things as parts infinitely small; yet the subtilty of the particles of several bodies is such, that they very much surpass our conception; and there are innumerable instances in nature of such parts actually separated from one another.

Mr. Boyle gives us several instances of this. He speaks of a silken thread 300 yards long, that weighed but two grains and an half. He measured leaf-gold, and found by weighing it, that 50 square inches weighed but one grain: if the length of an inch be divided into 200 parts, the eye may distinguish them all; therefore there are in one square inch 40000 visible parts; and in one grain of gold there are 200000 of such parts; which visible parts no one will deny to be farther *divisible*.

Again, a whole ounce of silver may be gilt with eight grains of gold, which may be afterwards drawn into a wire thirteen thousand feet long.

In odoriferous bodies we can still perceive a greater subtilty of parts, and even such as are actually separated from one another; several bodies scarce lose any sensible part of their weight in a long time, and yet continually fill a very large space with odoriferous particles.

By help of microscopes, such objects as would otherwise escape our sight, appear very large: There are some small animals scarce visible with the best microscopes; and yet these have all the parts necessary for life, as blood, and other liquors: how wonderful must the subtilty of the parts be which make up such fluids; whence is deducible the following theorem: Any particle of matter, how small soever, and any finite space, how large soever, being given; it is possible for that small find, or particle of matter, to be diffused through all that great space, and to fill it in such manner, as that there shall be no pore in it, whose diameter shall exceed any given line; as is demonstrated by Dr. Keil. *Introduci. ad Ver. Phys.*

DIVISION, the act of separating a whole into the parts it contains.

If the whole be composed of parts really distinct, called *integral parts*, the *Division* made thereof is properly called *partition*: as when a house is divided into its apartments.

If the whole be composed of parts, called *subjectives*; that is, if the whole be only one common term, the subjects comprized in the extent whereof are the parts, the *Division* thereof is what we properly call *Division*: such is the *Division* of a genus into its species, &c.

DIVISION, in physics, or *DIVISION CONTINUA*, is the separation of the parts of a quantity; whereby, what before was one, is now reduced into several. See **CONTINUITY**.

This *Division* is effected by means of motion, without which there can be no separation of any continuum, or even continuum.

This motion is performed diverse ways, by fraction, scission, section, fission; resolution, dilution, maceration, dispersion, effusion, distraction, &c.

DIVISION, in logic, is the separating any thing into diverse parts, or ideas. See **DISTRIBUTION**.

The school-men define it a discourse; explaining a thing by its parts: in which it approaches near to the nature of a definition; whose character is to define a thing by its parts.

Division, we have said, is a distribution of a whole, &c. But there are two sorts of wholes, as above expressed.

The first is what consists of integral parts; as the human body, which contains diverse members.

The second is properly no other than an abstract idea common to more things than one, as the universals: or a compound idea comprehending the substance, and its accidents, or at least most of its accidents.

This whole admits of a triple *Division*. 1^o. When the genus, or kind, is divided by its species, or differences; as when substance is divided into body and spirit; or into extended, and thinking.

2^o. When any thing is divided into several classes, by opposite accidents; as when the stars are divided into those which shine by their own light, and those that only reflect a borrowed light.

3^o. When the accidents themselves are divided according to the subjects in which they inhere; as when goods are divided into those of the body, the mind, and fortune.

The laws of *Division* are, 1. That it be full, and adequate, that is, that the members of the *Division* entirely exhaust the whole thing divided: as when all numbers are divided into equal, and unequal.

2. That the members of the *Division* be opposite; as equal, and unequal; corporeal, and not corporeal; extended, and thinking.

3. That one member of the *Division* be not contained in another, so as the other may be affirmed of it. Though, in other respects, it might be included without any fault in the *Division*: thus extension, geometrically considered, may be divided into a line, surface, and solid: though the line be included in the surface, and the surface in the solid.

4. The *Division* not to be made into too many, or too general parts. Lastly, the members, unless the subject require it, not to be too unequal; as if the universe were divided into heaven, and earth.

DIVISION of a word, is a discourse explaining the latitude, or comprehension of a word: the latitude, when the word is universal; as when the genus is divided into species, and differences: the comprehension, when the word is ambiguous, as *taurus*, bull; which sometimes denotes a constellation, sometimes a beast, and sometimes a mountain.

DIVISION of a mode, divides a quality into its degrees. Philosophers, after the physicians, suppose eight degrees of every quality: hence when a quality is said to be in the 8th degree, it marks, that it can be no further intended, or heightened.

DIVISION, in arithmetic, is the last of the four great rules, being that whereby we find how often a less quantity is contained in a greater; and the overplus.

Division, in reality, is only a compendious method of subtraction; its effect being to take a less number from another greater, as often as possible; that is, as oft as it is contained therein. There are, therefore, three numbers concerned in *Division*: 1. That given to be divided, called the *Dividend*.

2. That whereby the dividend is to be divided, called the *Divisor*. 3. That which expresses how often the divisor is contained in the dividend; or the number resulting from the *Division* of the dividend by the divisor, called the *Quotient*.

There are diverse ways of performing *Division*, one called the *English*, another the *Flemish*, another the *Italian*, another the *Spanish*, another the *German*, and another the *Indian* way, all equally just, as finding the quotient with the same certainty, and only differing in the manner of arranging, and disposing the numbers.

We have likewise *Division* in integers; *Division* in fractions; and *Division* in species, or algebra.

Division is performed by seeking how often the divisor is contained in the dividend; and when the latter consists of a greater number of figures than the former, the dividend must be taken into parts, beginning from the left, and proceeding to the right, and seeking how often the divisor is found in each of those parts.

For example, it is required to divide 6759 by 3: I first seek how oft 3 is contained in 6, viz. twice; then, how oft in 7, which is likewise twice, with one remaining. This 1, therefore, is joined to the next figure 5, which makes 15, and I seek how oft 3 in 15; and lastly, how oft 3 in 9. All the numbers expressing how oft 3 is contained in each of those parts, I write down according to the order of the parts of the dividend, that is, from left to right; and separate them from the dividend it self, by a line, thus.

Divisor. Dividend. Quotient.

$$\begin{array}{r} 3 \quad 6759 \quad 2253 \\ \hline \end{array}$$

It appears, therefore, that 3 is contained 2253 times in 6759; or that 6759 being divided into 3, each part will be 2253. If there be any remainder, that is, if the divisor repeated a certain number of times is not equal to the dividend, what remains is wrote over the divisor fraction-wise. Thus, if instead of 6759 the dividend were only 6758, the quotient will be the same as in the former case, except for the last figure 3; for 3 being only contained twice in 8, the last number in the quotient will be 2; and as twice three is only 6, there remains 2 of the dividend; which I write after the quotient, with the divisor underneath it, and a line to separate the two; thus,

$$\begin{array}{r} 3 \quad 6758 \quad 2252 \frac{2}{3} \\ \hline \end{array}$$

Proof of DIVISION.

Division is proved by multiplying the quotient by the divisor, or the divisor by the quotient: and adding what remains of the *Division*, if there be any thing. If the sum be found equal to the dividend, the operation is just, otherwise there is a mistake.

DIVISION $\left\{ \begin{array}{l} \text{in Decimal Fractions,} \\ \text{in Vulgar Fractions,} \\ \text{of Proportion,} \end{array} \right\}$ See $\left\{ \begin{array}{l} \text{DECIMAL.} \\ \text{FRACTION.} \\ \text{PROPORTION.} \end{array} \right.$

DIVISION, in species, or algebra, is performed by reducing the dividend and divisor into the form of a fraction: This fraction being the quotient.

Thus, if ab were to be divided by cd , it must be placed thus, $\frac{ab}{cd}$ and that fraction is the quotient: though others

chuse to write it thus, $cd \overline{) ab}$, or $cd : ab$, or $ab \div cd$, which last mark \div is the most common character for *Division*.

To perform the work of *Division* algebraically, these rules are to be observed: 1. When the dividend is equal to the divisor, the quotient is unity, and must be placed in the quotient, because every thing contains itself once.

2. When the quotient is expressed fraction-wise (as in simple *Division*) if the same letters are found equally repeated in each member of the numerator, and denominator; cast away those letters, and the remainder is the quotient: thus, $\frac{abc}{abc}$ (a, and $\frac{abc}{abc}$ (c, &c.

3. When there are any co-efficients, divide them as in common arithmetic, and to the quotients annex the quantities expressed by letters: thus, $\frac{360 ab}{24 b} (= 15 a$.

4. The general way of *Division* of compound quantities, is like the ordinary way in common arithmetic, respect being had to the rules of algebraic addition, subtraction, and multiplication; as also that like signs give +, and unlike — in the quotient: taking care to divide every part of the dividend by its corresponding divisor, (that is, that whose letters shew it of the same kind with the other) to prevent a fraction, which would otherwise arise: thus,

$$\begin{array}{r} a a + a b \\ \hline a \quad a - c a - c b \\ \hline \quad \quad - c a - c b \\ \hline \quad \quad \quad \quad 0 \end{array}$$

That

That the same reason for like signs giving a positive, and unlike a negative quotient, does hold in *Division*, as in multiplication, is clear from considering the nature of *Division*; (which is only resolving the thing into its parts) consequently, since every dividend is nothing else but the product of the divisor, and quotient multiplied by each other, the quotient must consist of such signs, which could produce the dividend; therefore, if the dividend be divided by a quantity, that has a similar sign with it, the quotient must be positive; if by a quantity having a dissimilar sign, the quotient must be negative.—It may be a general rule in compound *Division* in algebra, always to place such a letter in the quotient, as will, when multiplied into the divisor, produce the dividend; for that is always a rectangle under the divisor, and the quotient: as for example,

$$\begin{array}{r} z^6 - 16z^4 \\ 8z^4 - 124z^2 \\ \hline 8z^4 - 128z^2 \\ \hline 4zz - 64 \\ 4zz - 64 \\ \hline 0 \end{array}$$

DIVISION by $\left\{ \begin{array}{l} \text{Npairs Bones.} \\ \text{Logarithms.} \end{array} \right\}$ See $\left\{ \begin{array}{l} \text{NEPAIRS Bones.} \\ \text{LOGARITHMS.} \end{array} \right\}$

DIVISION, in lines, or *Geometrical DIVISION*, is also called *Application*; the design of which, when it is employed about the construction of plain problems, is this, viz. a rectangle being given, as also a right line; to find another right line, the rectangle contained under which with the right line given, shall be equal to the rectangle first given.—Such effect, or construction, is called the *Application* of a given rectangle to a right line given; and the right line arising by such application, is called the *Geometrical Quotient*. This is found by the rule of three, by saying, as the line given is to one side of the rectangle, so is the other side, to the line sought.

Not unlike to which is Des Cartes's way of working *Division* in lines, by scale, and compass: thus, suppose $ac (=6)$ were to be divided by $ad (=3)$ *Tab. Geomety, fig. 17.* make any angle at pleasure, and therein set off first $ad (=3)$ the divisor, and then on the same leg, $au = to unity$: then on the other leg of the angle set $ac (=6)$ the dividend, and joyn d c , and to it through u , draw ub parallel to dc , which shall cut off ab the quotient sought; for as $ad : au :: ac : ab$; that is, as the divisor : is to unity :: so is the dividend : to the quotient; on which proportion depends all *Division*.

DIVISION, in music, imports the dividing the interval of an octave into a number of lesser intervals.

The 4th, and 5th, each of them, divide, or measure the octave perfectly, though differently. When the 5th is below, and serves as a base to the 4th, the *Division* is called *Harmonical*; when the 4th is below, the *Division* is called *Authentic*.

DIVISIONS of an Army, the several brigades into which it is cantoned. See *BRIGADE*.

DIVISIONS of a Battalion, the several parcels into which it is divided in marching: consisting generally of about 6 files each: lead by the lieutenants and ensigns. See *BATTALION*.

DIVISION, in the sea-language, the third part of a naval army, or fleet; or of one of the squadrons thereof, under the command of some flag officer. See *SQUADRON*. Naval battels are usually ranged in three lines, according to their three *Divisions*.

DIVISOR, the dividing number; or that which shews how many parts the dividend is to be divided into. See *DIVISION*.

DIVORCE, a breach, or dissolution of the bond of marriage. In our law *Divorce* is of two kinds: the one, a *vinculo matrimonii*; which alone is properly *Divorce*: the other, a *mensa & thoro*; a separation from bed and board.

The woman divorced a *vinculo matrimonii*, receives all again that the brought with her: the other has a suitable separate maintenance allowed her out of her husband's effects.

The first only happens through some essential impediment, as consanguinity or affinity within the degrees forbidden, precontract, impotency, adultery, &c. of which impediments the canon law allows fourteen, comprehended in these verses:

Error, conditio, votum, cognatio, crimen,
Cultus, disparitas, vis, ordo, ligamen, honestas,
Si sit affinis, si forte coire nequibis,
Si parachi & duplicis desit presentia testis.
Raptave sit mulier, nec parti reddita tuta.

Divorce is a spiritual judgment, and, therefore is passed in the spiritual court. Under the old law, the woman divorced was to have of her husband a writing, as St. Jerom and Josephus testify, to this effect: *I promise, that hereafter I will lay no claim to thee*; which was called a *Bill of Divorce*.

Divorce was allowed of in great latitude both among the Pagans and Jews. At Rome, barrenness, age, disease, madness,

and banishment, were the ordinary causes of *Divorce*. Carvilius, 500, or 600 years after the building of Rome, was the first who put away his wife because she was barren.

Justinian afterwards added impotence; a vow of chastity, and the profession of a monastic life, as valid reasons of *Divorce*. Among the Jews, ugliness, old age, or ill humour in a wife, were sufficient reasons for giving her a bill of *Divorce*. Nay, even the man's own pleasure, or his repenting of his match, were admitted as good reasons.

It is generally held, that Jesus Christ allowed of *Divorce* in the case of adultery. But some take this for a mistake; and maintain, that *Divorce* is no where permitted in the New Testament for adultery; but only a separation. See *Matth. XIX. 9.* *Mark X. 11.* *Paul 1 Cor. VII. 27.* See also the council of Florence; at the end, after the questions proposed to the Greeks. *Tertull. de Monogam. c. 9.* and *10. Augustin. de Bono Conjugio, & de Adult. Conjug.* See also what we have delivered under the article *ADULTERY*.

Pope Innocent I. in his decretal to Exuperius, declares such a contract a new marriage after *Divorce*, adulterers; as well as the persons they marry withal. The occasion of this decree was, that such marriages were then allowed of by the Roman laws. There is an exception, however, in the case of marriage between two heathens, which the decrees allow to be dissolved after the conversation of one of the parties. And St. Paul says the same, *1 Cor. VII. 15.* Yet even in this case, 1. The marriage is not immediately dissolved by the conversion of one of the parties, but they may still live together, and even on some occasions they ought to do so. Nor is it even dissolved by the separation of the infidel party; for if the heathen converted, he is obliged to take back his wife: as Innocent himself decides it, *L. IV. Decret. de Divort. C. Gaudemus*. But the marriage is totally dissolved by a second marriage of the converted party with another person.

2. Though the party converted to the faith, may, the minute of his conversion, legally separate himself, and contract with another; a liberty the christian law allows him; as in justice he is not deemed to owe any thing to an infidel; yet charity frequently forbids such *Divorce* and separation: as, e. gr. if the infidel consent to live with him, and do not molest him in his religion; if his faith be not at all in danger; if there be any hopes of converting her; or of gaining the children; if the separation would prove a scandal to the heathens, and render christianity odious, &c. See *St. Paul 1 Cor. VII. 13, 14.* *St. Augustin L. I. de adult. Conjug. ad Pollent.*

The 4th council of Toledo decrees, that in a country where christianity is the prevailing religion, the infidel party must be advertized to become christian; which if he refuse, the marriage is to be dissolved.

The council of Trent prohibits *Divorce* on any occasion whatever. The papal dispensations, however, are a salvo for this piece of rigor.

In England *Divorce* can only be had by consent of parliament. Milton has an express treatise of the doctrine and discipline of *Divorce*, where he maintains, that *Divorce* ought to be permitted for a mere incompatibility of humors.

DIURESIS *, ΔΙΟΥΡΗΣΙΣ, that separation which is made of the urine by the kidneys

* The word is formed from *dia, through*; and *uresu, I make water*.

DIURETICS, in medicine, are such remedies as provoke, or promote the discharge of urine.

Such is water drank plentifully, white wine drank in a morning; alkali salts of all kinds; sea-salt, sal gemmæ, nitre, borax, alum, tartar, sal ammoniac, whey, four milk, lemon juice, &c.

Aqueous liquors are generally *diuretic*, especially if mixed with salt, and drank cold. Fermented liquors are the least *diuretic* of all; and the less so as they are the fatter. Sharp thin four wines, rhenish, &c. as also acid spirits of vinegar, salt, sulphur, alum, vitriol, &c. asparagus, bitter almonds, smillage, eryngium, eupatorium, fassifras, &c. are all *diuretics*.

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

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

DIURNAL Circle, is an immoveable circle, in which any star, or point in the surface of the mundane sphere, moves by its diurnal motion.

Thus, if a right line be conceived to be continued from the centre of a star, perpendicular to the axis of the world, as far as the surface of the sphere of the world; it will describe a *diurnal circle* thereon, in making one revolution about its axis.

DIURNAL Motion of a planet is so many degrees and minutes, &c. as any planet moves in 24 hours.

The *DIURNAL Motion* of the earth is its rotation round its axis, the space whereof constitutes the natural day.

The reality of the *diurnal rotation* of the earth is now past all dispute.

DIURNAL is also used in speaking of what belongs to the nyct-meron, or natural day of 24 hours.—In which sense it stands opposed to annual, menstrual, &c.

The *diurnal* phenomena of the heavenly bodies are solved from the *diurnal* revolution of the earth; that is, from the revolution of the earth round its own axis in 24 hours.—To illustrate this: suppose the circle PRTH, (*Tab. Astronomy, fig. 2.*) to denote the earth; C the centre of the earth, through which its axis is conceived to pass, around which its *diurnal* revolution is performed: P denotes any place on the earth; and the line EW the visible horizon of the place; E the east point of the said horizon, W the west: the circle abcdef the circumference of the heavens; the circle S the fun in the heavens, the semi-circle PRT, the enlighten'd hemisphere of the earth, or that half of it opposite to the fun; and lastly, the semi-circle PHT the darkened hemisphere of the earth.

Now, the earth supposed in this situation, and moving round its axis towards the fun; it is evident, the place P of the earth, will then just begin to be enlightened by the fun, and so the fun will appear there to be just rising, or ascending the horizon at E the east point of it. The earth being moved round its own axis, so as the place P of the earth, which afore was under the point a in the heavens, is now under the point b; it is evident, the horizon of the said place P, will be now so situated, as that the fun will appear to a spectator at P, as ascending considerably above E the east end of the horizon. And while by the revolution of the earth round its axis, the place P passes from the under point b in the heavens, to the point c, the horizon of the place P will continually sink lower and lower in respect of the fun, and so the fun will appear to ascend higher and higher, till P is come under c, where the fun will appear in its greatest height above the horizon for that day; and so it will be noon, or mid-day, at the place P. The earth moving on, as the place P passes from under c to d, the west point of its horizon will ascend higher and higher, and so the fun will appear more and more to descend, as is represented by the horizon at the point of the earth under d. The place P being carried by the *diurnal* revolution of the earth from under d to under e, the fun will then appear just in W, the west point of the horizon, and so will appear to be just setting. The place P being come under f, it will be then mid-night there. Lastly, the place P being come round again under a; it will be there fun-rising again.

The same holds good as to any other of the celestial lights, and the earth; as is obvious from the figure: the circle representing the sun being taken to denote any other star, planet, &c. It remains to observe, that whereas by the *diurnal* revolution of the earth, all the several celestial lights seem to move in the heavens from east to west, hence this seeming *diurnal* motion of the celestial lights is called their *common motion*, as being common to all of them.—Besides which, all the celestial lights except the sun, have a proper motion; from which arise their proper phenomena: as for the proper phenomena of the sun, they likewise seem to arise from the proper motion of the sun: but they are really produced by another motion, which the earth has, and whereby it moves round the sun once every year, whence it is called the *annual motion of the earth*.

DIURNARY, DIURNARIUS, an officer in the Greek empire, who wrote down in a book for that purpose, whatever the prince did, ordered, regulated, &c. every day. See the 8th law of the Theodosian Code, *de Cibariis*.

DIVUS, DIVA, in antiquity, appellations given to men and women who had been deified, or placed in the number of the gods. See **DEIFICATION**.

Hence it is, that on medals struck for the consecration of an emperor, or empress, they give them the title of *Divus*, or *Diva*: for example, **DIVVS JULIVS. DIVO ANTONINO PIO. DIVO PIO. DIVO CLAUDIO. DIVA FAUSTINA AUG. &c.**

DIZZINESS. See the article **VERTIGO**.

DOCK, DOCKING, in law, a means, or expedient for cutting off an estate tail in lands, or tenements; that the owner may be enabled to sell, give, or bequeath the same.

To effect this a feigned writ of entry *sur disseisin* in le post is brought of the lands whereof the party intends to *dock* the entail; and in a feigned declaration made thereon, it is pretended he was disseised by a person, who by a feigned fine, or deed of bargain and sale, is named, and supposed to be tenant of the lands.

The feigned tenant, if it be a single recovery, is made to appear, and vouch the bag-bearer of writs to the custos brevium in the court of common pleas; who making default, a judgment is by such fiction of law entered, that the demandant shall recover, and have a writ of seisin for the possession of the lands demanded; and that the tenant shall recover the value of the lands, against the lands of the vouchee bag-bearer, a poor, unlanded, illiterate person; which is feigned to be a satisfaction to the heir in law; though he never be to expect any.

DOCK, in the sea language, a pit, pond, or creek by the side of an harbour, made convenient to work in, in order to build or repair ships.

This is of two sorts: a *dry Dock*, where the water is kept out by great flood-gates, till the ship is built, or repaired, but afterwards can be easily let into it again to float, and launch her.

A *wet Dock*, is any place in the ouze, out of the tide's way, where a ship may be haled in, and so *dock* her self or sink her self a place to lie in.

DOCKET, sometimes denotes a little bill tied to wares or goods, and directed to the person, and place they are to be sent to.

DOCTOR, a person who has passed all the degrees of a faculty, and is empowered to teach, or practise the same.

The title of *Doctor* was first created towards the middle of the XIIIth century; to succeed to that of master, which was become too common, and familiar.

The establishment of the *Doctorate*, such as now in use among us, is ordinarily attributed to Imerius, who himself drew up the formulary. The first ceremony of this kind was performed at Bologna, in the person of Bulgarus, who began to profess the Roman law, and on that occasion was solemnly promoted to the *Doctorate*, i. e. installed *juris utriusque Doctor*. But the custom was soon borrowed from the faculty of law to that of theology: the first instance whereof was given in the university of Paris, where Peter Lombard and Gilbert de la Porree, the two top divines of those days, were created *Doctors* in theology, *Sacrae Theologiae Doctores*.

Spelman gives another turn to the thing: he takes the title of *Doctor* not to have commenced till after the publication of Lombard's sentences, about the year 1140, and affirms, that such as explained that work to their scholars, were the first that had the appellation of *Doctors*.

Others go much higher, and holds Bede to have been the first *Doctor* at Cambridge, and John de Beverley at Oxford, which latter died in the year 721. But Spelman will not allow *Doctor* to have been the name of any title, or degree in England, till the reign of king John, about the year 1207.

To pass *Doctor in divinity* at Oxford, it is necessary the candidate have been 4 years bachelor of divinity. For *Doctor of laws*, he must have been 7 years in the university to commence bachelor of law; 5 years after which he may be admitted *Doctor of laws*. Otherwise, in three years after taking the degree of master of arts, he may take the degree of bachelor in law; and in four years more, that of **LLD.** which same method and time are likewise required to pass the degree of *Doctor in physic*.

At Cambridge, to take the degree of *Doctor in Divinity*, it is required the candidate have been 7 years bachelor of divinity. Though in several of the colleges, the taking of the bachelor of divinity's degree is dispensed with, and they may go out *per saltum*. To commence *Doctor in laws*, the candidate must have been five years bachelor of law, or seven years master of arts. To pass *Doctor in physic*, he must have been bachelor in physic five years, or seven years master of arts.

DOCTOR of the law, was a title of honour, or dignity among the Jews.

The Jews, it is certain, had *Doctors* long before Jesus Christ. The investiture, if we may so say, of this order, was performed by putting a key, and a table book in their hands; which is what some authors imagine our Saviour had in view, Luke XI. 52. where speaking of the *Doctors of the law*, he says, *Woe unto you Doctors of the law, for you have taken away the key of knowledge; you entered not in your selves, and them that were entering, you hindered.*

The Greek text of St. Luke calls them *Noumeis* and the vulgate *Legisperiti*; agreeably to which our English translators call them *lawyers*. But the French version of *Docteurs de la loi*, seems the most adequate. In effect, the word *Lawyer, Legisperitus* is only found in St. Luke, and St. Paul, Titus III. 13. And *Noumeis* in St. Matthew, XXII. 35. is rendered by the vulgate, *legis Doctor*; though the English version still retains the word *lawyer*.

These Jewish *Doctors* are the same whom they otherwise call *Rabbins*. See **RABBIN**.

DOCTOR of the church, a title given to certain of the fathers whose doctrines and opinions have been the most generally followed, and authorized.

We usually reckon four *Doctors* of the Greek church, and three of the Latin. The first are St. Athanasius, St. Basil, St. Gregory Nazianzen, and St. Chrysostom. The latter are St. Jerom, St. Augustin, and Gregory the Great.

In the Roman breviary there is a particular office for the *Doctors*. It only differs from that of the confessors by the anthem of the *Magnificat*, and the lessons.

DOCTOR is also an appellation adjoined to several specific epithets expressing wherein the merit of such as the schools owned for their masters, consisted.

Thus Alexander Hales is called the *irrefragable Doctor*, and the *fountain of life*, as mentioned in Poffevinus. Thomas Aquinas is called the *angelical Doctor*; St. Bonaventure the *seraphic Doctor*; John Duns Scotus, the *subtile Doctor*; Raimond

mond Lully the *illuminated Doctor*; Roger Bacon the *admirable Doctor*; William Ockham the *singular Doctor*; John Gerson, and Card. Cusa the *most christian Doctors*; Dionysius the Carthusian, the *extatic Doctor*; and an infinity of others to be met with in ecclesiastical writers.

DOCTOR, ΔΙΔΑΚΤΑΟΣ, in the Greek church, is a particular officer, appointed to interpret part of the scriptures.

He who interprets the gospels, is called *Doctor of the gospels*: he who interprets St. Paul's epistles, *Doctor of the apostle*: he who interprets the psalms, *Doctor of the psalter*.

DOCUMENT, in law, some written monument produced in proof of any fact asserted, especially an ancient one.

The antiquity of the foundation of such a church is proved by a number of authentic *Documents*.

DODECAGON, a regular polygon, or figure with twelve equal sides and angles.

Dials are sometimes drawn on all the sides of a *Dodecagon*. In fortification, a place surrounded with twelve bastions, is called a *Dodecagon*: such is Palma Nova in Friuli, &c.

DODECAHEDRON, in geometry, one of the regular bodies, comprehended under twelve equal sides, each whereof is a pentagon.

Or, a *Dodecahedron* may be conceived to consist of twelve quinquangular pyramids, whose vertices, or tops meet in the centre of a sphere conceived to circumscribe the solid; consequently they have their bases and altitudes equal.

To find the *solidity of the Dodecahedron*; find that of one of the pyramids, and multiply it by the number of bases, viz. 12; the product is the solidity of the whole body. Or its solidity is found by multiplying the base into $\frac{1}{4}$ of its distance from the centre, 12 times: and to find this distance, take the distance of two parallel faces: the half is the height.

The diameter of the sphere being given, the side of the *Dodecahedron* is found by this theorem: the square of the diameter of the sphere is equal to the rectangle under the aggregate of the sides of a *Dodecahedron*, and hexaedron inscribed in the same, and triple the side of the *Dodecahedron*. Thus, if the diameter of the sphere be 1, the side of the *Dodecahedron* inscribed will be $(\sqrt{\frac{1}{2}} - \sqrt{\frac{1}{3}}) : 2$; consequently, that, is to this, as 2 to $(\sqrt{\frac{1}{2}} - \sqrt{\frac{1}{3}})$ and the square of that, to the square of this, as 4 to $5 - \sqrt{3}$. Therefore the diameter of the sphere is incommensurable to the side of an inscribed *Dodecahedron* both in it self, and its power.

DODECATEMORY, the twelfth part of a circle.

The term is chiefly applied to the twelve houses, or parts of the zodiac of the primum mobile; to distinguish them from the 12 signs.

DODECATEMORY, is also a denomination some authors give to each of the twelve signs of the zodiac, by reason they contain a twelfth part of the zodiac a-piece.

DODONÆUS*, **DODONIAN**, in antiquity, an epithet given to Jupiter, as adored, or worshipped in the temple of *Dodona*, in a forest of the same name.

* *Dodona*, whence the appellation arises, is an ancient city of Epirus, celebrated on diverse accounts, as the forest of *Dodona*, the oracle of *Dodona*, and the fountain of *Dodona*.

Dodona's forest, was a wood, or grove of oaks, all consecrated to Jupiter. In this was a temple of that god, wherein was the most famous, and as it is said, the most ancient oracle of all Greece.

Indeed, it was not in the temple only, that oracles were delivered; the very pigeons that inhabited the wood, are said to have done the same.

The origin, and occasion of this fable, we have from Herodotus, who observes, it was founded on this, that Πελιας, which in the Thessalian language signifies a pigeon, does likewise signify a witch, or prophetess. But what is more extraordinary, is, another tradition among the poets, as if the very oaks of the forest of *Dodona* spoke, and delivered oracles. This fable is easily deduced from the former: the pigeons in the oaks being supposed to speak, it was no great flight of poetical fancy, to introduce the trees themselves speaking, &c. See *Vossius de Idolol.* L. 1. c. 7. p. 27.

The fountain of *Dodona*, was in the temple of Jupiter. The ancient naturalists assure us, it had a property of re-kindling torches, &c. when newly extinguished. This, no doubt, it did by means of some sulphurous fumes exhaling from it; as we still find a fountain in Dauphine, called the *burning fountain*, do. It is also said, to have extinguished lighted torches; which is no great miracle, since plunging them into a place where the sulphur was too dense, or into the water, must have that effect.

DODRANS, in antiquity, a division of the As; being $\frac{1}{4}$ thereof, or 9 uncies. See As.

DOG, in astronomy, a name common to two constellations, called the *great*, and *little Dog*; but among astronomers, more usually, *Canis major*, & *minor*. See *CANIS major* & *minor*.

DOG-DRAW, in the forest-law, a manifest apprehension of an offender against venison in a forest; when he is found *drawing* after a deer by the scent of a hound, led in his hand.

There are four offences in the forest, noted by Manwood, viz: *Stable-stand*, *Dog-draw*, *Back-bear*, and *Bloody-hand*. See *STABLE-Stand*, &c.

Bite of a Mad Dog. See the article ΗΥΔΡΟΦΟΒΙΑ.

DOGE*, the chief magistrate in the republics of Venice, and Genoa.

* The word properly signifies *Duke*, being formed from the Latin *Dux*; as *Dogate*, and *Dogade*, from *Ducatus*, Dutchy.

The *Dogate*, or office and dignity of *Doge*, is elective: at Venice, the *Doge* is elected for life; at Genoa, only for two years; he is addressed under the title of *Serenity*, which among the Venetians is superior to that of Highness.

The *Doge* is the chief of the council, and the mouth of the republic; he being always to answer for her. Yet the Venetians do not go into mourning at his death, as not being their sovereign, but only their first minister. In effect, the *Doge* of Venice is no more than the phantom, or shadow of the majesty of a prince; all the authority being reserved to the republic. He only lends his name to the senate: the power is diffused throughout the whole body, though the answers be all made in the name of the *Doge*. If he give any answers on his own bottom, they must be very cautiously expressed, and in general terms, otherwise he is sure to meet with a reprimand. So that it is absolutely necessary he be of an easy, and pliable disposition.

Anciently, the *Doges* were sovereigns; but things are much altered; and at present, all the prerogatives reserved to the quality of *Doge*, are these which follow. He gives audience to ambassadors; but does not give them any answer on his own head, in matters of any importance; only, he is allowed to answer as he judges good, to the compliments they make to the signory; such answers being of no consequence. The *Doge*, as being first magistrate, is head of all the councils; and the credentials which the senate furnishes its ministers in foreign courts, are wrote in his name; and yet he does not sign them, but a secretary of state signs them and seals them with the arms of the republic. The ambassadors direct their dispatches to the *Doge*; and yet he may not open them, but in presence of the counsellors. The money is struck in the *Doge's* name, but not with his stamp, or arms. All the magistrates rise, and salute the *Doges*, when he comes into council; and the *Doge* rises to none, but foreign ambassadors.

The *Doge* nominates to all the benefices in the church of St. Mark; he is protector of the monastery delle Virgine; and bestows certain petty offices of others of the household, called *Commanders of the Palace*. His family is not under the jurisdiction of the master of the ceremonies; and his children may have staff-officers, and gondoliers in livery.

His grandeur, at the same time, is tempered with abundance of things which render it burthenfome. He may not go out of Venice, without leave of the council; and if he does go out, he is liable to receive affronts, without being entitled to demand satisfaction; and, if any disorder should happen where he was, it belongs not to him but to the Podesta, as being invested with the public authority, to compose it.

The children, and brothers of the *Doge*, are excluded from all the chief offices of state. They may not receive any benefice from the court of Rome; but are allowed to accept of the cardinalate, as being no benefice, nor including any jurisdiction. The *Doge* may not divest himself of his dignity, for his ease; and after his death, his conduct is examined by three inquisitors, and five correctors, who sift it with a deal of severity.

DOGGER, a small ship, built after the Dutch fashion, with a narrow stern, and commonly but one mast; principally used in fishing on the *Doggers* bank.

DOGMA, a maxim, tenet, settled proposition, or principle; particularly in matters of religion, or philosophy.

We say, the *Dogmata of Faith*; such a *Dogma* was condemned by such a council. The *Dogmata* of the Stoics were most of them paradoxes. Speculative *Dogmata*, which do not lay any restraint on men, appear to them more essential to religion, than virtues which restrain, and confine them; nay, they often persuade themselves, that it is allowable to maintain those *Dogmata*, at the expence of all the virtues. See *FATH*, &c.

DOGMATICAL, something relating to a doctrine, or opinion.

In common use, a *Dogmatical* philosopher is such a one as asserts things positively; in opposition to a Sceptic, who doubts of every thing.

A *Dogmatical* physician, is he who, on the principles of the school philosophy, rejects all medicinal virtues not reducible to manifest qualities.

DOGMATICS, **DOGMATISTS**, a sect of ancient physicians, called also *Logici*, logicians, from their using the rules of logic, and reason in subjects of their profession.

They

They laid down definitions, and divisions, reducing diseases to certain genera, those genera to species, and furnishing remedies for them all; supposing principles, drawing consequences, and applying those principles and consequences to the particular diseases under consideration.—In which sense the *Dogmatists* stand contra-distinguished to Empirics, and Methodists.

The *Dogmatists* were those who brought physic into a form, and arrangement, like those of other speculative sciences; defining, dividing, laying down principles, and drawing conclusions: and hence they had also the appellation of *Logici*; *q. d.* Reasoners. They also applied themselves to seek the causes of diseases, the nature of remedies, &c.

Erasistratus, a famous *Dogmatist*, went so far, that not contented to dissect dogs, and other brute animals, he begged condemned criminals of the magistrates, and opened them while alive, and searched in their entrails.

DOLE, in the Saxon tongue, signifies a part or portion, most commonly of a meadow.

Hence also *Dole-Meadow*; a meadow wherein several persons have shares.

The word still signifies a *share*; a distributing, or dealing of alms; or a liberal gift made by a great man to the people.

DOLIMAN, a kind of long calcock, worn by the Turks, hanging down to the feet, with narrow sleeves, buttoned at the wrist.

The Turks, both men and women, wear drawers next the skin; or that a shift, or shirt; and over the shirt a *Doliman*. In summer it is linen, or mullin; in winter, fatten, or stuff.

DOLLAR, or **DALLER**, a silver coin nearly of the value of the Spanish piece of eight, or French crown.

Dollars are coined in diverse parts of Germany, and Holland; and have their diminutions, as *Semi-dollars*, *Quarter-dollars*, &c.

They are not all of the same fineness, nor weight. The Dutch *Dollars* are the most frequent. In the Levant they are called *Astaini*, from the impression of a lion thereon.

DOLPHIN, *Delphinus*, in astronomy. See **DELRPHINUS**.

DOM, or **DON**, a title of honour, originally Spanish, though used occasionally in other countries. See **TITLES**.

It is equivalent to *Master*, *Sir*, or *Lord*, *Monsieur*, *Sieur*, *Myneer*, &c.

Gollut in his *Mém. des Bourg.* L. V. C. 11. assures us, that the first, on whom the Spaniards conferred the title, was *Dom Pelayo*; when, upon their being routed, and driven out by the Sarazens, at the beginning of the VIIIth century, they rallied again on the Pyrenians, and made him king.

In Portugal, no body is allowed to assume the title of *Dom*, which is a badge or token of nobility, without the king's leave.

DOM, is likewise used in France among some orders of religious, as the Chartreux, Benedictines, &c.

We say, the reverend father *Dom Calmet*, *Dom Alexis*, *Dom Balhafar*, &c.

In the plural they write *Doms*, with an *s*, in speaking of several. RR. PP. *Doms* Claude du Ruble, and Jacques Douceur.

The word is formed from the Latin *Domus*, or *Dominius*; of which it is an abbreviation: *Domus* is found in diverse Latin authors of the barbarous age. Onuphrius assures us, it was a title first given the pope alone; then to the bishops, abbots, and others who held any ecclesiastical dignity, or were eminent for virtue and religion. At length it was usurped by the mere monks.

Some say, the religious declined the title *Dominus* out of humility, as belonging to God alone; and assumed that of *Domus*, as expressing inferiority, *quasi minor Dominus*. Indeed, the appellation *Domus* for *Dominus* appears very ancient, if we consider the surname of Julia, wife of the emperor Septimus Severus, who is called on medals, *JVLIA DOMNA*, for *JULIA DOMINA*.

DOMAIN *, the inheritance, estate, or possession of any one. See **DEMESNE**.

* *Menage* derives the word from *Domanius*, wrote in the barbarous Latin for *Dominium*. See **DOMINIUM**.

DOM-BOOK. See the article **DOMES-DAY**.

DOME, or **DOOM**, signifies judgment, sentence, or decree.—The homagers oath in the black-book of Hereford ends thus: So help me god at his holy *Dome*, and by my trowthe.

DOMES*, in architecture, a spherical roof; or a work of a spherical form raised over the middle of a building, as a church, hall, pavillion, vestibule, stair-case, &c. by way of crowning, or acroter.

* The word is formed from the barbarous Latin, *Doma*, which signified a *roof*, or *open porch*; as is observed by Papias. It is frequent in the corrupt Latin authors, who borrowed it from the Greeks, among whom *Trullus*, or *Trullum* is a common name for any round building; such as the palace of Constantinople, wherein was held the council thence called in *Trulls*.

Domes are the same with what the Italians call *Cuppola's*; and we frequently *Cuppola's*: The Latins according to Vitruvius, *Tholi*: See **CUPOLA**.

They are usually made round; though we have instances of square ones; as those of the Louvre; and others that are polygons, as that of the Jesuits church in the Rue St. Antoine at Paris. They have usually columns ranged around their out-sides, both by way of ornament, and to support the vault.

A **Flat DOME** is that whose sweep, or contour, is less than a hemisphere.

Eye of a DOME. See the article **EYE**.

DOME, in chemistry, the arched cover of a reverberatory furnace. See **REVERBERATORY**.

DOMES-DAY, or **DOOMS-DAY-Book**, *Liber judicarius vel censualis Angliæ*, the judicial book, or book of the survey of England; a most ancient record made in the time of William the Conqueror; upon a survey, or inquisition of the several counties, hundreds, tithings, &c.

Its name is formed from the Saxon *Dom*, doom, judgment, sentence; and *Day*, which has the same force: so that *Domes-Day* is no more than a reduplicative, importing judgment judgment.

The drift, or design of the book, is to serve as a register, by which sentence may be given in the tenures of estates; and from which that noted question, whether lands be ancient demesne, or not, is still decided. Its contents are summed up in the following verses:

*Quid deberent scire, quæ, quanta tributa,
Nominè quid census, quæ vestigalia, quantum
Quisque teneret feudali favore jure,
Qui sunt exempti, vel quos angaria damnat,
Qui sunt vel glebæ servi, vel conditionis,
Quove manumissus patrono jure ligatur.*

This book is still remaining in the exchequer, fair and legible; consisting of two volumes, a greater, and a less; the greater comprehending all the counties of England, except Northumberland, Cumberland, Westmoreland, Durham, and part of Lancashire; which were never surveyed; and except Essex, Suffolke, and Norfolk, which are comprehended in the lesser volume, which concludes with these words: *Anno millesimo octogesimo sexto ab incarnatione domini, vigesimo vero regis Wilhelmi, facta est ista descriptio non solum per hos tres comitatatus, sed etiam alias.*

It is called *Liber Judicialis*, by reason a just, and accurate description of the whole kingdom is contained therein; with the value of the several inheritances, &c.

It was begun by five justices, assigned for that purpose in each county, in the year 1081. and finished in 1086. Camden calls it, *Gulielmi Librum Censualium*, king William's tax-book.

Our ancestors had many *Dome-Books*. We are told by Ingulphus, that king Alfred made a like register with that of William the Conqueror. It was begun upon that prince's dividing his kingdom into counties, hundreds, tithings, &c. when an inquisition being taken of the several districts, it was digested into a register, called *Domboc*, *q. d.* the judgment-book, and was deposited in the church of Winchester; whence it is also called the *Winchester-Book*, and *Rotulus Winton*. And upon the model of this *domboc* it is, that the *Doom-Day* of the conqueror was formed.

That of king Alfred referred to the time of king Ethelred. And that of the Conqueror, to the time of Edward the Confessor: The entries being thus made, *C. tenet Rex Gulielmus in Dominico, & valet ibi ducate*, &c. T. R. E. *valebat* s. *q. d.* it was worth so much *Tempore Regis Eduardi*, in the time of king Edward.

There is a third *Dom-Boc*, or *Domes-Day-Book* in quarto, differing from the other in folio, rather in form, than matter. It was made by order of the same conqueror; and seems to be the more ancient of the two.

A fourth book there is in the exchequer, called *Domes-Day*; which, though a very large volume, is only an abridgment of the other two. It has abundance of pictures, and gilt letters at the beginning, which refer to the time of Edward the Confessor.

DOMESTIC, a term of somewhat more extent than that of servant; the latter only signifying such as serve for wages, as footmen, lacques, porters, &c. *Whetæas Domestic* comprehends all who act under a man, compose his family, and live with him, or are supposed to live with him. Such are secretaries, chaplains, &c.

Sometimes *Domestic* goes further, being applied to the wife, and children.

DOMESTIC gown, *Toga Domestica*. See **TOGA**.

DOMESTICUS, *Δουεστικος*, in antiquity, was a particular officer in the court of the emperors of Constantinople.

Fabrot, in his glossary on Theophylax Simocatta, defines *Domesticus* to be any person intrusted with the management of affairs of importance; a counsellor, *cujus fidei graviore aliquid curæ, & sollicitudinis committuntur*.

Others hold, that the Greeks called *Domestici* those who at Rome were called *Comites*; particularly, that they began to use the name *Domesticus*, when that of count was become a name of dignity, and ceased to be the name of an officer in the prince's family.

Domestici, therefore, were such as were in the service of the prince, and assisted him in the administration of affairs; both those of his family, those of justice, and those of the church.

The **Grand DOMESTIC**, *Megadomesticus*, called also absolutely the *Domesticus*, served at the emperor's table, in quality of what we occidentals call *Dapifer*. Others say, he was rather what we call a *Major-domo*.

DOMESTICUS *Menſæ* did the office of grand seneschal, or steward,

DOMESTICUS *Rei Domestice* acted as master of the household.

DOMESTICUS *Scholarum*, or *Legionum*, had the command of the reserved forces called *Scholæ Palatinæ*, whose office was to execute the immediate orders of the emperor.

DOMESTICUS *Murorum*, had the superintendance of all the fortifications.

DOMESTICUS *Regionum*, that is, of the east and west, had the care of public causes, much like our attorney or solicitor general.

DOMESTICUS *Icanatorum*, or of the military cohorts.

There were diverse other officers of the army, who bore the appellation *Domesticus*, which signified no more than commander, or colonel. Thus, the *Domestic* of the legion called *Optimates*, was the commander thereof.

DOMESTICUS *Chori*, or *Chantor*, whereof there were two in the church of Constantinople; one on the right side of the church, and the other on the left.—They were also called *Protosaltres*.

Dom. Magri distinguishes three kinds of *Domestici* in the church: *Domestic* of the patriarchal clergy: *Domestic* of the imperial clergy, that is, master of the emperor's chapel: And *Domestic* *Despoticus*, or of the emperors.—There was another order of *Domestici*, inferior to any of those abovementioned, called *Patriarchal Domestici*.

DOMESTICI was also the name of a body of forces in the Roman empire.—Pancirollus takes them to have been the same with those called *Protectors*; who had the chief guard of the emperor's person, in a degree above the *Prætorians*; and who under the Christian emperors had the privilege to bear the grand standard of the cross.

They are supposed to have been 3500 before Justinian's time, who added 2000 more to the number. They were divided into several companies, or bands, which the Latins called *Scholæ*, some whereof are said to have been instituted by Gordian. Some of them were cavalry, and some infantry.

Their Commander was called *Comes Domesticarum*.

DOMICELLARY *Canons*. See the article **CANONS**.

DOMIFYING, **DOMIFICATION**, in astrology, the dividing or distributing the heavens into twelve houses; in order to erect a theme, or horoscope, by means of six great circles, called *Circles of Position*.

There are divers ways of *Domifying*, according to diverse authors. That of Regiomontanus, which is the most usual, makes the circles of position pass through the intersections of the meridian, and horizon. Others make them pass through the poles of the world, or the equator; and others through the poles of the zodiac.

DOMINATION, in theology, the fourth order of angels, or blessed spirits in the hierarchy; reckoning from the seraphim. See **HIERARCHY**, and **SERAPH**.

St. DOMINGO *Company*. See the article **COMPANY**.

DOMINI—*Anno DOMINI*. See the article **ANNO**.

Bull in Coena DOMINI. See the article **BULL**.

DOMINIAL *Offices*. See the article **OFFICES**.

DOMINICAL * *Letter*, in chronology, properly called *Sunday-Letter*, one of the seven letters of the alphabet ABCDEFG, used in almanacs, ephemerides, &c. to denote the fundays throughout the year.

* The word is formed from *Dominica*, or *Dominicus dies*, lord's day, funday.

The *Domincal Letters* were introduced into the calendar by the primitive christians, in lieu of the nundial letters in the Roman calendar.

These letters, we have observed, are seven: and, that in a common year, the same letter should mark all the fundays, will easily appear; inasmuch as all the fundays are seven days a-part; and the same letter only returns in every seventh place.

But in bissextile, or leap year, the case is otherwise: for by means of the intercalary day, either the letters must be thrust out of their places for the whole year afterwards, so, *e. gr.* as that the letter which answers to the first of March, shall likewise answer to the second, &c. or else the intercalary day must be denoted by the same letter as the preceding one. This latter expedient has been judged the better, and accordingly the fundays after the intercalary day have another *Domincal Letter*.

Hence, 1^o. As the common Julian, and Gregorian year consists of 365 days, *i. e.* of 52 weeks, and one day; the beginning of the year, every common year, goes backwards by one day; thus, *e. gr.* if this year the beginning, or first day fall on a Sunday, the next year it will fall on Saturday, the next on Friday, &c. Consequently, if A be the *Domincal Letter* of the present year, G will be that of the next year.

2^o. As the Julian, and Gregorian bissextile, or leap-year, consists of 366 days, *i. e.* 52 weeks, and 2 days, the beginning of the next year after bissextile goes back 2 days. Whence, if in the beginning of the bissextile year, the *Domincal Letter* were A, that of the following year will be F.

3^o. Since in leap years the intercalary day falls on the 24th of February, in which case the 23d and 24th days are denoted by the same letter; after the 24th day of February the *Domincal Letter* goes back one place: thus, if in the beginning of the year the *Domincal Letter* be A, it will afterwards be G.

4^o. As every fourth year is bissextile, or leap-year; and as the number of letters is 7; the same order of *Domincal Letters* only returns in 28 years; which, without the interruption of bissextiles, would return in 4 years.

5^o. Hence the invention of the solar cycle of 28 years; upon the expiration whereof the *Domincal Letters* are restored successively to the same days of the month, or the same order of the letters returns.

To find the **DOMINICAL Letter** of any given year: Seek the cycle of the sun for that year; as directed under **CYCLE**: and the *Domincal Letter* is found corresponding thereto. Where there are two; the proposed year is bissextile; and the first obtains to the 24th of February; and the last for the rest of the year.

By the reformation of the calendar under pope Gregory, the order of the *Domincal Letters* was again disturbed in the Gregorian year: for the year 1582, which at the beginning had G for its *Domincal Letter*; by the retrenchment of 10 days after the 4th of October, came to have C for its *Domincal Letter*; by which means the *Domincal Letter* of the ancient Julian calendar is four places before that of the Gregorian: the letter A in the former answering to D in the latter.

DOMINICAL, in church-history. The council of Auxerre, held in 578, decrees, that women communicate with their *Domincal*. Some authors contend, that this *Domincal* was a linen cloth, wherein they received the species; as not being allowed to receive them in the bare hand. Others will have it a kind of veil, wherewith they covered the head. The most probable account is, that it was a sort of linen cloth, or handkerchief, wherein they received, and preserved the eucharist in times of persecution, to be taken on occasion.

DOMINICANS, an order of religious, called in some places *Jacobins*, and in others, *Predicantis*, or *Preaching Fryars*. See **JACOBS**, &c.

The *Dominicans* take their name from their founder Dominic de Gusman, a Spanish gentleman, born in 1170, at Calarvega, in Old Castile. He was first canon and archdeacon of Oñate; and afterwards preached with great zeal, and vehemence against the Albigenses in Languedoc, where he laid the first foundation of his order. It was approved of in 1215, by Innocent III. and confirmed in 1216, by a bull of Honorius III. under the rule of St. Augustin, and the title of *Preaching Fryars*.

The first convent was founded at Tholouse, by the bishop thereof, and Simon de Montfort. Two years afterwards they had another at Paris near the bishop's house; and some time after, a third in the Rue St. Jacques, St. James's-street, whence the denomination of *Jacobins*.

St. Dominic, at first, only took the habit of the regular canons, that is, a black cassock, and rochet; but this he quitted in 1219, for that which they now wear, which, it is pretended, was shewn by the blessed virgin herself to the beatified Renaud d'Orleans.

This order is diffused throughout the whole known world. It has 45 provinces under the general, who resides at Rome; and 12 particular congregations, or reforms, governed by vicars general.

They reckon three popes of this order, above 60 cardinals, several patriarchs, 150 archbishops, and about 800 bishops. Beside matters of the sacred palace, whose office has been constantly discharged by a religious of this order, ever since St. Dominic, who held it under Honorius III. in 1218.

The *Dominicans* are also inquisitors in many places. The Dogmata of the *Dominicans* are usually opposite to those of the Franciscans.

There are also nuns, or sisters of this order, called in some places, *Preaching Sisters*. These are even more ancient than the fryars; St. Dominic having founded a society of religious

maids,

maids, at Proutles, some years before the institution of his order of men, viz. in 1206.

There is also a *Third order of Dominicans*, both for men and women.

DOMINIUM, DOMINION, in the civil law, denotes the absolute power, or property of a thing, to use or dispose of it how we please.

Directum Dominium is the right alone of *dominium*; and *Dominium utile*, the profit redounding from it. The wife retains the *Dominium directum* of her jointure, and the *Dominium utile* passes to her husband. With respect to signory, he who pays rent, has the *Dominium utile* of the lands; and the lord he pays it to the *Dominium directum*.

DOMINIUM, DOMINION, or DOMAINE, in our ancient customs, denotes a rent due to the lord, where the property is not his.

Affidatio DOMINORUM. See the article *AFFIDATIO*.

DOMINUS, in ancient times, a title prefixed to a name, usually to denote the person either a knight, or a clergyman. See *VICE-DOMINUS*.

Though, the title was sometimes also given to a gentleman not dubb'd; especially, if he were a lord of a manour. See *DOM, SIRE, and GENTLEMAN*.

Redo quando DOMINUS remisit. See the article *RECTO*.

DONATION, DONATIO, an act, or contract, whereby a man transfers to another, either the property, or the use of the whole, or a part of his effects, as a free gift.

A *Donation* to be valid, and complete, supposes a capacity both in the donor, and the donee; and requires consent, acceptance, and delivery: and by the French law also registry.

DONATISTS, ancient schismatics in Africa, so denominated from their leader, *Donatus*.

They had their origin in the year 311; when, in the room of Mensurius, who died in the preceding year on his return to Rome, Cæcilian was elected bishop of Carthage; whom the people refused to acknowledge, and to whom they opposed Majorinus, who accordingly, was ordained by Donatus, bishop of Casa Nigra. They were condemned in a council held at Rome, two years after their separation, and afterwards in another at Arles, the year following.

The errors of the *Donatists*, beside their schism, were, 1. That baptism conferred out of the church, that is, out of their sect, was null. 2. That there was no church but in Africa: all the rest of the churches they held as prostitute, and fallen.

Donatus seems likewise to have given into the doctrine of the Arians, with whom he was closely allied; and accordingly, St. Epiphanius, Theodoret, and some others, accuse the *Donatists* of Arianism. But St. Augustin, Ep. 185. to Count Boniface, affirms, that the *Donatists*, in this point, kept clear of the errors of their leader.

In 344, under the empire of Theodosius the Great, there arose a schism among the *Donatists* themselves, by which they were broke into two parties. For Parmenian, their bishop, being dead, some elected Primian, and were called *Primianists*; and others, Maximian, called *Maximianists*. The *Donatists* had likewise other appellations, as *Circumcelliones, Montenses, or Mountainers, Campites, Rapites, &c.* They held three councils, or conciliabules; that of Cirra in Numidia, and two at Carthage. Constantine decreed exile, and even death, against the *Donatists*. Constantius, and Honorius, made laws for their banishment; and Theodosius, and Honorius, condemned them to grievous mulcts.

DONATIVE, DONATIVUM, a present made any person, called also *Gratuity*.

The Romans made large *Donatives* to their soldiers. Julia Pia, wife of the emperor Severus, is called on certain medals, *MATER CASTRORVM*, by reason of the care she took of the soldiery, by interposing for the augmentation of their *Donatives, &c.*

Donative was properly a gift made to the soldiery; as *Congiarium* that was made to the people. See *CONGIARIUM*. Salmalius, in his notes to Lampridius in his life of Heliogabalus, mentioning a *Donative* that emperor gave of three pieces of gold per head, observes, that this was the common, and legitimate rate of a *Donative*. Cæsaubon, in his notes on the life of Pertinax by Capitolinus, observes, that Pertinax made a promise of three thousand Denarii to each soldier; which amounted to upwards of 97 pence sterling. The same author writes, that the legal *Donative* was 20000 Denarii; and that it was not customary to give less, especially to the Prætorian soldiers; that the centurions had double, and the tribunes, &c. more in proportion.

DONATIVE, in the canon law, a benefice given, and collated to a person, by the founder, or patron; without either presentation, institution, or induction by the ordinary.

If chapels founded by laymen, be not approved by the diocesan, and, as it is called, *spiritualized*, they are not accounted proper benefices, neither can they be conferred by the bishop, but remain to the pious disposition of the founders: so that the

founders, and their heirs, may give such chapels without the bishop.

Gwin observes, that the king might of ancient time found a free chapel, and exempt it from the jurisdiction of the diocesan. So may he by letters patent give liberty to a common person to found such a chapel, and make it *Donative* not-presentable. And the chaplain; or beneficiary, shall be deprivable by the founder, or his heir, and not by the bishop. And this seems to be the original of *Donatives* in England.

All bishoprics in ancient time were *Donative* by the king. Again, where a bishop has the gift of a benefice, it is properly called a *Donative*, because he cannot present to himself.

DONJON, in fortification, generally denotes a large strong tower, or redoubt of a fortress, where the garrison may retreat in case of necessity, and capitulate with greater advantage. See *DUNGEON*.

DONOR, in law, he who gives lands, or tenements to another in tail.—As *Donee*, is he to whom the same are given.

DOOR, in architecture, an aperture in a wall, to give entrance, and exit in and out of the building, or some apartment thereof.

It ought to be a rule, 1. That the *Doors* of a house be as few in number, and as moderate in dimensions, as possible: for, in a word, all openings are weakenings.

2. That they do not approach too near the angles of the walls; it being a most glaring solecism to weaken that part which must weaken all the rest: a precept, well recorded, but ill practised by the Italians themselves, particularly at Venice.

3. That the *Doors*, if possible, be right over one another; that void may be over void, and full over full.

4. That, if possible, they be opposite to each other, so as that one may see from one end of the house to another: which will not only be graceful, but also convenient; as it affords a means of cooling the house in summer, by letting in air; and of keeping out the wind in winter, which way forever it fit.

5. It is not only ornamental, but secure, to turn arches over *Doors*; as it discharges them in great measure of the superincumbent weight.

The proportions of *Doors* are adjusted by those of a man: in larger buildings they must always be larger than in smaller; but in none should they be less than 6 feet high, to admit a man of just stature, erect; and as the breadth of a man, with his arms placed a-kimbo, is nearly subduple his height, the width should never be less than 3 feet.

Some architects give us these dimensions: in small buildings the breadth of the *Door* 4 feet, or 4 and a half; in middling buildings, 5 or 6; in large ones, 7 or 8: in chambers of the first, 3 and a half, 3½, or 4; of the second, 4, or 4 and a half; and of the third, 5, or 6; in churches, 7, or 8; in gates, 9, 10, or 12: hence their height is easily determined; except for the gates of cities, which should only be 4 of their breadth.

It is an observation of Palladio, that the principal *Door*, or entrance of a house, must never be regulated by any certain dimensions, but by the dignity of the person that is to live in it: yet, to exceed rather in the more, than the less, is a mark of generosity; and may be excused with some noble emblem, or inscription, as that of the Conte di Bevilacqua over his large gate at Verona, where had been committed a like disproportion, *Patet Janna, Cor magis*.

Scenography of a Door. See the article *SCENOGRAPHY*.

Architrave Doors. See the article *ARCHITRAVE*.

DORIC, in grammar.—The *Doric Dialect* is one of the five *Dialects*, or manners of speaking which obtained among the Greeks.

It was first used by the Lacedæmonians, and particularly those of Argos; thence it passed into Epirus, Lybia, Sicily, the islands of Rhodes, and Crete.

In this *Dialect*, Archimedes and Theocritus wrote, who were both of Syracuse; as likewise Pindar.

In strictness, however, we should rather define *Doric* the manner of speaking peculiar to the *Dorians*, after their recess near Parnassus, and Aëtopus; and which afterwards came to obtain among the Lacedæmonians, &c.

Some even distinguish between the Lacedæmonian, and *Doric*, but in reality they were the same; setting aside a few particularities in the language of the Lacedæmonians; as is shewn by Rulandus in his excellent treatise, *de Lingua Græca, ejusque Dialectis*, L. V.

Beside the authors already mentioned to have written in the *Doric dialect*, we might add Archytas of Tarentum, Bion, Callinus, Simonides, Bacchylides, Cypselas, Alcman, and Sophron.

Most of the medals of the cities of Græcia Magna, and Sicily, favour of the *Doric dialect* in their inscriptions; witness.

AMBPAKIOTAN, AHOAONIATAN, AXEPONTAN, AXTPITAN, HPAXAEOTAN, TPAXINION, OEPMITAN, KATAOINIATAN, KOIILIATAN, TATPOMENITAN, &c. Which shews the countries wherein the *Doric* dialect was used. The general rules of this dialect are thus given by the Port Royalists.

D's Ηρα, *d'w* grand, *d'e* d'o *et* d'e l'a fait le Doré.
D' u fait vra; *d'e*, *u*; *et* d'w au fait encore.
Osse i de l'infini: *et* pour le singulier
Se fert au féminin du nombre pluriel.

But they are much better explained in the IVth book of Rulandus; where he even notes the minuter differences of the dialects of Sicily, Crete, Tarentum, Rhodes, Lacedæmon, Laconia, Macedonia, and Thessaly.

The *α* abounds every where in the *Doric*: but this dialect bears far near a conformity with the *Æolic*, that many reckon them but one.

DORIC, in architecture, is the second of the five orders; being that between the Tuscan and Ionic.

The *Doric* order seems the most natural, and best proportioned of all the orders; all its parts being founded on the natural position of solid bodies. Accordingly, the *Doric* is the first, and most ancient of the orders of architecture, and is what gave the first idea of regular building.—See *Tab. Archit. fig. 28.* see also the article ARCHITECTURE.

At its first invention it was more simple than at present; and when in after-times they came to adorn, and enrich it more, the appellation *Doric* was restrained to this richer manner, and the primitive simple manner they called by a new name the Tuscan order.

The tradition is, that *Dorus*, king of Achaia, having first built a temple of this order at Argos, which he dedicated to Juno, occasioned it to be called *Doric*: though others derive its name, I know not how, from its being invented, or used by the Dorians.

Some time after its invention they reduced it to the proportions, strength, and beauty of the body of a man. Hence, as the foot of a man was judged the 6th part of his height, then made the *Doric* column, including the capital, 6 diameters high, *i. e.* six times as high as thick. Afterwards they added another diameter to the height, and made it 7 diameters; with which augmentation it might be said to be nearer the proportion of a man: the human foot, at least in our days, not being a 6th, but nearly a 7th part of the body.

The characters of the *Doric* order, as now managed, are, the height of its column, which is 8 diameters; its frize, which is enriched with triglyphs, drops, and metopes; its capital, which is without volutes; and its admitting of cymatiums. The ancients, we have already observed, had two *Doric* orders: the first, which was the more simple and massive, they used chiefly in temples; the second, which was the more light and delicate, served in portico's, and theatres.

Vitruvius, indeed, complains of the *Doric* as very troublesome and perplexing, on account of the triglyphs, and metopes, so as scarce to be capable of being used, except in the pycnostyle, by putting a triglyph between each two columns, or in the areostyle, by putting three triglyphs between each two columns.

The moderns on account of its solidity, use it in large strong buildings; as in the gates of cities, and citadels, the outsidings of churches, and other massy works, where delicacy of ornaments would be unsuitable.

The most considerable ancient monument of this order, is the theatre of Marcellus, at Rome, wherein the capital, the height of the frize, and its projection, are much smaller than in the modern architecture.

Vignola adjusts the proportions of the *Doric* order thus: the whole height of the order, without pedestal, he divides into 20 parts, or modules; one of which he allows the base, 14 to the shaft, or sust, one to the capital, and four to the entablature.

The particular proportions, &c. of the several parts, and members, see under their respective articles, COLUMN, CAPITAL, ENTABLATURE, PEDESTAL, BASE, ARCHITRAVE, FRIZE, and CORNICH.

DORIC Cymatium. See the article CYMATIUM.

DORIC, in music. The *Doric Mode* is the first of the authentic modes of the ancients.

Its character is to be severe, tempered with gravity, and mirth: it is proper for occasions of religion, and war. It begins with *D, Sol, Re.*

Plato admires the music of the *Doric* mode; and judges it proper, to preserve good manners, as being masculine. And on this account he allows of it in his common-wealth.

The ancients had likewise their *Sub-Doric Mode*, which was one of their plagal modes. Its character was to be very grave, and solemn. It began with *G Ut*, a diatessaron lower than the *Doric Mode*.

DORMANT, is the herald's term for the posture of a Lyon, or other beast, born as sleeping in a coat of arms.

DORMANT-TREE, in building, a name the workmen frequently give to a great beam lying across the house; usually called a *Summer*.

DORMANT, or **DORMAR-TYLES**. See the article TYLE.

DORMER, or **DORMANT**, in architecture, denotes a window made in the roof of an house, or above the entablature; being raised upon the rafters.

The Latins call it *Lucerna*, whence the French *Lucerne*, and our *Luthern*.

There are diverse kinds; square, round, &c. See **LUTHERN**.

DORMITORY *, a gallery in convents or religious houses, divided into several cells, wherein the religious lodge, or lie, &c.

* The word is formed from the Latin *Dormitorium*, of *dormire*, to sleep.

It is deemed a crime in a religious to lie out of the *Dormitory*. By chap. XXII. of the rule of St. Benedict, it appears, that the ancient *Dormitories* were not divided into cells, but were a kind of large open wards, filled with beds, as in our hospitals.

DORMITORY, is also used for a burying-place. See the article CORMETERIUM.

DORSAL Nerves. See the article NERVES.

DORSI Latissimus, in anatomy. See the article LATISSIMUS *Dorsi*.

DORSI Longissimus, a muscle common to the loins, and the back: it rises from the upper part of the Os sacrum, Ilium, and first Vertebrae of the loins, and in its beginning is confounded, if not the same with the Sacrolumbalis. It runs upwards along the whole tract of the back, and is connected to every transverse process in its way; ending sometimes in the first vertebra of the back, and sometimes in the first of the neck.—See *Tab. Anat. (Myol.) fig. 7. n. 17. 17.*

Sacer Dorsi. See the article SACER.

DORSIFEROUS, or **DORSIPAROUS Plants**, are those of the capillary kind; which are without stem, and bear their seeds on the backside of their leaves.

DORSUM, in anatomy, is the hind part of the thorax; commonly translated the *Back*.

The *Dorsum* includes also the loins. See the article LOINS.

DORSUM Manus, and **Pedis**, is the outside of the hand, and foot; or that part opposite to the palm, and sole.

DORSUM Nasi, is the ridge of the nose, which runs the whole length of that part.

In those we call Roman noses, the *Dorsum* is higher, and more prominent about the middle, than in the rest; which part is called the *Spina*, or *Spine*.

DOSE *, in pharmacy, &c. the quantity of a medicine to be taken at one time.

* The word is formed from the Greek, *δωσις*, which signifies *gift*, or a thing given, from *διδωμι, do, I give*.

A secret in physic is nothing, unless the *Dose* be known. In authors, and dispensaries, that describe the same remedy, frequently the *Dose* is different; which occasions a great difference in its effect.

Dr. Cockburn has given us an essay towards determining the *Doses* of purgative medicines, on mechanical principles.

DOSITHEANS, **DOSITHEI**, an ancient sect among the Samaritans.

Mention is made in Origen, Epiphanius, Jerom, and diverse other Greek and Latin fathers, of one *Dositheus*, the chief of a faction among the Samaritans; but the learned are not at all agreed, as to the time wherein he lived. St. Jerom in his dialogue against the Luciferians, places him before our Saviour; wherein he is followed by Drusus, who in his answer to Serrarius, places him about the time of Sennacherib, king of Assyria: but Scaliger will have him posterior to our Saviour's time. And, in effect, Origen intimates him to have been contemporary with the Apostles; where he observes, that he endeavoured to persuade the Samaritans, that he was the Messiah foretold by Moses.

He had many followers; and his sect was still subsisting at Alexandria in the time of the patriarch Eulogius; as appears from a decree of that patriarch, published by Photius. In that decree Eulogius accuses *Dositheus*, of injuriously treating the ancient patriarchs, and prophets; and attributing to himself the spirit of prophecy. He makes him contemporary with Simon Magus; and accuses him of corrupting the pentateuch in diverse places, and of composing several books, directly contrary to the law of God.

Archbishop Usher takes *Dositheus* to be the author of all the changes made in the Samaritan pentateuch; which he argues from the authority of Eulogius. But all we can justly gather from the testimony of Eulogius, is, that *Dositheus* corrupted the Samaritan copies since used in that sect. But that corruption did not pass into all the copies of the Samaritan pentateuch,

tateuch, now in use among us, which vary but little from the Jewish pentateuch.

And in this sense we are to understand that passage in a Samaritan chronicle, where it is said, that Douis, i. e. Dositheus, altered several things in the law of Moses.

The author of that chronicle, who was a Samaritan by religion, adds, that their high-priest sent several Samaritans, to seize Douis, and his corrupted copy of the pentateuch. Epiphanius takes him to have been a Jew by birth, and to have abandoned the Jewish party for that of the Samaritans. He imagines him likewise to have been the author of the sect of the Sadducees; this is inconsistent with his being later than our Saviour. And yet the Jesuit Serrarius agrees to make Dositheus the master of Sadoc, from whom the Sadducees are derived.

Tertullian, making mention of the same Dositheus, observes, that he was the first who dared to reject the authority of the prophets, by denying their inspiration. But he charges that as a crime peculiar to this sectary, which, in reality, is common to the whole sect, who have never allowed any but the five books of Moses for divine.

DOTAL goods. See the article **GOODS**.

NOTE—*Resto de NOTE.* See the article **RECTO**.

DOUBLE Aspect.—See the article **ASPECT**.

DOUBLE Bastion. See the article **BASTION**.

Instances of DOUBLE Children, DOUBLE Cats, DOUBLE Pears, &c. are frequent in the *Philosoph. Transact.* and elsewhere. See **MONSTER**.

Sir John Floyer in the same *Transactions*, giving an account of a double turkey, furnishes some reflections on the production of double animals in general. Two turkeys, he relates, were taken out of an egg of the common size, when the rest were well hatched, which grew together by the flesh of the breast-bone; but in all other parts were distinct. They seemed less than the ordinary size, as wanting bulk, nutriment, and room for their growth, which latter, too, was apparently the occasion of their cohesion.

For, having two distinct cavities in their bodies, and two hearts; they must have arose from two cicatricula's; and consequently, the egg had two yolks; which is no uncommon accident. He had a dried double chicken, he assures us, that, though it had four legs, four wings, &c. it had but one cavity in the body, one heart, and one head; and that this consequently, was produced from one cicatricula.

So, Pareus mentions a double infant, with only one heart; in which case, the original, or flamen of the infant was one, and the vessels regular; only, the nerves and arteries towards the extremities dividing into more branches than ordinary, produced those double parts.

The same is the case in the double flowers of plants, occasioned by the richness of the soil. So it is in the eggs of quadrupeds, &c.

There are, therefore, two reasons of duplicity in embryo's: 1. The conjoining, or connexion of two perfect animals; and, 2. An extraordinary division, and ramification of the original vessels, nerves, arteries, &c.

DOUBLE Descant, in music. See the article **DESCANT**.

DOUBLE Diess. See the article **DISSIS**.

DOUBLE Eccentricity. See the article **ECCENTRICITY**.

DOUBLE Feast. See the article **FEAST**.

DOUBLE Fever. See the article **FEVER**.

DOUBLE Fiché, or **DOUBLE Fichy,** in heraldry. A cross is denominated double fiché, when the extremities are pointed at each angle; that is, when each extremity has two points: in contradistinction to fiché, where the extremity is sharpened away to one point.

Leigh calls it double pitchy, which seems to be a mistake. Gibbon expresses it by an octagonal cross, the two points whereof at each extremity are parted inwards by a small space of a line. By which it is distinguished from the cross of Malta, the two points whereof proceed from a third point; or acute angle between them.

DOUBLE Fine. See the article **FINE**.

DOUBLE Fugue. See the article **FUGUE**.

DOUBLE Letter, in grammar, a letter, which has the force and effect of two; as the Hebrew *Tfade*, which is equivalent to *T* and *S*; or the Greek ξ , or Latin x , &c.

These letters are evidently equal to two; when we pronounce the Latin *axis*, or the English *axillary*, we give the *x* the same sound, as if it were wrote with two *ce*, *accis*, *accillary*, or *c* and *s*, *acis*, *acillary*.

The Greeks have three Z , Ξ , Ψ : The Latins only two X and Z . And most of the modern languages have the same.

DOUBLE Measure. See the article **MEASURE**.

DOUBLE Pedestal. See the article **PEDESTAL**.

DOUBLE Plea, in law, is where the defendant alleges for himself two several matters in bar of the action; whereof, either is sufficient to effect his desire, in debarring the plaintiff. This is not admitted in the common law: for which reason it is to be well observed, when a plea is double, and when not;

for if a man alledge several matters, one nothing dependant on another, the plea is accounted double; but if they be mutually depending on each other, then it is accounted but single.

DOUBLE Plough. See the article **PLOUGH**.

DOUBLE Point, in the higher geometry.—When all the right lines tending the same way with the infinite leg of any curve, do cut it in one only point, (as happens in the ordinates of the cartesian, and the cubical parabola, and in the right lines which are parallel to the abscisses of hyperbolas, and paraboli's) then you are to conceive, that those right lines pass through two other points of the curve, placed (as I may say) at an infinite distance. Which coincident intersection, whether it be a finite, or an infinite distance, Sir Isaac Newton calls the double point.

DOUBLE Position. See the article **POSITION**.

DOUBLE Quarrel, duplex querela, a complaint made by a clerk, or other, to the archbishop of the province, against an inferior ordinary, for delaying justice in some ecclesiastical cause; as to give sentence, institute a clerk presented, or the like.

Its denomination seems owing to this, that it is commonly made both against the judge, and him at whose suit justice is delayed.

DOUBLE Ratio. See the article **DUPLE**.

DOUBLE Roads. See the article **ROADS**.

DOUBLE Tenaille. See the article **TENAILLE**.

DOUBLE Time. See the article **TIME**.

DOUBLE Vault. See the article **VAULT**.

DOUBLE Vessel, in chemistry, is when the neck of one bottle-head, or matras, is put, and well luted into the neck of another.

Of these there are diverse kinds and forms, used in the circulation of spirits, in order to their being exalted, and refined as high as can be. See **CIRCULATION**.

DOUBLE wheeled plough. See the article **PLOUGH**.

DOUBLE winding stairs. See the article **STAIRS**.

Grafting by DOUBLE incision. See the article **ENGRAFTING**.

Recovery with DOUBLE voucher. See the article **RECOVERY**.

DOUBLED Column. See the article **COLUMN**.

DOUBLINGS, in heraldry, the linings of robes, or mantles of state; or of the mantlings in achievements.

DOUBLING, in a military sense, is the putting two ranks, or files of soldiers, into one.

When the word of command is, *double your ranks*, then the second, fourth, and sixth ranks are to march up into the first, third, and fifth; so that of six ranks they make but three, leaving double the interval there was between them before.—

But it is not so when they *double the half files*, because then three ranks stand together, and the three others come up to double them; that is, the first, second, and third, are doubled by the fourth, fifth, and sixth; or on the contrary.

Double your files, directs each to march to that next to it on the right, or left, according to the word of command; in which case the six ranks are turned into twelve, the men standing twelve deep; the distance between the files being now double of what it was before.

DOUBLING a Cape, or Point, in navigation, signifies the coming up with it, passing by it, and leaving it behind the ship.

The Portuguese pretend to be the first that ever doubled the Cape of Good Hope, under their admiral Vasquez de Gama; but we have accounts in history, particularly in Herodotus, of the Egyptians, Carthaginians, &c. having done the same long before them.

DOUBLON, DUBLOON, a Spanish and Portuguese coin, being the Double of a pistole. See **PISTOLE**.

There are also double doubloons now current among us for 3 pound 12 shillings.

DOUBTING, the act of withholding a full assent from any proposition; on suspicion, that we are not thoroughly apprized of the merits thereof; or from our not being able peremptorily to decide between the reasons for, and against it.

The Sceptics, and Academics, doubt of every thing: the character of their philosophy is, not to allow any thing for true; but to withhold the assent, and keep the mind free; and in suspense. See **SCPTICS**.

The Epicureans trust their senses, and doubt of their reason: their leading principle is, that our senses always tell truth; that they are the first and only criterions of truth; and that go ever so little from them, and you come within the proper province of doubting.

The Cartesians, on the contrary, of all things bid us doubt our senses; they are perpetually inculcating the deceitfulness of our senses; and tells us that we are to doubt of every one of their reports, till they have been examined, and confirmed by reason. See **CARTESIANS**.

DOUBTING, in rhetoric, a figure wherein the orator appears some time fluctuating, and undetermined what to do, or say. What shall I do? shall I apply to those I once neglected! or implore those who now forsake me!

Tacitus furnishes us with an instance of doubting, almost to a degree

degree of diffractation, in those words of Tiberius, written to the senate: *Quid scribam, P. S. aut quomodo scribam, aut quid omnino non scribam hoc tempore. Dii me deaque pejus perdant quam perire quotidie sentio, si scio.*

DOUCINE, in architecture, a moulding, or ornament on the highest part of the cornice, in form of a wave, half convex, and half concave. See *Tab. Archit. fig. 8.*

The *Doucine* is the same with a *Cymatium*, or *Gula*. See *Cymatium*, and *Gula recta*, and *inversa*.

DOVE-TAIL*, in carpentry, the strongest of all the kinds of jointings; wherein the tenon, or piece of wood that enters the other, goes widening to the extreme, and so cannot be drawn out again, by reason the tip, or extreme is bigger than the hole.

* It has its denomination from the resemblance the tenon bears to a Dove's tail.—The French call it *queue d'aronde*, swallow's tail; which name the English themselves also retain in fortification.

DOVETAILING, in architecture, is a way of fastening boards, or timbers together, by letting one piece into another indentedly, with a *Dove-tail* joint. See *DOVE-TAIL*.

DOWAGER, **DOWISSA**, (*q. d.* a widow *endowed*, or that has a jointure) a title, or addition applied to the widows of princes, dukes, earls, and persons of high rank only.

QUEEN DOWAGER. See the article **QUEEN**.

DOWER, **DOTARIUM**, or **DOARIUM**, a portion of lands, or tenements, which a widow enjoys for term of life, from her husband, in case he survives him; and which at her death, descends to their children.

Among the Goths, the *Dower* was only the tenth part of the husband's estate: among the Lombards, a fourth; among the Romans, and Sicilians, it was a third: which is the rate that still obtains among us, and most other nations.

Our law-books distinguish five kinds of *Dower*: *viz. Dower per legem communem: per consuetudinem: ex assensu patris: ad optium ecclesie: et ad de plus belle.*

DOWER by the common law, is a third part of such lands, as the husband was sole seized of in fee, during the marriage; which the wife is to enjoy during her life, and for which there lies a *writ of Dower*.

DOWER by custom, gives the wife, in some places, half her husband's lands, so long as she lives single, as in gavelkind. And as custom may enlarge, so may it abridge *Dower* and restrain it to a fourth part.

In **DOWER ex assensu patris**; and **ad optium ecclesie**, the wife may have so much *Dower*, as shall be assigned, or agreed upon; but it ought not to exceed the third part of the husband's lands. If this be done before marriage, it is called a *jointure*.

DOWER de plus belle. By this she is *endowed* with the fairest, and best part of her husband's estate.

Admeasurement of DOWER. See **ADMEASUREMENT**.

Assignment of DOWER. See the article **ASSIGNMENT**.

Tenant in DOWER. See the article **TENANT**.

DOWNS*, a bank or elevation of sand, which the sea gathers and forms along its shores; and which serves it as a barrier.

* The word is formed from the French *Dune*, of the Celtic *Dum*, a mountain. Charles de Visch. in his *Compend. Chronolog. Exord. & Progress. Abbat. Clariss. B. Marise, de Dunis*, says, *qualem reperit arenarum collibus (quos incolae Duyenen vocant) antiqua civitatem.*

DOWNS are particularly used for a famous road for ships, along the eastern coast of the county of Kent; from Dover to the north Foreland.

This road has excellent anchorage, and is well defended by the castles of Sandwich, Deal, and Dover.

Here it is, the English fleets usually meet. We say, the fleet is yet in the *Downs*: failed from the *Downs*.

DOWRY, *Dos*, is properly the money, or fortune, which the wife brings her husband in marriage, to have the use of it, during her marriage, towards supporting the charge thereof.

It is otherwise called *maritagium*, marriage goods; by the Romans *dos*: and it differs from *Dower*. See **DOWER**.

Among the Germans it was anciently customary for the husband, to bring a *Dowry* to his wife. *Romanis non in usu fuit uxoris Dotes retribuere; ideo verbo genuino carent quo hoc dignoscitur: & rem ipsam in Germanorum moribus miratur Tacitus: Dotem, inquit, non uxor marito, sed uxori maritus affert.* Spelman.

At present, in Germany, the women of quality have but very moderate fortunes. For instance, the princesses of the electoral house of Saxony, have only 30000 crowns: those of other branches of the same family, 20000 florins: those of Brunfwic, and Baden, only 1500 florins besides a sum for cloaths, toys, and equipages. *Dist. de Trev.*

DOWRY, is also used in a monastic sense, for a sum of money given along with a maid, upon entering her in some religious order.

In France, the *Dowry* of persons entering a monastery, to make profession of a religious life, is limited by law. That, *e. gr.* given upon entering a monastery of Carmelites, Ursulines, and others, not regularly founded, but established since

the year 1600, by letters patents, must not exceed the sum of 8000 livres, in towns where parliaments are held; nor 6000, in other places.

DOXOLOGY, an appellation given by the Greeks to the 14th verse of the second chapter of St. Luke, *Glory be to God in the highest, &c.* because beginning with the Greek word *δοξα*, *Glory*.

This they distinguish by the name of *great Doxology*: and the *Gloria Patri*; *Glory be to the Father*, they call the *less Doxology*, as beginning with the same word *δοξα*.

Philostorgius, L. III. N. 13. gives three formula's of the *less Doxology*. The first is, *Glory be to the Father, and to the Son, and to the Holy Ghost.* The second, *Glory be to the Father, by the Son, in the Holy Ghost.* And the third, *Glory be to the Father, in the Son, and the Holy Ghost.*

Sozomen, and Nicephorus, give a fourth, *viz. Glory be to the Father, and the Son, in the Holy Ghost.*

The first of these *Doxologies*, is that in common use throughout the western church. It was first instituted about the year 350, by the Catholics of Antioch, then called *Eustathians*.

The three others were composed by the Arians: the second was that of Eunomius, and Eudoxus, and which was approved by Philostorgius. The three were all made about the year 341, in the council of Antioch, when they first began to disagree among themselves: Philostorgius assures us, that Flavian, afterward patriarch of Antioch, was the author of the first, or *catholic Doxology*; but Sozomen, and Theodoret, say nothing of it; and Philostorgius, an Arian author, scarce deserves to be credited on his single word.

There were anciently very great disputes, and principally at Antioch, as to the form of *Doxology*: that mostly used among the orthodox, was the same as still obtains; the rest were affected by the Arians, and other Antitrinitarians: yet, St. Basil, in his book, *on the Holy Spirit*, defends the second as orthodox, and legitimate.

Some authors write hymnology, as synonymous with *Doxology*: but there is a difference; hymnology is applied to psalms, or the recitation of psalms; and *Doxology* only to the little verse, *Glory be the Father*, &c. repeated at the end of each psalm.

DOZEIN. See the article **DECENNIER**.

DOZINERS. See the article **DECENNIER**.

DRACHM, ΔΡΑΧΜΗ, an ancient silver coin, used among the Greeks. See **COIN**.

The *Drachma* is supposed by most authors to have been the same among the Greeks, with *Denarius*, or penny among the Romans, which was equivalent to four sesterces.

Of this opinion is Budeus, *de Asser*; who confirms it from the authorities of Pliny, Plutarch, Strabo, and Valerius Maximus, with whom *δραχμη* is synonymous with *Denarius*.

But this is no strong conviction, that the two moneys were precisely of the same value: those authors, not treating expressly of coins, might easily render the one by the other, provided there were no considerable difference between them.

Scaliger, in his dissertation, *de Re Nummaria*, does not say absolutely, that the *Denarius* and *Drachma* were the same thing; but from a Greek passage, in an ancient law, C. XXVI. *Mandati*, where the *Drachma* is said to be composed of six Oboli, he concludes, that in the age of Severus, at least, the *Denarius* and *Drachma* were the same.

But Agricola, *de Mens. & Ponder.* L. IV. proves from Pliny, Celsus, and Scribonius Largus, that the *Denarius* only contained 7 ounces; and from Livy, Appian, Cleopatra, &c. that the *Drachma* contained 8: and maintains, that when some Greek authors speak of the ounce as only containing 7 *Drachms*; they do not mean the *Attic Drachm*, but the Roman *Denarius*, which Greek authors render by *δραχμη*.

Gronovius agrees with Agricola, *viz.* that the *Drachma* was the 8th part of an ounce. The opinion is confirmed by Isidore, L. XIV. c. 24, by Fannius, who says as much in express terms, and by Volusius who divides the ounce into 24 scrupuli, or scruples, whereof the *Drachm* comprehended three.

Thus much supposed, and supposing likewise the ancient Roman ounce equal to the modern one, and of consequence 40 grains less than the French, it follows, that the ancient Roman ounce weighed 536 French grains, and the *Attic Drachma* 67 grains. Lastly, supposing the silver at Athens of the same fineness with ours; and taking ours at the price it now bears, the *Attic Drachma* will be found equivalent to 7 pence 3 farthings sterling.

The Grecian way of accounting sums of money, was by *Drachmæ*: 10 of which were equal to 6 shillings, 5 pence $\frac{2}{3}$ penny; and 100 equal to a mina.

DRACHM, is also a weight, used by our physicians; containing just sixty grains; or 3 scruples; or the 8th part of an ounce.

DRACHM was likewise an ancient Jewish money, having on one side a harp, and on the other side a bunch of grapes.

This coin was a half shekel; and was so called by the Jews. It is only the Greeks called it *δραχμη*. It was equal to two *Attic Drachmæ*. See **SHEKEL**.

DRACO, DRAGON, in astronomy, a constellation of the northern hemisphere; whose stars according to Ptolemy, are 31; according to Tycho, 32; according to Bayer, 33; and according to Mr. Flamsteed, 49. The longitudes, latitudes, magnitudes, &c. whereof are as follows:

NAMES and SITUATIONS of the STARS.	Sign.	Longit.	Latitude. North.	Magnit.
Last of the Tail.	♈	5 59 05	57 13 24	6
Another Subseq. and Contiguous.		6 29 10	57 30 55	6
		12 33 10	61 10 10	6
Last but one of the Tail.		11 51 58	61 43 40	4
That follows this.	♉	11 25 45	61 57 45	5
15				
Preceding the Antepenultimate.	♈	0 31 19	65 21 50	5
Antepenultimate of the Tail.		3 03 11	66 21 43	3
Preceding in the last Bend.	♈	0 32 27	71 03 49	3
Subsequent in the same Bend.		12 20 34	75 25 09	3
Preced. of two follow. the last Bend.	♈	9 58 34	78 27 02	3
10				
North in the third Bend.	♈	0 42 04	81 06 11	6
Last of those following the last Bend.		29 49 05	81 39 25	6
Middle in the third Bend; double.		0 10 58	83 19 35	6
		1 06 40	83 21 30	6
In the Tongue.	♈	20 11 05	79 14 30	6
15				
Subsequent in third Bend.	♈	28 35 53	84 47 29	3
That over the eye.	♈	7 21 37	73 18 35	6
In the Mouth; double.		5 38 33	78 10 58	6
		5 42 55	78 10 07	6
Preced. of two follow. the third Bend.	♈	20 24 33	86 52 52	6
20				
Subsequent in the same		7 18 11	86 54 30	5
		19 06 14	74 11 06	6
Preced. of the preced. Δ in the Belly.	♈	9 10 29	84 07 35	4
Against the Jaw.	♈	20 21 13	80 19 43	4
Bright one in the crown of the head.		23 35 35	74 58 26	2
25				
Another and following.	♈	29 25 24	84 29 50	6
N. of 3. in the first Bend of the Neck.	♈	18 12 21	81 48 48	6
South of the preced. Δ in the Belly.	♈	6 46 10	80 02 04	4
North of the same Triangle.		12 02 00	83 30 27	4
30				
Middle in the first Bend.	♈	21 38 02	79 47 27	6
South in the same Bend.		25 31 25	77 44 56	6
Behind in the first Bend.	♈	10 55 52	80 49 31	6
		9 35 57	79 06 28	5
		3 29 55	81 35 53	5
35				
		6 44 17	76 57 50	6
		4 52 05	74 40 03	5
Preced. of the 2d. Δ in the Belly.	♈	16 04 14	83 09 33	5
		15 20 52	77 13 18	5
		18 48 48	77 44 31	6
40				
(the preced. side.				
N. in the □ against the 2d. Bend. of South of the same Side.	♈	13 10 55	82 51 04	3
		29 26 46	81 48 28	4
		4 56 12	78 58 10	6
North of the second Δ in the Belly.	♈	20 32 52	80 37 58	5
South of that Triangle.	♈	27 11 22	80 53 11	6
45				
North of those following, in the □		28 34 21	79 26 17	4
Inform near Cepheus's arm; double.		2 07 35	77 20 00	6
		1 27 34	77 19 45	7
South of those following in the □	♈	16 17 23	78 07 15	5

DRACO Volans, among meteorologists, a fat heterogeneous, earthy meteor, appearing long, and sinuous, something in the shape of a flying Dragon.

This shape is supposed to arise from the hind part of the matter of this meteor being fired with greater impetuosity than what comes first out of the cloud; and it is supposed that the broken parts of the cloud, and the sulphurous matter which adheres to them, form the apparent wings of this imaginary dragon.

DRACONARIUS, in antiquity, *Dragon-bearer*. Several nations, as the Persians, Parthians, Scythians, &c. bore dragons on their standards; whence the standards themselves were called *Dracones*, Dragons. The Romans borrowed the same custom from the Parthians, or, as Casaubon has it, from the Dacæ; or, as Codin, from the Assyrians.

The Roman *Dracones* were figures of dragons painted in red, on their flags; as appears from Ammianus Marcellinus: but among the Persians, and Parthians, they were like the Roman eagles, figures in full relieve; so that the Romans were frequently deceived, and took them for real dragons.

The soldier, who bore the dragon, or standard, was called by the Romans *Draconarius*; and by the Greeks *Δρακοναριος*, and *Δρακονισσορος*; for the emperors carried the custom with them to Constantinople.

Pet. Diaconus *Chron. Casim. L. IV. C. 39.* observes, that the Bajuli, Cercostathii, Staurophori, Aquiliferi, Leoniferi, and Draconarii, all marched before King Henry when he entered Rome.

Caput DRACONIS. See the articles **CAPUT**, and **DRAGON**.
Cauda DRACONIS. See the article **CAUDA**.
Sanguis DRACONIS. See the articles **SANGUIS**, and **DRAGON**.
Venter DRACONIS. See the article **VENTER**.
DRACONTIC Month, the space of time wherein the moon going from her ascending node, called *Caput Draconis*, returns to the same.

DRACUNCULI, in medicine, a disease in children, wherein they feel a vehement itching; supposed to arise from little worms, called *Dracunculi*, generated of a viscid humour under the skin, about the back, shoulders, and arms.

Children seized with the *Dracunculi*, become hectic, and scarce receive any nourishment at all, though they eat plentifully. The disease, however, is not so peculiar to children, but that grown persons have been sometimes affected with it. The emperor Henry V. is said, to have died of it; having had it from his birth.

The women in Poland cure their children of the *Dracunculi*, after the following manner: the child is washed, and bathed in warm water, wherein a quantity of crumbed bread, and a handful of ashes have been cast. The water being poured off, and the bread gathered into a mass; when they come to break it again the next day, they find in it an infinite quantity of fine hairs, which some call *Dog's Hair*, and others, *Worms*; and it is those hairs, or worms, which are supposed to be the cause of the disease.

After thus bathing the children, they rub their shoulders, and arms, with flour steeped in vinegar, or honey; upon which immediately there arises on the skin a great number of tubercles, like poppy-seeds; supposed to be the heads of worms. These they scrape off as fast as they appear; otherwise they withdraw beneath the skin again. The operation is repeated till such time as no more tubercles arise.

The *Dracunculi* is a disease little known in England. The editors of the *Leipfic acts*, speaking of it, in the tome for the month of October 1682, call the bodies, which put forth at the pores after bathing, thick hairs, *corpuscula pilorum castorum instar densa & spissa*, and not fine slender hairs, as Casaubon calls them. They add, that these little corpuscles are hence called *Crinones*; and by reason of their devouring the food, which should nourish the children, *Comedones*—Velschius, in a curious dissertation on the subject, calls them *Capillary Worms: exercitatio de vermibus capillaribus infantum*.

As to the nature and figure of these little bodies, the same editors observe, that the microscopes have put it past doubt, that they are real living animals, of an ash-colour, having two long horns, two large round eyes, and a long tail terminated with a tuft of hair; but that it is difficult to draw them out whole, by scraping the child's body; in that being very soft, the least rubbing bruises them, and breaks them. See *Supplement*, article **DRACUNCULI**.

DRAG, in building.—a door is said to *drag*, when in opening and shutting it hangs, or grates upon the floor.

DRAGOMAN*, or **DRAGMAN**, a term of general use through the east, for an interpreter, whose office is to facilitate commerce between the orientals, and occidentals.

* The word is formed from the Arabic, *Targaman*, or *Targinan*, of the verb *Targan*, he has interpreted. From *Dragoman*, the Italians formed *Dragomano*, and, with a nearer relation to its Arabic etymology, *Targinmano*; whence the French, and our *Trucheman*, as well as *Dragoman*, and *Dragman*.

DRAGON, in astronomy. *Dragon's head*, and *tail*, *caput & cauda Draconis*, are the nodes of the planets; or the two points, wherein the ecliptic is intersected by the orbits of the planets; and particularly that of the moon; making with it angles of five degrees.

One of these points looks northward; the moon beginning then to have northward latitude: and the other southward; where she commences south.

This her deviation from the ecliptic seems (according to the fancy of some) to make a figure like to that of a *Dragon*, whose belly is, where she has the greatest latitude; the intersections representing the head and tail, from which resemblance the denomination arises.

But note, that these points abide not always in one place, but have a motion of their own in the zodiac, and retrograde-wise almost three minutes a day; completing their circle in about 19 years: so that the moon can be but twice in the ecliptic, during her menstrual period; but at all other times will have latitude, as they call it.

It is in these points of intersection that all eclipses happen. They are usually denoted by these characters ♁ *Dragon's head*, and ♃ *Dragon's tail*.

DRAGON'S BLOOD*, *sanguis draconis*, in medicine, a resinous substance brought from the east, of considerable use, as an agglutinant, against fluxes, &c.

* It derives its name *Dragon's Blood* from the redness of its colour, and gives its name *Dragon* to the tree that yields it. Some botanists talk of the figure of a *Dragon*, finely represented under the rind of the fruit of that tree. But this is a mere fiction.

The ancients had a notion, that the *Dragon* fighting with the elephant, sucked all its blood through its eyes and ears; that the elephant falling down dead, crushed the *Dragon*; and that from their blood, thus mixed on the ground, arose what they called *Dragon's Blood*, which they held in high esteem.—This is the account given by Solinus, Pliny, Ididore, and others after them; but this combat is a mere fable, originally invented by the merchants.

The genuine *Dragon's Blood* is the juice, or resin of a large tree, called *Draco Arbor*, the *Dragon tree*, growing in Africa, and America, as well as in China. The resin is of a dark red, and easily dissolves when brought towards the fire: if cast into the fire, it flames; but it dissolves with much difficulty in any liquor.

It is a good astringent; and is used in hæmorrhages, and dysenteries; as also to fasten the teeth, and strengthen the gums. There is also a counterfeit *Dragon's Blood*, made of the gum of the cherry, or almond-tree, dissolved, and boiled in a tincture of Brazil wood; but this is of no use, except for external diseases of horses.

DRAGONNEE, in heraldry. A *Lyon Dragonnee*, is where the upper half resembles a *Lyon*; the other half going off like the hind part of a *Dragon*.

The like may be said of any other beast as well as the lion.

DRAGOONS*, in war, an order of soldiery, who march on horse-back, and fight on foot, though sometimes, too, on horse-back.

* *Menage* derives the word *Dragoon* from the Latin *Dracoenarius*, which in Vegetius is used to signify soldier. But it is more probably derived from the German *Tragen*, or *Dragen*, which signifies to carry; as being infantry carried on horseback.

The *Dragoons* are usually posted in the front of the camp and march first to the charge, like a kind of *enfants perdus*. They are usually reputed as belonging to the infantry, and in that quality have colonels, and serjeants; but they have cornets, too, like cavalry. In the French army they are said to ride without boots.

Their arms are a sword, fire-lock, and bayonet. In the French service, when the *Dragoons* march on foot, their officers bear the pike, and the serjeants the halbert; neither of which are used in the English service.

DRAGS. See the article **SEA-DRAGS**.

DRAMS. See the article **CORDIALS**.

DRAMA*, in poetry, a piece, or poem, composed for the stage.

* The word is Greek *δραμα*, which literally signifies *Action*; by reason in *Dramas*, or dramatic poems, they act, or represent *Actions*, as if they really passed.

A *Drama*, or as we popularly call it, a *Play*, is a composition either in prose or verse, consisting, not in the simple recitation, but in the actual representation of an action.

Our *Dramas*, are tragedies, comedies, and farces: for those grotesque entertainments, lately introduced upon the stage, scarce deserve the appellation.

Some critics take the book of canticles for a *Drama*, or *Dramatic poem*: others maintain the fame of the book of Job. Some scrupulous authors would restrain *Drama* to serious pieces; as tragedies: but with respect to the etymology, a comedy is as much a *Drama*, as a tragedy.

The primary parts of the *Drama*, as divided by the ancients, are the *Prologus*, *Epitasis*, *Catastasis*, and *Catastrophe*.—The secondary parts, are the *Acts* and *Scenes*.—The accessory parts, are the *Argument* or *Summary*, the *Prologue*, *Chorus*, *Mimus*, *Satura*, and *Atellana*.—Lastly, the *Epilogue* which pointed out the use of the piece, or conveyed some other notice to the audience in the poet's name.

DRAMATIC, in poetry, is an epithet given to pieces wrote for the stage.

For the laws of *Dramatic* poetry. See **UNITY**, **ACTION**, **CHARACTER**, **FABLE**, &c.

Stylis **DRAMATICO**. See the article **STYLE**.

DRAPERY*, in painting, and sculpture, the representation of the garments, or clothing of human figures.

* The word is French *Draperie*, formed from *Drap*, cloth.

In the general sense, *Drapery* includes not only the garments, but also the tapistry, lincens, and most other things that are not carnations, nor landscapes.

The art of *Drapery* consists chiefly in three points, viz. the ordering of the folds, or plaits; the different quality of the stuffs; and the variety of their colours.

As to the folds, they should be so managed, that you may easily perceive what it is that they cover, and distinguish it from any thing else. For instance, that you see it is an arm that is under the *Drapery*, and not a leg, &c. The folds, again must be large, as breaking, and dividing the sight the less. There should likewise be contrast between them, otherwise the *Drapery* will appear stiff.

The quality of the stuffs should likewise be well considered; some making their folds abrupt, and harsh, and others more soft, and easy. The surface of some, again, has a lustre, others

are dull: some are fine, and transparent; others strong, and solid.

The variety of colours, when well managed makes the great beauty of a painting; all being not equally amicable, and friendly with respect to each other; and some are never to be placed near certain others.

M. de Piles gives abundance of good observations, relating to *Drapery*. Their first effect, he observes, and that which the painter ought to have principally in view, is, that they express the thing they are supposed to cover: and they must never be made to adhere, and stick to the parts of the body: a great lightness, and motion of the *Draperies*, are only proper for figures in great agitation, or exposed to the wind. The nudities of the figures should always be designed, before the painter proceed to the *Draperies*. Paolo Veronese excelled in *Draperies*.

DRASTIC, a strong and powerful medicine, more particularly, a purgative that works with speed, and vigour; as Jalap, Scammony, and the other stronger cathartics.

DRAUGHT, in medicine. See the article **POTION**.

DRAUGHT, in trade, is an allowance made in the weighing of commodities; the fame as clough. See **CLOUGH**.

DRAUGHT, in painting, &c. See the article **DESIGN**.

DRAUGHT, or, as it is pronounced, **DRAFT**, in architecture, the figure of an intended building described on paper; wherein is laid down by scale and compass, the several divisions, and partitions of the apartments, rooms, doors, passages, conveniences, &c. in their due proportion.

It is usual, and even exceedingly convenient, before a building is begun to be raised, to have *Draughts* of the ichnography, or ground-plot of each floor, or story; as also of the form and fashion of each front, with the windows, doors, ornaments, &c. in an orthography, or upright. Sometimes the several fronts, &c. are taken, and represented in the same *Draught*, to shew the effect of the whole building, this is called a *scenography*, or *perspective*. See **SCENOGRAPHY**.

Reduction of a **DRAUGHT**. See the article **REDUCTION**, and **PENTAGRAPH**.

DRAW.—A ship is said to draw so much water, according to the number of feet she sinks into it.

Thus, if fifteen feet from the bottom of her be under water, or if she sink into the water fifteen feet perpendicularly, she is said to draw fifteen feet water; and according as she draws more, or less, she is said to be of more, or less *Draught*.

DRAW, in the forest-law. See the article **DOG-DRAW**.

DRAW-BACK, in commerce, a rebate, or discount upon the price of commodities, purchased on certain conditions. See **REBATE**, and **DISCOUNT**.

DRAW-BRIDGE, a bridge made after the manner of a floor, to be drawn up, or let down, as occasion serves, before the gate of a town or castle.

DRAWING Medicines, or **DRAWERS**. See **EPISPASTICS**, and **RIPENERS**.

DRAWING of gold, or *silver*, is the passing it through a number of holes in an iron, each less than other, to bring it into a wire. See **WIRE-drawing**.

DRAWING of a bill of Exchange, is the writing, signing, and giving it to the person who has already paid the value, or content thereof, to receive it in another place.

A person should never draw a bill of exchange, unless he be well assured, it will be accepted, and paid. See **BILL of Exchange**.

DRAWING, in painting, &c. See **DESIGNING**, and **COUNTER-DRAWING**.

DRAWING, among hunters, is when they beat the bushes after a fox.

DRAWING amiss, is when the hounds, or beagles hit the scent of their chace the contrary way, so as to pursue it up the wind, when they should have done it down the wind.

DRAWING on the spot, is when the hounds touch the scent, and draw on till they roufe or put up the chace.

Fine-**DRAWING**. See the article **FINE-drawing**.

DRAY Plough. See the article **PLOUGH**.

DRENCH, among farriers, a physical draught, or potion given a horse, by way of purge.

DRENCHES, or **DRENGES**, **DRENGI**, or **THRENGI**, in our old customs, a term about which the lawyers and antiquaries are a little divided. See **THRENGUS**.

Drenges, says an ancient manuscript, were *tenentes in capite*: according to Spelman, they were *e genere vassallorum non ignobilium, cum singuli qui in domes-day nominantur singula possident maneria*: iuch, as at the coming in of the conqueror, being put out of their estates, were afterwards upon complaint restored thereto; so, that, they, being before owners thereof, were neither in auxilio, nor concilio against him.

DRESSING of meats, the preparing them for food, by means of culinary fire.

The design of *dressing*, is to loosen the compages, or texture of the flesh, and dispose it for dissolution, and digestion in the stomach. Flesh not being a proper food without *dressing*, is allowed

alleged as an argument, that man was not intended by nature for a carnivorous or flesh-eating animal.

The usual operations are *roasting, boiling, and stewing*.—In *roasting*, it is observed, meat will bear a much greater and longer heat than either in *boiling, or stewing*; and in *boiling* greater and longer than in *stewing*. The reason is, that *roasting* being performed in the open air, as the parts being externally to warm, they extend and dilate, and so gradually let out part of the rarefied included air, by which means the internal successions, on which the dissolution depends, are much weakened, and abated; *boiling* being performed in water, the pressure is greater, and consequently, the successions to lift up the weight, are proportionably strong; by which means the coction is hastened: and even in this way there are great differences; for the greater the weight of water, the sooner is the business done.

In *stewing*, though the heat be infinitely short of what is employed in the other ways, the operation is much more quick, because performed in a close vessel, and full, by which means the successions are more often repeated, and more strongly reverberated. Hence the force of Papin's digester; and hence an illustration of the operation of digestion.

Boiling, Dr. Cheyne observes, draws more of the rank, strong juices from meat, and leaves it less nutritive, more diluted, lighter, and easier of digestion: *roasting*, on the other hand, leaves it fuller of the strong, nutritive juices, harder to digest, and needing more dilution. Strong, grown, and adult animal food, therefore, should be *boiled*; and the younger, and tenderer, *roasted*.

DRESSING of hops. See the article HOPS.

DRIE, or DRY. See the article DRY.

DRIFT of the forest, an exact view, or examination of what cattle are in the forest; that it may be known, whether it be overcharged, or not, and whose the beasts are; and whether they are commensurable beasts, or not. See FOREST, and COMMON.

DRIFT-SAIL, in a ship, a sail used under water; veered out right a-head, by sheets, as other sails are: its use being to keep the ship's head right upon the sea, in a storm; and to hinder a ship's driving too fast in a current; with which view it is generally used by fishermen, especially in the north-sea.

DRINK, a part of our ordinary food, in a liquid form, serving to dilute, and moisten the dry meat.

The *Drinks*, in different countries, are different. Those ordinarily used among us, are, water, malt-liquors, and wine.

The extraordinary, are, cyder, punch, brandy, tea, strong waters, &c. See each under its proper article CYDER, &c. The *Malt-Drink* brewed in England, in one year, Chamberlayne assures us, amounts to very near two millions of barrels strong and small.

Water, Dr. Cheyne observes, was without all dispute the primitive, original drink of man, as it is the only simple fluid (for there are but three more in nature, mercury, light, and air, none of which is fit for human *Drink*) fitted for diluting, moistening and cooling; the only ends of *Drink* appointed by nature: and happy had it been for the race of mankind, had other mix'd, and artificial liquors never been invented. Water alone is sufficient, and effectual for all the purposes of human wants in *Drink*. Strong liquors were never designed for common use. They were formerly kept, here in England, as other medicines are, in apothecaries shops, and prescribed by physicians, as they do dia-cordium, and Venice treacle, to refresh the weary, strengthen the weak, and raise the low-spirited. The effect of the ordinary use of wine, and spirituous liquors, as natural causes will always produce their effects, is to inflame the blood into gout, stone, and rheumatism, fevers, pleurisies, small pox, &c. to draw up the juices, and scorch and shrivel the solids. Those, whose appetite, and digestion is good, and entire, never want strong liquors to supply them with spirits: such spirits are too volatile, and fugitive for any solid, or useful purposes of life. Two ounces of flesh meat, well digested, beget a greater stock of more durable, and useful spirits, than ten times as much strong liquors.

All strong liquors are as hard to digest, and require as much labour of the concoctive powers, as strong food it self. Water is the only universal solvent, or menstruum, and the most certain diluter of all bodies proper for food. There are a great many spirituous liquors, which not only will not dissolve, but which will harden, and make more indigestible, certain parts especially the salts of bodies, wherein their active qualities, that is, those which can do most harm to human constitutions consist. And we have known persons of tender constitutions, who could neither eat, nor digest, upon *drinking* wine, who, by *drinking* at meals common water, warm'd, have recovered their appetites, and digestion, and have thriven, and grown plump. It is true, strong liquors by their heat and stimulation on the organs of concoction, by increasing the velocity of the motion of the fluids, and thereby quickening the other animal functions, will carry off the load that lies upon the stomach, with more present cheerfulness. But then, beside the future damages of such a quantity of wine to the stomach, and the

fluids by its heat, and inflammation, the food is hurried into the habit unconcocted, and lays a foundation for a fever, a fit of the colic, or some chronical disease. *Essay on Health, &c.* p. 47, & seqq.

DRINKING-Glasses. See the article GLASSES.

DRIP, in architecture. See the article LARMIER.

DRIPS, is also used in building for a kind of steps, on flat roof, to walk upon.

This way of building is much used in Italy; where the roof is not made quite flat, but a little raised in the middle; with *Drips*, or steps, lying a little inclining to the horizon. See ROOF.

DRIVE, in the sea-language.—A ship is said to *drive* when an anchor being let fall, it will not hold her fast, but that she falls away with the tide, or wind.

The best way to prevent this, is to veer out more cable; for the more cable she has, the surer, and safer the rides; or else to let fall more anchors.

Also, when a ship is a-hull, or a-try, they say, the *Drives* to leeward, or in with the shore, according to the way she makes.

Wool-DRIVERS. See the article WOOL.

DROGMAN. See the article DRAGOMAN.

DROIT, Jus, in our law-books, signifies *right, or law*: whereof some distinguish six kinds, *viz.*—1. *Jus recuperandi*, right of recovering: 2. *Jus intrandi*, right of entering: 3. *Jus habendi*, right of having: 4. *Jus retinendi*, right of retaining: 5. *Jus percipiendi*, right of receiving: 6. *Jus possidendi*, right of possessing. See LAW, and RIGHT; as also RECTUM, ENTRY, POSSESSION, &c.

Monstrans de DROIT. See the article MONSTRANS.

DROPAX, ΔΡΟΠΑΞ, in pharmacy, an external medicine, in form of a plaster, used to take off the hairs from any part. See HAIR, and DEPLATORY.

The *Dropax* is of two kinds, *simple, and compound*.—The *simple* is made of an ounce of dry pitch, and two drachms of oil.

The *compound* is made with pitch, wax, colophony, common salt, bitumen, sulphur, vivum, pepper, euphorbium, cantharides, and castor.—There are also other ways of making it, to be found in the dispensatories.

It was anciently much in use also to warm the parts, to draw the blood and spirits to them, and to cure atrophies. To this purpose it was applied hot on the part affected, after first shaving it; and was pulled off again before quite cold, then heated a-fresh, and applied again; and the operation thus repeated, till the part were rendered very red.

DROPPING, or DRIPPING, a term used among falconers, when a hawk mutes directly downwards, in several *Drops*, not throwing out her dung straight forwards.

DROPS, in meteorology. See the article RAIN.

The spherical form, into which the *Drops* of fluids conform themselves, is a phenomenon that has a little perplexed the philosophers.—The solution commonly given, was, that the equable, uniform pressure of the ambient, or incumbent atmosphere closed them into this form.—But this account will no longer pass; now that we find the phenomenon holds in vacuo as well as in air.

The Newtonian philosophers, therefore, ascribe it to their attraction, which being greater between the several particles of the fluids, than between them, and those of the medium, they are, as it were, concentrated, and brought as near each other, and into as little compass, as may be: which cannot be, without their being spherical.*

* Thus, Sir Isaac Newton: *Guttae enim corporis ejusque fluidi, ut figuram globosam inducere conentur, facit mutua partium suarum attractio; eodem modo quo terra marisque in rotunditatem undique conglobantur, partium suarum attractione mutua, quae est gravitas.* Opt. p. 338.

Drops, in medicine, a liquid remedy, whose dose is estimated by a certain number of *Drops*.

A little lowness of spirits, says Dr. Cheyne, speaking of the softer sex under fits of the vapours, &c. requires *Drops*, which pass readily down under the notion of physic: *Drops* beget drams, and drams beget more drams, till they come to be without weight, and without measure. *Highers,* and more severe fits, beget by these, bring forth farther necessity upon necessity of *Drops*, drams, and gills, till at last, &c. *Essay on Health.*

English Drops, or volatile English Drops, guttae anglicanae, is a liquor drawn by fire from a great number of ingredients, and found a powerful remedy against coagulations of the blood, obstructions, apoplexies, malignant fevers, small-pox, &c. Its inventor was Dr. Goddard, a physician of London, King Charles II. had much ado to purchase the secret of him, though he offered 5000 pounds for it: However, he prevailed at length; but the physician looked on it as a favour done the prince, to impart it to him on such terms.—Hence it is, that the remedy took the name of *guttae anglicanae.* See GUTTAE Anglicaenae.

Drops, Guttae, in architecture, an ornament in the doric entablature, representing *Drops*, or little bells, immediately under the triglyphs.—See Tab. Archit. fig. 28. lit. c and n. See also TRIGLYPH.

DROPPER. See **FISHING.**

DROPSY *, ΤΑΡΑΞ, in medicine, a preter-natural collection of serum, or water, in some part of the body; or a too great proportion thereof in the blood.

* The word is compounded of the Greek *Ταρος*, water.

The *Dropsy* acquires different names from the different parts it afflicts, or the different parts the waters are collected in.—That of the abdomen, or lower belly, called simply, and absolutely *Dropsy*, is particularly denominated *Ascites*.—That of the whole habit of the body, *Anasarca*, or *Leucophlegmatia*.—That of the head, *Hydrocephalus*.—That of the scrotum, *Hydrocele*.

There is also a species of this disease supposed to be caused, instead of water, by a collection of wind, called *Tympanites*, and by Hippocrates, the *dry Dropsy*.

We also meet with *Dropsies* of the breast, pericardium, uterus, ovaries, &c.

The causes of *Dropsies*, in general, are whatever may obstruct the serous part of the blood, so as to make it stagnate in the vessels; or burst the vessels themselves, so as to let the blood out among the membranes; or weaken, and relax the tone of the vessels; or thin the blood, and make it watery; or lessen the perspiration.

These causes are various, viz. sometimes acute diseases, scirrhus tumors of any of the more noble viscera, excessive evacuations, particularly hæmorrhages, hard drinking, &c.

The ascites, or *Water-Dropsy* of the abdomen, is the most usual case, and what we particularly call the *Dropsy*: its symptoms are tumors, first of the feet, and legs, and afterwards of the abdomen, which keep continually growing; and if the belly be struck, or shook, there is heard a quaffing of water. Add to this three other attendants, viz. a dyspnoea; intense thirst; and sparing urine: with which may be numbered heaviness, listlessness, costiveness, a light fever, and an emaciation of the body.

The curative indications are two, viz. the evacuation of the water; and the strengthening of the blood, and viscera. The first is effected by strong purgatives, particularly elaterium, and the infusion of crocus metallorum, tho' this last works upwards more than downwards. For such are too weak to bear purgatives, Dr. Sydenham recommends diuretics, whereof the best are those made of the lixivial salts.

For the second intention, exercise and change of air, wine, and other generous liquors, also stomachics, chalybeats, and other corroborating medicines are prescribed.

Where other means fail for evacuating the water, recourse is to be had to the paracentesis, or operation of tapping.

Mayerne recommends mercurius dulcis, and nitre, and ants eggs, for the promoting of urine, and draining the tumour. Exercise and change of air; wine, and other generous liquors cautiously taken; have also their use.

Baglivi notes, that in a *Dropsy* arising from a morbid liver, there is always a vehement dry cough: which is never observed in any other species. Tycho Brahe, notes, that hydroptic persons usually die about the full moon. Wainwright extols an infusion of green tea in rhenish wine; as also briony juice, as excellent in this disease. See commend garlic. See Supplement article **HYDROPS**.

DROWNING, the act of suffocating, or being suffocated, by water.

People not accustomed to diving, Dr. Halley observes, begin to *drown* in about half a minute's time.

Drowning was anciently a kind of punishment: in the time of Louis XI. of France, the chronicles assure us, that they frequently *drowned* their criminals, instead of hanging them. *Chron. Scand.*

Natural historians, and physicians, furnish us with diverse well attested instances of surprising recoveries of persons *drowned*: which, if maturely considered, might perhaps let a little light into the dark notion of life, and death.

Pechlin, *de Aer. & Alim. def. c. 10.* gives the history of a gardener of Troningholm, then living, aged 65 years, who 18 years before slip'd under the ice to the depth of 18 ells, where he stood at the bottom, upright as it were, for 16 hours; when, being drawn out with a drag truck into his head, and wrapped up in clothes, from the common persuasion of those people, that he would recover; he was afterwards stroaked, rubbed with linnen swaths, and air blown up his nostrils for several hours; till the blood began to move. Lastly, plying him with antipoplegic, and genial liquors, he was restored to life. In memory of this accident, the queen mother settled a yearly stipend upon him, &c.

Tilsius, keeper of the king's library, gives us a yet less probable history of a woman he himself knew, who he says was under the water three whole days, yet brought to life again after the same manner as the Troningholm gardener; and was at the time of his writing the account alive.

But what shall we say to Burmannus, who assures us, that being in the village Bonefs, of the parish of Piethou, he assisted at the funeral sermon of one Laur. Jona, an old man of seventy; where the preacher related, that when a youth of 17, he had been buried seven weeks under water, and at

length drawn forth, and brought again to life. Pechlin, *ubi sup. sit penes ipsum fides!*

DRUG, in commerce, a general name for all spices, and other commodities, brought from distant countries, and used in the bulnies of medicine, dying, and the mechanic arts.

The *Drugs* used in medicine, are very numerous, and make the greatest part of the commerce of our *Druggists*. Some of them grow in England, France, &c. But the greatest part are brought from the Levant, and the East-Indies.

A list of all of them would be endless. Some of the principal are, aloes, amber-gris, amber, assa fetida, antimony, bezoar, borax, benjoin, camphor, cantharides, cardamum, cassia, castoreum, colcoquintida, civet, coral, cubes, coffee, cocoa, gum animæ, armoniac, draganth, elemi, gamboge, labdanum, opopanax, fagapanum, sandarac, lacca, jalap, manna, mastic, myrrh, musc, opium, pearls, quinquina, hellebore, galanga, zedoary, rhubarb, sarsaparilla, storax, galbanum, sanguis draconis, fenna, sperma ceti, spica nardi, scammony, sal ammoniac, tamarinds, tea, turpentine, turbit, tutia, &c.

The natural history, &c. whereof see under their respective articles **ALOE**, **AMBER-GRIS**, &c.

The *Drugs* used by dyers, are of two kinds: the *colouring*, which give a dye or colour; and *non-colouring*, which only dispose the stuffs to take the colours the better, or to render the colours more shining.—Of the first kind, are, paltels, woad, indigo, kermes, cochineal, madder, turmeric, &c.—Of the second kind, are, allum, tartar, arsenic, realgal, salpetre, common salt, sal gemmæ, sal ammoniac, crystals of tartar, agaric, spirit of wine, urine, pewter, iron, bran, starch, lime, ashes, &c.

There is a third sort of *Drugs*, which answer both intentions; as the root, bark, and leaf of the walnut-tree, galls, copperas, &c.

DRUGGET, in commerce, a sort of stuff, very thin, and narrow, usually all wool, and sometimes half wool and half silk; having sometimes the whale, but more usually without; and woven on a worsted chain.

Those without the whale are wove on a loom with two treadles, after the same manner as linnen, camblet, &c.—M. Savery invented a kind of gold, and silver *Druggets*; the warp being partly gold and silver thread, and the woof linnen.

DRUIDS *, **DRUIDES**, or **DRUIDÆ**, the priests, or ministers of religion, among the ancient Celts, or Gauls, Britons, and Germans.

* Some authors derive the word from the Hebrew *דורש* *Deruffin*, or *Druffin*, which they translate, *contemplators*. Picard, *Celtopæd.* L. II. p. 58. believes the *Druids* to have been thus called from *Druis*, or *Druius*, their leader, the 4th, or 5th king of the Gauls, and father of Saron, or Naumos. Pliny, Salmastius, Vigenere, &c. derive the name from *Δρυς*, *Oak*; on account of their inhabiting, or at least frequenting, and teaching in forests; or perhaps, by reason, as Pliny says, they never sacrificed but under the oak. But it is hard to imagine, how the *Druids* should come to speak Greek. Menage derives the word from the old British *Drus*, *dæmon*, *magician*. Borel from the Saxon *Dry*, *magician*; or rather the old British *Drus*, *Oak*; whence he takes *Drus* to be derived. Gorop. Becanus, Lib. I. takes *Druidis* to be old Celte, and German word, formed from *Druidis*, or *Druidis*, a doctor of the truth, and the faith: which etymology Vossius acquiesces in.

The *Druids* were the first, and most distinguished order among the Gauls, and Britons: they were chose out of the best families; and the honours of their birth, joined with those of their function, procured them the highest veneration among the people. They were versed in astrology, geometry, natural philosophy, politics, and geography; and had the administration of all sacred things; they were the interpreters of religion, and the judges of all affairs, indifferently. Whoever refused obedience to them, was declared impious and accursed.

We know but little as to their peculiar doctrines; only that they believed the immortality of the soul, and as is generally also supposed, the metempsychosis: though a late author makes it appear highly probable they did not believe this last, at least not in the sense of the Pythagoreans.

They were divided into several classes, or branches; viz. the *vacerri*, *bardi*, *ebages*, *semnothii*, or *semnothei*, and *faronida*.—The *vacerri* are held to have been the priests: the *bardi* the poets; the *ebages*, the augurs; and the *faronida*, the civil judges, and instructors of youth.—As to the *semnothei*, who are said to have been immediately devoted to the service of religion, it is probable, they were the same with the *vacerri*.

Strabo, however, Lib. IV. p. 197. and Picard after him, in his *Celtopædia*, do not comprehend all these different orders under the denomination of *Druids*, as species under their genus, or parts under the whole; but make them quite different conditions, or orders.

Strabo, in effect, only distinguishes three kinds; *bardi*, *vates*, and *Druids*. The *bardi* were the poets; the *vates*, *Ovatus*, (apparently the same with the *vacerri*) were the priests, and naturalists; and the *Druids*, beside the study of nature, applied themselves likewise to morality.

Diogenes Laertius assures us in his prologue, that the *Druids* were the same amongst the ancient Britons, with the Sophi, or philosophers among the Greeks, the Magi among the Persians, the Gymnosophists among the Indians, and the Chaldeans among the Assyrians:

The *Druids* had one chief, or *Arch Druid* in every nation, who acted as high-priest, or pontifex maximus. He had absolute authority over all the rest; and commanded, decreed, punished, &c. at pleasure. At his death he was succeeded by the most considerable among his survivors; and if there were several pretenders, the matter was ended by an election, or else put to the decision of arms.

The *Druids*, we have observed, were in the highest esteem. They presided at sacrifices, and other ceremonies, and had the direction of every thing relating to religion. The British and Gaulish youth flocked to them in crowds, to be instructed by them. The children of the nobility, Mela tells us, they retired withal into caves, or the most desolate parts of forests; and kept them there, sometimes for 20 years, under their discipline.

Beside the immortality, and metempsychosis, they were here instructed in the motion of the heavens, and the course of the stars, the magnitude of the heavens, and the earth, the nature of things, the power and wisdom of the gods, &c. They preferred the memory and actions of great men in their verses, which they never allowed to be wrote down, but made their pupils get them off by heart. In their common course of learning, they are said to have taught them 24000 such verses,

They held the plant mistletoe in singular veneration. Pliny relates the ceremony wherewith they gathered it every year. Lib. XVI. c. 44. They placed a world of confederate serpents eggs gathered after a peculiar manner, and under a certain disposition of the moon described by Pliny; and imagined them effectual means for the gaining of law-suits, and procuring the good graces of princes. And hence, the same author concludes it is, that the caduceus, or rod encompassed with two serpents interweave, has been assumed as a symbol of peace. Suetonius, in his life of Claudius, assures us, they sacrificed men; and Mercury is said to be the god they offered these inhuman victims to. Diod. Siculus, Lib. VI. observes, it was only upon extraordinary occasions they made such offerings; as, to consult what measures to take, to learn what should befall them, &c. by the fall of the victim, the tearing of his members, and the manner of his blood gushing out. Augustus condemned the custom; and Tiberius, and Claudius, punished and abolished it. See *Cæsar* Lib VI. c. 13. and *Mela* Lib. III. c. 2.

We learn from *Cæsar*, that the *Druids* were the judges, and arbiters of all differences and disputes, both public and private, they took cognizance of murders, inheritances, boundaries, and limits, and decreed rewards, and punishments. Such as disobeyed their decisions, they excommunicated, which was their principal punishment; the criminal being hereby excluded from all public assemblies, and avoided by all the world; so that no body durst speak to him, for fear of being polluted.—*Strabo* observes, they had sometimes interest and authority enough to stop armies, upon the point of engaging; and accommodate their differences.

They held an assembly every year at a certain season about the middle of the country; and there in a place consecrated for the purpose, they kept their assizes, and terminated the differences of the people, who flocked thither from all parts.

Cæsar, who had seen some of the *Druids* in Britain, was of opinion, they had comethence into Gaul: diverse among the moderns, take this for a mistake, and believe the very contrary. In effect, it appears pretty probable, that the ancient Britons were originally Gauls; that some of the Celts, or Belge, Gaulish nations, were the first that entered our island, and peopled it; and that the *Druids* went along with them.

Hornius, in his history of philosophy, Lib. II. c. 12. believes all the learning and philosophy of the *Druids* to have been derived from the Assyrian Magi, who are still called in Germany, *Truttin*, or *Truttner*; and that, as *Magus* has lost its ancient signification, which was honourable, and now signifies a magician, or forcerer; so *Druid*, which had the same sense, has likewise degenerated, and now signifies no other, than a person who has commerce with the devil, or is addicted to magic. And accordingly, in Friesland, where there anciently were *Druids*, witches are now called *Druids*.—*Gale*, *Dickenson*, and some others, vainly contend, that the *Druids* borrowed all their philosophy, as well as religion, from the Jews.

There were also women, who bore the appellation *Druides*, or *Druide*, among the Gauls, &c.—The authors of the *Historia Augusta*, particularly *Lampridius*, and *Vopiscus*, make mention hereof. A *Druide*, says *Lampridius*, p. 135. told *Alexander Severus* something which denoted he should be unhappy. *Vopiscus*, in the life of *Aurelian*, relates, that having consulted the Gaulish *Druides*, whether or no the empire should remain in his family; they gave him for answer, that no

name should be more glorious in the empire, than that of the descendants of *Claudius*. On which the historian takes occasion to observe, that *Constantius*, the father of *Constantine*, was a *Claudius*.

Lastly, the same *Vopiscus*, in his life of *Numerianus*, relates; that a *Druide* had foretold *Dioclesian*, that he should be emperor when he should have killed *Aper*, which signifies a boar; and which also was the name of a *Praefectus Praetorii*, whom he killed with his own hand.

Salmastus, in his notes on *Lampridius*, is a little in doubt who these women were: but he gives into the most easy, and plausible opinion, that they were either the wives, or the children of the *Druids*.

DRUM, *Tympanum*, a military, musical instrument, of use principally among the foot, serving to call the soldiers together, and to direct their march, attac, retreat, &c.

The body of the *Drum* is made of very thin oak which is bent into a cylinder, and covered at each end with parchment, which is strained, or braced more or less, according to the height, or depth of the sound required, by strings; and is then struck with sticks. The depth of the *Drum* is equal to its breadth, which does not exceed two foot and a half, by reason, no skins can be had to cover bigger.—There are also *Drams*, whose body is of brass.

DRUM, or **DRUMMER**, also denotes a soldier appointed to beat the *Drum*.—In each company of infantry there is at least one *Drum*; usually two; and a *Drum Major* in every regiment. There are diverse beats of the *Drum*: as the *march*, *double march*, *assembly*, *charge*, *retreat*, *alarm*, *chamade*, &c. See **ASSEMBLY**, **CHAMADE**, &c.

DRUM, in anatomy, or **Ear-DRUM**, denotes a cavity in the inner ear, thus called from the resemblance it bears to the figure of a *War-Drum*. See **EAR**.

Its outer extreme is covered with a membrane, by anatomists called also *tympanum*, *Drum*; but more properly, *membrana tympani*.

The office of this *Drum*, or *membrana tympani*, has been greatly controverted among anatomists. The account best warranted, is, that being a medium for the conveyance of the sound to the auditory nerve, by its different degrees of tension, it serves to modify the sound, and propagate it to the nerve well proportioned, and commensurate thereto. See **SOUND** and **HEARING**.

String of the DRUM. See **CHORDA Tympani**.

DRUM, in architecture. See the article **TAMBOUR**.

DRUNGUS, ΔΡΟΥΓΟΣ, a body, or company of forces, thus called in the later times of the Roman empire.

The name *Drungus**, as appears from *Vegetius*, Lib. III. c. 16. was at first only applied to foreign, and even enemy's troops; but under the eastern empire, it came in use for the troops of the empire it self, where it amounted pretty nearly to what we call a *regiment* or *brigade*.—*Leunclavius* observes, that the *Drungus* was not less than 1000 men, nor more than 4000.

* The same author notes, that Δρῦσι among the modern Greeks signifies a *staff*, or *rod*, the badge of a dignity, or office, as *agis* among the Turks; and he thinks, that the name may be formed from the Latin *truncus*. But it appears from *Vegetius*, that *Drungus* is a barbarous, not a Latin word.—*Spelman* takes it for Saxon, because at this day, *throng*, in English signifies a multitude; *Salmastus* derives it from *Πυρρῶν*, *beak*: on account of the *Drungus*'s being disposed beak-wise, or terminating in a point.

DRUNKENNESS, *Ebrietas*, physically considered, consists in a preter-natural compression of the brain, and a discomposure of its fibres; occasioned by the fumes, or spirituous parts of liquors.

It is accounted for thus: an immoderate quantity of wine taken into the stomach, is there heated, and undergoes a kind of effervescence; which arises the more readily, as the liquor abounds the more in sulphur. By this action it becomes attenuated, and rarefied; so that the grosser parts being left behind, its finer parts are fitted to penetrate, and shoot through the veins to the brain; or are conveyed through the veins to the heart; whence, after a further beat, and rarefaction, they are sent through the carotid arteries, &c. to the brain. Hence necessarily arises a repletion of the meninges of the brain; and a compression of the fibres of the brain it self, from the fresh stock of rarified sulphur continually exploded into them: hence also an obstruction of the pores, or passages of the brain, arise a frequent, and disorderly pulsation of the fibres, and the other symptoms of this disordered state.

Hence it is, that all liquors will not give *Drunkenness*; but only such as, by their sulphur, or spirit, are disposed for an effervescence in the stomach, and heart, to diffuse their subtle attenuated parts plentifully to the brain.

It is a popular mistake, that the only remedy for gluttony, is *Drunkenness*; or that the cure of a surfeit of meat, is a surfeit of wine: than which nothing can be more contrary to nature.

Chryse.

The ancient Lacedæmonians used to make their slaves frequently *arunk*, to give their children an aversion, and horror

for this Vice. The Indians hold *Drunkonks* a species of madness; and in their language, the same term *ranjam*, that signifies *Drun kard*, signifies also a phrenetic.

DRY Baths. } See the article } **BATHS.**
DRY Confects. } } **CONJECTS.**
DRY Dock. } } **DOCK.**
DRY Exchange, Cambium Siccum *, a soft appellation, auciently used to disguise usury under; intimating something to pass on both sides; whereas, in truth, nothing passed but on one: in which respect it might be called *dry*. See **INTEREST**, and **USURY**.

* *Cambium siccum*, says Lud. Lopez, *de Contract. & Negot. off. Cambium non habens existentiam Cambii, sed apparentiam, ad instar arboris exsiccate, &c.*

DRY Fish.	} See the article	FISH.
DRY Fruits.		FRUITS.
DRY Mass.		MASS.
DRY Moat.		MOAT.
DRY Rent.		RENT.
DRY Storax.		STORAX.
DRY Suture.		SUTURE.
DRY Measures.		MEASURES.
DRY Spavin.		SPAVIN.

DRYADES, DRYADS, in the heathen theology, the nymphs of the woods; a sort of imaginary deities, which the ancients believed to inhabit the woods, and groves; and to hide themselves under the bark of the oak, called by the Greeks *Agæ*.

The *Dryades* differed from the *Hamadryades*, in that these latter were attached to some particular tree, with which they were born, and with which they died; whereas the *Dryades* were the goddesses of the trees, and woods in general, and lived at large in the middle thereof. For though *Agæ* properly signifies an *Oak*; it was also used for *Tree* in general. We likewise find mention made in divers authors of a kind of prophetesses, or witches, among the Gauls, called *Dryades*, or rather *Druides*. See **DRUIDS**.

DUBIOUS Acids. See the article **ACIDS**.

DUBITATIVE Conjunctions. See **CONJUNCTION**.

DUCAL. The letters patent granted by the senate of Venice are called *Ducals*.—So also are the letters wrote in the name of the senate to foreign princes.

The denomination *Ducal* is derived hence, that at the beginning of such patents the name of the duke, or doge, is wrote in capitals, thus: *N— Dei Gratia Dux Venetiarum, &c.*—The date of *Ducals* is usually in Latin; but the body is in Italian. A courier was dispatched with a *Ducal* to the emperor, returning him thanks for renewing the treaty of alliance (in 1776) against the Turks, with the republic of Venice.

DUCAT, a foreign coin, either of gold, or silver, struck in the dominions of a duke; being about the same value with a Spanish piece of eight, or a French crown, or 4 shillings and 6 pence sterling, when of silver: and twice as much, when of gold. See **CORN**.

The origin of *Ducats* is referred to one Longinus, governour of Italy; who revolting against the emperor Justin the younger, made himself duke of Ravenna, and called himself *Exarcha*, i. e. *without lord, or ruler*. And to shew his independence, struck pieces of mouey of very pure gold in his own name, and with his own stamp; which were called *Ducati*, *Ducats*; as Procopius relates the story.

After him, the first who struck *Ducats*, were the Venetians, who called them also *Zecchini*, or *Sequins*, from *Zecca*, the place where they first were struck. This was about the year 1280, in the time of John Danduli: but we have pretty good evidence, that Roger king of Sicily, had coined *Ducats* as early as 1240. And du Cange scruples not to affirm, that the first *Ducats* were struck in the Dutchy of Apulia, in Calabria. The chief gold *Ducats* now current, are the single, and double *Ducats* of Venice, Florence, Genoa, Germany, Hungary, Poland, Sweden, Denmark, Flanders, Holland, and Zurich. The heaviest of them weighs 5 penny weights 17 grains, and the lightest 5 penny weights 10 grains; which is to be understood of the double *Ducats*, and of the single in proportion.

The Spaniards have no *Ducats* of gold, but in lieu thereof they make use of the silver one; which with them is no real species, but only a money of account like our pound. It is equivalent to 11 rials. See **RIAL**.—The silver *Ducats* of Florence serve there for crowns.

DUCATOON, a silver coin, struck chiefly in Italy, particularly at Milan, Venice, Florence, Genoa, Lucca, Mantua, and Parma; though there are also Dutch, and Flemish *Ducatoons*.

They are all nearly on the same footing; and being a little both finer and heavier than the piece of eight, are valued at 2 pence or 3 pence more; viz. at about 4 shillings and 8 pence sterling.

There is also a gold *Ducatoon*, struck, and current chiefly in Holland. It is equivalent to 20 florins, on the footing of 1 shilling, 11 pence, half-penny, the florin.

DUCENARIUS, in antiquity, an officer in the Roman army, who had the command of two hundred men.

The emperors had also *Ducenarii* among their procurators, or intendants, called *procuratores Ducenarii*.—Some say that these were such whose salary was 200 sesterces; as in the games of the circus, horses hired for two hundred sesterces, were called *Ducenarii*.—Others hold, that *Ducenarii* were those who levied the two hundredth penny; or the officers appointed to inspect the raising of that tribute. In the inscriptions at Palmyra the word *Ducenarius*, in Greek Δυκεναριος, occurs very often.

DUCES Tecum, a writ commanding one to appear at a day in chancery, and to bring with him some evidences, or other things, which the court would view.

DUCES tecum licet languidus, a writ directed to a sheriff, who having in his custody a prisoner, in a personal action, returns upon a habeas corpus, that he is *adeo languidus*, that without danger of death he cannot have his body before the justices.

DUCKING, or plunging in water, Olaus Magnus tells us, this was a diversion anciently practised among the Goths, by way of exercise; but among the Celts, and Franks, it was a sort of punishment. Tacitus likewise assures us, that it was executed among the ancient Germans on the lazy, and infamous. At Marcellus, and Bourbon, their men and women of scandalous life are condemned to the *cale*, as they call it, that is, to be shut up, naked to the shift, in an iron cage fastened to the yard of a shaloop, and *ducked* several times in the river. The same is also done at Tholouze, to blasphemers.

DUCKING, is also a punishment for seamen; who are thrown into the sea from the top of the yard of the main-mast, several times, according to the quality of their offence. Sometimes a cannon-ball is fastened to their feet, to make the fall the more rapid.

There is also a kind of *dry ducking*, wherein the patient is only suspended by a rope, a few yards above the surface of the water: this is a species of strapada.

The punishment is usually made public by the discharge of a cannon.

DUCKING-Stool, in our customs. See **CUCKING-Stool**.

DUCT, DUCTUS, in anatomy, is applied in a general sense, to all the canals, or tubes in the animal body, as veins, arteries, &c. through which the humours, or juices are conveyed.

DUCT has also a more immediate application to several particular vessels; as the

DUCTUS Alimentalis, a name given by Dr. Tyson, to the gula, stomach, and intestines; all which make but one continued canal, or *Duct*. This *Duct* he makes the proper characteristic of an animal.

DUCTUS Adiposus, are little vesicles in the omentum, which either receive the fat separated from the adipose loculi, or cells, or else bring it to them: for the extreme fineness of these vessels renders it extreme difficult to trace their origin, or course. Indeed it remains somewhat doubtful, whether they be hollow, and real *Ducts*; or whether they be not solid fibres, such as are observed in the spleen, along which the liquid fat goes, as Dr. Drake expresses it, drill its way, as the easiest it can find. Malpighi, their first discoverer, inclines to the former opinion *. All we know for certain, is, that they terminate in little globules of fat; concerning the use and progress whereof much remains to be discovered.

* Malpighi starts a doubt, whether the adipose ducts may not be propagated from fibres which abound in the spleen; or those fibres from them?—As also, whether there be not a yet undiscovered communication between the adipose membrane and the omentum?

Aquose DUCTS. See the article **AQUOSE**.

DUCTUS Chyliferus, or Roriferus, the same as *Ductus Thoracicus*. See **THORACIC**.

DUCTUS Communis Choledochus, a large canal formed by an union of the *Ductus cysticus*, and hepaticus. This *Duct* descending about four inches, discharges it self into the Duodenum, by an oblique insertion, which does the office of a valve, in preventing the regrefs of the bile conveyed hereby into the intestines.—See *Tab. Anat. (Splanchn) fig. 5. lit. k.* See also the articles **BILE**, and **CHOLEDOCHUS**.

The *Ductus communis* sometimes opens into the duodenum at the same aperture with the pancreatic *Duct*.

DUCTUS Cysticus, or Meatus Cysticus, a canal about the bigness of a goose-quill, which arising from the neck of the gall-bladder, about two inches distance therefrom, joins the porus biliaris, and together with it constitutes the *Ductus communis*.—See *Tab. Anat. (Splanchn) fig. 1. lit. d. fig. 5. lit. g. g.*

Excretory DUCTS. See the article **EXCRETORY**.

Galactophorous DUCTS. See the article **GALACTOPHOorous**.

DUCTUS Hepaticus. See the article **CYST-HEPATIC**.

DUCTUS Hepaticus, called also *Meatus Hepaticus*, and *Biliary Pore*. See **PORUS Biliaris**.

DUCTUS Lachrymalis, the excretory vessels of the glandulæ lachrymales, serving for the effusion of tears. See **LACHRYMAL DUCTS**.

DUCTUS Pancreaticus, a little canal arising from the pancreas, and opening into the duodenum, serving to discharge the pancreatic juice into the intestines. See PANCREAS, and PANCREATIC Juice.

This *Duct* being first discovered by Wirtfungius, is frequently called *Ductus Wirtfungianus*. See VIRTUNGIANUS.

PEQUETS DUCT. See the article PEQUETS.

DUCTUS Salivales, the excretory tubes of the salival glands; serving to discharge the secreted saliva into the mouth. See SALIVAL Ducts.

DUCTUS Thoracicus. See the article THORACIC Duct.

DUCTUS Umbilicalis. See the article FUNICULUS UMBILICALIS.

DUCTUS Urinarius, the same as *Urethra*. See the article URETHRA.

DUCTUS Vertungianus. See the article VERTUNGIANUS.

DUCT, DUCTUS, in building. See CALIDUCT, VENTIDUCT, SEWER, CLOACA, &c.

DUCTILITY, in physics, a property of certain bodies, whereby they become capable of being beaten, pressed, drawn, or stretched forth, without breaking; or whereby they are capable of great alterations in their figure, and dimensions; and of gaining in one way, as they lose in another.

Such are metals, which being urged by the hammer, gain in length and breadth what they lose in thickness; or being drawn into wire through holes in iron, grow longer as they become slenderer.

Such, also, are gums, glues, resins, and some other bodies, which, though not malleable, yet may be denominated *Ductile*, in as much as when softened by water, fire, or some other menstruum, they may be drawn into threads.

So that we have two classes of *Ductile* bodies: the one *hard*, and the other *soft*; on each of which we shall bestow some considerations.

The cause of *Ductility* is very obscure; as depending in great measure on hardness, than which there is nothing in nature we know less of. It is true, we usually account for hardness, from the force of attraction between the particles of the hard body; and for *Ductility* from the particles of the *ductile* body, being, as it were, jointed, and entangled within each other.

Instead of fanciful hypotheses to account for *Ductility*; we shall here entertain the reader with some truly amazing circumstances, and phenomena thereof, in the instances of gold, glass, and spiders-webs.

DUCTILITY of gold—One of the properties of gold, is to be the most *ductile* of all bodies; of which the gold-beaters, and gold wire-drawers, furnish us with abundant proof.

—Fa. Merfenne, M. Robault, Dr. Halley, &c. have made computations thereof: but they trusted to the reports of the workmen. M. Reaumur, in the *memoires de l'Académie Royale des sciences*, an. 1713, took a surer way: he made the experiment himself. A single grain of gold, he found, even in the common gold-leaf, used in most of our gildings, is extended into 36 and a half square inches; and an ounce of gold, which in form of a cube is not half an inch either high, broad or long, is beat under the hammer into a surface of 146 and a half square feet: an extent almost double to what could be done 90 years ago. In Fa. Merfenne's time, it was deemed prodigious, that an ounce of gold should form 1600 leaves; which together only made a surface of 105 square feet.

But the diffusion of gold under the hammer (how considerable soever) is nothing to that it undergoes in the drawing iron.—There are gold leaves, in some parts, scarce $\frac{1}{100000}$ part of an inch thick; but $\frac{1}{100000}$ part of an inch is a notable thickness, in comparison of that of the gold spun on silk in our gold thread.

To conceive this prodigious *Ductility*, it is necessary, to have some idea of the manner wherein the wire-drawers proceed.

—The wire, and thread we commonly call *Gold-Thread*, &c. which every body knows is only silver-wire gilt, or covered over with gold, is drawn from a large ingot of silver, usually about 30 pound weight. This they round into a cylinder, or roll about an inch and a half in diameter, and 22 inches long; and cover it over with the leaves prepared by the gold-beater, laying one over another, till the cover is a good deal thicker than that in our ordinary gilding. And yet even then it is very thin; as will be easily conceived from the quantity of gold that goes to gild the 30 pound of silver. Two ounces, ordinarily, do the business; and frequently little more than one. In effect, the full thickness of the gold on the ingot rarely exceeds $\frac{1}{100}$, or $\frac{1}{100}$ part, and sometimes not $\frac{1}{1000}$ part of an inch.

But this thin coat of gold must be yet vastly thinner: the ingot is successively drawn through the holes of several irons each smaller than other, till it be as fine, or finer than a hair. Every new hole lessens its diameter; but it gains in length what it loses in thickness, and of consequence increases in surface. Yet the gold still covers it: it follows the silver in all its extension; and never leaves the minutest part bare, not even to the microscope. Yet, how inconceivably must it be

attenuated while the ingot is drawn into a thread, whose diameter is 9000 times less than that of the ingot.

M. Reaumur, by exact weighing, and rigorous calculation, found, that one ounce of the thread was 3232 feet long, and the whole ingot 1163520 feet, Paris measure, or 66 French leagues, equal to 126,1400 English feet, or 240 miles English: an extent which far surpasses what Fa. Merfenne, Furetiere, Dr. Halley, &c. ever dreamt of.

Merfenne says, that half an ounce of the thread is 100 toises; or fathoms long; on which footing, an ounce would only be 1200 foot; whereas M. Reaumur finds it 2232. Dr. Halley makes six foot of the wire one grain in weight, and one grain of the gold, 98 yards, and consequently the ten thousandth part of a gram, above one third of an inch. The diameter of the wire he found one 186th part of an inch; and the thickness of the gold one 154500th part of an inch. But this, too, comes short of M. Reaumur: for on this principle, the ounce of wire would only be 2880 feet.

But the ingot is not yet got to its full length. The greatest part of our gold-thread is spun; or wound on silk; and before they spin it, they flat it, by passing it between two rolls, or wheels of exceedingly well polished steel; which wheels, in flattening it, lengthen it by above one seventh. So that our 240 miles are now got to 274. The breadth, now, of these laminae, or plates, M. Reaumur finds, is only one 8th of a line, or one 66th of an inch, and their thickness one 3072d. The ounce of gold, then, is here extended to a surface of 1190 square feet; whereas, the utmost the gold-beaters can do, we have observed, is, to extend it to 146 square feet.

But the gold, thus exceedingly extended, how thin must it be? From M. Reaumur's calculus it is found to be one 175000th of a line, or one 200000th of an inch; which is scarce one 13th of the thickness of Dr. Halley's gold. But he adds, that this supposes the thickness of the gold every where equal; which is no ways probable; for in beating the gold-leaves, whatever care they can bestow, it is impossible to extend them equally. This we easily find by the greater opacity of some parts than others. For where the leaf is thickest, it will gild the wire the thickest.

M. Reaumur computing what the thickness of the gold must be where thinnest, finds it only one 315000th of an inch.

But what is the one 315000th part of an inch? Yet this is not the utmost *Ductility* of Gold: for instead of two ounces of gold to the ingot, which we have here computed upon, a single one might have been used; and then the thickness of the gold, in the thinnest places, would only be the 630000th part of an inch.

And yet, as thin as the plates are, they might be made twice as thin, yet still be gilt; by only pressing them more between the flatter's wheels, they are extended to double the breadth, and proportionably in length. So that their thickness at last will be reduced to one thirtieth, or fourteenth millionth part of an inch.

Yet with this amazing thinness of the gold, it is still a perfect cover for the silver. The best eye, or even the best microscope, cannot discover the least chasm, or discontinuity. There is not an aperture to admit alcohol of wine, the subtlest fluid in nature, nor even light itself. Add, that if a piece of this gold-thread, or gold-plate, be laid to dissolve in aquafortis, the silver will be all excavated, or eat out, and the gold left entire in little tubules.

As to the *DUCTILITY of soft Bodies*, it is not yet carried to that pitch. The reader, however, must not be surprized, that among the *ductile* bodies of this class, we give the first place to the most brittle of all other, glass.

DUCTILITY of Glass—We all know, that when well penetrated with the heat of the fire, the workmen can figure, and manage *Glass* like soft wax: but what is most remarkable, it may be drawn, or spun out into threads exceedingly fine, and long.

Our ordinary spinners do not form their threads of silk, flax, or the like, with half the ease, and expedition, as the glass-spinners do threads of this brittle matter. We have of them used in plumes for children's heads, and diverse other works, much finer than any hair; and which bend, and wave like it with every wind.

Nothing is more simple and easy than the method of making them: there are two workmen employed: the first holds one end of a piece of glass over the flame of a lamp; and when the heat has softened it, a second operator applies a glass-hook to the metal thus in fusion; and withdrawing the hook again, it brings with it a thread of glass, which still adheres to the mass. Then, fitting his hook on the circumference of a wheel about two feet and a half in diameter, he turns the wheel as fast as he pleases; which drawing out the threads, winds it on its rim; till after a certain number of revolutions it is covered with a skain of glass-thread.

The mass in fusion over the lamp, diminishes insensibly, being wound out, as it were, like a peloton, or clue of silk upon the wheel; and the parts, as they recede from the flame, cooling, become more coherent with those next to them; and thus by

degrees:

degrees: the parts nearest the fire, are always the least coherent, and of consequence must give way to the effort the rest make to draw them towards the wheel.

The circumference of these threads is usually a flat oval, being three or four times as broad as thick. Some of them scarce seem bigger than the thread of a silk-worm; and are flexible to a miracle. If the two ends of such threads be knotted together, they may be drawn and bent, till the aperture, or space in the middle of the knot do not exceed one 4th of a line, or one 48th of an inch in diameter.

Hence M. Reaumur advances, that the flexibility of glass increases in proportion to the fineness of the threads; and that probably had we but the art of drawing threads as fine as those of a spider's web, we might weave stuffs, and clothes hereof, for wear—Accordingly, he made some experiments this way: and found he could make threads fine enough, as fine in his judgment, as any spider's web, but he could never make them long enough, to do any thing with them.

DUCTILITY of Spider-webs.—The ingenious author, so often above cited, observes, that the matter whereof spiders, and silk-worms form their threads, is brittle when in the mass, like dry gums. As it is drawn out of their bodies, it assumes a consistence, much as glass-threads become hard, as they recede from the lamp; though from a different cause. The *Ductility* of this matter, and the apparatus thereto, being much more extraordinary in spiders, than in silk-worms; we shall here only consider the former. Something also has already been said of each under the article *SILK*, which see.

Near the anus of the spider are six papillæ, or teats, represented in *Tab. Nat. History*, fig. 6. The extremities of the several papillæ are furnished with holes, that do the business of wire-drawers, in forming the threads. Of these holes, M. Reaumur observes, there are enough in the compass of the smallest pins-head, to yield a prodigious quantity of distinct threads. The holes are perceived by their effects: take a large garden-spider ready to lay its eggs, and applying the finger on a part of its papillæ, as you withdraw that finger, it will take with it an amazing number of different threads. M. Reaumur has often counted 70, or 80 with a microscope, but has perceived, that there were infinitely more than he could tell. In effect, if he should say, that each tip of a papillæ furnished a thousand, he is persuaded, he should say vastly too little. The part is divided into an infinity of little prominences, like the eyes of a butterfly, &c. each prominence, no doubt, makes its several thread; or rather, between the several protuberances, there are holes that give vent to threads; the use of the protuberances, in all probability, being to keep the threads at their first exit, before yet hardened by the air, asunder. In some spiders those protuberances are not so sensible; but in lieu thereof there are tufts of hair, which may serve the same office, viz. to keep the threads a-part. Be this as it will, there may threads come out at above a thousand different places in every papillæ; consequently, the spider having six papillæ, has holes for above 6000 threads. It is not enough that these apertures are immensely small: but the threads are already formed before they arrive at the papillæ, each of them having its little sheath, or duct, in which it is brought to the papillæ from a considerable distance.

M. Reaumur traces them up to their source, and shews the mechanism by which they are made. Near the origin of the belly, he finds two little soft bodies, which are the first source of the silk. Their form and transparency resemble those of glass-beads (see fig. 7.) by which name we shall hereafter denote them. The tip of each head, as R, goes winding, and makes an infinity of turns, and returns towards the papillæ. From the base, or root of the bead, proceeds another branch much thicker; which winding variously, forms several knots, and takes its course like the other, towards the hind part of the spider. In these beads, and their branches, is contained a matter proper to form the silk, only that it is too soft. The body of the bead is a kind of reservoir, and the two branches two canals proceeding from it. A little further backwards, there are two other lesser beads, which only send forth one branch a-piece, and that from the tip. Beside these, there are three other larger vessels on each side the spider, which M. Reaumur takes for the last reservoirs, where the liquor is collected. They are represented (fig. 8.) The biggest is near the head of the insect, and the least near the anus. They all terminate in a point; and from the three points of these three reservoirs it is, that the threads, at least the greatest part of the threads drawn out at the three papillæ, proceed. Each reservoir supplies one papillæ. Lastly, at the roots of the papillæ, there are discerned several fleshy tubes: probably, as many as there are papillæ. Upon lifting up the membrane, or pellicle, that seems to cover these tubes, they appear full of threads, all distinct from each other, and which, of consequence, under a common cover, have each their particular one; being kept like knives in sheaths. The immense quantity of threads contained here, M. Reaumur concludes

upon tracing their course, does not all come from the points of the reservoirs; but some from all the turns, and angles; nay probably, from every part thereof. But by what conveyances the liquor comes into the beads, and out of the beads into the reservoirs, remains yet to be discovered.

We have already observed, that the tip of each papillæ may give passage to above a thousand threads; yet the diameter of that papillæ does not exceed a small pins-head: but we were there only considering the largest spiders.

If we examine the young, growing spiders, produced by those; we shall find, that they no sooner quit their egg, than they begin to spin. Indeed their threads can scarce be perceived; but their webs, formed thereof, may: they are frequently as thick, and close, as those of house-spiders; and no wonder: there being often 4, or 500 little spiders concurring to the same work. How minute must their holes be? the imagination can scarce conceive that of their papillæ! The whole spider is, perhaps, less than a papillæ of the parent which produced it.

This is easily seen: each big spider lays 4 or 500 eggs; these eggs are all wrapped up in a bag; and as soon as the young ones have broke through the bag, they begin to spin. How fine must their threads at this time be?

Yet is not this the utmost nature does: There are some kinds of spiders so small at their birth, that they are not visible without a microscope. There are usually found an infinity of these in a cluster, and they only appear like a number of red points. And yet there are webs found under them, though well nigh imperceptible. What must be the tenacity of one of these threads; the smallest hair must be to one of these what the most massive bar is to the finest gold-wire above-mentioned.

The matter whereof the threads are formed, we have observed, is a viscid juice. The beads are the first receptacles where it is gathered, and the place where it has the least consistence. It is much harder when got into the six great reservoirs, whither it is carried by canals from the former: This consistence it acquires in good measure in its passages; part of the humidity being dissipated in the way, or secreted by parts destined for that purpose.

Lastly, the liquor is dried still further, and becomes thread, in its progress through the respective canals to the papillæ. When these first appear out at the holes, they are still glutinous; so that such as spring out of neighbouring holes, stick together. The air compleats the drying.

By boiling the spider, more, or less, the liquor is brought to a greater or less consistence, fit to draw out into threads; for it is too fluid for that purpose while yet inclosed in its reservoirs.

The matter contained in these reservoirs, when well dried, appears a transparent gum, or glue, which breaks when much bent: like glass, it only becomes flexible by being divided into the finest threads. And probably it was on this account nature made the number of holes so immense. The matter of silk formed in the bodies of spiders being much brittle than that formed in silk-worms, needed to be wound smaller. Otherwise we do not conceive, why she should form a great number of threads, which were afterwards to be reunited: a single canal might else have done.

DUEL*, a single combat, at a time and place appointed, in consequence of a cartel, or challenge.

* The word is usually derived from *Duellum*, used by the barbarous Latin writers, *quasi duorum bellum*.

Duels were anciently allowed by common law, in cases where proof could not be had.—In which view, Plea defines *Duel*, *singularis pugna inter duos ad probandum veritatem litis, & qui vicit, probasse intelligitur*. Stat. de Finib. Levat. 27. Edw. I.

This *Duelling* was so general a method of terminating differences among the nobility; that even ecclesiastics, priests, and monks, were not excused from the same. Only, to prevent their being stained with blood, they obliged these to procure champions to fight in their stead; as is shewn at large by father Dacheri, in the VIIIth tome of his *Spicilegium*. None were excepted from these legal *Duels* but women, sick people, and cripples, and such as were under 21 years of age, or above 60.

The custom was for the two champions to enter a list, or small enclosure, appointed by the authority of the ordinary judge, not only on criminal occasions, but on some civil ones, for the maintenance of their right.

The monk Sigebert even relates, that a question on a point of law being presented to the emperor Otho I. viz. whether representation had place in direct succession? and the doctors finding themselves embarrassed in the resolution thereof; the emperor remitted the decision of so critical a point to the judgment of arms; and pitched on two bold fellows to maintain the *pro* and the *contra*. The victory fell to him who contended for representation; in favour of whom a law was straightway made, which is in force to this day.

This custom came originally from the northern nations; among whom it was usual to end all their differences by arms; as we are assured by Paterculus. It afterwards passed as a law among the Germans, Danes, and Franks; especially after Gondebaud, king of the Burgundians, admitted it in lieu of swearing. M. Godeau, in his history of the church, VII. cent. says, it was the Lombards who first introduced into Italy the barbarity of single combats, whence the custom spread throughout the rest of Europe.

The form of the combat was this.—The accuser and accused giving pledges to the judge, on their respective behalves; the judge took first up that of the defendant, and next that of the demandant. They were then both clapped up in safe prison; and the chief justice was to furnish them with suitable arms.—Such as fought on foot had only a sword and buckler: the horsemen were armed at all points, as well as their horses. The day of combat being come, they made choice of four cavaliers to guard the field; and performed diverse ceremonies, prayers, oaths, &c. described by Pasquier, and other authors and quoted by du Cange, who mentions an ordonnance of king Philip the Fair in 1306, prescribing the several rules, conditions, and ceremonies, to be observed herein.

The vanquished, whether accuser, or accused, was punished with death, or mutilation of members, or was ignominiously dragged out of the camp, and hung on a gibbet, or burnt, according to the circumstances of the case.

The method of trial by *Duel*, was instituted as a way of consulting providence, to learn who was the criminal; and it was imagined, that God thus interrogated, would not fail to declare himself in favour of the innocent. But it happened so often, that the unjust accuser came off victorious; that they at length began to be convinced, they must not prescribe to his wisdom, the necessity of interrupting the course of second causes. This was giving rules to murder, and disguising assassinations under method and measure.

Saxo Grammaticus observes, that as early as the year 981, the kings of Denmark had abrogated the proof by *Duel*; and in lieu thereof, appointed the proof by red-hot iron, which was also annulled in its turn.

But *Duels* were condemned before by a council held at Valentinia in 855; where the person who killed his enemy, was excommunicated; and the person killed was pronounced unworthy of burial. Afterwards, the popes Nicholas I. Celestin III. and Alexander III. likewise interposed; and Frederic I. and II. prohibited them in Germany. St. Louis did what he could to abolish them in France; but his ordonnance only took place in his own territories, and not in those of his vassals. After his example, the counts d'Auvergne and Poictou, and several other lords, forbid them likewise. Philip the fair, following the foot-steps of his grand-father, St. Louis, at one time forbid all gages, or pledges of battle; and yet he permitted them in four cases, in the ordonnance above-mentioned of the year 1306. The last *Duel* of note was in the year 1547, before king Henry II. between Jarnac and Chataigneraye, mentioned by Thuanus, and de Serres.

In England, the trial by *Duel* is disused; though the law on which it is founded be still in force.—The last trial of this kind admitted, was in the 6th year of king Charles I. between Donnal, lord Rey, or Rhee, appellant, and David Ramsey esquire, defendant, in the painted chamber at Westminster.

DUEL is also used for a single combat on some private quarrel, or occasion.

The *Duel* must be premeditated; otherwise it is only a rencounter.

The folly, or rather madness of *Duelling* reigned for some ages in France; where the flower of the noblesse perished thereby. It is one of the glories of the late Louis XIV. to have used all his power and authority for abolishing *Duels*.

The severe edicts and laws he made against *Duelists* have in a great measure put a stop to the custom.

DUKE *, *Dux*, a sovereign prince, without the title, or quality of king.—Such are the *Duke* of Lorraine, *Duke* of Holstein, &c.

* The word is borrowed from the modern Greeks, who call *Doucas*, what the Latins call *Dux*.

There are also two sovereigns, who bear the title of *Great-Duke*; as, the *Grand-Duke* of Tuscany, and the *Grand-Duke* of Muscovy, now called the *Czar*, or emperor of Russia.—The emperor of Germany is *Arch-Duke* of Austria.

DURE, *Dux*, is also a title of honour, or nobility, the next below princes.

The *Dukedom*, or dignity of *Duke*, is a Roman dignity, denominated a *Ducatus*, leading, or commanding.—Accordingly, the first *Dukes*, *Duces*, were the *Ductores Exercituum*, commanders of armies.—Under the late emperors, the governors of provinces in war time were entitled *Duces*.—In after times the same denomination was also given to the governors of provinces in time of peace.

The first governor under the name of *Duke*, was a *Duke* of

the Marchia Rhetica, or Grifons, whereof mention is made in Cassiodorus. The Goths, and Vandals, upon their over-running the provinces of the western empire, abolished the Roman dignities wherever they settled. But the Franks, &c. to please the Gaulish people, who had long been used to that form of government, made it a point of politics, not to change any thing therein; and accordingly they divided all Gaul into duchies, and counties; and gave the names sometimes of *Dukes*, and sometimes of counts, *comites*, to the governors thereof.

In England, during the Saxons time, Camden observes, the officers and commanders of armies were called *Dukes*, *Duces*, after the ancient Roman manner, without any addition. After the conqueror came in, the title lay dormant, till the reign of king Edward III. who created his son Edward, first called the *black prince*, *Duke* of Cornwall. After whom, there were more made, in such manner as that their titles descended to their posterity. They were created with much solemnity, *per circuturam gladii, cappelque, & circuli auri in capite impositionem*.

Though the French retained the names, and form of the ducal government, yet under their second race of kings, there were scarce any such thing as *Dukes*; but all the great lords were called *Counts*, *Peers*, or *Barons*. Excepting, however, the *Dukes* of Burgundy, and Aquitaine; and a *Duke* of France, which was a dignity, Hugh Capet himself held, corresponding to the modern dignity of *Maire de Palais*, or the king's lieutenant.

By the weakness of the kings, the *Dukes*, or governors sometimes made themselves sovereigns of the provinces trusted to their administration. This change happened chiefly about the time of Hugh Capet; when the great lords began to dismember the kingdom, so that that prince found more competitors among them than subjects. It was even with a great deal of difficulty they could be brought to own him their superior, or to hold of him by faith, and homage.

By degrees, what with force, and what by marriages, these provinces, both duchies, and counties, which had been rent from the crown, were again united to it. But the title *Duke* was no longer given to the governors of provinces.

From that time *Duke* became a mere title of dignity, affected to a person, and his heirs male, without giving him any domain, territory, or jurisdiction over the place whereof he is *Duke*. All the advantages thereof now consist in the name, and the precedence it gives.

The *Dukes* of our days retain nothing of their ancient splendor, but the coronet on their escutcheon; which is the only mark of their departed sovereignty.—They are created by patent, circure of the sword, mantle of state, imposition of a cap, and coronet of gold on the head, and a verge of gold in their hand.

The eldest sons of *Dukes* are by the courtesy of England styled *Marquises*, and the younger sons, *Lords*, with the addition of their christian name, as lord James, lord Thomas, &c. and they take place of viscounts, though not so privileged by the laws of the land.

A *Duke* has the title of *Grace*; and being writ to, he is styled, in the heralds language, *most high, potent, and noble prince*. *Dukes* of the blood royal, are styled, *most high, most mighty, and illustrious princes*.

DUKE-DUKE, a quality given in Spain to a grandee of the house of Sylva, on account of his having several duchies, from the uniting of two considerable houses in his person.

Don Roderigo de Sylva, eldest son of Don Ruy Gomez de Sylva, and heir of his duchies, and principalities, married the eldest daughter of the *Duke* de Infantado; in virtue of which marriage, the present *Duke* de Pastrana, who is descended therefrom, and is grandson of Don Roderigo de Sylva, has added to his other great titles, that of *Duke-Duke*, to distinguish himself from the other *Dukes*, some whereof may enjoy several duchies, but none so considerable ones, nor the titles of such eminent families.

DULCIFYING, *Sweetening*, a term used in physic, for rendering a fluid less acid, and rough; either by taking away its salts, or breaking their points, or by covering them with something smooth, and soft.

DULCIS, *Asa*, or *Asa*. See the article *ASSA*.

DULIA, ΔΟΥΛΙΑ, *Service*. See the articles *WORSHIP*, *LATRIA*, and *HYPERDULIA*.

DULL *Appui*. See the article *APPUI*.

DUMBNESS, the state of a person who wants the natural use of speech.

People born deaf, are said to be all naturally *dumb*, as not being able to learn words.

Dumbness is sometimes the result of the want, or even the ill conformation, of the tongue.—Yet in the third tome of the *Ephem. German.* we have an account of a book, entitled, *Jac. Rolandi Aglossistomographia, sive Descriptio: Oris sine Lingua, quod perfecte loquitur*, &c. See *TONGUE*, and *MUTA*.

DUNG, in agriculture, and gardening. See MANURING, and COMPOST.

DUNGEON *, **DONJON**, in fortification, the highest part of a castle built after the ancient mode; serving as a watch-tower, or place of observation.

* The word comes from the French *Donjon*, which signifies the same; and which Fauchet derives from *Domicilium*, in that the *Duncheon* being the strongest part of the castle, was usually the lord's apartment. Menage derives it from *Domination*, or *Domination*, which in some antient writings we find used in the same sense. Others derive it from *Domus Julii Caesaris*, or *Domus Jugi*; and others from *Domus Juliani*, the emperor Julian having built several such castles among the Gauls, whereof there is one still standing in Lorraine, called *Dom-Julien*. Du Cange derives the appellation from *Dun* and *Castellum*, which the barbarous writers have altered into *Dunjo*, *Dungo*, *Dongio*, *Dangio*, *Dangio*, and *Domnia*.

In some castles as that of Vincennes, &c. the *Donjon* serves as a prison for persons they would have the most securely kept; whence the general use of our word *Duncheon*, for a dark close prison under ground.

DUO, in music, a song, or composition to be performed in two parts only; the one sung, and the other played on an instrument; or by two voices alone.

DUO, is also when two voices sing different parts, accompanied with a third, which is a thorough bass.—Unifons and Octaves are rarely to be used in *Duo's*, except at the beginning and end.

DUODENA Arteria, and *Vena*, a branch of an artery, which the Duodenum receives from the cœliac; to which answers a vein of the same name, returning the blood to the porta.

DUODENUM *, in anatomy, the first of the *intestina tenuia*, or small guts; being that which receives the food half chylified from the stomach.—See *Tab. Anat.* (Splanchn) *fig. 1. lit. b and i. fig. 2. lit. c.*

* It has its name *Duodenum*, as being above twelve fingers breadth, long: on which account, some call it *Dodecadactylum*.

The *Duodenum* arises from the pylorus, or right orifice of the stomach; whence descending towards the spine, from right to left, quite straight, it terminates where the circumvolutions of the rest begin.

Its coats are thicker, and its cavity or canal is less than in any of the other intestines. At its lower end are two canals, opening into its cavity, one from the liver, and gall-bladder, called the *ductus communis choleochus*; and the other from the pancreas, called *pancreaticus*.

The *Duodenum* is quite straight; but the *intestinum jejunum* makes diverse windings, and inflexions: the reason is, that the bile, and pancreatic juice mixing at the beginning thereof, or at the end of the *Duodenum*, would otherwise precipitate not only the gross parts of the excrements, but also the chyle it self, too hastily.

DUPLA, DUPLÉ Ratio, is where the antecedent term is double the consequent; or, where the exponent of the *Ratio* is 2:—Thus 6 : 3 is in a *Duple Ratio*. See **RATIO**.

SUB-DUPLE Ratio, is where the consequent term is double the antecedent; or, the exponent of the *Ratio* is $\frac{1}{2}$:—Thus, 3 : 6 is in a *Sub-duple Ratio*.

DUPLA-Sesquialtera } *Ratio* } See **RATIO**.

DUPLE Ternis. See the article **TRIME**.

DUPLICATE *, a second instrument, or act, in writing; or a transcript, or copy of another.

* The word is formed from the Latin *Diploma*, of *Diplum*, double.

It is usual to send a *Duplicate*, when it is apprehended the first dispatch, &c. is lost.

DUPLICATE, in chancery, is particularly used for a second letter patent granted by the lord chancellor, in a case where he had formerly done the same. See **PATENT**.

DUPLICATE Ratio, the *Ratio* between the squares of two quantities.—Thus the *Duplicate Ratio* of *a* to *b* is the *Ratio* of *aa*, to *bb*, or of the square of *a* to the square of *b*.

In a series of geometrical proportions, the first term to the third is said to be in a *Duplicate Ratio* of the first to the second; or as its square is to the square of the second: Thus, in 2, 4, 8, 16, the *Ratio* of 2 to 8, is *Duplicate* of that of 2 to 4; or as the square of 2 to the square of 4; wherefore *Duplicate Ratio* is the proportion of squares; as triplicate is of cubes, &c. and the *Ratio* of 2 to 8, is said to be compound of that of 2 to 4, and of 4 to 8.

DUPLICATION, DOUBLING, in arithmetic, and geometry, the multiplying a quantity, either discrete, or continued, by two.

DUPLICATION of a Cube, is the finding the side of a cube that shall be double in solidity to a given cube: which is a famous problem cultivated by the geometricians these two thousand years.

It was first proposed by the oracle of Apollo at Delphos; which, being consulted about the manner of stopping a plague then raging at Athens, returned for answer, that the plague should cease when Apollo's altar, which was cubical, should be doubled.—Upon this, they applied themselves in good earnest, to seek the *Duplicature* of the cube, which hence forwards was called the *Delian Problem*.

The problem is only to be solved by finding two mean proportionals between the side of the cube, and double that side; the first whereof will be the side of the cube doubled, as was first observed by Hippocrates Chius.

Eutochius, in his comments on Archimedes, gives several ways of performing this by the mesolabe. Pappus Alexandrinus, and his commentator Commandine, give three ways: the first, according to Archimedes; the second, according to Hero; and the third, by an instrument invented by Pappus, which gives all the proportions required.

The Sieur de Comiers has likewise published an elegant demonstration of the same problem, by means of a compass with three legs: but these methods are all only mechanical.

RE-DUPLICATION. See the article **RE-DUPLICATION**.

DUPLICATUM Arcanum. See the article **ARCANUM**.

DUPLICATURE, in anatomy, a doubling, or folding of membranes, or other like parts.

Such are the *Duplicatures* of the peritonæum, of the omentum, of the pleura, &c.

In the history of the French academy for the year 1714. an account is given of a young man, who died at the age of 27 years, in the *Duplicature* of whose meninges there were found little bones, that seemed to proceed out of the inner surface of the dura mater, and with their acute points stimulated the pia mater.

That *Duplicature* of the peritonæum, wherein the ancients placed the bladder, is not found by the modern anatomists. Dionis.

Fabricius ab Aquapendente, first discovered the *Duplicature* of the cuticula.

DUPONDIUS, in antiquity, a weight of two pounds: or a money of the value of two As's. See **AS**.

As the *As*, at first, weighed a just pondo, or libra; the *Dupondius*, then weighed two. And hence the name.

And though the weight of the *As* was afterwards diminished, and of consequence that of the *Dupondius* also; yet they still retained the denomination. See **POUND**, and **LIBRA**.

DURA Mater, or *Meninx*, a strong, thick membrane, which lines, or covers all the inner cavity of the cranium, and includes the whole brain; being itself lined on its inner, or concave side by the pia mater, or meninx tenuis.—See *Tab. Anat.* (Osteol.) *fig. 4. lit. ee. fig. 6. lit. cc.*

The *dura Mater* sticks very close to the basis of the skull, and its sutures by the fibres, and vessels it sends to the pericranium.

It is fastened to the pia mater, and the brain, by the vessels which pass from one to the other. It gives a coat, or covering to all the nerves which rise from the brain; and to the medulla spinalis, and all the nerves, which rise from it.

Its surface is rough towards the skull, and smooth towards the brain. It is a double membrane, woven of strong fibres, which may be plainly seen on its inside, but very little on its outside next the skull: It has three processes made by the doubling of its inner membrane.—The first resembles a sickle, and is therefore called *Falsus*.—The second separates the cerebrum from the cerebellum, down to the medulla oblongata, that the weight of the cerebrum may not offend the cerebellum, which lies under it. This process is very strong, and thick, and in ravenous beasts for the most part it is bony, because of the violent motion of their brain.—The third is the smallest, and separates the external substance of the hind parts of the cerebellum into two protuberances.

In the *dura Mater* are several sinus's, or channels, which run between its internal and external membranes: the four principal ones, are the sinus longitudinalis; the second and third sinus's are called *Lateralis*; and the fourth, *Torcular*. Besides these, there are more of inferior note, mentioned by anatomists, as du Vernay, Dr. Ridley, &c.—Their use is, to receive the blood of the adjacent parts from the veins, to which they serve as so many trunks, and to discharge it into the internal jugulars.

The vessels of the *dura Mater*, are, first, a branch from the carotid, while it is in its long canal, which is dispersed in the fore and lower part of the *dura Mater*; secondly, an artery, which

which enters the hole of the skull, called *foramen arterie dura matris*; it is dispersed on the sides of this membrane, and runs as high as the sinus longitudinalis: the vein which accompanies the branches of this artery, goes out of the skull, by the foramen lacerum. Thirdly, a branch of the vertebral artery, and vein, which last passes through the hole behind the occipital apophysis, where they are dispersed in the hind-part of the *dura Mater*.—It has also nerves from the branches of the fifth pair, which give it an exquisite sense.

It has a motion of systole, and diastole, which is caused by the arteries which enter the skull. No doubt, the great number of arteries in the brain contribute more to it, than those few peculiar to it felt; these may assist a little, though not very sensibly, because of their smallness, and paucity.

The use of the *dura Mater* is to cover the brain, the spinal marrow, and all the nerves; to divide the cerebrum into two, and to hinder it from pressing the cerebellum.

DURA Portio. See the article PORTIO.

DURABLE Fortification. See the article FORTIFICATION.

DURATION, an idea we get by attending to the fleeting, and perpetually perishing parts of succession.

The idea of succession we get by reflecting on that train of ideas, which continually follow one another in our minds, while awake. The distance between any parts of this succession is what we call *Duration*: and the continuation of the existence of ourselves, or any thing else commensurate to the succession of ideas in the mind, is called our *own Duration*, or that of the thing coexisting with our thinking. So that we have no perception of *Duration*, when that succession of ideas ceases.

Duration, in Mr. Locke's philosophy, is a mode, or modification of space.

The simple modes of *Duration*, are any lengths, or parts thereof, whereof we have distant ideas; as hours, days, weeks, months, years, time, eternity, &c.

Duration, as marked by certain periods, and measures, is what we properly call *Time*.

1. By observing certain appearances, at regular, and seemingly equidistant periods, we get the ideas of certain lengths, and measures of *Duration*, as minutes, hours, &c. 2. By being able to repeat those measures of time, as often as we will, we come to imagine *Duration* where nothing really endures, or exists: thus, we imagine, to-morrow, next year, yesterday, &c. 3. By being able to repeat such idea of any length of time, as of a minute, year, &c. as often as we will, and add them to one another, without ever coming to an end, we get the idea of eternity.

Time is to *Duration*, as place is to space, or expansion. They are so much of those boundless oceans of eternity, and immensity, as is set out, and distinguished from the rest; and they thus serve to denote the position of finite, real beings, in respect of each other in those infinite oceans of *Duration*, and space.

DURATION of Action. See the article ACTION.

DURATION of an Eclipse. See the article ECLIPSE.

SCRUPLES of half DURATION. See the article SCRUPLE.

DURATION of a solar Eclipse. See the article ECLIPSE.

DURE, DOOR. See the article SUTH-DURE.

DURESSÉ, Hardship, in law, is, where a person is kept in prison, or restrained of his liberty, contrary to order of law; or is threatened to be killed, maimed, or beaten.

In which case, if a person be in prison, or in fear of such threats, make any specialty, or obligation, by reason of such imprisonment, or threats; such deed is void in law: and in an action brought on such specialty, the party may plead, that it was brought by *Durese*.

DUST, minute and almost insensible particles broken off from any hard body.

Those broken from stones, or formed of extremely small stones are more properly called *Sand*. See SAND.

The subtle matter of des Cartes, is a sort of *Dust* produced by the collision of the matter of the second element. See SUBTILE MATTER.

Gold-DUST } See the articles { GOLD.

Lead-DUST } See the articles { LEAD.

DUTCH Coins.

DUTCH Fortification.

DUTCH Monies.

DUTCH Pens.

DUTCH Telescope.

DUTCH Tyles.

DUTCH Trading Companies.

DUTCH Measures.

DUTCHY-COURT, a court wherein all matters belonging to the *Dutchy*, or county palatine of Lancaster, are decided by decree of the chancellor of that court.

The original of this court was in Henry the IVth's time, who obtaining the crown by deposition of Richard II. and having

the *Dutchy* of Lancaster, by descent, in right of his mother, became seized thereof as king, not as duke. So that all the liberties, franchises, and Jurisdictions of the said county passed from the king, by his great seal, and not by livery, or attornment, as the earldom of March, and other possessions, which descended to him by other ancestors than the king's, did. Henry IV. by authority of parliament, severed the possessions, liberties, &c. of the said *Dutchy* from the crown: but Edward IV. restored them to their former nature.

The officers belonging to this court, are a chancellor, attorney general, receiver general, clerk of the court, and messenger; beside the assistants, as an attorney in the exchequer, another in chancery, and four counsellors. See CHANCELLOR and ATTORNEY of the *Dutchy*.

The *Dutchy* of Lancaster, says Gwin, grew out of the grant of Edward III. who gave that *Dutchy* to his son John of Gaunt, and endowed it with royal rights, equal to those of the county palatine of Chester. And so far as it came afterwards to be extinct in the person of king Henry IV. by reason of its union with the crown; the same king suspecting himself more rightfully duke of Lancaster, than king of England, determined to save his right in the *Dutchy*, whatever should befall the kingdom. Accordingly, he separated the *Dutchy* from the crown; and settled it so in his own person, and heirs, as if he had been no king, or politic body at all: in which condition it continued during the reigns of Henry V. and VI. who descended from him; till Edward IV. who by recovery of the crown, reuniting the right of the house of York, appropriated the *Dutchy* to the crown again. Yet so, as he suffered the court and officers to remain as he found them. In this manner, it came, together with the crown, to Henry VII. who taking Henry IV's policy (by whose right, indeed, he obtained the kingdom) re-separated the *Dutchy*, and so left it to his posterity, who still enjoy it.

DUTY, in a moral sense. See OFFICE.

DUTY of marriage. See the article MARRIAGE.

DUTY, in policy, and commerce, an impost, laid by authority of a prince, &c. on merchandizes, and commodities, either of his own country, or brought from abroad; towards supporting the expences of the government. See CUSTOMS.

The *Duties* on various kinds of commodities are infinite. The principal are, the

DUTIES of exportation, and importation, paid upon the bringing in, or carrying out, of the diverse kinds of goods, animals, and even persons; agreeable to the tariffs settled between the several nations. See EXPORTATION, &c.

There is no state in Europe, or perhaps in the world, where the *Duties* of exportation and importation, are so many, and so considerable, as in England.—The two principal, are the *Duties* of tonnage, and poundage. The first charged on liquors, in proportion to their measure, and content. See TONNAGE.—The second on the other commodities, and paid according to their value, settled in a tariff. See POUNDAGE.

These two *Duties*, which have a long time been on foot in England, were re-established at the restoration of king Charles II. in 1660, upon the parliaments annulling all the laws made under Cromwell, and decreeing the executing of the ancient ordinances.

To these there have been eighteen new *Duties* added since that time: ten of them for liquids, and the other eight on other kinds of commodities.

The **DUTIES on liquids**, are the ancient *Duty* of tonnage, or old subsidy: the additional *Duty*; *Duty* of excise, *Duty* of coinage, the old imposition, the additional imposition, the orphans money, the *Duty* on French wines, the new subsidy, the *Duty* on Hungary wines, and the one third, and two thirds subsidies.

The **DUTIES on other commodities**, are the ancient *Duty* of poundage: the additional *Duty* of 1660, on linnens, and silks: the new imposition of poundage, called the *impost* of 1660: another imposition of four sixths in 1693: the *Duty* of 25 per cent. on French goods, imposed in 1695: the new subsidy of poundage in 1697: another additional subsidy of a third of poundage in 1703: another third in 1704: a *Duty* on fish, oils, and whale fins, in 1709: another on leather, velom, and parchment in 1711: a second on the same goods, in 1712: and lastly, in the same year, a *Duty* on paper, paste-board, and soap.

We shall here enter into a more particular detail of the *Duties* on liquids; as wines, brandies, vinegars, cyders, &c.—First then, the *DUTY of tonnage*, or the *old subsidy*, we have already observed, was established in the twelfth year of king Charles II. It was at first only granted to him for life; but afterwards was continued for the first year of king James II. and after this during the life likewise of that prince. And lastly, by several acts, in the reign of queen Anne, it was again continued for 96 years, ending in the year 1808.

This first *Duty* of tonnage, is 4 pound 10 shillings sterling per tun, on all French wines brought by English vessels into the port of London; and only 3 pound, into the rest. The same

COINS.
FORTIFICATION.
MONIES.
PENS.
TELESCOPE.
TYLES.
COMPANY.
MEASURES.

See the articles

same wine brought by foreign vessels into the port of London, pays 6 pound; and into the other ports, 4 pound 10 shillings sterling. French vinegar made of wine, pays 4 pound 10 shillings, brought by English vessels; and six pound by foreign. French cyder, and perry, and vinegar made of those liquors, pay as in the preceding article. Rhenish wine brought into any port of England, pays 1 pound sterling *per* awine, a measure amounting to the sixth of a tun, so that the *Duty per* tun is about 7 pound 7 shillings, which is a fourth more than that of French wine. Spanish and Portuguese wines, muscadines, malmseys, and other Greek wines, pay the same as French wines; and the like is to be understood of vinegars made thereof.

Additional Duty of the old subsidy. This first augmentation of the old tunnage, was made in 1660, and continued like the subsidy it self to 1808.

For this *Duty*, French wines pay 3 pound sterling *per* tun. Rhenish wines pay as French wines. Spanish wines pay 4 pound; Portugal wines, 3 pound; muscadines, malmseys, and other Greek wines, pay the same as Spanish wines. Vinegar, cyder, and perry, are exempt from this *Duty*. See *SUBSIDY*.

Duty of excise, is not laid on wines, but only on malt-liquor, &c.

Duty of estimage was imposed in the 18th year of king Charles II. to defray the expence of coining the money. It has been continued by diverse acts to the year 1715, and since that time.

Wines of all kinds pay equally 10 shillings sterling *per* tun on this *Duty*. See *COINAGE*.

Duty of old imposition of tunnage was established in the year 1685, and continued by diverse acts; that of 1711 made it perpetual.

By this *Duty*, French wines pay 8 pound sterling *per* tun in all the ports of England; Spanish, Portugal, Muscadine, and other Greek wines, 12 pound: vinegar 8 pound.

Duty of additional imposition was established in 1690, continued by diverse acts to 1710, and in 1712 made perpetual. This *Duty* none but the French pay, the other nations being exempt from it.

Each tun of French wine pays for this *Duty* 8 pound sterling in any port of England: vinegar, cyder, and perry pay 25 *per cent.* of their value.

Orphans-Duty is only charged on wines brought into the port of London. Its name expresses the pious office it is intended for. It had its rise in the 6th year of king William III. It is fixed at 4 shillings *per* tun on all wines indifferently.

Additional Duty on French wines, is one of the *Duties* to which French wines alone are subject. It was established in the year 1695, for 20 years, and since continued.—It is rated at 25 pound sterling *per* tun for wines: and for vinegars at 15 pound.

Duty, called *new subsidy*, was granted to king William III. in 1695, for his life, and after continued to queen Anne for her life.

This is properly a duplicate of the *Duty* of tunnage, to which French and other wines are equally subject, whether brought in English, or in foreign vessels; though there are some differences, as to vinegars, cyders, and perry.

Duty on Hungary wines, is very late, only established in the first year of queen Anne. It is the same with that paid by Rhenish wines.

Duty, called *third subsidy*, is a third of the old subsidy, first established in 1703, and since continued by diverse acts to expire in 1805.

Duty, called *two thirds subsidy*, is likewise a new *Duty*, first established in 1704, to last only for a certain time, though since made perpetual.—It consists in two other thirds of the old subsidy, so that these two *Duties* of 1703, and 1704, are equal to the whole subsidy.

Besides these *Duties* imposed on all wines imported, both by natives and foreigners; there are likewise the *Duty* of Butlerage, another *Duty* called *alien's*, another of Bristol, and another of Southampton, amounting together to about 40 shillings *per* tun: but as these *Duties* are only levied on wines imported in foreign vessels, it is but rarely that they are paid; most of the wine-trade being managed by English vessels.

From this state of the several *Duties* paid by wines and other liquors brought into England, it appears that French wines imported by Englishmen into the port of England, pay 55 pound, 16 shillings, and 8 pence sterling *per* tun. Those imported by the same into the other ports, 51 pound 23 shillings, and 6 pence: those brought by foreigners into the port of London, 61 pound, 15 shillings, and 10 pence; and into the other ports, 57 pound, 12 shillings, and 8 pence.

Spanish, Italian, Muscadine, Malmsey, and other Greek wines, imported by the English into the port of London, pay 27 pound, 7 shillings, and 10 pence sterling; and brought by the same into the other ports, 23 pound, 4 shillings, and 9 pence. The same wines brought to London by foreigners, pay 33 pound, 7 shillings, 3 fourths.

Portugal, Rhenish, and Hungary wines brought to London

by English vessels, pay 26 pound, 10 shillings, and 3 pence; into the other ports, 22 pound, 7 shillings, and 2 pence: the same wines imported to London by foreigners, pay 32 pound, 9 shillings, and 5 pence; and into other ports, 28 pound, 6 shillings, 3 pence.

French vinegars imported to London by the English, pay 27 pound, 10 shillings, 11 pence; and into the other ports, 26 pound, 4 shillings, 6 pence: imported by foreigners into London, they pay 28 pound, 17 shillings, 3 pence; and in the other ports, 27 pound, 10 shillings, 11 pence.

Spanish and Portugal vinegars, imported to London by English vessels, pay 12 pound, 10 shillings, 11 pence; in the other ports, 11 pound, 4 shillings, 6 pence: imported by foreigners into London by foreign vessels, pay 13 pound, 17 shillings, 3 pence; and in the other ports, 12 pound, 10 shillings, 1 penny.—As to cyders, and perryes, the importation is not considerable.

French brandies imported by any vessel into any port, pay 78 pound, 4 shillings sterling *per* tun; and brandies from any other countries, except France, only 48 pound, 4 shillings: all other foreign brandies being exempted from *Duties* of 30 pound sterling, charged on French brandies by acts of parliament, under the reign of king William III.

The English merchants, it is to be observed, are not obliged to pay these several *Duties* before 12 months; nor foreigners before 9: giving security for the same. Or, if they pay ready money, there is a deduction made them of 5 *per cent.* on the old new third, and two third subsidy, and on the other *Duties* 6, and one fourth *per cent.* Add, that if these merchandizes be again exported into other countries, after they have been entered in England, the *Duties* are returned; though this only within the compass of a year to natives, and of 9 months to foreigners.

In Spain, the *Duties* of export, and import, are called, *Duties of alcavala*, and amount to about 5 *per cent.* of the value of the goods: for instance, the piece of velvet of 40 Spanish vares, or yards, pays 20 rials: hats of Vigonia, 5 rials a-piece: linnens, 224 rials per 100 vares: gold and silver laces, 2 rials 3 quarters, the mark weight. The *Duties* of exportation are nearly on the same footing.

In Portugal, the *Duties* of importation were anciently the same on all kinds of goods; *viz.* 18 *per cent.* of the value. But since the year 1667, silks have been excepted out of the general tariff, and reduced to 13 *per cent.* For exportation the *Duties* are only 6 *per cent.*

In Holland, the *Duties* of exportation, and importation, are nearly alike; both of them being about the rate of 5 *per cent.* of the value of the goods.—At Hambourg, and Bremen, the *Duties* are but 1 *per cent.*—At Lubeck, three 4ths *per cent.*—In Muscovy they are 5 *per cent.*

At Venice, these *Duties* are 6 and three 4ths *per cent.* for what the natives import; and 10 and a half to strangers: the *Duties* of exportation are 9 *per cent.*—At Leghorn, the *Duties* of exportation, and importation, are very inconsiderable; but with the addition of a number of petty-dues, they become as great as at Venice.

In the ports of the Levant, Constantinople, Smyrna, Aleppo, &c. the *Duties* of exportation, and importation are nearly on an equal footing, *viz.* 3 *per cent.* except to the Venetians, and Jews, who pay 5 *per cent.*—The consuls *Duties* are likewise to be added for Smyrna, &c. which are about 2 *per cent.*

At Cairo, Alexandria, and some other cities of Egypt, the *Duties* are of two kinds: one for goods brought in ships from Europe; the other, for those brought by the caravans from Asia. The first are fixed at 20 *per cent.* The second are arbitrary, but they are always very high. Beside the ordinary *Duty*, they here pay the golden *Duty*, which is the tenth part of what is paid for the first *Duty*.—As to *Duties* of exportation, they may be said to pay none, the 1 and a half *per cent.* being rather the custom-house fee, than any *Duty* paid the sovereign.

DUUMVIR, a general appellation among the ancient Romans, given to magistrates, commissioners, and officers, where two were joined together in the same function.—So that they had almost as many *Duumviri*, as they had officers joined two by two in commission.

There were *Duumviri* to direct the building, repairing, and consecrating of temples, and altars; *capital Duumviri*, who took cognizance of crimes, and condemned to death: *Duumviri* of the marine, or navy, &c.—But the most considerable of the *Duumviri*, and those usually thus called by way of eminence, were the

Duumviri Sacrorum, created by Tarquin, for the performance of sacrifices, and keeping of the Sibyl's books.—These were chose from among the nobility, or Patricians; and held their office for life: they were exempted from serving in war, and from the offices imposed on the other citizens: and without them the oracles of the Sibyls could not be consulted.

The commission lasted till the year of Rome 388; when, at the request of C. Licinius, and L. Sextius, tribunes of the people, they were changed into *Decemviri*; that is, in lieu of

two persons, the trust was committed to ten, who were half patricians, half plebeians.

Sylla added five more to their number, upon which they became denominated *Quindicemviri*. Their body was afterwards much increased, and at length amounted to sixty; yet still it retained the denomination of *Quindicemviri*.

They were entirely abolished under the emperor Theodosius, along with the rest of the heathen superstitions.

The capital DUUMVIRI, *Duumviri perduellionis*, were not ordinary magistrates; but created only on certain occurrences.

—The first commissioners of this kind were those appointed to judge the surviving Horatius, for killing his sister, after vanquishing the Curiatii.

There were also DUUMVIRI in the Roman colonies; who held the same rank and authority in their respective colonies, that the consuls held at Rome.—They were chose out of the body of Decurions, and wore the prætexta, or robe bordered with purple.

We also read of *municipal Duumviri*, whom Vigenère compares to our sheriffs, or rather mayors of towns.

DUUMVIRATE, DUUMVIRATUS, the magistrature, office, or dignity of the *Duumviri*. See DUUMVIR.

The *Duumvirate* lasted till the year of Rome 388; when it was changed into a *Decemvirate*.

DWALE, or DWAL, in heraldry, the herb night-flade; used by rank as blazon with flowers and herbs, instead of colours and metals, for fable, or black.

DWARF. See GIANT, PYGMY, and STATURE.

DWARF-TREES, a sort of diminutive fruit-trees, frequently planted in the borders of gardens: thus called from the lowness of their stature.

They seldom are suffered to grow above four or five feet high; and have usually a hoop tied within the middle of the branches; to make them spread around.

Dwarf-trees are of special advantage for table-fruit, whether pears, apples, plums, or cherries; the fruit they yield is usually of the finest, and best kind; and as such they make a considerable article in the gardeners province.

There are diverse ways of producing *Dwarfs*.—*Dwarf-pears* are usually had by inoculating on quince-stocks, which grow the *Dwarf's* height.

As for *dwarf-apples*, the stocks they chuse to graft on are those raised of the cuttings of the apple-tree.—In order to provide stocks of each kind, they chuse such stems, and branches, as grow straightest, in the month of October, from trees whose cuttings will grow, and which in the places they are to be grafted in are at least an inch thick: these they cut off an hand's breadth below the knots or burs, which are the places where they usually put forth their roots; and cut off the top, that they may not be above a yard long. If they cannot be got so long of quinces, shorter must do. They cut off all side-branches close to the body, except one small twig near the top for the sap to vent it self at. Set them in beds, as seed-plants are: and keep them a foot above ground.

It being somewhat difficult, to get enough of such branches as have burs and knots on them; a particular method has been invented to bring those knots, and burs, artificially, called *circumposition*. It is performed by tying some earth in a piece of old hat, a foot long, about the place where you intend to cut, in the month of February; and in October it will have foot roots therein.

Such trees alone, as are very apt to put forth roots, are proper for *dwarf* stocks; as the Kentish codlin, genet moil, some sorts of sweet apples, bitter sweets, the quince-tree, and the Paradise apple-tree.

Stocks for *dwarf* apple-trees are likewise raised by cutting down an old tree, which is apt to cast forth good suckers from the old roots; these at two years age may be transplanted, or else inoculated where they stand.

As for *dwarf* pear-trees, stocks may be raised for them from the suckers of old pear-trees. Else, cut off the top of some old ill pear-tree, and the roots will cast forth suckers.

For *dwarf* cherries and plums, suckers of the common red cherry, and ordinary plum-tree are the best.

As to the grafting, or inoculating of *dwarf*-stocks, it must be done as low as may be, with two cyons, and those longer than in grafting for long standards; that they may spread from the ground.

As to the planting of *dwarf*-trees, it is best in a light, hot earth, from the middle of October, to the end of November. In a cold, wet soil, it is best in March and April. The stem of the tree to be cut off seven or eight inches above the graft; and remember to cut off half the length of the roots, and hairy fibres; to turn the cut of the tree towards the north; to let the graft be always two or three inches above the ground, left it take root; to plant them shallow, as being apt of themselves, in light ground, to sink a foot deep, which is sufficient; and to cover the ground, when they are planted, with horse-litter. See ENGRAFTING and PLANTING.

DYADIC Arithmetic. See the article ARITHMETIC.

VOL. I.

DYE *, in architecture, the trunk of the pedestal; or that part between the base and the cornice: being so named, because it is frequently made in the form of a cube, or *Dye*.—See *Tab. Archit. fig. 24, 26, 28, 30, 32.*

* It is also called *Dada*, by the Italians; and by Vitruvius, *Tenuis*. See PEDESTAL.

DYE, is also used for a cube of stone, placed under the feet of a statue, and over its pedestal; to raise it, and shew it the more.

DYERS Black. See the article BLACK.

DYERS Blue. See the article BLUE.

DYING, the art; or act of tinging cloth, stuff, or other matter with a permanent colour; which penetrates the substance thereof.

Dying differs from bleaching; or whitening, which is not the giving a new colour, but the brightening of an old one: it also differs from painting, gilding, marbling, and printing, or stamping, in that the colours in these only reach the surface.

Dying may be defined the art of colouring wool, linnen, cotton, silk, hair, feathers, horn; leather, and the threads and webs thereof; with woods, roots, herbs, seeds and leaves; by means of salts, limes, lixiviums, waters, heats, fermentations, macerations, and other processes.

Dying with regard to the manner of applying the colours, is divided into *hot*, and *cold*.

DYING hot, *Θεσιβασις*, is that wherein the liquors and ingredients are boiled, before the cloth be dipped therein; or even where the cloths themselves are boiled in the *Dye*.

DYING cold, *Ψυχοβασις*, is where the ingredients are dissolved cold; or at least suffered to grow cold, before the stuffs be put in them.—V. *Savar. D. Comm. T. 2. p. 1697. voc. Teinture. Salmat. Exerc. ad Solin. T. 2. p. 1167.*

Origin of DYING.—The *dying* art is of great antiquity; as appears from the traces of it in the oldest sacred, as well as profane writers. The honour of the invention is attributed to the Tyrians*; though what lessens the merit of it, is that it is said to have owed its rise to chance. The juices of certain fruits, leaves, &c. accidentally crushed, are supposed to have furnished the first hint: Pliny assures us, that even in his time the Gauls made use of no other *Dyes*: it is added, that coloured earths, and minerals washed and soaked with rain, gave the next *dying* materials.—But the purple, an animal juice, found in a shell fish called *Murex*, *Conchylinum*, and *Purpura*, seems from history to have been prior to any of them. This indeed was reserved for the use of kings, and princes; private persons were forbidden by law to wear the least scrap of it. The discovery of its tinging quality is said to have been taken from a dog, which having caught one of the purple-fishes among the rocks, and eaten it up, stained his mouth and beard with the precious liquor; which struck the fancy of a Tyrian nymph so strongly, that she refused her lover Hercules any favours till he had brought her a mantle of the same colour **.—V. *Plin. Nat. Hist. Lib. XXII. c. 2.* **Savar. Lib. cit. p. 1698.*—*Leg. I. C. Que res ven. non poss. Salmuth ad Panciroll. Lib. I. Tit. 1. p. 8. § 9.* † *Poll. Lib. I. de verb. Idon. ad Commod. Polyd. Virg. de Invent. Rer. Lib. III. c. 7.* See also the article PURPLE.

* Pliny seems to ascribe the invention of the art of *dying* wools to the Lydians of Sardis: *Isficere lanas Sardibus Lydi* *; where the word *incipere* must be understood †. But a modern critic suspects a false reading here; and not without reason, for *Lydi*, substitutes *Lydda*, the name of a city on the coast of Phœnicia, where the chief mart of the Purple-dye was †.—V. *Plin. Hist. Nat. Lib. VII. c. 66.* † *Hardou. not. ad loc. c. Nurra, in Bill. Chief. T. 20. p. 193. § 9.*

* After the Phœnicians, the Sardinians seem to have arrived at the greatest perfection in the *dying* art; inasmuch that *βαμμα Σαρδινιακον*, *Sardinian Dye* passed into a proverb among the Greeks. Aristophanes in two places, to express a thing red as scarlet, compares it to the *βαμμα Σαρδινιακον* †. *Salmuth, Palmerius* and *Spanheim* indeed for *Σαρδινιακον* substitute *Σαρδινιακον*, which they suppose a possessive of Sardis, and to denote *Sardian Dye*: but *Nurra* in a dissertation expressly on the subject has strenuously supported the pretensions of his country against this innovation †.—† *Ariopoli, in Achæran. v. 112. item Pax. v. 11. 74.* † *I Paul Nurra Digt. de Varia Lestione Adagii ΒΑΜΜΑ ΣΑΡΔΙΝΙΑΚΟΝ, tinziara Sardinica. Flor. 1709. 4^o. le Clerc. Bibl. Chief. T. 20. p. 187. § 99.*

Till the time of Alexander we find no other sort of *Dye* in use but purple, and scarlet.—It was under the successors of that monarch, that the Greeks applied themselves to the other colours; and invented, or at least perfected, blue, yellow, green, &c. †.—For the ancient purple it has been long lost, but the perfection to which the moderns have carried the other colours, abundantly indemnifies them of the loss. In this, particularly in the scarlet and black colours, the French under the auspices of that excellent minister M. Colbert, seem to have outstripped most of their neighbours †. See GOBELEINS.—V. *Pitife. L. Ant. T. 1. p. 249. voc. Baphia.* † *Savar. lib. cit.*

Among the Romans, the *Dye-houses*, *Baphia*, were all under the direction of the comes sacrarum largitionum †; though they had

had each their peculiar præpositus, as at Alexandria, Tyre, &c. ¹—The Dyers of London make the 13th company of the city, incorporated under Hen. VI. consisting of a master, warden, and livery ^k.—At Paris, and in most of the great cities in France, the Dyers are divided into three companies; viz. those of the *great Dye*, *du grand & bon teint*, who are only to use the best ingredients, and such as strike the surest and most lasting colours.—Dyers of the *lesser Dye*, *du petit teint*, who are allowed to use the inferior sorts of drugs, which only yield false and fading colours.—And silk, wool and thread Dyers.—All the higher prized cloths and stuffs are reserved to the Dyers of the first sort: those of less value, particularly such as are not rated at above 40 sols the ell in white, are committed to the masters of the *petit teint*. Blue, red, and yellow, are reserved more peculiarly to those of the *grand teint*; browns, fallows and blacks are common to both sorts. As to black, it is begun by the Dyers of the *grand teint*, and finished by those of the *lesser* ^l.—It seems there is a tradition among Dyers, that Jesus Christ was of their profession; which we also find delivered in the *gospel of the infancy of Jesus*, tho' on what grounded we know not. But it is hence that the Persian Dyers, notwithstanding all their Mahometanism, have chosen Jesus for the patron of their art; inasmuch that among them a *Dye-house* is called *Christ's shop* ^m.—^h V. Notit. Imper. Hoffm. L. T. 1. p. 469. ⁱ Pitisc. loc. cit. ^k *New View of Lond.* T. 2. p. 601, *seqq.* ^l *Savar. D. Comm.* T. 2. p. 1688, *voc Teint.* ^m *Sike Nat. ad Evang. Infant.* p. 55. *Hilfcher de Stud. Christ. in Misc. Lips. Obs.* 96. § 10. T. 5. p. 34.

Requisites in DYING.—There are three things demanded by the Greek chemists to a good *Dye*; viz.—*Αραιωσις*, opening or rarefying of the body to be dyed, to dispose it to imbibe the colour.—*Βαση*, the tincture or *Dye* itself.—*κατοχη*, or *στυψις*, by the Romans called *aligatio*, the binding or fixing the colour, to prevent its fading or being discharged.—Some add a fourth condition, viz. *Στασις*, by the Latins called *lumen*, by us *lustre* or *brighness*.

Among some, these three were done severally at three different operations, in different liquors, or decoctions: by the first, the stuff was prepared to receive the *Dye*; this was called *εργασια*, and *υποστυψις*; by the second, the desired colour was given it; and by the third, the colour was fixed on it.—But others did all three at once, with one decoction, and at one dip.—V. *Salmat. Exerc. ad Salin.* T. 2. p. 1146, *seq.*

Advancement of DYING. The basis of a just history of Dying, must be a theory of light and colours. Two things, it may be observed, are chiefly aimed at in the enquiry of colours, the first to increase the *materia tinctoria*; the second, to fix those colours we have.

In order to these it may be remembered, that some colours are *apparent*, as those of flowers, the juices of fruits, and those of animals.—Others are *latent*, and only discovered by the effects which the several species of salts and other things have on them.

Concerning the *apparent* colours of vegetables and animals, and the effects of different salts in changing them from one colour to another, we have many instances in Mr. Boyle, collected and ranged in a new order by Dr. Lister, as—^{1st}, That acid salts advance the colours of flowers, and berries: thus they make the infusions of balauftia or pomegranate flowers, red-roses, clove-july flowers, mezerion, peafe-flowers, violets, and cyanus flowers, of a very fine red; and the juices of the berries of lignumfrum, of black-cherries, and buckthorn berries, of a much fairer red.—To the same purpose it is observed, that acid salts make no great alterations upon the white flowers of jasmim and snow-drops.

^{2dly}, Urinous salts and alcalies, on the contrary, quite alter the colours of the flowers last named, as well as the juices of the berries abovementioned, from red to green.

^{3dly}, Urinous salts and alcalies advance, at least they do not hurt the colours of the juices of vegetable leaves, woods and roots.—Thus urinous spirits and alcalies make the yellow infusions of madder roots, red; of brazil wood, purplish; of lignum nephriticum, blue; the red infusion of logwood, purple; and that of the leaves of fena, red.

^{4thly}, Acid salts quite alter the said infusions from red or blue to yellow.

^{5thly}, Cochineel, which of it self is red, upon the affusion of oil of vitriol, an acid salt, strikes the most vivid crimson that can be imagined; and with urinous salts and alcalies, it will be again changed into an obscure colour betwixt a violet and a purple.

^{6thly}, All red, blue and white flowers are immediately, upon the affusion of an alcaly, changed to a green colour; and thence, in no long process of time, they turn yellow.

^{7thly}, All the parts of vegetables which are green, will in like manner strike a yellow with an alcaly.

^{8thly}, What flowers are already yellow, are not much changed, if at all, by an alcaly, or urinous spirit.

^{9thly}, The blue seed-husks of glastum sylvestre old gathered and dry diluted with water, stain a blue, which upon the affusion of lye strikes a green; which said green or blue being

touched with oil of vitriol dyes a purple: and all these three colours stand.

^{10thly}, On the tops of the fungus tubulosus are certain red knots, which upon the affusion of lye, will strike a purple, and stand.

For the *latent* colours in animals and vegetables, discovered to us by the affusion of salts; they likewise are very numerous. We will only mention a few—^{1st}, The milky juice of the lactuca sylvestris costa spinosa, & fonchus asper & levis, upon the affusion of lye, will strike a vivid flame-colour or crimson, and after some time quite degenerate into a dirty yellow.

^{2dly}, The milk of the cataputia major, upon the affusion of lye, especially if it be drawn with a knife, and have any time stood upon the blade thereof, will strike a purple or blood red colour, and soon after will change into a dull yellow.

^{3dly}, The common hawthorn-caterpillar will strike a purple or carnation with lye, and stand.

^{4thly}, The heads of beetles, pisiformes, &c. will with lye strike the same carnation colour, and stand.

^{5thly}, The amber coloured scolopendra will give with lye a most beautiful and pleasant azure, or amethystine, and stand. It remains to be observed,—^{1st}, That in all the instances abovementioned, whether vegetable or animal, there is not one colour truly fixed; though there may be some use made of them, as they are.—By *not truly fixed*, we mean, not proof against salt and fire; for, what seem to stand, and be lye-proof, are either wholly destroyed by a different salt, or changed into a much different colour; which must needs prove a stain and blemish, when it shall happen in the use of any of them.

^{2dly}, That both the apparent and latent colours of vegetables are fixable: an instance whereof we may observe in the seed husks of glastum, and the use Dyers make of the leaves of that plant after due preparation.

^{3dly}, It is probable from the same instance, that we may learn from the colour of some part of the fruit or seed, what colour the leaves of any vegetable, and the whole plant, might be made to yield for our use.

^{4thly}, That the latent colours of vegetables are pre-existent, and not produced; from the same instance of wood; and likewise from this, that the milky juice of lactuca sylvestris affords of it self a red serum.

^{5thly}, That the change of colours in flowers is gradual and constant.

^{6thly}, That the colours of flowers, which will not stand with lye, seem to be wholly destroyed by it, and irrecoverable.—Thus one part of a violet leaf, upon the affusion of lye, is changed very soon into yellow, and will never be revived into a red by an acid salt; but if another part of the same leaf be still green, it will be revived.

^{7thly}, That dryness seems to be a means, if not of fixing, yet of bringing the vegetable colour into a condition of not wholly and suddenly perishing by the otherwise destroying alcaly.

^{8thly}, That those plants or animals which will strike different yet vivid colours, upon the affusion of different salts, and stand, as the cochineel, and glastum, are of all others to be reckoned the best.—V. *List. in Phil. Transf.* N^o. 70. p. 2132, *seqq.* see also Boerh. *Elem. Chem.* P. 3. T. 2. p. 467, *seqq.* Edit. Lips.

DYING Ingredients, or the *materia tinctoria*, are best reduced under two heads:—*Colorata*, or those which properly give the colour.—And *Non-colorata*, used to prepare the stuffs for better taking the *Dye*, and to heighten the lustre of the colours.

The *colouring* ingredients are of three sorts, blue, yellow and red.—To the first sort, belong indigo, woad, weld, wood-wax, and log-wood; to the second, fustic; to the third, madder, brazil, cochineel, kermes, safflower, and sanders.—To which may be added arnotto, and young fustic, for orange-colours: lastly, wood foot.

The *non-colouring* ingredients are,—Certain *refringent* or *binding* materials, as galls, sumac, alder bark, pomegranate peel, walnut rinds and roots, sapling bark, and crab-tree bark.—

Certain *salts*, as alum, argol, salt-petre, salarmoniac, pot-ashes, lime and urine.—*Liquors*, as well water, river water, aqua vite, vinegar, lemon juice, aqua fortis, honey, and molasses.—*Gums*, as tragacanth, arabic, mastic, and sanguis draconis.—*Smectics*, or *absterfives*, as soap, fullers earth, linsced-oil, ox-gall, &c.—*Metals*, as steel filings, flippe, and pewter, to which add copperas, verdgrease, antimony, litharge, and arsenic.—*Lastly*, bran, wheat-flower, yolks of eggs, leaven, cumin seed, fenugreek seed, agaric and fenna.

Of most of these ingredients some account may be found under their respective articles in the course of this book; but with regard to their use and effect in *dying*, it will be necessary to consider them more particularly, and to bring together in one view.

Among the *non-colouring* drugs, then, from the mineral kingdom come; ^{1st}, Copperas, steel filings, and flipp (the stuff found in the troughs of old grind-stones whereon edge-tools have been ground) these are used for all true or Spanish blacks; though not for the Flanders blacks.—^{2dly}, Pewter dissolved in aqua fortis, used for the new scarlet or bowdye.—

3dly, Litharge, though not owned or allowed, is used to add weight to dyed silks.—*4thly*, Antimony used chiefly for the same purpose, though it also contains a tincture sulphur, which by precipitation, &c. affords a great variety of colours.—*5thly*, Arsenic used in dying crimson, on pretence of giving a lustre.—*6thly*, Verdegrease, used by linnen dyers, in their yellow and green colours.—*7thly*, Alum, much used, though with what intent is not agreed on; whether to fix the dye to render water a proper menstruum to extract the tincture particles of certain hard drugs? or to fower the fibres, which may interpose between the stuff and the dye, and hinder their due adhesion? or to intertinate the hairs of wool, and hair stuffs, that they may better imbibe their colours? or to contribute to the colour it self, as copperas does to galls in making black, or juice of lemons to cochineal in carnations, or aqua fortis impregnated with pewter in the bowdye? or which seems most probable, to serve as a vinculum between the cloth and the colour, as clammy oils, and gum waters, do in painting; alum being a substance whose aculeated particles, dissolved with hot liquors, will enter the pores of stuffs, and on which the particles of dying drugs will catch! though it may also serve another use, viz. to dry up certain particles which disagreed with the colour to be superinduced; to which add, that it may also serve to brighten a colour, by incrustating the stuff to be dyed with its crystals, on which the dye coming to be applied, has a finer effect, than if it were applied on a scabrous matter, such as an unaluned cloth is.—*8thly*, Bran, and bran water, whose fower entering the pores of the stuff, levigates its surface, and thus renders the colour laid on it more beautiful; much as woods to be gilded, are first smothered over with white colours.—*9thly*, Saltpetre, used chiefly in aqua fortis, in the bowdye, to brighten colours by back boiling; for which purpose,—*10thly*, Argol is more commonly used.—*11thly*, Lime, or calke, used in the working of blue fats.

Non-colouring ingredients of the animal kind, are—*1st*, Honey.—*2dly*, Yolks of eggs.—*3dly*, Ox-gall: though this, and the two last, are only used by a few particular dyers to scower, promote fermentation, and increase weight.—*4thly*, Stale urine, used as a lixivium to scower, also to help the fermenting, and heating of woad; though it is also used in the blue fats instead of lime: in reality, as it discharges the yellow, wherewith blue, and most greens, are compounded, it is used to spend weld withal: yet it is known, that the urine, or old mud of pissing places, will dye a well scowered piece of silver of a golden colour; it being with this (not Bath water, as imagined) that the Bath fixences, &c. are prepared.

To the class of non-colouring ingredients may also be added water, by dyers called *white liquor*, which is of two sorts.—*1st*, Well water, used in reds, and in other colours wanting refringency, as well as in dying stuffs of a loose texture, as callico, luffian, and the several species of cottons: but naught for blues, and making yellows and greens look rusty.—*2dly*, River water, softer and sweeter than the former, and dissolving soap better, used in most cases by the dyers, for washing, rinsing, &c. their cloths after dying.—*3dly*, Liquor absolutely so called, which is bran liquor made of one part bran, and five of river water, hoiled an hour, and put in a leaden cistern to settle: four or five days in summer turn it too sour, and unfit for use: its office is to contribute to the holding of the colour: it is known that starch, which is only the flower of bran, makes a clinging paste, which will conglutinate paper, though not wood or metals. Accordingly, bran liquors are used to mealy dying 'stuffs, as to madder, which is rendered clammy and glutinous by being hoiled in bran water; and thus made to stick better to the villi of the stuff dyed.—*4thly*, Gums, tragacanth, arabic, mastic, and sanguis draconis, are used in dying silks, chiefly to give it a glossiness, which may make it seem finer, as well as stiffer, and to increase its weight.

For the colouring ingredients, *colorantia colorata*, we have,—*1°*. Iron and steel, or what is made from them, which we have observed, are used in dying blacks; though how they contribute thereto is not so obvious: we know that green oaken boards become black by the friction of a saw; a green four apple cut with a knife turns of the same colour; the white greafe wherewith the wheels of coaches are anointed becomes likewise black by means of the iron boxes wherewith the nave is lined, and the friction between the nave and the axle-tree; and that an oaken-stick becomes black by a violent friction against other wood in a turning lathe; and the black colour on earthen-ware is given with scalings of iron vitrified. From all which it seems to follow, that the business of blacking lies in the iron, and particularly in its vitulation or affriktion.

Be this as it will, copperas, the most usual ingredient for dying black, is the salt of the pyrites wherewith old iron is incorporated. And, wherewith this is used, some of the affringents are to accompany it.—*2°*. Redwood chopped, and ground in a mill, is used for dying cloth, rugs, &c. of the coarser sort. Its tincture, which is a sort of brick-

bour, is got out by long-boiling it with galls, and the cloth with it. It stands better than brazil.—*3°*. Brazil chopped also, and ground, dyes a pink-colour, or carnation nearest approaching cochineal: it is used with alum: with pot-ashes it also serves for purples. It easily stains.—*4°*. Madder gives a colour near approaching the bow-dye, or new scarlet: a thoe called bastard-scarlets are dyed with it. It endures much boiling, and is used both with alum and argol; and holds well: the brightest dyes with madder are made by over-dyeing the stuff, and then discharging part of it by back-boiling in argol. It is used with bran water instead of white liquor.—*5°*. Cochineal, used with bran liquor in a pewter vessel, with aquafortis, gives the dye called among us, though improperly, *scarlet in grain*. Too much acid takes off the intense redness of this colour, and turns it towards an orange, or flame colour. With this colour the Spanish leather and wool used by ladies, are dyed.—*6°*. Arnott gives an orange colour, especially to silks, linnen and cottons; for it does not penetrate cloth: it is used with pot-ashes.—*7°*. Weld, by the help of pot-ashes, yields a deep lemon colour; though it is used to give all sorts of yellows.—*8°*. Wood-wax, or green wood, called also *genista tinctoria*, and the *dyer's weed*, has the like effect, as weld, though its use is chiefly confined to coarse cloths. It is set with pot-ashes, or urine.—*9°*. Puffic is of two sorts, young and old.—The former chopped and ground, yields a kind of reddish orange colour: the latter, a hair colour distant several degrees of yellow from the former. It spends with or without salts, works either hot or cold, and holds firm.—*10°*. Wood-foot, containing not only a colour, but a salt, needs nothing to extract its dye, or make it strike on the stuff. The natural colour it yields is that of honey, but it is the foundation of many other colours on wool, and cloth, only.—*11°*. Woad ground, or chopped with a mill for the purpose, is made up into balls, which being broken, and streved on lime or urine, is used with pot-ashes, or sea-weed, and gives a lasting blue. The lime or chalk accelerates the fermentation of the woad, which in three or four days will work like a guile of beer, and be covered with a greenish froth or flower. An intense woad colour is almost black, that is, of a damson colour. It is the foundation of so many colours, in its different degrees or shades, that the dyers have a scale whereby to compute the lightness and depth of this colour. See *WOAD*.—*12°*. Indigo is of the like nature, and used for the same purpose as woad, only that it is stronger. *13°*. Logwood, chopped and ground, yields a purplish blue: it may be used with alum: formerly it was of ill repute as a most false and fading colour; but, since it has been used with galls, it is less complained of.—*V. Petty's Apparatus*, to *Hist. of dying*, in *Sprat's Hist. Roy. Soc.* P. 2. p. 288, *seqq.* Merr. *Not. on Neri*, c. 110. p. 335, *et seqq.*

The dying materials are generally applied in decoctions made in water, more or less strong, according to the occasion; sometimes by only dipping the stuff in the vat of dye; sometimes by boiling it therein; and sometimes by leaving it a day or more to steep.—For the alum, in dying silks, it is always applied cold, in which state alone it contributes to the brightness of the dye.

The *Art of DYING* may be divided into as many branches as there are different colours to be communicated, and sorts of different stuffs to be the subjects of it.

DYING of Cloths, Serges, Druggets, and other woollen Manufactures.—For black, in cloths and stuffs of price, it is begun with a strong decoction of woad and indigo, which give a deep blue; after which, the stuffs, being boild with alum and tartar, or pot-ashes, are to be maddered with common madder; then dyed black with aleppo galls, copperas, and sumac; and finished by back-boiling in weld.—*Scarlet* is dyed with kernes and cochineal, with which may also be used agaric and arsenic.—*Crimson scarlet* is given with cochineal mestic, aqua fortis, sal armoniac, sublimate, and spirit of wine.—*Violet-scarlet, purple, amaranth, and pansy-scarlets*, are given with woad, cochineal, indigo, brazietto, brazil, and orchal.—For common reds, pure madder is used, without any other ingredients.—*Crimson-reds, carnations, flame and peach-colours*, are dyed according to their several hues, with cochineal mestic, without madder, or the like.—*Crimson-red* is prepared with Roman alum, and finished with cochineal.—*Peach-colour*, must be hack-boiled a little with galls and copperas, or the like.—*Orange-aurora, or golden-yellow, brick-colour, and onion-peel-colour*, are given with woad and madder, tempered according to their respective shades.—For blues, the dark are given with a strong tincture of woad: the brighter, with the same liquor, as it weakens in working.—*Dark-browns, minims, and tan-colours*, are given with woad, weaker in decoction than for black, with alum and pot-ashes; after which, they are maddered higher than black: for tan-colours, a little cochineal is added.—*Pearl-colours* are given with galls and copperas; some are begun with walnut-tree roots, and finished with the former; though

though to make them more serviceable they usually dip them in a weak tincture of cochineal.—*Greens* are begun with woad, and finished with weld.—*Pale-yellows, lemon-colours, and sulphur-colour,* are given with weld only.—*Olive-colours* of all degrees are first put in green, and taken down again with foot, more or less, according to the shade required.—*Ferulemort, hair-colour, musk, and cinnamon-colour,* are given with weld and madder.—*Nacarot, or bright orange-red,* is given with weld, and goats hair, boiled with pot-ashes. Fustic here is forbid, as a false colour.—V. Savar. *D. de Comm.* T. 2. p. 1690, *seqq.* See also *le Teinturier Parfait, Leid.* 1708, 12°. *Salm. Polygraph.* 1. 3. c. 37.

DYING of wools for tapestry, is performed after the same manner as cloths, excepting blacks, which are only to be woaded, and then put in black, as above.

Black wools for cloths and serges may be begun with walnut-tree root, and walnut rinds, and finished by dipping in a vat of black.

DYING of silks is begun by boiling them with soap, &c. then scowring and washing them out in the river, and steeping them in alum water cold.—For crimson they scower them a second time before putting them in the cochineal vat.

Red crimson is dyed with pure cochineal methic, adding galls, turmeric, arsenic, and tartar, all put together in a copper of fair water almost boiling: with these the silk is to be boiled an hour and a half; after which, it is suffered to stand in the liquor till next day.—*Violet crimson* is also given with pure cochineal, arsenic, tartar, and galls; but the galls in less proportion than in the former. When taken out it is to be well washed, and put in a vat of indigo.—*Cinnamon crimson* is begun like the violet, but finished by back-boiling, if too bright, with copperas; if dark, with a dip in indigo.—*Light blues* are given in a back of indigo.—*Sky blues* are begun with orchal, and finished with indigo.—*For citron colours,* the silk is first alumed, then welded, with a little indigo.—*Pale yellows,* after aluming, are dyed in weld alone.—*Pale and brown aurora's,* after aluming, are welded strongly, then taken down with rocou dissolved with pot-ashes.—*Flame-colour* is begun with rocou, then alumed, and dipped in a vat or two of brazil.—*Carnation, and rose-colours,* are first alumed, then dipped in brazil.—*Cinnamon-colour,* after aluming, is dipped in brazil, and braziletto.—*Lead-colour* is given with fustic, or with weld, braziletto, galls, and copperas. But the galls, on these and other occasions, are not to be overdoled, which encreases the weight to the damage of the purchaser; for which reason, it is punished in France as a fraud: and in reality few but black silks need galls.

Black silks of the coarser sort, are begun by scowring them with soap, as for other colours; which done, they are washed out, wrung, and boiled an hour in old galls, where they are left to stand a day or two; after which, they are washed again with fair water, wrung, and put in another vat of new and fine galls; then washed and wrung again, and finished in a vat of black.—*Fine black silks* are only put once into galls, *viz.* the new and fine sort, which has only boiled an hour; then they are washed, and rung out, and dipped thrice in black, to be afterwards brought down by back-boiling with soap.—V. Savar. *lib. cit.* p. 1693, *seqq.*

DYING of thread is begun by scowring it in a lye of good ashes; after which, it is rung, rinsed out in river water, and wrung again.—For a *bright blue,* it is given with braziletto, and indigo.—*Bright green* is first dyed blue, then back-boiled with braziletto, and verdeter, and lastly woaded.—For a *dark green* it is given like the former, only darkening more before woaded.—*Lemon, or pale yellow,* is given with weld, mixt with rocou.—*Orange and Isabella,* with fustic, weld, and rocou.—*Red,* both *bright and dark,* with *flame-colour, &c.* are given with brazil, either alone, or with a mixture of rocou.—*Violet, dry rose, and amaranth,* are given with brazil, taken down with indigo. *Ferulemort, and olive-colour,* are given with galls and copperas, taken down with weld, rocou, or fustic.—*Black* is given with galls and copperas, taken down and finished with braziletto wood.

DYING of hats is done with braziletto, galls, copperas, verdegrease, dissolved and boiled in a copper capable of receiving, besides the liquor, twelve dozen of hats on their blocks, or moulds. Here the hats are suffered to boil some time; after which, they are taken out, and suffered to stand and cool; then dipped again; and thus alternately, oftner or seldomer, as the stuff is of a nature to take the dye with more or less difficulty. Savar. *lib. cit.* p. 1697. See also the article **HAT.**

Proof of DYES.—There are diverse ways of proving the truth of *Dyes,* or examining the justness and legitimacy of their composition.—To discover whether a cloth have been duly treated by the dyer, and the proper foundation laid, a white spot, by the French called *Rosette,* of the bignets of a shilling, ought to be left; besides a white stripe between the cloth and the list.

Further proof is had by boiling the dyed stuff in water with other ingredients different according to the quality of the dye to be proved. If the colour sustain the test, *i. e.* do not dif-

charge at all, or very little, so that the water is not tinged by it, the dye is pronounced good; otherwise it is false.

Proof of the DYES of silks.—For red crimson, the proof is made by boiling the silk with an equal weight of alum.—For scarlet crimson, it is boiled with soap almost of the weight of the silk.—For violet crimson, with alum of equal weight with the silk, or with citron juice, about a pint to a pound of silk.—These ingredients are to be mixed, and put in fair water when it begins to boil; after which, the silks are also to be put in; and after boiling the whole for half a quarter of an hour, if the dye be false, the liquor of the red crimson will be violet, in case it have been dyed with orchal, or very red, if with brazil.—That of crimson scarlet, if rocou have been used, will become an aurora colour, or, if brazil have been used, red.—And that of violet crimson, if brazil, or orchal have been used, will be of a colour bordering on red.—On the contrary, if the three sorts of crimson be truly dyed, their liquors will discover very little alteration.

A still surer way to discover whether crimson silks have been rightly dyed, is by boiling a piece of standard dyed crimson silk, kept for that purpose at Dyers-hall, after the same manner, and then comparing the tinctures of the two liquors.

To discover whether other colours have been dyed with galls, the silk is to be put in fair boiling water, with pot-ashes, or soap, nearly of the weight of the silk; after some time, it is taken out; upon which, if it have been dyed with galls, the colour will be all vanished, and nothing but that of the galls left, which is a sort of feulemort, or wood colour.

The *dying* of silk with galls may also be detected by putting it in boiling water, with a gallon of citron juice; being taken out, and washed in cold water, and then dipped in a black dye, if galls have been used, it will turn black; if not, it will be of a brown-bread colour.

To discover whether black silk have been overdoled with galls, steel filings, or slipp, it is boiled in fair water, with twice its weight of soap: if it be loaden with galls, it will turn reddish, otherwise, it will keep its colour.

To discover whether black cloth have been first woaded, and madder; a sample of it, and at the same time, a sample of standard black, kept for that purpose by the Dyers company, is to be taken; and then as much roman alum as is equal in weight to both, together with a like weight of pot-ashes, is to be put over the fire in a pan of bran water: when it begins to boil, the two samples to be put in; and after half an hour to be taken out, and compared.—The piece which has only been woaded will be found bluish, with somewhat of a dull green; if it have been both woaded and madder, it will be of a tan, or minim colour; and, if it have been neither woaded, nor madder, its colour will be dunnish, between yellow and fallow.

For cloths dyed of a minim colour, the proof is to be made after the same manner as that of blacks.

To know whether scarlet, or crimson cloth, have been dyed with pure cochineal, they are to be boiled with an ounce of alum to a pound of cloth.

For cloths of other colours, the proof is to be made in the same manner as that of blacks and minims.—V. Savar. *lib. cit.* T. 1. p. 1665, *seqq.* voc. Debouilli.

Theory of DYING.—This article we cannot better close, than with some general deductions which may let a little necessary light into the theory of *dying.* As,

1°. That all the materials, which of themselves give colour, are either red, yellow, or blue; so that out of them, and the primitive fundamental colour, white, all that great variety, which we see in dyed stuffs, arises.—2°. That few of the colouring materials, (as cochineal, foot, wood-wax, or woad) are in their outward and first appearance, of the same colour, which by the slightest solutions in the weakest menstrua, they dye upon cloth, silk, &c. 3°. That many of the colouring materials will not yield their colours without much grinding, steeping, boiling, fermenting, or corrosion by powerful menstrua; as red-wood, weld, woad, arnotto, &c.—4°. That many of the said colouring materials will of themselves give no colouring at all, as copperas; or galls, or with much disadvantage, unless the cloth, or other stuff to be dyed, be first covered or incrustated as it were, with some other matter, though colour-less, beforehand; as madder, weld, and brazil, with alum.—5°. That some of the colouring materials, by the help of other colour-less ones, do strike different colours from what they would alone, and of themselves; as cochineal, and brazil.—6°. That some colours, as madder, indigo, and woad, by reiterated tinctures, will at last become black.—7°. That though green be the most frequent and common of natural colours, yet there is no simple ingredient, which is now used alone, to dye green with upon any material; sap-green, the condensed juice of the rhamnus or buckthorn-berry, being the nearest; and this only used by country people.—8°. There is no black thing in use which dyes black; though both the coal and foot of most things burnt, or scorched, be of that colour; and the blacker, by how much the matter, before it was burnt, was whiter,

whiter, as in the famous instance of ivory black.—9°. The tincture of some dying stuffs will fade even with lying, or with the air, or will stain even with water; but very much with wine, vinegar, urine, &c.—10°. Some of the dyers materials are used to bind and strengthen a colour; some to brighten it; some to give lustre to the stuff; some to discharge and take off the colour; either in whole or in part; and some out of fraud, to make the material dyed, if costly, to be heavier.—11°. Some dying ingredients, or drugs by the coarseness of their bodies, make the thread of the dyed stuff seem coarser; and some by shrinking them, smaller; and some by levigating their asperities, finer. 12°. Many of the fame colours are dyed upon different stuffs with different materials; as red-wood is used in cloth, not in silks; arnotto in silks, not in cloth; so that they may be dyed at several prices.—13°. Scouring, and washing of stuffs to be dyed, is to be done with appropriate materials; as sometimes with ox-galls, sometimes with fullers earth, sometimes with soap; this latter however, is pernicious in some cases, where pot-ashes will stain or alter the colour.—14°. Where great quantities of stuffs are to be dyed together, or where they are to be done with great speed, and where the pieces are very long, broad, thick, &c. they are to be differently handled, both in respect to the vessels and ingredients.—15°. In some colours and stuffs the tingent liquor must be boiling; in other cases only blood-warm, in some it may be cold.—16°. Some tingent liquors are fitted for use by long keeping; and in some the virtue wears away by the fame.—17°. Some colours, or stuffs, are best dyed by reiterated dippings ever into the same liquor at several intervals of time; and some by continuing longer, and others lesser whiles therein.—18°. In some cases, the matter of the vessel wherein the liquors are heated, and the tinctures prepared, must be regarded; as that the kettles be pewter for bow-dye.—19°. Little regard is had how much liquor is used in proportion to the dying drugs; the liquor being rather adjusted to the bulk of the stuff, as the vessels are to the breadth of the same; the quantity of dying drugs being proportioned to the colour higher or lower, and to the stuffs both; as likewise the salts are to the dying drugs.

Concerning the weight which colours give to silks, for in them it is not taken notice of, as being sold by weight, and being a commodity of great price; it is observed, that one pound of raw silk loses four ounces by washing out the gums, and natural fordes.—That the same coloured silk may be raised to above thirty ounces from the remaining twelve, if it be dyed black, with certain materials. That the reason why black colour may be dyed the heaviest is, that all ponderous drugs may be dyed black, being all of colours lighter than it; whereas, perhaps, there seem to be few or no materials wherewith to encrease the weight of silk, which will consist with fair light colours; such as will having been used, as white arsenic to carnations.

Of things useful in dying, especially black, nothing encreases weight so much as galls; by means whereof black silks recover the weight which they lost by washing out their gum: Nor is it counted extraordinary, that blacks should gain about four or six ounces in the dying upon each pound.—Next to galls, old suttie encreases the weight, about 1 1/2 in 12.—Madder about an ounce in the pound.—Weld half an ounce.—The blue fat, in deep blues of the fifth salt, adds no considerable weight.—Neither do logwood, cochineal, or arnotto; nor even copperas of it self, where galls are not used.—Slipp adds much to the weight, and gives a deeper black than copperas, which affords a good excuse for the dyers that use it.—Petty's *Appar. to Hist. of Dying*, ap. Sprat. lib. cit. p. 302, seqq.

DYING, in a more extensive sense, is applied to all kinds of colourings given to bodies of any fort.

In which sense, *Dying* amounts to the same with *coloration*; and includes staining, painting, gilding, marbling, printing, &c.—The Chinese are said to practise the *Dying* of tea with catechu, which gives the worse sorts of green tea-leaf the colour, and its infusion the tincture of bohea.—V. Short. *Diss. on Tea*, pref. p. 15. See also the articles TEA, and CATECHU.

The sorts of *Dying*, or coloration, now commonly used in vulgar trades, are, 1. Whitenening of wax, and several sorts of linnen, and cotton clothes, by the sun, air, and reciprocal effusions of water. See BLEACHING.—2°. Staining of wood and leather by lime, salt, and liquors, as in staves, canes, marble leathers, marquetry, &c.—3°. Marbling of paper by tempering the colours with ox-gall, and applying them upon a stiff gummed liquor. See PAPER.—4°. Colouring, or rather discolouring silks, tiffanies, &c. by brimstone.—5°. Colouring several iron and copper works into black with oil.—6°. Giving leather a gold colour, or rather dying flwer-leaves like gold, by varnishes; and in other cases by urine and sulphur.—7°. Staining of marble and alabaster, with heat and coloured oils.—8°. Tinging silver into brass with brimstone or urine.—9°. Colouring the barrels and locks of guns blue and purple with the temper of small-coal heat.

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—10°. Colouring glass, crystals, and earthen ware, with the rusts, and solutions of metals. See POTTERY, &c.—11°. Colouring live hair, as in Poland, both horse and man's hair; and also of furs. See ENAMELLING and annealing. See ENAMELLING.—12°. Application of colours, as in the printing of books, and pictures, and the making of playing cards, japanning, &c.—See PRINTING, CARDS, and JAPANING.—14°. Gilding, and tinning with mercury, block tin, and fal armoniac. See GILDING and TINNING.—15°. Colouring metals, as copper with calamine into brass, and with zink or spelter into false gold, or into false silver with arsenic. See CALAMIN, BRASS, ZINK, ARSENIC, &c.—16°. Making painters colours, by preparing of earth, chalk, and slates, as in umber, oker, cologn earth, &c. out of the calces of lead, as cerufs and minium; by sublimates of mercury and brimstone, as in vermilion; by tinging of white earths variously, as in verdeter, and some of the lakes; by concrete juices or feculae, as in indigo, pink, sap-green, and lakes; and by rusts, as in verdegrease, &c. See CERUSS, MINIUM, VERMILLON, INDIGO, &c.—17°. The applying of these colours by the adhesion of ox-gall, as in the marbled paper aforesaid; or by gum-water, as in limning; or by clammy drying oils, as the oils of linseed, nuts, spike, turpentine, &c. See PAINTING, LIMNING, &c.—18°. Watering of tabbies. See WATERING, CALENDER, TABBIE, &c.—V. Petty *Appar. Hist. of Dying*, ap. Sprat *Hist. Roy. Societ.* p. 285, seqq.

* Glass dyed is the common matter of artificial jewels: the tinctures are given with zaffer, manganese, ferretto, crocus martis, &c.—The processes are described at large in Antonio Neri, *de Re Vitruvia*, Lib. I. c. 12, 13, 14, seqq.—See also GLASS, GEM, &c.

** The Peruvian women, when grown old, dye their grey hairs black by a very untoward operation, *viz.* holding the head some hours with the hair sopped in a boiling tincture of the root of a tree called *Cuchau*, by the Spaniards *Maquay*.—Those brooks and springs mentioned by Strabo, Pliny, and others, were much more commodious, which would change the colour of the hair; as well as of the coats of animals, with only drinking their waters. For the use of angling, white hair is dyed green by boiling it in ale with allum.—then steeping it in a decoction of copperas in common water.—It is dyed yellow by boiling in alum and ale with walnut-tree leaves stamped in it.—And brown, by steeping in felt and ale. *Mem. de Trev.* Sept. 1707. p. 1606, seqq. * *Appl. Hist. Anim. de Gener.* Lib. IV. and V. Probl. 8, 9, Conring. *de Habit. Germ. Corp. Cauf.* p. 126. p. Gent. Angl. p. 9, seqq.

DYING of leather, skins; &c.—A Blue colour is given by steeping the subject a day in urine and indigo, then boiling it with alum: or it may be given by tempering the indigo with red wine, and washing the skins therewith.—Red is given by washing the skins, and laying them two hours in galls; then wringing them out; dipping them in a liquor made with lignifrum, alum and verdegreis in water; and lastly, in a Dye made of brazil wood boiled with lye.—Purple is given by washing the skins with a solution of roche alum in warm water, and when dry again, rubbing them with the hand with a decoction of log-wood in water cold.—Green is given by smearing the skin with sap-green and alum water boiled: to darken the colour, a little more indigo may be added.—Dark green is also given with steel filings and fal armoniac steeped in urine till soft, then smeared over the skin; which is to be dried in the shade.—Sky colour is given with indigo steeped in boiling water, and the next morning warmed and smeared over the skin.—Yellow, by smearing the skin over with aloes and linseed oil dissolved and strained: or by infusing it in wel.—Orange-colour is given by smearing with suttie berries boiled in alum-water: or for a deep orange, with turmeric.—V. Salm, *Polygr.* lib. III. c. 34. p. 272, seqq.

DYING or staining of woods, for inlaying, veneering, &c.—Red, is done by boiling the wood in water and alum; and then taking it out, adding brazil to the liquor, and giving the wood another boil in it.—Black, by brushing it over with log-wood boiled in vinegar, hot; then washing it over with a decoction of galls, and copperas, till it be of the hue required.—Any other colour may be given by squeezing out the moisture of horchedung through a sieve, mixing it with dissolved roche alum and gum arabic; and to the whole adding green, blue, or any other colour designed: after standing two or three days, pear-tree, or other wood, cut to the thickness of half a crown is put into the liquor boiling hot, and suffered to remain till it be sufficiently coloured.—V. Park. *Treat. of Japan.* c. 27. p. 82, seqq.

DYING of bone, horn or ivory.—Black is performed by steeping brass in aqua fortis till it be turned green: with this the bone, &c. is to be washed once, or twice; and then put in a decoction of log-wood and water, warm.—Green is begun by boiling the bone, &c. in alum-water; and then with verdegreis, fal armoniac and white wine vinegar; keeping it hot therein till sufficiently green.—Red is begun by boiling it in alum-water, and finished by decoction in a liquor compounded of quicklime steeped in rain-water, strained, and to every pint an ounce of brazil

wood added: the bone, &c. to be boiled herein till sufficiently red.—Other methods are given by Salmon.—And from him by Houghton.—V. Park. lib. cit. p. 83, *seqq.* Salm. *Polygraph.* l. 3. c. 35. p. 275, *seqq.* Hought. *Collect.* N^o. 138. T. 1. p. 361.

The refuse of the bow-dye given hogs to feed on, is said to tinge their very bones red: This is a spontaneous kind of *dying*, not unlike that in Virgil; who speaks of *dying* wool, on the fleeces backs, as seems in the text, by their feeding on properly coloured plants.

*Nec variis discit mentiri laxa colores:
Ipsæ sed in prætis arvis jam suæve rubenti
Murice, jam croceo mutabitis vellera lato:
Sponte sua sandyx patientes vestiet agnos.*

Ed. 4. v. 42, *seqq.*

The difficulty is to conceive how lambs should feed on the sandyx, which is a mineral substance; the fame with what is otherwise called *Sandaracha*? It is certain the poet takes it for a plant, as was long ago observed by Pliny: *Animæserto Virgilium existimasse herbam id esse.* Hist. Nat. l. 35. c. 6. This inference is chiefly drawn from the word *patientes*, which can mean nothing else, but that the lambs browsing on the sandyx, should receive the *dye* in their fleeces from the aliment. Dr. B— here gives us a correction which sets all to rights: for *patientes* he reads *nascentes*. On which footing the tenor of the passage is this: from that time there will be no need of *dying* wool with beautiful colours; but the sheep shall have their fleeces *dyed* naturally, and spontaneously; some with the *maræ*, or purple colour; others with the *lutæus*, or yellow; others with *sandyx*, or red. Those that were already in being, and had white fleeces, shall change them *in prætis*, in the meadows; but all the lambs shall be *dyed* beautifully *nascentes*, at their birth. V. *Mem. of Liter.* T. 2. art. 2. p. 7. *seqq.*

DYNASTY *, a term in history, signifying a race or succession of kings of the same line, or family. See **RACE**.

* The word is formed from the Greek *δυναστία*, of *δυναστω*, to be powerful, to be king.

We find frequent mention in ancient history of *Dynasties* of Persians, Assyrians, Medes, &c. Manetho has left an historical chronology of Egypt, divided into 30 *Dynasties*.

DYPTYCHA, or rather **DIPTYCHA**. See **DIPTYCHA**.

DYSCRASY, an ill temperament or habit of the blood and humours, as in a jaundice, or the like.

DYSENTERY, ΔΥΣΕΝΤΕΡΙΑ, in medicine, a bloody diarrhæa; or a flux of blood by stool; attended with pains, and griping.

The word *Dysentery* is formed from the Greek *δύς*, difficulty, and *έντερων*, intestine; and properly signifies that kind of flux of the belly, characterized by the frequency of stools, or dejections, mixed with blood, and accompanied with gripes: the fever, ulcers, &c. which attend it, are not essential to the disease; though many, both of the ancients and moderns, think the latter are.

The *Dysentery*, Sydenham observes, begins with a chillness, and shivering; which is followed by a heat; then gripings of the belly ensue, with mucous, or sanious stools, which in progress of time are found interperled with streaks of blood, and attended with vehement pain.

The stools are sometimes void of blood; and yet, if they be frequent, and attended with gripes, and a mucous colluvies, the same author says, it is a proper *Dysentery*.

Along with the excrements, beSIDE a whitish mucosity, frequently there comes scrapings of the guts, in form of little skins. If pure blood be evacuated the patient's life is in great danger.

Etmuller makes three kinds of *Dysenteries*.—1. When a laudable blood is evacuated, from a mere plethora, or plenitude, without any disorder of the intestines; as in the hæmorrhoidal flux.

2. When a thin, watery blood is evacuated; called the *Hæpatic Flux*, though really arising from the hæmorrhoidal vessels.

The third kind, which is that we more peculiarly call *Dysentery*, is, when blood is cast out mixed with a purulent matter in the excrements.

This is either *benign*, i. e. without a fever, and not contagious; or *malignant*, which is attended with a pestilential fever, and frequently ravages whole cities, and provinces: happening most commonly in armies. In the last stage, a sort of caruncles are frequently ejected along with the purulent matter, which are difficult to be accounted for, unless from an excoriation, and ulceration of the intestines. Sometimes the intestines in this case are even gangrened.

The cause of the *Dysentery*, as assigned by some physicians, is a ferous, or other morbid humour, mixed with the mass of blood; the consequence of which is a too great fermentation in the blood, and a dissolution of its parts, which

are thus rendered too liquid.—The second cause is a vellecation, and irritation of the nervous fibres of the intestines, occasioned by sharp, acid humours separated from the blood; which occasion the spiral fibres, that produce the peristaltic motion of the guts, to move too fast, and thus to expel the matters too hastily out of the intestines.—The mediate cause, in the physicians language, is some foreign body adhering strongly to the intestines, and by its sharp points, vellecating the nervous fibres of the intestines, and at length ulcerating them.—The remote causes are any thing that corrupts the mass of blood, as viscid and crude, sharp juices; ill foods; autumnal fruits; grapes; new wine drunk in excess; poisons; violent medicines; waters that have corroded leaden pipes; rainy weather in the spring, with a dry winter, and a hot summer, and autumn.

The seat of the disease is in the intestines, either the large, or the small, or both: when the disease is in the small ones, the gripes begin long before the stools, and are felt about the navel; and the blood, and excrements, are more blended; as being longer together. When the larger intestines are seized, the pain is less vehement, and is felt lower, &c.

Purgatives have rarely any good effect in *Dysenteries*; as increasing the fermentation of the blood, and irritating the fibres of the intestines more and more. Nor are emetics much better; as tending to draw the peccant humours into the stomach, or at least into the higher intestines, and thus cause more frequent stools.

Ipecacuanha, however, is excellent on this occasion: not so much as a vomitory, Dr. Friend observes, as a sudorific; having this faculty beyond all other emetics, that it corrects the *Dysenteric* ferment, in proportion as it evacuates it.—In the *Philosophical Transactions* we have an express discourse on the subject; where it is asserted to be infallible in all *Dysenteries* and loosenesses, how dangerous and inveterate soever; except in pulmonic and hydroptic patients, whose fluxes are indications of approaching death.

Sydenham commends phlebotomy: but Willis says, no evacuation is good: and prescribes hot cardiacs, as spirit of wine a little burnt, &c.—Balsamic, and styptic medicines are also to be used, according to the diverse causes, and symptoms of the disease.

Borri, in a letter to Bartholine, affirms there is no better medicament in *Dysenteries* than rose-water, wherein gold has been extinguished.

Doleus relates, that he cured above an hundred persons with oil of sweet almonds, mixed with orange-juice. See *Supplement*, article **DYSENTERY**.

DYSPEPSY *, ΔΥΣΠΕΨΙΑ, in medicine, a difficulty or weakness of digestion. See **DIGESTION**.

* The word is formed from the Greek *δύς*, difficulty, and *πέψιν*, coquere, to concoct.

The *Dyspepsy* may arise from the too great weakness of the ferment of the stomach, or its being too sparing in quantity; from a relaxation of the fibres of the stomach; the want of a proper heat in the stomach, &c.—Bitters, and sub-astringents, are its proper remedy.

DYSPNOEA *, ΔΥΣΠΝΟΙΑ, in medicine, a difficulty of breathing.

* The word is formed from the Greek *δύς*, difficulty, and *πνεύμα*, I breathe.

The *Dyspnœa* admits of three degrees: a short-breath; an asthma; and an orthopnœa.—The short-breath, is the first, and lightest degree.—The asthma is more violent, and is accompanied with a wheezing.

The orthopnœa is the highest of all; the patient affected therewith not being able to lie down, but obliged to keep erect, without which he could not respire.

The most usual causes of *Dyspnœa*'s are phlegm lodged in the bronchia; or the too strong contraction of the bronchia themselves, which prevent the easy ingress of the air into the lungs. See **ASTHMA** and **ORTHOPNŒIA**.

DYSURIA *, ΔΥΣΟΥΡΙΑ, in medicine, a difficulty of making urine, accompanied with pain, and a sense of heat.

* The word is formed from the Greek *δύς*, difficulty, and *ούρον*, to make urine.

It is also called *Ardor Urinæ*, by reason the urine seems to burn the urethra, as it issues forth.

The *Dysuria* differs chiefly from the strangury in this, that in the strangury, the urine only oozes out, as it were drop by drop; whereas in the *Dysuria* when it is made it streams out without an interruption, and frequently in the proper quantity.

The ordinary causes of the *Dysuria*, are the acrimony, or sharpness of the urine; and the excoriation, or exculcation of the neck of the bladder, or of the urinary passage.

E.

E

E

The fifth letter of the alphabet, and the second vowel.

E, is a letter that admits of some variety in the pronunciation, in most languages; whence grammarians usually distinguish several E's, or kinds of E. The Greeks, *e. gr.* have their short and long *e*, viz. *e* and *η*, epsilon and eta.

The Latins have an opener *e*, called *vastius*; such was the second *e*, in the word *here*, *mafter*; and another closer, as that in the adverb *here*, *yesterday*. This latter *e* they frequently used promiscuously with *i*. Thus for *here*, they wrote, *heri*: and, in diverse places, we meet with *sibe*, *quase*, &c. for *sibi*, *quasi*, &c.

The Roman *e*, was likewise sometimes wrote, by corruption, *æ*: for which reason, F. Hardouin takes that medal of Gallienus, GALLIENÆ AUGUSTÆ, not to be any satirical medal, as others have imagined; nor to be a dative feminine, but a vocative masculine, *Galliene auguste*, wrote with the *æ*. In English we easily distinguish three E's, or three sounds of E: The first, *mute*, and not heard at all; as in *Amsterdam*, *sunfe*, *blue*, &c. The second, *close* or *short*, pronounced with the lips nearly shut; as in *nettle*, &c. The third, *open* or long, as in *fiar*, *east*, &c.

The French have, at least, six kinds of E; the first, pronounced like A; as in *emporer*, *orient*, &c. The second, a final mute, in the last syllable of diverse words not pronounced at all; as in *bonne*, *donne*, &c. The third, an imperfect mute, pronounced much like the diphthong *ea*, &c. as in *Je*, *de*, *te*. The fourth, *e ferme*, or *e masculine*, marked at the ends of words with an accent *é*. The fifth, is *e ouvert*, or long *e*, having the same found with *ai*; as in *mer*, *seste*, &c. In the middle of words it is sometimes marked with a circumflex, and in the end, with an accent, *ê*. The sixth, is an intermediate *e*, between the *ouvert* and *ferme*; as in *cabaret*, *lettres*, &c. Some add a seventh kind of *e*, not reducible to any of the former, as that in *grammarien*, *historien*, &c. And others admit of only three kinds, viz. the mute, open, and shut; but they make variations therein, which amounts to the same thing.

As to the figure of the letter E, we borrow it from the Latins, who had it from the Greeks, and they from the Phœnicians, by Cadmus, who first brought it them. Now the Phœnicians had the same characters with the Hebrews. Accordingly, the form of the ancient Hebrew *He*, was the same with that of our E, as may be seen in the Hebrew medals, and the Jesuit Soucier's *dissertation* thereon, p. 143. All the difference between them consists in this, that the Hebrews reading from right to left, turn their letters that way; whereas the moderns, reading from left to right, write their letters accordingly.

The little *e*, was formed of the great one, by writing it fast, and making the cross strokes at top and bottom without taking pen off paper, and then adding the stroke in the middle.

The Greek *η*, or *H*, *Eta*, or *Ita*, was no original letter; but was added to the alphabet in after times. Of this we have proofs still extant in the ancient monuments; particularly, the Farnese columns, brought to Rome from the *Via Appia*, where the *Epsilon*, E, is used in lieu of the H: *e. gr.* ΔΕΜΕΤΡΟΣ ΚΟΡΕΣ, or ΔΗΜΗΤΡΟΣ ΚΟΡΗΣ. This letter is said to have been added by Simonides. *Bibliand. de Ration. Cohnun. Linguar. p. 40.*

The pronunciation of the *η*, seems to have been varied; it having been sometimes the same with the Latin *e*, sometimes with *i*. Terentianus assures us of the former; and the Greeks themselves for many ages have only used the latter.

It has been much disputed how the Latins render the *η*, in their language? The common opinion is, that they render it by an *e*; as in *Δουλειε*, *βίβα*, *μυσε*, *ονου*, *οναυε*, &c. which they rendered *Demetrius*, *Beta*, *Hemera*, *Thefus*, *Thefaurus*, &c. Though there are persons exceedingly well versed in antiquity, who hold that they pronounced it like an *i*. Lud. de Dieu, one of the most learned grammarians of his age, observes as much in his animadversions on Genesis vi. 24. Adding, that it is for this reason, that the Hebrews, *e. gr.* the paraphrast Jonathan, express it by a *Hibirik*; *מְהַרְהַר*. J. Rod. Wettstein proves the same in his learned oration on the true pronunciation of the Greek tongue from an infinity of instances. To this purpose he cites a MS. *Psalter* of the VIIIth century, where all the *η*'s are expressed by *i*'s. In effect, Wettstein shews, not only that the Latins pronounced and wrote it as an *i*, which might happen from its being so easily confounded in writing with an *i*; but also that they ren-

E A G

dered it by an *æ*, and *ai*; that it was often used for *γ* and *Ε*; and that in the time of Plato this letter had a kind of intermediate found between the *æ* and *i*. See that author, and Vossius *de Idolo*, L. II. C. 16.

E on the keys of an organ, or harpsichord, denotes the tones *E*, *mi*, *la*.

On the compass, in sea-charts, &c. it marks the east point, or wind. E. East. ESE. East South East. NE. North East, &c.

In the calendar, E makes the 5th of the dominical letters. Among authors, *E. gr.* stands for *exempli gratia*, for instance. In several *Dictionaries* we find it noted, that the letter E, among the ancients was a numeral letter, signifying 250, according to the verse,

E quoque Ducentos & Quinquaginta tenebit.

But it has already been observed, that this use of numeral letters was unknown among the earliest people. Isidore Hispanensis, an author of the VIIth century, says as much in express terms, in the first book of his *Origines*, cap. III. In effect, it was first introduced in the times of barbarism and ignorance.

EAGER *Wine*. See the article WINE.

EAGLE, *Aquila*, *Aeros*, in natural history, the largest, strongest, and swiftest of all the birds that live by prey.

It has a long beak, hooked almost from the root; yellow, scaly legs; thick, crooked talons; and a short tail. Its plumage is chestnut coloured, brown, ruddy and white. Its beak, black at the tip; and in the middle, blue, though in some yellow.

The *Eagle* is distinguished from the hawk by his beigness; and from the vulture, by the crookedness of his beak.

Its acry, or nest, is usually on the highest rocks, sometimes on the tops of old trees. It feeds its young till such time as they are able to fly, and then drives them out of the nests. Its food is birds, hares, lambs, kids and fawns; nay, Sir Robert Sibbald assures us, children too, when it can catch them; of which he gives an instance in the Orcaes islands. *Prod. Nat. Hist. Scot. L. III. p. 2. and 14.*

Ray mentions an *Eagle's* nest, found near the river Derwent, in 1668. It consisted of large strong sticks, one end whereof was laid on the crag of a rock, and the other on two beech-trees; it was two yards square: in it were found one *Eaglet*, with the carcasses of one lamb, one hare, and three grylls. *Synops. Method. Av. p. 6.* The *Eagle* frequently watches the fishing hawk, and as soon as it perceives it to have struck a fish, takes wing, pursues the bird till it lets fall its prey, and often catches it before it reaches the earth or water. *Philos. Transact. N^o. 201.*

It lives very long, and as naturalists assure us, rarely dies but of hunger; the upper part of its crooked beak growing so long with age, that it closes up the lower, and so disables it from opening and taking in food. But this seems to be only a popular error.

Its sight is quick, strong and piercing to a proverb. The reason why the *Eagle*, the fibres of whose optic nerves are not stronger than those of other animals, is able to face the sun, and endure its brightest rays, the Jesuit Angelus, in his *Optics*, assures us, is, that it has two sets of eye-lids, the one thick and close, and the other thinner and finer, which last it draws over the eye, when it looks at any luminous body, and thus breaks the force of its rays.

The falconers have trained up *Eagles* to the game; but they only succeed in mountainous countries. On plains they cannot keep any time on the wing, and when they stoop, or light are weak, so that the fiker beats them.

Aristotle, and Pliny, reckon up six kinds of *Eagles*, to which they give names corresponding to the difference of their plumage: as the *Eagle-royal*, called by Aristotle, *γυμνι*, and *αετω*, from the ruddy, golden colour of its feathers, which are likewise spotted as it were with *stars*. The *black Eagle*, *valeria*, the smallest and most vigorous of all. The *white-tailed Eagle*, or *pygargus*. The *middle sized Eagle*, with a large tail, living in morasses, *morphus*: The *Sea-Eagle*, *halietus*: and the *Bearded-Eagle*, a kind of *affraga*.

EAGLE, in heraldry, is the symbol of royalty, as being, according to Philostratus, the king of birds; and for that reason dedicated, by the ancients, to Jupiter.

The *Eagle*, is the arms of the emperor, the king of Poland, &c. It is accounted one of the most noble bearings in heraldry, and, according to the learned in that art, ought never to be given, but in consideration of singular bravery, generosity, &c. On which occasions, either

either a whole *Eagle*, or an *Eagle Naissant*, or only the head, or other parts, agreeable to the exploit, may be granted.

The *Eagle* is sometimes represented with one head, and sometimes with two, though never more than one body, two legs, and two wings opened, or stretched out, in which posture, it is said to be *spread or displayed*: such is that of the empire, which is blazoned a *spread Eagle, sable, diademed, langued, beaked and membered, gules*.

The reason why *Eagles* are generally given in heraldry displayed, is partly, because in that posture they fill up the escutcheon better, and partly, because it is imagined a posture natural to the *Eagle*, when it plumes its feathers, or faces the sun. However, there are *Eagles* born in other postures: and some monstrous ones, with human or wolves heads, &c. The late authors only say *displayed*, to express the two heads: and say an *Eagle*, without any addition, when it has but one. The kingdom of Poland bears *gules, an Eagle argent, crowned and membered, or*.

The *Eagle* has been born, by way of ensign, or standard, by several nations. The first who seem to have assumed the *Eagle*, are the Persians; according to the testimony of Xenophon. Afterwards, it was taken by the Romans; who, after a great variety of standards, at length fixed on the *Eagle*, in the second year of the consulate of C. Marius: till that time, they used indifferently wolves, Leopards, and *Eagles*, according to the humour of the commander.

Several among the learned maintain, that the Romans borrowed this custom from Jupiter, who had appropriated the *Eagle* as his own badge, in commemoration of its supplying him with nectar, while he lay concealed in Crete, for fear of being devoured by his father Saturn. Others hold that they borrowed it from the Tuscan, and others from the Epirotes.

The *Roman Eagles*, it must be observed, were not painted on a cloth, or flag; but were figures in relieve, of silver or gold, bore on the tops of pikes; the wings being displayed, and frequently a thunder-bolt in their talons. Under the *Eagle*, on the pike, were piled bucklers, and sometimes crowns. Thus much we learn from the medals. See Feschi in his *Dissert. de Insignibus*. And Lipsius, *de Militia Romana*, L. IV. Dial. V.

Constantine is said to have first introduced the *Eagle* with two heads, to intimate, that though the empire seemed divided, it was yet only one body. Others say, that it was Charlemain, who refusing the *Eagle*, as the Roman ensign, added to it a second head: but that opinion is destroyed, by an *Eagle* with two heads, noted by Lipsius, on the Anthonine column: as also by the *Eagle's* only having one head on the seal of the golden-bull, of the emperor Charles IV. The conjecture, therefore, of F. Menestrier, appears more probable, who maintains, that as the emperors of the east, when there were two on the throne at the same time, struck their coins with the impression of a cross, with a double traverse, which each of them held in one hand, as being the symbol of the christians; the like they did with the *Eagle* in their ensigns; and instead of doubling their *Eagles*, they joined them together, and represented them with two heads. In which they were followed by the emperors of the west.

Fa. Papebroche, wishes that this conjecture of Menestrier were confirmed by ancient coins; without which, he rather inclines to think the use of the *Eagle* with two heads, to be merely arbitrary: though he grants it probable, that it was first introduced on occasion of two emperors in the same throne.

The *Eagle* on medals, according to M. Spanheim, is a symbol of divinity, and providence; and according to all other antiquaries, of empire. The princes on whose medals it is most usually found, are the Ptolemies and the Seleucides of Syria.—An *Eagle* with the word CONSECERATIO, expresses the apotheosis of an emperor.

EAGLE, *Aquila*, in astronomy, is a constellation of the northern hemisphere, having its right wing contiguous to the equinoctial.

For the stars in this constellation, their number, longitude, latitude, &c. See **AQUILA**.

There are also three several stars, particularly denominated among the Arab astronomers, *Nasr*, i. e. *Eagle*. The first, *Nasr Sebail*, the *Eagle of Canopus*, called also *Sitarek Jemen*, the star of Arabia felix, over which it is supposed to preside: the second, *Nasr Althair*, the flying *Eagle*; and the third, *Nasr Alwake*, the resting *Eagle*.

White EAGLE, is a Polish order of knighthood, instituted in 1325, by Uladilas V. on marrying his son Casimire, with a daughter of the great duke of Lithuania.

The cavaliers of this order were distinguished by a gold chain, which they wore on the stomach, whereon hung a silver *Eagle* crowned.

Black EAGLE, was a like order, instituted in 1701, by the elector of Brandenburg, on his being crowned king of Prussia.

EAGLE, in architecture, is a figure of that bird antiently used as an attribute, or cognizance of Jupiter, in the capital and friezes of the columns of temples consecrated to that god.

EAGLE-STONE, in natural history, a stone, by the Greeks, called *Ætites*, and by the Italians, *pietra d'Aquila*, as being supposed to be sometimes found in the *Eagle's* nest; it is of famous traditional virtue, either for the forwarding, or preventing the delivery of women in labour, according as it is applied above, or below the womb.

Matthioli tells us, that birds of prey could never hatch their young without it, and that they go in search for it as far as the East-Indies. Bauhch. has an express Latin treatise on the subject. See Supplement article **ÆTITES**.

EAGLET, or **EAGLON**, a diminutive of *Eagle*, properly signifying a young *Eagle*.

The *Eagle* is said to prove his *Eaglets* in the brightness of the sun; and if they shut their eye lids, he disowns them.

In heraldry, when there are several *Eagles* on the same escutcheon, they are called *Eaglets*.

EALDERMAN, or **EALDORMAN**, among the Saxons, was of like import with *earl* among the Danes. Camb. Britan. p. 107.

The word was also used for an elder, senator, or statesman. Hence, at this day, we call those *Aldermen*, who are assistants to the chief officer in the common council of a city or corporate town.

EAR, *Auris*, the organ of hearing; or that part whereby animals receive the impression of sounds.

The *Ear* is generally divided into *internal* and *external*.—The *external*, or *outer Ear*, in most animals, consists of two principal parts, viz. that which appears prominent from the head, called the *Auricle*; and an inner part, which enters the skull by a narrow passage, called the *Meatus Auditorius*, and leads to the *Auris*, or *Ear*, properly so called.

The *Auricle*, or outer part of the *external Ear*, is semi-circular, and contains diverse sinuosities. Its upper part, which is the broadest, is called *pinna*, and sometimes *ala*; and the lower, which is narrower, softer and pendant, the *lobes*, or *fibra*, being that to which ladies hang their ear-rings, &c.

The outer area, or extent of the *Auricle*, is called the *helix*; and the inner, opposite thereto, the *anthesis*: the little protuberance of the side next the face, is called the *tragus*, or *ircus*; and the ridge just above, and opposite to it, the *antitragus*; and the cavity, leading to the beginning of the *meatus*, the *concha*. See each part described under its proper article.

The *Auricle* stands out from the head, and is furrowed with diverse winding canals, which receive and collect the wandering circumambient impressions, and undulations of sound, and modify and forward them to the inner *Ear*. It is formed of a thin cartilage, covered with a skin. It has two muscles, which in men are very small, whence some anatomists deny there are any at all, though others increase their number to three, one attollent, and two retract; and others to four. But in brutes, which move and prick the *Ears*, as horses, asses, &c. they are very large and considerable. Those who have lost their *Auricles*, M. Dionis observes, have but a confused way of hearing; and are obliged either to form a cavity round the *Ear* with their hands, or to make use of a horn, applying the end of it to the *meatus auditorius*.

The inner part of the *external Ear*, is possessed by the *meatus auditorius*, or auditory passage, which commences from the bottom of the concha, called the *Alvearium*, and is continued in a winding direction, turning sometimes this way, and sometimes that, to the *membrana tympani*. The *meatus* is dug out of the *os temporis*, and lined with a skin, or membrane, which is furnished with diverse little glands, that separate a thick, yellow, glutinous humor, called *cerumen*, or *ear-wax*, serving to defend the *Ear* from the ingress of vermin, and other extraneous bodies. This *meatus* is all the *external Ear*, in diverse animals, as reptiles, birds, moles, diverse fishes, &c. The further end thereof is closed by a thin, dry, round, transparent membrane, called the *membrana tympani*, and improperly, *tympanum*, or drum, which separates the *external Ear* from the *internal*.

Behind the *membrana tympani*, is a cavity called, by different authors, the *tympanum*, *cavitas tympani*, *concha interna*, and *meatus auditorius internus*. In this cavity are five considerable parts, viz. four little bones, two apertures, called *foramina*, or *fenestree*, as many *meatus's*, or passages; four muscles, and a branch of a nerve.

The first of the bones, or ossicles, is the *malleolus*, *malleus*, or hammer: the second, is called the *incus*, or anvil: the third, the *stapes*, or stirrup: and the fourth, the *orbicularis*. These bones are nearly of the same bigness at the birth of the child, as when it is arrived at maturity; so that all that age does is to harden them.

To give motion to these bones, is the office of the four muscles of this cavity; three of them belonging to the malleus, viz. the

the externus, obliquus, and internus; and the fourth to the flapes, called the *musculus stapedis*.

The two meatus's are situate at the sides of the cavity; the one opening into the palate, called *aqueaductus*; the other shorter and bigger, opening into the sinus in the mamillary process.

The two apertures, or fenestræ, of the tympanum, are in the surface of the os petrosum, which is opposite to the membrane of the tympanum. The first, called *fenestra ovalis*, by reason of its figure, is situate a little higher than the other, and receives the basis of the flapes. The other is called *rotunda*, notwithstanding its figure, is oval like the former, and is closed by a thin, dry, transparent membrane, resembling that of the tympanum.

The last thing considered in the cavity of the tympanum, is a fine chord which runs over the inner surface of the membrane, called *choria tympani*. Anatomists have long disputed, whether it was an artery, a vein, a nerve, or the tendon of one of the muscles of the malleus: but it is now discovered to be a branch of the fifth pair of nerves, which meets the portio dura of the auditory nerve.

The two fenestræ abovementioned, open into a cavity dug out of the os petrosum, called the *labyrinth*, as being perplexed with diverse windings and meanders. In this cavity is supposed to be contained the innate air. It is divided into three parts; the first called the *vestibule*, by reason it leads into the other two: in it are observed nine apertures, or foramina. The second, placed on one side of the vestibulum towards the back of the head, comprehends three round canals, disposed in a semi-circular form, and thence called *canales semi-circulares*. The third is the *cochlea*, which consists of two parts, *viz.* a spiral semi-oval canal; and a lamina, formed into a spiral figure. The canal makes two turns and an half round a newel, or axis, still growing leis as it ascends. The spiral lamina divides this cavity into two, being fastened by its base to this newel, and by its other extremity, to the surface of the canal opposite to the newel, by means of a very fine membrane. The cavity of the cochlea thus divided, forms, as it were, two winding stair-cases, both formed on the same newel, one over the other, but without any communication between them. In the aqueduct is the auditory nerve, which consists of two branches, or parts, the one soft, called *portio mollis*; and the other harder, *portio dura*: the soft part is spent on the organ of hearing, being divided into five branches, which form a delicate web, that lines the vestibulum, cochlea, &c. The hard part, passing out of the cranium is distributed among the parts of the external ear, &c.

The other vessels of the internal ear, are arteries and veins from the carotids and jugulars.—Particular descriptions of each part of the ear, see under the proper articles, FENESTRA, MALLEOLUS, STAPES, ORBICULARE, LABYRINTH, VESTIBULE, COCHLEA, CANALES *Semi-circulares*. AUDITORY Nerve, &c.

The immediate organ of hearing, has been generally supposed to be the membrane of the tympanum: but later anatomists shew this to be a mistake, from diverse instances wherein that membrane has been absolutely destroyed, and broke, without the least diminution of the sense of hearing.

The parts that bid the fairest for this prerogative are those which compose the labyrinth, *viz.* the cochlea, lamina spiralis, vestibule, and semi-circular canals: the portio mollis of the auditory nerve, ramified and diffused through these parts, receives the impressions of sounds, and propagate them to the brain.

Behind, and under, the external ear, are a number of large glands called *parotides*, wherein is separated a great deal of saliva, which is conveyed by the excretory ducts into the mouth.

Distempers incident to the ear and adjacent parts, are noises, otalgia, otocela, deafness, &c.

The comparative anatomy of the ear furnishes abundant instances of the creator's wisdom:—In birds, the outer ear is of a form proper for flight; not protuberant, as that would obstruct their progress, but close and covered.

In quadrupeds, its form is agreeable to the posture and motion of the body, but admirably varied, according to their various occasions: in some, as the hare, it is large, open, and erect; by which means, that timorous, defenceless creature, is warned of the least approach of danger: in others, it is covered, to keep out noxious bodies. In the subteraneous quadrupeds, who are forced to mine and dig for their food and habitation, as a protuberant ear would obstruct them, and be liable to injuries, their ears are very short, and are lodged deep and backwards in the head.

Thus moles have no auricle at all, but only a round hole, between the neck and shoulder. Some authors observe, that this meatus, or passage, is closed with a little skin, which opens and shuts like an eye-lid. The sea-calf, and the several species of lizards and serpents, are likewise without any external

ear. And the tortoise, cameleon, and generality of fishes; have the passage of the ear quite stopped, or covered over. And there is a sort of whale, which has the aperture of the ear under the shoulder.

Among all the varieties in the structure of this organ, none, Dr. Grew observes, are more remarkable than those in the passage into the os petrosum. For in an owl, which perches on a tree, or beam, and hearkens after the prey beneath her, it is produced further out above, than below, for the better reception of the least sound: in a fox, which scouts underneath the prey at roost, it is for the same reason produced further out below: in a pole-cat, which hearkens strait forwards, it is produced behind, for the taking of a forward sound: whereas in a hare, which is very quick of hearing, and thinks of nothing but being pursued, it is supplied with a bony tube, directed backwards, so as to receive the smallest, and most distant sound that comes behind her.

Schelhammer denies the existence of the innate air, so much talked of, in the labyrinth; and with good reason, as there is a passage out of the labyrinth into the throat, through which the innate air must escape. This is past doubt: since by stopping the breath, and straining; we can force the external air into the ear, and even hear it rushing in. When the passage is any way stopped, as by a cold, &c. the hearing thereby becomes dull and obtuse: and when by strong swallowing, or other motion of the throat; the passage is opened, we perceive it by a sudden crack, and immediately hear very clearly; the load of feculent air being then discharged from the inner ear.

Several naturalists and physicians have held, that cutting off the ears rendered persons barren, and unprolific; and this idle notion was what first occasioned the legislators to order the ears of thieves, &c. to be cut off, lest they should produce their like.

The ear has its beauties, which a good painter ought by no means to disregard: where it is well formed, it would be an injury to the head to be hidden. Suetonius insists particularly on the beauties of Augustus's ears; and Ælian, describing the beauties of Aspasia, observes she had short ears. Martial also ranks large ears among the number of deformities. Felibien.

Among the Athenians, it was a mark of nobility to have the ears bored, or perforated. And among the Hebrews and Romans this was a mark of servitude.

Tingling of the EAR. See the article TINNITUS.

EAR, in music, denotes a kind of internal sense, whereby we perceive and judge of harmony, and musical sounds.

In music, we seem universally to acknowledge something like a distinct sense from the external one of hearing; and call it a good ear. And the like distinction we should probably acknowledge in other affairs, had we got distinct names to denote those powers of perception by.

Thus, a greater capacity of perceiving the beauties of painting, architecture, &c. is called a *fine taste*.

EAR-RING, } See the articles { PENDANT.

EAR-WAX, } { CERUMEN.

EAR, is also applied to a long cluster of flowers, or seeds, produced by certain plants, and usually called by botanists, *spica*.

The flowers and seeds of wheat, rye, barley, &c. grow in ears. The same holds of the flowers of lavender, &c.

We say, the stem of the ear, i. e. its tube or straw: the knot of the ear: the lobes, or cells, wherein the grains are enclosed: the beard of the ear, &c. great numbers of ears of wheat have been known to arise from the same root.

Jews EAR. See the article JEW.

EARING Third. See the article THIRD.

EARL, an English title of honour, or degree of nobility, next below a marquis, and above a viscount.

Earls, were anciently attendants, or associates of the king in his councils, and martial expeditions; such as comites, counts, were of the magistrates of Rome, in quality of deputies, to execute their offices for them.

Hence, also Earls are called in Latin, *comites*; in French, *comtes*, counts, &c.—The Germans call them *graves*, as landgrave, markgrave, palgrave, &c. The Saxons, *caldormen*; the Danes, *eorlas*; and the English, *Earls*. Originally, the title Earl always died with the man; William the Conqueror first made it hereditary; giving it in fee to his nobles; and annexing it to this or that shire or county: for the support of the state thereof, he allotted the third penny out of the sheriffs court, sitting out of all pleas of the shire from which the Earl took his title. But of later days the matter is much altered.

Earls are now created by charter, without any authority over, or particular relation to, their counties; and without any profit arising thence, except some annual stipend out of the exchequer for honour sake. The number of Earls being of late much increased, and no more counties being left for them; several of them have made choice of some eminent part of a county,

county, as Lindsey, Holland, Craven, &c. Others, of some town, as Marlborough, Exeter, Bristol, &c. And others of some village, or their own feat, park, &c. as Godolphin, Bolton, Danby, Wharton, &c.

Two *Earls* we have which are not local, *i. e.* not dignified from any places, but from noble families, *viz.* *Earl Rivers*, and *Earl Paulet*. A third is denominatèd from his office, *viz.* the *Earl Marshal*.

Earls are created by cincture of sword, mantle, a cap and a coronet put on his head, and a charter in his hand. They are styled by the king, *consanguinei nostri*, our cousins. Their title is, *most potent and noble lord*. Their coronet has the pearls raised on points, with leaves between.

Earl was a mighty title among the Saxons: it is observèd to be the most ancient of any of the peerage; and that there is no other title of honour in use among the present nobility which was likewise used among the Saxons, beside it.—The original titles of honour among the Saxons, were *Æling*, *Calepman*, and *Dezen* or *Dezn*.—The first appropriated to those of the royal family: the other two to the rest of the nobility; only the thani were afterwards distinguished into majores and minores.

EARL-MARSHAL, is a great officer, who had anciently several courts under his jurisdiction, as the court of chivalry, now almost forgotten; and the court of honour, lately revived.

He has also some preheminance in the court of marshalsea; where he may sit in judgment against criminals offending within the verge of the court; whence the chief officer under him is called *Knight-Marshal*.—Under him is also the herald's office, or college of arms.

The office of *Earl-Marshal* is hereditary in the most noble family of Howard; and enjoyed by the duke of Norfolk, the principal branch thereof; though now, for reasons of state, it is discharged by deputation: but yet it is to be observèd, it is not given out of the name, and family of Howard.

EARNEST, *Arrhæ*, money advanced to compleat, or assure, a verbal bargain, and bind the parties to the performance thereof.

By the civil law, he who recedes from his bargain, loses his *earnest*: or, if the person, who received the *earnest*, give back, he is to return the *earnest* double. But, with us, the effect of *earnest* is more: the person who gave it, is in strictness obligèd thereby to abide by his bargain; and in case he decline it, is not discharged upon forfeiting his *earnest*; but may be sued for the whole money stipulated.

EARTH, *Terra*, in natural philosophy, one of the four vulgar or prapetetical elements; defined a simple, dry and cold substance; and as such, an ingredient in the composition of all natural bodies.

It should be well observèd, that the element *earth* is a very different matter from the *earth* whereon we tread: Aristotle having laid down cold and dry as his first element; to give it a suitable name, looked among the diverse bodies, for that which should come the nearest thereto; which being *earth* he gave his first element that denomination: though, thus borrowing a word that had been used for a different thing, occasioned a great part of his followers to run into an extravagant error, and to suppose, that this habitable fossil *earth*, was an element.

EARTH, in chymistry, is the fourth of the chymical elements, or principles, into which all bodies are resolvable by fire.

After drawing off the spirit, sulphur and phlegm, and salt, *e. gr.* of wine, what remains in the retort, is a tasteless smellèd, dusty matter, not capable either of being raised by distillation, or dissolved by solution, and is called *earth*, or *terra damnata*, or *caput mortuum*. See **CAPUT MORTUUM**.

This *earth* is supposed to be the basis, or substratum of all bodies; and that, wherein the other principles reside. It is all that is solid, *e. gr.* in an animal or vegetable body, *i. e.* all the real vascular part; the rest being juices.

EARTH, in natural history, is a fossil, or terrestrial matter, whereof our globe principally consists; whose character is to be neither dissoluble by fire, water nor air; not transparent, more fusible than stone, and generally containing some degree of fatness.

Of such *earths* some are simple, and immutable; others, compound and fatty. Of the first kind is chalk, pumice, and rotten-stone; of the second, or compound kind, are boles of all kinds, red, white and brown; fullers *earth*, the diverse kinds of medicinal *earth*, as the cretica, hungarica, turcica, fœcica, lemnian *earth*, malta *earth*, terra sigillata, &c. To this class are likewise referred argillæ, or clay-*earths* formed into potters ware.

These *earths* are all chymically resolvable into an oil, a little acid salt, &c. and a calx, which is the basis, or the *earth* properly so called. See the divers kinds of *earths* described

under their proper articles, CHALK, PUMICE, BOLE, SIGILLATA-Terra, &c.

Naturalists generally rank sand as a species of *earth*; though with no great propriety. Sands being, in strictness, a sort of crystals, or little transparent pebbles, calcinable, and by the addition of a fixed alkaline salt, fusible, and convertible into glass: and therefore properly reducible to the class of stones.

By means of sand it is, that the fatty *earth* is rendered fertile, and fit to feed vegetables, &c. for pure *earth* is liable to coalesce into a hard coherent mass, as in clay; and *earth* thus imbedded and as it were glued together, would be very unfit to nourish plants. But if with such *earth*, sand, *i. e.* hard crystals which are indissoluble in water, and still retain their figure, be intermixed, they will keep the pores of the *earth* open, and the *earth* it self loose and incompact, and by that means will give room for the juices to move, ascend, &c. and for plants to be nourished thereby. Thus a vegetable, planted either in the sand alone, or in the fat glebe and *earth* alone, receives no growth or increase; but is either starved or suffocated; but mix the two, and the mass becomes fertile. In effect, by means of sand, the *earth* is rendered in some measure organical: by preserving a sort of pores, and interstices therein, somewhat analogous to vessels is effected, by which the juices of the *earth* may be conveyed, prepared, digested, circulated, and at length excreted and thrown off into the roots of plants. See Supplement article TERRÆ.

CASTING, in EARTH. See the article CASTING.

EARTH, in geography, this terraqueous globe, or ball, whereon we inhabit, consisting of land and sea.

The *earth*, considered in different relations, or habitudes, makes the subject of geography, and geometry.

The figure of the EARTH is demonstratèd to be nearly spherical.

Thus the moon is frequently seen eclipsed by the shadow of the *earth*; and in all eclipses, that shadow appears circular, what way soever it be projectèd, whether towards east, west, north or south, and howsoever its diameter vary, according to the greater or less distance from the *earth*.

Hence it follows, that the shadow of the *earth*, in all situations, is really conical; and consequently the body that projects it, *i. e.* the *earth*, is nearly spherical.

The natural cause of this sphericity of the globe is according to Sir Isaac Newton, the great principle of attraction, which the creator has stamped on all the matter of the universe; and whereby all bodies, and all the parts of bodies mutually attract one another.

And the same is the cause of the sphericity of the drops of rain, quicksilver, &c.

We say it is nearly spherical; for the inequalities on its surface prevent its being perfectly so. Besides, that Huygens and Sir Isaac Newton have shewn, that the *earth* is higher and bigger under the equator, than at the poles: so that its figure, nearly, is that of an oblate spheroid, swelling out towards the equatorial parts, and flattened or contracted towards the poles.

The ratio of the greater diameter to the less, Huygens determines to be as 578 to 577.

The reason of this inequality is deduced from the diurnal rotation of the *earth* on its axis; as is already shewn in that of the sun.

This roundness of the *earth* is further confirmèd by its having been frequently sailèd round: the first time was in the year 1519, when Ferd. Magellan made the tour of the whole globe in 1124 days. In the year 1537, our countryman Drake performed the same in 1056 days: in the year 1586, Sir Thomas Cavendish made the same voyage in 777 days; Simon Cordes, of Rotterdam, in the year 1590; and in the year 1598, Oliver Noort, a Hollander, in 1077 days; Will. Corn. van Schouten, in the year 1615, in 749 days; Jac. Heremites and Joh. Huygens, in the year 1623, in 802 days: all of whom sailing continually from east to west, at length arrived in Europe, whence they set forth; and in the course of their voyage observèd all the phenomena, both of the heavens and *earth*, to correspond to and confess this spherical figure.

What the *earth* loses of its sphericity by mountains and valleys, is nothing considerable; the highest eminence being scarce equivalent to the minutest protuberance on the surface of a lemon: what it loses by the swelling of the equatorial parts is more sensible.

Sir Isaac Newton makes the greatest diameter 34 miles bigger than the less, fixing the ratio, as 692 to 688. If the *earth* were in a fluid state, its revolution round its axis would necessarily make it put on such a figure, by reason the centrifugal force being greatest towards the equator, the fluid would there rise, and swell most: and that it should be so now, seems necessary to keep the sea in the equinoctial regions from overflowing the *earth* thereabouts.

Add, that experiments made on pendulums, which must be

of different lengths, to fwing equal times here and at the equator, evince the fame thing.

M. de la Hire and M. Derham, indeed, have fhewn, that this diverfity may arife either from the greater heat, or the greater rarity of the air there than here; as having obferved a like variation between pendulums when heated and cold, and when in vacuo and open air. But, befides that Sir Ifaac Newton and M. Bernoulli, have fet afide thefe caufes as insufficient; M. Caffini has found, that the degrees of a meridian grow larger, the further we go towards the line by one eight hundredth part of every degree; which puts the fphericity of the earth beyond queftion.

The ancients had various opinions as to the figure of the earth: fome, as Anaximander, held it cylindrical; and others, as Leucippus, in form of a drum. But the principal opinion was, that it was flat; that the vifible horizon was the bounds of the earth, and the ocean the bounds of the horizon; that the heavens and earth above this ocean was the whole vifible univerfe, and that all beneath the ocean was Hades. Of which opinion were not only diverfe of the ancient poets and philofophers, but alfo fome of the christian fathers, as Laftantius, St. Auguftine, &c.

Fa. Taquet draws fome pretty conclufions from the fpherical figure of the earth; as, 1. That if any part of the furface of the earth were quite plain; a man could no more walk upright thereon, than on the fide of a mountain: 2. That the traveller's head goes a greater fpace than his feet; and a horfeman than a footman, as moving equal arches of greater circles: 3. That a vefel full of water being raifed perpendicularly, fome of the water will be continually flowing out, yet the vefel fill remain full; and on the contrary, if a vefel full of water be let perpendicularly down, though nothing flow out, yet it will ceafe to be full: confequently there is more water contained in the fame vefel at the foot of a mountain, than on the top; by reafon the furface of the water is compreffed into a fegment of a lefs fphere below than above. *Tacq. Afronom. L. I. c. 2.*

The magnitude of the EARTH, and the number of miles its diameter contains, has been variously determined by various authors, ancient and modern. The way to arrive at it, is, by finding the quantity of a degree of a great circle of the earth. But this degree is found very different, according to the different methods and instruments made ufe of, as well as the different obfervers.

The method obferved by Mr. Norwood, and the French aftronomers, Picard, Caffini, &c. viz. by meafuring the diftance between two remote places on the fame meridian, is undoubtedly the beft; and was performed with fuch exceeding accuracy, efpecially by M. Caffini, that hardly any thing further or better can be expected. According to that author, the ambit or circumference of the Earth is 123750720 Paris feet; or, 134650777 Englifh feet; or, 25031 $\frac{1}{2}$ of our ftature miles: whence, fuppofing the Earth fpherical, its diameter muft be 7967 ftature miles; and confequently its radius, or femi-diameter, may be taken in a round number for 20000000 feet: its furface will be 199444226 miles; which being multiplied into $\frac{1}{4}$ of its femi-diameter, gives the folid content of the globe of the earth 26485600000 cubic miles. On the furface of the earth are conceived the fame circles, as on the furface of the mundane fphere already defcribed; viz. an EQUATOR, ECLIPTIC, PROLECKS, POLAR-Circles, MERIDIANS, HORIZON, PARALLELS, &c. which fee, alfo SPHERE and GLOBE.

The teraqueous globe is now generally granted to have two motions, the one diurnal, around its own axis, in the fpace of 24 hours, which conftitutes the natural day or nycthemeron.

The other, annual, round the fun, in an elliptical orbit, or track, in 365 days 6 hours, conftituting the year.

From the former we derive the diverfities of night and day. (See NIGHT and DAY.) And from the latter, the vicifitudes of feafons, fpring, fummer, &c.

See the motion of the earth proved under the article EARTH in aftronomy.

In the teraqueous globe we diftinguifh three parts, or regions, viz. 1. The external part, or cruft, which is that from which vegetables arife, and animals are nourifhed. 2. The middle, or intermediate part, which is poffeffed by foftils, extending further than human labour ever yet penetrated. 3. The internal, or central part, which is unknown to us, though by many authors fuppofed of a magnetic nature; by others, a maſs, or fphere of fire; by others, an abyſs, or collektion of waters, furrounded by the frata of earth; and by others, a hollow, empty fpace, inhabited by animals, who have their fun, moon, plants, and other conveniencies within the fame. Others divide the body of the globe into two parts, viz. the external part, which they call the cortex, including the whole depth or maſs of the frata of the earth; and the internal, which they

call the nucleus, being of a different nature from the former, and poffeffed by fire, water, or the like.

The external part of the globe either exhibits inequalities, as mountains and valleys; or it is plain and level; or dug in channels, filures, beds, &c. for rivers, lakes, feas, &c. These inequalities in the face of the earth, are by moſt naturalifts fuppofed to have arofe from a rupture, or fubverfion of the earth, by the force either of the fubterraneous fires or waters. The earth in its natural and original ftate, Des Cartes, and after him Burnet, Steno, Woodward, Whitton, and others, fuppofe to have been perfectly round, fmooth, and equable; and they account for its prefent rude and irregular form, principally from the great deluge. See DELUGE. In the external, or cortical part of the earth, we meet with various frata, which are fuppofed to be the fegments of various floods, the waters whereof being replete with matters of diverfe kinds, as they dried up, or oozed through, depofited thefe different matters, which in time hardened into frata of ftone, fand, coal, clay, &c.

Dr. Woodward has confidered the buſineſs of thefe frata, with great attention, viz. their order, number, ftration with reſpect to the horizon, depth, interfections, filures, colour, confiftence, &c. He afcribes the origin and formation of them all, to the great flood, or cataclysmus. At that terrible revolution, he fuppofes all the terreftrial bodies of all kinds to have been difolved and mixed with the waters, and fufained therein, fo as only to conſtitute one common maſs therewith. This maſs of terreftrial particles, intermixed with water, he fuppofes to have been at length precipitated to the bottom, and that generally, according to the laws of gravity, the heavieft ſinking firſt, and the lighter in their order. By fuch means were the frata formed, whereof the earth confiſts, which attaining their folidity and hardneſs by degrees, have continued fo ever ſince. Thefe fegments, he further concludes to have been at firſt all parallel and concentrical, and the furface of the earth formed thereby, perfectly ſmooth and regular: but that in courſe of time, diverfe changes happening from earthquakes, vulcano's, &c. the order and regularity of the frata was difturbed and broke, and the furface of the earth, by fuch means, brought to the irregular form in which it now appears. See further particulars under DELUGE.

EARTH, in aftronomy, is one of the primary planets, according to the fyſtem of Copernicus. Its character is δ .

In the hypothefis of Ptolemy, the earth is the centre of the fyſtem.

Whether the earth move, or remain at reſt, i. e. whether it be fixed in the center, with the fun, heavens, and ftars moving round the fame from eaſt to weſt; or whether the heavens and ftars being at reſt, the earth move from weſt to eaſt, is the great article that diftinguiſhes the Ptolemaic from the Copernican fyſtem?

Motion of the EARTH.—The happy induftry of the aftronomers of our age, has put the mobility of the earth beyond all reaſonable doubt: on which account, the names of Copernicus, Gaſſendus, Kepler, Hook, Flamſteed, &c. will ever be mentioned with the higheſt honour.

Indeed, the fame motion had been held by many of the ancient philoſophers. Cicero, in his *Tuſc. Queſt.* affirms us, that Nicetas of Syracuſe firſt diſcovered that the earth had a diurnal motion, by which it revolved round its axis in the fpace of 24 hours: and Plutarch, de *Placit. Philoſoph.* tells us, that Philolaus diſcovered its annual motion round the fun. And about 100 years after Philolaus, Ariftarchus the Samian, propoſed the motion of the earth in ſtronger and clearer terms, as we are affured by Archimedes, in *Arenar.*

But the religious opinions of the heathen world, prevented the doctrine's becoming more cultivated. For Ariftarchus being accuſed of heriege by Cleanthes for moving Veſta, and the tutelary deities of the univerſe out of their place; the philoſophers began to lay afide ſo perilous a poſition.

Many ages afterwards, Nic. Cuſanus revived the ancient fyſtem, in his *Doct. de Pignorant*, and aſſerted the motion of the earth: but the dogma got but little ground till the time of Copernicus, who ſhewed its great uſe and advantages in aftronomy; and who had, immediately all the philoſophers and aftronomers, that durſt think differently from the croud, and were not afraid of eccleſiaſtical cenſures, on his ſide. So that Kepler, his contemporary, made no ſcruple to cry: *hodie no tempore præſtantiffimi quique philoſophorum & aftronomorum Copernico adſtipulantur: ſcila eſt hæc glacies; vincimus ſuffragiis melioribus: cæteris pene ſola obſtat ſuperſtitio aut metus a Cleanthibus.*

The arguments alledged againſt the motion of the earth, are weak and frivolous. The principal are,

1. That it is a heavy body, and very unfit for motion.
2. That if the earth were to move round its axis in 24 hours, all our houſes, buildings, &c. would tumble down.
3. That bodies would not fall upon the places perpendicularly

unde:

under them: nor could a bullet, *e. gr.* shot perpendicularly from the ground, fall back again upon the same spot.

4. That it is contrary to the words of scripture: and,
5. That it is repugnant to our senses, which represent the *earth* at rest, and the sun in motion.

The arguments for the motion of the *earth* are of another kind, and carry other sort of evidence with them; being deduced from actual observation and phenomena, and not from the fanciful surmises of timorous zealots. They are these: 1. The sun will equally appear in motion, and the *earth* as standing still, to a spectator on the *earth*; whether the sun really move round the *earth* at rest; or the *earth* move round the sun at rest.

For suppose the *earth* in T, (*Tab. Astronom. fig. 15. n^o. 2.*) and the sun in I; the sun will then appear in Y. And suppose the sun to proceed in an orbit, surrounding the *earth*, from I to 2, he will then appear in X; and if he proceed further to 3, he will be seen in H; and thus will he appear to go on, according to the order of the signs in the ecliptic.

Suppose again the *earth* in I; and the sun in S; the sun will now be seen in z: let the *earth* go on from I to 2, the sun will appear to the inhabitants of the *earth* to have proceeded from z to W; and if the *earth* proceed to 3, the sun will appear to have advanced further from W to F; and so on, according to the successions of the sign of the ecliptic.

Thus does the sun appear alike to move, whether he really move or stand still; so that the objection from sense is of no force. But again,

2. If one of the planets be supposed to have moved a certain space, from west to east; the sun, *earth*, and other planets, together with the fixed stars, will all seem to an inhabitant of that planet, to have moved just so far round it the contrary way.

For suppose a star M, (*fig. 16. n^o. 2.*) in the zenith of an inhabitant of a planet placed in T; and suppose the planet to have revolved on its axis from west to east; in a certain space of time, the sun S, will have arrived at the zenith of T; then the star I, then N, then the *earth* L, and at length the star M again. To the inhabitant of the planet therefore, the sun S, with the *earth* L, and the stars I, N, M, &c. will appear to have moved round the planet a contrary way.

Thus, to the inhabitants of the planets, if any such there be, the mundane sphere, with the sun, stars, and all the other planets, will, as to us, appear to move round them from east to west. And accordingly, the inhabitants of our planet the *earth*, are only liable to the same delusive appearances with those of the rest.

3. The orbits of all the planets include the sun, as the common center of them all: but it is only the orbits of the superior planets that include the *earth*, which however is not in the centre of any of them, as we have already shewn under the articles SUN and PLANET.

4. The *earth's* orbit being proved to be between those of Venus and Mars; it follows, that the *earth* must turn round the sun; for, as it lies within the orbits of the superior planets, their motion would indeed appear unequal and irregular; but they would never either be stationary or retrograde without this supposition.

5. From the orbits and periods of the several planets about the sun, and of the moon and satellites round the *earth*, Jupiter and Saturn, it is evident, that the law of gravitation is the same towards the *earth*, Jupiter and Saturn, as towards the sun; and the periodical times of the several bodies moving around each, are in the same ratio to their several distances from them.

Now, it is certain, that on the hypothesis of the *earth's* annual motion, her periodical time exactly suits this law, bearing such a proportion between those of Mars and Venus, as the several other bodies directed by the same law do bear, *i. e.* the squares of the periods are in all, as the cubes of the distances from the centre of their orbits. But supposing the *earth* too at rest, this law is broken most exorbitantly.

For if the *earth* do not move round the sun, the sun must move with the moon round the *earth*: now the distance of the sun to that of the moon, being 10000 to 46; and the moon's period being less than 28 days, the sun's period should be found no less than 242 years, whereas in fact it is but one year. Which single consideration, Mr. Whiston thinks of weight enough to determine the controversy between the two systems, and to establish the motion of the *earth* for ever.

Whereas, supposing our *earth* to have once revolved about the sun in a circular orbit, whose semi-diameter were equal to the *earth's* original distance from the sun six degrees past its perihelion, the annual period would be found exactly and surprizingly equal to the lunar of the ancient solar year, which were exactly commensurate; containing 12 synodical, or 13 periodical months, *i. e.* 365 days, 4 hours, 19 minutes.

6. The distances of certain of the fixed stars from the zenith, have been observed to be various at various times of the year.

That, particularly, of the pole-star from the pole, has been discovered by Mr. Flamsteed from repeated observations, for 7 years successively; to be greater about the summer solstice, than about the winter, by about 40 seconds. Whence it appears, that the *earth* changes its situation; receding from the pole-star, and returning back to it again annually.

Which argument is further confirmed from this, that the *earth* is nearer the sun at Christmas than at Midsummer; as appears both from the sun's apparent diameter being greater in December than in June; and from its motion being swifter by one 25th part in the former season, than the latter: whence it is that there are about 8 days more in the summer half year, *viz.* from March to September, than in the winter, from September to March.

7. Either the heavenly bodies revolve round the *earth* in 24 hours, or the *earth* revolves round its axis in that time. Now the planets, revolving round the sun, perform their revolutions in greater or less times, as their orbits are greater or less, *i. e.* as they are more or less remote from the sun. Of consequence, if the stars and planets revolved round the *earth*, they would perform their revolutions in unequal times, according as their orbits, or their distances, were unequally big. At least, the fixed stars, which are at such prodigious distances from the *earth*, would never move round it in 24 hours, as the nearest planet is supposed to do.

This is an inequality, which is avoided in the system where the *earth* is supposed to move; and where every planet is so much the longer in describing its annual orbit round the sun, as that orbit is greater.

8. In all the works of nature which we are acquainted withal, the Creator appears to act by the shortest, easiest, and simplest means. Now, if the *earth* be at rest, and the stars move, the velocity of these latter must be immense; and yet all the purposes thereof, might have been answered by a moderate motion of the *earth* alone.

For the moon's mean distance from the *earth*, is 57 semi-diameters of the *earth*; which, supposing a semi-diameter of the *earth* 3440 geographical miles, amounts to 196680 miles. Hence, the circumference of the moon's diurnal circle, being 1231380 such miles, the moon's horary motion must be 483308 miles: consequently in each second, a space less than that of the pulse of an artery, the moon, though the slowest of all the heavenly bodies, must move 3 miles and five 9ths. Again, the sun's mean distance from the *earth* is 22000 semi-diameters of the *earth*, or 75680000 geographical miles; consequently the sun's diurnal progress, when in the equator, must be 475270400 miles: and therefore in the space of one second, *i. e.* in the twinkling of an eye, he must move 54.80 miles.

Again, the distance of the sun from the *earth*, is to that of Mars nearly as one and a half; to that of Jupiter, as one to five and a quarter; and to that of Saturn, as one to nine: wherefore, as the diurnal spaces, and all other things described in the same time, are in the same ratio; Mars in one twinkling of an eye, must fly 8222; Jupiter 28688; and Saturn 52060 miles. Lastly, the fixed stars being yet vastly more remote from the *earth* than Saturn, their motion in, or near the equator, must be vastly swifter than that of Saturn.

9. If the *earth* be at rest, and the stars move by any common motion, the several planets must each day describe several spirals running forth to a certain term towards the north, and thence returning to the opposite term towards the south; sometimes narrower, and sometimes broader.

For the distances of the several planets from the zenith alter every day; increasing to a certain point towards the north, and thence decreasing again towards the south: consequently, the altitude of the pole, being always found the same, and the planets not returning to the same point of the meridian; they do not describe circles but spirals. Add, that as the several planets do not retain the same distance from the *earth*, but are sometimes nearer, and sometimes recede further from it; at a greater distance, a greater spiral, and at a less, a less is described.

Further, as their motion is slower, when the planet is further from the *earth*; the greater spirals are described in lesser times than the lesser. And as the greatest and least distance of the planets from the *earth* is not affixed to the same point of the heavens, the planets have moved in different tracts every day from the beginning.

10. Bodies let fall from any considerable height, are found by experiment not to fall upon the spot perpendicularly under them, but to the south-east thereof. See DESCENT.

The experiments was proposed to Dr. Hook, in the year 1679, by a person, who suggested, that if the *earth* had any diurnal motion, the body would fall to the east of the perpendicular. Dr. Hook, on that occasion, read a discourse before the Royal Society, wherein he endeavoured, *a priori*, to assign what curve a falling body would describe; asserting particularly that the fall of the body would not be directly east, but south-east; which was confirmed by diverse actual trials.

11. The power of gravity is found to decrease as you approach nearer to the equator: which is a circumstance that agrees to all bodies which have a motion on their axis, and them only, as being really the necessary result of such motion.

For a body, revolving on its axis, the parts, or appendages thereof, are continually endeavouring to recede from the centre. Consequently, the equator being a great circle, and the parallels all decreasing towards the poles, the centrifugal force is greatest in the equator, and decreases towards the poles, in the ratio of the diameters of the parallels to that of the equator. Now the power of gravity determines the several parts or appendages towards the centre of the whole; consequently the centrifugal force acting contrary to the power of gravity, retards the descent of bodies, and that most where it is greatest.

Dr. Keil computes, that the force of gravity to the centrifugal force at the equator is as 289 to 1; consequently, a body placed there, would lose one 289th part of the weight it would have, were the earth at rest. Consequently, the centrifugal force at the poles, being infinitely small, a body will there weigh 289 pounds, which at the equator only weighs 288.

12. The following is an actual demonstration of the earth's motion, drawn from physical causes, for which we are indebted to the discoveries of Sir Isaac Newton; and which Dr. Keil takes for conclusive and unanswerable.

All the planets, it is demonstrated, gravitate towards the sun: and observations testify to us, either that the earth turns round the sun, or the sun round the earth, in such manner, as to describe equal areas in equal times. But it is demonstrated further, that whenever bodies turn round each other, and regulate their motion by such law, the one must of necessity gravitate to the other: consequently, if the sun in its motion, do gravitate to the earth; action or re-action being equal and contrary, the earth must likewise gravitate towards the sun. Again, the same author has demonstrated, that when two bodies gravitate to one another, without directly approaching one another in right lines; they must both of them turn round their common centre of gravity: the sun and earth, therefore, do both turn round their common centre of gravity; but the sun is so great a body in respect of our earth, which is, as it were, but a point; that the common centre of gravity of the two bodies, will lie within the body of the sun itself, and not far from the centre of the sun. The earth, therefore, turns round a point, which is in the body of the sun; and therefore it turns round the sun. Q. E. D.

To say no more, to suppose the earth at rest, confounds and destroys all the order and harmony of the universe, annuls its laws, and sets every part at variance with other, robs the Creator of half the praise of his work, and mankind of the pleasure of the contemplation thereof. In effect, it renders the motions of the planets inextricable and useless, which otherwise are plain and simple. So that such of the later astronomers, as have asserted it with the most zeal, have been forced to set it aside, when they came to compute the motions of the planets. None of them would ever attempt to compute these motions in variable spirals; but in all their theories they tacitly suppose the earth to move on its axis, so as to turn the diurnal spirals into circles.

Thus, the jesuite Riccioli, tho' he, at the pope's command, opposed the motion of the earth with all his might, as something contrary to holy scripture; yet, to frame astronomical tables, which should any thing tolerably agree to observation, he was forced to have recourse to the motion of the earth, as his only refuge.

This, De Chales, another of the same fraternity, frankly confesses: 'P. Riccioli—nullas tabulas optare potuit que vel mediocriter observationibus responderent, nisi secundum systema terræ motæ; notwithstanding, that he called in all the foreign and forced assistances of moveable epicycles: so that in his *Astronomia reformata*, where he undertakes to give accurate tables of the celestial motions, he gives into the hypothesis of the motion of the earth.' De Chales *Astron. Reformata*. l. X. c. 1.

The system, then, which supposes the earth at rest, is, of it self, of no use, or significance in astronomy; nor does it avail more in physics: for the principal phenomena are no way deducible from it; but the retainers thereto are either forced to fly to the immediate agency of the deity (which in physics is the same as the *retutitio ad absurdum* in geometry) or to reasons and principles unknown.

Some oppose the motion of the earth, as contrary to revelation; there being mention made, in holy scripture, of the sun's rising and setting; of his standing still in the time of Joshua; and his going back in that of Hezekiah.

Now, to take the genuine sense of these passages, the laws of interpretation must be settled. 1. Then, we suppose, that the several words of scripture have their several ideas corresponding to them; and that a man takes their sense, in whom those ideas are excited by the reading. 2. That the words of scripture, attentively read, are sufficient to excite those ideas in a mind not prepossessed. Hence, 3. It follows,

that either God must have exhibited the definitions of the words that occur in scripture; or, that he supposes prior notions, and leaves us to take their sense in the ordinary way. Hence, 4. We argue, that no other ideas are to be affixed to the words of scripture, but such as occur to a person who looks or attends to the things themselves spoke of.

By the sun's rising, therefore, is meant no more than his re-appearance in the horizon, after he had been hid below it: and by his setting, an occultation of the sun, which was before visible in the horizon. When the preacher therefore says, Eccles. i. 5. *The sun rises, and sets, and returns to his place*; he means, doubtless, no more than the sun, which before was hid, is now seen in the horizon; and after being there conspicuous, is hid again, and at length re-appears in the east. For thus much only appears to a person who views the sun; and therefore thus much, and no more, is expressed by the sacred writers.

In like manner, when in Josh. x. 12, 13, the sun and moon are said to have stood still; all meant by itation is, that they did not change their place, with respect to the earth. For that general, by *sun stand thou still over Gibeon, and thou moon, over the valley of Ajalon*; required no more, than that the sun, which then appeared over that city, should not change its situation. And from his bidding the sun to keep his situation, it would be unjust to infer, that it moves round the earth at rest.

Gassendus, very pertinently to the present purpose distinguishes two sacred volumes, the one written, called the bible; the other, nature, or the world; God having manifested himself by two lights, the one of revelation, and the other of demonstration. Accordingly, the interpreters of the former are divines, of the latter mathematicians. As to matters of natural knowledge, the mathematicians are to be consulted; and as to the objects of faith, the prophets; the former, being no less interpreters, or apostles, from God to men, than the latter. And as the mathematician would be judged to wander out of his province, if he should pretend to controvert, or set aside any article of faith from principles of geometry; so it must be granted, that divines are no less out of their limits, when they venture to pronounce on a point of natural knowledge, beyond the reach of any not versed in geometry, and optics, merely from holy scripture, which does not pretend to teach any thing of the matter.

For instances, we may quote Lactantius, and Augustine; the first of whom rendered himself ridiculous by disputing, from scripture, against the roundness of the earth; and the latter, against the antipodes. See ANTIPODES.

The earth, thus proved to move, it is to be further observed, that the altitude of the pole being found at all times of the year, i. e. in all points of its annual orbit, (the ecliptic) to be the same; it follows, that the earth proceeds in such manner along its orbit, as that its axis is constantly parallel to the axis of the world, and of consequence parallel to it self.

This motion, which Copernicus calls the *motion of libration*, may be well enough illustrated, by supposing a globe, with its axis parallel to that of the earth, painted on the flag, or anti-ent of a mast, moveable on its axis, and continually driven by the west wind, while it makes the tour of an island: it is evident that in every situation of the ship, the axis of the painted globe will continue parallel to the axis of the world.

According to Sir Isaac Newton's principles, the earth's axis does, in every annual revolution, incline twice towards the ecliptic, and twice return to its former position. On which mutation it is, that the precession of the equinoctial points is supposed to depend; and as Mr. Flamsteed imagines, the annual parallax of the fixed stars likewise.

Latitude of the EARTH. } See { LATITUDE,
Longitude of the EARTH. } { LONGITUDE.
Inclination of the axis of the EARTH. See INCLINATION,
AXIS, and ANGLE.

EARTH, in agriculture, and gardening. See SOIL, LAND, &c. Untried EARTH, the soil, or earth which is six or seven inches deep, where neither spade nor plough has reached.

This is greatly recommended by Mr. Lawrence, for amendments and improvements, both in the fruit and kitchen garden: he assures us, from his own experience, that no kind of compost, made with art, exceeds it; and adds, that if the choicest fruit trees be planted herein, they presently discover an uncommon healthfulness and vigour: and that if any tender sorts of annuals be discretely sown in this earth, made fine by sifting, their looks, colour, &c. soon discover that they like the soil. Melons and cucumbers, need no other compost but this *untried earth*: and a sparagus it self will prosper, at least, as well in this *untried earth*, if laid a foot and a half deep, as with all the usual expence of dung. Though for the tenderer flowers, and exotics, this earth is not found to have any extraordinary excellencies. For annual plants, produced

from seed, a coat of this *untried earth*, two inches deep, may suffice: on other occasions, a greater depth is required.

JAPAN EARTH. See the article **JAPAN**.

EARTH black. See the article **BLACK**.

Fullers EARTH. } See { **FULLERS Earth.**
Samian EARTH. } **SAMIAN Earth, &c.**
Lemnian EARTH. } **LEMNIAN earth.**
Scaled EARTH. } **SIGILLATA terra.**
Soap EARTH. } **SOAP earth.**

EARTH-BAGS, *sacs a terre*, in fortification. See **SACKS of earth.**

EARTH-flax. See the article **Plume ALLUM.**

EARTHED sugar. See the article **SUGAR.**

EARTHEN floors. See the article **FLOOR.**

EARTHING, in the general sense. See **INTERRING.**

EARTHING, in agriculture, and gardening, denotes the covering of vines, sellery, and other shrubs and plants with *earth*.

EARTHQUAKE, in natural history, a vehement shake, or agitation of some considerable place, or part of the earth; from natural causes; attended with a terrible noise like thunder, and frequently with an eruption of water, or fire, or else of smoke or winds.

Earthquakes are the greatest, and most formidable phenomena of nature. Aristotle, and Pliny, distinguish two kinds, with respect to the manner of the shake, *viz.* a *tremor*, and a *pulse*; the first being horizontal, in alternate vibrations, compared to the shaking of a person in an ague. The 2d, perpendicular, up and down: which latter kind are also called by Aristotle, *pegnas*, from the resemblance of their motion to that of boiling.

Agricula increases the number, and makes four kinds; which Alb. Magnus again reduces to three, *viz.* *inclination*, when the earth vibrates alternately from right to left; by which mountains have been sometimes brought to meet, and clash against each other: *pulsation*, when it beats up and down like an artery: and *trembling*, when it shakes and quavers every way, like a flame.

Phænomena of EARTHQUAKES.—The *Philosoph. Transact.* furnish us with abundance of histories of *earthquakes*; particularly, one at Oxford, in 1665, by Dr. Wallis and Mr. Boyle. Another, at the same place, in 1683, by Mr. Pigot. And another in Sicily, in 1692-3, by Mr. Hartop, Fa. Alessandro Burgos, and Vin. Bonajutus; which last, is one of the most terrible ones in all history.

This shook the whole island, and not only that, but Naples and Malta shared in the shock. It was of the second kind mentioned by Aristotle and Pliny, *viz.* a perpendicular pulsation, or succussion. It was impossible, says the noble Bonajutus, for any body, in this country, to keep on their legs, on the dancing earth; nay, those that lay on the ground, were tossed from side to side, as on a rolling billow: and high walls leaped from their foundations several paces, &c. *Phil. Trans.* N^o. 207.

The mischief it did is amazing: almost all the buildings in the countries were thrown down. Fifty-four cities and towns, beside an incredible number of villages, were either destroyed or greatly damaged. We shall only instance the fate of Catania, one of the most famous, ancient, and flourishing cities in the kingdom; the residence of several monarchs, and an university. This once famous, now unhappy Catania, to use the words of Fa. Burgos, had the greatest share in the tragedy. Fa. Anthon. Serovita, being on his way thither, and at the distance of a few miles, observed a black cloud, like night, hovering over the city; and there arose from the mouth of Montebello, great spires of flame, which spread all around. The sea all of a sudden began to roar, and rise in billows; and there was a noise, as if all the artillery in the world had been at once discharged. The birds flew about astonished, the cattle in the fields ran crying, &c. His and his companions horses stopped short, trembling; so that they were forced to alight. They were no sooner off, but they were lifted from the ground above two palms; when casting his eyes towards Catania, he with amazement saw nothing but a thick cloud of dust in the air. This was the scene of their calamity: for of the magnificent Catania, there is not the least footprint to be seen. S. Bonajutus assures us, that of 18914 inhabitants, 18000 perished therein. The same author, from a computation of the inhabitants, before and after the *earthquake*, in the several cities and towns, finds that near 60000 perished out of 254900. *Ibid.* n^o. 202.

Jamaica is remarkable for *earthquakes*. The inhabitants, Dr. Sloan informs us, expect one every year. This author gives us the history of one in 1687; and another horrible one in 1692, as described by several anonymous authors. In two minutes time this shook down and drowned nine tenths of the town of Port-Royal. The houses sunk out-right, 30 or 40 fathoms deep. *Phil. Transact.* n^o. 209.

The earth opening, swallowed up people; and they rose in other streets; some in the middle of the harbour, and yet many were saved; though, there were 2000 people lost, and 1000 acres of land sunk. All the houses were thrown down throughout the island. One Hopkings had his plantation removed half a mile from its place. Of all wells, from one fathom to six or seven, the water flew

out at the top with a vehement motion. *Ibid.* While the houses, on one side of the street were swallowed up, on the others they were thrown on heaps; and the sand in the street rose like waves in the sea, lifting up every body that stood on it, and immediately dropping down into pits; and at the same instant, a flood of water breaking in, rolled them over and over; some catching hold of beams and rafters, &c. ships and floops in the harbour were overfet and lost; the Swan Frigate particularly, was thrown over by the motion of the sea, and sinking of the wharf, and was driven over the tops of many houses, *Ibid.* It was attended with a hollow rumbling noise like that of thunder. In less than a minute, three quarters of the houses, and the ground they stood on, with the inhabitants, were all sunk quite under water; and the little part, left behind, was no better than a heap of rubbish. The shake was so violent, that it threw people down on their knees, or their faces, as they were running about for shelter. The ground heaved and swelled like a rolling sea; and several houses, still standing, were shuffled and moved some yards out of their places. A whole street is said to be twice as broad now as before; and in many places, the earth would crack, and open, and shut, quick and fast. Of which openings, two or three hundred might be seen at a time; in some whereof, the people were swallowed up; others, the closing earth caught by the middle, and pressed to death; in others, the heads only appeared. The larger openings swallowed up houses; and out of some would issue whole rivers of waters, spouted up a great height into the air, and threatening a deluge to that part the *earthquake* spared. The whole was attended with stench and offensive smells, the noise of falling mountains at a distance, &c. and the sky in a minute's time, was turned dull and reddish, like a glowing oven. Yet, as great a sufferer as Port-Royal was, more houses were left standing therein, than on the whole island beside. Scarce a planting-house, or sugar-work was left standing in all Jamaica. A great part of them were swallowed up, houses, people, trees, and all at one gape: in lieu of which afterwards, appeared great pools of water, which when dried up, left nothing but sand, without any mark that ever tree, or plant had been thereon. Above 12 miles from the sea, the earth gaped and spouted out, with a prodigious force, vast quantities of water into the air; yet the greatest violences were among the mountains and rocks; and it is a general opinion, that the nearer the mountains, the greater was the shake; and that the cause thereof lay there. Most of the rivers were stopped up for 24 hours, by the falling of the mountains; till swelling up, they made themselves new tracks and channels; tearing up in their passage trees, &c. After the great shake, many of those people who escaped, got on board ships in the harbour, where many continued above two months; the shakes all that time being so violent, and coming so thick, sometimes two or three in an hour, accompanied with frightful noises like a rustling wind, or a hollow rumbling thunder, with brimstone blasts, that they durst not come ashore. The consequences of the *earthquake* was a general sickness, from the noisome vapours belched forth, which swept away above 3000 persons of those who were left. *Ibid.*

After the detail of these horrible convulsions, the reader will have but little curiosity left, for the less considerable phenomena of the *earthquake* at Lima, in 1687, described by Fa. Alvarez de Toledo, wherein above 5000 persons were destroyed; this being of the vibratory kind, so that the bells in the church rung of themselves: or that at Batavia in 1699, by Wizen: that in the North of England in 1703, by Mr. Thoresby: or, lastly, those in New-England in 1663, and 1670, by Dr. Mather. We will therefore relieve him with some attempts towards a theory of *earthquakes*.

Causes of EARTHQUAKES.—Naturalists are here divided. Some ascribe *earthquake* to water, others to fire, and others to air; and all of them with some reason. To conceive which, it is to be observed, that the earth every where abounds in huge subterraneous caverns, veins and canals; particularly about the roots of mountains: that of these cavities, veins, &c. some are full of water, whence are composed gulphs, abysses, springs, rivulets; and others full of exhalations; and that some parts of the earth are replete with nitre, sulphur, bitumen, vitriol, &c.

This premised, 1. The earth it self may be the cause of its own shaking; when the roots, or basis, of some large mass being dissolved, or wore away by a fluid underneath, it sinks into the same; and with its weight, occasions a tremor of the adjacent parts; and produces a noise; and frequently an inundation of water.

2. The subterraneous waters may occasion *earthquakes*, by their overflowing, cutting out new courses, &c. Add, that the water being heated, and rarified by the subterraneous fires, may emit fumes, blasts, &c. which by their action, either on the water, or immediately on the earth it self, may occasion great succussions.

3. The air may be the cause of *earthquakes*: for air, being a collection of fumes, and vapours raised from the earth and water; if it be pent up in the too narrow viscera of the earth, the subterraneous, or its own active heat, rarifying and

expanding it, the force wherewith it endeavours to escape, may shake the earth: hence there will arise diverse species of earthquakes, according to the different position, quantity, &c. of the imprisoned aura.

Lastly, Fire is a principal cause of earthquakes; both as it produces the aforesaid subterraneous aura, or vapour; and as this aura, or spirit, from the different matter and composition whereof arise sulphur, bitumen, and other inflammable matters, is kindled either from some other fire it meets withal, or from its collision against hard bodies, or its intermixture with other fluids; by which means bursting out into a greater compass, the place becomes too narrow for it; so that pressing against it on all sides, the adjoining parts are shaken; till having made itself a passage, it spends it self in a volcano, or burning mountain.

But to come nearer to the point: Dr. Lister, in *Philosoph. Transact.* N^o. 157. is of opinion, that the material cause of thunder, lightning, and earthquakes, is one and the same, viz. the inflammable breath of the pyrites, which is a substantial sulphur, and will take fire of it self.

The difference between these three terrible phenomena, he takes only to consist in this; that this sulphur, in the former, is fired in the air; and in the latter, under ground. Which is a notion that Pliny had long before him: *quid enim*, says he, *aliud est in terra tremor, quam in nubis tonitru?* This he thinks abundantly indicated by the same sulphurous smell being found in any thing burnt with lightning, and in the waters, &c. call up in earthquakes, and even in the air before and after them.

Add, that they agree in the manner of the noise; which is carried on as in a train, fired; the one rowling and rattling through the air, takes fire as the vapours chance to drive; as the other fired under ground, in like manner, moves with a defultory noise.

Thunder, which is the effect of the trembling of the air, caused by the same vapours dispersed through it, has force enough to shake our houses; and why may not there be thunder and lightning under ground, in some vast repositories there, I see no reason. Especially if we reflect, that the matter which composes the noisy vapour above us, is contained in much larger quantities under ground. *Philosophical Transactions*, N^o. 202.

That the earth abounds in cavities, every body allows; and that these subterraneous cavities are, at certain times, and in certain seasons, full of inflammable vapours, the damps in our mines sufficiently witness, which fired, do every thing as in an earthquake, only in a lesser degree.

That the pyrites alone, of all the known minerals, yields this inflammable vapour, is highly probable: for that no mineral, or ore whatsoever, is sulphurous, but as it is wholly or in part, a pyrites; and there is but one species of brimstone, at least with us in England, which the pyrites naturally, and only yields. The sulphur vive, of natural brimstone, which is found in and about the burning mountains, is certainly the effect of sublimation; and those great quantities of it said to be found about the skirts of volcano's, is only an argument of the long duration and vehemence of those fires: Possibly, the pyrites of the volcano's, or burning mountains, may be more sulphurous than ours: And, indeed it is plain, that some of ours in England are very lean, and hold but little sulphur; others again very much: which may be one reason, why England is so little troubled with earthquakes; and Italy, and almost round the Mediterranean sea, is very much: though another reason is, the paucity of pyrites in England, in regard to those places.

Comparing our earthquakes, thunder and lightning, with theirs, it is observed, that there it lightens almost daily, especially in summer time, here seldom; there thunder and lightning is of long duration, here it is soon over; there the earthquakes are frequent, long, and terrible, with many paroxysms in a day, and that for many days; here they are very short, only of a few minutes, and scarce perceptible. To this purpose, the subterraneous cavities in England are small, and few, compared to the vast vaults in those parts of the world; which is evident, from the sudden disappearance of whole mountains and islands.

Dr. Woodward gives us another theory of earthquakes. He endeavours to shew, that the subterraneous heat, or fire (which is continually elevating water out of the abyss, to furnish the earth with rain, dew, springs, and rivers) being stopped in any part of the earth, and so diverted from its ordinary course, by some accidental glut, or obstruction, in the pores or passages, through which it used to ascend to the surface; becomes, by such means, preternaturally assembled, in a greater quantity than usual, into one place; and therefore causeth a great rarefaction, and intumescence of the water of the abyss; putting it into great commotions, and disorders, and at the same time making the like effort on the earth; which being expanded upon the face of the abyss, occasions that agitation and concussion which we call an earthquake.

This effort, in some earthquakes, he observes, is so vehement

that it splits and tears the earth, making cracks and chasms in it, some miles in length, which open at the instants of the shocks, and close again in the intervals betwixt them; nay, it is sometimes so violent, that it forces the super-incumbent strata, breaks them all throughout, and thereby perfectly undermines, and ruins the foundation of them; so that these falling, the whole tract, as soon as the shock is over, sinks down into the abyss, and is swallowed up by it; the water thereof immediately rising up, and forming a lake in the place, where the said tract before was. That this effort being made in all directions indifferently, the fire dilating and expanding on all hands, and endeavouring to get room, and make its way through all obstacles, falls as foul on the water of the abyss beneath, as on the earth above, forcing it forth which way soever it can find vent, or passage, as well through its ordinary exits, wells, springs, and the outlets of rivers, as through the chasms then newly opened, through the camini, or spiracles of *Ætna*, or other neighbouring volcano's; and those hiatus's at the bottom of the sea, whereby the abyss below opens into it, and communicates with it. That as the water, resident in the abyss, is, in all parts of it, stored with a considerable quantity of heat, and more especially in those, where these extraordinary aggregations of this fire happen; so likewise is the water, which is thus forced out of it; inasmuch, that when thrown forth, and mixed with the waters of wells, or springs of rivers, and the sea, it renders them very sensibly hot.

He adds, that though the abyss be liable to these commotions in all parts; yet the effects are no where very remarkable, except in those countries, which are mountainous, and consequently stony and cavernous underneath; and especially where the disposition of the strata is such, that those caverns open into the abyss, and so freely admit, and entertain the fire; which assembling therein, is the cause of the shock; it naturally steering its course that way, where it finds the readiest reception, which is towards those caverns. Besides, that those parts of the earth, which abound with strata of stone, or marble, making the strongest opposition to this effort, are the most furiously shattered; and suffer much more by it, than those which consist of gravel, sand, and the like laxer matter, which more easily give way, and make not so great resistance; but above all, these countries which yield great store of sulphur, and nitre, are, by far, the most injured and incommoded by earthquakes; those minerals constituting in the earth a kind of natural gunpowder, which taking fire upon this assemblage, and approach of it, occasions that murmuring noise, or subterraneous thunder, which is heard rumbling in the bowels of the earth during earthquakes, and by the assistance of its explosive power, renders the shock much greater; so as sometimes to make miserable havoc and destruction.

And it is for this reason, that Italy, Sicily, Anatolia, and some parts of Greece, have been so long, and so often alarmed and harrassed by earthquakes; these countries being all mountainous and cavernous, abounding with stone and marble, and affording sulphur, and nitre in great plenty.

Further, that *Ætna*, *Vesuvius*, *Hecla*, and the other volcano's, are only so many spiracles, serving for the discharge of this subterraneous fire, when it is thus preternaturally assembled. That where there happens to be such a structure and conformation of the interior parts of the earth, as that the fire may pass freely, and without impediment from the cavern, wherein it assembles unto those spiracles; it then readily and easily gets out, from time to time, without shaking, or disturbing the earth: but where such communication is wanting, or the passage is not sufficiently large and open, so that it cannot come at the spiracles, it heaves up and shakes the earth, with greater or lesser impetuosity, according to the quantity of fire thus assembled, till it has made its way to the mouth of the volcano. That therefore there are scarce any countries much annoyed with earthquakes, but have one of these fiery vents; which are constantly in flames, when any earthquake happens; as disgorging that fire, which, whilst underneath, was the cause of the disaster. Lastly, that were it not for these diverticula, it would rage in the bowels of the earth much more furiously, and make greater havoc than it doth.

Thus we have seen what fire and water may do; and that either of them, in good hands, are proved sufficient for all the phenomena of earthquakes: If they should both fail, we have a third agent, scarce inferior to either of them: The reader must not be surprized when we tell him it is air.

M. Amontons, in the *Mémoires de l'Acad. des sciences*, an. 1703, has an express discourse to prove, that on the root of the new experiments of the weight and spring of the air, a moderate degree of heat may bring the air into a condition, capable of causing earthquakes. It is shewn, that at the depth of 43528 fathoms below the surface of the earth, air is only one fourth less heavy than mercury. Now, this depth of 43528 fathoms is only a 74th part of the semi-diameter of the earth. And the vast sphere beyond this depth, in diameter 6451538

fathoms,

fathoms, may probably be only filled with air; which will be here greatly condensed, and much heavier than the heaviest bodies we know of in nature. But it is found by experiment, that the more air is compressed, the more does the same degree of heat increase its spring, and the more capable does it render it of a violent effect: and that, for instance, the degree of heat of boiling water increases the spring of the air above what it has in its natural state, in our climate, by a quantity equal to a third of the weight wherewith it is pressed. Whence we may conclude, that a degree of heat, which on the surface of the earth will only have a moderate effect, may be capable of a very violent one below. And as we are assured, that there are in nature degrees of heat, much more considerable than that of boiling water: It is very possible there may be some, whose violence, further assisted by the exceeding weight of the air, may be more than sufficient to break and overturn this solid orb of 43528 fathoms; whose weight, compared to that of the included air, would be but a trifle.

Artificial EARTHQUAKES. Chemistry furnishes us a method of making artificial earthquakes which shall have all the great effects of natural ones: which, as it may illustrate the process of nature in the production of these terrible phenomena underground, we shall here add.

To twenty pounds of iron filings, add as many of sulphur: mix, work, and temper the whole together with a little water, so as to form a mass, of the consistence of a firm paste. This being buried three or four foot under ground, in six or seven hours time, will have a prodigious effect: The earth will begin to tremble, crack and smok, and fire and flame will burst through.

Such is the effect even of two cold bodies, in the cold ground: And there only wants a sufficient quantity of this mixture to produce a true ætna. If it were supposed to burst out under the sea, it would produce a water-spout. And if it were in the clouds, the effect would be thunder and lightning.

EASE, in the sea-language, signifies as much as slacken, or let go slack.

Thus they say, *ease* the bowling, and *ease* the fleet, that is, let them go slack.

Chapels of EASE. See the article CHAPEL.

EASEL-PIECES, among painters, such smaller pieces, either portraits, or landscapes, as are painted on the *casel*, i. e. the frame whereon the canvas is laid.

They are thus called, to distinguish them from larger pictures drawn on walls, ceilings, &c.

EASEMENT, in law, a service, or convenience, which one neighbour has of another by charter, or prescription, without profit: as a way through his ground, a sink, or the like.

In the civil law, *easements* are called *servitus prædii*.

EAST *, in cosmography, one of the cardinal points of the horizon; being the point wherein the prime vertical intersects that quarter of the horizon which the sun rises in.

* The word *east* is Saxon: in Italy, and throughout the Mediterranean, the *east* wind is called the *levants*. In Greek, *ανατολη*, and *ανατολις*, because it comes from the side of the sun, *ανα* *ηλις*. In Latin, *orientis*.

To find the *east* and west line, points, &c. See MERIDIAN Line.

EAST Wind, is that which blows from the *east* point. See WIND.

EAST Dials. See the article DIAL.

EAST-India Companies. See the article COMPANY.

EAST-India Silk. See the article SILK.

Mooring for EAST. See the article MOORING.

EASTERN. See the article ORIENTAL.

EASTER, a feast of the church, held in memory of our Saviour's resurrection.

The Greeks and Latins call it *Πασχα*, *pascha*, originally a Hebrew word, signifying *passage*; applied to the feast of the passover, which is held among the Jews, much about the same time. In English it is called *easter*, from the Saxon *Eaſtſepe*, a goddess worshipped with peculiar ceremony in the month of April.

Easter is one of the most considerable festivals in the christian calendar; being that which regulates and determines the times of all the other moveable feasts.

The rule for the celebration of *easter*, fixed by the council of Nice, in the year 325, is, that it be held on the Sunday which falls upon, or next after the full moon, next after the 21st of March; i. e. the Sunday which falls upon, or next after the first full moon after the vernal equinox.

The reason of which decree was, that the christians might avoid the celebrating their *easter*, at the same time with the Jewish passover, which, according to the institution of Moses, was held the very day of the full moon.

To find *easter*, agreeable to this rule, the method that obtained throughout the church, from the time of Dionysius Exiguus, to that of the reformation of the calendar under pope Gregory; and which still obtains in England, Sweden,

and among the Greeks, where the Gregorian correction is not admitted; is, by means of the golden numbers duly distributed throughout the Julian calendar.

The vernal equinox, at the time of the Nicene council happening on the 21st of March, has been, upon Dionysius's authority, affixed to the same day of the Julian year ever since; so that in the Julian way of computing, no full moon is paschal, but that immediately after the 21st of March.

Therefore *easter* can never happen earlier than the 22d of March.—Now, by finding the full moons, next after the 21st of March, for the several golden numbers, or years of the lunar cycle, we shall have a table for the finding of *easter* for ever.

Such table being of considerable use in the Julian computation, we shall here subjoin.

Gold. Numb.	Full Moons next after Ver. Equin.	Gold. Numb.	Full Moons next after Ver. Equin.
I	5 April, D	XI	15 April, G
II	25 March, G	XII	4 April, C
III	13 April, E	XIII	24 March, F
IV	2 April, A	XIV	12 April, D
V	22 March, D	XV	1 April, G
VI	10 April, B	XVI	21 March, C
VII	30 March, E	XVII	9 April, A
VIII	18 April, C	XVIII	29 March, D
IX	7 April, F	XIX	17 April, B
X	27 March, H		

Now to find *easter*, for any given year, find the dominical letter, and the golden number of the given year, as directed under the articles DOMINICAL Letter, and GOLDEN Number.

Then, in the table, seeking the dominical letter, with the day of the paschal full moon, and the Sunday letter annexed thereto; compare this letter with the dominical letter of the given year; that it may appear how many days are to be added to the day of the paschal full moon, to give *easter* day.

E. gr. In the year 1715, the dominical letter is B, and the golden number VI; consequently, the paschal full moon, is fixed, by the table, to the 10th of April; whose Sunday letter being B, the dominical letter given, it self is a Sunday: and, therefore, *easter* will fall on the eighth day following, viz. on the 17th of April.

But in this computation, the vernal equinox is supposed affixed to the 21st of March; and the cycle of nineteen years, or golden numbers, is supposed to point out the places of the new and full moons exactly: both which suppositions are erroneous. Whence it follows, that the Julian *easter* never happens at its due time, unless by accident.

For an instance of the error, it may be observed, that in the year 1715, the vernal equinox falls on the 10th of March; 11 days before the rule supposes it: and the paschal full moon on the 7th of April, three days earlier than was supposed. *Easter*-day, therefore, which is held on the 17th of April, should be held on the 10th.

This error was grown to such a pitch, in course of time, that pope Gregory XIII. thought it necessary to correct it. And accordingly, in the year 1582, by the advice of Aloysius Lilius, he ordered 10 days to be thrown out of October; so to bring back the vernal equinox to its old place, viz. the 21st of March. And hence the Gregorian calendar, Gregorian year, &c.

In the new, or Gregorian computation, in lieu of golden numbers, the time of *easter* is found by means of epacts, contrived for that purpose. See EPACT.

The following table renders the finding of *easter* in the Gregorian year, from the year 1700, to the year 1900, very easy.

Epacts.	Paschal full Moons.	Epacts.	Paschal full Moons.
X	13 April, E	IX	4 April, C
XI	2 April, A	XX	24 March, F
XXII	22 March, D	I	12 April, D
III	10 April, B	XII	1 April, G
XIV	30 March, E	XXIII	21 March, C
XXV	18 April, C	IV	9 April, A
VI	7 April, F	XV	29 March, D
XVII	27 March, B	XXVI	17 April, E
XXVIII	15 April, G	VII	6 April, B
		XVIII	26 March, A

Now, to find *easter* for any given Gregorian year. Seek the dominical letter, and the Gregorian epact; as shewn under EPACT, &c. Find the epact in the table, and note the paschal full moon, with the weekly letter, corresponding to the same. The rest is performed, as already taught for the Julian *easter*.

E. gr. The dominical letter of the year 1715, is F, and the epact XXV; consequently, the paschal moon falls on the 18th of April, C: and therefore *after-day* is the 21st of April.

Though the Gregorian calendar be, doubtless, preferable to the Julian; yet it also has its defects. It cannot, for instance, keep the equinox fixed on the 21st of March; but it will sometimes fall on the 19th, and sometimes on the 23d.

Add, that the full moon happening on the 20th of March, might sometimes be paschal; yet is it not allowed as such, in the Gregorian computation: as, on the contrary, the full moon of the 22d of March, may be allowed for paschal, which yet it is not. Scaliger and Calvisius have also proved other inaccuracies on this calendar. See CALENDAR.

EASTER Term.	} See the articles	TERM.
EASTERN Amplit. &c.		AMPLITUDE.
EASTERN Church.		CHURCH.
EASTERN Horizon.		HORIZON.
EASTERN Ocean.		OCEAN.

EAVES, the margin, or edge of the roof of a house; being the lowest tiles, flaves, or the like, which hang over the walls, to throw off the waters to a distance from the wall.

EAVES-LEATH, a thick, feather-edged board, generally nailed round the eaves of a house, for the lowermost tiles, flave, or shingles to rest upon.

EBIONITES, ancient heretics, who rose in the church, in the very first age thereof; denying the divinity of Jesus Christ.

Origen takes them to have been so called from the Hebrew word, *ebion*, which in that language signifies *poor*; because, says he, they were poor in sense, and wanted understanding. Eusebius, with a view to the same etymology, is of opinion they were thus called, as having poor thoughts of Jesus Christ; taking him for no more than a mere man.

It is more probable, the Jews gave this appellation to the christians in general, out of contempt; because in the first times there were few but poor people, that embraced the christian religion. This opinion Origen himself seems to give into, in his book against Celsus; where he says, that they called *Ebionites*, such among the Jews, as believed that Jesus was truly the expected Messiah.

It might even be urged, with some probability, that the primitive christians assumed the name of themselves, in conformity to their profession. It is certain, Epiphanius observes, they valued themselves on being poor, in imitation of the Apostles. The same Epiphanius, however, is of opinion, that there had been a man of the name *Ebion*, the chief, and founder of the sect of *Ebionites*, contemporary with the Nazarenes, and Corinthians. He gives a long and exact account of the origin of the *Ebionites*, making them to have arisen after the destruction of Jerusalem; when the first christians, called *Nazarenes*, went out of the same to live at Pella.

The *Ebionites*, then, are little else than a branch of *Nazarenes*; only, that they altered and corrupted, in many things, the purity of the faith held among those first adherents to christianity. For this reason, Origen distinguishes two kinds of *Ebionites*, in his answer to Celsus; the one believed that Jesus Christ was born of a virgin; and the others, that he was born after the manner of other men.

The first were orthodox in every thing, except that to the christian doctrine, they joined the ceremonies of the Jewish law, with the Jews, Samaritans, and Nazarenes: they differed from the Nazarenes however, in several things, chiefly as to what regards the authority of the sacred writings: for the Nazarenes received all for scripture, contained in the Jewish canon; whereas the *Ebionites* rejected all the prophets; and held the very names of David, Solomon, Isaiah, Jeremiah, and Ezekiel, in abhorrence.

They received nothing of the Old Testament but the Pentateuch; which should intimate them to have descended rather from the Samaritans than from the Jews. They agreed with the Nazarenes in using the Hebrew gospel of St. Matthew, otherwise called the gospel of the twelve Apostles: But they had corrupted their copy in abundance of places. And, particularly, had left out the genealogy of our Saviour, which was preserved entire in that of the Nazarenes, and even in those used by the Cerinthians.

These last, whose sentiments, as to the birth of our Saviour, were the same with those of the *Ebionites*, built their error on this very genealogy.

Beside the Hebrew gospel of St. Matthew, the *Ebionites* had adopted several other books under the names of St. James, John, and the other Apostles. They also made use of the *travels of St. Peter*, which are supposed to have been written by S. Clement; but had altered them so, that there was scarce any thing of truth left in them. They even made that Saint tell a world of falsehoods, the better to authorize their own practices. See S. Epiphanius, who is very diffusive on the ancient heresy of the *Ebionites*, Her. 30.

EBONY, EBENUM, in natural history, a kind of wood,

brought from the Indies, exceedingly hard and heavy, susceptible of a very fine polish, and on that account, used in Mosaic, and inlaid works, toys, &c.

There are diverse kinds of *ebony*; the most usual among us are black, red, and green; all of them the product of the island of Madagascar, where the natives call them indifferently, *bazou maintsi*, q. d. *black wood*: The island of St. Maurice, belonging to the Dutch, likewise furnishes part of the *ebonies* used in Europe.

Authors, and travellers, give very different accounts of the tree that yields the black *ebony*: by some of their descriptions it should be a sort of palm tree, by others a cyprus, &c. The most authentic of them, is that of M. Flacourt, who resided many years in Madagascar as governor thereof: He assures us that it grows very high, and big; its bark being black, and its leaves resembling those of our myrtle, of a deep, dusky, green colour.

Tavernier assures us, that the islanders always take care to bury their trees when cut down, to make them the blacker. F. Plumier mentions another black *ebony* tree, discovered by him at St. Domingo, which he calls *spartium portulacae foliis aculeatum ebeni materie*. Candia also bears a little shrub, known to the botanists, under the name of *ebenus critica*.

Pliny and Dioscorides say, the best *ebony* comes from Ethiopia, and the worst from India; but Theophrastus prefers that of India. Black *ebony* is much preferred to that of other colours. The best is a jet black, free of veins and rind, very massive, astringent, and of an acrid pungent taste.

Its rind infused in water, is said to purge pituita, and cure venereal disorders; whence Matthiolus took guaiacum for a sort of *ebony*. It yields an agreeable perfume, when laid on burning coals: when green, it readily takes fire, from the abundance of its fat. If rubbed against a stone, it becomes brown. The Indians make statues of their gods, and keepers for their princes of this wood. It was first brought to Rome by Pompey, after his subduing Mithridates. It is now much less used among us, than anciently; since the discovery of so many ways of giving other hard woods a black colour.

As to green *ebony*, besides Madagascar, and St. Maurice, it likewise grows in the Antilles, and especially in the isle of Tobago. The tree that yields it is very bushy, its leaves are smooth, and of a fine green colour. Beneath its bark is a white blea about two inches thick; all beneath which, to the very heart, is a deep green, approaching towards a black; though sometimes, streaked with yellow veins. Its use is not confined to Mosaic work; It is likewise used in dyeing, as yielding a fine green rincture.

As to red *ebony*, called also *grenadilla*, we know little of it more than the name.

The cabinet-makers, inlayers, &c. make pear-tree, and other woods, pass for *ebony*, by ebonying, or giving them the black colour thereof. This, some do, by a few washes of a hot decoction of galls, and when dry, adding writing ink thereon, and polishing it with a stiff brush, and a little hot wax. And others heat, or burn their wood black. See DYING.

EBRUBARITES, a sect, or order of religious among the Mahometans; thus called from their founder *Ebrubard*, a disciple of Nachschibendi.

The *Ebrubarites*, notwithstanding the extraordinary sanctity they make profession of, with an absolute dereliction of all worldly things, are regarded by the Musselmen, as no better than heretics; by reason they do not esteem themselves obliged to go in pilgrimage to Mecca. To excuse themselves herefrom, they urge that the pureness of their souls, their sublime contemplations, extasies, &c. shew them Mecca and Mahomet's tomb, without stirring out of their cells.

EBULLITION, in physics, the act of emitting bubbles, by a vehement agitation of the parts of a fluid, produced by fire or otherwise.

Philosophers are disagreed about the cause, and manner of *ebullition*: some account for it from an attenuation of the particles of the fluid, at the bottom of the vessel; which, by being attenuated, become lighter, and heave upwards against the super-incumbent load; others, from the particles of fire mixing with, and dilating the particles of the fluid, and so rendering them specifically lighter: and others, not from any attenuation, nor even rarefaction of the particles of the fluid by the action of heat; but from a rarefaction of the air pent up, and intermixed with the fluid; which coming to expand, tend upwards against the pressure of the less heated, less rarified part of the fluid.

A more precise account of the process, see under the foregoing article BOILING.

EBULLITION, in chemistry, &c. is used for a violent intestine motion, or collocation of parts, occasioned by the mixture of salts of different natures.

Dr. Harris will have it properly, and immediately, to signify that particular struggle, or effervescence, arising upon the mingling together of an acid and alkaline liquor.

Mr. Boyle has an experiment to shew, that a considerable ebullition may be produced by such a mixture, without the bodies acquiring any heat; nay, that a degree of cold may be produced with it greater than was in either of the bodies singly; though accompanied with a great struggle, tumult, noise, and froth. For having shook one part of oil of vitriol, into 12 parts of common water, the mixture was at first sensibly warm; then, the ball of a thermometer was placed in it, till the included spirit had gained the temperament of the mixture; but then a convenient quantity of volatile salt of sal armoniac, being gradually put in to satiate the acid spirits of the mixture, the spirit in the thermometer descended above an inch.

ECARTELE', in heraldry. See **QUARTERLY**.
ECCANTHIS, or **ENCANTHIS**, in medicine. See **ENCANTHIS**.

ECCE-HOMO *, among painters, a name given to a picture, wherein our Saviour is represented in a purple robe, with a crown on his head, and a reed in his hand; such as he was presented before Pilate by the Jews.

* The phrase is Latin, borrowed from the words of the Jews themselves, *q. d.* this is the man.—Such a person has a fine *ecce homo*.

ECCENTRIC. } See the articles } **EXCENTRIC**.
ECCENTRICITY. } **EXCENTRICITY**.
ECCHYMOISIS, **ΕΚΚΥΜΩΣΙΣ**, the effusion of blood from a rupture in some of the small veins near the skin; causing a lividity, or blueness thereof.

This is also called *ecchymema*, **Εκχυμωμα**, and stands distinguished from the *enchymosis*, where there is no extravasation. The *ecchymosis* is either *simple*, or *with abscess*. The former is a mere disface of the skin, wherein the blood extravasated by some blow or contusion, upon its arrival between the fleshy or muscular parts and the cutis, stops there and turns black or livid, without any appearance of a wound.—In the latter, the extravasated blood suppurates, and breeds an imposthume.

ECCLESIA, a Latin, or rather Greek term, signifying church. See **CHURCH**.

In our ancient law-books, Fitz-Herbert observes, that **ECCLESIA**, **ΕΚΚΛΗΣΙΑ**, properly signifies a *parsonage*. Whence, if a church were made to a chapel, as to a church, by the name of *ecclesia*, it changed the name thereof, and it presently commenced a church.

When the question was, whether it were, *ecclesia*, *aut capella pertinens ad ecclesiam*? the issue was, whether it had *baptisterium* & *sepulchrum*? for if it had the administration of the sacraments, and sepulture, it was in law judged a church. See **CHAPEL**.

Restitutio extracti ab ECCLESIA. } See **RESTITUTION**.
Recto de advocacione ECCLESIAE. } **RECTO**.
Warda ECCLESIAE. } **WARDA**.

ECCLESIANS, **ECCLESIANI**, in church history.—Upon any falling out or misunderstanding, between the emperors and the church men, the adherents to the emperor called such as stuck to the interests of the church, and church men, *ecclesiani*, a term of reproach, answering to our high-churchmen.

ECCLESIASTES, one of the books of the Old Testament; thus called, by a Greek word, signifying *preacher*; in regard the author in it declaims, or *preaches*, against the vices and vanities of the world.

This is Mariana's judgment; Grotius thinks otherwise; taking the book to derive its appellation from its being a collection of fine sentences, and reflexions on the vanity of the things of our earth, &c. From the word **קָהָל**, which signifies to *amass*, or *collect*, **קְהָלֵי**, **קְהָלֵי**. Some Hebrew doctors supposing the same etymon, will have it to have been thus called on account of its *amassing* a great deal of wisdom; others because the author's aim is to *assemble*, and *call* together, all such as are willing to consult their safety, and avoid the dangers of the world; which is the opinion of Gejerus: lastly, others, with Calovius, deduce it from his *assembling* them about him, as a preacher assembles his auditory.

There are different sentiments as to the author of this book: the most common is, that it is Solomon's, who is supposed to have wrote it towards the close of his life, to give tokens of his penitence to posterity.

Grotius, indeed, takes the work to be posterior to Solomon; and to have been wrote after his death by I know not what authors, six in number; who, to give their book the greater authority, put Solomon's name to it, and represented him as repentant. What he founds so many positive acts on, is, that we meet with words in this book, which are no where else seen, but in Daniel, Eſſras, and the Chaldee paraphrases. But, it is certain, all, both Hebrews, Greeks, and Latins, have always spoke of it as a work of Solomon. Indeed, there are authors, who have attributed all the books of Solomon to Isaiah; but these are only to be understood, as if that prophet had collected them. If it be true, that there are Chaldee words in the *Ecclesiastes*, it is easier to suppose Solomon understood that language, than to deny him the author of the book.

If the book is not Solomon's, because Grotius has found four or five words, which are only to be explained by the Chaldee and Arabic; we are not sure of the author of any book in the Bible. Moses must not be the author of Genesis; for even in the very first verse of that book we meet with two or three words, that are only deducible from Arabic roots. And how many authors attribute to Solomon, or to Moses, the book of Job, which is that of all the books of the Old Testament, where there is the most Arabic, and Chaldee, or Syriac.

In fine, Calovius assures us, that the true reason why Grotius would not allow Solomon the author of the book of *Ecclesiastes*, is, that it speaks too clearly, and precisely for his time, of the universal judgment, eternal life, and the pains of hell, but these are truths established before Solomon, in the Psalms, the Pentateuch, and Job.

There appears no reason therefore, for denying this book to Solomon; but several for ascribing it to him. As, 1^o. The title of the book, which asserts its author to be the son of David, and king of Jerusalem. 2^o. Several passages in the book, which agree to no body but that prince, as c. i. v. 12. c. vii. v. 24. c. xii. v. 9. &c. and 3^o. The constant tradition of the ancient Jews and Christians.

The Talmudists, and other Rabbins, however, note that the book of *Ecclesiastes*, was some time ere it was put in the canon. See the *Genara* on the Pirke Abboth, f. i. col. 1. Masfick Schabbath, c. 2. fol. 30. col. 2. Aben Ezra on the *Ecclesiastes* vii. 4. Maimonides, Moreh Nebochim, l. III. c. 28. and Mercerus, Calovius, and Gejerus on this book.

ECCLESIASTIC, or **ECCLESIASTICAL**, something belonging to, or set apart for the church; in contradistinction to *civil*, or *secular*, which regard the world. See **CIVIL**, &c. There are *ecclesiastical* things and persons: *ecclesiastical law*, *jurisdiction*, *history*, *ceremonies*, *discipline*, *preferments*, &c. *Ecclesiastical* persons, are either *regular* or *secular*. See **REGULAR** and **SECULAR**.—In the empire there are three *ecclesiastical* electors, *viz.* the archbishops of Mentz, Treves, and Cologne.—In France, they have *ecclesiastical Peers*, &c. See **PEER**.

ECCLESIASTIC chambers. See **CHAMBER**.
ECCLESIASTIC community. } See the articles } **COMMUNITY**.
ECCLESIASTIC corporation. } **CORPORATION**.
ECCLESIASTIC faith. } **FAITH**.
ECCLESIASTIC patronage. } See the articles } **PATRONAGE**.
ECCLESIASTIC tradition. } **TRADITION**.

ECCLESIASTICAL courts, are the convocation, court of delegates, of arches, of audience, prerogative court, court of peculiars, bishops court, and archdeacons court. See each under its proper article, **CONVOCAION**, **AUDIENCE**, **ARCHES**, &c. *Ecclesiastical* censures and punishments, are excommunication, penance, suspension, deprivation, and deposition, or degradation. See **EXCOMMUNICATION**, &c.

ECCLESIASTICO primo beneficio habendo. See the article **PRIMO**.

ECCLESIASTICUS, an apocryphal book, composed by Jesus the son of Sirach, and admitted by the Romish church, into the canon of the Old Testament. It is frequently cited by the abbreviation, *Ecclel.* to distinguish it from the *Ecclesiastes*, which is cited by *Eccle*. Isidore, l. VI. *Ety.* c. 2. and among the moderns Grotius, and Drusius, deny the author of the *Ecclesiasticus* to be Jesus the son of Sirach, grandson of the high priest Jesus, who returned from Babylon with Zorobabel. Genebrard asserts, that Jesus the son of Sirach was of the race of Jesus son of Joseph. But this does not appear.

St. Jerome assures us, in his preface to the books of Solomon, that he had seen this book in Hebrew; and that the Hebrews intitled it *parables*: from which the jesuite Mariana concludes, that the high priest Jesus wrote this book in Hebrew; as it appears likewise from the prologue to the book itself; and that his grandson translated it into Greek, which likewise appears from the prologue: that he made this translation in Egypt, where the author lived in his 38th year; that it was done under the reign of Ptolemy Evergetes, successor of Ptolemy Philadelphus, who began to reign in the year of Rome 512, 240 years before Christ; that the grandfather had intitled it *parables*, which the grandson changed into *Ecclesiasticus*: lastly, that the book, however, is attributed to the translator by reason he changed, and added many things to the original. Fa. Calmet takes the book of *Ecclesiasticus* to have been composed under the pontificate of Onias III, son of Simon, and the reign of Antiochus Epiphanes, king of Syria. He adds, that neither the author of the Latin translation, nor the time when it was made, is known; but being quoted regularly by all the ancient fathers, there is no doubt of its being very ancient. He takes it to have been done by the translator of the book of Wisdom.

ECCOPE *, **ΕΚΚΟΠΗ**, in chirurgery, the same with excision, or amputation.
 The word is formed from the Greek **εκκοπειν**, *excoindere*, to cut off.

ECCORPE, is likewise used for a kind of fracture, or solution of continuity of the skull, by a simple incision.

ECCOPROTICS *, ΕΚΚΟΠΩΤΙΚΑ, in medicine, laxative, or loosening remedies, which purge gently, by softening the humours and excrements, and fitting them for expulsion.

* The word is composed of the Greek particle εκ, and κωρῶ, excrement.

ECHARPE. See **BATTERY** en *Eucharpe*.

ECHÉVIN. See the article **ESCHÉVIN**.

ECHINATE seeds, are such as are prickly and rough like the coat of a chestnut; or, as some say, like the skin of a hedge-hog.

ECHINUS, in architecture, a member, or ornament, near the bottom of the Ionic, Corinthian, and composite capitals; which, from its circular form, and composite capitals; which, from its circular form or contour, is called by the French, *quart de rond*, and by the English, *quarter round*, or *baulet*; and from its being usually carved, or cut with figures of eggs, &c. is called also by the Latins, *ovum*, by the Italians, *ovolo*, the French, *ovif*, and the English, *eggs* and *ovobars*.—See *Tab. Archit. fig. 28. lit. p.* Lastly, the eggs being encompassed with a cover, and thus bearing some resemblance to a chestnut cut open; the Greeks have called it *εχινῶς*, *echinus*, a word which denotes the prickly cover of a chestnut.

ECHINUS, is also used by some botanists for the prickly head, or top of any plant; thus called from its likeness to an hedge-hog, or the cover of a chestnut.

ECHINUS, the hedge-hog, and **ECHINUS** marinus, the sea-urchin. See in the *Supplement*, articles **ECHINUS**, and **ECHINODERMA**.

ECHIQUETE, in heraldry. See **CHECKY**.

ECHO *, or **ECCHO**, a sound reflected, or reverberated, from a solid, concave body, and so repeated to the ear. See **SOUND** and **REFLECTION**.

* The word is formed of the Greek *εχῶς*, *sound*, of the verb *εχῶ*, *sona*, *I sound*.

The Peripatetics, who took found for I know not what species, or image of the sonorous body, impressed on the adjoining air, account for *echo* from a reflection of that species, occasioned by its meeting some obstacle in the way. But the moderns, who know sound to consist in a certain tremor, or vibration in the sonorous body communicated to the contiguous air, and by that means to the ear, give a more consistent account of *echo*.

For a tremulous body, striking on another solid body, it is evident, may be repelled without destroying or diminishing its tremor; and consequently a sound may be redoubled by the reflection of the tremulous body, or air.

But a simple reflexion of the sonorous air, is not enough to solve the *echo*: for then every plain surface of a solid hard body, as being fit to reflect a voice or sound, would redouble it; which we find does not hold.

To produce an *echo*, therefore, it should seem that a kind of concameration, or vaulting were necessary, in order to collect, and by collecting, to heighten and increase, and afterwards reflect the sound; as we find is the case in reflecting the rays of light, where a concave mirror is used.

In effect, as often as a sound strikes perpendicularly on a wall, behind which is any thing of a vault, or arch, or even, another parallel wall; so oft will it be reverberated in the same line, or other adjacent ones.

For an *echo* to be heard, therefore, it is necessary the ear be in the line of reflection: for the person who made the sound to hear its *echo*, it is necessary he be perpendicular to the place which reflects it: and for a manifold or tautological *echo*, it is necessary there be a number of walls and vaults, or cavities, either placed behind each other, or fronting each other.

A single arch, or concavity, &c. can scarce ever stop and reflect all the sound; but if there be a convenient disposition behind it, part of the sound, propagated thither, being collected and reflected, as before, will present another *echo*: or if there be another concavity, opposed at a due distance to the former, the sound reflected from the one upon the other will be tossed back again by this latter, &c.

Many of the phenomena of *echo's*, are well considered by the bishop of Leigis, who remarks, that any sound, falling either directly or obliquely, on any dense body of a smooth, whether plain or arched, superficies, is reflected, or, in other words, it *echo's* more or less. The surface, says he, must be smooth, otherwise the air, by reverberation, will be put out of its regular motion, and the sound thereby broke and extinguished. He adds, that if *echo's* more or less, to shew, that when all things are, as before described, there is still an *echoing*, though it be not always heard; either because the direct sound is too weak to beat quite back again to him that made it, or that it does return to him, but so weak, that it cannot be discerned; or that he stands in a wrong place to receive the reflected sound, which passes over his head, under his feet, or on one side of him, and which therefore may be heard by a man standing in the place where the reflected sound does come, provided no interposed body intercepts it; but not by him that originally made it.

Echo's may be produced with different circumstances; for,
1. A plane obstacle reflects the sound back in its due tone and loudness; allowance being made for the proportionable decrease of the sound, according to its distance.

2. A convex obstacle reflects the sound somewhat smaller, and somewhat quicker, though weaker, than it otherwise would be.

3. A concave obstacle; *echo's* back the sound, bigger, slower, and also inverted; but never according to the order of words.

Nor does it seem possible to contrive any single *echo*, that shall invert the sound, and repeat backwards: because, in such case, the word last spoken; that is, which last occurs to the obstacle, must be repelled first, which cannot be. For where in the mean time should the first words hang and be concealed; or how, after such a pause; should they be revived, and animated again into motion?

From the determinate concavity, or archedness of the reflecting bodies, it may happen that some of them shall only *echo* back one determinate note, and that only from one place.

4. The *echoing* body being removed farther off, it reflects more of the sound than when nearer; which is the reason why some *echo's* repeat but one syllable, some one word, and some many.

5. *Echoing* bodies may be so contrived, and placed, as that reflecting the sound from one to the other, either directly and mutually, or obliquely and by succession, out of one sound, shall a *multiple echo*, or many *echo's* arise.

Add, that a *multiple echo* may be made, by so placing the *echoing* bodies, at unequal distances, as that they may reflect all one way, and not one on the other; by which means, a manifold successive sound will be heard; one clap of the hands like many; one ha like a laughter; one single word like many of the same tone and accent; and so one musical instrument, like many of the same kind, imitating each other.

Lastly, *echoing* bodies may be so ordered, that from any one sound given, they shall produce many *echo's*, different both as to tone and intension. By which means a musical room may be so contrived, that not only one instrument playing therein, shall seem many of the same sort and size, but even a consort of different ones; this may be contrived by placing certain *echoing* bodies so, as that any note played, shall be returned by them in 3ds, 5ths, and 8ths.

ECHO, is also used for the place where the repetition of the sound is produced, or heard.

Echo's are distinguished into diverse kinds, *viz.*

1. *Single*, which return the voice but once; whereof some are *tonical*, which only return a voice when modulated into some particular musical tone. Others, *polysyllabical*, which return many syllables, words and sentences. Of this last kind, is that fine *echo* in Woodstock park, which Dr. Plot assures us, in the day-time, will return very distinctly seventeen syllables, and in the night twenty. See *Nat. Hist. Oxford*, c. 1, p. 7.

2. *Multiple, or tautological*, which return syllables and words the same oftentimes repeated.

In *echo's*, the place where the speaker stands, is called the *centrum phonicum*; and the object, or place, that returns the voice, the *centrum phonocampticum*.

At the sepulchre of Metella, wife of Crassus, there was an *echo*, which repeated what a man said, five times. Authors mention a tower at Cyzicus, where the *echo* repeated seven times. One of the finest *echo's* we read of is that mentioned by Barthius, in his notes on Statius's *Thebais*, l. VI. v. 30, which repeated the words a man uttered seventeen times: this was on the banks of the Naha, between Coblents and Bingen. Barthius assures us, he had proved what he writes; and had counted fifteen repetitions. And whereas, in common *echo's*, the repetition is not heard till some time after hearing the word spoke, or the notes sung; in this, the person who speaks, or sings, is scarce heard at all; but the repetition very clearly, and always in surprising varieties; the *echo* seeming, sometimes to approach nearer, and sometimes to be further off. Sometimes the voice is heard very distinctly, and sometimes scarce at all. One person hears only one voice, and another several: one hears the *echo* on the right, and the other on the left, &c. Addison, and other travellers into Italy, mention an *echo* in that country, still more extraordinary, which will return the sound of a pistol 56 times, even tho' the air be very foggy. See *Addis. Trav.* edit. 1718, p. 32. *Misson. Voyag. d'Ital.* T. 2. p. 196, edit. 1691.

ECHO, in architecture, is applied to certain vaults, and arches, most commonly of elliptical, or parabolical figures; used to redouble sounds, and produce *artificial echo's*. The method of making an *artificial echo*, is taught by the jesuit Blancani, in his *Echometria*, at the end of his book on the *Sphere*.

Vitruvius tells us, that in diverse parts of Greece, and Italy, there were brazen vessels, artfully ranged under the seats of the theatres, to render the sound of the actors voices more clear, and make a kind of *echo*; by which means, of the prodigious multitude of persons present at those spectacles, every body might hear with ease and pleasure.

ECHO, in poetry, denotes a kind of composition, wherein the last words, or syllables, of each verse, contain some meaning, which being repeated a-part, answers to some question, or other matter, contained in the verse.

Such is that famous *echo* of Erasmus, *decem annos consumpsi in legendo Cicerone—one, i. e. ove, asine.*

The first *echo*, in verse, according to Pasquier, is that in the Sylve of Johannes secundus; but Pasquier is mistaken; for the ancient Greek and Latin poets have wrote *echo's*. This, Martial intimates plainly enough, when laughing at such sorts of baubles, he says, there is nothing like them among his poems. *Nisquam gracula quod recantat echo:* by which, on the one side, he shews there were Latin poets in his time, who made *echo's*; and on the other, that the invention came from the Greeks.

Aristophanes, in his comedy, intitled *Σεσμφορονίζουσαι*, introduces Euripides in the person of *echo*. And Callimachus, in the epigram, *Ἐχθαίρω το ποιῆμα το κωμικόν*, seems to have intended a kind of *echo*.

ECHOMETER *, in music, a kind of scale, or rule, with several lines divided thereon, serving to measure the duration, or length, of sounds, and to find their intervals, and ratio's.

* The word is formed of the Greek *ἠχῶ*, *sound*, and *μετρέω*, *measure*.

ECLECTIC *, **ECLECTICI**, a name given to some ancient philosophers, who without attaching themselves to any particular sect, took what they judged good, and solid from each.

* Hence their denomination; which, in the original Greek, signifies, that they be chosen, or that chosen, of the verb *ἐκλέγω*, *I choose*.

Laertius notes, that they were also, for the same reason, denominated *analageticci*, but that they called themselves *Philalithes*, i. e. lovers of truth.

The chief, or founder of the *eclecticci*, was one Potamon, of Alexandria, who lived under Augustus, and Tiberius; and who, weary of doubting of all things with the Sceptics and Pyrrhoniens, formed the *eclectic* sect; which Vossius calls the *eclecticive*.

ECLEGMA *, or **ECLEGMA**, **EΚΑΕΙΜΑ**, in medicine, a pectoral remedy, of the consistence of a thick syrup; called also *lobach*, *linctus*, and *lambative*.

* The word is Greek formed of *ἐκ*, and *λεγεῖν*, *to lick*; by reason the patient is to take it by licking it off the end of a liquorice stick dip't therein; in order that being taken thus by little and little, it may remain the longer in the passage, and moisten the breast the better.

There are *eclegma's* of the syrups of poppy, others of lentils, others of squills, &c. Their intention is to heal, or ease the lungs in coughs, peripneumonics, &c. they are usually composed of oils, incorporated with syrups.

ECLIPSE *, in astronomy, a privation of the light of one of the luminaries, by the interposition of some opaque body, either between it and the eye; or between it and the sun.

* The word is derived from the Greek, *ἐκλειψις*, of *ἐκλείπω*, *deficio*, I fail.

The ancients had frightful ideas of eclipses, supposing them pre-fages of the most dismal events: Plutarch assures us, that at Rome, it was not allowed to talk publicly of any natural causes of eclipses. They made a great noise with brazen instruments, and raised loud shouts, during eclipses of the moon, as thinking thereby to ease her in her labour: whence Juvenal, speaking of a talkative woman, says; *una laboranti poterit succurrere luna*. Others have attributed the eclipse of the moon to the arts of magicians, who by their incantations, plucked her out of heaven, and made her skim over the grass. The natives of Mexico keep fast, during eclipses; and, particularly, their women, who beat and abuse themselves, drawing blood from their arms, &c. They imagine the moon has been wounded by the sun in some quarrel between them.

The duration of an ECLIPSE, is the time between the immersion, and emersion.

Immersion, or incidence of an ECLIPSE, is the moment when part of the sun planet, or moons disk first begins to be hid. See IMMERSSION.

Emersion, or expurgation of an ECLIPSE, is the time when the eclipsed luminary begins to re-appear, or emerge out of the shadow.

To determine the duration of eclipses, they usually divide the diameter of the luminary eclipsed, into 12 equal parts, called *digits*, or *digits eclipsici*.

Eclipses, are divided with respect to the luminary eclipsed, into eclipses of the sun, of the moon, and of the satellites: and with respect to the circumstances, into total eclipses, partial, annual, &c. eclipses.

ECLIPSE of the moon, is a deficiency of light in the moon, occasioned by a diametrical opposition of the earth between the sun and moon.

The manner of this eclipse is exhibited in *Tab. Astronom. fig. 34.* where A represents the earth, and B or C the moon. When all the light of the moon is intercepted, i. e. when her whole disk is covered, the eclipse is said to be total, when only part, partial. When the total eclipse lasts for some time, it is

said to be *totalis cum mora*, total with continuance; when only instantaneous, *totalis sine mora*, total without continuance.

Eclipses of the moon, only happen in the time of full moon; by reason it is only then the earth is between the sun and moon. Nor do they happen every full moon, by reason of the obliquity of the moon's way with respect to the sun's; but only in those full moon's, which happen either in the nodes, or very near them, where the aggregate of the apparent semi-diameters of the moon and the earth's shadow, is greater than the latitude of the moon, or the distance between their centres.

The most considerable circumstances in the eclipses of the moon, are, 1. That as the sum of the semi-diameters of the moon, and earth's shadow, is greater than the aggregate of the semi-diameters of the sun and moon, (that when least, being $5\frac{1}{2}$, and this, when greatest, scarce $3\frac{1}{2}$.) It is evident, lunar eclipses may happen in a greater latitude of the moon, and at a greater distance from the nodes, and consequently are more often observed in any one part of the earth, than solar ones; though with respect to the whole earth, the latter are as frequent as the former.

2. Total eclipses, and those of the longest duration, happen in the very nodes of the ecliptic: by reason the section of the earth's shadow then falling on the moon, is considerably greater than her disk. There may likewise be total eclipses, within a little distance of the nodes; but the further, the less their duration; further off still, there are only partial ones, and at length none at all: as the latitude and the semi-diameter of the moon together, are either less, equal, or greater than the semi-diameter of the shadow.

3. All lunar eclipses are universal, i. e. are visible in all parts of the globe which have the moon above their horizon; and are every where of the same magnitude, and begin and end together.

4. In all lunar eclipses, the eastern side is what first immerses and also emerges; so that though at first the moon be more westerly than the earth's shadow, yet her proper motion being swifter than the same, she overtakes and outgoes it.

5. The moon, even in the middle of an eclipse, has usually a faint appearance of light; which Gassendus, Ricciolus, Kepler, &c. attribute to the light of the earth's atmosphere transmitted thither.

Lastly, She grows sensibly paler, and dimmer, before ever she enters within the earth's shadow, which is attributed to the earth's penumbra.

Astronomy of lunar ECLIPSES, or the method of calculating their times, places, magnitudes, and other phenomena.—Preliminary

1. To find the length of the earth's shadowy cone. Find the sun's distance from the earth for the given time; see SUN and DISTANCE. Then, as the sun's diameter is known in semi-diameters of the earth, the length of the cone will be found from the rules given under SHADOW.

Suppose, e. gr. the sun's greatest distance from the earth, 34996 semi-diameters of the earth; and the sun's semi-diameter to be to that of the earth as 153 to 1. Then will the length of the shadowy cone be found $230\frac{1}{2}$. Hence, as the moon's least distance from the earth, is scarce 64 semi-diameters; the moon, when in opposition to the sun, in or near the nodes, will fall into the earth's shadow, though the sun and moon be in their apogees. And much more, if they be in or near their perigees, by reason the shadow is then longer; and the moon nearer the base of the cone.

2. To find the apparent semi-diameter of the earth's shadow, in the place of the moon's passage, for any given time. Find the sun and moon's distance from the earth; and thence, their horizontal parallaxes: add the parallaxes together, and from the sun, subtract the apparent semi-diameter of the sun. The remainder is the apparent semi-diameter of the shadow. Thus, suppose the moon's horizontal parallax $56' 48''$, the sun's $6'$: the sum is $56' 54''$; from which the sun's apparent semi-diameter $16' 5''$ subtracted, leaves $40' 49''$ for the semi-diameter of the shadow.

Note, M. de la Hire omits the sun's parallax, as of no consideration: but increases the apparent semi-diameter of the shadow by a whole minute, for the shadow of the atmosphere; which would give the semi-diameter of the shadow, in our instance, $41' 13''$.

3. The moon's latitude, AL, at the time of her opposition, together with the angle at the node B, being given; to find the arch between the centres AI, and the arch IL. (Fig. 35.) Since in the spherical triangle AIL, rectangular at I; the side AL is given, as also the angle ALI, as being the complement of LAI, or B to a right angle; the arch between the centres AI, is found by spherical trigonometry; and since the angle LAI, is equal to B, each of them, with IAB, making a right angle; and the moon's latitude AL is given; the arch LI will likewise be found by spherical trigonometry. See SPHERICAL triangle.

To determine the bounds of an ECLIPSE of the moon.—Since there is no eclipse possible, but when the aggregate of the semi-diameters of the shadow and the moon, is greater than the moon's latitude, (for without this, the moon will not come in the

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the shadow) add the apparent semi-diameters of the moon in perigæo, and of the shadow, supposing the sun in apogæo; by which you will have the side MO, fig. 36. Then, in the spherical triangle MNO, having given the angle at the node, whose quantity is the moon's greatest latitude in the conjunctions; the right angle E; and the leg MO; find the moon's distance from the node NO: which is the utmost bound, beyond which the *eclipse* cannot reach. After the same manner, adding the apparent semi-diameters of the moon in apogæo, and of the shadow of the sun in perigæo, for the sake of having the LH, in the triangle NLI; the distance of the moon, from the ascending node HN, will be found by spherical trigonometry; which is the bound within which the moon will necessarily be *eclipsed*.

Thus, e. gr. the semi-diameter of the shadow, when the sun is in apogæo, and the moon in perigæo, according to Kepler, is $49' 40''$. And the apparent semi-diameter of the moon in perigæo $16' 22''$. Consequently MO is $66'$, or $1^\circ 6'$; and therefore there will be no *eclipse* at all, if the moon's latitude be greater than $1^\circ 6'$. Now, as the same angle N is supposed by Kepler to be $5^\circ 18'$.

Log. Sin. N 8965537
 Sin. MO 8282433
 Whole Sine 10000000

Log. of Sine ON 93177996. The number corresponding to which in the tables is $11^\circ 59' 50''$. If, therefore, the moon's distance from the ascending node be greater than 12° ; no *eclipse* can happen. And, in like manner, the semi-diameter of the shadow in the sun's perigæo, and the moon's apogæo is $43' 50''$, and the moon's semi-diameter in her apogæo $15'$. Consequently, LH is $58' 50''$. And, therefore, there will be an *eclipse*, if the moon's latitude do not exceed $58' 50''$. But here, as before, the argument of the latitude is found $1^\circ 40'$.

To determine the quantity of an *eclipse*, or the number of digits eclipsed.—Add the moon's semi-diameter IC, (fig. 35,) to the semi-diameter of the shadow AM; then will $AM + IK = AI + IM + IK = AI + MK$. From this sum, therefore subtract the arch between the centres AI, the remainder gives the scruples, or parts of the diameter eclipsed MK. Say, therefore, as the moon's diameter KH, is to the scruples, or parts thereof eclipsed MK; so is 12, to the digits eclipsed.

Thus, supposing KH, $30' 44''$, and consequently IK, $15' 22''$; AM, $41' 13''$; and AL, $43' 14''$: the moon's semi-diameter will be $13' 22''$, and that of the shadow $41' 13''$; the sum whereof, is $56' 35''$. From which the arch between the centres $43' 14''$; being subtracted, leaves $13' 21''$ scruples, or 801 seconds. Then as $1844 : 801 :: 12 : 5 \frac{2}{3}$ dig. or 5 dig. $13'$.

To find the scruples of half duration of an *eclipse*, or the arch of the lunar orbit, which her centre describes from the beginning of the *eclipse* to the middle thereof.—Add the semi-diameters of the shadow AP, and the moon PN together; the sum gives AN. From the square of AN, subtract the square of AI; the remainder is the square of IN. And the square root of this residue is the arch IN required.

To find the scruples of half duration of total darkness, in a total *eclipse*.—Subtract the moon's semi-diameter SV, from the semi-diameter of the shadow AV; the remainder is AS: in the triangle AIS, which is rectangular at I, therefore, we have the arch AS given by the last method; and the arch between the centres AI: where the arch IS is found, as in the last problem.

To find the beginning, middle, and end of a lunar *eclipse*.—Say, as the moon's horary motion from the sun, is to 3600 horary seconds; so are the seconds of the arch LI, fig. 35, to the horary seconds equivalent thereto. Subtract these scruples, or seconds, in the first and third quadrant of the anomaly, from the time of full moon, and add it to the same in the second and fourth; the result is the time of the middle of the *eclipse*. Then say, as the moon's horary motion from the sun is to 3600 scruples, or seconds, so are the seconds of half duration IN, to the time of half duration: the double of which gives the whole duration. Lastly, subtract the time of half duration, from the time of the middle of the *eclipse*, the remainder will be the beginning of the *eclipse*. And add the same to the same, the sum will be its end.

Suppose, e. gr. $LI = 4' 5'' = 245''$, IN $2530''$, time of full moon $9^h 23' 49''$, horary motion of the moon from the sun, $30' 12''$, or $1812''$, then will

Log. hor. D from O 32581581
 Log. 3600 35563025
 Log. LI 23891660

59454685

Log. of time required 26873104; the number corresponding to which, in the tables, is $486'$, or $8' 6''$.

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Time of full moon $9^h 23' 49''$
 Time of middle *eclipse* $9^h 15' 43''$
 Log. hor. D from O 32581581
 Log. 3600 35563025
 Log. IN. 33404934

68967959

Log. of half duration 36386378; the number corresponding to which, in the tables, is $4351''$, or,

$1^h 12' 31''$.

Duration of *eclipse* $2^h 25' 2'$
 Time of middle *eclipse* $9^h 15' 43''$
 Half duration subtract. $1^h 12' 31''$

Beginning of *eclipse* $8^h 3' 12''$
 Time of middle *eclipse* $9^h 15' 43''$
 Half a duration added $1^h 12' 31''$

End of *eclipse* $10^h 28' 14''$

To calculate an *eclipse* of the moon.—1. For the given time of the mean full moon, compute the moon's distance from the node; to find whether there be an *eclipse* or not: as taught in the first problem.

2. Compute the time of the true full moon, with the sun and moon's true place reduced to the ecliptic.

3. For the time of the true full moon, compute the moon's true latitude, and the distance of each luminary from the earth, with the horizontal parallaxes, and apparent semi-diameters.

4. For the same time, find the sun and moon's true horary motion.

5. Find the apparent semi-diameter of the shadow.

And 6. The arch between the centres AI, with the arch LI.

7. Compute the scruples of half duration IN.

And thence, 8. Determine the beginning, middle, and end of the *eclipse*.

Lastly, Find the scruples eclipsed, and thence the quantity of the *eclipse*: as taught under the preceding problems.

E. gr. anno 1708, the mean full moon fell on the 29th day of September, at $3^h 45' 4''$ afternoon: and then the moon's distance from the ascending node, was $5^\circ 22' 36''$. Consequently the full moon was *eclipsed*. Now, for that time we find

True full moon $9^h 23' 49''$
 True place of the sun $6^h 43' 47''$
 Moon's place in the ecliptic $6' 43' 47''$
 Moon's true latit. north $43' 25''$
 Horizon. parallax. of O 6
 of D 56 18
 Apparent semi-diam. of O 16 5
 of D 15 22
 True horar. mot. of D from O 30 12
 Semi diam. of shadow 41 13
 Arch between the centers 43 14
 Arch LI 4 5
 Scruples of half duration 36 30
 Scruples eclipsed 13 21
 Duration of *eclipse* $2^h 25' 2''$
 Beginning $8^h 3' 12''$
 Middle $9' 15' 43''$
 End $10' 28' 14''$
 Quantity 5 dig. $13'$.

To draw a type, or figure of a lunar *eclipse* on a plane.—1. Let CD, (fig. 38.) represent the ecliptic; and let the centre of the shadow be in A: through which draw a right line GQ, perpendicular to DC: and suppose D the east, C the west, A the south, and G the north.

2. From A, with the interval of the aggregate AN, of the semi-diameter of the shadow AP, and of the moon PN, describe a circle DGCC; and with the interval of the semi-diameter of the shadow AP, draw another concentric circle EMFR, which will exhibit the section of the shadow in the passage of the moon.

3. Let AL be equal to the latitude of the moon at the beginning of the *eclipse*; and in L erect a perpendicular LN, meeting the greater circle in N, towards the west. Then will the centre of the moon, at the beginning of the *eclipse*, be in N.

4. After like manner, make AS equal to the latitude of the moon at the end of the *eclipse*; and in S, erect a perpendicular OS, parallel to DC: then will the centre of the moon be in O, at the end of the *eclipse*.

5. Connect the points O and N by a right line: ON will be the arch of the orbit, which the centre of the moon describes during the *eclipse*.

6. From O and N, with the interval of the moon's semi-diameter,

3 F f

diameter,

diameter, describe circles PV and TX, which will exhibit the moon at the beginning and end of the *eclipse*.

7. Then, from A, letting fall a perpendicular AI to ON; the centre of the moon will be in I, in the middle of the darkness.

Wherefore, lastly from I, with the interval of the moon's semi-diameter, describe a circle HK: this will represent the moon in the greatest darkness, and at the same time the quantity of the *eclipse*.

ECLIPSE of the sun, is an occultation of the sun's body, occasioned by a diametrical interposition of the moon between the sun and the earth.

It is distinguished, like that of the moon, into *total* and *partial*, &c. to which must be added a third species called *annular*.

Eclipses of the sun, some authors observe, should in propriety be called *eclipses of the earth*.

As the moon is found to have a parallax of latitude; *eclipses* of the sun only happen when the latitude of the moon, viewed from the sun, is less than the aggregate of the apparent semi diameter of the sun and moon. *Solar eclipses*, therefore, happen when the moon is in conjunction with the sun, in, or near the nodes, *i. e.* at the new moons. Consequently, the memorable *eclipse of the sun*, at our Saviour's passion, happening at the time of full moon, when the sun and moon are in opposition, was preternatural.

Though the new moon cover the sun from the earth, yet is not there an *eclipse* every new moon; by reason the moon's way is not precisely under the ecliptic, but is placed obliquely thereto; only intersecting it twice in every period. So that *eclipses* can only be occasioned in such new moons, as happen in these intersections or nodes, or very near them.

In the nodes, when the moon has no visible latitude, the occultation is total; and with some continuance, when the disk of the moon, in perigæo, appears greater than that of the sun in apogæo, and its shadow is extended beyond the surface of the earth; and, without continuance, at moderate distances, when the cup, or point of the moon's shadow, barely touches the earth. Lastly, out of the nodes, but near them, the *eclipses* are partial.

The other circumstances of *solar eclipses*, are, 1. That none of them are universal; that is, none of them are seen throughout the whole hemisphere, which the sun is then above; the moon's disk being much too little, and much too near the earth, to hide the sun from the disk of the earth, which is fifteen times bigger than it.

2. Nor does the *eclipse* appear the same in all parts of the earth, where it is seen; but when in one place it is total, in another it is only partial.

Further, when the moon, being in her apogæe, appears much less than the sun; as happens most sensibly, when he is in perigæo: the cup of the lunar shadow not reaching the earth, he becomes in a central conjunction with the sun, yet not able to cover his disk; but lets his whole limb appear like a lucid ring or bracelet: this is hence called an *annular eclipse*.

3. It does not happen at the same time, in all places where it is seen; but appears more early to the western parts, and later to the eastern.

4. Its beginning is always on the western side the sun, and on the same side it ends.

5. In most *solar eclipses*, the moon's darkened disk is covered with a faint, dawning light; which is attributed to the reflexion of the light, from the illuminated part of the earth.

Lastly, In total *eclipses* of the sun, the moon's limb is seen surrounded by a pale circle of light; which the late astronomers take for a manifest indication of a lunar atmosphere. See ATMOSPHERE.

The astronomy of ECLIPSES of the sun.—To determine the bounds of a *solar eclipse*.

If the moon's parallax were insensible, the bounds of a *solar eclipse* would be determined after the same manner as those of a *lunar*: but by reason here is a sensible parallax, we must alter our measures a little, *viz.*

1. Add the apparent semi-diameters of the luminaries both in apogæo and perigæo together.

2. Since the parallax diminishes the northern latitude; and the former sum, add the greatest parallax of latitude possible: and since the parallax augments the southern latitude, from the same sum, subtract the greatest parallax of latitude. Thus, in each case, will you have the true latitude, beyond which there can be no *eclipse*.

This latitude given, the moon's distance from the nodes, beyond which *eclipses* cannot happen, is found, as already directed for *lunar eclipses*.

As different authors follow very different hypotheses, with regard to the apparent diameters of the luminaries, and the greatest parallax of latitude; they differ much in assigning the bounds at which *solar eclipses* happen. Ptolemy makes the utmost bound of *eclipses* at $19^{\circ} 25'$, distance from the node; Copernicus, at $19^{\circ} 12'$; Tycho, at $18^{\circ} 25'$; Kepler, at $17^{\circ} 16'$; Ricciolus, at $18^{\circ} 49'$. Though Ptolemy,

in other places, judges $16^{\circ} 42'$ minutes distance from the node, necessary; Copernicus, $16^{\circ} 25'$; Tycho, $17^{\circ} 9'$; Kepler, $15^{\circ} 55'$; and Ricciolus, $15^{\circ} 58'$.

To find the digits eclipsed.—Add the apparent semi-diameters of the luminaries into one sum; from which subtract the moon's apparent latitude, the remainder is the scruples, or parts of the diameter *eclipsed*. Then say, as the semi-diameter of the sun is to the scruples *eclipsed*; so are 6 digits reduced into scruples, or 360 scruples, to the digits *eclipsed*.

To find the scruples of half duration, or the line of immersion.—The method is the same as that delivered for *lunar eclipses*.

To determine the duration of a solar eclipse.—Find the horary motion of the moon from the sun, for one hour before the conjunction, and another hour after: then say, as the former horary motion is to the seconds in an hour, so are the scruples of half duration to the time of immersion: and as the latter horary motion is to the same seconds, so are the same scruples of half duration to the time of immersion. Lastly, adding the time of immersion to that of emersion; the aggregate is the total duration.

To determine the beginning, middle, and end of a solar eclipse.—From the moon's latitude, for the time of conjunction; find the arch IL, (fig. 35), or the distance of the greatest obscuration. Then say, as the horary motion of the moon from the sun, before the conjunction, is to 3600 seconds of an hour; so is the distance of the greatest darkness, to the interval of time between the greatest darkness and the conjunction.

Subtract this interval, in the first and third quarter of the anomaly, from the time of the conjunction; and in the other quarters, add it to the same; the result is the time of the greatest darkness. Lastly, from the time of the greatest darkness, subtract the time of incidence, and add it to the time of emersion; the difference, in the first case, will be the beginning; and the sum, in the latter case, the end of the *eclipse*.

Indeed, as the interval between the conjunction, and the greatest obscuration is very small, and exceedingly precarious; it is scarce worth while to be so very precise; and accordingly, many authors use the time of the apparent conjunction for that of the greatest darkness.

<i>E. gr.</i> in our case,	
Time of conjunction	21 ^h 36' 59"
Time of incidence	1 2 36
Beginning of <i>eclipse</i>	20 34 23
Or 8 ^h morn.	34 23
Time of conjunction	21 36 59
Time of emersion	1 5 47
End of <i>eclipse</i>	22 ^h 42 46
Or 10 morn.	42 46

Or if you would determine it with more accuracy, subtract about two minutes for the distance between the conjunction seen, and the time of the greatest obscuration.

To find the moon's apparent latitude at the beginning and end of an eclipse.—From the argument of the moon's latitude, computed for the time of the apparent conjunction, subtract the scruples of half duration, together with the motion of the sun, answering to the time of incidence: the remainder, is the argument of latitude, at the beginning of the *eclipse*.

To the same sum add the same scruples, together with the sun's motion answering to the time of emersion: the aggregate is the argument of latitude, at the end of the *eclipse*.

The argument of the latitude given; the moon's true latitude is found after the common manner.—(See LATITUDE.) And from the true latitude, is soon found the apparent one.

The apparent latitude of the moon, at the beginning and end of a solar eclipse, given; to draw a type or figure thereof.—This is performed, as already taught for *eclipses* of the moon.

To calculate an ECLIPSE of the sun.—1. Find the mean new moon, and thence the true one; together with the place of the luminaries for the apparent time of the true one.

2. For the apparent time of the true new moon, compute the apparent time of the new moon observed.

3. For the apparent time of the new moon seen, compute the latitude seen.

4. Thence determine the digits *eclipsed*.

5. Find the times of the greatest darkness, immersion, and emersion.

6. Thence determine the beginning, and ending of the *eclipse*.

From the preceding problems, it is evident, that all the trouble, and fatigue of the calculus, arises from the parallaxes of longitude and latitude; without which, the calculation of *solar eclipses* would be the same with that of *lunar* ones.

ECLIPSES of the satellites. See SATELLITES of Jupiter.

The chief circumstances here observed are, 1. That the satellites of Jupiter undergo two or three kinds of *eclipses*; where-

of, the first are proper, being such as happen when Jupiter's body is directly interposed between them and the sun: these happen almost every day. Mr. Flamsteed and Cassini, give us tables, wherein their immersions into Jupiter's shadow, and emersions again, are computed to hours and minutes.

The 2d are occultations, rather than obfuscations; wherein the same satellites, coming too near to Jupiter's body, are lost in his light: which Ricciolus calls *occidere zephace*, fitting jocularly. In which case, Jupiter's nearest satellite exhibits a third kind of *eclipse*; being observed like a macula, or dark round spot, transiting Jupiter's disk, with a motion contrary to that of the satellite: just as the moon's shadow projected on the earth, will appear to do, to the lunar inhabitants.

The *eclipses* of Jupiter's satellites furnish the best means of finding the longitude at sea. Those, particularly, of the first satellite, are much surer than the *eclipses* of the moon; and withal they happen much oftener: beside that, the manner of applying them is very easy. See LONGITUDE.

ECLIPTIC, ECLIPTICUS, something belonging to eclipses.

All new and full moons are not *ecliptic*, i. e. eclipses do not happen every new and full moon, though there be then an interposition, either of the earth between the sun and moon, or of the moon between the sun and earth. The reason is, that the interposition is only as to longitude, and not as to latitude. The sun is always in the *ecliptic*, but the moon is not; she deviates from it about five degrees, sometimes on the north side, and sometimes on the south. But every five months, or thereabouts, she cuts the *ecliptic*; and it is only about those times, that there can be eclipses either of the moon or sun.

The places, wherein she cuts the *ecliptic*, are called the *nodes* of the moon.

ECLIPTIC bounds, or terms, termini ecliptici, denotes the space of about 15 degrees from the nodes of the *ecliptic*; within which, if the moon be, at the time of a conjunction or opposition with the sun, there may be an eclipse of the sun, or moon, though she be not precisely in the nodes.

ECLIPTIC digit, digiti ecliptici. See DIGITS.

ECLIPTIC, is more particularly used for a line, or circle, on the surface of the sphere of the world, under which the center of the sun proceeds in its proper motion: or a line, which the sun's center describes in his annual progress.

It has its name *ecliptic*, by reason all eclipses happen when the two planets are in or near the nodes, or intersections of the *ecliptic*.

It is also called the *sun's orbit*, and *sun's way*, by reason that the sun never deviates from it, in his annual motion from east to west.

The north, or ascending node of the *ecliptic*, is called the *dragon's-head*, and the south, or descending node, the *dragon's tail*.

The *ecliptic* is placed obliquely with respect to the equator, and cuts it into two points, *viz.* the beginning of aries and libra, or into two equal parts; and, accordingly, we find the sun twice every year in the equator: and all the rest of the year, either on the north or south side thereof.

The *ecliptic* is a great circle of the sphere, bisected by the horizon; consequently, the arch of the *ecliptic*, intercepted between the horizon and the meridian, is a quadrant. And again, the solstitial points of the *ecliptic*, i. e. those most remote from the equator, are a quadrant distant from the equinoctial ones. Lastly, as the greatest declination of the *ecliptic*, from the equator, is an arch of a great circle distant by a quadrant from the equinoctial points; it will be the measure, or quantity of the obliquity of the *ecliptic*, i. e. of the angle formed by the intersection of the equator with the *ecliptic*.

The obliquity of the *ecliptic*, or the angle wherein it cuts the equator, is usually fixed at $23^{\circ} 29'$; which, therefore, is the greatest declination of the *ecliptic* from the equator: the points of which greatest declination on each side, are called the *solstitial points*; through which are drawn the two tropics.

The method of observing the greatest declination of the *ecliptic* is thus: about the time of one of the solstices observe the sun's meridian altitude with the utmost care, for several days successively: from the greatest altitude observed, subtract the height of the equator. And the remainder is the greatest declination in the solstitial point.

Ricciolus, *e. gr.* at Bologna, in the year 1646, observed the sun's meridian altitude, on the 20th of June, to be $68^{\circ} 59' 55''$; on the 21st, $69^{\circ} 0' 10''$; and on the 22d, $68^{\circ} 59' 55''$. The greatest then was, $69^{\circ} 50' 10''$; from which the altitude of the equator $45^{\circ} 29' 50''$, being subtracted, left $23^{\circ} 30' 20''$ for the greatest declination.

It has been matter of great dispute among the late astronomers, whether the obliquity of the *ecliptic* be fixed or moveable? It is certain, the observations of the ancient astronomers represent it considerably greater, than those of the moderns; whence Purbachius, Reimholdus, Regiomontanus, Copernicus,

Rheticus, Longomontanus, Tycho, Snellius, Lansbergius; Bullialdus, and others, have concluded it variable.

To determine the point, the observations of the astronomers of all ages, have been collected together; the chief of which are: that of Pytheas, in the year before Christ 324, which makes it $23^{\circ} 52' 41''$: that of Eratosthenes, in 230, $23^{\circ} 51' 20''$: and that of Hipparchus, in the year before Christ 140, $23^{\circ} 51' 20''$: that of Ptolemy, in the year after Christ 140, $23^{\circ} 51' 20''$: of Albategnius in 880, $23^{\circ} 35'$: Regiomontanus, in 1460, $23^{\circ} 30'$: Waltherus, in 1476, $23^{\circ} 30'$: Copernicus, in 1525, $23^{\circ} 28' 24''$: Rothmannus and Byrgius, in 1570, $23^{\circ} 30' 20''$: Tycho, in 1587, $23^{\circ} 30' 22''$: Kepler, in 1627, $23^{\circ} 30' 30''$: Gassendus, in 1636, $23^{\circ} 31'$: Ricciolus, in 1646, $23^{\circ} 30' 20''$: Hevelius, $23^{\circ} 30' 20''$: Mouton, $23^{\circ} 30'$: and De la Hire, in 1702, $23^{\circ} 29'$.

Upon the whole, though the oldest observations make the obliquity the greatest, yet it appears to be immutable: for it was by mistake that Eratosthenes concluded, from his observations, the greatest declination to be $23^{\circ} 51' 20''$: from the same observations he should only have made it $23^{\circ} 31' 5'$; as is shewn by Ricciolus. And the like oversight has been found by Gassendus and Peirescius in the observation of Pythias; which mistakes of Eratosthenes and Pythias were retained by Hipparchus and Ptolemy; and gave occasion to the forementioned authors to conclude that the obliquity was continually decreasing.

Yet the Chevalier de Louville, who has examined the merits of the cause with great attention, is of another opinion: the result of his researches, he gives us in the memoirs of the Royal Academy, for the year 1716, *viz.* that the obliquity of the *ecliptic* diminishes at the rate of a minute in 100 years. The ancients, we know, had no regard to any refractions in their observations; and besides, they made the sun's horizontal parallax $3'$; whereas the modern astronomers scarce make it $10''$. These two inaccuracies have a very ill effect in their observations; which M. de Louville is obliged to free them of, before he can build on them.

According to an ancient tradition of the Egyptians, mentioned by Herodotus, the *ecliptic* had anciently been perpendicular to the equator: this notion they were led into, by observing, for a long series of years, that the obliquity was continually diminishing; or which amounts to the same, that the *ecliptic* was continually approaching to the equator. For hence they took occasion to suspect that those two circles, in the beginning, had been as far off each other as possible. Diod. Siculus relates, that the Chaldeans reckoned 403000 years from their first observations to the time of Alexander's entering Babylon. This enormous account, may have some foundation, supposing the Chaldeans to have built on the diminution of the obliquity of the *ecliptic* of a minute in 100 years. M. de Louville, taking the obliquity such as it must have been at the time of Alexander's entrance into Babylon, and going back to the time when the *ecliptic*, at that rate, must have been perpendicular to the equator, actually finds 402942 Egyptian, or Chaldean years, which is only 58 years short of the former epocha. In the general, there is no way of accounting for the fabulous antiquity of the Egyptians, Chaldeans, &c. so probable, as from the supposition of long periods of very slow celestial motions, whereof they had observed a little part, and thence calculated the beginning of the period; making the world and their own nation to commence together. If M. de Louville's system be true, in 140000 years more, the *ecliptic* and equator must coincide and mix in one.

The *ecliptic* is divided into twelve parts, called *signs*. See SIGN.

Poles of the ECLIPTIC. See the article POLE.

Reduction of the ECLIPTIC. See REDUCTION.

ECLIPTIC, in geography, &c. is a great circle of the globe, cutting the equator under an angle of $23^{\circ} 29'$. See GLOBE. The *terrestrial ecliptic*, therefore, is in the plane of the *caelestial ecliptic*; like which it has its equinoctial and solstitial points, and is bounded by tropics.

ELOGUE, ΕΛΟΓΗ, in poetry, a kind of pastoral composition, wherein shepherds are introduced conversing together.

The *eclogue* is properly an image of the pastoral life: nor do we see what finesse it was that determined Sannazarus to put fishermen in lieu of shepherds, who had been time out of mind in possession of the *eclogue*.

The beauty of the *eclogue*, M. Fontenelle observes, is not attached to what is rural, but rather to what is calm, and easy in the rural life. Shepherds being agreeable personages, the poets abuse them; and provided they do but talk a little about reeds, and herbage, they conclude of course it is an *eclogue*.

There are *eclogues* in Theocritus of a lofty character; and Virgil has some in the sublime style; the *eclogue*, therefore, occasionally raises its voice. Yet M. Fontenelle esteems it a fault in some modern poets, to have put matters of high concern in their *eclogues*; and to have made their shepherds sing the praises of kings and heroes. Ronfard, in particular,

has made himself ridiculous, by giving the *eclogæ* of Budæus and Varable in his first *eclogue*, from the shepherd Margot. Such folks should have been above the knowledge of the simple Margot. The sentiments, in *eclogues*, the same author observes, should be finer, and more delicate than those of real shepherds; only, their form should be as simple, and country-like as can be. But this simplicity excludes none but glaring, and excessive ornaments.

Since the establishment of the academy, or assembly of Arcadians at Rome, about the year 1690; the taste for *eclogues* has been greatly improved among the Italians. Those gentlemen, who are the flower of the wits of Italy, take the name of the shepherds of Arcadia, and will not allow their assembly to be treated as an academy. They have each of them a poetical name, which is always that of some shepherd; and apply themselves particularly to *eclogues*, as pieces most proper to their profession.

The learned Sig. Crescimbeni, one of the founders of the assembly, who had long been custos, i. e. president thereof, and bore the name of Alphesibeo Cario, has wrote the laws and establishment of the society, with the names of all who had been admitted thereof, at the end of his book, entitled, *la Bellezza de la Volgar Poesie*.

The word *eclogue*, is formed from the Greek *ελογον*, choice. So that according to the etymology of the word, *eclogue* should be no more than a select or choice piece; but custom has determined it to a farther signification, viz. a little elegant composition in a simple, natural style and manner.

Idyllion and *eclogues*, in their primary intention are the same thing: thus, the idyllia, *ειδυλλια* of Theocritus, are pieces wrote perfectly in the same vein with the *eclogæ* of Virgil. But custom has made a difference between them, and appropriated the name *eclogues*, to pieces wherein shepherds are introduced speaking; idyllion, to those wrote like the *eclogues*, in a simple, natural style, but without any shepherds in them. Some imagine the name *eclogue*, to have been originally attributed to such poems, as were wrote in imitation of others; such as the *eclogues* of Virgil; which are only imitations of Theocritus.

Others are of opinion, the word was first formed from *ωζ*, *αιωζ*, goat, and *λογος*, discourse, q. d. a conversation or discourse of goats, or goat-herds. But Rucus, in his notes on Virgil, thinks, they would then have made it *Αγορολογια*, *agology*, rather than *eclogue*; or, at least, the word would have been wrote in Greek with *ω*, and in Latin by *æ*, not *e*.

Barthius advances another opinion, viz. that the name *eclogue*, was given to all poetical compositions that were of a moderate length, though too short to give them the name of books; and that hence it is, that Statius, in the epistle at the head of the IIIId book of his *Sylvæ*, and in the preface to his fourth book, calls his poems, *eclogues*; though he had not called them so in the title.

Ausonius, in the preface to his *Cypriæ crucifixa*, calls also his idylls, *eclogues*. Add, that Cruquius, in his comment on Horace, declares to have seen very ancient manuscripts, wherein the satyrs of the poet are called *eclogues*; in which he is seconded by our learned countryman Mr. Baxter.

ECLOGUE, is also applied to certain compositions in prose. Thus, we read of the *eclogues* of Diodorus, of Polybius, of Ctesias, Theophrastus, Strabo, &c. In which sense the word only signifies *extracts*, or *collection*.

ECPHORA, *Projeſture*, in architecture, usually denotes the line, or distance, between the extremity of a member, or moulding, and the naked of the column, or other part it projects from.

Some authors, however, account the *ephora*, or *projeſture*, from the axis of the column; and define it to be the right line intercepted between the axis and the outermost surface of a member or moulding.

ECPHRACTICS *, *ΕΚΦΡΑΚΤΙΚΑ*, in medicine, such remedies as have a faculty of opening, and untopping the vessels, through which the humours are to pass; or which incise, and attenuate tough, viscid humours, and thereby promote their discharge.—They are the same with *aperients* and *deobſtruent*s.

* The word is formed from the Greek *εκφρασις*, to free from obſtructions; of *εκ* and *φρασις*, abſtrao, ſepio.

The chief simple *ecphractics*, are the little centaury, wormwood, agrimony, hyſſop, chamædrys, bark of tamarisk, roots of capers, ſcolopendrium, &c.

ECPIESMA, *ΕΚΠΙΕΣΜΑ*, in chirurgery, a kind of fracture of the skull, &c. wherein there are several splinters, that press and disorder the inner membranes. See **FRACTURE**.

ECTHESIS *, in church history, a name which the emperor Heraclius gave to a confession of faith published by him in 639.

* The word is Greek, *εκθεσις*, and signifies *expofition*. The *Ectheſis* favoured the error of the Monothelites, and established only one will in Jeſus Chriſt. Heraclius published it at the instigation of Athanaſius, chief of the Jacobites, Cypus patriarch of Alexandria, and Sergius patriarch of Con-

ſtantinople: but finding that the Roman church esteemed it heretical, he diſowned it, and declared by another edit, which he spread throughout the east and west, that Sergius was the author of *Ectheſis*.

ECTHLLIPSIS *, in the Latin profody, a figure whereby an *is* is retrenched, or cut off, chiefly at the end of a word, when the following word begins with a vowel or an *b*.

* The word is Greek *εκτηλλις*, which signifies *elision*.

Thus in, *multum ille*, &c. In scanning the verse, we drop the *m* at the end of *multum*, and only make three syllables in the two words, *mult-ill-le*.

Some account the *ecthllipsis*, a poetical licence in the Latin verification, but in reality, the elision of an *m* final, when the following word in the same verse begins with a vowel, is a matter of necessity, not of licence.

Anciently, the *s* was likewise retrenched before a consonant; as *facundu ſuoque*, for *facundus*, &c. In effect, the *m* and *s*, were peculiarly rough and harsh in the Latin pronunciation; as appears from Quintilian: and it was this that led the poets to retrench them at the ends of their words; as the like cause did the French, to drop their *r* feminine before a word beginning with a vowel, to avoid the hiatus, or concurrence of vowels.

ECTHYMOSIS *, in medicine, a vehement agitation and dilatation of the blood and spirits; such as happens in extraordinary emotions of joy.

* The word is formed of *εκ*, *ex*, and *θυμος*, *animus*, mind.

ECTROPIUM, *ΕΚΤΡΟΠΙΟΝ*, in medicine, a disease of the eyes, consisting in a sort of inversion of the lower eye-lid, which disables it from covering its part of the eye.

ECTYLOTICS *, *ΕΚΤΥΛΩΤΙΚΑ*, remedies proper to consume, and eat of callus's, warts, and other excrescences formed on the flesh.

* The word is formed of *εκ*, and *τυλος*, *callus*.

ECTYPE *, *ΕΚΤΥΠΟΣ*, among medalists, an imbossed figure, or impression of a seal, ring, or medal; or a figured copy of an inscription, or other ancient monument.

* The word is Greek: *αρχετυπον*, denotes the original, or model; *επιτυπον*, the copy, or image, moulded or struck in *ερεως*; and *επιλυτον*, *επιτυπον*, the image in relievo, or embossed.

In books of travels, we find abundance of *ectypes* of ancient inscriptions, of the Trajan column, of Chilmimar, &c.

ECU, or **ESCU**, the French crown. See the articles **CROWN**, and **ESCU**.

ECURY. See the article **EQUERY**.

EGUSSON, in heraldry, an inescutcheon, or little escutcheon. See **ESCUTCHEON**.

EDDISH, or **EDASH**, the latter pasture, or grass, which comes after mowing, or reaping: otherwise called *caegrass*, *earſe*, and *etſh*.

EDDY, in natural history, is when the water, at any place, runs back, contrary to the tide, or stream, and so falls into the current again.

The sea-men call that *eddy water* which falls back, as it were, on the rudder of a ship under fail, the *dead water*.

An *eddy wind*, is that which returns, or is beat back from any fall, &c.

EDELING. See **EDHLING**, and **ATHELING**.

EDGINGS, in gardening, rows of shrubs, herbs, or flowers, placed by way of borders, around beds, compartments, &c. For the *edgings* of compartments, box seems the most proper.

But they are frequently also made of aromatic plants, sage, sweet marjoram, thyme, lavender, hyſſop, &c.

EDHLING, **EDHLINGUS**, an ancient appellation of the nobility among the Anglo-Saxons.

The Saxon nation, says Nithard, *Hiſt. l. IV.* is divided into three orders, or classes of people; the *edlingi*, the *ſtrilingi*, and the *lazzi*: which signify the nobility, the freemen, and the vassals or slaves.

Instead of *edling*, we sometimes meet with *atheling*, or *ætheling*; which appellation was likewise given to the king's son, and the presumptive heir of the crown. See **ATHELING**.

EDICT, an instrument signed, and sealed by a prince, to serve as a law to his subjects.

Edicts have no room in England, where the enacting of laws is not lodged in the king, but in the parliament.

In the Roman law, we find frequent mention of the *edit* of the *praetor*, *quod praetor edixit*, which was a phrase consecrated to the ordinances of the *praetor*; though it was sometimes also used on other occasions.

In the French law, *edicts*, *edits*, make a great figure: they are of various kinds: some importing a new law, or regulation, as the *edit* of duels, that of second marriages, &c. Others the erection of new offices, establishment of duties, rents, &c. Sometimes articles of pacification, as the *edict* of Nantz, &c.—*Edicts* are all sealed with green wax, to shew that they are perpetual and irrevocable.

Edicts with them, are much the same as proclamations with us; but with this difference, that the former have the authority of a law in themselves, from the power which issues

issues forth; whereas the latter are only declarations of a law, to which they refer, and have no power in themselves.

Chamber of the Edict. See the article CHAMBER.

EDIFICE*, **ÆDIFICIUM**, a building. See BUILDING.

* The word is formed of the Latin, *ædæ*, and *facio*, I make.

EDILE, or rather **ÆDILE**. See the article ÆDILE.

EDITOR, in the common-wealth of learning, a person who takes care of publishing the work of another author; usually, an ancient author: for *editor* is neither properly applied to a workingprinter, nor to an author who prints his own works.

Erasmus, was a great *editor* of ancient writings: the Lovain doctors, Scaliger, Petavius, Fa. Sirmond, bishop Walton, Mr. Hearn, &c. are learned *editors*.

EDUCATION, the art of bringing up, forming and instructing children.

The follies of a too delicate *education*, are well expressed in that device of an ape, which by over caressing and hugging its young ones, strangles them; with this motto, *complētando necat*. Octavius Ferrarius, has a very good Latin treatise on the subject of *education*, entitled *Chiron*; the name of the centaur, who was Achilles's tutor.

Mr. Locke's excellent treatise of *education*, is known to every body. Quintilian employs the second chapter of his first book, in enquiring whether a domestic, or a college *education*, be preferable, *i. e.* whether it be better to bring up ones children at home, or to send them to the colleges, and public schools. After urging all that can be said on either side, he concludes for a college, or school *education*.

EDULCORATION, in pharmacy, is the dulcifying, or sweetening of any food, or remedy, by means of honey, sugar, or syrups.

EDULCORATION, in chemistry, denotes the freshning, or purging any thing of its salts, by repeated lotions, or washings in cold water.

Such is the dulcifying of the precipitates of mercury, metals, &c. by washing away those sharp salts, by whole means they had been dissolved, or which had been mingled with them, to effect a dissolution. See **ABLUTION**.

EEL Fishing. See the article FISHING.

EFFARE, or **EFFRAYE**, in heraldry, a term applied to a beast, when rearing on its hind legs, as if it were affrighted.

EFFECT, the result, or consequence, of the application of a cause, or agent, on some subject.

It is one of the great axioms of philosophy, that full or adequate *effects*, are always proportionable to the powers of their causes.

EFFECT is also of some further import in the arts: As when we say, in painting and architecture, that such a contralt, or such a drapery, or such an attitude, have a fine, or an ill *effect*, *i. e.* are beautiful, or noble, &c. Too many breaks, and little enrichments in a building, have a pitiful *effect*, *i. e.* they give it a mean aspect.

EFFECT, in the manage, is applied to the motions of the hand, which direct the horse.

They distinguish four *effects* of the hand, *viz.* in using the bridle to put a horse forwards, draw him backwards, and shifting it out of the right hand into the left, or *vice versa*.

EFFECTS, in commerce, &c. the goods possessed by any person, whether moveable, or immovable: particularly those which merchants and dealers acquire by trade.

The *effects* of merchants are usually distinguished into three classes, good, bad, and doubtful: by an ordinance of the French court in 1673, every merchant is obliged to take an inventory, or review every year, of all his *effects* of every kind.

Vacant EFFECTS. See the article VACANT.

EFFECTIONS, in geometry, the geometrical constructions of propositions.

The term is also used in reference to problems and practices; which when they are deducible from, or founded upon, some general propositions, are called the *geometrical effections* thereof.

EFFERVESCENCE, is popularly used for a light ebullition; or a brisk intestine motion, produced in a liquor, by the first action of heat, without any notable separation of its parts.

EFFERVESCENCE, in chemistry, is not applied to all ebullition, or motions produced by fire; but only to those resulting from the mixture of bodies of different natures, which by their acting on one another, occasion a heat, resembling the ebullition, or boiling produced by fire.

Acids, mixed with alkalies, *e. gr.* oil of tartar, and spirit of vitriol, produce an *effervescence*, &c.

Chauvin defines *effervescence* more scientifically, to be a violent expulsion of the air, out of the pores of the particles of one body, by the intrusion of the particles of another body mixed therewith, into those pores before possessed by air.

In order for *effervescence* to take place, the particles of the latter body must be supposed *conformable*, both in bulk and figure, to the pores of the other; so that they may enter, and fill the same, like wedges: And beside there must be a strong degree of attraction between the particles of the two bodies, stronger than the attraction, or force of cohesion, between the particles of either of the bodies alone.

Hence it should seem, that *effervescence* only differs from fermentation, in the degree of explosion; which in *effervescences*, by reason of the greater purity and freedom of the acid and alkali, is greater than in fermentations.

Of *effervescences*, some are *hot*, and others *cold*. Of the first kind, are those produced by mixture of oil of tartar *per deliquium*, with spirit of vitriol; quicklime with cold water; all acid spirits, with alkaline, or earthy bodies; aqua fortis, spirit of vitriol, spirit of nitre, aqua regia, &c. with metallic bodies, marcasites, and minerals; coral, with lemon, or orange juice; marble with spirit of salt; chalk, crabs eyes, mother of pearl, and all shells with acids. In all which, the *effervescences* are attended with a more or less intense heat. Oil of vitriol, and oil of turpentine, particularly mixed together, produce such a vehement heat, that unless they be mixed drop by drop, they are apt to burst forth into a flame, and break the vial.

Powdered coral, mixed with distilled vinegar, produces a cold *effervescence*, which the same philosophers account for hence, that the pores of the coral being very great, it may be easily dissolved in the acid spirit, without any great friction, or collision of the parts, such as would be necessary to generate any considerable heat.

An *effervescence* may also be produced by the mixture of many other cold liquors. See **DISSOLUTION**.

EFFICACIOUS, **EFFECTUAL**, in theology. Within these 150 years there have been great disputes on the subject of *efficacious* grace. Grace is usually divided into sufficient, and *efficacious*; though the Jansenists hold, that there is no grace sufficient, but what is *efficacious*, *i. e.* but what effectually determines the will to act.

Efficacious grace, is that which enlightens the mind, and touches the heart, in such manner, as always to produce its effect, however it be opposed, or resisted by the will. See **GRACE**.

Some divines maintain, that *efficacious* grace is *efficacious* of it self. *Efficacious* grace of it self, if there be any such thing, is that which produces its effect merely of it self, and not in virtue of any consent of the will. Calvin, is the first that used the term *gratia efficax per se*, grace *efficacious* of it self.

A late divine holds the *efficacy* of grace in it self to consist in this, that *efficacious* grace is always joyned with a moral necessity of doing the thing it inclines to; and sufficient grace, joyned with a moral impotence of doing it.

The Arminian and Popish way of conceiving the necessity of *efficacious* grace, is to hold that this grace is never wanting, at least to the righteous, except through their own default; that they always stand in need of other inner graces, truly and properly sufficient, in order to draw down this *efficacious* grace; and that these do infallibly draw it down, when they are not rejected, though they often remain without effect, by reason men resist, instead of yielding their consent thereto.

F. Malebranche maintains, that the mutual commerce between soul and body, *i. e.* life, has no other vinculum, or principle, but the *efficacy* of God's decrees: And that second causes have no proper *efficacy*, &c.

EFFICIENT, in philosophy.—An **EFFICIENT** cause is that which produces an effect. See **CAUSE**, and **EFFECT**. Philosophers usually distinguish four kinds of causes in nature: the *efficient*, *final*, *formal*, and *material*. See each under its proper article.

The school philosophers are exceedingly divided as to the nature and essence of an *efficient* cause.—Aristotle defines it, *id unde*, that from which; or, the first principle of change, and rest, *i. e.* of production and conservation.

The *efficient* is called *id unde*, that from which; as the end or final cause, is that *propter quod*, for which; the exemplar, *ad quod*, that to which; the matter, *ex quo*, that out of which; and the form, *per quod*, that by which.

It is called the first principle, not in respect of priority of time, for the end exerts its causality before the *efficient*, but of dignity; the *efficient* being a physically active principle; and the end only acting objectively.

Others of the schoolmen define *efficient* to be *principium per se influens in aliud sine mutatione sui*. The Ramists, after Plato and Cicero, define an *efficient* to be that, *a qua res est*, from which a thing is: To which a great author, objecting that a thing may also be from its end, adds, that an *efficient* is that, *a qua res vera causalitate proficiscitur*.

Others define *efficient* to be, *quæ per actionem causat*, that which causes by acting: for to effect, every body knows, is

to act; and hence neither a procatartick, nor an exemplary cause, are properly *efficient*, though usually ranked among them.

Lastly, others define an *efficient* to be a cause, *a qua aliud producat*, from which something is produced; consequently, what arises from such a cause, is called an *effect*: and thus God is the *efficient* cause of the world; and the world the effect of God. To which definition of an *efficient*, all the former definitions are reducible.

An *efficient cause* then, is either physical, as fire is the *efficient* cause of heat; or moral, as an adviser is the cause of a murderer; or universal, which in various circumstances produces various effects, as God and the sun; or particular, as a horse, which produces a horse; or univocal, which produces an effect like itself, as a horse begets a horse; or equivocal, according to the old doctrine, as the sun producing a frog; or natural, which acts not only without precept, in opposition to artificial, but also from within, and according to its own inclination, in opposition to violent, as fire acts when it warms; or spontaneous, as a dog eating; or voluntary and free.

Others consider *efficient* causes, either as principal, or as instrumental. Others, either as next, or remote; or as mediate or immediate. Others, in fine, divide *efficient* causes, among all the kinds of beings, natural and super-natural; spiritual and corporeal; substantial and accidental; vital and not vital, &c.

But the most celebrated division of *efficient*, is that into *first* and *second*.

A *first efficient* cause, is that between which and the effect there is some necessary connection. Of which kind there is none but God alone.

A *second efficient* cause is that from which an effect follows in consequence of the will, or constitution of the creator; and which the Cartesians call an *occasional cause*.

But these precarious, or occasional causes are, in reality, no causes at all, but only antecedent effects.—This is easily shewn: For, 1. All action, at least all corporeal action, is contained in motion; but motion can only result from the first cause: it being an allowed principle, that body of it self is inert and inactive. The true cause of motion, therefore, is a spiritual not a corporeal nature. But neither can a finite, spiritual nature, be the chief cause of motion; for there is no necessary connection between the will, *e. gr.* of an angel, and the motion of a body, nor between that of any other being except God. Thus, when an angel wills, a stone moves; by reason God has constituted such a law between the will of the angel, and the motion of the stone: And thus we move our hands when we please. Not that the soul is the principal cause of such motion, but only the occasional cause.

EFFICIENTS, in arithmetic, the numbers given for an operation of multiplication; called also the *factors*. See FACTOR, COEFFICIENT.

The *efficient* are the multiplicand and multiplier.

EFFIGY, EFFIGIES, a portrait, or representation of a person to the life. See PORTRAIT.

Kings are shewn in *effigy* in their state beds.

EFFIGY, is also used for the print, or impression of a coin, representing the prince's head who struck it.

To execute or degrade in **EFFIGY**, denotes the execution, or degradation of a condemned, contumacious criminal, who cannot be apprehended, or seized.

In France they hang a picture on a gallows, or gibbet, wherein is represented the criminal, with the quality, or manner of the punishment: at bottom is wrote the sentence, or condemnation.—It is only sentences to death, that are executed in *effigy*.

EFFLORESCENCE, a breaking out of humours in the skin: as in the measles, or the like. See EXANTHEMA.

EFFLUVIUM, a flux, or exhalation of minute particles from any body: or an emanation of subtle corpuscles, from a mixed, sensible body, by a kind of motion of transpiration.

That there are such *effluvia*, continually emitted from all bodies, is pretty certain: Thus, if a body be immersed in water, or any other humid matter, little bubbles are continually transmitted therefrom to the surface of the water; which are supposed to be nothing else but little particles, detached from the solid body; and which, when they arrive at the surface, emerge in form of bubbles. And thus a body, placed in the receiver of an air pump, is seen, as it were, in a kind of effervescence, by reason of the external particles continually flowing from the same.

Odoriferous bodies, every one knows, are continually emitting substantial *effluvia*; by means whereof it is, that they excite in us the sense of smelling. These minute *effluvia* are sometimes perceived by the eye, in form of fumes and vapours.

The school philosophers hold these *effluvia* to be intentional qualities, as they call them, and nothing substantial; but the moderns laugh at the notion, as finding that these *effluvia* refresh and nourish both the animal and vital spirits.

Some bodies are found to emit *effluvia* for a great number of years, without any considerable loss, either as to bulk or weight; as magnets, electrical bodies, ambers, and diverse odorous bodies, the tenuity of whose emanant corpuscles is incredible: not but that the loss they sustain by the continual emission of *effluvia*, may be made up to them by the reception of other similar *effluvia* of the same kinds of bodies, diffused through the air.

It is added, that these *effluvia* are emitted in manner of *radii*, rays, *in orbem*, and that the circumference or bound of the activity of the radiation, exhibits the same figure as is that of the radiant. This the astronomers sufficiently prove, from the ratio of the refraction of the atmosphere. For the law of the emission of these *effluvia*. See QUALITY.

That *effluvia* may considerably operate upon, and have great effects on bodies within the sphere of their activity, is proved by Mr. Boyle, in an express treatise on the *subtlety* of *effluvia*; where he shews, 1. That the number of corpuscles, emitted by way of *effluvia*, is immensely great. 2. That they are of a very penetrating nature. 3. That they move with vast celerity, and in all manner of directions. 4. That there is frequently a very wonderful congruity, or incongruity in the bulk and shape of these *effluvia*, with the pores of the bodies they penetrate into and act upon. 5. That in animal and organic bodies, particularly, these *effluvia* may excite great motions of one part of the frame upon another, and thereby produce very considerable changes in the oeconomy. Lastly, That they have sometimes a power of procuring assistance in their operations from the more catholic agents of the universe, such as gravity, light, magnetism, the pressure of the atmosphere, &c.

That *effluvia* are emitted to very great distances, we have a notable proof in this: That our wines grow turbid in the hog-heads and bottles, precisely at the same time when the grapes are at their maturity in other remote countries, whence the wine was imported. Beside, that odoriferous *effluvia* are, in many cases, perceived at the distance of many leagues. Again, that the generality of *effluvia* retain the proper colour, smell, taste, and other properties, and effects of the bodies whence they proceeded, and this even after they have passed through the pores of other solid bodies, we have abundant proof: Thus, magnetical *effluvia* penetrate all, even the most solid bodies, without any change of their nature, or loss of force. And the same we see confirmed in lymphatic inks, and powders, and in the fagacity of blood-hounds, &c.

EFFLUXION, a flowing out, from *ex*, out of; and *fluere*, to flow.

EFFUSION, the pouring out of any liquid thing with some degree of force.

In the ancient heathen sacrifices, there were diverse *effusions* of wine, and other liquors; called *libations*. When our princes conclude a treaty of peace, they usually pretend it is to prevent the *effusion* of christian blood.

EFFUSION, or **FUSION**, in astronomy, denotes that part of the sign Aquarius, represented on celestial globes and planispheres, by the water issuing out of the urn of the water-bearer. See AQUARIUS.

EGG, in natural history, a part formed in the females of certain animals; which, under a shell or cortex, includes an embryo or foetus, of the same species; the parts whereof are afterwards displayed and dilated, either by incubation or by the accession of a nutritious juice.

The species of animals that lay *eggs*, are particularly denominated *oviparous*; and the part wherein the *egg* is formed, the *ovary*.

Of the various kinds of *eggs*, those of hens, or pullets, being the most usual, and which have been the most observed, we shall say somewhat of the structure thereof, and the generation of the chick therein.

The exterior part, then, of a hen's *egg* is the shell; a white, thin, friable cortex, including all the other parts, and defending them from injuries. Immediately under the shell lies the *membrana communis*, which lines the whole cavity of the shell, adhering pretty closely to it, except at the bigger end, where a little cavity is left between them, which with age grows bigger. Under this membrane are contained two albumina, or whites, each wrapped up in its own membrane. In the middle of the inner white, is the vitellus, or yolk inclosed likewise, in its separate involucrem, or cover. The outer albumen is oblong or oval, accommodated to the figure of the shell: The inner is spherical, and of a more crass, and viscid substance; and the yolk is of the same figure.

At each end is a chalaza, which are, as it were, the poles of this microcosm: these are white, dense bodies, consisting each of three little globules like hail joined together: by these not only the several membranes are connected, or knit together, by which means the several liquors are kept in their proper place and position to each other; but they serve also to keep one and the same part of the yolk uppermost, till the *egg* be turned which way it will.

About

About the middle, between the chalazæ, on the side of the yolk, and in the membrane thereof, is a little vesicle or bladder, not unlike a vetch, or lentil, called the *ciatricula*, and by some the eye of the egg. In this vesicle is contained a humour, in, and of which the chick is generated.

All these parts of a pullet's eggs, are found in all other eggs, to which the definition of an egg properly and strictly agrees: such egg being that, of a part whereof the animal is formed, the rest serving for its food. Accordingly, the first feed, or flamen of the chick, is in the *ciatricula*.

The albumen is the nutritious juice, whereby it is distended and nourished till it become big; and theylk serves it for food after it is well grown, and partly also after it is hatched. For, a good part of the yolk remains after exclusion; being received into the chicken's belly, as a store-house, and conveyed thence by the *appendicula*, or *ductus intestinalis*, as by a funnel, into the guts, serving instead of milk.

An Egg, improperly so called, is that of the whole whereof the animal is formed: such are the eggs of flies, butterflies, &c. which Aristotle calls *vermicula*.

The two have this further difference, that whereas the former, after they are excluded from the female, need no external nutriment, nor any thing but warmth and incubation, to bring the fœtus to perfection: the latter, after they are fallen out of the ovary into the uterus, require the nutritious juices of the uterus to distend and enlarge them; whence they remain much longer in the uterus than the other.

The principal differences among eggs properly so called, are, that some are *perfectæ*, i. e. have all the parts above described, while in the ovary, or uterus: and others, *imperfectæ*, as not having all those parts till after they are excreted or laid; such are the eggs of fishes, which after they are brought forth, assume an albumen to themselves in the water.

Another difference is, that some are *fecundated*, and others not: the first are those which contain a sperm, injected by coition of the male, to dispose them for conception: the rest, not impregnated with this sperm, never breed young by any incubation, but always putrify.

An egg fecundified, contains the rudiments of the chick, before ever the hen have fate upon it. By the microscope we see, in the middle of the *ciatricula*, the plain cavina of the chick, swimming in the liquor or humour; it consists of fine white zones, or threads, which the warmth of future incubation enlarges, by rarifying and liquifying the matter first of the albumen, and then of the vitellus, and pressing them into the vessels of the *ciatricula*, for a further preparation, digestion, assimilation, and accretion; till the chick, too big for its coverle, breaks the shell, and is delivered.

It was anciently thought, that none but birds and fishes, with some other animals, were produced, *ab ovo*, from eggs; but the generality of the moderns incline to think, that all animals, even man himself, is generated the same way. Harvey, de Graaf, Kerckringius, and several other great anatomists, have so strenuously asserted this opinion, that it now generally obtains.

In the testes of women, are found little vesicles, about the size of green peas, which are accounted as eggs; for which reason, these parts, which the ancients called *testicles*, the moderns call *ovaries*. These eggs, fecundified by the most volatile and spirituous part of the seed of the male, are detached from the ovary, and fall down the fallopian tubes into the uterus, where they grow and increase.

This system is countenanced and confirmed by abundance of observations and experiments. M. de S. Maurice, upon opening a woman at Paris, in 1682, found a fœtus perfectly formed in the testicle.

M. Olivier, a physician at Brest, attests, that in the year 1684, a woman, pregnant seven months, was brought to bed of a whole plate full of eggs, fastened together like a bunch of grapes, and of various sizes, from that of a lentil, to that of a pigeon's egg. Wormius assures us, that he had himself seen a woman who had laid an egg. And Bartholin confirms him, Cent. I. Hist. Anatom. IV. p. 11. The same author tells us, he knew a woman at Copenhagen, who, after twelve weeks conception, was delivered of an egg wrapped up in a soft shell. Lanzozius, Dec. II. An. ix. Obs. 38. p. 73. of the *Curiosæ Naturæ*, relates the same thing of another woman (seven weeks gone) the egg she brought forth was of a size between that of a hen and a pigeon; and he adds, was covered with membranes instead of a shell. The outer membrane, or chorion, was thick and bloody; and the inner, or amnios, thin and transparent, including a whitish humour wherein the embryo swam fastened by umbilical vessels, like threads of silk.

Bonetus, in a letter to Zuingerus, published in the ephemerides of the *Curiosæ Naturæ*, Dec. II. An. 2. Obs. 186. p. 417. relates that a young maid had cast forth a great number of

little eggs. Con. Virdungius observes, that in dissecting a woman who had a rupture, he found eggs of diverse sizes in the cornua of the womb. Lastly, we meet with diverse instances of the same thing in Rhodius, Cent. III. Obs. 57. and in several places of the memoirs of the *Curiosæ Naturæ*. Inasmuch that Berger in his treatise de *Natura humana*, L. II. C. I. p. 461. makes no scruple to give it as his opinion, that the only difference between animals, called *oviparous*, and those denominated *viviparous*, consists in this; that the former cast their eggs out of the body, and lay them in nests; and that their eggs contain all the nourishment requisite for the fruit, or fœtus: whereas in the latter, the eggs are only layed from the ovary into the uterus; that they have but little juice; and that the mother furnishes the rest.

There is not so much as a plant, whose generation according to the sentiment of Empedocles, and since him of Malpighi, Rallius, Fabric. de Aquapendente, Grew, and others, is not effected by the way of eggs.

On the other hand, we have numerous instances of *oviparous* animals sometimes producing their young absolutely alive, and without eggs. Such instances we have of a crow, a hen, serpents, fishes, eels, &c. See Fibrod. ab Amelanxen, *Breviar. Memorabil.* N. 28. in *Append. Ephem. Curios. Nat. Dec. II. An. 4. p. 201.* Lyferus, *Obs. VI. Aldrovand. Hist. Serp. & Draco.* p. 399. Seb. Nuremberg, *De Mirac. Natur. in Europ.* C. 41. Franc. Paulin de Angulla, S. I. C. 2. &c.

But this is not all: Naturalists tell us of instances of males, and even men, casting out eggs by the fundament. The thing will look too odd to an English reader, that we might be censured, were we to relate the various accounts of this kind in form. We shall therefore, content ourselves to refer the reader, who has curiosity enough that way, to the authors and places where he may meet with them, viz. Christ. Paulin. *Cynograph. Curios. Sect. I. L. 3. §. 56.* Ephem. Nat. Curios. Dec. II. A. 8. Obs. 117. p. 261. and Dec. I. An. 2. Obs. 250. and Dec. II. An. 4. *Append. p. 199.* Schenck. *Hist. Monst.* p. 129, &c.

M. Stoltzerfucht is of opinion, that at least, in some of these cases, what was taken for eggs might be no more than certain aliments ill digested, and coagulated; an instance of which he himself had seen. As to those of women, Wormius and Fiomann. L. III. de *Fœtibus.* P. VI. C. 20. §. 9. p. 882. take it for the effect of the devil; but Bartholin and Stoltzerfucht treat this notion, as it deserves, with derision.

Goussset, de *Causis Lingua Hebraica*, explodes the modern system of generation *ab ovo*, as contrary to scripture; and others imagine they have seen the animal alive, and formed in the seed of the male.

Malpighi, has made very curious observations with the microscope, of all the changes that happen in the egg, every half hour of incubation. Vossius, and diverse other authors, are very solicitous about settling the question, which was formed first, the egg or the pullet? de *Idol.* L. III. C. 78.

In Egypt, they hatch their eggs by the heat of a furnace, or oven; and frequently have seven or eight thousand chickens come forth at a time. An account of the method hereof we have in the *Philosophical Transactions*.

At Tonquin, they are said to keep eggs entire for the space of three years, by covering them up in a paste made of ashes and brine. The tortoise is said to lay no less than fifteen hundred eggs, which she covers in the sand, and leaves the sun to hatch them; and the eggs of the ostrich are hatched after the same manner. Willugh. *Ornithol.* L. II. C. 8. §. 1.

In the *Acta Erudit. Lips.* An. 1683. p. 221. mention is made of a hen's egg, in all respects like the common ones, in the middle whereof was found another, of the size of a pigeon's egg.

Eggs with double shells, are no unusual phenomenon. Harvey is very large on the rationale of their appearances, in his treatise de *Generation. Animal.*

Among the ancients, the egg was the symbol of the world; it being a tradition among them, that the world was made of an egg; whence eggs became of singular importance, in the sacrifices of Cybele, the mother of the Gods. Some of their deities they said were likewise produced from eggs.

Wind Egg. See the article *WIND Egg.*

Cow Egg. is a name which some authors give to a kind of bezoard, found in the stomachs of the cow kind.

Egg, in architecture, an ornament of an oval form, cut in the echinus, or quarter-round, of the Ionic and composite capitals. The profile, or contour of the echinus, is enriched with eggs and anchors, alternately placed.—See *Tab. Archit.* fig. 10.

Philosophical Egg in chemistry. See *PHILOSOPHICAL*.

EGUISCE.

EGUISCE'. See the article *ARGUISCE'*.

EGYPTIANS, in our statutes, a counterfeit kind of rogues, who, being English, or Welsh people, disguise themselves in uncouth habits, sinearing their faces and bodies, and framing to themselves an unknown, canting language, wander up and down; and under pretence of telling fortunes, curing diseases, &c. abuse the common people, trick them of their money, and steal all that is not too hot, or too heavy for them.—See several statutes made against them, 28 Henry VIII. c. 10. 1 and 2 Phil. & Mar. C. 4. 5 Eliz. C. 20.

The origin of this tribe of vagabonds called *Egyptians*, and popularly *Gypsies*, is somewhat obscure; at least the reason of the denomination is so. It is certain, the ancient Egyptians had the character of great cheats, and were famous for the subtilty of their impostures; whence the name might afterwards pass proverbially into other languages; as it is pretty certain it did into the Greek, and Latin. Or else, the ancient Egyptians, being much versed in astronomy, which in those days was little else but astrology, the name was on that score assumed by these *diseurs de bonne aventure*, as the French call them, or tellers of good fortune.

Be this as it will, there is scarce any country of Europe but has its *Egyptians*, though not all of them under that denomination: the Latins call them *Aegyptii*; the Italians, *Cingari* and *Cingari*; the Germans, *Zigeuner*; the French, *Bohemians*; others, *Saracens*; and others, *Tartars*, &c. Munster, *Geogr. L. III. c. 5.* relates, that they made their first appearance in Germany, in 1417, exceedingly tawny and sun-burnt, and in pitiful array; though they affected quality, and travelled with a train of hunting dogs after them, like nobles. He adds, that they had passports from king Sigismund of Bohemia, and other princes. Ten years afterwards they came into France, and thence passed into England. Paquier, in his *Recherch. L. IV. c. 19.* relates the origin of the *Gypsies*, thus: on the 17th of April 1427, there came to Paris twelve penitents, or persons, as they said, adjudged to penance, *viz.* one duke, one count, and ten cavaliers, or persons of horseback: they took on themselves the character of *christians of the lower Egypt*, expelled by the Saracens, who having made application to the pope, and confessed their sins, received for penance, that they should travel through the world for seven years, without ever lying in a bed. Their train consisted of 120 persons, men, women and children, which were all that were left of 1200, who came together out of *Egypt*. They had lodgings assigned them in the chapel, and people went in crowds to see them. Their ears were perforated, and silver buckles hung to them. Their hair was exceedingly black and stizzled; their women were ugly, thievish, and pretenders to telling of fortunes. The bishop soon afterwards obliged them to retire; and excommunicated such as had shewn them their hands.

By an ordonnance of the estates of Orleans, in the year 1560, it was enjoined all these impostors, under the name of *Bohemians* and *Egyptians*, to quit the kingdom on penalty of the galleys. Upon this they dispersed into lesser companies, and spread themselves over Europe. The first time we hear of them in England, was three years afterwards, *viz.* anno 1563. Raph. Volateranus making mention of them, affirms that they first proceeded or strolled from among the *Uxii*, a people of Persis, or Persia.

EGYPTIAN-year. See the article *YEAR*.

EJACULATION, in medicine, the act of emitting seed; from the Latin *ejaculari*, to cast outwards. See *EMISSIO*. To evince a man's virility, in a court of justice, where he is accused of impotency, it is required he give evidence of erection, intromission, and *ejaculation*.

EJACULATOR, in anatomy, a name applied to two muscles of the genitals, from their office in the *ejaculation* of the seed.

The *ejaculatores* arise from the sphincter of the anus, and advance along the urethra, as far as the middle thereof; where they are inserted laterally.

The same denomination is likewise given two muscles of the clitoris, which arising from the sphincter ani, advance laterally along the labia, and are inserted aside of the clitoris.

EJACULATORY, in anatomy, is a term applied to two little ducts, or canals, arising from the vesiculae feminales.

The *ejaculatory ducts* are about an inch in length: towards the vesiculae, they are pretty wide; but they contract themselves as they approach towards the urethra, which they penetrate together.

Some authors also apply the name *ejaculatory* to the vasa deferentia.

EICETÆ, called also *HEICETÆ*, and *HICETÆ*, heretics of the VIIth century, who made profession of the monastic life.

From that passage in Exodus, where Moses and the children of Israel are said to have sung a song in praise of the Lord, after they had passed the Red Sea wherein their enemies had perished; the *icetæ* concluded, that they must sing and dance, to praise God aright: and as Mary the prophetess, sister of Moses and Aaron, took a drum in her hand, on the same oc-

caison; and all the women did the like, to testify their Joy, by playing, beating, and dancing, the *icetæ*, the better to imitate their conduct herein, endeavoured to draw women to them to make profession of the monastic life, and assist in their mirth.

EJECIT *infra terminum*. See *QUARE* *ejcit*.

EJECTION, the act of throwing out, or discharging any thing at some of the emunctories; as by stool, vomiting, or the like.

EJECTION *firmæ*, a writ which lies for the lessee for years who is ejected before the expiration of his term, either by the lessor, or a stranger.

FIGHT, *piece of*. See *PIECE of eight*.

EIGHT pair of nerves. See the article *NERVE*.

EIRE, in law. See the article *EYRE*.

ELABORATION, the act of finishing, or perfecting any thing with labour, and time.

The term is chiefly used in medicine, where the chyle, blood and semen, are said to be *well elaborated*, when they are well conditioned, have undergone all the secretions, mixions, impregnations and circulations necessary to bring them to perfection.

If the chyle went directly from its receptaculum to the breasts, it would not be sufficiently *elaborated* to afford good milk. See *MILK*.

ELABORATORY. See the article *LABORATORY*.

ELASTIC * *body* is that, which by being struck, or stretched, has its figure altered; but endeavours, by its own force, to resume the same.—Or, it is a springy body, which when compressed, condensed, or the like, makes an effort to set it self at liberty; and to repel the body that constrained it.—Such is a sword-blade, a bow, &c. which are easily bent, but presently return to their former figure and extension.

* The word is formed from the Greek, *ελαστος, impulsor*, of *ελαστων, to impell, push*, &c. See *SPRING*.

Elastic bodies are either *natural*, or *artificial*: those most eminent for their *elastic power* among *artificial bodies*, are steel, brass, ivory, and marble balls; leathers, skins, membranes; brass, silver, iron, and steel chords or wires; nerves, guts, hemp and flax strings, &c.

Amongst *natural bodies*, the principal are air, sponges, the branches of green trees, wool, cotton, feathers, &c.—It is disputed, whether or no water have any *elastic force*: the most common opinion is, that it has none of it self; and that if it shew any, it is owing to the air contained therein.

The principal phenomena observed to obtain in *elastic bodies*, are, 1. That an *elastic body*, (*i. e.* a *body perfectly elastic*, if any such there be) endeavours to restore it self with the same force wherewith it is pressed or bent. Thus, whatever force is applied to bend a bow, with the same force it strives to unbend it self, or return to its natural state. For the force, wherewith the string is drawn, is the same with that which resists the draught; the bow being bent so long, till the force applied, and that which resists it, are in equilibrium.

2. An *elastic body* exerts its force equally towards all sides; though the effect is found chiefly on that side where the resistance is weakest: as is evident in the case of a bow shooting out an arrow; a gun exploding a ball, &c.

3. *Elastic bodies*, in what manner soever struck, or impelled, are inflected, and rebound after the same manner. Thus a bell yields the same found in what manner, or on what side soever it be struck.

4. A body perfectly fluid, if any such there be, cannot be *elastic*; by reason its parts cannot be compressed. See *FLUID*.

5. A body perfectly solid, if any such there be, cannot be *elastic*; in that having no pores, it is capable of being compressed. See *SOLID*.

6. Hard, long, flexible bodies, apt to acquire *elasticity*, do it chiefly in three manners: either by being extended, by being contracted, or by being bent.

7. Bodies, in dilating themselves by their *elastic power*, exert a greater force at the beginning of their dilatation, than towards the end thereof. By reason the bodies are more compressed at first; and the renitency is always equal to the compression.

8. The motion, whereby compressed bodies restore themselves, is usually an accelerated motion.

For the *laws of motion and percussion* in *ELASTIC bodies*, see *MOTION*, and *PERCUSSION*.

ELASTICITY, or *ELASTIC force*, in physics, a property or power, in natural bodies, which denominates them *elastic*; and by which they are restored to the figure, and extension they had lost from any external cause. See *ELASTIC body*.

The cause, or principle, of this important property *elasticity*, or springiness, is variously assigned: the Cartesians account for it from the materia subtilis making an effort to pass through pores that are too narrow for it. Thus, say they, in bending, or compressing, a hard, elastic body, *e. gr.* a bow, its parts recede from each other on the convex side, and approach on the concave: consequently the pores are contracted or streightened on the concave side; and if they were before round,

round, are now, for instance, oval: so that the materia subtilis, or matter of the second element, endeavouring to pass out at those pores, thus frightened, must make an effort, at the same time, to restore the body to the state it was in when the pores were more patent and round, *i. e.* before the bow was bent: and in this consists its *elasticity*.

Other later, and more wary philosophers, account for *elasticity* much after the same manner as the Cartesians; with this only difference, that in lieu of the subtle matter of the Cartesians, these substitute æther, or a fine ethereal medium, that pervades all bodies.

Others, setting aside the precarious notion of a materia subtilis, account for *elasticity* from the great law of nature, attraction, or the cause of the cohesion of the parts of solid and firm bodies.

Thus, say they, when a hard body is struck or bent, so as the component parts are moved a little from each other, but are not quite disjointed, or broke off, or separated so far as to be out of the power of that attracting force whereby they cohere; they must certainly, on the cessation of the external violence, spring back to their former natural state.

Others resolve *elasticity* into the pressure of the atmosphere: for a violent tension, or compression, though not great enough to separate the constituent particles of bodies far enough to let in any foreign matter, must yet occasion many little vacuola between the separated surfaces; so that upon the removal of the force they will close again, by the pressure of the aerial fluid upon the external parts.

Lastly, others attribute the *elasticity* of all hard bodies to the power of reflection in the air included within them. And so make the *elastic force* of the air, the principle of *elasticity* in all other bodies.

Laws of ELASTICITY.—To enquire a little more expressly into the nature and laws of *elasticity*, we shall consider the phenomena thereof. Let it be premised, then, that all the bodies wherein this power is observed, do consist, or may be conceived to consist, of small threads, or fibres, which, laid together, constitute such bodies. To examine *elasticity*, therefore, in its most simple case, we had best consider it in musical strings, or chords, and particularly in those of metal; for those of cat-gut, having a spiral twist, cannot be considered as the fibres whereof bodies are formed.

Now the *elasticity* of a fibre, or chord, consists in this, that it may be stretched or extended; and that upon removing the force whereby it was stretched, or lengthened, it returns again to its former dimensions. Fibres have no *elasticity*, unless they be extended with a certain force; as appears in lax chords, which may be moved a little out of their position, without endeavouring to recover it. Though what the degree of tension is, necessary for *elasticity* to commence, is not yet determined by experiment. Add, that when a fibre is too far stretched, it loses its *elasticity*; though here too, the degree of tension that destroys *elasticity* is unknown. But it is certain, *elasticity* depends on tension, and is confined within a certain sphere, or boundary thereof on either side.

This, if it do not give us the proper adequate cause of *elasticity*, yet shews us the difference between *elastic* and *inelastic* bodies; how it is that a body loses its *elasticity*; and how a body, destitute of any such force, comes to acquire it.—Thus, a plate of metal, by repeated blows of a hammer, becomes *elastic*; and being heated, again loses that property.

Between the limits of tension, wherewith *elasticity* is terminated, there are different forces required to give different degrees of tension, in order to stretch chords to certain lengths. What the proportion of these forces is, can only be determined by experiments made with chords of metal. But as the lengthenings of such chords are scarce sensible, the proportions cannot be directly measured; but a particular apparatus, and a kind of circuit, are necessary to arrive thereto. Dr. s'Gravensande has taken a good deal of pains, in order to fix these laws, the result of whose experiments are as follow.

1. That the weight, whereby a fibre is increased a certain length, by stretching, is in different degrees of tension, as the tension itself: *i. e.* *gr.* there be three fibres of the same kind, length, and thickness, whose tensions are as 1, 2, and 3; any weights, in the same proportion, will stretch them equally.

2. That the least lengthening of the same fibres are to one another, nearly as the forces whereby the fibres are lengthened. Which property may likewise be applied to their inflexion.

3. In chords of the same kind, and thickness, and which are equally stretched, but of different lengths, the lengthenings produced by superadding equal weights, are to one another as the lengths of the chords. Which arises hence, that the chord is lengthened in all its parts: consequently the lengthening of a whole chord is double the lengthening of half of it, or a chord of half the length.

4. Fibres of the same kind, but of different thicknesses, may be compared together after the like manner; only considering them as consisting of a greater or less number of fine fibres of

the same thickness; the number whereof must be taken in the ratio of the solidity of those fibres, *i. e.* as the squares of the diameters, or as the weights of these fibres, when their lengths are equal. Such fibres, of consequence, will be equally stretched by forces that are in the same ratio of the squares of the diameters; which same ratio, is likewise required between the forces whereby the chords are inflected, that the sagittæ may be equal in the given fibres.

5. The motion of a stretched fibre agrees with the motion of a body vibrating in a cycloid; and how unequal soever the vibrations are, they are all regularly performed in the same time.

6. In two equal chords, unequally stretched, unequal forces are required to inflect them equally. Their motions may be compared to those of two pendulums, describing similar cycloids, by different forces. Consequently, the squares of the times of the vibrations of the fibres are to each other inversely, as the forces whereby they are equally inflected, which are as the weights by which the chords are stretched.

7. The motions of similar chords, equally stretched, but of different lengths, may be compared with that of pendulums after another manner; for as the times of the vibrations are to be considered, the celerities also, wherewith the chords are moved, must be considered. Now these celerities are to one another directly as the weights whereby the chords are inflected, and inversely as the quantities of matter in the chords; that is, inversely as their lengths. The celerities, therefore, are in an inverse duplicate ratio of those lengths; that is, they are inversely as the squares of the lengths: and the squares of the times of the vibrations, are likewise in the inverse ratio: Consequently, the lengths of the chords will be as the times of the vibrations.

Elastic laminae, or plates may be considered as congeries, or bundles of *elastic* chords. When the plate is inflected, some fibres are lengthened; and there are unequal lengthenings in several points of the same plate.

The curve formed by the inflected plate, is easily determined from what has been shewn concerning chords. In effect, in the vibrations of such plate, or spring, the motion thereof is accelerated, after the same manner as the motion of a chord, and of a pendulum in a cycloid, are accelerated. And the vibrations of such springs are all performed in the same time.

Elastic balls, spheres, &c. may be considered as consisting of several *elastic* plates, or springs; and the introcessions, or yieldings inward of any point thereof, are proportionable to the forces wherewith the body is compressed.

The *ELASTICITY* of fluids is accounted for, from their particles being all endowed with a centrifugal force; whence Sir Isaac Newton, prop. 23. lib. 2. demonstrates, that particles, which mutually avoid, or fly off from one another by such forces as are reciprocally proportional to the distances of their center, will always compose an *elastic fluid*, whose density shall be proportional to its compression; and *vice versa*, if any fluid be composed of particles, that fly off and avoid one another, and hath its density proportional to its compression; then the centrifugal forces of those particles will be reciprocally, as the distances of their centers.

ELASTICITY of the air, is the force wherewith that element dilates it self, upon removing the force whereby it was before compressed.

The *elasticity* or *spring* of the air, was first discovered by the great Galileo. Its existence is proved by this experiment of that philosopher: an extraordinary quantity of air, being intruded by means of a syringe into a glass or metal ball, till such time as the ball, with this accession of air, weigh considerably more in the balance than it did before; upon opening the mouth thereof, the air rushes out, till the ball sink to its former weight.

For hence we argue, that there is just so much air gone out, as compressed air had been crowded in. Air, therefore, returns to its former degree of expansion, upon removing the force that compressed, or resisted its expansion; and consequently it is endowed with an *elastic force*.

It must be added, that as the air is found to rush out, in every situation, or direction of the orifice; the *elastic force* of the air acts every way, or in every direction.

The *elasticity* of the air making a considerable article in the new pneumatics, we shall here give the principal laws thereof.

1. The *elasticity* of the lower air, is equal to the weight of all the upper incumbent air. For the upper air is easily proved to press on the lower.

And the *elasticity* of the air, has already been shewn equal to the compressing power: whence it follows, that the *elasticity* of the air is equal to the weight of the whole incumbent atmosphere.

Hence, as the weight of the upper air, incumbent on the lower, is equal to the weight of a column of water of the same diameter with the column of air, and the altitude of 31 feet; or to a column of mercury 28 inches high: the spring of the lower air is equal to the same column of water, or mercury.

Hence, again, the spring of the air, included in a vessel, &c. is likewise equal to the weight of the whole incumbent atmosphere. Consequently the air, included in a vessel, presses with the same force, as the weight of the atmosphere. And, therefore, the elasticity of the included air, is able to sustain mercury to the height of 28 inches, and water to the height of 31 feet, in an empty tube. See AIR-PUMP.

2. The elastic force of air compressed, is to that of the same air dilated; reciprocally, as the bulk of the dilated air to that of the compressed air.

For the elasticity of air more compressed, is to that of air less compressed; as the weight incumbent on that, to the weight incumbent on this. But the bulks of more, and less compressed air, are in the same reciprocal ratio of these weights. Therefore the elastic force, &c.

Hence the elasticity of air more compressed, is stronger than that of air less compressed.

3. The elasticity of more compressed air, is to that of air less compressed, *ceteris paribus*, as the mass, or quantity of more compressed air, is to a mass of air less compressed of the same bulk.

4. The ratio of the space filled by air pressed only by the weight of the atmosphere, to the space it is reduced into by further compression, being given; to determine the elastic force of the compressed air.

Since the spring of the air, pressed only by the weight of the atmosphere, is equal to the weight of a column of mercury, of the same base with the column of air, and of the height of 28 inches; to the bulk of the compressed air, that of the air not compressed, and the weight of the column of mercury; seek a fourth proportional: this will express the quantity of the elastic force in the compressed air.

Hence, subtracting the weight of the column of mercury from the quantity of the elastic force thus determined, the remainder is the force of elasticity whereby it exceeds the resistance of the weight of the atmosphere.

5. Heat increases the elasticity of the air; and cold diminishes it. See HEAT, and COLD.

6. The elastic force of the air, whereby it is expanded, in rarefaction, is to the elasticity of the air condensed; as the bulk of rarefied air, to the bulk of condensed air.

ELATERIUM*, EAATHPON, in pharmacy, a violently purgative medicine, prepared from the wild cucumber.

* The word is formed from the Greek, ελατριον, *Limpel, agitate, &c.*

Elaterium is made of the juice of the fruit, forced out with the finger, which suffered to stand some time lets fall a sediment, which carefully dried on chalk stones is the elaterium.

Elaterium is a vigorous purge, and is sometimes used in lethargies, palsies and hypochondriacal melancholies.

ELBOW, the outer angle made by the flexure, or bend of the arm.

That eminence, whereon the arm rests, called by us *elbow*, is by the Latins called *cubitus*, and the Greeks *αγκων*, and by others, *αγκυρον*.

ELBOW, is also used by architects, masons, &c. for an obtuse angle of a wall, building, or road, which diverts it from its right-line.

ELCESAITES, HELCESAITES, or ELCESAIANS, as Theodoret calls them, ancient heretics thus denominated from their great prophet *Elesai*.

This *Elesai*, by others called *Elsai*, who lived in the time of Trajan, gave into the sentiments of the Ebionites, touching Jesus Christ; though he altered and reformed them in some things, to denominate himself the author of a sect.

His fundamental doctrines were, that Jesus Christ, who was born from the beginning of the world, had appeared from time to time under diverse bodies; that he was a celestial power, or virtue, called the *Christ*, whereof the Holy Spirit was sister; (note the Hebrew word for spirit, is feminine) and that both of them had descended into Jesus the son of Mary.

The *Elcesaites*, according to St. Epiphanius, were by some also called *Sampsians*, from the Hebrew word, *sames*, sun. Scaliger was notoriously mistaken, in holding that *Elsai* was no more than *Essai*, or *Essene*; on which supposition he made the *Elcesaites* the same with the sect of *Essenes*, which is contrary to all antiquity.

Origen makes mention of the *Elcesaites*, in one of his homilies, as a heresy newly risen. The retainers hereto, says he, do not admit all the books of the canon, but only some of them. They allow some passages out of the Old Testament and the evangelists, but reject all the epistles of St. Paul.

Add, that they have produced a book, which they pretend descended to them from heaven; and maintain, that whoever perform what is enjoined therein, shall obtain pardon of all their sins. See Eusebius, *Hist. Lib. VI. c. 38.* who remarks, that this heresy became extinct almost as soon as it arose.

St. Epiphanius is very full on the subject of this sect, *Har. 19.* where he observes, that *Elsai* was a Jew by birth, and that not being able to live according to the law of Moses, he

invented new opinions, and got himself followers. He was a professed enemy of virginity, and obliged all who followed his doctrine to marry. He tutored them to hypocrisy in times of persecution; pretending it was lawful to adore idols, provided the heart had no share therein.

ELDERS, *Seniors*, in the Jewish history, were the most considerable persons for age, experience, and virtue, among that ancient people.—Moses, we read, assembled the *elders* of the people together, and acquainted them with what the Lord had commanded.

Long afterwards, those who held the first rank in the synagogues, were usually called *zekenim*, *elders*, in imitation of the 70 *elders*, whom Moses established for the judges of the Sanhedrin.

The president, or chief, had in a particular manner the appellation of *elder*, being, as it were, the *decanus seniorum*, dean of the *elders*.

In the assemblies of the primitive christians, those who held the first place, or rank, assumed the denomination of presbyters, or *elders*. For the word *presbyteri*, which occurs so frequently in the Old Testament, and which includes alike both bishops and priests, does properly signify *elders*. See M. Simon's observation thereon, in his *Supplement aux ceremonies des Juifs*.

The president, or bishop, as being the chief of the *elders*, did likewise assume the denomination of *elder*: whence it is, that in the New Testament the name *bishop* is frequently confounded with that of *presbyter*. See BISHOP and PRESBYTER.

For the like reason, the council of the first churches, was called *presbyterium*, or council of the *elders*, where the bishop presided in quality of first *elder*, being seated in the middle of the other *elders*. The priests, or *elders*, who sat by him, had each his judge's chair; for which reason they are called by the fathers, *assessores episcoporum*. Nothing of any importance was done, till it had first been examined, and resolved in this assembly, where the bishop only made one body with the other *elders*, or priests; the jurisdiction which we now call episcopal, not being then dependant on the bishop alone, but on all the *elders*, over whom he was only the president.

ELDERS, is also a denomination still retained in the presbyterian discipline.

The *elders* are officers, who, in conjunction with the pastors, or ministers, and deacons, compose the consistories, or kirk-sessions, meeting to consider, inspect and regulate matters of religion and discipline. They are chose from among the people, and are received publicly with somewhat of ceremony. In Scotland, there are an indefinite number of *elders* in each parish, generally about twelve.

Chamberlayne makes mention of a *ruling elder* in each parish, chose by the kirk-session; the congregation afterwards approving the choice, after a strict scrutiny into his life and manners. He adds, that the minister ordains him; and that his office is for life: his business being to assist the minister in overseeing and correcting the manners of the people; to attend him in visiting, catechising, praying for the sick, in private admonitions, and at the communion table.

But this we apprehend to be a mistake; what that author says of *ruling elders*, belonging properly to the *simple elders*. As to *ruling elders*, there are no such things, but in the general assemblies, where they appear as representatives of the rest. See KIRK-Sessions, SYNOD, and PRESBYTER.

ELECAMPANE wine. See the article WINE.

ELECT, *chosen*, in theology, particularly in the scriptures, is applied to the saints, the predestinated.—In this sense, the *elect* are those persons whom God has chosen to bestow the glory of heaven upon.

The apostles also apply the word to the primitive christians.—In which sense, the *elect* are those chosen and admitted to the favour and blessing of christianity.

God, who has predestinated the *elect* to glory, has likewise predestinated them to sanctification.

ELECT, is likewise applied to archbishops, bishops, and other officers, who are chosen, but not yet consecrated, or actually invested with their office or jurisdiction.

The emperor is said to be *elect*, before he is inaugurated and crowned: a lord mayor is *elect*, before his predecessor's mayoralty is expired, or the sword is put in his hands.

Philip of Savoy was five years archbishop of Lyons, without ever being ordained or consecrated; after which he quitted his archbishopric to marry the countess of Burgundy. All that time he bore the title and quality of archbishop, *elect* of Lyons, *electus Lugdunensis*.

ELECTION, a choice made of any thing, or person, whereby it is preferred to some other.

There seems this difference, however, between *choice* and *election*, that *election* has usually a regard to a company, or community, which makes the choice; whereas choice is seldom used, but when a single person makes it.

We say, the *election* of a bishop, a member of parliament, &c. See BISHOP, PARLIAMENT, &c.

The most solemn *election* is that of a pope; which is performed

formed by the cardinals, in four several manners.—The first, by the Holy Spirit, as they call it; when the first cardinal who speaks, having given his vote for any person, proceeds to the adoration, and proclaims him pope, as by a sudden inspiration of the Holy Ghost. In which case, he is deemed duly *electus*, if all, or at least two thirds of the assembly be consenting thereto.

The second, by Compromise, when the whole college pitches on three cardinals, to whom they give a power of nominating the pope; which power expires upon the burning out of a candle lighted on that occasion.

The third, by way of Poll or Scrutiny, which last is the most usual; the cardinals throwing sealed tickets, wherein their votes are wrote, into a chalice, or cup, placed on the altar. Two thirds of the votes are required to determine an *election* by scrutiny.

The fourth is by way of Acceffion; when, the votes being too much divided to *elect* any body, some of the cardinals, desist from their first suffrage, and accede, that is, give their votes to him, who has already the majority by scrutiny.

The way of acceffion, however, is always added to the scrutiny; it being the constant practice for all the cardinals, to give their voices, after the last scrutiny, to him whom they find to have the plurality already. So that all *elections* of popes are, with the unanimous consent of all the cardinals.

ELECTION, is also the state of a person who is left to his own free will, to take or do either one thing, or another, which he pleases. See **LIBERTY**.

ELECTION, in theology, signifies the choice which God, of his good pleasure, makes of angels or men, for the objects of mercy, and grace.

The *election* of the Jews, was the choice God made of that people to be more immediately attached to his worship and service, and for the Messiah to be born thereof.

ELECTION also, sometimes, signifies a predestination to grace and glory; and sometimes to glory only.

It is an article of faith, that predestination to grace is gratuitous, merely and simply so: *gratia quia gratis data*. But the divines are much divided as to the point, whether *election* to glory be gratuitous, or whether it suppose obedience and good works, *i. e.* whether it be before, or after the provision of our obedience?

Some hold that it is before, and after, at the same time: it is before the provision of our obedience, as glory is intended as antecedent to our obedience: And it is after, as this glory is intended us as a reward, and of consequence, as a sequel of our obedience. See **GRACE**, and **REPROBATION**.

ELECTION, is also used for a part of pharmacy; being that which teaches how to chuse the medicinal simples, drugs, &c. and to distinguish the good from the bad.

Some distinguish a general *election*, which gives the rules and marks for all medicines in general; and a particular one for each medicine in particular. Pomet, in his history of drugs, gives very good rules for this *election*.

ELECTIVE, something that is done, or passes by election.

The empire of Germany was hereditary in time of Charlemaign; and did not become *elective*, till after the death of Louis the III, the last of the race of Charlemaign in the empire. Indeed, it was not entirely *elective* till the time of Frederic II. in 1210.

Some benefices are *elective*, others collative. Municipal offices in England, are generally *elective*; in Spain, venal: Poland is an *elective* kingdom. All prelatures in France are *elective*, since the Concordat.

ELECTOR *, a person who has a right to *elect*, or choose another to an office, honour, &c.

* The word is formed of the Latin, *eligere*, to choose. We say, the *electors* of a burghs, a knight of the shire, a grand master of an order, &c.

ELECTOR, is particularly, and by way of eminence, applied to certain princes of Germany, in whom lies the right of electing the emperor; being all sovereigns, and the principal members of the empire.

The origin of *electors* is not well known: some refer it to the time of Otho III. in the year 997; others to Frederic II. who died in 1250; and others, to Ralph of Hapsburg, founder of the house of Austria, in the year 1280.

Their number, however, was unsettled, at least till the time of Frederic II. in the 13th century. The golden bull, published by Charles IV. in 1356, fixed the number of *electors* to seven; three of them ecclesiastical, *viz.* the archbishops of Mentz, Treves, and Cologne; and four seculars, *viz.* the king of Bohemia, the count palatine of the Rhine, the duke of Saxony, and the marquis of Brandenburg. By the treaty of Munster, in 1648, this order was changed: the duke of Bavaria being put in the place of the count palatine, and an eighth electorate erected for the count palatine.

In the year 1692, a ninth electorate was created by the emperor Leopold, in favour of Ernest duke of Hanover, under

the title of *elector* of Brunswic. Some opposition was made to this election; and the princes of Germany stood out for some time, and refused to acknowledge it. But they afterwards acquiesced in it, and it has been since recognized by all the foreign princes. The king of France did it at last by the treaty of Rastad.

The several functions of the *electors* are as follow: the *elector* of Mentz, is chancellor of Germany; he convokes the states, and gives his vote before any of the rest. The *elector* of Cologne, is grand chancellor of Italy, and consecrates the emperor. The *elector* of Treves, is grand chancellor of the Gauls, and confers the imposition of hands on the emperor. The count palatine of the Rhine is grand master of the imperial palace, and presents the emperor with a globe at his coronation. The marquis of Brandenburg is grand chamberlain, and puts the ring on the emperor's finger. The duke of Saxony, now king of Poland, is grand marshal, and gives the sword to the emperor. The king of Bohemia, who was anciently only duke, is grand butler, and puts Charlemaign's crown on the emperor's head. Lastly, the *elector* of Hanover, now king of Great Britain, is arch-treasurer; though first erected under the title of standard-bearer of the empire.

ELECTORAL, something relating, or belonging to an elector.

The *electoral* prince is the eldest son of an elector, and the presumptive heir of his dignity.

Electors are always addressed under the title of *electoral highnesses*.

The *electoral* college, consisting of all the electors of the empire, is the most illustrious and august body in Europe. Belarmin and Baronius attribute the institution of the *electoral* college to pope Gregory V. and the emperor Otho III. in the Xth century. Of which opinion, are the generality of historians, and particularly the canonists. Wicquefort is of another sentiment; and endeavours to make it appear, from the elections of the succeeding princes, that the number of electors was not then fixed; nor the *electoral* dignity annexed to any particular principalities, exclusive of the other princes of Germany. He adds, that there was nothing settled with regard hereto before Charles IV. and that the publication of his golden bull, was only to prevent schisms, and secure the repose of the kingdom by a regulation in form.

It was the golden bull, therefore, published in 1356, that constituted the *electoral* college, and reduced the number of electors to seven.

ELECTORAL Crown, or **Coronet**, is a scarlet cap, turned up with ermine, and closed with a semi-circle of gold, all covered with pearls. On the top of it there is a globe with a cross thereon.

ELECTORATE, the dignity of an elector, with the territory, or dominions, to which that quality is annexed. See **ELECTOR**.

We say, the *electorate* of Saxony, of Bavaria, &c. The emperor, of his own special authority, in the year 1692, erected a ninth *electorate*, in favour of the house of Brunswic-Lunenburgh. The princes, who disputed the validity of this election, were called the *opposers of the ninth electorate*.

Though the custom ordinarily be, in Germany, for the sons of princes to share their father's lands, and territories among them; those whereto the *electorate* is annexed, are not used to be divided; but pass entire to the eldest son, who succeeds to the *electorate*.

ELECTRICITY, or **ELECTRICAL Force**, is that power, or property, whereby amber, jet, sealing-wax, agate, glass, and most kinds of precious stones, attract straws, paper, and other light bodies to themselves.

Electricity differs from *magnetism* in this, that the latter only attracts iron, whereas the former indifferently attracts most kinds of bodies; though the effect is principally sensible in light ones.

The Peripatetics hold this power to consist in I know not what secret quality, or sympathetic power, subsisting between the amber, *e. gr.* and the straw, and resulting from the substantial form of each.

But the later philosophers generally agree to make it the effect of a corporeal effluvia, emitted from, and returning to, the electrical body. Though as to the nature of these effluvia, and the manner of their acting, they are hitherto greatly divided. Some, with Cabeus, suppose actual steams to issue out of the *electrical* body, when agitated by attrition; and that these discuss and repel the ambient air, which, after it has been driven off a little way, makes as it were a little vortex, by the resistance it meets withal in the remoter air, to which these *electrical* steams did not reach: and that these steams shrinking quickly back again to the attracting body, do, in their return, attract and bring along with them such light and small bodies as they meet in their way.

Others, with Dr. Gilbert, Gassendus, Sir Kenelm Digby, &c. hold, that on rubbing, or chafing, the *electrical* body is made to emit rays, or fibres, of an unctuous nature; which coming to be condensed and cooled by the ambient air, do lose their agitation, and so shrink back again into the body from which

which they fallied; and by that means carry along with them such light and small bodies, as happen to be fastened, or sticking to their further ends. Gassendus adds, that these unctuous effluvia being emitted all manner of ways, do frequently decussate, or cross each other; and by that means take the better hold of straw, &c.

The Cartesian, not being able to imagine how so hard and brittle a body as glass should emit effluvia, attribute *electricity* to the globules of the first element; which breaking out through the pores, or chinks of the body, like little darts or swords, and not meeting with proper meat's, or passages in the air, return whence they came, and carry the little bodies, whose pores they happen to enter, and be entangled in, along with them.

Mr. Boyle, Mr. Hauksbee, &c. have made a number of experiments, to ascertain the nature, and laws of *electricity*; the result whereof may be summed up under the following articles.

1. That *electrical* bodies do not at all, or very rarely attract, except when warmed, and thereby sollicit to emit effluvia more copiously.

Mr. Hauksbee, having heated a glass tube, of about an inch diameter, and 30 inches long, by rubbing it vehemently on paper, and then applying it to several pieces of leaf brass, found that they were no sooner within the sphere of activity of the effluvia emitted by the tube, than they began to be put into very brisk and surprizing motions; would leap towards the tube, even at the distance of 12 or 14 inches; would sometimes adhere, and fasten to the tube, settle on its surface, and there remain quiet: and sometimes be thrown off from it with a great force. And thus would they be alternately attracted and repelled, for several times successively. Sometimes, again, they would move slowly toward the tube; sometimes, they would remain suspended between the tube and the table they were first laid on; and sometimes would slide along in the direction of the side of the tube, without touching it.

2. That bodies, warmed by fire, do not attract so forcibly, as when heated by rubbing; though if they be first heated, and then rubbed, they will attract the more strongly.

Mr. Hauksbee assures us, that the hotter he made the tube by rubbing, to the greater distance did the attractive force extend itself: but that this would answer in proportion, to any degree of heat excited, he will not undertake. When the tube was rendered the hottest by the strongest attrition, the force of the effluvia was rendered manifest to another sense, namely that of feeling, being plainly perceived on the face, or any other tender part, making strokes or impulses on the skin, much like those made by pushing a number of limber hairs against it.

3. That friction or wiping, is almost universally necessary, as well as attrition or rubbing, to produce *electricity*; by reason the effluvia can more readily escape, when there is nothing to stop up, or choke the pores.

4. That the interposition of the finest linnen, as muslin, gauze, or the like, will totally hinder the operation of *electrical* bodies.

5. The effect is less sensible in thick and cloudy weather. For the air being clogged with vapours and exhalations raised from below, the resistance the *electrical* effluvia meet withal, must be greater than when the air is free of any such impediments. Hence, also, in all probability, arises the necessity of friction; the watry particles being apt to run together, and condense on the surface of the body, and so to obstruct the passage of the effluvia.

6. *Electrical* bodies are more forcible, *ceteris paribus*, in hot weather than in cold, in summer than in winter; by reason the more vigorous action of the solar rays, does more effectually shake the parts of bodies, and unlock the pores, and so make room for a more plentiful emission of effluvia. Beside, that in warmer weather, the medium being rarer, makes less opposition to the passage of the effluvia.

7. The air being exhausted out of the tube, it loses almost all its *electricity*: so that though rubbed, and heated more vehemently, and leaf-gold applied nearer than usual, it scarce attracts at all. And what little attraction remains, Mr. Hauksbee conjectures, may arise from the little portion of air remaining in the tube: and so the attraction may continue in proportion to the quantity of air. When the air is let into the tube again, the attractive power is immediately restored; and that before any new attrition can be given the tube, or before it be removed from the distance and position it was in when exhausted. Mr. Boyle, however, found that a piece of amber did sensibly attract when the air was pumped out of the receiver.

8. *Electrical* bodies attract all things indifferently, whereas the magnet draws only iron and steel.

9. A large piece of very *electrical* amber being suspended by a silken thread, and one end of it rubbed strongly on a little cushion; the cushion being brought nearer, towards the amber at rest, will plainly make the amber tend towards it, and follow it. Whence it appears that the *electrical* body is attracted by the other bodies, as well as it attracts them. And that it is only by accident that the small attracted bodies approach to the *electrical* ones.

10. After an *electrical* body has been well rubbed, there is a certain nick of time in which the light body, instead of being attracted, will be actually repelled, or driven away from the *electrical* one, by the effluvia going briskly out, and not returning again.

Mr. Hauksbee assures us, that two pieces of leaf gold would be sometimes thrown off from his tube with a great force, even to the distance of six or seven inches. And thus, not only when they adhered to the surface of the tube, would they be suddenly and precipitantly driven from it; but also in their motion of ascent towards it.

11. A glass globe, being contrived to be whirled round, with its axis parallel to the horizon, and a semi-circle of wire fitted round the upper hemisphere thereof, at the distance of four or five inches, with several pieces of woollen thread hung thereon, of such lengths, as that when extended in a direction towards the centre of the glass, they would reach within an inch of the circumference thereof; but when left at liberty, hung down in a parallel position: upon applying the hand, and so adding an attrition to the former rotation, the threads presently began to change their direction, and all harmoniously pointed to the centre of the globe; and to put it past doubt, that this effect depended on the attrition, the experimenter, by shifting the place of the attrition hither and thither, could draw the threads towards this or that end of the globe, though they all still went uniformly converging towards some centre, in the axis thereof; and so formed a kind of conical surface.

The same phenomena followed upon shifting the wire, and putting it on the lower hemisphere. Add, that upon suspending the motion and attrition, the threads would continue in their straight direct posture for the space of four or five minutes. And in the mean time, if the finger, or any other body, were applied near the extremity, or points of the threads, they would avoid and fly from the same: but if applied about an inch distance from the end of such thread, the thread would usually be attracted towards it. Since these a multitude of other curious experiments have been made. See *Supplement*, article *ELECTRICITY*.

ELECTRUM, is sometimes used for *amber*. See the article *AMBER*.

ELECTRUM more frequently signifies a mix'd metal of great value amongst the ancients. See *Gottlieb Rink de vet. Num. Pot. & Qualitate*. cap. IX.

ELECTUARY *, in pharmacy, a form of medicine, composed of powders and other ingredients, incorporated with some conserve, honey, or syrup; to be divided into doses, like bolus's, when taken.

* Some will have it thus called, by reason all the parts, or ingredients it consists of, should be well chosen; from the Latin verb *eligere*, to choose, whence *electus*, chosen. Others derive it from *lax*; and accordingly the Greeks, under the Eastern empire, called it *λαξιαειον*. Sculiger derives it from *λεωχρον*, *lick*, and calls it in Latin, *electium*. Vossius observes, that all the remedies prescribed for the sick, as well as the confusions taken by way of regale, were called by the Greeks, *ελεγχματα*, and *ελεχματα*, of the verb *λεωχρον*, *lick*: whence, says he, was formed the Latin *electuarium*, and afterwards *electuarium*. This conjecture he supports from the laws of Sicily, where it is ordained, that *electuaries*, syrups, and other remedies, be prepared after the legal manner. The Bollandists, who relate his etymology, seem to confirm it. *Act. Sand. Mart. T. II. p. 131.*

Electuaries are either soft, or solid; and of each kind, some are alterative, others corroborative, others purgative, &c.—The soft are of the consistence of honey, and may consist of three ounces of powder to a pound of honey or conserve and syrup.

The purgatives are usually of the soft kind: but the corroborative only admit of 1 or 1½ ounce of powders to five or six ounces of conserve, with a proper quantity of syrup.

Among the soft *electuaries* of the shops, are reckoned Venice treacle, mithridate, the confection of hamech, that of alkermes, the catholicon, diaprunum, diaphœnicum, Galen's hiera picra, &c. which see explained under their respective articles.

Among the solid *electuaries*, are reckoned those of carthamum, rose juice, violet juice, &c. M. Lemery reckons up about 120 sorts of *electuaries*, and beside these there is an infinite variety in extemporaneous prescriptions.

ELEEMOSYNA *Carucarum*, or *pro Aratri*, or *Aratri*, in our ancient customs, a penny which king Ethelred ordered to be paid for every plough in England, towards the support of the poor.—Sometimes it is also called *eleemosyna regis*, because first appointed by the king.

ELEEMOSYNA, is also used for the possessions belonging to churches. See *ALMS*, and *FRANK ALMOIGN*.

ELEEMOSYNARIA. See the article *AMBER*.

ELEGANCE, **ELEGANCY**, denotes a manner of doing, or saying things politely, agreeably, and with choice.

With choice, to as to rise above the common manners; politely, to as to strike people of a delicate taste; and agreeably, to as to diffuse a relish which hits every body.

Poetical *elegancies*, *elegantie poetice*, are of service to scholars in making their verses: by being too regular in the grammatical construction, we lose certain licences, wherein the *elegance* of language consists. *Elegance*, though irregular, is better than regularity without *elegance*.

The *elegance* of a painting is not founded on the correctness of the design, as appears in Raphael and the Antique. It is most felt in works otherwise careless and inaccurate; as in Correggio, where, spite of all the defects as to justness of design, there is an *elegance* even in the manner of the design itself, as well as in the turn of the attitudes, &c.

The *elegance* of a design, is a manner which embellishes, and heightens objects either as to their form, or colour, or both; without destroying or perverting the truth.

ELEGIAC, in the Latin poetry, something that belongs to *elegy*.

Elegiac verses, *Elegiaci*, are alternately hexameter, and pentameter.

Quintilian esteems Tibullus the top of the *elegiac* poets: but the younger Pliny gives the preference to Propertius. They have each of them reason on their side; and one might make a third choice, as just as either of them.

ELEGIT, in law, a judicial writ, which lies for him who has recovered debt or damages, or upon a recognizance in any court, against one not able in his goods to satisfy; and directed to the sheriff; commanding him to make delivery of half the party's lands, and all his goods, oxen and beasts for the plough excepted.

The creditor shall hold the moiety of the said land so delivered to him, till his whole debt and damages are satisfied; and during that time, he is tenant by *elegit*. See **TENANT**.

ELEGY, *Elegia*, a mournful, and plaintive kind of poem.

The first inventor of the *elegy* is not known: some say it was one Theocles of Naxos, or, according to others, of Eretria, who, in the heat of his phrenzy, first produced this kind of composition. But, no wonder we at this time are in the dark as to the matter: Horace assures us, it was a point not settled among the grammarians even in his time, who the author was.

*Quis tamen exiguus elegos emisit autor
Grammatici certant & adhuc sub judice lis est.*

The chief writers of *elegy* among the Greeks, are Callimachus, Parthenius, and Euphorion: And among the Latins, Ovid, Catullus, Tibullus, and Propertius.

The Flemish have distinguished themselves among the moderns for this kind of Latin verse: The *elegies* of Bidermann, Grotius, and especially Sedronius and Vallius, seem worthy of the purest antiquity. The countess de la Suze, has distinguished her self for *elegies* in the French tongue.

In the English, we have nothing considerable of the *elegiac* kind, but what we have in Milton. The English and French *elegies* are chiefly in Alexandrine verses.

In process of time, *elegy* degenerated from its original intention; and not only matters of grief, but also joy, wishes, prayers, expostulations, reproaches, and almost every subject, were admitted into *elegy*.

The office of *elegy* is well delivered by M. Boileau:

*La plaintive elegie en longs habits de deuil,
Scand, les cheveux epars, gemir sur un cercueil!
Elle peint des amans la joye, & la tristesse;
Flatte, menace, irrite, apaise une maistrisse.*

In mourning weeds *fad elegy* appears,
Her hair dishevell'd, and her eyes in tears:
Her theme, the lover's joys, but more his pains;
By turns she sings, soothes, threatens, and complains.

The diction of *elegy* ought to be clean, easy, perspicuous, expressive of the manners, tender, and pathetic; not oppressed with sentences, points, &c. No apostrophe's are allowed; and the sense ought to be generally closed in every distich, or two lines. At least in Latin compositions.

ELEMENTARY, something that relates to the principles or elements of bodies.

The elements of a body are also called the *elementary principles* thereof. See **PRINCIPLE**.

The whole space, included within the concave, or orbit of the moon, is also called the *elementary region*, as being the seat, or sphere of the four vulgar elements, and the bodies compounded thereof.

The author of the *Comte de gabalis*, gives the name *elementary people* to a kind of beings who are supposed to inhabit the elements, and are only known by what they call the *philosophers*, or *sages*. According to these folks, the element of fire is inhabited by Salamanders; water, that is, the sea and rivers, by Nymphs, or Orilians; earth by Gnomes and Gnomides; and air, by Sylphs and Sylphides.

ELEMENTARY Air.
ELEMENTARY Fire.
ELEMENTARY Geometry.
ELEMENTARY Music.

See the articles }
AIR. }
FIRE. }
GEOMETRY. }
MUSIC. }

VOL. I.

ELEMENTS, in physics, the first principles, or ingredients of things, whereof all bodies are compounded; and into which they are all resolvable.

Elements are conceived as the most simple, homogeneous parts, or corpuscles; of an assemblage, and mixture whereof, all the bodies we see, consist.

Authors generally talk wildly and inconsistently of the *elements*, and confound them with the *principles* of things: yet is there a great deal of difference. As we find, by experience, that all things cannot indifferently be made of all; that stone, for instance, and marble, are not convertible into flesh, nor are fit to nourish or augment an animal body: it seems to follow, that all the variety of bodies could never arise from the first simple combination of the two principles, matter and form; but only some infinitely simple being, or corpuscles, which being variously intermixed, might constitute all other bodies. Now those most simple of all beings, thus formed of the first determination and concretion of principles, are what the philosophers properly call *elements*: so that *elements* and principles have this difference between them; that a principle, as matter, is a kind of incomplete nature; but an *element*, is a perfect or complete one.

Hence it follows, that there must, of necessity, be more *elements* than one: since otherwise all things would be equally simple, and there would be no such thing as a compound in nature. Most of the ancients, not aware of this, confound *element* with principle: by which means the *elements* are sometimes represented as corruptible, and sometimes as incorruptible. The retainers to incorruptible *elements*, mean precisely by *element* what we mean by the first matter. In effect, their *elements* are their atoms, or corpuscles, which are supposed indivisible, incorruptible, &c.

Democritus is held to have been the first author of this tenet; which accordingly is adhered to by Epicurus, and many of their descendants, the Epicurean and corpuscular philosophers. Among those who hold the *elements* corruptible, some will only have one, and some several. Of the former, the principal are Heraclitus, who held fire; Anaximenes, air; Thales Mileusius, water; and Hesiod, earth; as the only *element*. Hesiod is followed by Bernardin, Telefus; and Thales, by many of the chemists.

Among those who admit several corruptible *elements*, the principal are the Peripatetics; who, after their master Aristotle, contend for four *elements*, viz. fire, air, water, and earth. Aristotle took the notion from Hippocrates; Hippocrates from Pythagoras; and Pythagoras from Ocellus Lucanus, who seems to be the first author of the dogma.

But there is a still further variety of *elements*: for the philosophers, not considering matter in it self, or in the general, but only some of the sensations it excites in us; some of them refer all to the sense of sight, and assert lucid and obscure, or pellucid and opaque, to be the *elements* of all things: and others, regarding only the sense of touch, make hard and liquid, or hot and cold, the *elements* of things.

In this latter class we are to reckon Aristotle; though his way of proceeding was somewhat different from the rest. For, considering the four principal qualities that fall under the sense of touching, heat, cold, dryness or hardness, and humidity or liquidity; and observing that two of these qualities might be one and the same thing taken in two different relations; and that they might be combined four ways; he made four *elements*; the first, cold and dry; the second, cold and moist; the third, hot and moist; and the fourth, hot and dry. Then, to give proper names to these *elements*, he enquired in what things these several *elements* seemed chiefly to prevail? Accordingly, taking the earth to be the coldest, and, at the same time, driest of all things; he called the first *element*, earth. And water, being the coldest and moistest of all things, he called his second *element*, water.

Again, judging air the moistest and at the same time hottest of all things, his third *element* he called air.

Lastly, fire being the hottest and driest of all things, his fourth *element* he denominated fire.

These denominations gave occasion to some, impertinently enough, to mistake his meaning; and to take this habitable earth, this potable water, this air we breathe, and this fire we burn on our hearths, to be the four *elements*; notwithstanding that the word *element* denotes a most simple thing; whereas the bodies just mentioned, are all exceedingly compound.

The Cartesians only admit three *elements*; which they pretend are all that could arise from the first division of matter: to explain their origin, they suppose the whole mass of matter in the universe, divided into an infinite number of particles of unequal magnitudes, and of any figure at pleasure. These several particles they suppose further, to have been revolved, or whirled, in various manners, each round its centre; so as to become truly separate and apart.

Thus much supposed, it is impossible but the angular, eminent, and implicated parts of the several particles must be

broke off; and thus, though little before, they must be made continually to grow less till they arrive at a perfect rotundity. By this means we get two kinds of determinate matter for the two first elements: the first, a fine dust rubbed, or broke off from the angles of the particles, till they are turned round; which is the matter of the first element, or the *materia subtilis*. The other, the parts themselves thus turned round, and smooth, which makes the second element.

And, as it is probable some particles of matter may either separately, or conjunctly, still retain irregular, hooked, and intricate forms; these constitute the third element.

It is added, that the elements are convertible into each other: for the third element, by becoming round, may become the second; and the second, by a continual comminution and subtilizing, may become the first.

Our great Sir Isaac Newton, considers the primary elements of bodies on the atomical system, thus: all things considered, it seems probable, that God in the beginning formed matter in solid, massive, hard, impenetrable, moveable particles of such sizes, and figures, and with such other properties, and in such proportion to space, as most conduced to the end for which he formed them; and that these primitive particles, being solids, are incomparably harder than any porous bodies compounded of them; even so very hard as never to wear out: no ordinary power being able to divide what God made one in the first creation. While the particles remain entire, they may compose bodies of one and the same nature and texture in all ages: but should they wear away, or break in pieces, the nature of things depending on them, would be changed. Water and earth, composed of old worn particles, and fragments of particles, would not be of the same nature and texture now, with water and earth composed of entire particles in the beginning. And, therefore, that things may be lasting, the change of corporeal things are to be placed only in the various separations, and new associations and motions of those permanent particles: compound bodies being apt to break not in the midst of solid particles, but where those particles are laid together, and only touch in a few points. It seems to him likewise, that these particles have not only a *vis inertiae*, with the passive laws of motion resulting therefrom, but are also moved by certain active principles, such as is gravity, and that which causes fermentation and the cohesion of bodies. See GRAVITY, FERMENTATION, and COHESION.

ELEMENTS, in chemistry, are the principles, or component parts of natural bodies, into which they are resolvable by fire, &c.

The effect of chemistry is to analyse or resolve bodies into their elements.

The chemical elements are divided into *active* and *passive*.

The chemists are somewhat divided as to their elements: the generality of them, to the vulgar peripatetic elements, water, which they call phlegm; and earth, which they call *caput mortuum*; add three more, *viz.* salt, sulphur, and mercury. Salt, they hold, the principle of taste; and sulphur, of smell and inflammability: as to mercury, which they also call spirit, some hold it the principal of colours, but others deny this; and, in effect, they agree in nothing, but that it is the most subtle and spirituous part.

The elements of fossils are, 1. Mercury, as the base; 2. Sulphur, as the coagulator, or binder; 3. Salt; 4. Earth. The elements of metals, are sulphur and mercury alone; mercury as the base, or matter, and sulphur as the binder, or cement. The elements of fossil salts, are an acid spirit and insipid earth. The elements of earths, are an oil, a little acid salt, and a calx. The elements of sulphurs, are an acid spirit, an oil, and an earthy or metallic matter. Boerhaave.

But, after all, it must be added, that there is no assigning any precise number of chemical elements; some bodies yielding more, and others less. And even these very elements themselves are reducible, by a further process, into other elements. Thus, by repeated distillations of wine, we successively get a spirit of wine, a vapour water, a subacid water, a more acid water, oil, bitter yellow spirit, and a caput mortuum, which is resolvable into earth, oil, &c. Now, are these so many several elements? Add, that what they account an element, now that it is separated, is very different from what it was when it existed in the mixt; as appears hence, that upon remixing all the elements a body is resolved into, the mixture will bear no resemblance to the first body.

In effect, these elements seem rather to be produced by the fire, than separated by it. Beside, that they are convertible, or at least resolvable, into one another.—Thus spirit of wine is found to yield an acid, an oil, and a water: and salts yield either an acid, or an alkali, with phlegm.

What makes the notion of the chemical elements still more precarious, is, that a pot-herb, and a poisonous herb, shall sometimes yield elements perfectly alike; more so, that the same plant analysed at two different times. M. Homberg has considered the difficulties charged on elements, with great attention.

The result of numerous experiments made to ascertain the matter is: that the four principles, salt, oil, water, and earth,

are always found in all plants, in what manner soever analysed: that these principles are more or less volatile, or fixed according to the different manners of analysing: that this difference arises, not only from the different force of fire, but also from the fermentation of the mixed, preceding the analysis: that a vehement fire, rendering different elements equally volatile, confounds them in the analysis: that the fire evaporates, and absolutely loses several parts: and that to have the elements as pure as may be, only fermentation and a gentle fire must be used.

ELEMENTS, is also used figuratively, for the grounds and principles of arts, and sciences.

Thus we say, letters are the elements of speech: he does not know the first elements of grammar.

The ELEMENTS of mathematics have been delivered by several authors in their courses, systems, &c.—The first work of this kind, is that of Peter Herigon, in Latin and French, published in 1664, in ten tomes; wherein are contained the elements of Euclid, Euclid's data, Apollonius Pergæus, &c. with the elements of arithmetic, algebra, trigonometry, architecture, geography, navigation, optics, spherics, astronomy, music, perspective, &c. The work is remarkable for this, that throughout, a kind of real and universal characters are used; so that the demonstrations may be understood by such as only remember the characters, without any dependance on language or words at all.

Since Herigon, the elements of the several parts of mathematics have been laid down by others, particularly the Jesuit Schottus, in his *cursum mathematicum*, in 1674; Sir Jonas Moor, in his *new system of mathematics*, in 1681; De Chales, in 1674; Ozanam, in his *cours de mathematique*, in 1699. And above all, Christ. Wolfius, in his *elementa mathematicæ universæ*, in two vols. 4to. The first published in 1713, and the second in 1715; a work never enough to be commended.

The elements of Euclid, are the first and best system of geometry. We have abundance of editions, and comments on the XV books of Euclid's elements. Orontius Fineus, first published the first VI books in 1530; with notes to explain Euclid's sense. The like did Peletarius in 1557. Nic. Tartaglia made a comment on all the XV books, about the same time, with the addition of some things of his own: and the like did Fran. Pluffates Candalla, a noble Frenchman, in the year 1578, with considerable additions as to the comparison, and inscription of solid bodies; which work was afterwards re-published with a prolix comment by Clavius, whose edition has since been reprinted, at various places and times.

De Chales, Herigon, and Commandinus, have likewise done well upon Euclid's elements; so has Dr. Barrow, who is remarkable for the conciseness and strictness of his demonstrations. But as the whole XV books do not seem necessary, especially for young mathematicians, some authors have chose only the first fix, with the eleventh and twelfth at most; it would be endless to relate the several editions hereof: the two best are the French one of De Chales, and the Latin one of And. Tacquet: the best edition of the former of which is that of Paris in 1709, by Ozanam; and of the latter, that of Cambridge in 1703, by Mr. Whiston.

Herlinus, and Daltypodius, have thrown all Euclid's demonstrations into syllogisms; to show how by a concatenation of syllogisms, a complex demonstration arises. Pet. Ramus disliked Euclid's order, as appears from his *discourse on the XV books of Euclid*; and therefore compiled 23 new books of elements, in the order of the schools; but unhappily: though his example was afterwards followed by others, particularly the Jesuit Gaston Pardies, in 1680; Arnaud, in 1667; and Fa. Lamy, in 1685; Polynier, a French physician, in 1704, digested Euclid into a new method: the like did Angelus de Marchettis of Pisa, in 1709, in his *Euclides reformatus*.

ELEMENT of an area, called also its differential, is the rectangle, PMR_p (*Tab. Analysis, fig. 18.*) of the semi-ordinate PM, into the differential of the absciss, Pp. See DIFFERENTIAL.

ELEMI, or ELEMV, in pharmacy, a pellicid resin, of a whitish colour, intermixed with yellowish particles, and often much of the colour and consistence of wax; of a pretty brisk bitter, though not disagreeable taste; and a smell somewhat like that of fennel.

It is usually called *gum elemi*, though very improperly, inasmuch as it takes fire readily enough, and dissolves in oleaginous liquors, which are the characters of a resin, not a gum.

It flows from incisions made in the trunk, and large branches of a large and tall tree, growing in Æthiopia, and Arabia Fœlix. It is also found in Apulia, a province of the kingdom of Naples.

Pomet, in his history, and Lemery in his dictionary of drugs, describe *elemi* as a white resin, bordering on green, odoriferous, and brought from Æthiopia, in cakes of two or three pounds a-piece, and usually wrapped up in the leaves of the Indian cane.

It is excellent in diseases of the head; and is proper to digest, resolve

resolve and suppurate. It is held a kind of natural balsam; and is sovereign in the cure of all sorts of wounds.

The true *gum elemi* is that above described; but there are several spurious sorts, some natural, and others factitious; frequently sold for it.

The factitious, or counterfeit, is usually made of rosin washed in oil of spic: though the ill smell, and white colour of this, might easily discover the fraud. The natural gums, obtruded for *elemi*, are,

1^o. A gum brought from the American islands, in cags of different weights, covered up with the leaves of a plant unknown in Europe.

The 2d might be taken for common rosin, but for its smell, which is somewhat sweeter, and more aromatic.

The 3d is of an ash colour, bordering on brown, brought over in large pieces, and very dry and friable.

Pomet does not take any of these for different genuine gums; but rather supposes them to be originally *elemi*, only impure, and coarse, since melted down, and made up by the fire.

ELENCUS, ΕΛΕΥΘΟΣ, in logic, by the Latins called *argumentum*, and *inquisitio*, is a virtuous, or fallacious argument, which deceives under the appearance of a truth; the same with what is otherwise called *sophism*.

ELEOSACCHARUM, rather ΕΛΕΟΣΑΚΚΑΡΟΝ, ΕΑΙΟ-ΣΑΚΚΑΡΟΝ, in pharmacy, a mixture of sugar with a distilled oil; in order to bring it to mix with some aqueous fluid for present use.

ELEPHANT*, ΕΛΕΦΑΣ, gives the denomination to an ancient and honourable military order, conferred by the kings of Denmark, on none but persons of the highest quality, and extraordinary merit.

* It is called the *order of the elephant*, from its badge, which is an elephant, with a castle on its back, set with diamonds, and hung on a water'd sky-colour'd ribbon, like the George in England.

There are different sentiments as to the origin and institution of this order: the first is that of Mennenius and Hoepingius, who attribute it to Christian IV. who was elected king in 1584. The second, that of Selden and Imhof, who derive it from Frederic II. elected in 1542. Gregorio Leti goes back as far as Frederic I. who reigned about the year 1530. Bernard Robolledus, will have King John to be the author, who began to reign in 1478. Anselmus, Roslerus, and Loescher, hold it to have had its rise under Christian I. father of Frederic I. Lastly, Voigtius, Becman, and Bircherodius, maintain Canutus VI. to have been the first institutor; and the occasion thereof to have been the croisades. This prince, according to the chronology of Swaning, reigned towards the close of the XIIth century, from the years 1168, to 1191.

This, at least, we are certain of, that the order was subsisting in the year 1494; there being a painting still extant, done that year by count Reinden, a knight of this order. And we have even authentic evidences of the marquis of Mantua's being created knight of the same order by Christian I. in 1474. There are bulls of pope Pius II. and Sixtus IV. confirming the statutes of the order, authorizing the holding of assemblies, or chapters, in the chapel of Roefchild, and settling the privileges of the knights.

The order was at first called the *order of St. Mary, ordo S. Mariae*: though it seems to have had the appellation of the *elephant*, as early as Christian I. Witness the figure of an elephant, so often struck on his coins, medals, &c.

The manner of its institution is thus related: king Canutus having sent a fleet against the Saracens, in 1180, which took Siluma and Ptolemais; a gentleman among the Danish croisces, killed an elephant; in memory of which extraordinary accident, the order was erected. This account is rendered the more probably by this; that it is referred to an era, when nothing was more common than to take the spoils of a vanquished enemy for armories, or cognizances: and accordingly some of the principal arms of the like kind now on foot, e. g. the lions of the low countries, had their rise at the time of the croisades; as is shewn by Heuterius and Hoepingius. Which circumstances greatly corroborate the opinion of those, who ascribe the order to king Canutus.

Bessarion brought with him a very ancient and rare coin from the east to Rome; whereon was seen the image of the Holy Virgin, with an elephant. Du Puis takes this to have been the badge, or symbol of the Danes, engaged in the croisades against the Saracens; and supposes it to relate to the order of the elephant. The chancellor Fritschius, had another coin of the like kind, whereon was the image of the Holy Virgin, an elephant, and a crescent, which was anciently a bearing in the arms of this order. Boisseau relates another ancient figure of the arms of this order, being the image of the Holy Virgin with four elephants, charged with towers. And Petra Sancta, a fourth, wherein was the Virgin with three keys, and four elephants, and spurs; whence it appears, that the order was under the protection of the Holy Virgin. Accordingly, it is still denominated the *order of St. Mary*.

To the collar of the order hangs an elephant, with a silver turret on its back, and underneath the elephant, an image

of the Holy Virgin, encircled with rays. See the abbot Justiniani, *Hist. de tutti gp Ord. Milit. e Caval. T. 2. c. 72*.

The chapel of Roefchild, was founded by Christian I. for the assemblies, or chapters of this order to be held in. It was at first called the *chapel of the three kings, capella trium regum*: afterwards Frederic I. gave it the name of the *royal chapel*.

The order was restored by Frederic II. who created abundance of knights at the ceremony of his coronation, which is the only time when the Danish kings make any knights of the elephant. Christian V. augmented and enriched it very considerably. In the year 1694, a grand chapter of the order was held at Fredericsburg, in the chapel of the knights, wherein six German princes were admitted into the order.

We have a multitude of writings on the subject of this order: whereof that of Janus Bircherodius may serve for all the rest: it is the latest, most ample, and learned. It was published at Copenhagen, in 1705, under the title of *Breviarium equestre; seu de illustissimo, & inclytissimo ordine elephantino, &c.*

ELEPHANTIASIS, in medicine, a kind of leprosy, called also *lepra arabum*, in contradistinction to the *lepra graecorum*, which is another disease.

The *elephantiasis*, is thus denominated, by reason those seized therewith, have their arms, and legs, big, swollen, and tumorous; the skin bloated, yet rough to the touch, and all wrinkled and rugose like the skin of an elephant.

The *elephantiasis*, is a disease unknown in our parts of the world, at least in these days. Some authors call it *leontiasis*, and others *satyriasis*. The Greeks call it *ελεφαντιασις*; and sometimes *ελεπας*, elephant, also *ελεφαντια*, and *ελεφαντιασθη*.

The *elephantiasis graecorum*, or *lepra arabum*, is described by Deodatus, as a contagious disease, infecting the body with a crowd of evils in it. The skin of the face, knees, elbows, thighs, hands, and feet is beset with moveable, indolent tubercles of a livid colour, tending to redness: in the mouth, palate, and jaws, likewise, arise tubercles, sometimes yellow, and sometimes livid: in the intervals between the toes, and on the soles of the feet, especially the hard callous parts thereof, as also in other parts of the limbs, break out ulcers, which penetrate the cutis, are very broad, and keep spreading, with callous, and tumid lips: these, upon a little violence, yield blood, and yet are indolent. Add, that ulcers eat the nose; tumours rise about the ears; and the lips thicken, and the feet and hands are wonderfully bloated.

Etmuller, Haly Abbas, and others, speak of the *elephantiasis* as a ruddy livid swelling chiefly of the feet and legs; with varices, and ulcers; which distend and make the feet appear like those of elephants.

ELEPHANTINE, something that relates to, or partakes of the qualities of elephants.

The term is chiefly applied to certain books of the ancient Romans, wherein were recorded the transactions of the emperors, and the proceedings, acts, &c. of the senate. This we learn from Pollio, and Vopiscus in the life of the emperor Tacitus, where he observes that in the 6th press of the Ulpian library, was kept one of these *libri elephantini*; wherein, for a long course of time, were wrote down the decrees, and edicts of the senate.

In some of these books, were registred all the acts and proceedings of the senate, and the magistrates of Rome; in others, the proceedings and events in the provinces, the armies, &c. There were above thirty-five large volumes of them, as many as there were tribes.—In them were likewise contained the births, and classes of the citizens; with the musters and all things belonging to the census. They were renewed every five years with the censors; and were all anciently kept in the ararium, or public treasury, in the temple of Saturn.

Vigenero, and several others, believe these books to have been called *elephantine*, by reason of their enormous bulk, q. d. as big as elephants, or bullocks. But Loisel on the XVIIth chapter of the XIth book of Aulus Gellius, gives us a different etymology; and assures us they were called *elephantine*, because composed of ivory leaves, or tablets, which every body knows is a production of the elephant. And, accordingly, Ulpian, L. 52. ff. de Legat. 3. makes mention of an ivory book.—Scaliger and Gerard Vossius, lay they were written on the intestines of elephants.

Vossius does not deny, indeed, but that they might have been made of ivory; but being there were several other books, and tablets, made of that matter, as appears from Martial, L. XIV. epigr. 3. and a hundred other ancient authors, and from what we have shewn under the term ΔΙΠΤΥΧ: it does not appear, why the name *elephantine* should be peculiarly appropriated to these.

Martial does not give the name *elephantinus*, but *eboreus*, of ivory, to the tablets mentioned in the place last quoted, *eborri pugillares*: Alexander ab Alexandro *Geniel. Dier. L. II. c. 2.* makes mention of the *libri elephantini*: so also does Salmasius on the passage in Vopiscus, just quoted; where he refers Scaliger, maintains that these books were of ivory, and shews that the ancients used the word *elephas*, for ivory; witness Virgil *Aeneid. L. III. v. 464.* and Servius on the same: and *elephantinus*, for what was of ivory; witness Martianus

Capella,

Capella, and Isidore in his glosses. He shews further, that it was no impossible thing to write on ivory, as Scaliger had suggested; that they did not make use of a goose quill as we do, nor of ink like ours: but of rushes, or reeds, formed after a different manner from our pens, and of ink fit to take upon ivory. The matter of fact, in fine, he asserts, is clear from Martial, and Plautus in his *Mottellaria*.

ELEVATION *, the altitude, or height, of any thing. See **ALTITUDE**.

* The word is formed from *elevare*, to raise, or lift up.

ELEVATION of a star, or other point, in the sphere, is an arch of the verticle circle, intercepted between such star, or other point, and the horizon.

Hence, as the meridian is a verticle circle; a meridian altitude, or *elevation*, i. e. the *elevation* of a point in the meridian, is an arch of the meridian, intercepted between that point, and the horizon.

ELEVATION of the pole, denotes the altitude of the pole above the horizon of any place; or an arch of the meridian, intercepted between the pole, and the horizon.

Thus, in *Tab. Astronomy*, fig. 4. A Q being supposed the equator, HR the horizon, HZPN the meridian, and P the pole; PR is the *elevation of the pole*.

In which sense *elevation* stands opposed to *depression* or depth. See **DEPRESSION**.

The *elevation of the pole*, is always equal to the latitude of the place; that is, the arch of the meridian intercepted between the pole, and the horizon, is always equal to the arch of the same meridian, intercepted between the equator and the zenith.

Thus the north pole is *elevated* $51^{\circ} 32'$ above the horizon of London: and there is the same distance, or number of degrees between London and the equator; so that London is likewise in $51^{\circ} 32'$ of northern latitude.

To observe the *elevation of the pole* of any place. See **POLE**, and **LATITUDE**.

ELEVATION of the equator, is an arch of the meridian, less than a quadrant, intercepted between the equator, and the horizon of the place.

Thus A Q, as before, representing the equator, HR the horizon, P the pole, and HZPN the meridian; HA is the *elevation of the equator*. See **EQUATOR**.

The *elevations of the equator*, and of the pole, together, are always equal to a quadrant: consequently, the greater the *elevation of the pole*, the less the *elevation of the equator*; and vice versa.

Thus in the figure just cited P A, is supposed by the construction a quadrant; and HA \perp AP \perp PR a semi-circle: consequently HA \perp PR is a quadrant.

To find the **ELEVATION of the equator**.—Find the *elevation of the pole*, after the manner hereafter directed under the article **POLE**.

Subtract the *elevation* found, from a quadrant, or 90° , what remains is the *elevation of the equator*. Thus, the *elevation of the pole* $51^{\circ} 32'$, being subtracted from 90° , leaves the *elevation of the equator* $38^{\circ} 28'$.

ELEVATION, in architecture, denotes a draught, or description of the principal face, or side of a building; called also its *upright*, or *orthography*. See **ORTHOGRAPHY**.

ELEVATION, we also find used in some writers of perspective, for the scenography, or perspective representation of the whole body, or building. See **SCENOGRAPHY**.

ELEVATION, in the Romish religion, is applied to that part of the mass, wherein the priest hoists, or raises the host, with the cup, above his head, for the people to adore it; after having first consecrated, and adored it himself.

The priest, who officiates at mass, rings a bell at the *elevation*; to apprise the people to cast their eyes upon their new formed favour, and adore him.

St. Louis decreed, that they should fall on their knees at the *elevation*, in imitation of certain religious whom he does not name. The Chartreux, and the religious de la Trappe, still observe this ceremony of prostrating themselves at the *elevation*.

ANGLE of ELEVATION, in mechanics, is the angle A R B, (*Tab. Mechanics*, fig. 47.) comprehended between the line of direction of a projectile A R, and the horizontal line A B. See **PROJECTILE**, and **ANGLE**.

ELEVATION of a canon or mortar piece, is the angle, which the chafe of the piece, or the axis of the hollow cylinder, makes with the plane of the horizon.

ELEVATOR, **ELEVATORIUM**, in chirurgery, an instrument used to raise up bones, as those in fractures of the skull, when beaten, or crushed in, with blows, or the like.

There are dented *elevators*, and *elevators* with three feet, called *elevatores triplodes*.—The *elevator* made lever wife, is a new invention: its use is in drawing teeth. One extremity of it is flat, to rest on the guni, at the bottom of the tooth, and the other hooked, like one of the branches of a pelican, to fasten hold of the tooth.

ELEVATOR, in anatomy, is a name common to several muscles, which do the office of raising or lifting up the parts they belong to; of equal import with *Attollens* and *Llevator*. See **LEVATOR**, and **ATTOLLENS**. Such are the

ELEVATOR ala nasi, a muscle, or pair of muscles of the nose, of a pyramidal figure, very narrow, though fleshy at its origin on the fourth bone of the upper jaw; and very broad and thin at its termination on the side of the ala nasi.—Its action is to pull the ala upwards, and turn it outwards. See *Tab. Anat.* (Myol.) fig. 1. lit. o.

ELEVATOR auris, or *attollens auriculam*, is in reality no more than a part of the muscle of the scalp, with some flesh fibres in it, as it descends over the temporal muscles to the upper part of the concha.—Its action is scarce visible; the auricles being hardly perceived in men to have ordinarily any motion at all.—See *Tab. Anat.* (Myol.) fig. 6. n. 3. fig. 1. n. 13.

ELEVATOR labium communis, a muscle of the lips, arising from the fourth bone of the upper jaw, and terminating at the angle of the lips, under the zygomaticus. See *Tab. Anat.* (Myol.) fig. 1. n. 4.

ELEVATOR labii inferioris, is a muscle that arises from the second bone of the under jaw, below the incisores. It descends, and passes under the zygomaticus, and is inserted into the under lip.

This, assisted by a small, but strong pair of muscles, arising from the gum of the dentes incisivi, and descending directly, is inserted into the lower part of the skin of the chin; and serves to pull the skin of the chin upwards, and consequently to thrust up the lip.

ELEVATOR labii superioris, arises from the upper part of the second bone of the upper jaw; and descending obliquely, is inserted into the upper lip, above the dentes incisivi.—It draws up the lip. See *Tab. Anat.* (Myol.) fig. 1. n. 3. and n. 5.

ELEVATOR oculi, one of the muscoli recti of the eye, serving to draw it upwards. See **RECTUS**, and **EXE**.

ELEVE, a term purely French; though of late used also in our language. Literally it signifies a disciple, or scholar, bred up under any one; being formed from the Italian, *allievo*, an apprentice or novice.

It was first used by the French writers in speaking of painters: such a painter was an *élève* of da Vinci, of Raphael, &c. From painting, it came to be applied to such as studied, or learned any other art under a master. In the Royal Academy of sciences, there were 20 *élèves*: and in that of inscriptions, 10 *élèves*. The *élèves* are to act in concert with the pensionaries. See **ACADEMY**.

We are not afraid, says M. Fontenelle, to compare a simple *élève*, such as M. Amontons was, to one of the greatest members the academy ever had. [M. Mariotte] The name *élève*, with us, implies no difference as to merit; it only signifies somewhat of less seniority, and sur vivance.

The denomination *élève*, however, has been since suppressed, and that of *adjoint* substituted in its room; by reason every body did not know the sense affixed to it by the academy. And now the pensionary academists have not, as formerly, each of them an *élève*: but the *élèves* are become *adjoints*, or associates of the academy.

ELEUSINIA *, in antiquity, the mysteries of the goddesses Ceres; or the religious ceremonies performed in her honour: thus called from *Eleusis*, a maritime town of the Athenians, wherein was a temple of that goddess, famous for the celebration of these mysteries.

* Some writers call the city, where the *eleusinia* were celebrated, *Eleusina*, not *Eleusis*: Harpocration confirms this orthography, in deriving its name from *Eleusius*, a son of Mercury: to which opinion, Pausanias likewise adheres in his Attica. Others, who write it *Eleusis*, advent, suppose it thus called, by reason Ceres, after running over the world in search of her daughter, stopped here, and put an end to her pursuit. Diodorus Siculus, L. V. will have the name *Eleusis* to have been given this city, as a monument to posterity, that corn, and the art of cultivating it, were brought from abroad into Attica.

The *eleusinia* were the most solemn and sacred ceremonies in use among the Greeks; for which reason they were called *mysteria* by way of eminence. They are said to have been instituted by Ceres herself, at *Eleusis*, in memory of the zeal and affection wherewith the Athenians received her.

This is the account Iocrates gives in his panegyric; but Diodorus Siculus assures us, L. VI. that the *eleusinia* were instituted by the Athenians, in gratitude to Ceres, for having instructed them to lead a less barbarous, and rustic life. Yet the same author, in the first book of his *Bibliotheca*, relates the thing in another manner.

A great drought, says he, having occasioned a miserable famine throughout all Greece; Egypt, which had that year reaped a most plentiful harvest, bestowed part of the fruits thereof upon the Athenians. It was Erichtheus that brought this extraordinary supply of corn; in commemoration of which beneficence, Erichtheus was created king of Athens, who instructed the Athenians in these mysteries, and the manner of celebrating them.

This account comes near to what we are told by Herodotus and Pausanias, viz. that the Greeks learned their gods, and their religion from the Egyptians.

Theodoret, L. I. *Græcicæ Aff. d.* writes that it was Orpheus, not Erichtheus, who made this establishment; and who instituted for Ceres, what the Egyptians practised for Isis: which sentiment

mentism is confirmed by the scholiast on the Alceftis of Euripides.

Eleusis, the city where these mysteries were celebrated, was so jealous of the glory thereof, that when reduced to the last extremities by the Athenians, it would not surrender but on this condition, that the *eleusinia* should not be taken away; though these were no religious ceremonies peculiar to the town, but were held common to all Greece.

The matter of these mysteries, as related by Arnobius and Lactantius, was an imitation, or representation of what mythologists teach of Ceres. They lasted several days; during which, the people ran about with burning torches in their hands; sacrificed abundance of victims, not only to Ceres; but also to Jupiter; made libations, from two vessels, one of them to the east; and the other to the west; marched in pomp to *Eleusis*, making pauses from time to time, wherein they sung hymns, and sacrificed victims: and this they performed, not only in going to *Eleusis*, but in returning back to Athens. For the rest, they were obliged to keep it an inviolable secret; and the law condemned to death any one who should dare to divulge their mysteries. Tertullian in his book against the Valentinians, relates that the figure shewn in the *eleusinia*, and which was so expressly prohibited to be made public, was that of a man's privy parts: Theodoret, Arnobius, and Clemens Alexandrinus, likewise make mention of it; but he says it was the figure of a woman's privities.

The day after the feast, the senate assembled at *Eleusis*, apparently to examine whether every thing had been managed according to order.

There were two kinds of *eleusinia*, the *great* and the *less*: those we have been hitherto speaking of were the greater.

The *less* were instituted in favour of Hercules: for that hero desiring to be initiated into the former; and the Athenians not being able to gratify him therein, by reason the law prohibited any stranger being admitted; being both however to give him an absolute denial, they instituted new *eleusinia* whereat he assented. The greater were held in the month Boedromion, which answered to our August; and the lesser in the month Anthestion, which happened in our January. People were only brought to partake of these ceremonies by degrees: at first, they were to be purified; then admitted to the lesser *eleusinia*; and at last initiated in the greater. Those who were yet only at the lesser, were called *myetes*; and those admitted to the greater, *epoptes*, or *aphori*, i. e. inspectors. They were usually to undergo a probation of five years, ere they passed from the lesser to the greater. Sometimes, indeed, they were contented with a single year; immediately after which, they were admitted to the most secret religious parts of the ceremony.—Meursius has an express treatise on the *eleusinia*, where most of these points are proved.

ELEUTHERIUS *, ΕΛΕΥΘΕΡΙΟΣ, in antiquity, a Greek word signifying, *liberator*, or *deliverer*; it was used by the Greeks as a surname, or epithet of Jupiter, given him on occasion of his having gained them the victory over Mardonius, general of the Persians, and killed as they say 300000 men of his army, and by that means deliver'd them from the danger the were in of being brought under the Persian yoke.

* The word is formed from, ελευθερος, free. There were also feasts solemnized on this occasion, in honour of Jupiter *Eleutherius*, and called *Eleutheria*. They were held every five years, with races of armed chariots, &c.—The scholiast on Pindar, *Olymp. Od. 7*, says, they were celebrated at Platea, the place where the victory was obtained.

ELICIT, or **ELICITE**, in ethics, is applied to an act of the will, immediately produced by, and of the will, and received within the same.

Such are willing, nilling, loving, hating, &c. These acts are denominated *elicit*, by reason being before in the power of the will, they are now brought forth into act. But they are so far intrinsic, that some authors consider them as the will it self; and deny they ought to be distinguished from it, any more than light is to be distinguished from the sun.

ELIGENDO *Fridario*. See the article **FRIDARIO**.

ELIGIBILITY *, in the Romish canon law. A bull of **ELIGIBILITY**, is a bull granted by the pope, to certain persons, to qualify them to be chosen, or invested with an office, or dignity, whereof they were before incapable, by reason of want of age, birth, or the like.

* The word is formed of the Latin, *eligere*, to chuse; whence the word *eligibilitas*, &c.

In several churches in Germany, a person who is not of the chapter, cannot be elected bishop, without a bull of *eligibility*.

ELIRE. See the article **CONSE de elire**.

ELISION, in grammar, the cutting off, or suppressing a vowel, at the end of a word, for the sake of sound, or measure. *Elisions* are but little known in English: in Latin, French, &c. they are frequent; and consist mostly in suppressions of the final *a*, *e*, and *i*.—As in *Phyllida amo ante alias*.—*Si ad vitulum spectes*, &c.

In writing, *elisions* are often marked by an apostrophe; as *egon quem quaram*, for *egone*. *Emin' ergo te* for *emine*. *Venistin' for venistine*, &c. *Cett' es'perance*, for *cette*. *P' homme*, for *le homme*.

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In the pronunciation we make frequent *elisions*, but do not mark them in writing, thus we write *riffique it*, but pronounce *riffy' it*. So the French pronounce *un' ame*, but write *une ame*. In effect, they never mark any *elisions* but at the end of the monosyllables, *je, ne, le, te, ce, que, and la*. They never elide the *s*, nor *u*, nor *t*, but in the the conjunction *si* before *il*; nor *a* but in *la*.

In poetry, the syllable where there is a vowel *elided*, is never reckoned: and great care is taken to avoid the clashing of syllables, where there is no *elision*; this making what they call a *hiatus*, or *chesm*.

Some reduce the *schlipsis* under the head of *elisions*: as in *monstrum, horrendum, ingens*, &c. See **ECTHILIPSIS**.

ELIXATION *, in pharmacy, &c. the infusing, seething, or boiling of any medicine in a proper liquor, gently, and for a considerable time: amounting to what, in the dressing of meats, we call *stewing*.

* The word is formed from the Latia, *lixare*, to boil, or boil in water.

The liquor ordinarily used in *elixations*, is spring or river water: though on some occasions they use spirit, milk, whey, beer, or the like.

The ordinary purpose of *elixation*, is to extract the virtue out of the medicine, and impart it to the liquor. Though it is sometimes also used to free the parts of animals, plants, &c. of their crudities; as well as to soften, and make them tender; to take away from foods, or medicaments, any disagreeable taste, or other ill quality; to separate the earthy or grosser parts, and for other intentions.

Decoction is also a sort of *elixation*. See **DECOCTION**.

ELIXIR *, in medicine, a compound tincture, or essence, drawn from a mixture of several ingredients, by infusing them in a proper menstruum.

* *Ménage* derives the word from the Arabic, *el-essir*, properly signifying *fraction*, by reason *elixirs* have the force of breaking difeases: others, more naturally derive it from the Arabic *alechiro*, an artificial extraction of some essence: others from the Greek, *ελαιον*, oil, and *σφρα*, I draw, q. d. an extract of the oil, which is the essential part of mixt. Others from the Greek verb, *αλεξω*, I help, or *αλφω*, by reason of the great succours we receive from *elixirs*.

An *elixir* is properly a strong, spirituous liquor, or juice, to be taken inwardly; containing the purest, and most efficacious parts of several mixed bodies, communicated to it by infusion and maceration.

Quincy defines it a strong infusion in some menstruum, whereby the ingredients themselves are almost dissolved, and a Liquor thus acquired of a thicker consistence than an ordinary tincture.

Boerhaave considers an *elixir* as a compound magistery, i. e. a compound of various bodies, changed after the same manner as a single body is in a magistery.

Spirits drawn from vegetables, i. e. the strong, or spirituous waters of vegetables, are usually the basis of *elixirs*, and the menstruum, or dissolvent, whereby the essence of the other ingredients is drawn or separated. Spirit of wine is the best and most commodious menstruum of all.

The Charletans abuse the term *elixir*, and apply it to abundance of simple extracts, or tinctures; only to put them off at the higher price.—Some authors, for *elixir*, use the word *quintessence*.

ELIXIR Proprietatis, is a remedy first invented by Paracelsus; composed of aloes, myrrh, and saffron; the tincture, or essence whereof, is drawn by putting them to dissolve, or digest with spirit of sulphur.—Some add spirit of wine to the spirit of sulphur.

Crollius takes this *elixir* to be the balm, or balsam of the ancients; adding, that it contains all the virtues of the natural balm. It comforts and fortifies the heart and stomach, assists digestion, purifies the blood, and promotes sweat.

ELIXIR, among the alchymists, is used for the philosopher's stone, or the powder of projection.—And sometimes, for an universal medicine, which will cure all difeases, called by way of excellence the *grand elixir*.

Those two things, most alchymists take to coincide; so that what will make gold, they think will cure all difeases. See **PHILOSOPHER'S Stone**.

The notion of a *grand elixir* is of a long standing. Kircher assures us, that the ancient Egyptians had a method of drawing an *elixir* from the hardest and most precious substances, which on account of its subtilty and perfection, they called *heaven*. And this he takes to be that admirable, and celestial water, capable of removing all difeases; called also the *stone*, and the *philosopher's stone*; as being drawn from precious stones; and sometimes, by the hermetical denominations, *agua vita*, *vegetable seed of nature*, *solar soul*, &c. *Oed. Egypt. Tom. II. p. 430*.

ELKS *clavus*, in pharmacy, a drug, supposed to be good against the epilepsy; known in the shops by the name of *unguis alicis*.

The animal that yields them, called by the Latins, *alic*; by the Germans, French, &c. *elend*; and by us, *elk*, is a wild beast, found in the forests of Mascovy, Sweden, and Prussia;

but more abundantly in Canada, and most parts of North America.

It is about the size and figure of a mule; only its snout bigger, its tail short, its feet cloven; and that it bears a large ramage, or horn, like that of a deer, weighing three, and sometimes four hundred weight. That anatomized in the royal academy of sciences, was five foot seven inches long. Its hair is brown, and about the length of that of a goat, its ears nine inches long, and four broad; and its tail not above two inches: its neck short and thick: its skin strong and hard, though thin; its flesh very delicate, especially that of the female: and the ligaments of its joints exceeding strong; which has occasioned some authors to say, that its legs had no joints at all; and that it was this made it so ready at sliding on the ice, to save itself from the wolves.—It neither runs, nor bounds; but its trot is almost equal to the swiftest running of a deer.—Pausanias says, that the male has horns: and Cæsar, that the female hath none: but we find that both have.

The hunting of the *elk*, is one of the principal and most agreeable employments of the savages of Canada, Accadie, &c. They chuse a time when the snow is on the ground; in which the beast is apt to sink and stick. When they have killed enough with their fire arms, to feast for several days; they flea them, and send the skins to the French, who dress them in oil, like the buffalo skin.

The savages likewise take care to cut off the left hind foot of each beast; especially if it be a female; the hoof of which foot is that applauded remedy for the falling sickness.

Ancient authors tell us, that to catch the *elk*, the northern people watch the occasion when it falls down of the epilepsy; which it frequently does; and that they lay hold of it ere it can recover strength enough to put its left foot in its ear, which cures it immediately.

And hence it is, that the notion of its virtue, in the cure of that disease, had its rise. The Germans call it *clendy*, that is, misery, by reason of the misery it is reduced to in falling so often into the epilepsy; though it has its remedy always about it; which has given people reason to suspect, that the virtue attributed to it is fabulous.

Accordingly, Olaus Magnus says, it is the outer hoof of the right foot, that the *elk* thus puts in its ear to cure the epilepsy; which being impossible, it should seem as if Olaus only spoke of it by way of sneer.

He adds, that the blows which the *elk* deals are so strong, that with its hind feet it will even break the trees; and with its fore feet pierce the hunters through and through.

Pomet gives us the marks to distinguish the genuine *elks* claws; but as their virtue is very equivocal, not to say absolutely false, there is no great harm in being deceived: the opinion alone may serve for the reality.

ELL, *Ubra*, a measure, which obtains under different denominations, in most countries.

The *ell* is the standard, or measure, whereby cloths, stuffs, linnens, silks, &c. are usually measured, or estimated; answering, in good measure, to the yard of England, the canna of Italy, the vara of Spain, the palm of Sicily, &c. Servius will have the *ell* to be the space contained between the two bands when stretched forth: but Suetonius makes it only the cubit.

The *ells* which occur most frequently in England, are *English* and *Flemish*: the *ell English* contains three feet nine inches; or one yard one quarter English measure: the *ell Flemish*, contains 27 inches, or three quarters of a yard; so that the *ell English* is to the *Flemish ell* as five to three.

M. Ricard, in his treatise of commerce, reduces the *ells* thus: an hundred *ells* of Amsterdam, are equal to ninety eight, three quarters of Brabant, Antwerp, and Brussels; to fifty eight and an half of England and France; to an hundred and twenty of Hambourg, Francfort, Leipzig and Cologne: an hundred twenty five of Breslaw: an hundred and ten of Bergen and Drontheim: and an hundred and seventeen of Stockholm.

ELLIPSIS*, in geometry, one of the conic sections; popularly called an *oval*.

* The word is formed from the Greek, ελλειψις, deficiency, a denomination which the ancient Greek geometers gave this figure, by reason, among other properties, this is one, that the squares of the ordinates are less than, or defective of, the rectangles under the parameters and abscissæ.

The *ellipsis*, to define it from its form, is a regular, continued curve line, including a space that is longer than broad; wherein are two points equally distant from the two extremes of the length; from which, two right lines being drawn to any point, assumed at pleasure in the *ellipsis*, their sum is equal to the length of the *ellipsis*.

Thus, in the *ellipsis* AEBMD, &c. (Tab. Conies, fig. 21.) the lines Fa and fa drawn from the two points F and f, equally distant from the two extremes A and B, are equal to AB.

Or, taking the *ellipsis*, as geometers frequently do, for the space contained, or included within this curve line; it is defined a figure, contained under one single oblong line, and having two unequal axes, or diameters AB and DE.

The greater axis of the *ellipsis*, or the right line representing the length of the *ellipsis* AB, or of the space included by the *ellipsis*, is called the *transverse axis*, or *diameter*: and the lesser axis, representing the breadth of the *ellipsis* DE, the *conjugate*, or *second axis*.—The two axes always bisect each other at right angles. See **AXIS**.

The two axes are the two greatest diameters of the *ellipsis*, but there are an infinity of other different diameters. See **DIAMETER**, &c.

The *centre* of an **ELLIPSIS**, is the point C, wherein the two axes intersect. See **CENTRE**.

The two points F and f, in the greater axis, equally distant from the extremes thereof A and B, are called the *foci*, or *umbilici* of the *ellipsis*; from which two lines, drawn to the circumference of the *ellipsis*, as already observed, are equal to the greater axis. See **FOCUS**.

The *ellipsis*, considering it as a conic section, that is, as a curve arising from a section of the cone, is best defined from its genesis, or the manner of its production, thus: an *ellipsis* is a curve line, produced by cutting the cone ABC, (fig. 21. n.º 2.) by a plane, in such manner, as that the axis of the section DE, meets with the diameter of the base AB, produced to F.

Or, defining it from one of its known properties assumed; an *ellipsis* is a curve line, wherein the square of the semi-ordinate PM, is to the rectangle of the segments of the axis AP and PB; as the parameter, is to the axis.

Thus, if AB=a, the parameter=b; PM=y; AP=x: then will b:a::y²:ax-x². Consequently ay²=abx-bx². See **CONIC SECTION**.

Hence, 1.º y²=bx-bx²:a. That is, the square of the semi-ordinate, is equal to the rectangle of the parameter into the absciss; abating another rectangle of the same absciss into a fourth proportional to the axis, parameter and absciss.

2.º To find the axis, parameter, and semi-ordinate of an **ELLIPSIS**. The parameter, absciss, and semi-ordinates, in an *ellipsis* being given; the axis is found by making 1. b:y::y:y², 2. x-y²=(bx-y²):x=x:a.

3.º The axis AB, the absciss AP, (fig. 22.) and the semi-ordinate PM being given, the parameter AG is thus found: make AI=PM; and from A, through M, draw the right line AL. In I erect a perpendicular LI: then, since AP:PM::AN:LI; LI=y²:x. Produce PM to O, till PO=LI=y²:x and from B, through O, draw the right line BG. In A erect a perpendicular GA=ay²:(ax-x²): this will be the parameter AG.

4.º The axis AB, and the parameter AG being given, we can assign every absciss, as BP, its semi-ordinate PN; by drawing a line GB to the parameter AG, which is perpendicular to the axis AB: then, erecting a perpendicular PN, make PL=PH. Lastly, on AL describe a semi-circle.

To find the foci, conjugate axis, ratio of the ordinates, &c. of an *ellipsis*.—1.º From B to L (fig. 19.) set off half the parameter; then will CL=½a-½b. In the centre C erect a perpendicular CK, meeting the semi-circle described on AL. Thus will CK=√(½a²-½ab.) Therefore, making CF=CK; F will be the focus.—The latter equation furnishes us this theorem.

If the axis A B, be cut in the focus F, the rectangle under the segments of the axis A F, F B will be subquadruple of the rectangle under the parameter and the axis. See **FOCUS**.

5.º The parameter, and axis A B given, the conjugate axis is easily found; as being a mean proportional, between the axis and parameter. Consequently, the parameter is a third proportional to the greater and lesser axis. Add, that the square of half the conjugate axis, is equal to the rectangle, under the distance of the focus from the vertex, and its complement to the axis.

6.º In an *ellipsis*, the squares of the semi-ordinates PM, pm, &c. are to each other as the rectangles under the segments of the axis. Hence DC: PM=CB²: AP.PB. Consequently DC: CB²=PM²: AP.PB. That is, the square of the less axis is to the square of the greater; as the square of the semi-ordinate, to the rectangle under the segments of the axis.

7.º The right line FD (fig. 24.) drawn from the focus F, to the extremity of the conjugate semi-axis; is equal to half the transverse axis AC.

Hence, the conjugate axes being given, the foci are easily determined. For, bisecting the greater axis AB in C; from C erect a perpendicular CD, equal to the conjugate semi-axis. Then from D, with the interval CA, the foci F and f are determined.

8.º To describe an *ellipsis*.—The sum of two right lines F M, and f m drawn from each focus of an *ellipsis*, F and f to the same point of the periphery M, being equal to the greater axis AB: the conjugate axes of an *ellipsis* being given; the *ellipsis* is easily described. For, determining the foci F and f, as already directed; and fixing two nails therein, and about these nails, tying a thread F M f, equal to the length of the greater axis AB:

AB: the thread being stretched, and a style, or pin, applied at its extent, the duct or sweep of the style or thread about the nails will describe an *ellipsis*.

9°. The rectangle under the segments of the conjugate axis, is to the square of its semi-ordinate, as the square of the conjugate axis, to the square of the greater axis. Hence, the co-ordinates to the conjugate-axis, have the same relation, as there is between the co-ordinates to the greater axis. Consequently, the parameter of the conjugate axis, is a third proportional to the conjugate axis, and the greater axis.

10°. To determine the subtangent PT (fig. 25.) and subnormal PR in an *ellipsis*.—As the first axis, is to the parameter; so is the distance of the semi-ordinate from the centre, to the subnormal.

11°. The rectangle under the segments of the axis, is equal to the rectangle, under the distance of the semi-ordinate from the centre, into the subtangent. See SUBTANGENT.

12°. As the distance of the semi-ordinate from the centre, is to half of the axis; so is the absciss to the portion of the subtangent intercepted between the vertex of the *ellipsis* and the tangent.

13°. The rectangle under the subtangent PT, into the absciss PC, is equal to the rectangle under the segments of the axis. Hence, the square of the semi-axis AC, is equal to the rectangle of CT, into PC.

14°. The rectangle under the subtangent, and the distance of the ordinate from the centre, is equal to the difference of this distance, and the square of the transverse semi-axis.

15°. In an *ellipsis*, the square of the semi-ordinate is to the square of the conjugate semi-diameter, as the rectangle under the segments of the diameter, is to the square of the semi diameter. Consequently, the relation of the semi-ordinates to the diameters, is the same as to the axes; and the parameter of the diameter, is a third proportional to the diameters.

Infinite ellipsis, are those defined by the equation $ay^m + n = bx^m (a-x)^n$ which some call *elliptoides*, if m be greater than 1, or n greater than 1.

In respect of these curves, the *ellipsis* of the former kind is called the *Apollonian ellipsis*.

QUADRATURE OF THE ELLIPSIS. See QUADRATURE.

ELLIPSIS, in grammar, and rhetoric, is a figurative way of speaking, wherein something is suppressed, or left out in a discourse, and supposed or understood.

This chiefly happens, when, being under the transport of a violent passion, a man is not at leisure to speak every thing out at length; the tongue being too slow to keep pace with the rapid motions of the mind. So that on these occasions we only bring forth broken, interrupted words and expressions; which represent the violence of a passion, better than any consistent discourse.

F. Bosſu considers the *ellipsis*, as a way of disguising sentences; by suppressing the word which should make the particular application, and leaving the whole in a kind of ingenious ambiguity.

Thus, the Trojans, in Virgil, being reduced by Turnus to the last extremity, and ready to be destroyed, *ſpy Æneas* coming to assist them: upon which the poet says, *ſpes addita ſuſcitat iras*. Which expression signifies either, in particular, that the hope they conceive retrieves and augments their courage: or in general, that the hope of assistance at hand naturally raises courage, and gives people new strength.

If the poet had added a word, and said, *illis ſpes addita ſuſcitat iras*, the passage had been expressly restrained to the first sense; and had ceased to be a sentence, and commenced only the application of a sentence. The suppression of that word makes it a sentence in form.

This, that excellent critic looks on as one of the finesses of the Latin tongue: wherein it had vastly the advantage of the modern tongues. *Trait. du Poeme Epique.* Page 466, &c.

ELLIPTIC, or **ELLIPTICAL**, something that belongs to an *ellipsis*.

Kepler first maintained, that the orbits of the planets are not circular, but *elliptical*; which hypothesis was afterwards adhered to by M. Bouillaud; Mr. Flamsteed, Sir Isaac Newton, M. Cassini, and others, of the later astronomers, have confirmed the same: so that this, which was once by way of contempt called the *elliptic hypothesis*, is now the prevailing doctrine.

Sir Isaac Newton demonstrates, that if any body revolve round another in an *elliptic* orbit, its centrifugal forces, or gravities, will be in a duplicate ratio; or as the squares of its distances from the umbilicus, or focus.

Serlio, Hartman, &c. endeavour to demonstrate that the best form for arches, or vaults, is the *elliptical*. See ARCH. See also CATENARIA.

ELLIPTIC SPACE, is the area, contained within the circumference, or curve of the *ellipsis*. See ELLIPSIS.

It is demonstrated, 1°. That the *elliptic space* is to a circle described on the transverse axis; as the conjugate diameter is to the transverse axis.

2°. That the *elliptic space* is a mean proportional between two circles described on the transverse and conjugate axes.

ELLIPTIC CONOID, is the same with the *hyperboloid*. See SPHEROID.

ELLIPTIC SPECULA, or **MIRRORS**. See MIRROR.

ELLIPTIC WINDING-STAIRS. } See the articles } STAIRS.

ELLIPTIC WIND-MILL. } See the articles } WINDMILL.

ELLIPTIC COMPASSES, an instrument, made usually in brass; for the drawing any *ellipsis*, or oval, by one revolution of an index.

ELLIPTIC DIAL, is an instrument, usually of brass, with a joint to fold together, and the Gnomon to fall flat; for the sake of the pocket.

By it are found the meridian, hour of the day, rising and setting of the sun, &c. See DIAL.

ELLIPTOIDES, an infinite *ellipsis*, i. e. an *ellipsis* defined by the equation $ay^m + n = bx^m (a-x)^n$, wherein $m > 1$ or $n > 1$. See ELLIPSIS.

Of this there are several kinds or degrees: as the cubical *elliptoid*, wherein $ay^3 = bx^3 (a-x)$. A biquadratic or surd-solid *elliptoid*, or that of the third order, wherein $ay^4 = bx^3 (a-x)^2$.

If any other ordinate be called v , and the correspondent absciss z ; there will be $av^m + n = bz^m (a-x)^n$. Consequently, $ay^m + n : av^m + n :: bx^m (a-x)^n : bz^m (a-x)^n$ that is, $y^m + n : v^m + n :: x^m (a-x)^n : z^m (a-x)^n$.

ELOCUTION, is defined by Tully; the choosing and adapting of words, and sentences, to the things, or sentiments, to be expressed.—To the *elocution* then properly belongs the diction verborum, or choice of words.

The beauties of *elocution* consist chiefly in the use of figures, and figurative dictions or expressions in the periods, and the style. See FIGURE, PERIOD, and STYLE.

ELOGIUM *, **ELOGE**, a praise, or panegyric, bestowed on any person, or thing; in consideration of its merit.

* The word is Latin, but formed of the Greek *ελογοια*, commendation; which is compounded of *ει*, *νολλι*; and *λεγοι*, to say, or speak.

In that fine discourse of Isocrates, entitled *πανηγυρις*, there is an historical *eloge*, of the city Athens: Fa. Labbe, has composed an historical *eloge* of the city Bourges; Fa. Menestrier, of the city of Lions; and M. Martignac, of the bishops, and archbishops of Paris, for about a century.

The secretary of the royal academy of sciences at Paris, composes the *eloges* of such members as die; and delivers them at the next public meeting of the company.—Funeral orations are only *eloges* of eminent persons deceased.—Some authors have wrote *eloges* on despicable, and even pernicious things.

Extravagant and improbable *eloges* are of the greatest difference to their own design; and do, in effect, diminish the person, whom they pretend to magnify. Any worthy man may pass through the world, unquestioned and safe, with a moderate recommendation: but, when he is set-off and bedawbed with rhetoric, and embroidered so thick that you cannot discern the ground; it awakens naturally (and not altogether unjustly) interest, curiosity, and envy: for, all men pretend a share in reputation, and love not to see it engross'd, or monopoliz'd; and are therefore apt to enquire (as of great estates suddenly got) whether the person so commended, came honestly by it, and of what credit the person is, that tells the story.

ELONGATION, in astronomy, the digression, or recess of a planet from the sun, with respect to an eye placed on our earth.

The greatest distance of the planet, &c. from the sun, is called the *greatest elongation*: which varies on two accounts, viz. in that both the earth, and the planet revolve, not in circles, but in ellipses.

The *elongation* is chiefly considered in Venus and Mercury; the *greatest elongation* of Venus is 45 degrees, and that of Mercury 30 degrees: that is, the former never recedes from the sun, or is seen distant from him, above 45°; nor the latter above 30°. Whence it is that Mercury is so rarely visible; as being usually lost in the light of the sun. See MERCURY, and VENUS.

ELONGATION, is also used, by some authors, for the difference in motion, between the swiftest and the slowest of two planets; or the quantity of space, whereby the one has overgone the other: called also *superation*.

The swiftest motion of the moon, with regard to the sun, is called the *elongation* of the moon from the sun.—We also say diurnal *elongation*, horary *elongation*, &c.

Angle of ELONGATION, or *Angle at the Earth*, is the difference between the sun's true place, and the geocentric place of a planet.—Such is the angle ETR (Tab. Astronom. fig. 25.) between the place of the sun E, and that of the planet R.

ELONGATION, in chirurgery, is an imperfect luxation; when the ligament of any joint is so extended, or relaxed, as to lengthen

lengthen the limb, but yet not to let the bone go quite out of its place. See LUXATION.

ELOPEMENT *, in law, is when a married woman, of her own accord, departs from her husband, and dwells with an adulterer; for which, without voluntary reconciliation to the husband, she shall lose her dowry; nor shall the husband, in such case, be compelled to allow her any alimony.

Sponte virum mulier fugiens, & adultera facta,

Dote sua caret, nisi sponsa sponte retracta.

* The word is formed from the Belgic, *El*, matrimony, and *Loopen*, to run away.

ELOQUENCE, the art of speaking, or writing well; so as to move, and persuade. See RHETORIC, and ORATORY.

Demosthenes, and Cicero, are the two princes of ancient eloquence; the one among the Greeks; the other among the Romans. Their manner, however, was exceedingly different; the first being close, strong, nervous, concise, and severe, so that a word could not be spared; the latter copious, florid and rich, so that a word could not be added.

It was objected to Cicero, that his eloquence was Asiatic, that is, redundant, or stuffed with superfluous words, and thoughts.

Pericles was called a *torrent of eloquence, a thunderbolt of eloquence*; Pedants do not distinguish eloquence from the heaping up of figures, the use of big words, and the roundness of periods.

True eloquence depends principally on the vivacity of the imagination. In strictness, it is not that which gives grace and ornament, but life and motion, to discourse. Its mien is that of an Amazon, not that of a Coquette.

The authors of the *Art of thinking* remark, that the rules of eloquence are observed in the conversations of people naturally eloquent, though they never think of them, while they practise them. They practise those rules because they are eloquent; not in order to be eloquent.

The eloquence of the chair, and pulpit, is much more difficult than that of the bar. Sir George Mackenzie has a treatise of the *eloquence of the bar*. *Idea Eloquentie forensis, &c.*

ELUDING, the act of evading, or rendering a thing vain, and of no effect; a dextrous getting clear, or escaping out of an affair, difficulty, embarrass, or the like.

We say to *elude* a proposition, &c.—The design of chicanery is to *elude* the force of the laws: this doctor has resolved the difficulty, but *eluded* it. Alexander, says the historian, in cutting the Gordian knot, either *eluded* the oracle, or fulfilled it: *Ille nequiquam luctatus cum latentibus nodis, nihil inquit, interest, quomodo solvatur; gladioque ruptis omnibus loris, oraculi sortem vel elusit vel implevit.* Q. Curt. 13.

ELYSIUM, ΕΛΥΣΙΟΣ, in the ancient theology, or rather mythology, a place in the inferi, *i. e.* in the lower world, or as we sometimes render it, in hell; furnished with fields, meads, agreeable woods, groves, shades, rivers, &c. whither the souls of good people were supposed to go after this life. Orpheus, Hercules, and Æneas, are held to have descended into *elysium*, in their life-time, and to have returned again. Virgil, lib. VI. v. 638, &c. Tibullus, lib. I. eleg. 3. give us fine descriptions of the *elysian fields*.

Virgil, opposes *elysium* to tartara; which was the place where the wicked underwent their punishment.

*Hæc locus est, partes ubi se via findit in ambas:
Dextera, quæ ditis magni sub mœnia tendit:
Hæc iter elysium nobis: at læva malorum*

Exerces pœnas, & ad impia tartara mittit.

Some authors take the fable of *elysium* to have been borrowed from the Phenicians; as imagining the name *elysium* formed from the Phenician *ללז אלז*, or *ללז אלז*, or *ללז אלז*, to rejoice, or to be in joy; the letter *a* being only changed into *e*, as we find done in many other names; as in Enakim, for Anakim, &c. On which footing *elysian fields* should signify the same thing as a place of pleasure; or,

—*Locus lætos & amœna virentia*

Fortunatorum nemorum, sedesque beatas. Virg.

Others, derive the word from the Greek, *λυω, solvo, I deliver, I let loose, or disengage*, (by reason here men's souls are freed, or disencumbered from the fetters of the body. Beroaldus and Hornius, *Hist. Philosoph.* l. III. c. 2. take the place to have derived its name from Eliza, one of the first persons who came into Greece after the deluge, and the author and father of the Ætoliens. Ol. Rudbecks contends, that it was in Sweden the *elysian fields* were placed.

ELYTROIDES *, ΕΛΥΤΡΟΙΔΗΣ, in anatomy, one of the proper coats, or tunics of the testicles. See TESTICLE.

* The word is formed of the Greek, *ελυτρον, vagina*, a sheath, and *ειδω, form*.

The *elytroides* is the second proper coat of the testes: it resembles a sheath, or vagina, whence some have also called it *vaginalis*.

It is formed of a dilatation, of the production of the peritonæum: its inner surface is smooth and equable; and the outer rough and unequal; which makes it adhere the more strongly to the first of the proper coats, called *erythroides*. **EMANATION** *, the act of flowing, or proceeding, from some source, or origin.—Such is the *emanation of light* from the sun; or that of *effluvia* from odorous, &c. bodies; of wisdom, from God, &c.

* The word is formed of the Latin *e*, out of, and *manare*, to flow, or stream.

EMANATION is also used for the thing that proceeds, as well as the act of proceeding.—The power given a judge, is an *emanation* from the regal power: The reasonable soul is an *emanation* from the divinity: The Holy Spirit is an *emanation* from the Father and the Son, &c.

EMANATION is also used among the schoolmen for the production of a lesser thing, in order to the production of a greater, by virtue of some natural connection, or dependence between them.

For, as when several moveables are joyned together, the same power that moves the first moves all the rest (as in pulling up the trunk of a tree, you pull up the roots, branches, &c. or in drawing one link, of a chain, you bring forward all the rest.) The same is to be understood in all conjunct natural effects, *viz.* that the same power whereby the first is produced, does also produce all the rest naturally connected to it: in that by means of the connection, the action of the agent is conveyed from one to the other; so that the first determines the agent to the production of all the rest.

And hence that is called an *emanative cause*, (in contradistinction to an efficient cause) which produces an effect by its mere presence, without the intervention of any action; as a rose doth a smell, &c.—Others, and with good reason, deny, that there is any such thing as an *emanative cause*, to produce an effect without any action. See CAUSE.

EMANCIPATION *, in the Roman law, was the act of setting a son free from the power, and subjection of his father.

* The word is formed from the Latin, *ex*, of, and *mancipium*, a slave.

Emancipation differs from *manumission*; as the latter was the act of a master in favour of his slave; the former that of a father in favour of his son.

The effect of *emancipation* was, that the goods, and moveable effects, which the son should thenceforth acquire, should be his sole property, and not the property of his father; as they were before *emancipation*. Beside, that *emancipation* put the son in a capacity of managing his own affairs, and of marrying without his father's consent, though a minor, or pupil, and under 25 years of age.

There were two kinds of *emancipation*: the one *tacit*, which was by the son's being promoted to some dignity, or by his coming of age, or by marriage: in all which cases, the son became his own master of course.

The other *express*, where the father declared before the judge, that he *emancipated* his son. This was not performed without some formality: the father was first to sell his son imaginarily, to another man, whom the lawyers call *pater fiduciarius*, father in trust; of whom being bought back again by the natural father, he manumitted, or set him free by a declaration before the judge.—This imaginary sale was called *mancipatio*; and the manumission, consequent thereon, *emancipatio*.

Emancipation still obtains in France, chiefly, with regard to minors, or pupils, who are hereby set at liberty to manage their effects, without the advice, or direction, of their fathers or tutors. It must be observed, however, that *emancipation* only extends to the selling of moveables, and letting of leases, &c. of immoveables; not to the selling or mortgaging of immoveables: which are only done with the consent of a curator, ordinarily appointed a person when *emancipated*.

Formerly, *emancipation* was performed in the ordinary courts of justice, when desired by the child; but if he were a minor, the king's letter was also required. Though there were other ways of *emancipation*, as by marriage; arriving at the age of 20 years; and in some provinces, by the death of the mother, by reason the children were there under the power of the father and mother jointly, so that the death of either of them *emancipated* the child.

Emancipation by marriage, in France, gives a power of marrying again, without the father's consent, though under age; but among the Romans, Cujas tells us, a widow, under 25 years of age, though *emancipated* by her former marriage, returned into the power of her father, and might not marry a second time without his consent.

Du Cange observes, that the word *emancipation* was also used in the monasteries, in speaking of monks, promoted to any dignity, or removed from under the power of their superiors: as also in speaking of monasteries, chapels, &c. themselves, when exempted by the pope, from the jurisdiction of the ordinary.

EMASCULATION, the act of taking from a male those parts which are characteristic of his sex. See CASTRATION.

EMAUX de P'Escu, in heraldry, the metals and colours of a shield, or scutcheon.

EMBALMING *, the opening a dead body, taking out the intestines, and filling their place with odoriferous, and delicate drugs, and spices, to prevent its putrefying.

* The word is formed from *balm*, which was a principal ingredient in the embalmings of the ancient Egyptians.

The body of Jacob was 40 days in *embalming* in Egypt. See Genesis l. v. 3. Mary Magdalen, and Mary the mother of James, bought perfumes to *embalm* Jesus. See Matthew, &c. John king of France, dying at London in 1364, his body was *embalmed*, and sent to France, and there interred at St. Dennis. Du Tillet. For the manner of *embalming* among the Egyptians, see Thevenot's *Collection*, tome I.

Dr. Grew, in his *Museum Regalis Societatis*, is of opinion, that the Egyptians boiled their bodies in a large cauldron, with a certain kind of liquid balsam: his reason is, that in the mummies preserved in the collection of the royal society, the balsam has penetrated not only the fleshy and soft parts, but even the very bones; so, that they are all as black as if they had been burnt.

The Peruvians had an effectual method of preserving the bodies of their yncas, or kings, *embalmed*.—Garciasso de la Vega takes their main secret to have been the burying of the corps in the snow, to harden them; and afterwards applying a certain bitumen, mentioned by Acofta, which kept them as entire, as if they had been still alive.

EMBARCADERO, in commerce, a Spanish term, much used along the coasts of America, particularly those on the side of the fourth sea.

It signifies a place which serves some other considerable city further within land, for a port, or place of shipping, i. e. of *embarking*, and *disembarking* commodities.

Thus Calao, is the *embarcadero* of Lima, the capital of Peru: and Arica, the *embarcadero* of Potofi. There are some *embarcaderos* 40, 50, and even 60 leagues off the city which they serve in that capacity.

EMBARGO, a restraint or prohibition, laid by a sovereign, on merchant vessels; to prevent their going out of port; sometimes to prevent their coming in; and sometimes both, for a limited time.

Embargo's are usual in time of war; in apprehensions of invasions, &c.—One great occasion of *embargo's* is, that the government may make use of the merchant vessels, with their equipage, &c. in armaments, expeditions, transporting of soldiers, &c. *Embargo's* are of very mischievous consequence in commerce.

EMBARRAS, a French term, though now naturalized; denoting a difficulty, or obstacle, which perplexes, or confounds a person, &c.

The *embarras* was very great in the road, by reason of the army which defiled therein. A man lives more in two days of leisure, and feels more of life therein, than in two years of hurry and *embarras*. Chev. de M.—It discovers a decay of passion, when lovers are under an *embarras* at finding themselves alone. La Bruyere.

EMBASSADOUR *, or AMBASSADOUR, a public minister, sent from one foreign prince, as a representative of his person to another.

* The word is derived from the corrupt Latin *ambasciator*, formed of *ambasius*, an old word borrowed from the Gaulish, signifying servant, client, domestic, or officer: such is the origin given by Borel, Menage, and Chifflet, after Salmasius and Spelman. But the Jesuits of Antwerp reject this opinion, in the *Acta Sancti Mart.* tom. II. p. 128. by reason the Gaulish *ambas* had been discontinued long enough before the Latin *ambascia* was ever thought of: which, however, is not strictly true; the word *ambascia* occurring in the Salic law, Tit. 19. and being formed of *ambasia*, by pronouncing the *t* as in *actia*; and *ambasia* came from *ambasius*, of *ambasi*. Lindenbroeg derives the word from the German, *ambaschi*, work; as signifying a person hired to perform a work, or legation: and Chorier, meeting with the same word in the laws of the Bourguignons, gives into the same sentiment. Alb. Acharius in his Italian dictionary derives it from the Latin *ambulare*, to walk, or travel. Lastly, the Jesuits of Antwerp, in the place last cited, observing that the word *ambascia* occurs in the laws of the Bourguignons, derive thence the words *ambasciatore*, and *ambasciatore*, as signifying envoys, or agents, from one prince, or state to another. Their opinion is, that among the Barbarians, who overpassed Europe, *ambascia* signified the discourse of a person who floops, or humbles himself; being formed from the same root with *abascif*, viz. of *an*, or *am*, and *bas*.

In Latin, we usually call this kind of minister *legatus*, or *orator*; though it is certain, the word *ambasciadour*, with us, has a much more extensive signification, than that of *legatus* among the Romans: and, excepting that they are both under the protection of the law of nations, there is scarce any thing in common between them.

Embassadours are either *ordinary* or *extraordinary*.

EMBASSADOUR in ordinary, is he who resides stately in the court of another prince, to maintain a mutual good understanding, look to the interests of their masters, and transact such affairs as may occur.

Embassadours in ordinary, are but of modern invention: It is not above 200 years ago since they were first heard of: till then, all *embassadours* were *extraordinary*, and retired as soon as they had dispatched the affair they were sent upon.

EMBASSADOUR extraordinary, is he who is sent to a prince's court on some particular, and emergent occasion; as to conclude a peace, or marriage; make a compliment, or the like.

Indeed, there is no essential difference between *ordinary* and *extraordinary ambassadours*; their errand is all: and they equally enjoy all the privileges and prerogatives which the law of nations decrees.

At Athens, the *ambassadours* from foreign princes and states, always mounted the tribune, or pulpit, of the public orators, and there opened their commission, and acquainted the people with their business and errand: at Rome they were introduced to the senate, and delivered their commission to them: among us, they make their address immediately and solely to the king.

Athens and Sparta, says M. Tourreil, when in all their glory, were never so much delighted, as to see, and hear a number of *ambassadours* in their assemblies, suing for the protection, or alliance of the one, or the other state. It seemed to them the noblest homage that could be paid them; and that state, which received the most *ambassies*, was judged to have the advantage over the other.

The name of *ambassadour*, Cicero observes, is sacred and inviolable; *non modo inter foederum jura, sed etiam inter hostium tela incolume versatur*. In Verr. Orat. VI.—David, we read, made war against the Ammonites, to revenge the injury done his *ambassadours*. 2 King. X. Alexander put the inhabitants of Tyre to the sword, for having insulted his *ambassadours*; and the youth of Rome for affronting the *ambassadours* of Vallona, were delivered up into their hands, to be punished at discretion.

The *ambassadours* of kings should never attend at any public assemblies, marriages, interments, or other solemnities, unless their masters have some interest therein; nor must they even go into mourning, or the like, on any occasions of their own, by reason they represent the persons of their princes, and must conform, and keep pace with them.

EMBASSY, or AMBASSY, *Legatio*, a mission from one foreign prince, or state, to another, of some able experienced person, to negotiate some affair, in quality of *ambassadour*.

Fa. Daniel observes, that under the ancient French kings, their *ambassies* consisted of a body, or number of persons, joined together in commission, and who composed a kind of council: something like which is still retained at treaties of peace. Thus the French *embassy* at Nimueguen, for the peace, consisted of three plenipotentiaries; that of Utrecht of two, &c.

We likewise read of *ambassadresses*: Madam the Marechale de Guebriant, Wicquefort observes, was the first, and perhaps the only woman, sent by any court in Europe, in quality of *ambassadress*. Matth. L. IV. *Pie d'Henry IV.* tells us, that the king of Persia sent a lady of his court on an *embassy* to the grand signior, during the troubles of the empire.

EMBATTLED, a term in heraldry, when the out-line of any ordinary is notched after the manner expressed in *Tab. Herald.* fig. 56. N^o. 2. representing the battlements of a wall, or castle. See BATTLEMENT.

EMBER-Weeks *, are those wherein the *ember* or *embring-days* fall.

* In the laws of king Alfred, and those of Canute, those days are called, *ymbren*, that is, circular days, from whence the word was probably corrupted into *ember-days*: by the canons they are called, *quatuor anni tempora*, the four cardinal seasons, on which the circle of the year turns: and hence Henshaw takes the word to have been formed, viz, by corruption from *temper*, of *tempora*.

The *ember-days* are the Wednesday, Friday, and Saturday, after Quadragesima Sunday, after Whitunday, after Holy-Rood day in September, and after St. Lucies day in December: which four times answer well enough to the four quarters of the year, Spring, Summer, Autumn, and Winter.

Mr. Somner thinks they were originally fasts, instituted to beg God's blessings on the fruits of the earth. Agreeably to which, Skinner supposes the word *ember* taken from the ashes, *embers*, then strewed on the head.

These *ember-weeks* are now chiefly taken notice of, on account of the ordination of priests, and deacons; because the canon appoints the Sundays, next succeeding the *ember-weeks*, for the solemn times of ordination. Though the bishops, if they please, may ordain on any Sunday, or holiday.

EMBLEM *, ΕΜΒΛΗΜΑ, a kind of painted ænigma, which representing some obvious history, with reflections, underneath, instructs us in some moral truth, or other matter of knowledge.

* The word is pure Greek, formed of the verb, *εμβάλλω*, to cast in, to insert: Suetonius relates, that Tiberius made the word be coined out of a decree of the Roman senate, because borrowed from another language.

Such is that very significant image of Scævola, holding his hand in the fire: with the words, *agere & pati fortia Romanum est*: to do and suffer courageously is Roman.

The emblem is somewhat plainer, and more obvious than the ænigma.—Gale defines *emblem* an ingenious picture, representing one thing to the eye, and another to the understanding.

The emblems of Alcibiades have been in as much reputation among the more learned, as those of Quarles among the vulgar.

The Greeks also frequently gave the name ΕΜΒΛΗΜΑΤΩΝ, *εμβληματα*, to *inlaid*, or Mosaic works, and even to all kinds of ornaments of vases, moveables, garments, &c. And the Latins used *emblemata*, in the same sense: accordingly, Cicero reproaching Verres with the statues, and fine wrought works he had plundered from the Sicilians, calls the ornaments fixed thereto (and which on occasion might be separated from them) *emblemata*. Add, that Latin authors frequently compare the figures and ornaments of discourse to these *emblemata*: thus, an ancient Latin poet, praising an orator, says, that all his words were ranged like the pieces in Mosaic.

Quam lapide lætes composuæ, ut tessellæ omnes, Arte pavimenti, atque emblemate vermiculata.

We do not use the English word, *emblem*, in this sense; though the ancient jurists consulted, always retain the Latin *emblemata* to express such ornaments; by reason the Greek *εμβληματα*, literally denotes any thing applied, or added to a body by way of enrichment.

With us, *emblem* ordinarily signifies no more than a painting, basso relievo, or other representation, intended to hold forth some moral, or political instruction.

What distinguishes an *emblem* from a *device*, is, that the words of an *emblem* have a full, compleat sense of themselves; nay, all the sense, and signification which they have together with the figure.

But there is a yet further difference between *emblem* and *device*: for a *device* is a symbol appropriated to some particular person, or that expresses something which concerns him particularly; whereas an *emblem* is a symbol that regards all the world alike.

These differences will be more apparent, from comparing the *emblem* above quoted, with the *device* of a candle lighted; and the words, *juvando consumor, I waste myself in doing good.*

EMBLEMATICAL Characters. See CHARACTER.

EMBLEMENTS, a term strictly signifying the profits of lands sown; though sometimes used more largely for any profits arising, and growing naturally from the ground: as *grain*, fruit, &c.

If a tenant, for life, sow the land, and die; his executor shall have the *emblemments*, and not he in reversion. But if the tenant for years, sow the land, and before severance the term expires, there the lessor, or he in reversion, shall have the *emblemments*, and not the lessee.

EMBOLISMIC, *Intercalary*, is chiefly used in speaking of the additional months, which chronologists insert to form the lunar cycle of 19 years.

The 19 solar years, consisting of 6939 days, and 18 hours; and the 19 lunar years, only making 6726 days: it was found necessary, in order to render the 19 lunar years equal to the 19 solar, which make the lunar cycle of 19 years, to intercalate or insert seven lunar months, containing 209 days; which, with the four bissextile days, happening in that interval, make 213 days, and the whole, 6939 days. See CYCLE.

By means of these seven *embolismic*, or additional months, the whole 6939 days and 18 hours of the solar years, are employed in the calendar.

In the course of 19 years, there are 228 common moons, and seven *embolismic* moons. Their distribution is thus: every 3d, 6th, 9th, 11th, 14th, 17th, and 19th years are *embolismic*, and consequently contain 384 days a-piece. And this was the method of computing time among the Greeks; when they used the enneadecæterides, or cycle of 19 years. But they did not keep regularly to it, as the Jews seem to have done.

The *embolismic* months, like other lunar months, are sometimes 30 days, and sometimes only 29. See YEAR.

The *embolismic epacts*, are those between XIX and XXIX; which are thus called, by reason with the addition of the epact XI, they exceed the number XXX: or rather, because the years, which have these epacts, are *embolismic*; having thirteen moons a-piece, whereof the 13th is the *embolismic*.

EMBOLISMUS *, ΕΜΒΟΛΙΣΜΟΣ, in chronology, signifies *intercalation*.

* The word is formed of *εμβάλλω*, to insert. See ΕΜΒΟΛΙΣΜΙC.

As the Greeks made use of the lunar year, which is only 354 days; in order to bring it to the solar, which is 365 days; they had every two or three years an *embolism*, i. e. they added a thirteenth lunar month every two or three years; which additional month they called *embolimus*, *εμβολιμαίος*, because inserted, or intercalated.

EMBOLUS, the moveable part of a pump, or syringe; called also the *piston*, and popularly the *sucker*. See PISTON: See also PUMP, and SYRINGE.

The pipe, or barrel of a syringe, &c. being close shut, the *embolus* cannot be drawn up without a very considerable force; which force being removed, the *embolus* returns again with violence. This phenomenon the Aristotelians attribute to nature's abhorrence of a vacuum. See VACUUM.

But the modern philosophers finding that in an exhausted receiver, the *embolus* is easily drawn up, though the orifice be stopped; prove that it is the pressure of the atmosphere on the external parts of the *embolus*, that makes the difficulty of drawing it up. See AIR, ATMOSPHERE, and SUCTIO.

EMBOSSING, or *IMBOSSING*, the act of forming, or fashioning works in relief, whether they be cast, or moulded, or cut with the chisell, &c.

Embossing is one great part of sculpture; being that which has to do with figures raised, or prominent from the plain, or ground; the other part, which makes figures, &c. that are indented, or cut in below the ground, is called *engraving*.

EMBRACEOR, he who, when a matter is in trial between party and party, comes to the bar with one of the parties (having received some reward so to do) and speaks in the cause, or privately labours the jury, or stands there to over-look, awe, or put them in fear.—The penalty hereof is 20 pounds, and imprisonment at the justices discretion.

EMBRASURE, in architecture; an enlargement of the gap, or aperture of a door, or window, within-side the wall. See DOOR.

Its use is to give the greater play, for the opening of the door, wicket, casement, &c. or to take in the more light.

The *embrasure* coming sloping inwards, makes the inner angles obtuse. When the wall is very thick, they sometimes make *embrasures* on the out-side.

EMBRASURES, in fortification, denote the holes, or apertures, through which the cannons are pointed; whether in casemates, in batteries, or in the parapets of walls. See CANNON, ORDNANCE, BATTERY, &c.

The *embrasures* are generally about 12 foot a-part, from six to nine feet wide without, and from two or three within. Their height from the plat-form is usually three feet on the inside, and a foot and half on the outside: that for the muzzle, on occasion, may be sunk, and the piece brought to shoot low.

They are sometimes called *cannonieres*, when big enough to pass the mouth of a cannon through; and *meurtrieres*, when only big enough for muskets.

When the parapet is so low, that the cannon may shoot without *embrasures*, it is said to shoot *en barbe*.

EMBROCATION *, or rather **EMBROCHATION**, ΕΜΒΡΟΧΗ, ΕΜΒΡΟΚΗ, in pharmacy, denotes the application of remedies, as oils, spirits, decoctions, and other liquids, by sprinkling, or even rubbing them on the part affected: this is called also *irrigation*.

* The word is formed from the Greek *βρέχω*, *irrigo*, *made-facio*, I sprinkle, wet, macerate.

Embrocations are only a kind of lotions: They are now little used, except in diseases of the head. If the pain do not abate, make an *embrocation* of cows milk, luke-warm, on the head. Degori. Apply an *embrocation* on the part with unguent. Diathæze, or oil of lilies very hot. Dionis.—The pumping used in natural baths is properly an *embrocation*.

EMBROIDERY *, the enriching of a cloth, or stuff, by working diverse figures thereon, with the needle, and thread of gold, or silver.

* The word *embroidery* is derived from the French *broderie*, of *broder*, to embroider; which some deduce, by transposition from *border*, by reason they formerly *embroidered* only the borders of stuffs; whence the Latins also call the embroiderers *limbularii*. Da Cange observes, that they anciently wrote *aus brustus*, for *embroidered* with gold, or *brustus brudatus*, and *brudatus*; whence *broderie*.

That done with silk, flax, or the like, is not now called *embroidery*; though anciently, and properly, the word denoted all kind of figuring, or flourishing.

The chief use of *embroidery* is in church vestments, cloaths, housings, guidons, standards, &c. The invention of *embroidery* is attributed to the Phrygians; whence the Latins call embroiderers *phrygiones*.

There are diverse kinds of embroidery: as embroidery on both sides, that which appears on both sides; only practicable on thin slight stuffs, as taffetas, gauze, muslins, &c. Embroidery on the flap, where the figures are very high, and prominent, being supported on wool, cotton, hair, &c. Low embroidery, where the figures are low, and without any enrichment between them.

EMBRYO *, in medicine, the first beginning, or rudiments of the body of an animal, in its mother's womb; before it have received all the disposition of parts, necessary to become animated: which is supposed to happen to a man on the forty-second day; at which time, the embryo commences a fetus.

* The word is derived from the Greek, *εμβρυον*, which signifies the same thing; formed of the proposition *εμ* and *βρυον*, *scaturio*, *pullulo*, I spring out; by reason of the manner of the first growth of the embryo, which resembles that of the first shoots of a plant, as being a kind of zoophyte, and having only a vegetative life.

The moderns have made abundance of fine discoveries on the formation, and growth of the embryo.

M. Dodart having an embryo of 21 days age put in his hands, made a nice examen thereof; to find the order nature observes in the formation of the parts, and the first rise of the parts themselves.

The placenta, he found more than half of the whole; and thence concludes, that the nearer the embryo is to the moment of its conception, the greater is the placenta with respect to the secundines, and the foetus. Which circumstance furnishes a reason why miscarriages are more dangerous than regular deliveries; notwithstanding that the foetus in the former case is much less than in the latter. For though the embryo have made a way sufficient for it self, it may not for so great a placenta, as is to follow it.

The embryo it self was only seven lines long; from the top of the head to the bottom of the spina dorsii, where it terminated. The thighs were not yet unfolded: they only appeared like two little warts at the bottom of the trunk: the arms made the same appearance on the shoulders. The head was just $\frac{1}{2}$ of the length of the whole seven lines: on this were seen two little black points, which would one day have been eyes. The mouth was very big; which M. Dodart takes for an indication that the foetus was fed by the mouth. There was no eminence for the nose; but two little, almost imperceptible, pits for the nostrils.

The painters usually make the head $\frac{1}{4}$ of the height of a well proportioned man; and $\frac{1}{3}$ of that of a young child: in the embryo we are speaking of, the head made $\frac{1}{3}$ part of the whole; whence it follows, that the younger the embryo, the bigger the head in proportion to the body. The parts nearer the head are also bigger in proportion to the rest; and the legs and feet the smallest.

The embryo was a little crooked forwards, and bore some resemblance to the maggot of a silk-worm: it weighed less than seven grains, which is an extraordinary lightness for a body seven lines long. It was so soft, that no part of it could be touched without making a change in its figure.

Upon opening it, M. Dodart discovered the heart, and the right auricle: all the other parts in the thorax, and lower venter, were only simple lineaments, or out-lines, and all vesicular, excepting a part on the left side, which may be supposed to be the spleen. There was no appearance of any thing on the right side for a liver. *Mem. de l'Acad.* See FETUS and GENERATION.

EMBRYO, is also used by naturalists, to express the grain, or seed of a plant; sometimes the germ, or first sprout appearing out of the seed; by reason the whole future plant is supposed to be contained therein. Just as the whole chick, is supposed contained in the cicatrix, or treddle of an egg.

EMBRYOTHLASTES, *EMBRYOTHAETES*, an instrument wherewith to crush the bones of an embryo, or dead child; so as to make it easier of extraction, and prepare it for the embryulcus, to draw it out of the womb,

EMBRYOTOMY *, *EMBRYOTOMIA*, in chirurgery, the operation of cutting off the funiculus umbilicalis, or navel string, of a child just born; and tying it up.

* The word is formed of the Greek, *εμβρυον*, and *τομω*, I cut.

EMBRYULKIA *, or *EMBRYOLKIA*, *EMBRYOTAXIA*, or *EMBRYOEXIA*, in chirurgery, an operation of extracting the child out of the mother's womb. See CÆSAREAN.

* The word is formed of the Greek, *εμβρυον*, *factus*, and *ελευω*, to draw.

What the Greeks call *embryolikia*, the Latins call *caesarean section*: which latter name M. Dionis observes, has taken place, and prevailed over the former; as being more easy of pronunciation.

EMENDALS, an old term still used in the accounts of the inner temple; where, so much in emendals at the foot of an account, signifies so much in the bank, or stock of the house, for repayment of losses, and other occasions.

EMENDATIO panis & cerevisiae, the assize of bread and

beer; or the power of supervising and correcting the weights and measures belonging to them. See ASSIZE.

EMERALD *, a precious stone, when in its greatest perfection green and transparent; and as to hardness, nearly equal to the Ruby.

* The word is formed from the French *esmeralde*, and that from the Latin *smaragdus*, which signifies the same. Others derive it from the Italian *smeraldo*, or the Arabic *zomorrad*.

Pliny reckons up twelve kinds of emeralds; and denominates each from the provinces, or kingdoms, where he supposed them to be found; as *Scythian*, *Bactrian*, *Egyptian*, *Peruvian*, &c.

But the modern naturalists, and jewellers, only know of two fine kinds, *viz. oriental* and *peruvian*. And if we may credit Tavernier, in his treatise of coloured stones found in the Indies, inserted in the second volume of his voyages, these two should be further reduced to one, *viz. the peruvian*.

In effect, he pretends that there is not, nor ever was, any mine of emeralds, in the East Indies; and that all that are there found, were brought from Peru by the way of the South Sea; which was a method of commerce, carried on by the Peruvians before the discovery of America by the Spaniards. But as the point of such commerce is not sufficiently proved, we must keep to the ancient division.

The *oriental emerald* is harder, more brilliant, and transparent than the *peruvian*; which has generally clouds found in it, and sparkles less. Beside, that there are such quantities brought from Peru, by the way of Carthage, that they are much sunk in value and reputation. There are also European emeralds, but they are little other than coloured crystal. Some authors say that emeralds are usually taken out of iron mines: and Pomet assures us, he had one to which the iron ore was still sticking. To which, all we have to say, is, that it could not be a *peruvian*, by reason there is no iron mine in the country.

The emerald is supposed to grow more and more perfect in the mine like the ruby; and to arrive at its greenness by slow degrees, as the fruit comes to maturity on trees. It is a common opinion, that the emerald grows in the jasper; and it is certain there are some jaspers so perfectly green and fine, that many have taken parts of them for emeralds.

But the proper matrix, or marcasite of this stone is the *preme d'Emeraud*, which is held among the coarser precious stones; being hard, semi-pellucid, and often intermixed with yellow, green, white and blue, &c.

The ancients made amulets of emeralds against all kinds of foreery; and supposed them effectual against a thousand different diseases. At present, that we have more experience, or less credulity, they are valued for their beauty, not their virtue; though there are still some who suppose, that when reduced into an impalpable powder, and mixed with rose water, they may be of some use in medicine.

We read in authors of several emeralds of incredible magnitude: Roderigo de Toledo tells us, that when the Saracens took that town, king Tarik had for his share of the plunder, a table 365 foot long, and all of a-piece, which he maintains to be an emerald. After this, the reader will not wonder at that pretended to have been seen by Theophrastus, in a temple in Egypt, four cubits long, and three broad; nor even at an obelisk of emerald 40 foot high. But these were not properly emeralds in our sense of the name, but only green marble or other such stones.

In the *Dictionnaire de Commerce*, we have a very curious and accurate estimate of the values of the different kinds of *peruvian emeralds*; which the reader will not be displeas'd to find transcribed here.

Rough EMERALDS. — Those of the first and coarsest sort, called *plumes*, for grinding, are worth 27 shillings sterling the marc, or 8 ounces. The demi-morillons, 8 lib. sterl. per marc. Good morillons, which are only little pieces, but of fine colour, from 13l. to 15l. per marc. Emeralds, larger than morillons, and called of the *third colour*, or *fort*, are valued at from 50l. to 60l. the marc. Emeralds, called of the *second sort*, which are in larger and finer pieces than the preceding, are worth from 65l. to 75l. per marc. Lastly, those of the first colour, otherwise called *negres cartes*, are worth from 110l. to 115l.

EMERALDS ready cut, or polished and not cut, being of good stone, and a fine colour, are worth,

	Lib.	Sh.
Those weighing one caract, or four grains	0	10
Those of two caracts	1	7
Those of three caracts	2	5
Those of four caracts	3	10
Those of five caracts	4	10
Those of six caracts	7	10
Those of seven caracts	15	0
Those of eight caracts	19	0
Those of nine caracts	23	0
Those of ten caracts	33	0

See Supplement article SMARAGDUS.

EMERALD, or **EMERAUD**, in heraldry, is used in lieu of vert, or green, in blazoning the arms of dukes, earls, &c.

EMERGENT Year, in chronology, is the epocha, or date, whence we begin to account our time.

Our *emergent year* is sometimes the year of the creation: the Jews use that of the deluge; or the Exodus, &c. The *emergent year* of the Greeks, was the establishment, or at least restoration of the olympic games by Iphitus. The Romans accounted their years from the building of the city, AB U. C. That is, AB URBE CONDITA.

EMERSON, in physics, the rising of any solid above the surface of a fluid specifically lighter than it self, into which it had been violently immersed, or thrust.

It is one of the known laws of hydrostatics, that a lighter solid being forced down into a heavier fluid, immediately endeavours to emerge; and that with a force, or moment, equal to the excess of a weight of a quantity of the fluid, above that of an equal bulk of the solid.

Thus, if a solid be immersed in a fluid of double its specific gravity; it will emerge again, till half its bulk, or body, be above the surface of the fluid.

EMERSON, in astronomy, is when the sun, moon, or other planet, begins to re-appear, after its having been eclipsed, or hid by the interpolation of the moon, earth, or other body.

The difference of longitude is sometimes found by observing the immersions and *emersions* of the first of Jupiter's satellites.

The immersions are observed from the time of Jupiter's being in conjunction with the sun, to his opposition; and the *emersions*, from the opposition to the conjunction. Which two intervals are usually six months a-piece, and divide the year between them.

But when Jupiter is in conjunction with the sun, and fifteen days before and afterwards; there is nothing to be observed: that planet, with his satellites, being then lost in the light of the sun.

EMERSON, is also used when a star, before hid by the sun, as being too near him, begins to re-appear, and to get out of his rays.

Scruples, or *minutes* of **EMERSON**, an arch of the moon's orbit, as I Q (*Tab. Astronom. fig. 46.*) which the moon's centre passes over, from the time she begins to emerge out of the shadow of the earth to the end of the eclipse.

EMERY *, a sort of metallic stone, found in several mines of metals; but chiefly in those of iron, being properly an iron ore.

* The word comes from the French *emiril*, formed from the Latin *imiris*, and that from the Greek *emeres*, which signifies the same thing; and which Lemery derives from the verb *εμερειν*, I clean, scour.

We usually distinguish three kinds of *emery*; the *spanish*, *red*, and *common emery*.—The first is found in the gold mines of Peru, and other provinces of the Spanish America: it is judged a kind of ore of that rich metal; being streaked with little veins, and specks of gold. It is for this reason the king of Spain prohibits its being exported: which renders it exceeding rare among us; to the great regret of the seekers of the philosopher's stone, who build great hopes in the transmutation of this precious mineral. The *red emery* is found in copper mines; the little we have of it comes from Sweden and Denmark.

The *common emery* is taken out of iron mines; and is almost the only sort used among us. The consumption hereof is very considerable among the armorers, cutlers, locksmiths, glaziers, lapidaries, masons, &c. Some of whom use it to polish and burnish iron, and steel works; others, to cut and scollop glass, marble, and precious stones.

This *emery* is of a brownish colour, sometimes bordering a little on red; exceedingly hard, and of consequence difficult to pulverize. The English are the only people that have got the art of making it into powder; which they do chiefly by means of certain mills contrived for that purpose: and thus send it in powder to their neighbours.

Pounding it in mortars were in vain; it being so hard that it would pierce, or break the mortar ere it would break it self.

Of the powder, the most subtle and impalpable is the best: as to the stone, it should be chose of a high colour, and as free of the rock as possible.

Emery fused with lead, and iron, hardens them. It is also said to encrease and heightens the weight and colour of gold. It is usual to mix a little of it with the gold from Madagascar, which is naturally pale and soft. See **GOLD**.

Patty of **EMERY**, is a kind of a dirty matter, found on the lapidaries wheels; containing part of the powder of *emery* they use.

EMETIC *, in medicine, a remedy that excites vomiting; or that purges the stomach by the mouth.

* The word is from the Greek, *εμεειν*, I vomit.

Of these there are a great variety; as *Ipecacuanha*, *Carduus*

Benedictus, &c.—The use of *emetics* is indicated by a foulness of the mouth in a morning, reaching, loathing, gnawing of the stomach, gradual loss of appetite, spontaneous vomiting, &c.

Vomiting is raised by irritating the spirits with the presence of something loathed; by an unusual agitation, as sailing, &c. by tickling the fibres of the fauces, and pharynx with a feather dipped in oil; by drinking quantities of warm water, &c. by any thing sharp and viscid; as the flowers and seeds of dill, leaves of groundel, &c. crocus and glass of antimony; the flowers and regulus thereof; mercurius vitæ, mineral turbit, and mercury sharpened any way with acids.

The **EMETIC wine**, *vinum EMETICUM*, is only white wine, wherein is infused some crocus metallorum, or glass of antimony.

The **EMETIC powder**, called also *powder of Algaroth*, from the name of its author, is a precipitate of antimony; or butter of antimony sweetened and softened by repeated lotions.

EMETIC tartar, is prepared from equal parts of crocus metallorum, and cream of tartar, boiled together in water, afterwards filtered and crystallized. See **CRYSTAL**.

The operation of *emetic* medicines is thus accounted for by Dr. Quincy: the particles of the *emetic* wedging themselves into the orifices of the emissaries of the glands, placed adjacent to the surface of the stomach, do dilate the same; (which by some extrinsic cause had been contracted) and after the same manner, do dissolve (at least in some degree) the cohesion of the stagnant moribund matter; rendering it more fluid, and consequently making its resistance less.

Now the natural and constant action of the glands being secretion; and the impediment, (by the dilatation of the orifice, and the attenuation of the fluid) being taken away, or at least made less than the natural momentum of the glands; the matter must naturally flow into the cavity of the stomach, till it be heaped up in such quantity (which not being to be done in an instant, must require some time) as is sufficient by its stimulus to vellicate, and force the fibres of the stomach, abdomen, and diaphragm, by communication of the fist with the two last, into a violent contraction; and thereby throw all out by the oesophagus; and this makes all quiet for a time, till a new and sufficient quantity be excreted from these glands to produce the aforesaid contraction.

Thus there happen fits of vomiting and quiet alternately, till either all the moribund matter be thrown out, or the force of the *emetic* be so diluted, that it is no longer able to draw out the moribund matter from the glands.

And the strong contraction in so many muscles, and muscular canals, as are at work in the action of vomiting, and the violent concussion which is produced all over the whole body by a power, which, by just computation, is not inferior to 260000 weight, may, and often does, take away the obstruction in many other canals, besides those which are adjacent to the stomach and gullet; as we plainly see, by those vast sweats, which plentiful fits of vomiting occasion.

Emetic and purgative medicines differ only in this, that the particles of the latter do not immediately vellicate the fibres of the stomach, dilate the orifices, and attenuate the matter contained in the glands of the stomach; but act gently, and assist the natural motion of digestion, and so are carried down into the guts: and how they operate there, see **PURGATIVE**.

EMINENCE, in geography, a little hillock, or ascent, above the level of the adjoining campaign.

This seat is built on an *eminence*. The enemies have taken possession of such an *eminence*, such a height, from which they can cannonade our rear.

EMINENCE, is also a title of honour given to cardinals.

It is his *eminence* the cardinal de——. The decree of the pope, whereby it was appointed, that the cardinals should be addressed under the quality of *eminence*, bears date the 10th of January, 1630. They then laid aside the titles of *illustrissimi*, and *reverendissimi*, which they had born before.

The grand master of Malta, is likewise addressed under the quality of *eminence*.

The popes John VIII. and Gregory VII. gave the same title to the kings of France. The emperors have likewise born it.

Eminentissimus, the superlative of *eminent*, has of late been attributed to the cardinals, *L'eminetissime cardinal de Richelieu*.

EMINENTIAL equation, is used by some algebraists in the investigation of the areas of curvilinear figures; for a sort of artificial equation, containing another equation *eminently*. Hayes *Flux.* p. 97.

EMINENTLY, **EMINENTER**, in the schools, is used in contradistinction to *formally*, and in the same sense with *virtually*, *viz.* to denote that a thing possesses, or contains any other in a more perfect or higher manner than is required to a formal possession thereof.

Thus an angel is said to have prudence *eminently*; as he has it in a higher and more perfect degree than it is in man, in whom it is formally.

For one thing to contain another *eminently*, there are usually required two conditions, 1. That the containing be of a more excellent nature than the contained. 2. That the less excellent be some way contained in the more excellent, viz. either as in its productive cause: or by some similitude: or as to the manner, and order of acting, &c.

EMIR *, a title of dignity, or quality, among the Turks, and Saracens; attributed to such as are relations, or descendants of their great prophet Mahomet.

* The word is Arabic, where it literally signifies *prince*. It is formed of the verb **أمر** *Amar*, which is originally Hebrew, and in both these languages signifies to say, and to command.

The *emirs* are held in high veneration; and have alone the privilege of wearing a green turban.—On the borders of the Holy Land there are several *emirs*, sovereign princes; as the *emir* of Gaza, and the *emir* Terabca, over whom the grand feignior has but little authority.—The *emir* Hagge, or prince conductor of the pilgrims of Egypt to Mecha, is *Bashaw* of Jerusalem, &c.

The title *emir*, at first, was only given to the caliphs: in Persia they were also called *emir zaheb*, q. d. prince's son: whence, by abbreviation of *emir*, they formed *mir*, and of *emir zaheb*, *mirza*. In after-times, when the Caliphs had assumed the title of Sultans; that of *emir* remained to their children, as that of *Cæsar* did among the Romans.

At length, the same title of *emir* came to be attributed to all, who were judged to descend from Mahomet by his daughter Fatimah, and who wear the green turban.

EMIR, is also a title, which being joined to some other word, frequently denotes an office, or employ.—As the *emir al amera*, commander of commanders; who, in the time of the Caliphs, was chief of the councils and armies.

The appellation **EMIR** is also applied, by the Turks, to all viziers, and bashaws, or governors of provinces. See **BASHAW**, &c.—Add, that *emir Akbar*, vulgarly *Invahor*, is master of the horse to the grand feignior.

Emir Alem, vulgarly *Miralem*, standard-bearer, and director of all the standards of the empire.

Emir Bazar, the provost, or superintendent of the markets, who regulate the prices of provisions.

Emir al Moflemis, or *emir al Moumenin*, i. e. commander of the faithful, or the believers, was a title assumed by the Almohavides and Almohades, who reigned in Africa and Spain.

EMISSARY *, a trusty, dextrous, able person sent, underground, to sound the sentiments, and views of another; to make him some proposal, or overture; or to spread reports, watch the actions, motions, and countenance of a contrary party, or person, in order to make advantages of them all. See **SPY**.

* The word is formed of the Latin *e*, and *mitto*, q. d. I send out.

The leaders of parties have abundance of *emissaries* employed in their service, who inform them of what passes every where, that they may take their measures accordingly. The pope and the chevalier have commonly their *emissaries* in England.

EMISSARY of a gland, the same with *excretory duct*, being the common canal, or pelvis, in which all the little secretory tubes of a gland do terminate.

EMISSION, the act of throwing, or driving a thing, particularly a fluid, from within, outwards.—The ancients took vision to be performed by the *emission* of visual rays from the eye.

But, the term *emission* is chiefly applied among us to the expulsion, or ejaculation of the seed. See **EJACULATION**.

EMMENAGOGUES *, **EMMÉNAGOGA**, in medicine, such remedies as promote the menses.

* They are thus called from *ev*, *in*, *unv*, *month*, and *agys*, *duco*, I lead; by reason their natural periods of flowing are once a month.

Emmenagogues either act by giving a greater force to the blood in its circulation, whereby its momentum against the vessels is increased; or by making it thinner, whereby it will more easily pass through any outlets.

The former intention is helped by chalybeats, which give a greater weight and momentum to a languid heavy blood, and all other substances of the like gravity and elasticity. And such is the case of a leuco-phlegmatic habit, or, as it is commonly called, the green-sickness, and its cure.

But in the latter case, where the blood is florid, and too high; attenuating alteratives and detergents are the only remedies, because fittest to render the blood more thin, and give it such a property, as will better carry it through those little apertures, destined for its discharge into the uterus.

EMOLLIENTS, in medicine, and pharmacy, remedies used to soften, and loosen indurations, or constrictions of the belly, or those of tumors, and swellings.—Such are mallows, mercurialis, lilly roots, linseed, butter, wax, gum ammoniac, &c.

The term *emollient* is applied to external as well as internal remedies.—We say, a laxative, anodyne, and *emollient* clyster, an *emollient* emplaster, an *emollient* cataplasm, &c. Fresh cherries are an *emollient* food; though, when dry, they rather

constringe than relax; as wanting a great part of the phlegm, which rendered them *emollient*. Ripe grapes, of astringent; which they were before, become laxative, and *emollient*. Hog's lard, applied externally, is *resolutive*, and *emollient*.

Quincy defines *emollients* to be such things as smother and soften the asperities of the humours, and relax and supple the solids at the same time. For it is easy to conceive how these should be both effected by the same medicine; thus,—By what means fever, (whether in the stomach, or any other parts) the juices have obtained a sharpness, or asperity, so as to vellicate and render uneasy the fibres, and nervous parts; which often happens; those things which are smooth, soft, and yielding, cannot but wrap up their points, and render them imperceptible; whereby they may gradually, by the proper course of circulation, be brought to some convenient emunctory, without doing any injury by the way.

Such sharpness of parts, likewise, draws the fibres into spasms, keeps them too tense, and frequently thereby occasions obstructions of the worst kind.

In all such cases, therefore *emollients* lubricate, and moisten the fibres, so as to relax them into their proper dimensions; whereupon such disorders cease.

EMOLUMENT *, is properly applied to the profits arising daily from an office, or employ.

* The word is formed of the Latin *emolumentum*, which, according to some, primarily signifies the profits rounding to the miller from his mill; of *mola*, *molera*, to grind.—

The patent, or other instrument, whereby a person is preferred to an office, gives him a right to enjoy all the dues, honours, profits, and *emoluments* belonging thereto.

In our law books, *emolument* is used in a somewhat greater latitude, for profit or advantage in the general.

EMPALEMENT *, or **IMPALEMENT**, a cruel kind of punishment, wherein a sharp *pale*, or stake, is thrust up the fundament and through the body.

* The word comes from the French *empaler*, or the Italian *impalare*; or rather they come all alike, from the Latin *palus*, a stake, and the preposition *in*, in, into.

We find mention of *empaling* in Juvenal: it was frequently practised in the time of Nero; and continues to be so in Turkey.

EMPALEMENT, in botany, denotes the cup, or outmost part of the flower of a plant, or that encompassing the foliation of the attire.

It is compounded of the three general parts of all plants, the skin, the cortical, and the woody bodies, each *empaler* being (whether consisting of one or more pieces) as another leaf, and designed to be a guard, and a band to the flower, where it is weak and tender: so that such plants as have flowers, with a firm and strong basis, as tulips, &c. have no *empalement*, nor need any.

EMPAPELLING, or **IMPANELLING**, in law, signifies the writing, and entering into a parchment schedule, or roll of paper, by the sheriff, the names of a jury summoned by him to appear for the performance of such public service, as juries are employed in.

EMPARLANCE, or **IMPARLANCE**; in law, a desire, or petition in court, of a day to consider, or advise what answer the defendant shall make to the action of the plaintiff.

The civilians call it *petitio indicarum*. Kitchin mentions *imparlance general*, and *special*: the first seems to be only that made in one word, or in general terms: *emparlance special*, is where the party requires a day to deliberate, adding these words, *salvis omnibus advantageis tam ad jurisdictionem curie, quam ad breve & narrationem*.

Britain also uses *emparlance* for the conference of a jury upon a cause committed to them. See **IMPARLANCE**.

EMPASMA, **EMPAZMA**, in pharmacy, a powder thrown, or sprinkled, over the body, to correct some ill smell thereof, or to prevent unnecessary sweats.

* The word is formed from the Greek, *εμπασσα*; I sprinkle.

EMPASTING *, or **IMPASTING**, a term used in painting; for the laying on of colours, thick, and bold, or applying several lays of colours, so as they may appear thick. See **COLOURING**.

* It is formed of the French *empaster*, which has the same signification, of *paste*, or *pâte*, paste.

A painting is said to be well *empasted* with colours, when the colours are bestowed plentifully, or it is well soaked, and saturated with colours.

The term is also used, when the colours are laid distinct and asunder; and not softened, or lost in each other.—This head is not painted: it is only *empasted*.

EMPERESS, *Imperatrix*, the feminine of emperor; applied either to an emperor's wife, or to a woman who rules singly over an empire, with all the authority of an emperor: as, at this time, the *emperess* of Russia: See **EMPEROR**, **QUEEN**, &c.

EMPERESS, is also used in the ancient French poetry, for a particular kind of rhyme, thus denominated by way of excellence.

The rhyme *Emperiere* was a sort of crowned rhyme, wherein the syllable that made the rhyme, was immediately preceded

by two other like syllables, of the same termination; which made a kind of echo, called the *triple crown*; and which, to the flame of the nation, (as some of their late authors express it) their best ancient poets took for a wonderful beauty and excellence.

Fa. Mourguis, in his treatise of French poetry, gives us an instance very proper to raise contempt of the miserable taste of that age, which knew no way of expressing, that the world is impure, and subject to change, to excellent, as by saying,

Qu' es tu qu' un immonde, monde, onde,

EMPEROR, *Imperator*, among the ancient Romans, signified a general of an army, who for some extraordinary success had been complimented with this appellation.

Afterwards, it came to denominate an absolute monarch, or a supreme commander of an empire; a Roman *emperor*, &c. In strictness, the title *emperor* does not, cannot, add any thing to the rights of sovereignty: its effect is, only to give precedence, and preeminence above other sovereigns; and as such, it raises those invested with it, to the top of all human greatness.

The *emperors*, however, pretend, that the imperial dignity is more eminent than the regal; but the foundation of such prerogative does not appear: it is certain the greatest, most ancient, and absolute monarchs, as those of Babylon, Persia, Assyria, Egypt, Macedonia, &c. were called by the name of *kings* in all languages both ancient and modern. See **KING**. It is disputed whether or no *emperors* have the power of disposing of the regal title? it is true, they have sometimes taken upon them to erect kingdoms; and thus it is, that Bohemia and Poland are said to have been raised to the dignity: thus, also, the *emperor* Charles the Bald, in the year 877, gave Provence to Bolon, putting the diadem on his head, and decreeing him to be called *king*; *ut more prisorum imperatorum regibus videretur dominari.*

Add, that the late *emperor* Leopold, erected the dual Prussia into a kingdom, in favour of the elector of Brandenburg; and though several of the kings of Europe refused, for some time to acknowledge him in that capacity: yet by the treaty of Utrecht, in 1712, they all came in.

In the east, the title, and quality of *emperor* are more frequent than they are among us: thus the sovereign princes of China, Japon, Mogol, Persia, &c. are all *emperors* of China, Japon, &c. In the west, the title has been a long time restrained to the *emperors* of Germany. The first who bore it was Charlemain, who had the title *emperor* conferred on him by pope Leo III, though he had all the power before.

In the year 1723, the czar of Muscovy assumed the title of *emperor of all Russia*; and procured himself to be recognized as such by most of the princes and states of Europe.

The authority of the *emperor* of Germany, over the states of the empire, consists, 1^o. In presiding at the imperial dyets, and in having a negative voice therein: so that his vote alone can prevent all the resolutions of the dyet. 2^o. In that all the princes, and states of Germany, are obliged to do him homage, and swear fidelity to him. 3^o. That he, or his generals, have a right to command the forces of all the princes of the empire, when united together. 4^o. That he receives a kind of tribute from all the princes and states of the empire, called the *Roman month*.—For the rest, there is not a foot of land, or territory, annexed to his title.

The kings of France were anciently also called *emperors* at the time when they reigned with their sons, whom they associated to the crown: thus, Hugh Capet, having associated his son, Robert, took the title, of *emperor*; and Robert, that of king. Under which titles they are mentioned in the history of the council of Rheims, by Gerbert, &c. King Robert is also called *emperor* of the French by Helgau of Fleury. Louis le Gros, upon associating his son, did the same. In the first register of the king's charters, fol. 166. are found letters of Louis le Gros, dated in 1116, in favour of Raymond bishop of Maguelonne, wherein he styles himself, *Ludovicus, Dei ordinante providentia, Francorum imperator augustus*.

The kings of England had likewise, anciently, the title of *emperors*; as appears from a charter of king Edgar: *Ego Edgarus Anglorum basileus, omniumque regum insularum oceanique Britanniam circumjacent, &c. imperator & dominus*.

Add, that we say, the king of England, *omnem habet potestatem in regno suo quam imperator vendicat in imperio*: whence the crown of England has been long ago declared in parliament to be an imperial crown.

EMPEROR elect. See the article **ELECT**.

EMPHASIS, in rhetoric, a force, stress, or energy, in expression, action, gesture, or the like. See **ENERGY**.

* The word is Greek, *εμφασις*, which signifies the same.

This orator speaks with a world of *emphasis*; all his words have an *emphasis*: what greater punishment, says de la Bruyere, than to hear sorry verses rehearsed with all the *emphasis* of an ill poet?

Some consider *emphasis* as a figure, whereby a thing is represented in the finest, and strongest terms;—such, e. g. is that of Augustus, *Forum alcatorum calefacimus*: which is much

more energetic, than if he had said, *studioso mulumque bisomus alea*.

EMPHATICAL is used by the ancient philosophers, to express those apparent colours, which are often seen in clouds before the rising, or after the setting of the sun, or those in the rainbow, &c.

These, because they are not permanent and lasting, they will not allow to be true colours. But, since these *emphatical* colours are light modified chiefly by refraction, and with a concurrence of reflections, and some other accidental variations; and since they are the proper objects of sight, and capable as truly to affect it, as other permanent colours are: there is no reason for excluding them from the number of true and genuine colours; since all other colours are only modifications of light as these are.

EMPHRACTIC *, in pharmacy, the same with *emphractiv*.

* The word is formed from the Greek, *εμφρακτιω*, *εμφρακτιω*.

EMPHYSEMA, ΕΜΦΥΣΗΜΑ, in medicine, a windy swelling, or bloating of the whole outer habit of the body; like that in the parts of diverse animals, when blown up, after they are killed.

The wind, or air, which is the matter of the *emphysema*, is lodged under the cutis, and principally in the cellular adipose. Hence the seat of the *emphysema*, or the place wherein the wind is chiefly lodged, is in the adipose cells, under the skin covering the thorax: the ordinary occasion is some wound in the thorax.

Mr. Litre accounts for it thus: when a person is wounded in the breast, there enters air in at the wound; now, it may happen, either from the narrowness of the wound, or the flesh's closing again readily, or some other cause, that the air thus admitted, cannot readily get out again, at least not all of it: and thus air comes to be inclosed in the capacity of the breast.

Now, at every inspiration, the lungs are to fill this capacity, by their swelling with the air which is naturally received. But here they cannot swell without pressing upon the other extraneous air: the consequence of which is, that this latter is made to slip between the interstices of the fleshy fibres, and perhaps to enter the little oscula of the minutest veins or lymphatics. Immediately, another force comes to take place, contrary to that of inspiration; viz. expiration: in this, the breast contracting itself, presses the extraneous air still more than the lungs had done in their dilatation: and the two opposite moments or actions conspire to the same effect.

The air, thus continually impelled, will be propagated along the passages it first opened itself, till at length it meets and becomes collected in some place. Now this place must be the cellules of the fat, rather than any where else, by reason of the thinness and flexibility of their membranes; and as the air came from within the cavity of the breast, it will be in the fat that covers the breast, under the skin, rather than elsewhere, that the windy tumor, or *emphysema* will lie.

Now, such tumor cannot be very considerable, when only formed by the air received in at a wound: but if we suppose the wound to have pierced the substance of the lungs, then beside the air taken in by the wound, there will be part of that taken by inspiration; so much as was contained in the bronchiz, or vesiculae, thus perforated, or opened, escaping into the cavity of the breast, and driven along with the former, into the flesh. And as a fresh quantity of this is supplied every moment, there will be a continual accession, so long as the wound of the lungs remains open.

Hence, an *emphysema* from a wound in the lungs, sometimes possesses the whole habit; the air being carried to all the parts of the body.

EMPHYTEUSIS *, in the civil and canon law, the letting out of poor barren lands for ever, or at least for a long term of years, on condition of the tenants cultivating, meliorating, or mending them; and paying a certain yearly consideration.

* The word is formed of the Greeks, *εμψυτευσις*, which signifies an *engraftment*, and by metaphor, a *melioration*, or amendment: for as we only graft trees to mend them; so a man only alienates his land by *emphyteusis*, on condition of having it amended.

Emphyteusis are a kind of alienations, differing from sales, in that they only transfer the dominum utile, the benefits of the ground; not the property, or fee-simple.—Among the Romans they were at first temporary; afterwards perpetual.

The 20th canon of the council of Carthage, prohibits the bishop's seizing the church's *emphyteusis*, out of the hands of private persons, unless they have been three years without paying rent.

EMPIRE, the territory, or extent of land under the command, and jurisdiction of an emperor. See **EMPEROR**.

We say the Roman *empire*, the *empire* of the east, the *empire* of the west, or the western *empire*, the *empire* of the great mogul, &c.

Tacitus observes of Galba, that all the world would have thought him worthy the *empire*, had he never been emperor. Antiquaries distinguish between the medals of the *upper* and *lower*, or *bas empire*.—The curious only value those of the

upper *empire*, which commences with Cæsar, or Augustus, and ends in the year of Christ 260.

The lower *empire* comprehends near 1200 years, reckoning as low as the destruction of Constantinople, in 1453.—They usually distinguish two ages, or periods, of the lower *empire*: the first beginning where the upper ends, *viz.* with Aurelian, and ending with Anastasius, including 200 years: the second beginning with Anastasius, and ending with the Palæologi, which includes 1000 years. See MEDAL.

EMPIRE, or the **EMPIRE**, used absolutely, and without any addition, signifies the *empire* of Germany, called also, in juridical acts and laws, the *holy Roman empire*, *S R I*, q. d. *sanctum imperium Romanum*; which constitutes what we otherwise call the *Germanic* body.

The empire had its beginning with the IXth century; Charlemain being created first emperor by pope Leo III. who put the crown on his head in St. Peter's church on Christmas-day in the year 800.

Authors are at a loss under what form of government to range the *empire*: some of them will have it a monarchical state, by reason all the members thereof are obliged to ask the investiture of their states of the emperor, and to take an oath of fidelity to him.

Others maintain it a republic, or aristocratic state, by reason the emperor cannot resolve, or determine any thing, without the concurring suffrages of the princes: it is added, that if they require investiture from, and swear fealty to him, it is only as head of the republic, and in the name of the republic, and not in his own: just as at Venice, every thing is transacted in the name of the doge. See DOGE.

Lastly, others will have the *empire* to be a monarcho-aristocratic state, *i. e.* a mixture of monarchy and aristocracy; for that though the emperor in many cases, seems to act sovereignly, yet his decrees and resolves have no force, in case the states refuse to confirm them.

In fine, we should rather chuse to call it an aristo-democratic state; by reason the dyet, wherein the sovereignty is lodged, is composed of princes, and the deputies of cities; and is divided into three orders, or bodies, called *colleges*, *viz.* the colleges of electors, the college of princes, and the college of cities.

We say, diet of the *empire*, circles of the *empire*, fiefs of the *empire*, princes of the *empire*, estates of the *empire*, members of the *empire*, capitulations of the *empire*, recesses of the *empire*, &c. See DIET, CIRCLE, FIEF, BAN, PRINCE, CAPITULATION, and RECESSUS.

The states or estates of the *empire* are of two kinds, *mediate* and *immediate*.—The *immediate* states or those who hold immediately of the *empire*; whereof, again, there are two kinds: the first, such as have seats, and voices in the imperial diet; the second, such as have none.—The *mediate* states are those who hold of the *immediate*.

The states which now compose the *empire*, are the princes of the *empire*, the counts of the *empire*, the free barons of the *empire*, the prelates of the *empire*, the princebishops, or abbesses of the *empire*, the nobles of the *empire*, and the imperial cities.

EMPIRIC *, a name given by antiquity, to such physicians as formed themselves rules, and methods, on their own practice, and experience; and not on any knowledge of natural causes, or the study of good authors; and who prescribed, without enquiring into the nature of the disease, or the properties and virtues of their medicines: depending wholly on the authority of some general experienced remedies.

* The word is formed of the Greek, *εμπειρικος*, and that of *εμπειρα*, *knowing, able*; but, particularly, knowing and learned by experience; the root being *πειρα*, *trial, experiment*.

Medicine was almost altogether in the hands of *empirics*, till the time of Hippocrates; who first introduced reason and the use of theory therein: and hence there arose a new sect, called *theoretici*.

Pliny, and Celsus, make mention of the *empirics*, and their profession, which the Greeks, and the Latins after them, call *empiric*; as attributing all to experience, and nothing to the authority of the matters of the art, or the deductions of reason.

Pliny relates, that the sect of *empirics* had its rise in Sicily: the first who professed it, he says, were Apollonius and Glaucias; others say, Acron Argentinus. They, and their followers, made great opposition to the dissecting of human bodies; and particularly to that practised by Herophilus, and Erasistratus on living bodies, of criminals who were condemned to death. But the word *empiric* is now more odious than ever; being confounded with that of *charlatan*, or *quack*, and applied to persons who practise physic at random, without a proper education, or understanding any thing of the principles of the art.

Indeed, it is possible, the word may be abused even on this side of the question; for those of the physicians servilely attached to the train, and method of the schools, the reasonings of Hippocrates, and Galen, and the statutes of the faculty,

we all know, have been ever forward to treat those who think more freely, and are less stiffly devoted to antiquity, custom, and the reigning practice, or mode, as *empirics*, charletans, and quacks. See MEDICINE.

EMPLASTER *, *ΕΜΠΛΑΣΤΡΟΣ*, popularly called **PLASTER**, a medicine of a stiff, glutinous consistence, composed of diverse simple ingredients, spread on leather, or linnen, and applied externally.

* The word is formed from the Greek, *εμπλαστρον*, or *εμπλαστον*, *to put in a mass, or to smear over*: by reason the *emplaster* is made of diverse kinds of simple drugs, worked up into a thick tenacious mass; or because it covers over the piece of leather, or linnen, to be applied on the part affected.

Emplasters are made up in a strong solid body, that by remaining a long time on the part, the medicinal ingredients, they are chiefly composed of, may have time enough to produce their effect.

The drugs, used to give a body and consistence to *emplasters* are usually, wax, pitch, gums, fats, litharge, and other preparations of lead.

There are *emplasters* of diverse kinds, and used with diverse intentions: stonachic *emplasters*; cephalic, styptic, hepatic, diaphoretic, resolutive, detensive, emollient, incarnative, astringent, conglutinative, &c. *emplasters*.

The most usual *emplasters*, are those of diapalma, and diachylon: the *emplastrum polychrestum*, the divinum, the manus dei, the magnetic, the plaster of saffron, de ranis, &c.

EMPLASTICS *, in pharmacy, are salves, or medicines, which stop up, and constrict the pores of the parts they are applied on: otherwise called *emphrastics*.

* The word is formed from the Greek, *εμπλασσειν*, *to stop up*.

Such are fats, mucilages, wax, the whites of eggs, &c.—The plaster is covered over with a very *emphastic* unguent, that it may stick the stronger to the skin. Dionis.

EMPLASTRA Amyntica. See the article **AMYNTICA**.

EMPORETICA Charta. See **CHARTA**, and **PAPER**.

EMPROSTHOTONOS *, *ΕΜΠΡΟΣΘΟΤΟΝΟΣ*, in medicine, a kind of tonic convulsion, wherein the head is drawn forwards, till the chin touch the breast.

* The word is Greek, composed of *εμπροσθεν*, *before*, and *τονος*, *tension, stiffness*, of the verb *τινω*, *I stretch*.

Sometimes too, it is so general, that the whole body is bent forward, and makes a kind of bow; and even sometimes, a kind of circle, the knees meeting of the head.

The cause of this disorder is a contraction of the anterior muscles, particularly those of the head called *myofides*.

EMPYEMA *, *ΕΜΠΥΗΜΑ*, in medicine, a collection of pus, or purulent matter, in the cavity of the breast; discharged thither upon the bursting of some abscess, or ulcer, in the lungs, or membranes, that inclose the breast.

* The word is formed of the Greek, *εμψυον*, *pus*; the letter *ν*, being here changed into *μ*: a thing often done; when the *ν* happens to come, in composition, before the labials *b* and *p*. As in the words *emblemata*, *emblemata*, *empyrium*, &c.

The *empyema* sometimes succeeds a quincy, sometimes a peripneumony, but more usually than either, a pleurisy; as being ordinarily the effect of a peripneumony or pleuritic abscess.

It usually comes 15 or 20 days after those diseases. Sometimes, also, it is generated of extravasated blood, issued out of a bursten, broken, or putrified vein: it is distinguished by a difficulty of breathing, a dry cough, a heaviness about the diaphragm, a noise, and fluctuating of the matter upon moving; a slow fever, ruddy cheeks, hollow eyes, the tips of the fingers hot, and a swelling of the abdomen.

The cure is difficult, from the difficulty of absorbing, or evacuating such extravasated matter: if nature shews any endeavour to throw it off by vomiting, or urine, or the like, she must be seconded, and assisted therein. Thus, if the urine be purulent, administer diuretics; if the stools, laxatives; if the spitting, expectorants, or even enetics; otherwise, recourse must necessarily be had to a paracentesis, or tapping.

In order to this, an aperture must be made in the thorax, by a proper instrument, on the side affected, between the 4th and 5th, or the 5th and 6th ribs, reckoning from the lowest; and through this, the pus must be slowly drawn.

There is also a kind of *spurious*, or *bastard empyema*, proceeding from a pituitous, or serous humour, brought by some duct, or passage, into the thorax: where corrupting, it degenerates into a matter like pus.

An *empyema*, in course of time, breeds a phthisis, and death often is the consequence.

EMPYREUM *, among divines, denotes the highest of the heavens, wherein the blessed enjoy the beatific vision: called also *empyrean heaven*, and *paradise*.

* The word is formed of *εμψυον*, *fire*, by reason of its splendour,

Some of the fathers take the *empyreum* to have been created before the heavens we see: St. Basil, and Eustathius of Antioch,

tioch, maintain this in exprefs terms. Being the abode of God, they fuppofe it muft be luminous in the higheft degree; and are in pain to account for the darknefs, which our part of the world was in, before the creation of the fun, &c. As judging that the infinitely vivid luftre of the *empyreum*, muft diftufe it felf to the greateft depths of this lower world.

They have, therefore, recourfe to a hypothesis; our vifible heavens, according to them, did the office of a fcreen, or curtain, and fheltered the earth and waters from the light of the *empyreum*. See Fa. Souciet, *Differt.* p. 171. 172.

EMPYREUMA *, ΕΜΠΥΡΕΥΜΑ, in chemiftry, &c. a fmell or tafte of burning; a quality, or change in bodies that have been burnt, or much scorched with fire, fenfible to the tafte and fmell; or perhaps, it may be fome extraneous matter impreffed, or added by the fire, and remaining on the burnt or scorched part, that gives the new offensive fmell and flavour.

* The word is formed of the Greek, *εμπυρσεν*, to inflame, *kindle*.

The term is chiefly ufed when in boiling, or diftilling any thing, it tricks and burns to the bottom of the vefel, or alembic; the offensive fmell and tafte whereof are expreffed by the word *empyreuma*.

EMPYREUMA is alfo ufed for the heat remaining upon the declenfion of a fever.

EMRODS, or rather *Hæmorrhoids*. See the article **HÆMORRHOIDS**.

EMULATION *, a noble jealousy, between perfons of virtue, or learning, contending for the fuperiority therein.

* The word comes originally from the Greek, *αμυλλα*, *diffute, conteft*; whence the Latin *emulus*, and thence our *emulation*.

Plato obferves of *emulation*, that it is the daughter of envy; if fo, there is a deal of difference between the mother and the offspring: the one is a virtue, and the other a vice. *Emulation* admires great actions, and ftrives to imitate them; envy refufes them the praifes that are their due: *emulation* is generous, and only thinks of furpaffing a rival; envy is low, and only feeks to leffen him.

EMULGENT, in anatomy, an epithet, beftowed on thofe arteries, which bring the blood to the kidneys; and thofe veins, which carry back what is fuperfluous thereof to the cava.—See *Tab. Anat. (Splanch) fig. 1. lit. k.* (*Angiol) fig. 1. n. 49. fig. 6. lit. s, s.*)

The *emulgent* arteries fpring from the defcending trunk of the aorta; and the *emulgent* veins terminate in the afcending trunk of the cava.

EMULSION *, in medicine, a foft, liquid remedy, of a colour, and confiftence, refembling milk.—It is compofed of oleaginous feeds, kernels, or fruits, pounded in a mortar, and diffolved in diftilled waters, or light decoctions, and afterwards, expreffed, or ftrained and fweetened with fugar, or fyrup.

* The word is formed from the Latin *emulgere*, to milk.

Emulfions feive to temper, dilute, and foften acrimonies of the breast; to moderate the heat of the kidneys; foften the fharpnefs of the urine, and give the patient reft and eafe.

The feed of the melon is one of the four greater cold feeds, much ufed in *emulfions*: the feed of the great gourd is alfo ufed in *emulfions*, broths, and decoctions.

EMUNCTORY *, in medicine and anatomy, a part of the body defigned for the feparation of fome humour judged ufelefs, or even hurtful to the animal; after its having circulated fome time with the blood.

* The word is formed from the Latin verb, *emungere*, to wipe away.

The term *emunctory* alfo implies a cavity, adjoining to the part that feparates; wherein the excrementitious humour is collected, and preferved in readinefs for evacuation.

The kidneys, urinary bladder, and milliary glands of the fkin, are *emunctories*: the parotides are not properly *emunctories*, becaufe deftined to feparate the faliva, which is no ufelefs, or excrementitious humour, but neceffary for the ufelefs of the food.

Some, without much propriety, confine *emunctory* to the receptacle into which the fecreted excrement is difcharged; as, the pituitous humour of the brain into the noftrils, the cerumen into the ears, the excrements into the intefines, &c. Though thefe laft indeed have not undergone any circulation.

ENÆMON, ΕΝΑΙΜΩΝ, an external medicine which ftops, or ftanches the blood: or which, by binding, cooling, or drying, clofes the paffages of the veffels before open; or diminifhes the fluidity and motion of the blood. See **STYRAC**.

ENÆOREMA, ΕΝΑΙΩΡΗΜΑ, expreffes fuch contents of the urine, as float about in the middle, refembling a cloud; and thefe alfo called *nubecula*. See **NUBECULA**, and **URINE**.

ENALLAGE *, in rhetoric, a figure whereby we change, and invert the order of the terms in a dicourfe; againft the common rules of language.

* The word is derived from the Greek, *εναλλαγη*, formed of *εναλλαττω*, which fignifies to change, as well as the fimple verb *αλλαττω*.

The grammarians, too, have a kind of *enallage*, whereby one part of fpeech, or one accident of a word, is put for another. Such is the change of a pronoun, as when a poffeffive is put for a relative, e. gr. *fauis for ejus*; or of a verb, as when one mood or tenfe is put for another.

ENALURON, in heraldry, is ufed by Guillim, to exprefs a bordure charged with birds; as an *enaluron* of martlets, &c.—But Mackenzy charges this as a miftake arifing from ignorance of the French tongue, *enaluron* properly fignifying orle, or in manner of a bordure, and being applicable to a bearing of any thing in that form.

ENAMEL, popularly ΑΜΕΛ, a kind of metalline colour, by the Latins called *encaustum*; ufed in enamelling, and painting in enamel.

The bafis of *enamels* is the fineft crystal glafs, made of the beft kali from Alicant, and fand vitrified together. See **GLASS**.—To thefe are added tin and lead in equal quantities, calcined by a reverberatory fire.

Such is the fundamental compofition of *enamels*; to which are added other metallic or mineral matters, to give them the colour required.—As, æs ufum for green, crocus martis for yellow, &c.

We may diftinguifh three kinds of *enamel*: the firft intended for the counterfeiting and imitating of precious ftones: the fecond, for painting in enamel: and the third ufed by the enamellers, jewellers, and goldfmiths, on gold, filver, and other metals; with which laft kind, particularly the white, it is that the makers of the Dutch ware, give the glafs to their works.

The *enamels* ufed in imitating precious ftones, and thofe for painting, are ufually prepared by the workmen themfelves, employed in thofe arts: the reft are brought from Venice and Holland. The compofition is the fame, in the main, in all the three kinds: all the difference confifts in giving the colour, or transparency.

ENAMELS for painting.—The white *enamel*, or colour ufed by the painters in enamel, is the fame with the common fort ufed by enamellers: only, it is to be prepared by grinding and cleaning it with aqua fortis. After which, wafhing it well in fair water, it is ground, or pounded a-frefh in a flint or agat mortar.

The ruddy brown, is made with faces of vitriol, and falt-petre, or with iron ruft, well ground on an agat, with oil of alfic. Black, is made of perigux well calcined, and ground with oil of alfic; to which is added equal quantity of the goldfmiths, or *enamellers* black.

Yellow, is the fame with the goldfmiths yellow, the compofition whereof will be given hereafter.

Blue is made of the lapis lazuli, ufed by the painters in oil, well purified and prepared with fpirit of wine, and expofed in a bottle five or fix days to the rays of the fun.

Vermillion red, is made with vitriol calcined between two crucibles, luted together; then wafhed in aqua fortis, and afterwards in fair water: the fire is to be moderate, and to remain about half an hour.

The lake red, is compofed of fine gold diffolved in aqua regia with fal armoniac, or common falt. The diffolution being completed, it is put in a cucurbit with fpring water and mercury, over hot fand for 24 hours. The powder remaining at the bottom of the cucurbit, when the water is poured off, is ground up with double its weight of flower of fulphur, and put in a crucible over a gentle fire. And when the fulphur, which takes fire, is exhaled, the red powder remaining is ground with roccalle.

Laftly, white coppers calcined, makes a colour much like the amber colour ufed by limners.

Thefe feven or eight colours, or *enamels*, feive for the compofition of all the reft, by a difcrete mixture and combination thereof.—Thus, blue and yellow make green; blue and red, violet; and fo of the reft.

ENAMELS, ufed by the jewellers, goldfmiths, and enamellers.—Thefe we have obferved, come chiefly from Venice and Holland: they are in little thin cakes of different fizes; ufually four inches in diameter, and $\frac{1}{4}$ an inch thick. Every cake has the maker's mark ftuck on it with a pounceon. The moft ufual marks are the name Jeſus, a fyren, monkey, fun, &c. Thofe brought from Venice are chiefly white, flate-colour, fky blue, carnation, yellow, green, and a deep blue, called a *faſſe lapis*. Thefe feven are the principles of all the others, which arife out of the mixture of thefe. And the white, in particular, is, as it were, the bafis of all the other fix principal colours.

White is made, as already obferved, of crystal glafs, tin, and lead calcined by a reverberatory fire. And this *enamel* is ufed

not only by the jewellers and enamellers on metal, but also by the painters in enamel, the makers of dutch ware, &c. By adding azure thereto, it becomes a slate colour; by adding copper, and cyprus vitriol, it makes a sky blue. By perigueux, a flesh colour; and by iron-rust, a yellow. To make a green, they add copper-filings, &c.

ENAMELLING, by the ancients called *Εγκαυστικον, encaustice*, the art, or act of applying enamels of various colours, on metals, &c. either in the way of painting, or by the lamp.

Painting in ENAMEL, is a method of painting with enamels, or metalline colours, ground, reduced to powder, and used like other colours, with a pencil; then fused, baked again, and vitrified by force of fire.

The art of *painting in enamel* is very ancient; and appears to have been first practised on earthen vessels, or potters-ware. As early as in the age of Porfenna king of Tuscany, we hear of beautiful vases made in his territories, *enamelled* with various figures; though far short of those afterwards made at Faenza, and Castell Durante, in the dutchy of Urbino, in the time of Raphael, and Michael Angelo. There are still some of those vases extant in the cabinets of antiquaries; in all which the design, or drawing of the figures, is much better than the colouring. For they were, at that time, only acquainted with two colours, *viz.* black and white; either for earthen, or metal works: excepting a faint kind of carnation for the faces and other parts.

In the time of Francis I. of France, the art was retrieved in that country, particularly at Limoges; where there were produced abundance of very valuable pieces, in the manner of the ancients, that is, well performed as to the draught, and the clair-obscur, chiefly in two colours.

There are two ways of *painting in enamel*; the one with clear and transparent, and the other with thick, and opaque colours. —To use the first, they are only ground up with water: the second are ground with oil of apic.

The first are laid on the metal flat, and bordered, or edged with a rim of metal, to keep the colours asunder. Though, we have seen pieces laid on contiguous, and without any partition; which is very difficult to practise, by reason the transparent colours, in melting are apt to run into each other; especially in the smaller works.

The invention of opaque colours, is much later, and is greatly preferable to that of transparent ones. —All metals, however, will not equally admit both kinds. Copper, for instance, which bears all the opaque colours, will not bear the transparent ones; but to employ these latter upon copper, they are forced, first, to cover it with a layer, or couch of black enamel, over which they lay a silver leaf, and on this apply the other suitable colours, that is, the colours or enamels proper for silver, which itself does not allow of all kinds.

Those which suit it best, are purple, green, azure, and aqua marina. But gold receives all the kinds, and colours, both opaque, and transparent, perfectly well. It must be added, however, that only the finest gold must be used herein. For the transparent colours being laid on a base gold, grow dim and livid; there being a kind of smok that settles on it not unlike black lead.

Of transparent enamels, the hardest are always the best; though there is a difference even among these; some losing their colour in the fire, and others retaining it. As to the reds, they are only red by accident, being only yellow when made and applied on the gold; and becoming red in the furnace. The best transparent reds are those made of calcined copper, iron rust, orpiment, and calcined gold, melted with the due proportions of sand and salt of glass.

But it is the method of painting with opaque, or thick enamel, to which we owe all our fine modern pieces of *enamel*; particularly those curious ones on gold, representing portraits to as much perfection as the best painting in oil; and even some history pieces: with this great advantage, that their beauty and lustre never decay, being equally secure from injuries of time and weather.

This art we are indebted for to the French; nothing of the kind having been attempted before the year 1630; when James Toutin, a goldsmith of Chateaudun, and a great master in the common way of painting with transparent enamel, first applied himself to find a way to use thick colours of different tints, which should melt with fire, and yet retain their lustre, purity, &c.

Toutin succeeded in his attempt, and having got the secret, communicated it to his fellow artists; who, in their turns, contributed to the bringing it to perfection: the first who distinguished himself was Dubie, a goldsmith, who wrought in the galleries of the Louvre. After him came Morliere, a native of Orleans, who applied himself chiefly to the painting on rings and watch cases. His disciple, Robert Vauquer of Blois, exceeded them all, both in his designs and his colours. After him Pierre Chartier of Blois, took himself to the painting of flowers, wherein he succeeded to admiration.

By this time, the English were fallen into the way; who, as

is allowed by foreigners themselves, seem to have been the first that applied it with success to the painting of portraits, which was now become mightily in vogue, in lieu of those in miniature.

M. Felibien observes, that the first, and most finished portraits, and those in the finest colours were brought into France by Petitot, and Bordier from England: This occasioned Louis Hance, and Louis du Guernier, soon after, two good painters in miniature to attempt the like; in which the latter succeeded beyond every body. He likewise invented several new tints for the carnations; and had he lived, had probably merited the glory of carrying the art to its last perfection.

This kind of painting, to be in perfection, must be on plates of gold: for copper, beside that it emits a fume which tarnishes the colours, is apt to scale and crackle; and silver turns the whites yellow.

These plates are made a little hollow on one side, and raised on the other, either in a circular or oval manner, to prevent the gold's fretting by the fire, and making the colours crack and fly: nor must they be made too thick. It is sufficient they can bear the colours; though it is usual to strengthen them all around with a circle somewhat thicker.

The plate being hammered very evenly throughout, they apply a white *enamel* on both sides, though the design be only to paint on one of them. The intent of this is to prevent any swelling and warping by the fire: for otherwise, in large pieces, and especially if the colours be laid on any thing unequally, they are apt to rise up in puffs or blisters. Now, this first lay, which is white, remaining smooth and uniform, serves as a ground for all the other colours. The composition of the white *enamel*, with the other opaque colours, is already delivered under the article **ENAMEL**.

The gold plate thus *enamelled* in white; the draught, or design to be painted, must be chalked thereon; and, afterwards, the whole accurately drawn out in a ruddy brown. The draught, or out-line, thus finished, the piece is set to the fire, and then painted with the colours above prescribed.

The white ground they paint on, serves all the colours for white. The method being to spare the ground from first to last, in the places where the lights are to be, after the same manner as in miniature: though they have another white, to lay over the other colours, when there is occasion to raise them.

Add, that as the painters in oil re-touch their paintings several times, and let them dry; so in this sort of painting, they touch the piece as often as they please, setting it each time to a reverberatory fire, and taking it away again, as soon as they perceive that the *enamel* has got its full polish.

The reverberatory fire is made in a little furnace, wherein there is fire both a-top and all around; only a void place in the middle, where the piece is to be put for the enamels to heal. The colours are laid on with the tip or point of the pencil, as in miniature; with this only difference, that they use oil of apic to dilute them instead of gum-water. See **MINIATURE**.

Method of ENAMELLING by the lamp.—The works of this kind are all performed by the flame of a lamp; wherein, in lieu of oil, is put horses grease, by some called *caballin oil*. The lamp is of copper, or tin, and consists of two parts, the box and the lamp: in the latter of these, which is a kind of flat oval, is put the oil, and out of this rises the wick. All the use of the box is to receive the oil, which the ebullition, occasioned by the intense heat, might throw abroad.

This lamp; or even where two or three at first work together, two or three more lamps, are placed on a table of a proper height, &c. under which, about the middle of its height, is a double bellows like those of an organ, which one of the workmen raises and falls with his foot, to increase and quicken the flame of the lamps, which is by such means excited to a degree of vehemence almost incredible.

The wind of the bellows is conveyed to the several lamps, though never so many, by means of grooves cut along the thickness of the table, and covered with parchment, extending from the bellows, to a tube or pipe placed before each lamp. These tubes are of glass, and that the enamellers may not be incommoded with the heat of the lamp, each tube is covered at about six inches distance with a piece of tin, called a *fan*, which is fixed in a hole of the table. In works that do not take up much time, they content themselves with a glass blow-pipe, to heighten the flame of the lamp.

Applying their cake of enamel to the flame of this lamp, they draw it out into threads inconceivably fine. Those made use of in artificial plumes of feathers are so very slender, that they may be wound on a reel, like silk or thread.

The fastidious jets of diverse colours, sometimes used in embroideries, are also made of enamel; and that with so much art, that each piece has its hole to pass the silk through, wherewith it is sewed. These holes are made by blowing them in long pieces, which are afterwards cut off with a proper tool.—See the process of drawing out the *enamel*, illustrated under the article **DUCTILITY of Glass**.

It is rare that the Dutch, or Venetian enamels, are used pure: the common way is to melt them in an iron ladle, with an equal quantity of glass or crystal. And when the two matters are in perfect fusion, they draw it out into threads of different sizes, as occasion requires, by taking a quantity between two pipe-stopples, held in the two hands, and removing them asunder as far as the arms will reach. If the thread is to be longer than the workman can stretch, a second person takes one of the ends, and continues to draw it out while the first continues to keep the enamel to the flame. All the threads drawn after this manner are round; so that if the nature of the work require them to be flat, they are afterwards drawn through a pair of pinchers while yet hot. They have another iron instrument, in manner of plyers, to draw out the enamel by the lamp, when it is to be worked or disposed in figures, or otherwise. Lastly, they have glass tubes, of various sizes, serving to blow the enamel into various figures, and preserve the necessary vacancies therein, as also to spare the stuff, and form the contours.

When the enameller goes to work, he seats himself before his lamp, with his foot on the treddle; and holding in his left hand the piece of work he has to enamel, or the brass or iron wires his figures are to be formed with; with his right hand, he draws out the thread from the enamel held to the lamp: and this is done with a dexterity and patience equally surprizing.

There is nothing but may be thus represented in enamel; and there are figures so finely finished of this kind, that one would take them to have come out of the hands of the ablest sculptors.

ENARTHROSIS, ΕΝΑΡΘΡΟΣΙΣ, a kind of jointing, or articulation, wherein the cavity that receives is deep, and the bone received is oblong.

Such is that of the buckle bone, &c. See **ARTICULATION**.

ENCÆNIA, ΕΓΚΑΙΝΙΑ, a Greek term, signifying *restoration, or renovation*.—Being compounded of the preposition *εν*, and *καιν*, *νovo*.

ENCÆNIA, is more particularly used for the name of a feast, celebrated by the Jews, on the 25th of the ninth month, in memory of the dedication, or rather purification of the temple, by Judas Maccabæus, after its having been polluted, and plundered by Antiochus Epiphanes.

The Jews had also two other *encænias*, viz. the dedication of the temple by Solomon; and that by Zorobabel, after the return from the captivity.

ENCÆNIA, is likewise applied in the fathers and church history, to the dedication of christian churches.

St. Augustine assures us, that in his time, the use of the word *encænias* was even transferred to profane matters; and that they called it *encænare*, when they put on a new suit of cloaths.

Our translators of the bible do not retain the word *encænias*, in St. John X. 22. where mention is made thereof: in lieu of that, they call it, *feast of the dedication*; which is less proper. In effect, it is not the *feast of the dedication*, but of the purification, or re-consecration of the temple profaned, that is there spoken of.

ENCANTHIS *, in medicine, denotes a tumour of the caruncula lachrymalis, in the great canthus, or angle of the eye.

* The word is Greek, *εγκανθις*, formed of the preposition *εν*, and *κανθ*, *corner of the eye*.

It is opposed to *rhynas*, which is a diminution, or consumption of the same caruncle. See **RHYAS**.

The *encanthis* is occasioned by a defluxion on that part, or an ulcer therein not speedily enough dried.

ENCAUSTICE, the art of enamelling. See **ENAMELLING**.

ENCEPHALI *, in medicine, an epithet applied to worms generated in the head; where they occasion violent pains, inasmuch as sometimes to produce distraction.

* The word is compounded of the preposition *εν*, *in*, and *κεφαλη*, *head*.

There are four kinds of *encephali*; those properly so called, which are found in the brain: the *narinari*, in the nose; *auriculares*, in the ears; and the *dentales*, in the teeth. The *encephali*, properly thus called, are rare: but there are certain diseases wherein they swarm; and we are told of pestilential fevers, that have arisen wholly from them.

In one of these fevers, the physicians having opened the person it had carried off, they found a little, short, red worm in the head. Hereupon, they tried various medicines to find what might destroy it; but all in vain, till Malmsey wine, wherein horse radish had been boiled, was applied: this was no sooner thrown on the worm than it died. The same remedy was afterwards tried on the sick; and it recovered them almost all. The like worms have also been taken out by trepanning, and the patient recover'd.

ENCEPPE, in heraldry, denotes chained, or girt round the middle; as is usual with monkeys, &c.

ENCHANTMENT. See **FASCINATION**, **MAGIC**, **SORCERY**, and **WITCHCRAFT**.

ENCHASING, **INCHASING**, or **CHASING**, the art of enriching, and beautifying gold, silver, and other metal works, by some design, or figures represented thereon, in low relief. See **SCULPTURE**, **RELIEVO**, &c.

Chasing is only practised on hollow, thin works; as watch-cases, cane-heads, tweezer-cases, or the like.—It is performed by puncting or driving out the metal to form the figures, from within-side, so, as to stand out prominent from the plane, or surface of the metal.

In order to this, they have a great number of fine steel blocks, or punches, of diverse sizes; and, the design being drawn on the surface of the metal, they apply the inside upon the heads, or tips, of these blocks, directly under the lines or parts of the figures. Then with a fine hammer, striking on the metal, sustained by the block; the metal yields, and the block makes an indentation, or cavity on the inside; correspondent to which, there is a prominence on the outside, which is to stand for part of the figure.

Thus, the workman proceeds to *chase* and finish all the parts, by successive applications of the block, and hammer, to the several parts of the design.

And it is surprizing, with what beauty, and justness, by this simple piece of mechanism, the artists in this kind will represent foliage, grotesques, animals, histories, &c.

ENCHEIRESIS, ΕΓΧΕΙΡΗΣΙΣ, in anatomy, denotes manual operation; as *dissection*.

ENCLAVE, in heraldry, is where one thing is let into another; particularly where the jointure is square.

ENCLITICA, in the Greek and Latin grammar, certain particles united so closely to the preceding word, that they only seem to form one word therewith: and the word which sustains them, does generally likewise bear the accent that governs them; especially when the *enclitic* is a monosyllable.—As in *dominusque, vocem*.

There are three *enclitic* particles in the Latin, viz. *que, ne, et*; but in the Greek many, as *τε, με, μοι, με, σε, σοι, σε, σου, σου, τε, γε, φημι, εμι, ποιη, ος, ος, ος*, &c.

ENCRATITÆ *, a sect of ancient heretics, thus called from their making profession of continence, and absolutely rejecting all use of marriage.

* The word is formed from the Greek, *ενκρατης*, *strong, continent*.

The founder of this sect was Tatian, a disciple of Justin, and one of the most learned persons of all antiquity. After the death of that martyr, he made a separation from the church; and soon had his followers; who beside the dogma just mentioned, borrowed a great many things from Saturninus, and Marcian, beside several errors which they adhered to in common with the Gnostics, and Valentinians.

They abstained from eating any thing that had life; and denied that Adam was saved. They looked on such as drank wine to be great sinners; and for this reason, only made use of water in celebrating the eucharist: as holding that wine came from the devil.—To countenance this tenet, they produced passages out of scripture, where mention is made of what befel Noah and Lot when they were drunk.

They only admitted such of the books of the Old Testament as they thought good: but in lieu thereof, they owned several spurious and apocryphal writings for canonical and divine. Such were the acts of St. Andrew, John and Thomas.

ENCROACHMENT, or **ACCRUACHMENT**. See **INCROACHMENT**.

ENCYCLOPÆDIA *, the circle, or chain of arts and sciences.

* The word is compounded of the preposition *εν*, *in*, *κυκλο*, *circle*, and *παιδεια*, *science, doctrine, discipline, learning*; the root being *παις*, *child, infant*.

The Greeks used the term for the knowledge of the seven liberal arts, and the possession of all the sciences. *Orbis ille doctrinae quem Græci εγκυκλοπαιδειαν vocant*, says Quintilian. It is sometimes also written *κυκλοπαιδεια*, *encyclopaedia*: Vitruvius in the preface to his 6th book calls it, *encyclios disciplina*. See **CYCLOPÆDIA**.

ENDECAGON, or **HENDECAGON**, in geometry. See **HENDECAGON**.

ENDECASYLLABUS, or **HENDECASYLLABUS**. See **HENDECASYLLABUS**.

ENDEMIC Disease, that which affects many people together in the same country; as proceeding from some cause peculiar to the country where it reigns.

Such are the *furvy* in the northern climes, intermitting fevers in marshy places, &c.

ENDENTED, **DENTED**, or **INDENTED**, in heraldry. See **INDENTED**.

ENDENTED is also applied to a fess, a pale, and other triangular pieces, when divided alternately between two different colours. Coupé, or *endented* with or and azure.

ENDITEMENT, or **INDICTMENT**, in common law. See **INDICTMENT**.

ENDLESS Rolls. } See the articles } **ROLLS**.

ENDLESS Screw. } } **SCREW**.

ENDORSE,

ENDORSE, in heraldry, an ordinary, containing the eighth part of a pale.

This, Leigh says, is never used but when a pale is between two fuch: though others hold, that an *endorse* may be bore between birds, fishes, beasts, &c.—Sir J. Ferne adds, that it shews the same coat has been sometimes two coats, and afterwards conjoined within one escutcheon, for some mystery of arms.—He bates azure an *endorse* argent.—V. *Tab. Herald.* fig. 56. N^o. 3.

ENDORSED, *Endosse'*, in heraldry, is where things are bore back, to back.

ENDORSEMENT, is particularly used in commerce for a writing on the back of a bill of exchange, by the proprietor, or bearer; either, thereby, to transfer it to some other, or to render it payable to the order of some other; or else to serve for an acquittance or receipt. See **EXCHANGE**.

The *endorsement* is only the name of the proprietor, or *endorser*. Note, when the *endorsement* of a bill of exchange is to render it payable to another, it is called an *order*.

To an order, it is necessary the *endorsement* be dated; and contain the name of him who paid the value thereof: in which case the bill belongs to the person with whose name the order is filled; without any other transfer: without these conditions, the bill is judged to belong to the person who *endorsed* it. The bearer of a bill of exchange protested, has a remedy against the *endorsers*, for the payment of the rechange of the places where the bill was negotiated by their order. In case a bill or note is refused to be paid, &c. the bearer has a remedy against any one of the *endorsers*, where there are several. See **BILL**.

ENDORsing, or **INDORSING**, in law, implies the writing on the backside of a deed, instrument, &c. something relating to the matters contained therein.

ENDOWMENT, or **INDOWMENT**, the giving, or assigning of a dower to a woman.

The word is also used figuratively for the setting forth, or severing a sufficient portion for a vicar, towards his perpetual maintenance, when the benefice is appropriated: whence such a vicarage, is called a vicarage *endowed*. See **VICARAGE**.

ENEMA, in medicine, denotes a *clyster*. See the article **CLYSTER**.

ENEMY. See the articles **HOST**, and **ALIEN**.

ENERGICI, an appellation given to a religious sect, of the sixteenth century; by reason they held that the eucharist was the *energy*, and virtue of Jesus Christ, not his body, nor a representation thereof.

ENERGUMENUS *, **ENPTOMENOS**, a term sometimes used by divines, and schoolmen, to signify a person possessed with a devil, or an evil spirit.

* The word is formed from the Greek, ενεργηδαι, to be agitated, worked, of εν, and ενεργον, opus.

Though, Papias says, the *energumeni* were such as counterfeited the actions of the devil, performing things which seemed supernatural. The council of Orange debars, or deprives, the *energumeni* of the functions of the priesthood.

ENERGY *, an uncommon force, or strength, in a discourse a sentence, or a word. See **EMPHASIS**.

* The word is Greek, ενεργεια, formed of the preposition εν, and ενεργον, work, labour.

ENERVATING, the act of destroying the force, use, or office of the nerves; either by cutting them, by weakening them with debauchery, or by some other violence.

Excess of wine, and other strong, hot, spirituous liquors, *enervate*, or weaken the nerves. When they would render a horse useless, they *enervate* him, or cut his nerves.

ENERVATING is particularly used in the manage for the cutting two tendons on the side of a horse's head, under the eyes, which meet on the tip of the nose: they thus *enervate* horses to make their head small and lean.

The word is also used figuratively.—It is no small artifice in disputing, to be able to *enervate*, and extenuate the allegations of one's antagonist. This author has a weak, *enervate* style. See **NERVE**.

ENERVATION, a term in the ancient anatomy, applied to the tendons of the recti, or straight muscles of the abdomen. The fibres of the recti of the abdomen, do not go from one extreme of the muscle to the other, but are interlaced by several nervous places, called by the ancients *enervations*; though they be real tendons.

Their number is not alike in all: some having three, others four, &c.

ENFANS Perdus *, a French phrase, used in war, to signify the soldiers who march at the head of a body of forces appointed to sustain them; in order to begin an attack, make an assault, or force a post.

* The word literally imports *lost children*, on account of the imminent danger they are exposed to.

In English they are called the *forlorn*, or *forlorn hope*. At present it is the grenadiers that usually begin such attacks.

ENFILADE *, a French term, sometimes used in English; signifying a series, or continuation, of several things, disposed, as it were, in the same thread, or line.—As, an *enfilade* of rooms, of doors, of buildings, &c.

* The word is formed of the French verb *enfiler*, to string a thing, which is compounded of en, in, and fil, of filum, thread: q. d. a thread, or string, of any thing.

ENFILADE, in war, is applied to those trenches, and other lines which are ranged in a right line, and so may be scoured, or swept by the cannon lengthwise, or in the direction of the line, and rendered almost defenceless.

Care must be taken that the lines be not *enfilad*, or *enfiladed*: on the contrary, the covert line must be *enfiladed*, that the enemy may be driven out of it.—The last boyau, or gut of the trenches, is subject to be *enfiladed*, that is, to be scoured according to its length.

A *batterie d'enfilade*, is that where the cannon sweep a right line.

A *post*, or *command d'enfilade*, is a height from which one may sweep a whole line at once.

ENFRANCHISEMENT, the incorporating any man into a society, or body politic. See **FREEDOM**, and **FRANCHISE**.

Thus, he that by charter is made denizen of England, is said to be *enfranchisid*.—The like is understood of a person made a citizen of London, or other city, or corporate town; by reason he is thereby made partaker of the liberties appertaining to the corporation whereof he is *enfranchisid*.

ENGASTRIMYTHUS *, **ΕΓΓΑΣΤΡΙΜΥΘΕ**, or **ENGASTRIMANDER**, a person who speaks from, or with, the belly; without opening the mouth; or, if open, without stirring the lips.

* Thus called by the Greeks, from εν, γαστρι, belly, and μυθον, speech; and by the Latins *ventrilocuus*, *quasi ex ventre loquens*.

The ancient philosophers, &c. are divided on the subject of the *engastrimythi*: Hippocrates mentions it as a disease.—Others will have it a kind of divination, and ascribe the origin, and first discipline thereof, to one Euryclus, whom no body knows any thing of.—Others attribute it to the operation, or possession of an evil spirit: and others to art, and mechanism.

The most eminent *engastrimythi*, were the Pythians, or priestesses of Apollo, who delivered oracles from within, without any action of the mouth or lips.

St. Chryostom and Occumenius, make express mention of a sort of divine men, called by the Greeks *engastrimandri*, whose prophetic bellies pronounced oracles.

M. Schottus, library-keeper to the king of Prussia, in a dissertation on the apotheosis of Homer, maintains, that the *engastrimythi* of the ancients, were only poets, who, when the priestess could not speak in verse, supplied the defect, by explaining or delivering, in verse, what Apollo dictated in the cavity of the basin placed on the sacred tripod.

Leo Allatius has an express treatise on the *engastrimythi*, entitled,—*de Engastrimytho, syntagma*.

ENGENDERING, or **INGENDERING**, the act of begetting, or producing the kind, by way of generation.

The term is likewise applied to other productions of nature: thus, meteors are said to be *engendered* in the middle region of the air. Crude fruits *engender* worms. The ancients believed that insects were *engendered* of putrefaction.

ENGINE *, a compound instrument, consisting of several simple ones, as wheels, screws, levers, or the like, combined together; in order to lift, cast, or sustain a weight, or produce some other considerable effect, to as to have either time, or force.

* The word is formed of the French *engin*, of the Latin *ingenium*, wit; by reason of the ingenuity required in the contrivance of engines, to augment the effect of moving powers.

The kinds of engines are infinite: some for war, as the ballista, catapulta, scorpio, aries, &c. Others for the arts of peace, as mills, cranes, presses, clocks, watches, engines to raise water, to extinguish fire, &c. which see under their respective articles, **MILL**, **CLOCK**, **WHEEL**, **PRESS**, and **HYDROCA- NISTERIUM**. See also **INSTRUMENT**.

ENGINEER, or **INGINEER**, in its general sense, is applied to a contriver, or maker, of any kind of useful engines, or machines.

In its more proper sense, it denotes an officer in an army, or fortified place, whose business is to contrive, and inspect attacks, defences, works, &c.

An *engineer* should be an able and expert mathematician, particularly versed in military architecture, and gunnery; being often sent to view and examine the places intended to be attacked, to chuse out and shew the general the weakest place, to draw the trenches, assign the places of arms, galleries, lodgements on the countercap, and half moons; conduct the works, saps, mines, &c. and appoint the workmen their nightly

nightly task: he is also to make the lines of contravallation, with the redouits, &c.

Under the new establishment of the office of his majesty's ordnance, there are six engineers, and four sub-engineers. See **ORDNANCE**.

ENGISOMA, **ENGISOMA**, a species of fracture of the skull, wherein one of the extremities of the fractured bone is thrust inwards upon the dura mater, and the other extremity raised outwards. *Dion. ap. Bibl. Anat. T. 1. p. 559.*

ENGLICERIE, **ENGLICHERIE**, or **ENGLSCHYRE**, a term of great import among our ancestors, though now obsolete; properly signifying the quality of an *Englishman*.

If a man were privately slain, or murdered, he was, anciently, accounted *francigena*, (which comprehended every alien, especially Danes) till *englicerie* was proved: *i. e.* till it was made appear that he was an *Englishman*. *Braçon, lib. 3.* See **FRANCIGENA**.

The origin of the custom was thus: king Canutus having conquered England; at the request of the nobles, he sent back his army into Denmark; only reserving a guard of Danes for his person: and made a law, that if any *Englishman* killed a Dane, he should be tried for the murder; or, if he escaped, the village where the man was slain should be charged to pay 66 marks into the exchequer. After this law, whenever a murder was committed, it was necessary to prove the party slain an *Englishman*, that the penalty of 66 marks might not be charged on the village.

ENGLISH, in a general sense, something that relates to the country, or people of England.

We say, the *English crown*, *English coppers*, *English names*, *English money*, *English measures*, *English weights*, &c.

The sweating sickness is called by foreigners *sudor anglicanus*, the *English sweat*. Dr. Cheyne calls the vapours the *English malady*. See **SUDORANGLICUS**.

ENGLISH Dreps, *Gutta Anglicanae*. See **DROP**.

ENGLISH, or the *ENGLISH tongue*, the language spoken by the people of England; and, with some variation, by those of Scotland, as well as part of Ireland.

The *English* is of Gothic, or Teutonic extraction: this was the root, or stock upon which several other dialects have been since grafted; particularly the Latin and French. See **TEUTONIC**, &c.

The language anciently spoken in our island was the British, or Welch, which was common to the Britons and Gauls; and which still subsists, in more or less purity, in the principality of Wales, the county of Cornwall, the islands and high lands of Scotland, part of Ireland, and some provinces of France, particularly Bretagne.

As the Roman empire, extending it self towards the western parts of Europe, came to take in Gaul and Britain, the Roman tongue became propagated therewith; all the edicts, &c. relating to the public affairs, being designedly wrote in that language.

The Latin, however, it is certain, never got so much ground, or prevailed so far in England, as in Lombardy, Spain, and the Gauls; partly on account of its great distance from Rome, and the small resort of Romans hither; and partly, for that the entire reduction of the kingdom was not effected, till so late as the empire of Claudius, when the empire was on the declining hand; and the new province was forced to be soon deserted by its conquerors, called to defend their territories nearer home.

Britain thus left naked, became an easy prey to the Angli, or Anglo-Saxons, a strolling nation from Jutland and Norway, who took an easy possession thereof; much about the time that the Franks, another German nation, entered Gaul. The Gauls and Franks, it seems, at length, came to terms; found means to unite into one nation: and thus the ancient Gaulish, with its mixture of Latin, continued the prevailing tongue, only further intermixed with the francic, or lingua franca, of their new inmates: but the Britons were more constant, and determined absolutely to refuse any such coalition; they had embraced Christianity, and their competitors were Heathens: rather than admit of such an union, therefore, they chose to be shut up, with their language, in the mountainous parts of Cambria, or Wales.

The *English Saxons* thus left absolute lords, changed every thing; their own language was now fully established, and the very name of the country was henceforth to be Anglo-Saxon. The new language remained, in good measure, pure and unmixed till the Norman invasion: the attempts of the Danes, and the neighbourhood of the Britons, indeed wrought some lesser innovations therein; but, in the main, it preserved it self; for, as to the Danes, their language was not much different therefrom. Edward the Confessor, however, who had lived long in France, might, possibly, bring in a little mixture of the dialect of that country.

But William I. and his Normans, having got possession of England, an alteration was soon attempted: the conquest was not complete, unless the conqueror's language, the French, or Franco-Gallic, were introduced; and accordingly all his acts,

diploma's, edicts, pleadings, and other judicial matters, were written, &c. in that tongue.

But his attempts proved unsuccessful; the number of Normans he brought over, being very small, in comparison of the *English* with whom they were incorporated, they lost or forgot their own language, sooner than they could make any change in the *English*. This, however, did not hinder, but by the endeavours of the conqueror, abundance of French words, though many of them of Latin original, crept into the *English*: and many *English* words by degrees grew out of use.

Hence, as to the origin and etymology of many of our words, Dr. Wallis lays it down, that such words of German original as we have in common with the French, are to be reckoned as our own, rather than as words borrowed from them; and that the old Gaulish words, common to the French and the Welch, which are found in our language, have been likewise taken from the Welch, rather than from the French.

Hence, also, the same author accounts, why the names of the diverse sorts of cattle are Saxon, as ox, cow, calf, sheep, hog, boar, deer, &c. And yet that their flesh, when prepared for food, is French, as beef, veal, mutton, pork, brawn, venison, &c. The Norman soldiers, forsooth, not concerning themselves with pastures, parks, and the like places, where such creatures are fed and kept; so much as with markers, kitchens, feasts, and entertainments, where the food was either prepared, fold, or eaten.

Under Henry II. Dr. Swift observes, the French made a still greater progress; by reason of the large territories he possessed on that continent, both from his father and his wife, which occasioned frequent journeys thither, with numerous retinues, &c. And for some centuries after, there was a constant intercourse between France and England, by the dominions we possessed there, and the conquests we made; so that the language two or three hundred years ago, seems to have had much more French than at present.

Besides this alteration from the conquerors, the language, in process of time, underwent diverse others; and at length came to have numerous words and phrases of foreign dialects, ingrafted into it; in lieu whereof the ancient Saxon ones gave way; particularly by means of negotiations, and commerce with other nations; by the marriages of royal families; by the affectation of many writers in most ages, who are fond of coining new words, and altering the usual forms of speech, for the greater delicacy; and by the necessity of framing or borrowing new words, according as new things and inventions turn up. And by such means was the old Anglo-Saxon converted into the present *English* tongue.

Having traced the rise and progress of our language historically; we think it may be no inconsiderable amusement to represent, by actual examples, the several successive changes and stages it has passed through, to arrive at its present perfection: in order to which we shall make use of the collections of the ingenious Mr. Greenwood.

From the Saxon invasion in 440, we have no memorial extant of the language for 250 years: the oldest Saxon writing in being, is a gloss on the evangelists, written in the year 700, by Eadric, bishop of Holy island: in which the three first articles of the Lord's prayer run thus.

Uren Fader thic arth in heofnas, sic gehalgod
Our Father who art in heaven, be hallowed
thic nama, so cymeth thic ric. Sic thic willa
thy name, come thy kingdom, be thy will
sue is heofnas, and in eorthis, &c.
so as in heaven, and in earth, &c.

Two hundred years after, in the year 900, the same was rendered thus:

Thu ure Fader the eart on heofenum, si thin nama
gehalgod; cume thic rice, si thin willa on eorthis
swa, swa on heofenum.

In the following age it was turned thus in the Saxon homilies, said to be translated by king Alfred.

Fader ure thu the eart on heofenum, si thin,
nama gehalgod, to cume thin rice, gewurthe
thin willa on eorthis swa swa on heofnum, &c.

About the year 1160, under Henry II. it was thus rendered by pope Adrian, an *Englishman*, in rhyme.

Ure Fader in heaven rich,
Thy name be haled ever lich,
Thou bring us thy michell bliss:
Als hit in heaven y-doe
Evar in yearth beene it also, &c.

About 100 years after, in the time of Henry III. it was turned thus:

Fadir that art in heaven blisse,
Thin helge nam it wurth the blis,
Cumen & mot thy kingdom,
Thin holy will be it all don,
In heaven and in erdh also, &c.

Two hundred years after, under Henry VI. it was rendered thus:

Our Fadir that art in hevencs, halewid be thi name, thi kingdom come to thee, be thi will don in eerthe, as in hevenc.

An extraordinary specimen of the English, as spoke in the year 1385. Dr. Hicks furnishes us withal, in his *Theosaur. Liter. Septent.* which we shall rather entertain the reader withal, as it is on this very subject the English tongue, and contains not only the history, but the reasons, of the changes and differences therein.

As it is knowe how meny maner peple beeth in this lond; there beeth also so many dyvers longages and tonges. Notheles Walsche men and Scots that beeth nought medled with other nations, holdeth wel nyh hir friste longage and speche; but yif the Scottes that were sometime confederat and woned with the Pictes drawe somewhat after hir speche; but the Fleminges that woneth in the weste side of Wales, haveth lest hir strange spech, and spekethe fexonliche now. Also Englishe men, they had from the bygynnyng thre maner speche: northerne, fowtherne, and middel speche in the middell of the lande, as they come of three maner of peple of Germania; notheles by comnyxton and melleynge first with Danes, and afterwards with Normans, in meny the contrary longage is apayred [corrupted]. This appayryng of the burthe of the tunge is bycause of twie thynges, oon is for children in scole agensif the usage and maner of all other nations, beeth compelled for to leve hire own longage, and for to construe hir lessons and here thynges in French, and so they haveth sethe Normans come first into Engeland. Also gentlemen children beeth taught to speke Frenche from the tyme that they beeth rokked in here cradd, and kunne the speke and play with a childes broche; and uplondische men will likne hymself to gentilmens, and fondeth with great belyneffe for to speake Frenche to be told of.—Hit seemeth a greet wonder how Englishe men and her own longage and tonge, is so dyvers of fown in this oon lond; and the langage of Normandie is comlyng of another land, and hath oon maner foun amonge alle men that speketh hit arigt in Engeland.—Also of the foresaid Saxon tonge that is deled [divided] a thre, and is abide fearcheliche with few uplondische men is greet wonder. For men of the est, with men of the west, is, as it were, under the same partie of hevenc acordeth more in fownnyng of speche, than men of the north, with men of the south. Therefore it is that mercii, that beeth men of myddel Engeland, as it were partners of the endes, understondeh bettre the side longages northerne and southerne, than northerne or southerne understondeh either other.—All the langage of the Northumbers, and specialliche at York, is so charp, sitting and frotyng, and unshape, that y southerne men may that langage unnethe understonde. I trow that that is by cause that they beeth nyh to strange men and nations, that speketh fstrongliche, and also bycause that the kinges of Engeland wonneth alwey fer from that country, &c.

How the English stood about the year 1400, may be seen in Chaucer, who refined and improved it very considerably; though he is charged with the affectation of mixing too many French, and Latin words with his *English*, and by that means with too much altering and corrupting the primitive language.

In the year 1537, the Lord's prayer was printed according to the following version:

Our Father which arte in heven, halowed be thy name: let thy kingdome come, thy will be fulfilled as well in ertth as it is in heven, &c.

Where the reader will observe the diction almost brought to the present standard; the variations being principally in the orthography.

Spencer, who lived in the same age, contributed not a little to the improvement and refining of the tongue: he threw aside abundance of the outlandish ornaments, and wrote a purer *English*, yet with more elegance and variety, than had been known before. He was succeeded in order, by Shakespear, Ben Johnson, lord Bacon, Milton, Cowley, Waller, Tilletson, and Dryden, whose works are in every body's hands; and by whom the language has been transmitted to us under all its present advantages.

The perfections ascribed to the *English*, and that in a degree superior to any of the other modern tongues, are,—1^o. That it is very strong and significant: to which our finely compounded words, formed on the model of the Greeks, do not a little contribute.

2^o. Copious: of which Mr. Greenwood gives us instances in the word striking: which we have above 30 different synonymous expressions for; as, to smite, bang, beat, baste, buffet, cuff, hit, thump, thwack, flap, rap, tap, kick, spurn, box, yerke, pummel, punch, &c. And the word anger, for which he enumerates above 40. So we say, to seeth or boil flesh, stew prunes, poche eggs, coddle apples, bake bread; for which expressions to seeth, fewe, poche, coddle, and bake, the Latins, with all the boasted copia of the tongue, have only one word, *coquere*; and the French, as much as they abound with terms of cookery, not many

more; the word *cuire*, serving indifferently for seething, boiling, baking, stewing, and coddling.

3^o. Musical and harmonious; in which respect Mr. Dennis makes no scruple to assert it superior even to the French. This, which some may think strange, he proves hence, that we have blank verse which is harmonious by mere force of numbers, and quantity; whereas the French have long ago desisted from all pretensions to poetical numbers, without the assistance of rhyme.

It may be added on this last head, from Mr. Welfsted, that the English has many measures, the Iambic and Trochee for instance, in common with the Greek and Latin; an advantage arising from the variation of the accent: and that rhyme is peculiarly natural to it, varying it self to the ear with excessive sweetness; not to mention the cæsuras, pauses, transpositions, and numberless other graces, which the English versification is capable of, probably beyond any other living language.

Some object to the *English*, that it consists too much of monosyllables; which others make a piece of merit, as it argues the greater antiquity, if what Salmalius says be true: *certum quippe est, linguas omnes quæ monosyllabis constant cæteris esse antiquiores*; he adds, that the ancient Greek abounded herein, as appears from the ancient poets, and such as affected antiquity. *De re hellenist.*

But we have a further advantage from our monosyllables, *viz. conciseness*; we being hereby enabled to express more matter in the same compass of letters, than any other modern tongue. The only thing we suffer by it, is, something in point of softness and numbers; and yet we have verses composed wholly of monosyllables, that do not want harmony; as that of Creech "Nor could the world have born so fierce a flame."

Others object to our language, that it does not come up to the softness, the delicacy of the more southern languages, France, Spain, and Italy. It seems, it retains somewhat of the Gothic roughness of the people who framed, and introduced it; the soil and the climate it was planted in, not tending much to mellow and refine it.

To this purpose does Dr. Swift speak, who accounts for the effect hence, that the Latin tongue was never in its purity in our island; and beside, such as it was, was called away ere it could have time to incorporate with the language of the country, and subdue, and soften it: as it did in the other provinces of France and Spain, &c.—But it is to be observed, that, upon the whole, this, supposing it true, does not fall as an objection against the language, but the people: our manners are also less polished, than some of our neighbours; we are not yet arrived, and may we never hereafter arrive, at that pitch of molleness, of delicateness, of softness, which we desire in them; and it is but just our language correspond with the rest of our character. We have somewhat more of the rough virtues of human nature unsubdued, unpolished away by art; and when these are gone, we may talk as softly, and as prettily, as the dissolute, enervate, effeminate, I would have said, but for the catachresis] nations on the other side the alps, where we see politeness in its perfection.

But the reverend doctor ventures yet further: "Our language," he affirms, is extremely imperfect; its improvements are in no proportion to its corruptions; and in many instances it offends against every part of grammar."—What this ingenious author means by offending against grammar, we do not apprehend. Is it, that the *English* tongue offends against the grammar of the same tongue? that were absurd: a language is not to be judged of and regulated, by any preconceived forms or rules of grammar, but the grammar is to be taken from the language: it is the language directs the grammar, not vice versa; so that if there be any disagreement between them, the fault must be charged on the grammar, which is so far deficient.—Does he mean, that it offends against the grammar of the Latin, or Greek? that may well be, without any fault; for the grammars of all languages widely differ: and it would be unjust to censure any language for varying from the grammar-rules of another.—If he means that in the *English*, there are many anomalies or departures from the general rules: we know of no language without them: idiotisms are perhaps as numerous in Latin or Greek as in *English*.

Mr. Welfsted is of opinion, that the *English* language is not capable of a much greater perfection, than it has already attained: we have trafficked, he observes, with every country for the enriching it: the ancients and moderns have both contributed to the giving it splendor and magnificence; the fairest cyons that could be had from the gardens of France and Italy, have been grafted on our old stocks, to refine the favageness of the breed; we have laid aside most of our harsh, antique words, and retained few but those of good sound and energy: the most beautiful polish is at length given our tongue that it will bear, without destroying, and altering the very basis and ground-work of it: its teutonic rust is worn away; and little or nothing is wanting, either of copiousness, or harmony. He goes on to argue the maturity and per-

fection of the *English*, from another very extrinsic principle; viz. by comparing the time, and circumstances of the improvements, made since the first refiners of it; with those of the Greek, Latin, French, and other tongues, that confessedly have risen to their height.

Every civilized nation, that author thinks, has its classical age; and he suggests, that the *English* are not far from it. So that what remains to be done for the *English* tongue, should not be to advance, but to fix it where it is, and prevent its declining. There is in effect, a point of perfection, which when a language has once arrived at, it cannot exceed, though it may degenerate from it; and thus it happened to the two finest languages the world has known.

It may seem odd to talk of fixing so unstable a thing as language: the Greek literatures of St. Basil, and St. Chrysostom, still used in that church, the one for solemn, the other for common days, have been a long time unintelligible to the people: so much is the vulgar Greek degenerated from its original purity! Polybius testifies, that the articles of truce between the Romans and Carthaginians, could scarce be understood by the most learned Roman antiquaries, 350 years after the time of their making. In effect, from the days of Romulus, to those of Julius Cæsar, the Latin was perpetually changing; and what was wrote three hundred years before Tully, was as unintelligible in his time, as the *English* and French of the same period are now: and these two have changed as much since William the Conqueror, in about 700 years, as the Latin appears to have done in the like term.

Whether our language will decline as fast as the Roman did, may admit of some doubt; there being many circumstances in the affairs of the nation, which contributed to that speedy corruption, that may not, in all probability, find place among us.—The French, for these 50 years past, has been polishing as much as it will bear; and it appears to be now declining, by the natural inconstancy of that people, and the affectation of some late authors, to introduce cant words, which is the most ruinous corruption in any language. But without some such consideration, there does not seem any absolute necessity, why a language should be perpetually changing.

We find examples to the contrary: from Homer to Plutarch, are above a thousand years; and so long, at least, Dr. Swift thinks, we may allow the purity of the Greek: the Grecians spread their colonies round all the coasts and islands of Asia minor, and the Egean sea, where the language was preserved entire for many ages after they themselves became provinces to Rome, and were over-run by the barbarous nations. The Chinese have books in their language above 2000 years old; neither have the frequent conquests of the Tartars been able to alter it. And the German, Spanish, and Italian, have admitted few or no changes for some ages past.

On such considerations, that author, moved the then prime minister, the earl of Oxford, to establish a society, or academy, for the settling, and ascertaining, the purity of our tongue; to set a mark on the improprieties which custom has made familiar, to throw out vicious phrases and words, to correct others, and perhaps retrieve some others now grown obsolete, and to adjust the orthography, pointing, &c.

Without some such means, he complains, that the same any writer can expect will be so short and scanty, as by no means to be a sufficient motive to call forth, and engage a man to exert his genius. Our language is chiefly confined to these two islands; and it is hard our authors same should be limited in time as well as place. Were it not for the Bible and Common-Prayer, we should hardly have been able to understand any thing written a hundred years ago.

It is a melancholy reflection, that Petrarch still speaks good Italian; whereas Chaucer, who lived an hundred years later, is not to be understood by an English reader without a Saxon and French glossary. And what security has Dryden himself, while things continue on their present footing, that he shall not in a like space of time become as obsolete as Chaucer is? Grammars, and dictionaries, with whatever care and judgment they are composed, will prove but a feeble stay to a fleeting language, unless they have some extraordinary sanction, and authority. And what is to be lamented, such writings have contributed to the corruption almost as much as the perfection of our tongue.

Dr. Gill, Ben Johnson, and Hexham, it is certain, by forcing the *English* tongue to the Latin method, have clogged and perplexed it with abundance of useless precepts concerning cases, genders, and declensions of nouns, tenses, moods, and conjugations of verbs, and other things which our language has nothing to do withal. Nor have even Dr. Wallis, Greenwood, &c. though sensible of the fault in those others, been able wholly to keep clear of it themselves.

Borough ENGLISH. See the article **BOROUGH**.
ENGNONASIS, ERTONÆIE, in astronomy, *Hercules*; one of the northern constellations. See **HERCULES**.

ENGRAFTING, GRAFTING, or GRAFFING, in agriculture and gardening, the art, or act, of inserting, or fixing, a cyon, shoot, or bud, of one tree, in the stock of another; in order to correct, and improve its fruit.

Engrafting is the art of applying a *graft*, or shoot, of one plant, to the stock of another; in such manner, as that the sap passing freely through both, the *tree grafted* on may produce the same kind of fruit with that whence the *graft* is taken.

Engrafting only differs from *inoculation*, in this, that the latter is performed when the sap is at the highest, in summer; and the former before it rises, at least, in any quantity.

Engrafting is one of the principal operations in gardening, and that whereon the goodness of great part of our fruit greatly depends.

It is very extraordinary that the seeds, or kernels, or stones of a fruit, as an apple, pear, peach, plum, cherry, &c. being sown, degenerate in the ground; so, that the tree arising from it is of another kind, a sort of wilding, harsher, sourer and coarser than that of the parent tree. To correct this, trees thus reared, must always be *grafted* from other better kinds. Apples are commonly raised by *engrafting* the intended kinds on crab stocks, procured by sowing the kernels: so are pears, procured by *grafting* on the wild pear stock: though for dwarf, or wall trees, they generally chuse to *engraft* on the quince stock.

They will also do if *grafted* on the white thorn. Peaches are produced by *grafting* on an almond or plum-stock. Indeed, in this fruit, it sometimes happens that the stone sown, produces better fruit than that from which it was taken: but this is not common; beside that the tree in such case, is long ere it comes to bear. Plumbs are raised by *engrafting* on a damson, or wild plum-stock: and cherries, on the black-cherry, or merry stock, raised from stones.

Our best gardeners, likewise, *engraft* their less kindly trees from other better of the same sort, to mend them; as also, the smaller and single flowers, as gilliflowers, &c. from the larger and finer.—*To produce stocks for engrafting on*; see **STOCK**.

The curious furnish us with other extraordinary and anomalous instances of *engrafting*: as of apples on plane, elder, thorn, cabbage-stalk, &c. and the like of pears, &c. pears on apple-trees, on elms, &c. cherries on the lawrel; coral berries on the plum; beech on the chestnut, oak on the elm, gooseberry on the currant, on the vine on the cherry-tree, &c.

*Inseritur lauro cerasus, partuque coacto
Tingit adaptivus virginis ora pidor.* Aufon.

Even Daphne's coyneels thou dost mock,
And weds the cherry to her stock. Cowl. to Evel.

— *Mutatunque insita mala*

Ferre pyrum, & prunis lapidosa rubescere corna.
Virg. Geor. l. 2.

— *Steriles platani, malos gessire valentis;*

Castaneæ, fagos; ornique incanuit albo

Flora pyri; glandemque suas frangere sub ulmis. Id. ibid.

The origin, and invention of *engrafting*, is differently related by naturalists: Theophrastus tells us, that a bird having swallowed a fruit whole, chanced to cast it forth into a cleft, or cavity, of a rotten tree; where mixing with some of the putrid parts of the wood, and being washed with the rains, it budded, and produced within this tree, another tree of a different kind. This led the Husbandman to certain reflections, from which, soon afterwards, arose the art of *engrafting*.

Pliny sets the thing in a different light: a countryman having a mind to make a pallisade in his grounds; that it might endure the longer, he thought himself to fill up, and strengthen the bottom of the pallisade, by running, or watering it with the trunks of ivy. The effect of this was, that the stakes of the pallisades taking root, became *engrafted* into the trunks, and produced large trees; which suggested to the husbandman the art of *engrafting*.

The reason, or philosophy, of *engrafting*, is somewhat obscure; and had not hazard given the first hint, all our knowledge of nature would never have led us to it. The effect is ordinarily attributed to the diversity of the pores, or ducts, of the *graft*, from those of the *stock*, which change the figure of the particles of the juices in passing through them to the rest of the tree.

Mr. Bradley, on occasion of some observations of Agricola, suggests something new on this head: the *stock grafted* on, he thinks, is only to be considered as a fund of vegetable matter, which is to be filtered through the cyon, and digested, and brought to maturity, as the time of growth in the vessels of the cyon directs. A cyon, therefore, of one kind, *grafted* on a tree of another, may be more properly said to take root in the tree it is *grafted* in, than to unite itself with it: for it is visible that the cyon preserves its natural purity and intent, though it be fed and nourished with a mere crab; which is, without doubt, occasioned by the difference of the vessels in the cyon from those

those of the stock: so that *grafting* may be justly compared to planting.

In prosecution of this view of that ingenious author, we add, that the natural juices of the earth, by their secretion and comminution, in passing through the roots, &c. before they arrive at the cyon, must doubtless arrive there half elaborated and concocted; and so disposed for a more easy, plentiful, and perfect assimilation and nutrition; whence the cyon must necessarily grow and thrive better and faster than if it were put immediately in the ground, there to live on coarse diet and harder of digestion: and the fruit produced, by this further preparation in the cyon, must be finer and further exalted, than if fed immediately from the more imperfectly prepared and altered juices of the stock.

The cyon, to say no more, is somewhat in the condition of the foetus in utero, fed from the mother's blood: or at least, it is in that of the infant after exclusion, fed with the mother's milk.

The methods, or kinds of *engrafting* are various; as *grafting* in the cleft, *grafting* in the rind, *whip grafting*, *grafting* by approach, *scutcheon grafting*, *root grafting*, re-iterated *grafting*, *grafting* on branches, &c.

The apparatus, or instruments used herein, are saws to cut off the heads of stocks; knives to make clefts; a chisel to pare away the wood; clay, mixed with horse-dung, to prevent freezing, and with tanners hair to prevent cracking; also bafs strings, or woollen yarn, to tie the *grafts* with, and *grafting* wax. See Wax.

GRAFTING in the cleft, or stock, called also slit-GRAFTING, is the most ancient, and ordinary way. We have a very beautiful description of it in Virgil, II. Georg. v. 78. it is chiefly used for middle sized stocks, from one to two inches diameter. Its season is the months of January, February, and March.—The method, as now practised, is thus:

The head of the stock being fawn, or cut off, smooth and clean; a perpendicular cleft is made therein, nearly two inches deep, with a strong knife, or chisel, as near the pith as may be to miss it. In this cleft, the *grafting* chissel, or wedge, is put to keep it open. The *graft*, or cyon, is prepared by cutting it a-slope, in form of a wedge, to suit the cleft; only leaving a small shoulder on each side: and, when cut, is to be placed exactly in the cleft, so, as that the inner bark of the cyon may aptly, and closely, join to the inner part of the bark, or rind of the stock; in the dexterous performance of which, the chief secret consists. If the cleft pinch too tight, a small wedge may be left in it to bear the stress. And, lastly, the cleft is covered over with clay: or rather, as Mr. Genill advises, with moss, or the fresh bark of a tree bound on with offer.

The reader, who would have this in more elegant terms, may be furnished with them from Virgil:

*Aur rursum enodes trunci reserantur, & alie
Fandiur in solidum cuneis via: deinde feraces
Plantae immittuntur: nec longum tempus, & ingens
Exiit ad caelum ramis felicibus Arbos,
Miraturque novus frondis, & non sua poma.*

GRAFTING in the rind, or shoulder-GRAFTING, called also *slicing*, and *packing*; is practised in the latter end of April, or beginning of May.—The method is as follows:

The top of the stock is cut off in a smooth, straight place: then the cyon, or *graft*, is prepared by cutting it on one side from the joint, or seam down slopewise, making the slope about an inch long; and observing its bend, that so, when the cyon is fixed to the stock, it may stand nearly upright. At the top of the slope, they make a shoulder, whereby it is to rest on the slope of the stock. The whole slope is to be plain and smooth, that it may lie even to the side of the stock. As to the length of the cyon, for a standard-tree, it may lie about four inches from the shoulder; but for a dwarf, or wall tree six inches. The cyon being prepared; the outside is applied to the west, or south west side of the stock, and its length and breadth measured thereon; which done, the bark of the stock is cut away to those dimensions, that the cut part of the cyon may fit it. Wherein, regard is to be had to the bigness of the stock, and the thickness of the bark, to proportion the length and breadth of the chip thereto; otherwise the passages of the juice in the stock and cyon will not meet. Lastly, laying the cut-part of the cyon on that of the stock, they bind them together with woollen yarn, and cover the whole with clay an inch above, and as far below the stock's head; working it round the cyon, till it become sharp at top, that the rain may run down it.

This method has several advantages over the former: as that the wound heals up sooner; and that, in the mean time, it is in less danger from the weather; that it does less injury to the stocks and *grafts*, as avoiding those severe splittings and pinchings: that the bark is more easily placed in the passage of the sap here, than in the cleft: that the *graft* thrives and shoots with greater vigour, and bears sooner in this way than in that: and that it is practicable on smaller stocks than the other, which must have a good body, and consistence, before they can bear clearing.

GRAFTING in the bark, is performed thus:—Prepare the stock, and cyon, as in *grafting in the rind*; but, instead of cutting the bark of the stock, slit the same on the fourth west side, from the top, almost as long as the sloped part of the cyon, and at the top of the slit loosen the bark; with the top of your knife. Thrust an instrument, made of ivory, silver, or the like, and formed at the end like the slope end of the cyon but much less, down, between the bark and wood, to make room for the cyon; which being put in, the bark is to be so managed, as that it may fall close to the stock, and edges of the cyon.

GRAFTING by approach, called also *inarching*, and *ablactation*. See ABLACTATION.

Whip-GRAFTING, or Tongue-GRAFTING, is a sort of *grafting* in the rind, proper for small stocks, from an inch diameter to a quarter of an inch. Mr. London speaks of it as the most effectual way of any, and that most in use.

In this, the stock and cyon are always to be of the same bigness. The cyon to be sloped off a full inch, or more; and the like is to be done to the stock; and so the one to be tied to the other. Otherwise, the top of the stock being cut off, a shoulder is to be made in the *graft*; and the rest to be performed as already shewn under *grafting in the rind*.

This method is also improved by what they call *tipping*, or *tonguing*; which is, the making a slit with a knife in the bare part of the stock, downwards; and the like in the sloped face of the cyon, upwards: then joining them, by thrusting one slice into the other, till the bare place of the cyon cover that of the stock.

Side-GRAFTING. In this, the cyon is prepared as in *whip-grafting*, but the head of the stock is not cut off. Only, from a smooth part on the west side, so much of the bark is pared off as the cyon will cover; then slitting both cyon and stock, as in the last article, they bind the two together, and close them up with clay. At the year's end, the top of the stock is cut off at the grafted place; slopewise, and the place is covered with clay.

Scutcheon-GRAFTING, is another method of *grafting* in the rind, practised in June, July and August; when the bark will not part from the stock. It is performed, by slitting the bark of the stock in form of the capital letter T, loosening it with the point of a knife, and clapping in a cyon, prepared as above. See SCUTCHEON.

Crown-GRAFTING, is when four or more *grafts*, are placed round the stock, between the bark and the rind, somewhat in the manner of a crown.—This is only practised in the larger trees, which are capable of receiving a number of *grafts*, and are too high to be cloven.—The method is in all respects the same as that already delivered for *grafting in the rind*.

Root-GRAFTING, is a modern invention, treated on at large by Agricola: its intention is somewhat different from the former, being for the propagation, or multiplication of plants.

To perform this, take a *graft*, or sprig of a young tree, which you intend to propagate; and a small piece of the root of another tree of the same kind, or of a kind very like it; or else pieces of roots cut off of other trees, in transplanting; and *whip-graft* them together: observing, that the two but-ends of the *graft* and root be united, and that the rind of the root join that of the *graft*. These may, afterwards, be planted out at pleasure, and the piece of root will draw the sap, and feed the *graft*, as the stock does the other way.

This way of propagation is very easy and expeditious; roots being more plentiful than stocks: by this method the pieces of roots of one crab-stock, or apple-stock, will serve for 20 or 30 apple *grafts*, and the like of other trees. The same is also an excellent way for raising of tender trees, that will hardly bear being *grafted* in the stock. Add, that trees thus *grafted*, bear sooner, and are more easily dwarfed, than those done any other way.

Re-iterated GRAFTING, or grafting by a double, or triple incision, is another method mentioned by Agricola: to perform which, first *graft* a good cyon on a stock, and cut it away to one half, or a third part; then fix another *graft* to it, of a better kind; and a third to that: for fill, the oftener a tree is *engrafted*, the finer fruit it produces.

By this method, that author assures us, he produced Muscat pears, that were admirable; making, at first, use of a stock *grafted* with a pound pear, on which he *grafted* a summer Bon Chretien; and when the branch of this latter had shot, he *grafted* on it a cyon of Bergamot; which he also cut, and *grafted* on it a cyon of a Muscat pear.

ENGRAFTING of branches, Agricola mentions as a very certain and profitable operation, best practised on large, full grown, and even old trees.

To do this, half or more of the branches must be lopped off, and *grafts* of three or four years old be applied to them; taking care to have stakes, or other things, to support them against the wind, &c.

He adds, that by this method, you will have, perhaps,

the same year, at least, the second or third, such a quantity of fruit, as the youngest and foundest tree would hardly produce.

ENGRAVING of the small-pox. See **INOCULATION**.
ENGRAILED, or **INGRAILED**, in heraldry (from the French *Irésle*, hail) is when a thing is represented with its edges ragged, or notched circularly, as if broke by something falling on it.—See *Tab. Herald*, fig. 56.

It differs from *indented*, in that the breaches there are all in straight lines; but here semi-circular: and from *invected*, in that the points of the little arches are turned inwards towards the middle of the field; which in *invected*, are turned outwards. See **INDENTED** and **INVECTED**.—Spelman expresses it in Latin by *imbriatus*, others by *ingrediatus*, and others by *striatus*.

ENGRAVING *, or **GRAVING**, the art, or act of cutting metals, and precious stones, and representing figures, letters, and other matters thereon.

* The word is a compound of the preposition *in*, and the Greek *γρᾶσι*, I write. Though Menage after Salmalius, derives it from the Latin *cavare*, to hollow; others from the Latin, *graphiare*; and others from the German, *graben*, q. d. *effodere*, to dig out. In Latin it is called *sculptura* and *caelatura*.

Engraving is properly a branch of sculpture; though with us it generally stands contra-distinguished from sculpture; as the latter, popularly called *carving*, expresses the forming of figures, &c. embossed, or in relievō; and the latter, those indented, or in creux.

Among the French, the term *engraving*, *graveure*, is of more extent. It includes all kind of sculpture, both that performed with the chissel and knife, on marbles and woods, in relievō; and that in metals, stones, &c. with the graver, indented.

Engraving is divided into several branches, according to the matters it is practised on, and the manner of performing it. The original way of *engraving* on wood is now distinguished by the name of *cutting in wood*; that on metals with aqua fortis, is called *etching*; that by the knife, burnisher, punch, and scraper, *mezzotinto*; that on stones, for tombs, &c. *carving* or *stone cutting*; and lastly, that performed with the graver on metals, as copper, brass, steel, silver, &c. as also on precious stones, crystals, &c. retains alone the primitive denomination of *engraving*.

Engraving is an art, for the greatest part, of modern invention; having its rise no earlier than the 16th century. The ancients, it is true, practised *engraving* on precious stones and crystals, with very good success; and there are still many of their works remaining, equal to any production of the later ages. But the art of *engraving* on plates, and blocks of wood, to afford prints, or impressions, was not known till after the invention of painting in oil.

The discovery is ascribed to Maso Finiguerra, a goldsmith of Florence; who having used to take impressions of every thing he cut, in clay; and to cast melted sulphur in this mould; at length hit on a way of taking the impressions thereof on paper, by smearing this figure of sulphur with oil and lamp-black. See **PRINTING**.

The secret soon got abroad, and coming to the hands of Albert Durer and Lucas, they greatly improved it, and began to engrave on wood and copper, in which they succeeded to admiration.

ENGRAVING in copper, is employed in representing diverse subjects, as portraits, histories, landscapes, foliage, figures, buildings, &c. either after paintings, or after designs made for the purpose.

It is performed either with the graver, or with aqua fortis.—For the first, there needs but little apparatus, and few instruments. The plate you work on being well polished, is covered over with a thin skin of virgin wax, and on this, the draught, or design, done in black lead, red chalk, or other ungunmed matter is laid; and rubbed down for the wax to take off. The design thus transferred upon the wax, is traced through on the copper, with a point or needle: then heating the plate, and taking off the wax, the strokes remain; to be followed, heightened, &c. according to the tenor of the design, with the graver, which is to be very sharp, and well tempered.

In the conduct of the graver consists all the art; for which there are no rules to be given; all depending on the habitude, disposition, and genius of the artist.

The other instruments are, a cushion, or sand-bag, to lay the plate on, to give it the necessary turns and motions.—A burnisher, round at one end, and usually flattish at the other, to rub out slips and failures, and to soften the strokes, &c.—A scraper, to pare off the surface, on occasion. And a rubber of black cloth, or hat, to fill up the strokes, that it may appear how the work proceeds.

ENGRAVING in copper with aqua fortis. See the article **ETCHING**.

ENGRAVING on precious stones, is the representing of figures, or

devices, either in relievō, or indented, on diverse kinds of hard, polished stones.

The art of *engraving* on precious stones, is one of those wherein the ancients excelled; there being diverse antique agats, cornelians, and onyx's, which surpass any thing of that kind the moderns have produced. Pyroteles among the Greeks, and Diocorides under the first emperors of Rome, are the most eminent engravers we read of: the former was so esteemed by Alexander, that he forbid any body else to engrave his head: and Augustus's head, engraven by the latter, was found to be beautiful, that the succeeding emperors chose it for their seal.

All the polite arts having been buried under the ruins of the Roman empire, the art of *engraving* on stones met the same fate. It was retrieved in Italy, at the beginning of the 15th century; when one John of Florence, and after him Dominic of Milan, performed works of this kind no way to be despised.

From that time, such sculptures became common enough in Europe, and particularly in Germany, whence great numbers were sent into other countries; but they came short of the beauty of those of the ancients; especially those on precious stones; for as to those on crystal, the Germans, and after their example, the French, &c. have succeeded well enough in them.

In this branch of *engraving*, they make use either of the diamond or emery.—The diamond, which is the hardest, and most perfect of all precious stones, is only cut by it self, or with its own matter.

The first thing is to cement two rough diamonds to the ends of two sticks, big enough to hold them steady by, in the hands; and to rub or grind them against each other, till they be brought to the figure desired. The dust, or powder rubbed off, serves afterwards to polish them; which is performed with a kind of mill, that turns a wheel of lead, pewter or copper.

The diamond is fixed in a brass dish, and thus applied to the wheel, which is covered with a diamond dust, mixed up with oil of olives: and when the diamond is to be cut facet-wise, they apply first one face, then another, to the wheel.

Rubbies, Sapphires, and Topazes, are cut and formed the same way, on a copper wheel; and polished with tripoli, diluted in water.

As to rubies, emeralds, hyacinths, amethysts, garnets, agats, and other of the softer stones, they are cut on a leaden wheel, moistened with emery and water; and polished with tripoli, on a pewter-wheel. Lapis lazuli, opal, &c. are polished on a wooden wheel.

To fashion and engrave vases of agat, crystal, lapis lazuli, or the like, they have a kind of lathe, like that of the pewterers; excepting, that whereas the latter is to hold the vessels, which are to be wrought with proper tools; the former generally holds the tools, which are turned by a wheel, and the vessel is held to them to be cut and engraved; either in relievō, or otherwise: remembering from time to time, to moisten the tools with diamond-dust and oil; or, at least, with emery and water.

To engrave figures or devices or any of these stones, when polished; such as medals, or seals, &c. they use a little iron wheel, the two ends of whose axis are received within two pieces of iron placed upright, as in the turners lathe; and to be brought closer, or set further apart, at pleasure. At one end of one of the axes, are fitted the proper tools, being kept tight by a screw. Lastly, the wheel is turned by the foot; and the stone applied by the hand to the tool; and thus shifted and conducted as occasion requires.

The tools are generally of iron, sometimes of brass. As to their form, it is various, but it generally bears some resemblance to chissels, gouges, &c. some have small round heads like buttons; others, like ferrels, to take the pieces out; others flat, &c. These tools are not applied directly against the stones; but, as it were, sidewise; thus wearing, and as it were, grinding off the substance. And still, whether it be figures, or letters, or characters, the manner of application is the same. The tools, as above observed, are to be frequently moistened with diamond-dust, and oil of olives. When the stone is engraven, they polish it on a wheel of brushes, made of hogs-bristles, with tripoli. For the larger, and less delicate works, they have copper, or pewter tools, on purpose to polish the ground, or plain parts, with tripoli, &c. which they apply after the same manner, as those wherewith the graving is performed.

ENGRAVING on Steel, is chiefly employed in cutting punches, matrices, and dies, proper for striking coins, medals, and counters.

The method of *engraving*, with the instruments, &c. are the same for coins, as for medals and counters: all the difference consists in their greater, or less relievō; the relievō of coins being much less considerable than that of medals; and that of counters still less than that of coins.

The engraver in steel usually begins with punches, or punchions, which are in relief, and serve for making the creux, or cavities of the matrices, and dies. Though, sometimes, he begins immediately with the creux; but it is only when the intended work is to be cut very shallow. The first thing is to design his figures; then he moulds them in white wax, of the size and depth required: and from this wax he graves his punch.

This punch is a piece of steel, or at least of iron and steel mixed; on which, before they temper, or harden it, the intended figure, whether a head, or a reverse, is cut, or carved in relief. The instruments used in this *graving* in relief, which are much the same as those wherewith the finishing of the work in creux, is effected, are of steel. The principal are gravers of diverse kinds, chisells, flatters, &c. when the punch is finished, they give it a very high temper; that it may the better bear the blows of the hammer, wherewith it is struck, to give the impression to the matrix.

What they call *matrice*, or *matrix*, is a piece of good steel of a cubic form, called also the *die*; whereon, the relief of the punch is struck in creux. It is called *matrice*, because in the cavities or indentures thereof, the coins, or medals, seem formed, or generated, as animals are in the matrix of their mother. To soften this steel, that it may more easily take the impressions of the punch, they make it red-hot; and after striking the punch thereon in this state, they proceed to touch up, or finish the strokes and lines, where, by reason of their fineness, or the too great relief, they are any thing defective; with some of the tools abovementioned.

The figure thus finished, they proceed to engrave the rest of the medal, as the mouldings of the border, the ungrailed ring, letters, &c. All which, particularly the letters, and graining, or engrainment, are performed with little steel punches, well tempered, and very sharp. Add, that as they sometimes make use of punchions, to engrave the creux of the matrix; so on some occasions, they make use of the creux of the matrix, to engrave the relief of the punch.

To see, and judge of the *engraving* in creux; diverse means have been devised to take the impressions therefrom, as the work proceeds. Sometimes they make use of a composition of common wax, turpentine, and lamp black; which always retaining its softness, easily takes the impression of the part of the *graving* it is applied to. But this only serving to shew the work piece-meal, they have had recourse to other ways, to shew the whole figure. The first, by pouring melted lead on a piece of paper, and clapping the matrix thereon: the second, with melted sulphur, managed the same way; and the third, proper only where the *graving* is shallow, by laying a piece of soft paper on the *graving*, and over the paper a leaf of lead; when, giving two or three blows with a hammer on the lead, the paper takes the impression of the work.

When the matrix is quite finished, they temper it, rub it well with a pumice-stone, and clean out the stone again with a hair-brush; and lastly, polish it with oil and emery. In this condition it is fit for the mill, to be used to strike coins, medals, &c.

After the like manner, are the matrices for casting of printing letters engraven. See *Letter Foundery*.

ENGRAVING of seals, stamps, punchions, marking irons, gilding irons, and other matters, for goldsmiths, pewterers, bookbinders, &c. either in relief, or indenture, is performed after the manner last described.

ENGRAVING in wood. See *Cutting in wood*.

ENGROSSING, the writing a deed over fair, and in proper legible characters. See *Copy*, *Calligraphus*, &c.

ENGROSSING, in matters of trade, signifies the buying up any commodity in the gross; or forestalling the market. See *Forestal*.

ENGUICHE, in heraldry, is applied to the great mouth of a hunting horn, when it has a rim of a different colour from the horn itself.

ENGYSCOPE, a machine, better known under the name of *microscope*. See *Microscope*.

ENHARMONIC, the last of the three genera, or kinds of music.

The *enharmonic* genus, is said to have been thus called by reason of its superior excellence; though wherein that consists, says, Mr. Malcolm, we do not see. It was by all acknowledged so difficult, that few could practise it.

The several genera are divided into diastems, upon which the differences depend: those of the *enharmonic* are the *diests* and *ditonum*: those of the *chromatic*, the *hemitonium* and *trihemitonium*; and in the *diatonic*, the *hemitonium*, or *limma*, and the *tonus*.

But under these general names, which distinguish the genera, there are several different intervals, or ratios, which constitute the *chraai*, or *colores generum*, or species of *enharmonic*, *chromatic*, and *diatonic*. See *Diatonic*, and *Chromatic*.

ENHARMONICAL Diests. See the article *DIESTS*.

ENHERITANCE. See the article *INHERITANCE*.

ENIGMA. See the article *ENIGMA*.

ENIXUM *Sal*, among many of the chemists, a neutral salt, neither acid nor alkaline, but participating of both. Such are common salt, nitre, allum, vitriol, &c. See *SALT*, *NITRE*, *ALLUM*, *VITRIOL*, &c. others apply it to peculiar salts of this general kind.

ENMANCHE, in heraldry, is when a chief has two lines drawn from the middle of the upper edge, to the sides, the depth of half the chief; the two lines including an obtuse angle, whose vertex is the centre of the top of the chief. See *Tab. Herald. fig. 49*.

The heralds conceive this, as bearing some resemblance to *fleeves*; whence the etymology of the word, from the French *manche*, sleeve. It differs from *chappe*, where the lines come from the top to the bottom of the chief.

ENNEADECAETERIS *, in chronology, a cycle, or period of nineteen solar years.

* The word is Greek, *enneadecasteris*, formed of *ennea*, nine, *deka*, ten, and *eteris*, year.

Such is the lunar cycle invented by Meton, at the end whereof the moon returns to the same point, from which it departed. Whence the Jews, Athenians, and other nations, who were minded to accommodate the lunar months to the solar year, made use of the *enneadecasteris*; allowing to seven of the years thirteen months a piece, and to the rest twelve.

The Jewish *ENNEADECAETERIS* is properly a cycle of 19 lunar years, beginning from molad tohu, and returning again and again; whereof, every 3^d, 6th, 8th, 11th, 14th, 17th, and 19th, are embolismic, or of 383 days, 21 hours a-piece; the rest common, or of 354 days, 8 hours a-piece. See *YEAR*.—Consequently, the Jewish *enneadecasteris* is 6939 days, 13 hours.

ENNEAGON *, in geometry, a figure of nine angles, and nine sides.

* The word is formed of *ennea*, nine, and *gonia*, angle.

In fortification, *ENNEAGON* denotes a place with nine bastions. See *FORTIFIED Place*.

ENNEATICAL Days, are every ninth day of a sickness; which some imagine naturally occasion a greater alteration, either for the better or worse.

ENNEATICAL Years, are every ninth year of a man's life. See *CLIMACTERIC*.

ENORMOUS *, something excessive, or monstrous, especially in bulk.—The Colossus of Rhodes was of an *enormous* stature.

* The word is formed of the privative *e*, and *norma*, rule, *q. d.* void of, or contrary to rule, or measure, *contra norma*. In the corrupt ages of Latinity, they used *inormis* and *inormis*.

In the French *jurisprudence*, *lesso enormis*, *enormis damage*, is that which exceeds half the value of the thing sold.

ENQUEST, or *INQUEST*, in law, denotes an inquiry of a jury by hearing of witnesses.

This is the most usual manner of trial, in all causes, both civil and criminal, within this realm.—In civil causes, after proof is made on either side, of so much as each party thinks good for himself; if the doubt be in the effect, it is referred to the discretion of twelve indifferent men, impanelled by the sheriff for that purpose; and as they bring in their verdict, so judgment passeth; for the judge saith, *the jury findeth the fact thus*.—For the *enquest* in criminal causes, see *JURY*.

ENRICHED Column. See the article *COLUMN*.

ENROLLMENT. See the article *ENROLLMENT*. *Clerk of the ENROLLMENT of Fines.* See *CLERK of the Enrollments*.

ENS, ENTITY, Being, in metaphysics, is applied in a general sense, to every thing which the mind any way apprehends, and whereof it affirms, denies, proves, or disproves any thing.—This, other philosophers call *cogitable*, and *intelligible*; and the logicians, *thema*.

ENS, in a less general sense, signifies something that is, or exists some way further than by being conceived, or being capable of being conceived in the mind.—This is particularly called, *ens positivum* or *reale*, positive, or real being.—In opposition to which stands *non ens*.

ENS, in its proper, or restrained sense, is that to which there are real attributes belonging; or that which has a reality, not only out of the intellect, but in it self.—This is what is properly meant by *res*, thing; and what we otherwise call *ens reale*, and also *substantia*.

ENS rationis, is that which depends wholly on the mind; or which exists only in the imagination.—Of which they distinguish three kinds: *ens rationis affectivum*, which is done, or produced by the mind; as knowledge: *ens rationis subjektivum*, which is received into the mind; as science: and *ens rationis objectivum*, which is represented by the mind; as a chimæra, a golden mountain, or the like.

Which last, if it have no other manner of being, *i. e.* if it be represented so as it does not, or cannot be, it is what we most properly call *ens rationis*.—The generality of school philosophers, and the peripatetics among the rest, assert, that there are of these *entia rationis objectiva*.—Others deny there are, or can be any such thing.

Ens, or *Ens primum*, among chemists, denotes the most efficacious part of any natural mixt body, whether animal, vegetable, or fossile; wherein, all the qualities or virtues of the ingredients of the mixt, are comprehended in a little compals.

Paracelsus pretends to have been able to separate the *ens primum* from bodies, and with it to effect prodigious things towards the renovation, and reformation of youth: but his processes are so obscurely delivered, that nobody has been induced to try them.

Mr. Boyle gives us a process from M. le Febvre, whereby the *ens primum*, or essence of bawm, is easily obtained; he adds, that the effects of an *ens* of bawm, thus drawn, are no ways inferior to those of Paracelsus; and instances in a special friend of his, who, upon taking it only for a fortnight, the nails of his hands and feet fell off, and were succeeded by a set of new ones; which convinced him so far of its efficacy, that he left off taking it himself: but giving some of it to an old woman of seventy years of age, who served in the house, it produced the menes again; and that so copiously, as wonderfully to startle the woman.

Upon giving a little of it to an old hen, her feathers began to moult on the sixth day, and she grew stark naked; but before a fortnight was over, she had others in their room, which were fairer, and better coloured than the former.

The relation is odd enough; yet considering the hand we have it from, and how easily the thing is tried, it is much no body, has yet attempted to prosecute it.—The process is thus:

Having gathered, *e. gr.* some bawm, or other fitting plant, at the proper season and time; beat it into a pulp in a marble mortar, and putting it into a bolt-head hermetically sealed, digest it forty days in a dunghill, or other analogous heat. This done, take out the matter which will now be more liquid than before, and separating from it the dregs, or grosser parts, digest it anew in a gentle bath; that the remaining grosser parts may also subside: filtrate it, and add to it the fixed salt, drawn from the former dregs, dried and calcined. To the liquor thus prepared, add equal parts of the liquor of good sea-salt well purified, and melted, and then let to run *per deliquium*. Lastly, seal up the mixture in a bolt-head; and expose it to the sun six weeks longer. At the end of which term, the *ens primum* of the plant will be found swimming on the liquor, in a liquid, transparent form, sometimes of a green, and sometimes a reddish colour, according to the plant used.

Ens Veneris, or *Flower of Venus*, a chemical preparation from vitriol, first published by Mr. Boyle; held a specific in the rickets, and much commended in nervous cases, obstinate cachexies, loss of appetite, and obstructions of all kinds.

It is prepared by subliming equal parts of the powder of Cyprus vitriol, (calcined till it is of a dark colour) and of sal ammoniac, into the form of yellow flowers.—It has its name from the particles of Venus, copper, therein, imparted by the vitriol.

ENSCONCED, in the military art. See the article **INSCONCED**.

ENSEMBLE, a French term, sometimes used in our language; literally signifying *together*, or *one with another*:—being formed from the Latin *in* and *sumul*.

In architecture, we say the *ensemble*, or *tout ensemble* of a building, meaning the whole work, or composition, considered together, and not in parts; and sometimes also, the relative proportion of the parts to the whole.—All those pieces of building make a fine *ensemble*.

To judge well of a statue, or other work of sculpture, one must first examine, whether the *ensemble* be good.

The *tout ensemble* of a painting, is that harmony which results from the distribution of the several objects or figures, whereof the whole is composed.—This picture is good, taking the parts separately; but the *tout ensemble* is naught.

ENSIFORMIS Cartilago. See the article **XIPHOIDES**.

ENSIGN, in the military art, a banner, or colours, under which the soldiers are ranged, according to the different companies, or parties they belong to. See **FLAG**, **COLOURS**, and **STANDARD**.

The Turkish *ensigns*, are horses tails: those of the Europeans, are pieces of taffety, with diverse figures, colours, arms, and devices thereon. Xenophon tells us, that the *ensigns*, bore by the Persians, was a golden eagle on a white flag: the Corinthians bore the winged horse, or Pegasus, in theirs; the Athenians an owl: the Messenians, the Greek Letter M: the Lacedaemonians the A.

The Romans had a great diversity of *ensigns*; the wolf, minotaur, horse, boar, and at length the eagle, where they stopped: this was first assumed in the second year of the consulate of Marius.

A military *ensign* on a medal of a Roman colony, denotes it a colony peopled with old soldiers.

ENSIGN, is also used for an officer in the infantry, who bears the *ensign*, or colours; by the Latins called *signifer*, and *vexillifer*.

He has the charge of the *ensign* in battle; and if he be killed, the captain is to take it in his stead.—The *ensign* is under the command of the lieutenant, and in his absence supplies his post.

ENTABLATURE *, in architecture, is that part of an order of column which is over the capital; comprehending the architrave, frieze, and cornice. See **ARCHITRAVE**, **FRIZE**, and **CORNICHE**.

* The word seems formed of the Latin *tabulaturus*, or *intabulamentum*.

The *entablature* is also called the *trabeation*; and by Vitruvius and Vignola, *ornament*: it is different in the different orders: Indeed it consists of the three grand parts, or divisions above mentioned, in all; but those parts consist of a greater, or less number of particular members, or sub-divisions, as the orders are more or less rich.

Vignola makes the *entablature*, a quarter of the height of the whole column, in all the orders.

In the Tuscan and Doric, the architrave, frieze, and cornice, are all of the same height. In the Ionic, Corinthian, and Composite, the whole *entablature* being fifteen parts; five of them are allowed for the architrave, four for the frieze, and six for the cornice. See **IONIC**, **CORINTHIAN**, &c.

ENTABLATURE, or **ENTABLAMENT**, is sometimes also used for the last row of stones on the top of the wall of a building, whereon the timber and the covering rest.

As this is frequently made to project beyond the naked of the wall to carry off the rain, some authors call it in Latin *stillicidium*, or drip.—Such an *entablature* does not stand out far enough: it lets the water fall on the foot of the wall.

ENTAIL, in law, signifies *see tail*, or *see entailed*; that is, abridged, curtailed, or limited to certain conditions. See **FEE**, and **TAIL**.—For the docking of an *entail*. See **DOCKING**, and **RECOVERY**.

ENTE, in heraldry, literally implies *engrafted*; and is used by the foreign heralds to express a method of marshalling, little known among us.—Yet we have an instance of it in the fourth grand quarter of his Majesty's royal ensign; whose blazon is, Brunswic and Lunenburg impaled with ancient Saxony, *enté in pointe*.

ENTELECHIA, **ENTELEXIA**, a Greek term, by which Aristotle defines the soul; and which not occurring in any other author, has given the critics and philosophers infinite perplexity to discover its true meaning. See **SOU**.

Hermolaus Barbarus, is even said to have consulted the devil about it; after which, in his paraphrase on Themistius, whether from the devil or himself we know not, he renders it by *perfectibilia*, which is not a whit the clearer. Cicero, whose interpretation should be preferable to that of any modern, defines *entelechia* (*Tuscul. q. L. I. C. 1.*) to be *a certain, continued, and perpetual motion*: whence it should seem that Aristotle took the soul for the mode of the body; a *continuous motion* being doubtless a mode of body.

The common peripatetics hold *entelechia* to signify *act*; and under it, suppose the form of the compound, or animal, to be understood.—Accordingly, some define it any *act*, whether substantial or accidental, considered as capable of performing some operation in the body.—Others define it a substantial *act*, whereby a thing is, what it is, in substance. Lastly, other, and those the latest peripatetics agree that the *act* or *entelechia*, is whereby Aristotle meant to explain the nature of the soul, is either some mode of the body, as motion, or it is nothing at all.—And thus the peripatetic notion comes round to that of Cicero.

ENTENDEMENT, in law. See the article **INTENDEMENT**.

ENTERFERING, in the manage. See the article **CURYTING**.

ENTEROCELE *, **ΕΝΤΕΡΟΚΗΛΗ**, in medicine, a rupture, or descent of the intestines.

* The word is formed of the Greek, *επιστρεφω*, *intestine*; and *κηλη*, *tumor*.

The *enterocèle* is a kind of hernia, or rupture, wherein the intestines, and particularly the ilium, fall either into the groin, or the scrotum. See **HERNIA**.

There are two kinds of *enterocèle*; the *perfect*, which happens when the intestine falls into the scrotum; and the *imperfect*, when it only falls into the groin.

The next cause of the *enterocèle*, is the relaxation, or extension of the lower part of the peritonæum, wherein the intestines are contained.—The remote causes are great lifts, too violent exercises, great coughs, frequent vomiting, much crying, &c. whence it is that children are much subject thereto.—The remedy is chiefly by external applications, as trusses and boullsters.

ENTERO-EPIPLOCELE, **ΕΝΤΕΡΟΠΙΠΛΟΚΗΛΗ**, a kind of rupture, wherein the intestines, and epiploon, or caul, fall together into the scrotum. See **HERNIA**.—The causes are the same as those of the *enterocèle*. See **ENTEROCELE**.

ENTERO-EPIPLOMPHALUS *, a kind of exomphalus, wherein the intestines, and epiploon, or caul, bunch out at the navel.

* The word is composed of *εντερον, intestine, επιπλον, caul,* and *ομφαλον, umbilicus, navel.*

ENTERO-HYDROMPHALUS *, in medicine, a kind of exomphalus, wherein, beside a displacing and bunching out of the intestine, there is a deal of watery humours collected along with it.

* The word is formed of the Greek, *εντερον, intestine, υδωρ, water,* and *ομφαλον, navel.*

ENTEROLOGY, (from *εντερον, intestine,* a gut, and *λογον, sermo, discourse,*) is properly a treatise of the bowels. — Though the word is generally understood to include the contents of three cavities, head, breast, and all the viscera, or belly.

ENTEROMPHALUS *, ENTEPOMPHALOS, in medicine, a kind of exomphalus, wherein the intestines being fallen out of their place, occasion a tumor in the navel. See EXOMPHALUS.

* The word is formed of the Greek, *εντερον, intestine,* and *ομφαλον, umbilicus.*

ENTERPLEDER, in law, the discussing, or trying a point incidentally falling out, before the principal cause can be determined.

Thus, two persons being found heirs to land, by two several offices in one county; the king is brought in doubt, to which of them livery ought to be made. Before livery, therefore, they must *enterplede*, that is, formally try between themselves which is the right heir.

ENTERMENT, or INTERMENT. See INTERMENT.

ENTHUSIASM *, ENΘΟΥΣΙΑΣΜΟΣ, a poetic or prophetic rage, or fury, which transports the mind, enflames and raises the imagination, and makes it conceive and express things extraordinary, and surprizing.

* The word is derived from the Greek, *ενθουσιαι, a man animated in an extraordinary manner with the spirit of God, in whom God is, or whom God animates.* Whence, the verb *ενθουσιαιζω, or ενθουσιαιω, and the noun ενθουσιαισμος, enthufiasm;* and *ενθουσιαιστος, enthufiast,* a person subject to such transports.

M. de Piles defines *enthufiasm*, to be a transport of the mind, whereby it is led to think and imagine things in a sublime, surprizing, yet probable manner.

The sublime, he thinks a necessary ingredient in the definition; as being the proper effect, and production of *enthufiasm*. — *Enthufiasm*, he adds, contains the sublime; as the trunk, the branches.

This is the *enthufiasm* felt in poetry, oratory, music, painting, sculpture, &c. But this *enthufiasm* which belongs to the works of art, is very different from that attributed to the sibyls and priestesses of the oracles, and heathen gods; which was little else but fanaticism, and consisted principally in grimace, and contortions of the body. See ORACLE, and PYTHIAN. See also the preface to this book.

There is a degree of assent, says Mr. Locke, which, with some men, has the same authority, as either faith or reason; and that is *enthufiasm*; which laying by reason, would set up revelation without it; whereby, in effect, it takes away both reason and revelation, and substitutes in the room of it, the ungrounded fancies of a man's own brain, and assumes them for a foundation both of opinion and conduct.

Immediate revelation being a much easier way for men to establish their opinions, and regulate their conduct by, than the tedious labour of strict reasoning; it is no wonder, that some have been very apt to pretend to it; especially in such of their actions and opinions, as they cannot account for by the ordinary methods of knowledge, and principles of reason. Hence we see, that in all ages, men, in whom melancholy has mixed with devotion, or whose conceit of themselves, has raised them into an opinion of a greater familiarity with God, than is allowed others; have often flattered themselves with the persuasion of an immediate intercourse with the deity, and frequent communications from the divine spirit.

Their minds being thus prepared, whatever groundless opinion comes to settle itself strongly upon their fancies, is an illumination from the spirit of God; and whatsoever odd action they find in themselves an inclination to do, that impulse is concluded to be a call, or direction, from heaven, and must be obeyed.

This we take to be properly *enthufiasm*, which, though rising from the conceit of a warm, or overwearing brain, works, where it once gets footing more powerfully on the persuasions and actions of men, than either reason, or revelation, or both together; men being most forwardly obedient to the impulses they receive from themselves.

When men are once got into this way of immediate revelation, of illumination without search, and certainty without proof, reason is lost upon them; they are above it: they feel the light infused into their understanding, and they cannot be mistaken; like the light of bright sun-shine, it shews it

self, and needs no other proof but its own evidence: they feel the hand of God moving them within, and the impulses of the spirit, and cannot be mistaken in what they feel. — But of this seeing and feeling, is it a perception of an inclination to do something, or of the spirit of God moving that inclination? these are two very different perceptions, and should be carefully distinguished.

If they know the thing to be a truth, they must do it, either by its own self-evidence, or by the rational proofs that make it out to be so: if they know it to be a truth, either of these two ways, they in vain suppose it to be a revelation: for thus all truths, of what kind soever, that men uninspired, are enlightned with, come into their minds. If they say, they know it to be true, because it is a revelation from God, the reason is good; but then it will be demanded, how they know it to be a revelation from God? if they say, by the light it brings with it; they should consider, whether this be saying any more, than that it is a revelation, because they believe it to be true; for all the light they speak of, is but a strong persuasion of their own minds, that it is a truth; which is a very unsafe ground to proceed on, either in our tenets or actions. True light in the mind, is nothing else but the evidence of the truth of any proposition; and, if it be not evident, all the light it can have, is from the clearness of those proofs upon which it is received. See EVIDENCE.

God, when he makes the prophet, doth not unmake the man: he leaves his faculties in the natural state, to enable him to judge of his inspirations, whether they be of divine original, or no. If he would have us assent to the truth of any proposition, he either evidences that truth by the usual methods of natural reason, or else makes it known to be a truth which he would have us assent to by his authority; and convinces us, that it is from him, by some marks, which reason cannot be mistaken in.

The holy men of old, who had revelations from God, had something else besides internal light of assurance in their own minds, to testify to them, that it was from God. They had outward signs to convince them, of the author of those revelations. And when they were to convince others, they had a power given them to justify the truth of their communion from heaven; and by visible signs to assert the divine authority of the message they were sent with. Moses saw the bush burn without being consumed, and heard a voice out of it. God, by another miracle, of his rod turned into a serpent, assured him likewise of a power to testify his mission, by the same miracle repeated before those to whom he was sent.

ENTHUSIAST, ENΘΟΥΣΙΑΣΤΗΣ, a person possessed with *enthufiasm*. See ENTHUSIASM, FANATIC, &c.

The word is usually understood in an ill sense. — It was applied by the ancients, to a sect of heretics, called also *Massilians*, and *Euchites*; who, as Theodoret expresses it were denominated *enthufiasts*, by reason that being possessed by the devil, they believed themselves divinely inspired. See MASSALIANS, and EUCHITES.

Among us, *enthufiast* is of like import with *fanatic*; and is applied to the quakers, the ancient anabaptists, and modern prophets, from their pretences to extraordinary lights, revelations, visions, impulses, &c. from heaven.

ENTHYMEME *, in logic, an argument consisting only of two propositions, — an antecedent, and a consequent deduced from it.

* The word is Greek, *ενθυμημα*, formed of the verb, *ενθυμησθαι, to think, conceive,* a compound of *εν* and *θυμησθαι, mind.*

Aristotle calls it, the *rhetorical, or probable argument*; the schools, the *imperfect syllogism*, in contra distinction to the perfect, which consists of three propositions, and is called the *dialectical argument*.

It must be observed, however, that the *enthymeme* is really a perfect syllogism in the mind, and only imperfect in the expression, by reason one of the premises is suppressed, as being sufficiently clear and obvious, and easily supplied by the understanding of those with whom we discourse.

Thus, in every right lined triangle, the three angles are equal to two right ones; and consequently, they are in a isosceles triangle: is an *enthymeme*; the proposition that an isosceles is a right lined triangle, being omitted, as being sufficiently known and granted.

The *enthymeme* is the most simple and elegant of all arguments, being what a man, in arguing closely, commonly makes, without attending at all to the form thereof. Thus, that verse remaining of Ovid's tragedy, entitled, *Medea*, contains an *enthymeme*: *servare patris, perdere an possim rogas?* I was able to save you; consequently, to have destroyed you. All the beauty would have been lost, had all the propositions been expressed; the mind is displeas'd with a rehearsal of what is no ways necessary.

Sometimes also, the two propositions of an *enthymeme*, are both included in a single proposition; which Aristotle calls, an *enthymematical sentence*; and gives this instance thereof, *mortal* do

do not bear an immortal hatred. The whole *entisymone* would be, *thou art mortal, let not, therefore, thy hatred be immortal.*

ENTIRE Tenancy, in law, is contra-distinguished to *several tenancy*; and signifies a sole possession in one man: whereas the other denotes a joint, or common one, in several. See **TENANT**, and **JOINTENANT**.

ENTIRE Arm. See the article **ARMS**.

ENTITATIVELY, ENTITATIVE, implies an abstraction, or separation, of all the circumstances, from a thing under consideration.

Thus, a thing is said to be taken, or considered, *entitatively*, or *secundum entitatem*, when considered nakedly, and precisely, according to what it is in itself, without any thing extrinsic.—*E. gr.* Peter *entitatively* taken, is Peter, as a thing, a substance, a man, &c. without any regard to his being a lord, a husband, learned, &c.

ENTITY, in the school philosophy, a physical ens, or being, considered according to what it is in its natural capacity. Some dealers in distinctions, give us several kinds of *entity*.—In its proper sense, they apply it to a compages of dissimilar parts: such as is the *entity* of a house, of the world, &c.—In a more limited sense, they apply it to a congeries of similar parts: such as is the *entity* of water, heat, &c.—And, in its general sense, to any reality: such as the *entity* of God, of angels, &c.

But this is mere subtilty: perhaps *entity* were best defined the actual essence, or existence of any thinking thing.

ENTOYER, or ENTOYER, in heraldry, is used to express a bordure, charged entirely with things without life. See **BORDURE**.

ENTRAILS, the intestines, or guts, of an animal. See **INTESTINES**.

* *Mengage* derives the word from the barbarous Latin, *interalia*; formed of the Greek *επιτερον*, *intestine*.

In embalming they take out the *entrails*.
Poison leaves its chief marks in the *entrails*.

ENTRAILS, is also used, in a more extensive sense, for the viscera; or all the parts contained in the cavities of the bodies of animals. See **VISCERA**.

The *arsuspina* of the ancients, was employed in considering the *entrails* of victims, as the heart, lungs, liver, &c. See **ARUSPICES**, &c.

ENTRIES, amongst hunters, those places in thickets, through which deer are found lately to have passed; by means whereof their bigness, or size is guessed at; and at which the hounds, or beagles, are put to them for the view.

ENTRUSION, or INTRUSION, in law, denotes a violent, or unlawful entrance into lands, or tenements, void of a possessor; by a person who has no right to them.

Thus, when a man steps into lands, the owner whereof lately died, ere the right heir, either by himself, or any other, hath taken possession, it is *entrusion*.

Entrusion and *abatement*, are sometimes taken for the same thing: though there is a difference.

ENTRUSION, in the canon law. See **INTRUSION**.

ENTRY, or ENTRANCE, in its general sense, denotes a door, gate, passage, &c. through which to *enter*, or arrive within a place.

ENTRY, in book-keeping. See **BOOK-KEEPING**.
Bill of ENTRY. See the article **BILL**.

ENTRY, is sometimes also used to denote a duty, or impost, laid on commodities imported into a state, either by land or sea.

The duties of *entry*, or importation, are paid according to a tariff settled for that purpose. Where the duty of *entry* of any commodity, is not fixed by the tariff; it is paid by estimation, *i. e.* in proportion to what some other commodity, of nearly the same quality and value, uses to pay. See **IMPORTATION**, **EXPORTATION**.

ENTRY, also denotes a solemn reception; or a ceremony performed by kings, princes, ambassadors, legates, &c. upon their first *entering* a city, or their return in triumph from some expedition.

ENTRY, in law, signifies also the taking possession of lands, or tenements, in virtue of a title thereto. See **POSSESSION**.

Forcible ENTRY. See the article **FORCIBLE**.

ENTRY is also used for a writ which grants possession of lands or tenements to a person, on account of a legal right thereto.

Writs of entry, says Briton, favour much of the right of property: some, *e. gr.* are to recover customs, and services; and in these are contained the two words, *soleat* and *debet*.—Such are the writs *quo jure, rationabilibus divisiis, rationabili estoverio, &c.* In the *plea of Entry* there are three degrees: the first, where a man demandeth lands or tenements, of his own seisin, after the term is expired.—The second, where one demandeth lands or tenements, let by another after the term is expired.—The third, where one demandeth lands or tenements of

that tenant, who had *entry* by one to whom some ancestor of the plaintiff did let for a term now expired: and according to these degrees, the writs for remedy are varied.—Beside which, there is a fourth form, without degree, and in case of a more remote seisin, to which the other three degrees do not extend.

The writ in the second degree, is called a *writ of entry in le per*.—In the third, *in le per & cui*.—And in the fourth, without degree, a *writ of entry in le poss*; that is, after disseisin, made by such a one to such a one.

If a *writ of entry* be conceived out of the right case, so that one form is brought for another, it is abatable.

A *writ of entry* differs from an *affize*, in that it lies, for the most part, against him who entered lawfully, but holdeth against law; whereas an *affize* lieth against him, who unlawfully disseized: yet, sometimes, a *writ of entry* lieth upon an *entrusion*. See **ASSISE**.

ENVELOPE, in fortification, denotes a mount of earth, sometimes raised in the ditch of a place, and sometimes beyond it; being either in form of a simple parapet, or of a small rampart bordered with a parapet.

These *envelopes* are made, where weak places are only to be covered with single lines; without advancing towards the field; which cannot be done but by works which require a great deal of room; *such as horn-works, half moons, &c.—*Envelopes* are sometimes called *fillons, contreguards, conserves, lunettes, &c.*

ENVIRONNE, in the French heraldry, is when a lion, or other figure, is *environed*, or encompassed round with other things.—*Environné* with so many bezants, &c. in orle.

ENUMERATION, the act of numbering, or counting.

God challenges Abraham in scripture, to *enumerate* the stars: at the time of our Saviour's birth, Augustus Cæsar had commanded an *enumeration* to be made of all the world, or rather of all the people under his empire. Though several able authors are of opinion that the census, tax, or *enumeration*, mentioned by St. Luke, did not extend to the whole empire, but only to the people of Judæa. See *Perizonius de Consequi Judæa*: and *Berger de Viti Militariibus*.

At Rome, it was an usual thing to have an *enumeration* made of all the families: the first of these was under Servius Tullius, when the men amounted to 80 thousand, Pompey, and Crassus, made another when they reached to 400 thousand. That of Cæsar did not exceed 100 thousand: so that the civil wars must have destroyed 300 thousand Roman citizens. Under Augustus, in the year 725, the Roman citizens throughout the empire were numbered at 4 million 63 thousand. In the year of Rome 746, the citizens being numbered again, were found 4 millions, 2 hundred 33 thousand. In the year 766, being the last year of Augustus's reign, that prince, together with Tiberius, made another *enumeration* of the citizens of Rome, when they were found 4 millions 137 thousand persons. Claudius made a new computation, in the year of Christ 48, when, as Tacitus relates it, the Roman citizens throughout the whole empire, amounted to 6 millions 964 thousand; though others represent the number as considerably greater.—A very rare, yet indisputable medal of Claudius, never yet made public, expresses the precise number in this list made by Claudius, which was called *estense*, to be 7 millions of people fit to bear arms, beside all the soldiers on foot in the armies, which amounted to 50 legions, 57 cohorts, and 66 soldiers.—After this *enumeration* we find no more till that of Vespasian, which was the last.

ENUMERATION, in rhetoric, denotes a part of the peroration, wherein the orator, collecting the scattered heads of what has been delivered throughout the whole, makes a brief and artful rehearsal, or recapitulation thereof.

ENUMERATION of the parts, in rhetoric, amounts to the same, with what we more usually call *distribution*. See **DISTRIBUTION**.

ENUNCIATION, a simple expression, or declaration, of a thing, in terms either of affirmation, or denial.

The schoolmen usually distinguish three operations of the understanding; apprehension, *enunciation*, and reasoning.

ENUNCIATION, among logicians, denotes the same as *proposition*. See **PROPOSITION**.

ENVOICE. See the article **INVOICE**.

ENVOY, a person deputed, or sent purposely to negotiate some particular affair with a foreign prince, or republic.

Those sent from the courts of England, France, &c. to Genoa, the princes of Germany, and other petty princes and states, do not go in quality of ambassadors, but of *envoys*.

Add, that those sent from one great prince, or state, to another; as from the king of England to the emperor, &c. when the affair they go upon is not very solemn and important, have frequently no other character but that of *envoys*. See **EMBASSADOUR**.

Envoys are either *ordinary*, or *extraordinary*.

Both kinds are under the protection of the law of nations, and enjoy all the privileges of embassadors; only differing from them in this, that the same ceremonies are not performed to them.

The quality of *envoy* extraordinary, Wicquefort observes, is very modern; more modern than that of resident: the ministers invested therewith, at first, took on them most of the airs of embassadors; but they have since been taught otherwise.

In the year 1639, the court of France made a declaration, that the ceremonies of conducting *envoys* extraordinary to their audience in the king and queen's coaches, with diverse others, should no longer be practised to *envoys*.

S. Justiniani, the first *envoy* extraordinary from Venice, after that regulation offered to cover, in speaking to the king; but it was refused him. And the king of France himself declared, that he did not expect his *envoy* extraordinary at the court of Vienna, should be regarded any otherwise than as an ordinary resident.

—Since this time, those two kinds of ministers have been treated alike. Wicquefort.

ENURNY, is the herald's term, for the bordure of a coat of arms being charged with any kind of beak.

EOLIC, or rather **ÆOLIC**. See **ÆOLIC**.

EON, or **ÆON**. See the article **ÆON**.

EPACTS, in chronology, the excesses of the solar month above the lunar synodical month; and of the solar year above the lunar year of 12 synodical months; or of several solar months, above as many synodical months; and several solar years above as many dozen of synodical months.

The *epacts*, then, are either *annual* or *menstrual*.

Menstrual EPACTS, are the excesses of the civil, or calendar month, above the lunar month.

Suppose, *e. gr.* it were new moon on the first day of January; since the lunar month is 29 days 12^h 44^m 3^s; and the month of January contains 31 days; the menstrual *epact* is 1 day 11^h 15^m 57^s.

Annual EPACTS, are the excesses of the solar year above the lunar.

Hence, as the Julian year is 365 days 6 hours, and the Julian lunar year 354 days 8^h 48^m 38^s; the annual *epact* will be 10 days 21^h 11^m 22^s; that is, nearly 11 days. Consequently, the *epact* of 2 years, is 22 days; of 3 years, 33 days; or rather 3, since 30 days make an embolismic, or intercalary month.

Thus, the *epact* of 4 years is 14 days, and so of the rest; and thus, every 19th year, the *epact* becomes 30 or 0; consequently the 20th year the *epact* is 11 again; and so the cycle of *epacts*, expires with the golden number, or lunar cycle of 19 years, and begins again with the same, as in the following table.

Gold. Numb.	Epact.	Gold. Numb.	Epact.	Gold. Numb.	Epact.
1	XI	7	XVII	13	XXIII
2	XXII	8	XXVIII	14	IV
3	III	9	XIX	15	XV
4	XIV	10	XX	16	XXVI
5	XXV	11	I	17	VIII
6	VI	12	XII	18	XIX
				19	XXX

Again, as the new moons are the same, that is, as they fall on the same day every 19 years, so the difference between the lunar and solar year, is the same every 19 years. And because the said difference is always to be added to the lunar year, in order to adjust, or make it equal to the solar year; hence the said difference respectively belonging to each year of the moon's cycle, is called the *epact* of the said year, that is, the number to be added to the said year to make it equal to the solar year; the word being formed from the Greek, *επαγω, induco, intercalo*.

Upon this mutual respect, between the cycle of the moon, and the cycle of the *epacts*, is founded this rule for finding the *epact* belonging to any year of the moon's cycle. Multiply the year given of the moon's cycle into 11; and if the product be less than 30, it is the *epact* sought: if the product be greater than 30, divide it by 30, and the remainder of the dividend is the *epact*. For instance, I would know the *epact* for the year 1712, which is the third year of the moon's cycle. Wherefore 3 is the *epact* for 1712: for 11 x 3 = 33; and 33 being divided by 30, there is left 3 of the dividend for the *epact*.

By the help of the *epact* may be found what day of any month in any year the new moon falls on, thus: to the number of the month, from March inclusively, add the *epact* of the year given; if the sum be less than 30, subtract it out of 30; if greater, subtract it out of 60; and the remainder will be the day, whereon the new moon will fall.

If the new moon be sought for in the month of January or March, then nothing is to be added to the *epact*; if for February or April, then only 1 is to be added.

For example: I would know what day of December the new

moon was on A. D. 1711, the *epact* whereof is 22. By the aforesaid rule, I find it will be December the 28th; for 22 + 10 = 32, and 60 - 32 = 28. See **MOON**.

The day whereon the new moon falls, being thus found it is easy to infer from thence what the age of the moon is on any day given. See **MOON**, and **AGE**.

However, there is a peculiar rule commonly made use of to this purpose, which is this: add the *epact* of the year, the number of the month, from March inclusively, and the given day of the month all into one sum, this if it be less than 30, shews the age of the moon; if it be greater than 30, divide it by 30, and the remainder of the dividend shews the age of the moon, or how many days it is from the last new moon: this method will never err a whole day.

For instance: what was the age of the moon on December 31st, A. D. 1711? by this rule, I find, that the Moon was then three days old; that is, it was then three days from the last new moon: For 22 + 10 + 31 = 63, and 63 being divided by 30, there will remain of the dividend 3. And this exactly agrees to the other foregoing rule, whereby it was found that the new moon was on December 28, 1711.

It must be observed, that as the cycle of 19 years, anticipates the new moons by one day in 312 years; the same cycle of *epacts* will not always hold: the moon's anticipation lessening the several *epacts* by one; every 312 years.

To have the *epacts*, therefore, point out the new moons perpetually; that *epact* given in the calendar is not sufficient; but all the 30 *epacts* should be bestowed throughout the whole year, that the calendar may exhibit all the cycles of *epacts*.

And, again, as in 300 Gregorian years, there is one bissextile year dropped; the new moons are thus thrown on the following day. Consequently, by the moon's post-position there is one added to every *epact*.

EPANORTHOSIS *, in rhetoric, a figure, whereby the orator revokes, and corrects something before alleged, as too weak; and adds something stronger, and more conformable to the passion he is agitated by.

* The word is Greek *επανορθωσις*, formed of *επαο*, right, straight, whence *επαο*, I straighten, *αρθωσις*, *επανορθωσις*, I revoke, straighten, correct, and *επανορθωσις*, correction.

Accordingly, the Latins call it *correctio*, and *emendatio*.

Such, *e. gr.* is that of Cicero for Cælius: *O Multitia! Multa: tuamne dicam, an impudentiam singularum. Oh folly! lolly did I call it, or rather intolerable impudence.—And in the first catilinarian; quamquam quid loquor! te ut ulla res frangat? tu ut unquam te corrigas? tu ut ulla fugam meditare? tu ut ulla exitium cogites? utinam tibi istam mentem Divi immortales donarent.—Thus also Terence, in the *Heautontimorumenos*, introduces his old man Menedemus, saying,*

Filium unicum adolescentulum Habes. Ab! quid dixi habere me? imo habui, Cbrema, Nunc habeam necne, incertum est.

EPAULE *, or **ESPAULE**, in fortification, the shoulder of the bastion; or the angle made by the face and flank; or otherwise called the *angle of the epaule*. See **BASTION**, and **ANGLE**.

* The word is pure French, and literally signifies *shoulder*.

EPAULEMENT, in fortification, a side-work hastily thrown up, to cover the canon, or the men.

It is made either of earth thrown up, of bags filled with sand or earth, or of gabions, fascines, &c. with earth: of which latter sort the *epaulements* of the places of arms, for the cavalry, behind the trenches, usually are.

EPAULEMENT, is also used for a demi-bastion, consisting of a face and flank, placed at the point of a horn or crown-work.

—Also, for a little flank, added to the sides of a horn-work, to defend them when too long.—Also, for the redoubts made on a right line to fortify it.—And lastly, for an orillon, or mass of earth almost square, faced and lined with a wall, and designed to cover the canon of a casemate. See **BASTION**, and **ORILLON**.

EPENTHESIS *, in grammar, the addition, or insertion of a letter or syllable, in the middle of a word.—As, *relligio* for *religio*, *maavors* for *maors*.

* The word is Greek, *επερθεσις*, formed of *επι*, *ει*, and *τιθημι*, *q. d.* *επερθημι*, *insero, immitto*.

EPHA, a dry measure in use among the Hebrews. See **MEASURE**.

The *epha* was the most ordinary measure they used; and that whereby the rest were regulated. It is commonly supposed that the *epha*, reduced to the Roman modius contained four modii and a half. Now the Roman modius of grain, or flower, contained 20 librae, or pounds; consequently the *epha* weighed 90 pounds. Dr. Arbuthnot reduces the *epha* to three pecks, three pints, English measure. The hospitality of Gideon is extolled for baking an *epha* of flower for a single angel; which might have served 45 men a whole day; the usual portion allowed the workmen being two pound of bread *per diem*.

EPHEMERA *, in medicine, an epithet applied to something that only lasts a day.—Particularly, to a sort of fever, which terminates in the compass of twenty four hours: called by

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Galen, *επιμυστος πυρετος*, *febris ephemera*, by the Latins *diaria*. See FEVER.

* The word, and the following one, *ephemerides*, are formed of the preposition *επι*, *de*, *of*, and *ημερα*, *die*, *day*.

EPHEMERON, or **EPHEMERA**, in natural history, denotes an animal, that only lives five hours: within the term whereof it is born, grows and extends its members, breeds eggs, propagates its species, grows and dies.

Aristotle, who gives the first account thereof, in his book *de Animal*, calls it by the name, *επιμυστος*, because its life is bounded within the day.—Aldrovandus, Johnston and Clufius, furnish us accounts of the *ephemeron*; and above all, Swammerdam, in an express work *de Ephem. Vita*.—He calls it *ephemera*, *hemerobios*, and in Latin, *diaria*.

The *ephemeron* is of the winged, or fly kind; and appears usually about St. John's tide. It is born about six a clock in the evening, and dies about eleven.

It must be observed, however, that before it assumes this figure, it has lived three years under that of a worm, in a clay cell, or case.

It never eats from the time of its change to its death; nor is it furnished with the parts necessary for the reception and concoction of food. Its metamorphosis seems intended merely for the sake of generating and multiplying its kind.

The business of its life is summed up in a few words. In the beginning, it sheds its clay coat; which done, and the poor little animal thereby rendered light and agile, it spends the rest of its short and winged state in frisking over the waters. During which, the female drops her egg on the waters, and the male does his office to impregnate them. These eggs, thus impregnated, descend to the bottom of the water by their own gravity, and are hatched by the warmth of the sun into little worms, which make themselves cases in the clay, and feed on the same without any need of parental care: till the time of their change, or metamorphosis come.

EPHEMERA, is also applied among botanists, to a kind of flowers, which open, and expand themselves at sun-rising, and wither or close up again at his setting.—Such are the dent delion, vulgarly dandelion, and diverse others.

Travellers into Arabia tell us of several *ephemeron trees*, which they say grow up every day, from morn to noon, and then disappear; though it is not known, whether they wither away entirely, or sink back into the sands among which they grow.

EPHEMERIDES, in astronomy, tables calculated by astronomers, shewing the present state of the heavens for every day, at noon; that is, the places wherein all the planets are found at that time.

It is from these tables, that the eclipses, conjunctions, and aspects of the planets, are determined; horoscopes, or celestial schemes constructed, &c.

We have *ephemerides* of Origan, Kepler, Argoli, Heckerus, Mezzaracchis, Wing, de la Hire, Parker, &c.—Sig. Cassini has calculated *ephemerides* of the sidera medicæ, or fatellites of Jupiter, which are of good use in determining the longitude.

EPHETÆ, in antiquity, a sort of magistrates among the Athenians, instituted by king Demophon, to take cognizance of murders committed by accident.

Their number was 100, whereof 50 were Athenians, and 50 Argians: they were not admitted to the post till upwards of 60 years of age.—Draco extended their authority: Ubbo Emmius *de Rep. Athen.* says, he transferred to them part of the jurisdiction of the Areopagites.

EPHIALTES, *ΕΠΙΛΑΘΗΣ*, or *ΕΠΙΛΑΘΗΣ*, in medicine, a disease, by the English called the *night mare*, and by the Latins, *incubus*; chiefly affecting persons asleep, when laid on their back, and having the stomach loaded with food of difficult digestion.

In this state they are oppressed, as it were, with a great weight on the breast, and imagine some spectre, or demon, stopping their breath.

The disease does not arise, as was anciently imagined, from gross vapours filling the ventricles of the brain: but chiefly from a too great repletion of the stomach, which hinders the motion of the diaphragm, and of consequence, the dilatation of the breast necessary for inspiration.

The pressure of the cerebrum on the cerebellum, and that of the full stomach on the descending trunk of the aorta, seem also to be concerned in this manner: for neither of these can happen without affecting the nerves that pass to the muscles of respiration. Without supposing one or both of these, it will be hard to assign a reason, why persons should be rather affected when laid on the back, than in any other posture.

Etmuller observes, that they are but rarely affected with this disorder who use a laudable diet, and sup sparingly: lying on the side, with the head pretty high, generally prevents it.

The Arabs call it, the *nocturnal epilepsy*, because, when habitual, it usually degenerates into the epilepsy, being the usual forerunner thereof, especially in young people.—In old, it frequently terminates in an apoplexy.

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Menjoitius accounts for its being most usual in boys, from their being too voracious, and eating more than they can digest.—Aurelianus assures us, it has killed several; adding from Symmachus, that there was a contagious, or epidemic *epibolæ* at Rome, which destroyed numbers, like a plague.

EPHIPPIUM, *ΕΠΙΠΠΙΟΝ*, in anatomy, a part of the sphenoïdes, called also *fella equina*, and *fella turcica*.

EPHOD *, a sacerdotal garment, in use among the ancient Jews, supposed to have been a kind of linnen alb, or surplice; the same with what the Latins call *super-humeralæ*.

* The word is Hebrew, *יֵפֹד*, *ephod*, derived from *יָפַד* *aphad*, signifying *to cloath*.

It is very hard to say precisely what the *ephod* was; and there is room enough for the interpreters to be divided about it. The only point they are agreed upon is, that it was an upper garment wore over all the rest, immediately under the pectoral, or breast-plate. Some hold it had sleeves; others deny it. The generality agree that it was very short, though some hold, that it hung down to the feet behind.

There were two kinds of *ephods*; the one, common to all who assisted in the temple; being only made of common linnen, mentioned in the 1st book of Samuel, ii. 18. The other, peculiar to the high-priest, mentioned Exod. xxviii. 6, 15, to be made of gold, of blue, and of purple, of scarlet, and fine twined linnen, with cunning work; having two shoulder pieces, with a curious girdle of the same matter, whereon were two onyx's, with the names of the children of Israel engraved thereon.

It is also expressed, in the 2d book of Samuel, vi. 14. that upon the removal of the ark of the covenant from the house of Obed Edom, David danced for joy, girt with a linnen *ephod*; whence some authors have concluded, that the *ephod* was also a regal garment worn on solemn occasions.

EPHORI *, *ΕΦΟΡΟΙ*, magistrates established in ancient Sparta, to balance, and check the power, and authority of the kings: as, at Rome, there were tribunes created to controul the power of the consuls.

* The word is formed of the Greek, *εφορα*, *intuor*, formed of the preposition *επι*, and the verb *εφα*, *to see*; whence *εφορος*, *q. d. Inspector, overseer*.

Lycurgus, being sensible that a perfect understanding between the prince and the people, was the basis and foundation of both their happiness; to maintain that good understanding, established *ephori*, or inspectors, as a kind of mediators, who should have an eye to the measures and conduct of both sides, to balance, and check the power, and authority of the kings: so equal a balance between them, that the regal power should never decline into severity and tyranny; nor the liberty of the people run into license and rebellion.

The authority of the *ephori* was very great: on certain occasions, they expelled, and even put to death, the kings; and abolished, or suspended the power of the other magistrates; calling them to account at pleasure. Agefilus, in the height of all his conquests, which even struck terror on the great king of Persia; stopped, and turned back, out of deference to the *ephori*, when they recalled him.

Some authors deny, that the *ephori* were established by Lycurgus; dating their origin 130 years after the time of that legislator.

EPIBATERION, a poetical composition, in use among the ancient Greeks.—When any person of condition, and quality, returned home after a long absence, or journey, into another country; he called together his friends, and fellow-citizens, and made them a speech, or rehearsed them a copy of verses, wherein he returned solemn thanks to the immortal gods, for his happy return, and ended with an address, by way of compliment, to his fellow-citizens.

These verses, made what the Greeks call *επιβατηριον*, *epibaterium*, of *επιβατω*, *I go aboard*.—At going away, they had another, called *epobaterium*.

EPIC POEM, an heroic poem; or a poem reciting some great, and signal transaction of a hero: called also *εποποιια*.

Such are the *iliad* and *odyssæ* of Homer, the *æneid* of Virgil, the *jerusalemme* of Tasso, and the *paradise lost* of Milton; which are the principal poems of the *epic* kind.

An *Epic poem*, according to Sir R. Blackmore, is a probable, marvellous narration of an important enterprise, or great suffering of some illustrious person, related with dignity, in verse of the sublime style, to give delight and instruction.

The *epic* poem, is more accurately and scientifically defined, by Bossu, a discourse invented with art, to form the manners, by instructions disguised under the allegory of an important action, related in verse, in a probable, entertaining, and surprising manner.

The *epic* poem is distinguished from comedy, in that the action of the latter is not important, nor is it related by the poet, but acted by the persons introduced for that purpose; which circumstance, likewise, distinguishes it from tragedy.

Nor is it a philosophical poem, as that of Lucietius, or the creation of Sir R. Blackmore; nor a treatise of agriculture, or the like; as the *georgics* of Virgil; those poems not being in-

intended to form the manners; beside, that the instructions they contain are naked, simple, and direct, without any disguise, or allegory. Which second circumstance likewise distinguishes it from a treatise of morality, wrote in verse: or a simple history in verse, as the paraphrase of Lucan; or the punie war of Silius; or the civil wars of Sam. Daniel: add, that its being confined to one important action, distinguishes it from a poem which relates all the actions of a person's life; as the thesoid and achilled of Statius, which are what we properly call *heroic poems*.

M. de la Motte, indeed, in his controversy with madam Dacier, on the subject of Homer, maintains, that the whole life of a hero, may justly be made the subject of an *epic poem*; and even, that the Lutrin of M. Boileau, might pass for an *epic poem*: but he seemed, afterwards, to return to the common sentiment. In effect, the question is not as to the sense, which may be annexed to the words *epic poem*, but the sense which custom has actually annexed to them.

If we had only regard to the etymology of the word *epic*, (*ἐπὶ ἔπος, versè, poetry*, from *εἶπα, dico, I speak, relate*) all poems wherein the poet speaks, or rehearses things himself, without making the persons of his poems speak, except at second hand, as he relates what they spoke on this or that occasion, would be properly *epic poems*; and so, there is not an epigram, sonnet, or madrigal, but would come under this denomination. But this were wild.

In effect, the term *epic poem*, is only attributed to a composition, whose subject is great, instructive, and serious; that only comprehends one single principal event, to which all the rest refer; which principal action is to be terminated in a certain space of time, ordinarily about a year. It is true, all this is arbitrary; but the sense of all words is so too: and in matters of language we must be guided by custom.

If M. de la Motte had only pretended, that one might make a fine, instructive poem, on the whole life of a hero; or an agreeable, and diverting poem, on some humourous adventure; all the world would have been of his side. But it is enough that custom has not thought good to apply the term *epic*, either to subjects of too much extent, and that are stuffed with too many incidents no wise connected together; nor to burlesque poems, as the batrachomyomachia of Homer; the scæchia rapta of Tassoni; the dèsaite de Dulot; the Lutrin of Boileau; the Hudibras of Butler; the rape of the lock of Mr. Pope; or the dispensary of Dr. Garth.

The *epic poem*, then, as appears from what was above observed, bears a relation, or analogy, to four things; history, morality, fable, and poetry.—To *history*, as both of them relate one or more actions; but then, the actions of history are singular; so that the *epopeia* is no history, nor kind of history.

To *moral philosophy*, as both of them consist of instructions for forming the manners; but the action and allegories distinguish it herefrom.

But it relates entirely to poetry and fable, as being strictly a poem, and a fable.

The nature of the *epic poem*, is finely drawn by the great critic above-mentioned: the *epic poets*, says that. Bossu, have done that with regard to morality, which the ancient heathen divines did with regard to the divinity. The too great diversity of divine actions and perfections, so very disproportionate to our comprehension; obliged the latter to divide a single idea of a simple essence, God, into several persons; to whom they attributed several names, Jupiter, Juno, Neptune, &c. And, on the contrary; the nature of moral philosophy, which never prescribes rules for particular things, lead the poets to collect into one single idea; or into one and the same person, and one apparently singular action, whatever of that kind was found in different persons; and different actions.

Thus Aristotle, *Ὁ ἐπιχρηστικὸς ἡμιθεὸς ἄνθρωπος*, &c. Poetry, says he, teaches moral philosophy, not by relating only, in manner of an historian, what Alcibiades, for instance, did or suffered; but by proposing what some person, named as the poet thinks fit, would, probably, or necessarily have done on the like occasion. And thus it is that he shews either the unhappy consequences usually attending imprudent schemes, or ill actions; or the reward of good actions, and the satisfaction resulting from a design laid in virtue, and conducted with prudence. So that in the *epic poem*, according to Aristotle's sentiment, the persons and actions, however named, are all to be feigned, allegorical, and universal, not historical and singular.

But the poets thus taking on them the office of moral philosophers, did not cease to be divines. On the contrary, their morality itself frequently obliges them to introduce the deity in their works; as the knowledge, fear, and love of God, are the first and most solid foundations of all morality. The presence of the divinity, and the share so august a personage was supposed to have in the action, obliged the poet to make the action great and important, and to have it transacted by kings and princes. The same likewise obliged them to think and speak, in a manner ele-

vated above the common pitch of men; and equal, in some measure, to the dignity of the divine persons introduced. To which end serves the poetical and figurative language, with the majesty of heroic verse. Add, that as so much of the divine and miraculous might ruin the probability, they were hereby obliged to have recourse to several rules to maintain the fame.

Thus much the poets were driven to by the substance of the things they had chose for the matter of their poems and instructions. The manner of delivering them usefully and methodically, obliged them to several other necessary rules.

The *epic poem* is intended more for the manners and habits, than for the passions. These latter rise all at once, and their violence is but of short duration; but the habits are more calm, and impressed, or quitted more leisurely. Consequently, the *epic action* could not be included in the space of a day, as that of the theatrical. A longer time was necessary than is required for tragedy, which is altogether for the passions.

This distinction has introduced a world of difference between tragedy and *epic poetry*. The tragic violence requires a more lively and animated representation, than a mere recital. Accordingly, it is wholly thrown into action, and the poet never speaks at all, as he does in the *epopeia*, where there are no actors.—See further of the nature of the *epic poem* under *FABLE*.—For its matter, see *ACTION*. For its form, see *NARRATION*. See also *MANNERS, CHARACTER, MACHINE, &c.*

EPICARPIUM *, **ΕΠΙΚΑΡΠΙΟΝ**, in medicine, a kind of remedy, usually in form of a cataplasm, or plaster; consisting of sharp, penetrating ingredients, as garlic, or onion, spiders-webs, hellebore, camphor, Venice treacle, &c. applied round the wrist, at the beginning of the access of a fever, to prevent the growth of the fame.

* The word is formed of the Greek *ἐπι, super, on*, and *καρπος, carpus, writ*.

EPICEDION *, **ΕΠΙΚΗΔΙΟΝ**, in the Greek and Latin poetry, a poem, or poetical composition, on the death of a person.

* The word is Greek, formed of *ἐπι, upon*, and *κεδος, funeral*.

At the obsequies of any man of figure, there were three kinds of discourses usually made: that rehearsed at his bustum, or funeral pile, was called *nenia*; that engraven on his tomb, *epitaph*; and that spoke in the ceremony of his funeral, *epicedion*. We have two beautiful *epicedions* in Virgil; that of Euryalus, and that of Pallas.

EPICERASTICS *, **ΕΠΙΚΕΡΑΣΤΙΚΑ**, in medicine, remedies, which by their temperate moisture, soften the acrimony of an humour, and assuage the painful sensation of a part irritated or afflicted by it: such are the roots of althea, mallows, liquorice; leaves of lettuce, mallows, water-lilly, purslain; the seeds of flax, poppy, &c.

* The word is formed of *ἐπι and ἐπιερραστια, tempero, I moderate, correct*.

EPICHIREMA, **ΕΠΙΧΙΡΗΜΑ**, in logic, an argumentation, consisting of four, or more propositions; some whereof are proofs of others.

Thus, that oration of Cicero for Milo, may be reduced to the *epichirema*: "Those who way-lay a man to kill him, it is lawful for him to kill; as is allowed by the laws of nature and nations, and by the practice of the best men: but Clodius way-laid Milo with that view; as appears from his forming an ambuscade before his country-house, and from his provision of weapons, soldiers, &c." Therefore it was lawful for Milo to kill Clodius.

EPICOENE, **ΕΠΙΚΟΙΝΟΝ**, in grammar, a term applied to nouns, which, under the same gender and termination, mark, indifferently, two kinds, or sexes. See *GENDER*.

Such, in Latin, is *aquila, vispertia*, &c. which signify equally, a male or female eagle, or bat.

Grammarians distinguish between *epicene* and common.—A noun is said to be common of two kinds, when it may be joined either with a masculine, or a feminine article; and *epicene*, when it is always joined to some one of the two articles, and yet signifies both genders.

EPICOLIC Regions, (from *ἐπι, supra, upon*, and *colon, the gut so called*) a name given by Dr. Glisson, to that space, on both sides, over the colon.

EPICUREANISM, or **EPICUREAN Philosophy**, the doctrine, or system of philosophy maintained by Epicurus, and his followers.

The noble poet Lucretius, who has given us a beautiful system of *epicureanism* in fine Latin verse, prefers its father Epicurus, to all other philosophers, whom; he makes no scruple to say, he obscured, as much as the sun does the other stars. It is said he first taught grammar; till upon reading Democritus's books, he began to apply himself to philosophy. From Democritus he learnt the doctrine of atoms, or corpuscles, which he afterwards made the basis of his physics. Clem. Alexand. *strom.* 6. advances, that Epicurus stole his chief

chief doctrines from Democritus. But, it is certain, he greatly improved and illustrated them. Diog. Laertius assures us, he composed an infinite number of volumes.

This philosophy consisted of three parts: *canonical*, *κατασκευαστικῶν*, *physical*, *φυσικῶν*, and *ἠθικῶν*, *ethical*; which he explained briefly in three epistles.

The first, as Laertius relates, was about the canons, or rules of judging; wherein, rejecting the use of logic, he established the senses, passions, and anticipations, as the criterions, or judges of truth.

In the second, he laid down atoms, space and gravity, as the first principles of all things. The universe he taught, consisted of atoms or corpules, of various forms, magnitudes, and weights, which having been dispersed at random through the immense inane, or space, fortuitously concurred into innumerable systems, or worlds, which were thus formed, and afterwards, from time to time, increased, changed, and dissolved again, without any certain cause, or design; without the intervention of any deity, or the interdependence of any providence.

Not that he denied the existence of a God: on the contrary, he asserted it; but he thought it beneath the majesty of the deity to concern himself with human affairs: Laertius assures us, he held him, *το μακάριον, καὶ ἀθάνατον, ἐν αὐτοῖς πράγματι ἔχει, ἐν ἄλλοις παρεχόμενον*, a blessed, immortal being, having no affairs of his own to take care of, and above taking care of those of others.

As to ethics; his first principle, or the supreme felicity of man, he held, was pleasure. Which some, as hereafter observed, understand of mental, and others of carnal pleasure.

EPICUREANS, a sect of ancient philosophers, who adhered to the doctrines, and opinions of *Epicurus*. See **EPICUREANISM**.

The *Epicureans* have, in all ages, been derided for their morals, and their attachment to the pleasures of sense: several authors, particularly, Cicero among the ancients, and Gassendus among the moderns, have endeavoured to vindicate them from this charge; by shewing that the pleasure wherein their master *Epicurus* places the summum bonum, or supreme happiness of this life, was not any sensual, or brutal pleasure, but a contentment, and tranquillity of mind, exempt from all tumultuary passions, &c.

This opinion seems just, and well-grounded; but, without entering into the question, which Gassendus, Du Rondel, and others have exhausted; it is certain, that in the common use of the word, *Epicurean* signifies, an indolent, effeminate and voluptuous person, who only consults his particular and private pleasure, without concerning himself with any thing serious.

In effect, there were always two kinds of *Epicureans*; the rigid, and remiss: the rigid *Epicureans*, were those strictly attached to the sentiments of *Epicurus*, who placed all their happiness in the pure pleasures of the mind, resulting from the practice of virtue. The loose or remiss *Epicureans*, taking the words of that philosopher in a more gross sense, placed all their happiness in pleasures of the body, in eating, drinking, loving, &c. The former kind, who were the genuine *Epicureans*, called the other the *sophists of their sect*.

The *Epicureans* take their name from the chief of their sect, *Epicurus*, whom, some, however, deny to be the author of the philosophy he taught; charging him with retailing for physics, the doctrine of Democritus; and for ethics, that of Aristippus.

Be this as it will, he was an Athenian, and the son of Neocles; born in the 109th olympiad, and consequently 342 years before Christ. He began to form his school at Mitylene and Lampachus, about the 32d of his life; though he afterwards removed to Athens, where he philosophized chiefly in his garden: he died of the stone at 72 years of age.

EPICYCLE *, in astronomy, a circle whose centre is on the circumference of another circle which bears it, and which for that reason is called its *Deferent*.

* The word is formed of the Greek, *ἐπι*, upon, and *κύκλος*, circle, q. d. a circle on a circle.

As astronomers invented an eccentric circle to solve the apparent irregularity of the planets, and their different distances from the earth; they likewise invented a little circle to solve the stations, and retrogradations of the planets: this circle which they call *epicycle*, has its centre in the circumference of another greater, which is the eccentric of a planet.

In this eccentric, the centre of the *epicycle* moves; carrying with it the planet fixed in its circumference, the centre of the planet, all the way, moving regularly along the circumference of the *epicycle*, when downwards, according to the order of the signs, and then upwards, contrary to it.

The highest point of the *epicycle* is called the *apogee*, and the lowest the *perigee*.

The great circle, in whose circumference the centre of the *epicycle* is placed, is also called the *deferent of the epicycle*, whose centre is in the orbit of the earth, according to the hypothesis of Copernicus; but in that of Ptolemy, who supposed the

heavens solid, the *epicycle* was a sphere, which revolved with the moon of the thickens allowed its heaven or orbit; and which, sometimes shewed it higher, and sometimes lower. See **PTOLOMAIC SYSTEM**.

The astronomers, who deny the motion of the earth; in order to render the phenomena of the motions of the planets more consistent with the motion of the sun, have affixed the orbit of the earth, as an *epicycle*, to the orbit of the planets: so that the planet should proceed in an *epicycle*, while it is carried through its orbit round the sun: but this is far from answering their expectations. *Wolf. Elem. Math. T. 2. p. 501.*

Ricciolus, though a zealous enemy of the motion of the earth, could not make any astronomical tables that should but tolerably agree with observation, without supposing the earth to move; not, though he called in all the foreign and forced assistances of changeable *epicycles*, liable to continual increase and decrease, and variously inclined to the ecliptic. *De Chales Astron. Reform. lib. X. c. 1. f. 353. &c.*

EPICYCLOID, in geometry, denotes a curve generated by the revolution of a point of the periphery of a circle, along the convex, or concave part of another circle.

A point of the circumference of a circle, proceeding along a plane, in a right line, and at the same time revolving on its centre, describes a *epicycloid*.

And the generating circle, if in lieu of moving on a right line, it move along the circumference of another circle, whether equal or unequal, the curve described by any point in its circumference is called an *epicycloid*.

If the generating circle proceed along the convexity of the periphery, it is called an *upper, or exterior epicycloid*: if along the concavity, a *lower, or interior epicycloid*.

In an *epicycloid*, the part of the circle, the generating point moves along, is called the *base of the epicycloid*: thus in *Tab. Geom. fig. 58*. DB is the base of the *epicycloid*, V its vertex; VB its axis; DPV half of the *exterior epicycloid*, made by the revolution of the semi-circle VLB, (which is called the *generant*) along the convex side of the base, DB: as DPV is the *interior epicycloid*, formed by the generant's revolving along the concave side of the base.

The length of any part of the curve, which any given point in the revolving circle has described, from the time it touched the circle whereon it revolved, is to double the versed sine of half the arch which all that time touched the quiescent circle, as the sum of the diameters of the circles, to the semi-diameter of the quiescent circle: provided the revolving circle moves upon the convex side of the quiescent circle; but, if upon the concave side, as the difference of the diameters, to the semi-diameter.

Dr. Halley gives us a general proposition for the measuring of all *epicycloids* and *epicycloids*; thus: the area of a *epicycloid*, or *epicycloid*, either primary, or contracted, or prolate, is to the area of the generating circle; and also the area's of the parts, generated in those curves, to the area's of analogous segments of the circle: as the sum of double the velocity of the centre, and velocity of the circular motion, to the velocity of the circular motion. The demonstration hereof, see in *Phil. Transact. N.º. 218*.

EPIDEMIA, ΕΠΙΔΗΜΙΑ, in antiquity, feasts of Apollo at Delphos, and Miletus; and of Diana at Argos.

These feasts bore the name *epidemia*, (from *ἐπι*, in, and *δημος*, people) by reason those gods were imagined to be present on those days among the people. Accordingly, on the last day of the *epidemia*, they sang a hymn, called *επισηματικὸς* to bid them adieu, and set them forwards on their journey.

As those gods could not be every where, and yet were honoured in abundance of different places; there were times allowed them to pass from one place to another to receive the vows of their adorers. See *Scaliger, Poet. lib. III. c. 114*.

EPIDEMIC *, ΕΠΙΔΗΜΙΟΣ, denotes a general, or spreading disorder, as a plague, arising from some corruption, or malignity in the air, which seizes great numbers of people in a little time.

* The word is Greek, formed of *ἐπι* and *δημιος*, *populus*, people; such diseases running among all kinds of people, of whatever age, sex, quality, &c. as arising from a common or general cause.

The Latins call them *populares morbi*, popular diseases; in opposition to those called *sporadici*, which are only here and there, as arising from private, or particular causes. See **SPORADIC**.

EPIDERMIS *, in anatomy, the cuticle, or scarf-skin.

* The word is formed of the Greek, *ἐπι*, on, over, and *δερμα* skin.

Some hold the *epidermis* to be formed of the excrements of the *derma*, or true skin: Hippocrates is of opinion, it is engendered by cold; as, on blood, broth, or the like, when cold, we see a pellicle formed.

But it is now past doubt, that it is produced at the same time, and after the same manner, with the other parts: it being found in foetus's of all ages, in the womb: it has neither veins, arteries, nor nerves: whence it is insensible.

EPIDIDYMS *, in anatomy, a little, round body, on the back of each testicle; called also *parastata*. See **PARASTATA**.

* The word is formed of the Greek, *επι, upon*, and *διδυμοσ, twin, testicle*.

EPIGASTRIC Region, is a name given to the upper part of the abdomen; reaching from the cartilago xiphoides, almost to the navel.

It is usually divided into three parts: the sides or lateral parts, called *hypochondria*; and the middle, the *epigastrium*.

There are also two *epigastric* veins, and as many arteries.

The arteries are branches of the iliac external arteries: the veins discharge themselves into the iliac external veins.—See *Tab. Anat. (Angeioi) fig. 1. n° 57. fig. 6. n° 3*.

EPIGASTRIUM *, **ΕΠΙΓΑΣΤΡΙΟΝ**, in anatomy, the middle part of the *epigastric* region.

* The word is formed of the Greek, *επι, upon*, and *γαστρι, belly*.

EPIGLOTTIS *, **ΕΠΙΓΛΩΤΤΙΣ**, in anatomy, the cover, or lid of the larynx.

* The word is formed of *επι, upon*, and *γλωσσα, or γλωττις, tongue*.

The *epiglottis* is a thin, moveable cartilage, made in form of a leaf of ivy, or a little tongue, and therefore likewise called *Lingula*; serving to cover the cleft, or rima of the larynx, called *glottis*.

Galen takes the *epiglottis* to be the principal organ, or instrument, of voice; serving to vary, modulate, and render it harmonious.

Its base, which is pretty broad, is in the upper part of the cartilago scutiformis, and its point, or tip, turned towards the palate. It is only shut by the weight of the piece in swallowing; but not so exactly, but that a crum, or a drop, sometimes escapes through into the trachea.

EPIGRAM *, in poetry, a short poem, or composition in verse, treating of one only thing, and ending with some point, or lively, ingenious thought.

* The word is formed of the Greek, *επιγραμμα, inscription, of επιγραφειν, to inscribe, or write upon*.

Epigrams, then, originally signify *inscriptions*, and they derive their origin from those inscriptions placed by the ancients on their tombs, statues, temples, triumphal arches, &c. See **INSCRIPTION**.

These, at first, were only simple monograms; afterwards, increasing their length, they made them in verse, to be the more easily retained: Herodotus, and others, have preserved us several of them.

Such little poems retained the name of *epigrams*, even after the design of their first institution was varied, and people began to use them for the relating of little facts, and accidents, the characterizing of persons, &c.

The Greeks confine their *epigrams* to a very narrow compass: for though, in the anthology, we here and there meet with a very long one; yet ordinarily, they do not exceed six, or at most, eight verses. The Latins were not always so scrupulous, and the moderns much less, as to these bounds.

M. le Brun, in the preface to his *epigrams*, defines an *epigram* a little poem, susceptible of all kinds of subjects, and ending with a lively, just, and unexpected thought: which are three qualifications essential to the *epigram*; particularly the first and last of them, *viz.* brevity, and the point, or close of the *epigram*.

To attain brevity, only one thing is to be aimed at in the poem, and that to be pursued in the concise terms possible. Authors are much divided, as to the length the *epigram* is to be confined to: the ordinary limits are from two to twenty verses; though we have instances, both among the ancients, and moderns, where they extend to fifty. But still it is allowed that the shorter the better, and more perfect, as it partakes more of the nature and character of this kind of poem. The point or turn is a quality much insisted on by the critics, who require the *epigram* constantly to close with something poignant, and unexpected, to which all the rest of the composition is only preparatory. Others there are, who exclude the point, and require the thought to be equally diffused throughout the whole poem, without laying the whole stress on the close: the former is usually Martial's practice, and the latter that of Catullus. Which is the most beautiful and perfect manner, is disputed by a third class of critics.

The Greek *epigrams* have scarce any thing of the point, or briskness of the Latin ones: those collected in the anthology, have most of them a remarkable air of ease and simplicity, attended with something just and witty: such as we find in a sensible peasant, or a child that has wit. They have nothing that bites, but something that tickles. Though they want the salt of Martial, yet to a good taste they are not insipid; except a few of them, which are quite flat and spiritless. However, the general faintness, and delicacy of the pleasantries in them, has given occasion for a Greek *epigram*, or *epigram a la Grecque*, to denote among the French, an *epigram* void of salt or sharpness.

It is principally the point that characterizes the *epigram*, and distinguishes it from the madrigal. See **POINT**.

In the modern verification, as observed by Fa. Mourgues, the *epigram* and madrigal, are distinguished by the number of verses, and the close. 1°. By the number of verses, which in the modern *epigram* does not go beyond eight, nor in the modern madrigal, comes short of six: and, 2°. In that the close, or period of the *epigram*, has always something more lively and studied than that of the madrigal.

The *epigram* is the lowest, and least considerable of all the productions of poetry; and it is in general rather an effect of good luck, than of art, to succeed therein. The fineness, and subtlety of the *epigram*, M. Boileau observes, should turn on the words, rather than the thought; which seems very little to the credit of this kind of composition, as it reduces it to the nature of the pun, or equivoque. Fa. Bohours confirms the hint, in adding, that the equivoque is what usually thins the most in the *epigram*.

One great beauty of the *epigram*, is to leave something for the reader to guess, or supply. Nothing pleases the mind so much, as to find something of it self in the objects presented it; nor does any thing disgust it more than to preclude it from shewing and exercising a faculty it values it self for. Segrais.

M. B. L. M. the author of a new collection of French *epigrams*, in the year 1720, has a deal of good observations on the nature of the *epigram*. He defines it an ingenious thought delivered in a few verses; and conceives it as a general name, including under it diverse kinds of short, lively poems, as the *sonnet, rondelay, madrigal*, and little *tales* which only turn on some merry thought. Epitaphs and inscriptions, he thinks, may be also reduced to the head of *epigrams*.

The *epigram* admits of great variety of subjects: some are made to praise, and others to satyrize, which last are much the easiest; ill nature serving instead of point and wit. Boileau's *epigrams*, are all satyrs on one or another. Those of des Reaux, are all made in honour of his friends. And those of Mad. Scudery, are so many eulogies. The *epigram* being only a single thought, it would be ridiculous to express it in a great number of verses; it must have its unity like the drama. The comedy has an action for its subject; and the *epigram* a thought.

EPIGRAPHE *, **ΕΠΙΓΡΑΦΗ**, an inscription on a building, to signify its use, occasion, the time when, and the persons by whom, it was built.

* The word is Greek, and signifies *supercription*.

EPILEPSY *, **ΕΠΙΛΗΨΙΑ**, in medicine, a convulsion, either of the whole body, or of some of its parts; attended with a deprivation of the senses and understanding; and returning from time to time in fits, or paroxysms.

* The word is formed of the Greek, *επιλαμβάνω, I surprize, seize hold of one*, by reason the disease seizes and overcomes the senses, so that the patient seems as if dead.

In English it is usually called the *falling sickness*, by reason people fall down when attacked therewith. The Latins call it *comitialis morbus*, by reason when any body was seized therewith in a comitia, or assembly of the Roman people, they presently broke up the assembly, as deeming it an unhappy preface.

Some call it the *morbus sacer*, as supposing it sent by way of immediate punishment from God. Others, *morbus caducus*, others *Herculeus, fonticus, lues deifica, &c.*

The patient seized herewith, falls instantly and suddenly down; or, rather, as it were throws and precipitates himself violently to the ground. When down, he grinds his teeth, foams at mouth, and frequently shakes his head; his arms, legs, neck, back, &c. either becoming rigid, or variously distorted. And as all the parts are in a violent contraction, there is frequently an involuntary flux of urine, seed, and fecal matter. After some time he returns to himself; only retaining a head-ach, heaviness, weariness of the limbs, &c.

Etmuller more accurately distinguishes the disease into three degrees: the first, or lowest, is much the same with the highest degree of a vertigo.

In the second, there arise various agitations and gesticulations; and the senses, both external and internal, either remaining, or being transported into a delirium, they dance, sing, laugh, weep, talk idly, shriek, and beat their breasts. Sometimes they remember all after the fit is over, and sometimes nothing at all of what has passed.

In the third degree, which alone is ordinarily called the *epilepsy*, they lose the use both of reason and sense; fall, or fling themselves down, foam, grind their teeth, and bite their lips, with the other circumstances above related. Those affected with the second degree, have been often supposed to be possessed by the devil.

The cause of this disease, Boerhaave attributes to too much action of the brain on the motory nerves, and none on the sensitive ones. Some are pleased to account for it, from the abundance of sharp humours mixing with the animal spirits, and giving them extraordinary and irregular motions, and directions; whence arises its distinction from a syncope, and apoplexy, which take away all motion as well as sense. See **SYNCOPE**, and **APOPLEXY**.

The *epilepsy* is either *idiopathic*, or *sympathetic*: it is *idiopathic*, when it arises merely from a disorder of the brain, or spirits: and *sympathetic*, when it is preceded by some other disease which brings it on.

The *epilepsy* sometimes hangs many years to a person, without much danger: though when its paroxysms return fast, it renders the patient more or less paralytic, delirious, or stupid. In young people there is hopes of its going off about the time of puberty. Hippocrates observes, that when it seizes a person after 25 years of age, it lasts for life; but this does not always hold.

The cure of a confirmed *epilepsy* is very difficult: the principal anti-epileptics are, the roots of peony, leaves of lily of the valley, seeds of rue, mistletoe of the oak, or hazle, box-wood, spirit of black cherries, spirit of human blood, human fecundines, human cranium, tooth of the sea-horse, castoreum, peacocks dung, camphor, and the salt, and oil of amber.

To recover a person in a fit, tobacco smoak, or that of burnt feathers, is recommended. Barbette above all things directs the flowers and spirits of sal ammoniac against this disease; Crato, native cinnabar. Sir John Colbatch has an express treatise on the mistletoe of the oak, to shew it a specific in this disease. Elks claws have long had the reputation of the same. See each remedy, its pretensions, &c. under its proper term, as *MISTLETOE*, *ELKS CLAWS*, &c.

M. Poupart, from a dissection of an *epileptic* person, wherein, immediately under the dura mater, was found a deal of white, thick, viscid, pituita, glued, and, as it were, incorporated with the membrane; thinks, that this might be the cause of the disease; the excessive quantity of such thick lymph, loading the brain, and obstructing its necessary motions. The first cause, he judges, might be the spongiosities of the dura mater, which imbibed the ferocities of the brain.

He adds, that he knew an *epileptic* person, who, upon the first approach of his disorder, rub'd his forehead with his hand, and bent his head as far backward as he cou'd, resting it against a wall; and by that means secured himself against the convulsion. It is probable, that by this he gave a motion to the lymph, and drove it from the place which before it disturbed.

EPILOGUE *, *EPILOGUS*, in oratory, &c. The peroration, or last part of a discourse, or treatise; containing ordinarily a recapitulation of the principal matters delivered.

* The word is Greek, *ἐπιλογία*, formed of the verb *ἐπιλάσσω*, I say after, the *epilogue* being the end, or conclusion of a discourse.

EPILOGUE, in dramatic poetry, is a speech addressed to the audience, when the play is over, by one of the principal persons, or actors therein; containing usually some reflections on certain incidents in the play, particularly those of the part of the person who speaks it.

In the modern tragedy, the *epilogue* has usually somewhat of pleasantry in it; intended, we suppose, to compose the passions raised in the course of the representation, and send away the audience in good humour: though how far that design is good and laudable, will bear some dispute: an ingenious author in the Spectator, compares it to a merry jig on the organ, after a good sermon, to wipe away any impressions that might have been made thereby, and send the people away just as they came.

In effect, though the *epilogue*, in this sense, may seem an abuse; yet has it the countenance of antiquity: the Romans had something of the same nature, though under another name. Their *exodium* was a kind of farce, brought on the stage when the tragedy was over; *ut quicquid lacrymarum ac tristitiæ effissent ex tragicis affectibus, hujus spectaculi risus detergeret*, says the scholiast of Juvenal.

The *epilogue* is but of modern date, much later than the prologue. Many, indeed, have taken the *exodium* of the ancient Greek drama, for an *epilogue*; by reason Aristotle defines it, to be a part rehearsed after the chorus had sung for the last time; but in reality, it was of a quite different nature. The *exodium* was the last of the four parts of the tragedy; containing the unravelling and catastrophe of the plot, and answering to our last, or fifth act.

EPIPINICION *, *EPIPINIKION*, in the Greek and Latin poetry, denotes, 1^o. A feast, ceremony, or rejoicing, on occasion of a victory obtained. 2^o. A poem, or composition, on the same subject.—Scaliger treats expressly of the *epinicion* in his poetics, l. I. c. 44.

* The word is formed from the Greek, *ἐπι, on*, and *πινικιον*, victory.

EPIPHANY, in ecclesiastical antiquity, the feast of kings; A double festival, of the first rank, solemnized on the 6th of January, in honour of the appearance of Jesus Christ to the three kings, or Magi, who came to adore, and bring him presents.

The feast of *epiphany*, now held in honour of the adoration of the magi, had, its first institution among the Greeks, from a different object, viz. our Saviour's birth; and was called *theophany*, and *epiphany*, that is, appearance, and manifestation of God.

Pope Julius, who reigned from the year 337, to 352, was the first who taught the church to distinguish the feasts of the nativity, and *epiphany*. Papebroch. *paral. ad Conat.* p. 23. *Act. SS. Maii.* T. VII.

The word in the original Greek, *Ἐπιφάνεια*, signifies appearance, or apparition; and was applied, as some critics will have it, to this feast, on account of the star which appeared to the Magi.—St. Jerom, and St. Chrysostom, take the *epiphany* for the day of our Saviour's baptism, when he was declared to men by the voice, *hic est filius meus dilectus, in quo mihi complacuit*: this is my beloved Son, in whom I am well pleased. And accordingly it is still observed by the Coptics and Ethiopians in that view. See Ludolph. *Hist. Ethiop. Lib. XXI. c. 2.*—Others contend, that the feast of Christmas, or the nativity of our Saviour, was held in diverse churches on this day; which had the denomination *epiphany*, or appearance, by reason of our Saviour's first appearance on earth, as at that time. And it must be allowed, that the word is used among the ancient Greek fathers, not for the appearance of the star to the Magi, but for that of our Saviour to the world. In which sense, St. Paul uses the word *epiphania*, in his second epistle to Timothy, c. i. v. 10.

Add, that the Armenians, to this day, celebrate the feast of the nativity, on the day of *epiphany*, according to the practice of the ancient church; which some Romish missionaries have impertinently censured them for, not knowing that the *epiphany*, originally, and properly, was the nativity of our Saviour. Ammianus Marcellinus makes mention of this feast, *Lib. XXI. c. 2.* and observes that it was held in January. Upon which passage, Valesius in his notes, endeavours to shew, that the historian meant by *epiphany*, the feast of the nativity. The heathen writers used the word *epiphania* in the like sense, viz. to express the appearance of their Gods on earth. And the christians, after their example, applied it, in the general, to express any appearance, or manifestation of the deity.

EPIPHONEMA, *ΕΠΙΦΩΝΗΜΑ*, in rhetoric; a sententious sort of exclamation, which is frequently added after a narrative, or rehearsal of any thing remarkable; containing, usually, a lively, close reflection, on the subject there spoken of. Such is that of St. Paul, when, after discoursing of the rejection of the Jews, and the vocation of the Gentiles, he cries out.

Oh the depth of the wisdom and knowledge of God!

Such also is that of Lucretius, after relating the story of Agamemnon's sacrificing his daughter Iphigenia:

Tantum religio potuit suadere malorum!

Such, lastly, is that of Virgil, upon occasion of Juno's persecuting Æneas:

Tantæ animis celestibus iræ!

Which M. Boileau has imitated in,

Tant de fiel entre l'il en l'ame des devots!

And Mr. Pope in,

And dwells such rage in softest bosoms then?

And lodge such daring souls in little men?

EPIPHORA *, *ΕΠΙΦΩΡΑ*, in medicine, a disease of the eyes; consisting in a preternatural defluxion of rheum, or the matter of tears; accompanied, frequently, with heat, redness, and twitching.

* The word is Greek, formed of *ἐπιφωρεω*, *inferre*, to draw, or bring into; by reason of the pain it occasions.

Pitcairn calls it a *catarrh of the glands of the eye*. See **CATARRH**.

The internal causes of the *epiphora*, or rheum in the eyes, are a relaxation of the glands of the eyes, and a too great acrimony, or sharpness of the serous humour separated thereby; which fretting and vellicating the eye, draws an unusual quantity of blood and lymph thereto; by which, at length, the cheek becomes excoriated, &c.—Children are most liable to it, from the frequent use and straining of the glands of the eye in crying.

The external causes of the *epiphora*, are sharp duffs, streams, &c. entering the eye, and irritating the same. Also a too cold and sharp air has frequently the like effect.—An inveterate *epiphora* often degenerates into a fistula lacrymalis.

The cure of the *epiphora*, is, 1^o. by causing a revulsion, or derivation of the peccant humour, to some other part, as by venæsection, cupping, blistering, or cathartics. 2^o. By correcting its acrimony by proper remedies. And, 3^o. By applying astringents externally. Lapis calaminaris is much commended.

EPIPHYSIS *, *ΕΠΙΣΤΙΣΙΣ*, in anatomy, a lesser bone adhering, or growing to another, by simple contiguity.

* The word is formed of the Greek, *ἐπι, on*, upon, and *συστις*, to grow, adhere: The Latins call it *appendix, additamentum, adnascens, &c.*

The substance of the *epiphyses* is rare and lax; in young children it is merely cartilaginous; but hardens as they grow in age, and, at length, becomes quite bony.

It is commonly laid down, that there is no regular articulation

tion between the *epiphyses* and the bone; though it is certain, that there is a reciprocal admission of the heads, or extremities of each, into the cavities of the other. See **ARTICULATION**.

There are some bones that have no *epiphyses* at all, as the lower jaw: others have no less than five, as the vertebrae. The design of adding *epiphyses* to bones, was, to supply their defects, and render them longer and bigger at the extremes.

EPIPHYSES vermiformes, are two eminences of the cerebellum, shaped like worms, which keep open the passage from the third, to the fourth ventricle.

In dilating the third ventricle of the brain, we perceive four eminences, two upper and bigger, called *orbicular protuberantes*; and two lower and less, called *epiphyses* of the orbicular protuberances. Dionis.

EPIPLASMA, the same with *cataplasma*. See **CATAPLASM**.

EPIPOLECE, ΕΠΙΠΟΛΕΧΗ, in medicine, a kind of hernia, or tumor, occasioned by the descent of the epiploon, or caul, into the scrotum. See **HERNIA**, and **ENTERO-EPIPOLECE**.

EPIPOIC, or **EPIPOID**, a term applied to the arteries and veins, distributed through the substance of the *epiploon*, or caul.—See *Tab. Anat. Angiol.* fig. I. n. 37. See also **EPIPOON**, and **GASTREPIPOON**.

EPIPOIS Dextra, is a branch of the cœliac artery, which runs through the right side of the inner, or hinder leaf of the caul.

EPIPOIS Postica, is a branch of the cœliac artery, springing out of the lower end of the splenic, and running to the hinder leaf of the caul.

EPIPOIS Sinistra, is a branch of the cœliac artery, which is bestowed on the lower and left side of the caul.

EPIPLOMPHALUS *, or **EPIPLOMPHALON**, ΕΠΙΠΛΟΜΦΑΛΟΝ, in medicine, a species of exomphalus, or navel-rupture; being a tumor or swelling of the part, occasioned by the epiploon's falling into it. See **EXOMPHALUS**, and **ENTERO-EPIPLOMPHALUS**.

* The word is compounded of the Greek, *επιπλοου*, caul, and *ομφαλου*, navel.

EPIPOON *, in anatomy, a fatty membrane, spread over the intestines, and entering even into the several sinuosities thereof; called also the *omentum*, and popularly the *caul*. See **OMENTUM**.

* The word is formed of the Greek, *επιπλων*, to swim upon, by reason it seems to float on the intestines.

EPIPOLOSARCOMPHALUS *, in medicine, a sort of tumor, of the exomphalus kind. It is formed of the epiploon, and the flesh. See **EXOMPHALUS**.

* The word is compounded of the three Greek words, *επιπλοου*, epiploon, *σαρκος*, flesh, and *ομφαλου*, umbilicus, navel.

EPIPOCACY, the quality of episcopal government, or that form of church discipline, wherein diocesan bishops are established, distinct from and superior to, priests or presbyters. See **BISHOP**, **EPISCOPAL**, **EPISCOPALIAN**, and **HIERARCHY**.

Episcopacy and *presbytery*, have been alternately established and abolished in Scotland.

EPIPOCACIDE, the crime of murdering a bishop by one of his own clergy.—By the ancient laws of England, the same obedience is due from a clergyman to his bishop, as from a child to his father: and therefore the offences of *episcopacide* and parricide, are made equal, that is, they are both petty-treason.

EPIPOCAL *, something that belongs to a bishop.

* The word is formed of the Greek, *επισκοπος*, *οπισκοπος*, derived from *επισκοπεω*, *inspicio*, I inspect, or overlook.

Episcopal government, is the government of a diocese, wherein one single person, legally consecrated, presides over the clergy of a whole district, in quality of head, or superintendent thereof; conferring orders, and exercising a sort of jurisdiction.

The Presbyterians reject the *episcopal* establishment, and condemn the *episcopal* order as a human institution, the mere result of pride, and ambition.

Among the *episcopal* functions, the principal is that of holding frequent visitations of the diocese.

EPIPOCALIA, is sometimes used in the same sense with *pontificalia*. See **PONTIFICALIA**.

EPIPOCALIA, is also used to denote synodals, or customary payments, due to the bishops from the clergy of their diocese; called also *onus episcopale*.

EPIPOCALLIANS, a name given to those who adhere to the church of England, and particularly to the ecclesiastical hierarchy, such as it was in the Romish church before the reformation; who affect the discipline of bishops, priests, canons, the office, or liturgy, &c. and retain the greatest part of the canon law, with the decretals of the popes, more closely than the catholics themselves of several countries. Though, as to matters of doctrine, or faith, they agree in most points with the calvinists, or reformed. In Scotland, the principal dissenters are the *episcopallians*: lay

episcopallians enjoy all the same civil privileges with those of the established church. They are under no restrictions; tied to no tests; but are employed in all places of trust, upon taking the oaths to the government. But the *episcopal* ministers are liable to several penal laws; the greatest part of them being nonjurors.

EPISCOPI multa. See the article **MULTA**.

EPISCOPIUS puerorum, *bishop of the boys*; a ludicrous kind of office, formerly exercised in churches, in that called the *feast of fools*, or the feast of the kalends.

The custom was for some youth in the feast of epiphany to plait his hair, that he might seem to have the tonsure, and to put on episcopal garments; and then to exercise a shew of jurisdiction, and do several ludicrous actions: for which reason he was called the *bishop of the boys*. This custom obtained among us, long after several constitutions were made to abolish it. See **INNOCENTS-DAY**. See diverse curious particulars concerning this *episcopus puerorum*, in John Gregory's *Posthumous Works*; or, for want of that, in the *Antiquities of the Cathedral Church of Salisbury*, p. 71.

EPISODE *, ΕΠΙΣΟΔΙΟΝ, is commonly conceived to be a separate incident, story, or action, which an historian, or poet, inserts and connects with his principal action; to furnish out the work with a greater diversity of events; though, in strictness, all the particular incidents, wherof the action or narration is composed, are called *episodes*.

* The word is formed from the Greek, *επι*, upon, and *εσοδος*, ingress, entry.

EPISODE, in dramatic poetry, was the second part of the ancient tragedy.

The origin and use of *episodes* is described by M. Hedelin, and F. Bossu. Tragedy, in its original, being only a hymn, sung in honour of Bacchus, by several persons, who made a kind of chorus, or concert of music, with dancing, and the like; to diversify the representation a little, and divert the audience, they bethought themselves at length to divide the singing of the chorus into several parts; and to have something rehearsed in the intervals.

At first, a single person, or actor, was introduced, then two, then more; and what the actors thus rehearsed, or entertained the audience withal, being something foreign, or additional to, or beside, the song of the chorus, and no necessary part thereof, was called *επισοδιον*, *episode*.

And hence tragedy came to consist of four parts, the *prologue*, *episode*, *exode*, and *chorus*.

The *prologue* was all that preceded the first entrance of the chorus.

The *episode*, all that was interposed between the singings of the chorus.

The *exode*, all that was rehearsed after the chorus had done singing.

And the *chorus*, was the grex, or company that sung the hymn.

And as this recitation of the actors was in several parts, and inserted in several places; it might either be considered together, as a single *episode*, consisting of several parts; or each part might be called a distinct *episode*.

These several *episodes* in the same tragedy might either be taken from so many different subjects; or from the same subject divided into a proper number of recitations, or incidents.

To consider only the first occasion, and institution, of these foreign, or additional pieces; it appears no ways necessary that they should all be taken from one and the same subject; three or four recitations of different actions, no-wise related, or connected to each other, would ease the actors, and amuse the people, in the intervals of the chorus, as well as if they were all so many parts of the same action. By degrees, what was at first only an addition to the tragedy, became the principal part thereof. Then, the several pieces, or *episodes*, began to be considered as one single body, which was not to have parts, or members of different nature, and independent of each other.

The best poets took the thing in this light, and drew all their *episodes* from the same action; which practice was so fully established in Aristotle's time, that he lays it down as a rule. Those tragedies wherein this unity and connection was not observed, he calls *episodic pieces*.

EPISODE in epic poetry. The term *episode*, by being transplanted from the stage to the *epopeia*, did not change its nature. All the difference Aristotle makes between the tragic and epic *episodes*, is, that the latter are more ample than the former.

Aristotle uses the word in three different senses: the first taken from the enumeration already made, of the parts of the tragedy, *viz.* *prologue*, *chorus*, *episode*, and *exode*. Whence it follows, that in tragedy, every thing is *episode* that is none of the other parts: so that as among us, there are tragedies without either *prologue*, *chorus*, or *epilogue*, the tragic *episode* includes the whole tragedy: consequently, the epic *episode* must

must be the whole poem, in like manner. All there is to retrench from its being the proposition, and invocation, which stand in lieu of the prologue. In this sense, the *epopœia* and tragedy, have each only one *episode*; and if the parts or incidents, be ill connected together, the poem will be *episodic* and defective.

But further, as all that was sung in the tragedy, was called the *chorus*, in the singular number; yet this singularity did by no means prevent every part or division of the fame from being called a *chorus*, without making several *chorus's*: so it was with the *episode*: each incident, and part of the fable and action, is not only a part of the *episode*, but is an *episode* itself.

The term *episode*, therefore in this sense, signifies every part of the action expressed in the plan, or first draught of the fable; as the absence and wanderings of Ulysses, the disorders in his family, and his presence which retrieved and set all to rights again.

Aristotle furnishes us with a third kind of *episode*; in shewing, that what is contained and expressed in the first plan of the fable is proper, and that all the rest is *episode*.

By *proper*, he means what is absolutely necessary; and by *episode* what in one sense is necessary, and in another not; so that the poet is at liberty to use, or let it alone.

Thus, Homer, having made the first draught of the fable of his odyssey, was not at liberty either to make Ulysses absent from his country, or not. His absence was essential; and therefore Aristotle ranks it among the things he calls *proper*. But he does not bestow that appellation on the adventures of Antiphate, Circe, the Syrens, Scylla, Charybdis, &c. The poet was at liberty to have left these alone, and to have chosen others in their room; so that they are *episodes*, distinct from the first action, to which they are not immediately necessary. Indeed, in one sense, they may be said to be necessary; for Ulysses's absence being necessary, it follows, that not being in his own country, he must be somewhere else. If therefore the poet was at liberty, not to have used those particular adventures above mentioned; yet he was not at liberty not to have used any: But if he had omitted those, he must necessarily have substituted others in their room. Otherwise, he would have omitted a part of the matter contained in his plan, and his poem would have been defective.

This third sense, therefore, of the word *episodes*, comes to the second: all the difference between them, is, that what we call *episode*, in the second sense, is the ground, or plan of the *episode*, in the third: and that the third adds to the second, certain circumstances which are only probable, and not necessary, as the places, princes, and people, among whom Ulysses was cast by Neptune.

It must be added, that in an *episode* in the third sense, the incident, or *episode* in the first sense, whereon it is grounded, is to be extended and amplified; otherwise, an essential part of the action and fable, does not become an *episode*.

Lastly, it is in this third sense that we are to understand that precept of Aristotle, not to make the *episodes*, till after the names of the persons have been chosen. Homer would not have spoke of the fleet and ships as he has done; if, in lieu of the names of Achilles, Agamemnon, and Iliad, he had chose those of Adrastus, Capaneus, and Thebaid.

Upon the whole, the term *episode*, in the epic poem, as used by the father of the critics, Aristotle, does not signify any foreign, or accidental adventure; but the whole narration of the poet, or a necessary and essential part of the action and subject, amplified with probable circumstances.

Thus, Aristotle enjoins, that the *episode* be not added to the action, or fetched from elsewhere; but that it be a part of the action; and never uses the word *adding*, in speaking of *episodes*, though it occurred so naturally to his interpreters that they have generally used it in their translations and comments. He does not say, that after laying the plan, and chusing the names, the poet is to add the *episodes*; but uses a derivative of the word *episode*, *επιεικός*, as if in English we should say, *episodesify* his action.

Add, that to shew the different extension of tragedy and *epopœia*, that is, how the one becomes longer than the other; he does not say, that there is but little *episode* in tragedy; but more accurately, that the *episodes* of tragedy are short and concise; whereas the *epopœia* is lengthened out and extended by them. In one word, the taking vengeance of the wicked people in Ulysses's court, as expressed in a few words by Aristotle, in his plan of the odyssey, is a simple proper action, necessary to the subject. It is no *episode*, but the basis, and, as it were, *stamen* of an *episode*. And this same punishment explained and opened, with all the circumstances of time, place, and persons, is no simple and proper action, but an action *episodesified*, or a real *episode*; which, though at the discretion of the poet, is yet necessary and proper to the subject.

From what has been said, we may venture to define *episodes* to be necessary parts of the action, extended and filled up with probable circumstances. Now, an *episode* is only a part of an action; and not a whole action. And this part of the action,

which is the basis, or ground of the *episode*, must not, when *episodesified*, retain any thing of the simplicity which it had when first expressed in general, in the plan of the fable.

Aristotle rehearsing the parts of the plan of the Odyssée, says expressly, that they are proper; and by that, distinguishes them from *episodes*. Thus, in the Oedipus of Sophocles, the ceasing of the plague at Thebes is no *episode*. It is only the ground and matter of an *episode*, which the poet might have used, had he pleased. And Aristotle, observing that Homer, in the Iliad, had taken but few things for his subject, but that he had used abundance of his *episodes*, intimates, that the subject contains in it self abundance of *episodes*, which the poet may use, or let alone, at pleasure. That is, it contains the grounds, or *stamina* thereof, which may either be left in their general and simple brevity, as Seneca has done the ceasing of the plague; or may be extended and unfolded, as the same author has done the punishment of Oedipus.

The subject of a poem may be lengthened two ways: either, by the poets making use of a great many of his *episodes*; or by his amplifying, and giving a great extent to every one. By this latter method, chiefly, it is, that the epic poets lengthen their poems much beyond the dramatic. It must be added, that there are certain parts of an action, which, of themselves, do not naturally present or afford more than one *episode*; such as the death of Hector, of Turnus, or the like: whereas, there are other parts of the fable more copious and fertile, and which oblige the poet to make diverse *episodes* on each; though laid down in the first plan, with as much simplicity as the rest: such are the battles of the Trojans and Grecians; the absence of Ulysses; the wanderings of Æneas, &c. For Ulysses's absence so many years from his own country, required his presence elsewhere; and the design of the fable was to throw him into several dangers, and different countries. Now each peril, and each new country, furnished an *episode*, which the poet might use if he pleased.

The result of the whole is, that *episodes* are not actions, but parts of actions; that they are not added to the action and matter of the poem, but what makes the action and matter themselves, as the members make the body: that, of course, they are not to be fetched from elsewhere, but raised from the ground, or basis of the action: that they are not united, and connected with the action, but with one another: that all the parts of an action are not so many *episodes*, but only such as are amplified, and extended with particular circumstances: and, lastly, that their union with each other, is necessary in the ground of the *episode*, and probable in the circumstances thereof.

EPISODIC, in poetry. A fable is said to be EPISODIC, when it is swelled with unnecessary incidents; and its *episodes* are not necessarily, nor properly connected with each other.

Aristotle lays it down, that those tragedies are most defective, whose *episodes* have no connection, or dependence, on each other; which he calls *episodic*, q. d. *superabundant in episodes*; by reason so many little *episodes* can never compose one whole one; but necessarily remain in a vicious plurality.

The most simple actions are most subject to this irregularity; in that, having fewer incidents and fewer parts than others, they afford less matter. An unwary poet will sometimes have consumed his whole stock in the first, or second time that his actors appear between the chorus: and be driven to a necessity of looking out for other actions, to supply the remaining intervals. Arist. Poet. c. 9.

The first French poets did the like: To fill each act, they took so many different actions of a hero; which had no other connection between them, but that they were done by the same person. Bossu, p. 106.

If an *episode* be used, the names and circumstances whereof are unnecessary, and whose ground and subject makes no part of the action, that is of the matter of the poem; such an *episode* renders the fable *episodic*. This irregularity is discovered, when one may take away a whole *episode*, without substituting any thing in its room; and yet leave no chasm, or defect in the poem. The history of Hypsipyle; in Statius's Thebaid, affords an instance of these faulty *episodes*. If the whole story of that illustrious nurse were retrenched, the sequel of the principal action would be the better for it. Nor would any body imagine he had forgot any thing, or that there was any member of his action wanting. Bossu.

EPISPASTIC*, in medicine, a remedy, which being externally applied, draws or attracts some humour to the part; called also an *attractivum*.

* The word is Greek, formed of *επι*, and *σπασ*, *trabo*, I draw.

Of *epispastics*, there are some which act very gently, and others with a deal of violence. Those of the latter kind swell, and bloat the skin, make it red, and even raise blisters thereon. See VESICATORY.

The principal simple *epispastics* are pellitory, garlic, mustard, onions, yeast, goose-dung, and that of pigeons, and cantharides. A blister plaster is now commonly denoted by the name of an *Epispastick*.

EPISTATES *, ΕΠΙΣΤΑΤΗΣ, in antiquity, a person who has the command and direction of an affair, or of a people.

* The word is derived from the Greek, ἐπι, *super*, over, and ἵσται, *sto*, I stand.

The term is of considerable use, in speaking of the ancient government of Athens; where the *epistates* was the senator in command for that day, or whose turn it was to preside that day. The constitution was this: the ten tribes of Athens, elected every year by lot, each of them fifty senators; which made a senate of five hundred. Every tribe had the precedence in its turn, and surrendered it again, successively, to another. The fifty senators in office were called *prytanes*; the particular place where they assembled *prytaneum*; and the term, or duration, of their office, *viz.* thirty-five days, *prytanea*. During these thirty-five days, ten of the fifty *prytanes*, presided weekly, under the name of *proedri*. And of these *proedri*, there was one to preside each day of the week, under the title of *epistates*.

No person was allowed to hold this office more than once in his whole life; lest he should fall too much into the taste of dominion. The senators of all the other tribes still voted, according to the order the lot had given them; but the *prytanes* alone convened the assemblies; the *proedri* laid the business before them; and the *epistates* took their votes and opinions. It must be added, that of the ten *proedri*, of each week, there were but seven that would preside, each his day, in quality of *epistates*. The ten *proedri* elected the seven *prytanes*.

EPISTEMONARCH *, a dignitary in the ancient Greek church, appointed to watch over the doctrines of the church; and to inspect, or superintend every thing relating to the faith, in quality of a censor thereof. His office answered pretty much to that of *magister sacri palatii* at Rome.

* The word is derived from the Greek, επιστημον, *science, knowledge*, and αρχη, *command, precedence*.

EPISTLE *, ΕΠΙΣΤΟΛΗ, a letter missive.

* The word is formed of the Greek, επιστella, *mitto*, I send. The term *epistle* is now scarce used, but for letters wrote in verse; and letters dedicatory.

In speaking of letters written by moderns, or rather in the modern languages, we never use the word *epistle*. Thus, we say, the letters, *not epistles*, of the cardinal d'Ossat; of Voiture, of Balzac, of Howel, of Pope, &c. But those wrote by the ancients, or rather in the ancient languages, we call *epistles*: as the *epistles*, not letters, of Cicero, Pliny, Seneca, Busbequius, Launoy, &c. of St. Augustin, St. Jerome, &c. The *epistles* of St. Paul, St. Peter, St. John, &c. to the Romans, Corinthians, &c.

James Altinius wrote 5000 letters, of which a few only are published in Bayle, *in vit.*—Drusius, beside Hebrew, Greek, French, English, and Flemish letters, received 2300 in Latin, which were found among his papers. *Curian. in Vit. p. 11.* See **LETTER**.

EPISTOLARY, a term chiefly used in the phrase, *epistolary style*.

EPISTOLARY is, sometimes, also applied to authors who have wrote *epistles*, or letters. The principal *epistolary* authors, are Sidorius Apollinaris, Tertullian, the younger Pliny, Seneca the philosopher, Petrarch, Politian, Busbequius, Erasmus, Lipsius, Muretus, Ascham, Milton, Petau, Launoy, Sarau, Balzac, and Voiture.

EPISTOMIUM, ΕΠΙΣΤΟΜΙΟΝ, in hydraulics, a plug, or instrument by the application whereof, the orifice of a vessel may be opened, and shut again at pleasure.

EPISTROPHEUS, in anatomy, (from επιστροφα, *convertio*, I turn about) the same with *cardo*.

EPISTYLE *, ΕΠΙΣΤΥΛΙΟΝ, in the ancient architecture, a term used by the Greeks, for what we call *architrave*, *viz.* a massive of stone, or a piece of wood, laid immediately over the capital of a column.

* The word is derived from the Greek, επι, *super*, upon, and στυλος, *column*.

The *epistyle* is the first, or lowest member of the entablature. See **ENTABLATURE**.

EPI TAPH *, ΕΠΙΤΑΦΙΟΝ, a monumental inscription, in honour, or memory of a person deceased; or an inscription engraven, or cut, on a tomb, to mark the time of a person's decease, his name, family, and usually some eulogy of his virtues, or good qualities.

* The word comes from ἐπι, *upon*, and ταφος, *sepulchre*.

The style of *epitaphs*, especially those composed in Latin, is singular.

At Sparta, *epitaphs* were only allowed to people who died in battle. Boethornius has made a collection of *epitaphs*, not very ample, but exceedingly well chosen. Fa. Labbe, has likewise given a collection of the like kind, in French; entitled, *tresor des epitaphes*. Camden and Weaver, have done something in the same way in our English *epitaphs*. An *epitaph* is said to be yet wanting to the duke of Marlborough's monument; though a premium of 500 pounds was offered by his dowager, to him that should compose one worthy of the hero deceased.

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In *epitaphs*, the dead person is sometimes introduced, by way of propocephala, speaking to the living; of which we have a fine instance, worthy the Augustan age; wherein the dead wife thus bespeaks her surviving husband.

*Impatura peri: sed tu felicior, annos
Vive tuos, conjux optime, vive meos.*

The French have a proverb, *meilleur comme une epitaph*: he lyes like an *epitaph*; in allusion to the eulogies ordinarily contained therein, which are not always over just.

EPI TAPH, is also applied to certain eulogies, either in prose or verse, composed without any intent to be engraven on tombs.

In the anthologies, or collections of epigrams, we have abundance of such *epitaphs*; some of them ludicrous and satirical: others grave.—For a specimen, we shall here add a very beautiful one, composed by Mr. Cowley, on himself, to be put on a little country-house, whither he retreated from the court and town, to spend his last days.

*Hic, O viator, sub late parvule,
Coulcius hic est conditus, hic jacet
Defunctus humani laboris*

Sorte, supervacuusq; vita;

Non indecora pauperie nitens;

Et non inerti nobilitas otio,

Vanusq; dilectis popelle,

Divitiis, animosus hostis.

Possis ut illum dicere mortuum,

Et terra jam nunc quantula sufficit?

Exempta sit caris, viator,

Terra sit illa levis, precare.

Hic sparge flores, sparge breves rosas;

Nam vita gaudet mortua floribus;

Herbifq; odoratis corona

Votis adhuc cinerem calentem.

EPI TASIS *, in the ancient poetry, denoted the second part, or division of a dramatic poem; wherein, the plot, or action proposed, and entered upon in the first part or protasis, was carried on, heightened, warmed, and worked up, till it arrived at its state, or height, called the *catastasis*.

* The word is pure Greek, ἐπιτασις, formed of ἐπιτινω, *intendo*, I heighten.

This division is laid aside in the modern drama; in lieu whereof, our plays are divided into acts. See **ACT**.

The *epitasis* might, ordinarily, take up about our second or third act.

EPI TASIS, ΕΠΙΤΑΣΙΣ, in medicine, denotes the increase, or growth, and heightening of a disease; or the beginning of a paroxysm, particularly in a fever.

EPI THALAMIUM *, ΕΠΙΘΑΛΑΜΙΟΝ, in poetry, a nuptial song; or a composition, usually in verse, on occasion of a marriage between two persons of eminence.

* The word is formed of ἐπι, and θαλαμος, *bride-chamber*.

The topics it chiefly insists on, are the praises of matrimony, and of the married couple; with the pomp and order of the marriage solemnity: it concludes, with prayers to the gods for their prosperity, their happy offspring, &c.—Catalus exceeded all antiquity, in his *epithalamiums*; and the cavalier Marino, all the moderns.

EPI THEM *, ΕΠΙΘΗΜΑ, in pharmacy, a kind of fomentation, or remedy of a spirituous, or aromatic kind; applied externally to the regions of the heart, liver, &c. to strengthen and comfort the same, or to correct some intemperature thereof.

* The word is formed from the Greek, ἐπι, *upon*, and τιθημι, *pono*, I put.

There are two kinds of *epithems*; the one *liquid*, the other *solid*: the *liquid epithem* is a fomentation of a more spirituous nature than the rest; the *solid*, is usually a mixture of conserves, theriaca, confections, and cordial powders, generally spread on a piece of scallot, or leather.

EPI THET *, ΕΠΙΘΕΤΟΝ, a noun adjective, expressing some quality of a substantive to which it is joined.

* The word is formed of ἐπι, *upon*, and θεσις, *positio*, putting.

As, a fruitful vine, a stately pile, an echoing vault, &c.

Epithets, are engines of mighty use, and convenience among the poets, and orators; who supply in *epithets*, what they want in things. Card. Perron even blames Homer on the head of *epithets*; observing, that he frequently hooks in *epithets*, without any sense, or significancy at all, to help out his measures; and that he equips every hero with an *epithet*, not according to the exigence of the case, but the measure of the verse.

EPI THET, is also used for a surname, or a person's second appellation.

Epithets, were anciently bestowed very frankly, either on account of any defects of the body, or mind: kings themselves, were not exempted from them. Hence, those *epithets* so frequent in history; as Henry Long-thanks, Edward Iron-sides, Richard Crook-back, John Lack-land, &c.

Nor have the French used their kings any better: witness their Charles the simple, Louis the lazy, *faineant*, (Ludovicus nihil faciens;) Pepin the short; and Louis the stammerer; *le bégue*.

EPITHYME, ΕΠΙΘΥΜΟΝ, *Dodder of Thyme*, a medicinal plant, of a very extraordinary nature, and figure. Its seed is very small, from which arise long threads like hairs, which soon perish, as well as the root, unless they meet with some neighbouring plant, both to sustain and feed them.

The *cuscuta*, in English called *dodder*, grows indifferently on all kinds of herbs; and, of consequence, the kinds thereof are infinite: to which writers usually attribute the particular virtues of the plants they grow on.

The most known of these plants, and those most used in medicine, are such as grow on thyme; which are the proper *epithymes*; and those on flax. There are two kinds in the shops; the one from Venice, the other from Candia: they have both an aromatic taste, but that of Venice has the strongest. Their use is to strengthen the parts, and prevent obstructions of the viscera, &c.

EPITOME *, an *abridgment*; or a reduction of the principal matters of a larger book, into a little compass.

* The word is Greek, ἐπιτομή, formed of ἐπισηύειν, *resecare*, to retrench, abridge, or cut off.

The *epitome* of Baronius's annals is done by de Sponde (Spondanus) Bernier has given an *epitome* of the philosophy of Gaffendus.

It is a popular objection against the *epitomizing* of authors, that it frequently occasions the loss of the originals. Thus the loss of the historian Trogus Pompeius, is attributed to his epitomizer Justin; and the loss of a great part of Livy to Lu. Florus.

EPITRITUS, in prosody, a foot consisting of four syllables; three long and one short.

Grammarians reckon four species of *epitrites*: the first consisting of an iambus and spondee: as Σάββατον. The second of a trochee and spondee: as Ἐπιτάφιος. The third of a spondee and an iambus: as Ἐπιτάφιος. And the fourth of a spondee and trochee: as Ἐπιτάφιος.

EPITROPE, in rhetoric, a figure of speech, by the Latins called *concessio*; whereby the orator grants something which he might deny; that, by this shew of impartiality, it may be more easily granted which he requires, in his turn.

This figure is frequently invidious; "Let them extol his probity; I acquiesce and am ready to be silent; but when they propose him for a pattern of wit, my spleen is raised," &c.

EPITROPUS, a kind of judge, or rather an arbitrator, which the Greek Christians, under the dominion of the Turks, elect, in the several cities, to terminate the differences that arise among them; and avoid carrying them before the Turkish magistrates.

There are several *epitropi* in each city: M. Spon, in his travels, observes, that at Athens there are eight, taken out of the several parishes, and called *vexchiarai*, i. e. old men.—But Athens is not the only place where there are *epitropi*: they are in all the islands of the Archipelago.

Some Latin authors of the Vth century, call *epitropi*, those who more anciently were called *villici*, and since *viduames*.

In times still earlier, the Greeks used the term ἐπιτροπῆ, in the same sense as the Latins did *procurator*, viz. for a commissioner, or intendant.

Thus the commissioners of provisions in the Persian army, are called by Herodotus, and Xenophon, *epitropi*: in the New Testament, ἐπιτροπῆ, denotes the steward of a household, rendered in the vulgate, *procurator*.

EPLOYE, in heraldry. An eagle *EPLOYE*, is what in English we more usually call an *eagle displayed*, or a *spread eagle*.

EPOCHA *, in chronology, a term, or fixed point of time, whence the succeeding years are numbered, or accounted.

* The word is Greek, ἐποχή, q. d. *inhibitio, repressio*, formed of ἐπισηύειν, *to sustain, stop*; by reason the *epocha* defines, or limits a certain space of time.

Different *epocha's*, obtain in different nations; and no wonder: for there being no astronomical consideration to render one preferable to another, their constitution is purely arbitrary. That principally regarded among Christians, is the *epocha* of the *nativity*, or incarnation of Jesus Christ; that of the *mahometans*, the *hegira*; that of the Jews, &c. the *creation of the world*; that of the ancient Greeks, the *olympiads*; that of the Romans, the *building of the city*; that of the ancient Persians and Assyrians, the *epocha* of Nabonassar, &c.

The doctrine and use of *epocha's*, is of very great extent in chronology.

To reduce the years of one *epocha* to those of another, i. e. to find what year of one, corresponds to a given year of another; a period of years has been invented, which com-

mencing before all the known *epocha's*, is, as it were, a common receptacle of them all, called the *Julian period*. To this period all the *epocha's* are reduced, i. e. the year of this period, whereon each *epocha* commences, is determined. All that remains therefore, is to add the given year of one *epocha*, to the year of the period corresponding with its rise; and from the same to subtract the year of the same period corresponding to the other *epocha*. The remainder is the year of that other *epocha*.

EPOCHA of Christ, or of our Lord, is the *vulgar epocha* throughout Europe; commencing from our Saviour's nativity, December 25; or rather, according to the usual account, from his circumcision, that is from the first of January; but particularly in England, from the incarnation, or annunciation of the blessed virgin, on the 25th of March; nine months prior to the nativity.

Now, the year of the Julian period whereon Christ was born, and circumcised, is usually computed to be the year 4713, consequently, the first year of the æra of Christ, corresponds to the year 4714 of the Julian period.

Hence, 1^o. If to any given year of Christ, you add 4713, the sum will be the year of the Julian period corresponding thereto. E. gr. if to the year 1725, be added 4713, the sum 6438, is that year of the Julian period.

2^o. On the contrary, subtracting 4713, from any given year of the Julian period, the remainder is the current year of Christ; e. gr. from the year of the Julian period 6439, subtracting 4713, the remainder is the year of Christ 1725.

In effect, the *epocha* of our Lord, serves not only for the computation of the years elapsed since the *epocha* commenced; but even of those before it.

Now, to find the year of the Julian period, corresponding to a given year before Christ; subtract the given year from 4714; the remainder is the correspondent year required. Thus, e. gr. the year before Christ 752, is the year 3956 of the Julian period. On the contrary, subtracting the year of the Julian period from 4714, the remainder is the year before Christ.

The author of the *vulgar epocha*, or way of computing from Christ, is an abbot of Rome, one Dionysius Exiguus, by nation a Scythian; who flourished under Justinian, about the year 507; though this Dionysius borrowed the hint from Pannodorus an Egyptian monk. Till his time, the generality of Christians computed their years, either from the building of Rome, or according to the order of the emperors and consuls, and the other ways in use with the people they lived among.

This diversity occasioning a great distraction between the churches of the east and west; Dionysius, to compose the same, first proposed a new form of the year, with a new general æra, which in a few years time was generally admitted.

Dionysius began his account from the conception, or incarnation, by us popularly called *lady-day*, or the *annunciation*: which method still obtains in the dominions of Great-Britain, and there only; so that the Dionysian, and English *epocha*, is the same. In the other countries of Europe, they reckon from the first of January; except in the court of Rome, where the *epocha* of the incarnation still obtains for the date of their bulls.

It must be added, that this *epocha* of Dionysius is charged with a mistake: the common opinion is, that it places our Saviour's nativity a year too late; or, that he was born the winter preceding the time prescribed by Dionysius for his conception.

But, the truth is, the fault lies on Beda, who misinterpreted Dionysius, and whose interpretation we follow; as has been shewn by Petavius, from Dionysius's own epistles. For Dionysius began his cycle from the year of the Julian period 4712; but his *epocha* from the year 4713, wherein the *vulgar æra* supposes Christ to have been incarnate.

The year, therefore, which according to the *vulgar epocha* is the first year of Christ; according to Dionysius's æra, is the second. So that the year, which we call 1749, should, in justice, be 1750. Though some chronologers, instead of one year, will have the error two.

To this *vulgar æra*, as a sure, fixed point, chronologers use to reduce all the other *epocha's*: though there is not one of them but what is controverted: so much uncertainty there is in the doctrine of time. We shall exhibit them as reduced to the Julian period.

EPOCHA of the creation, orbis conditi, according to the computation of the Jews, called also the *Jewish epocha*, is the year of the Julian period 953; answering to the year before Christ 3761; and commencing on the seventh day of October.

Hence, subtracting 952 years from any given year of the Julian period, the remainder is the year of the Jewish *epocha*

correct-

corresponding thereto. Thus, *e. gr.* the year 1725 being the 6438th year of the Julian period; it is the 5486th year of the Jewish *epocha*, or since the creation of the world.

This *epocha* is still in use among the Jews.

The *Epocha of the creation*; used by the Greek historians, is the year before the Julian period 787; answering to the year before Christ 5500.

Hence, to any given year of the Julian period, adding 787; the sum gives the year of this *epocha*. *E. gr.* 6438 being the year 1725 of the Julian period; 7390 is that year of this *epocha*, or the age of the world, according to this computation.

The author of this *epocha*, is Julius Africanus, who collected it from the historians. But when it came to be admitted into civil use, 8 years were added to it; that so every year thereof divided by 15, might exhibit the indiction, which the eastern emperors used in their charters and diplomas.

The *epocha of the creation* used by the later Greeks, and Russians, is the year 795, before the Julian period; or the year 5509 before Christ; commencing from the 1st day of September. Though the Russians, having lately admitted the Julian calendar, begin their year from the 1st of January.

Hence, adding 795, to the year of the Julian period, the sum gives the year of this *epocha*. Thus, *e. gr.* the Julian period of the year 1725 being 6438; that year of this *epocha*, i. e. the years from the creation, on this footing, are 7233. Again, from that year 7233, subtracting 5508; the remainder is the year of the common *era* 1725.

This *era* was used by the emperors of the east, in their diplomas, &c. And thence also called the *civil era of the Greeks*. In reality, it is the same with the *epocha of the Constantinopolitan period*; whence some call it the *epocha of the period of Constantinople*.

The *Alexandrian Epocha of the creation*, is the year 780, before the Julian period; answering to the year before Christ 5494; and commencing on the 20th day of August.

Hence, adding 5493, to the year of Christ 1725; the sum, 7218, gives that year of this *epocha*: or years elapsed since the creation, according to this computation.

This *epocha* was first concerted by Panodorus, a monk of Egypt, to facilitate the computation of Easter; whence, some call it, the *Greek ecclesiastical epocha*.

The *Eusebian Epocha of the creation*, is the year of the Julian period 486; answering to the year before Christ 4228; and commencing in autumn.

Hence, subtracting 486, from the Julian period of the year 6438; or adding 4228 to the year of Christ, 1725 the result 5953, will be that year of this *epocha*.

This *epocha* is used in Eusebius's chronicon, and the Roman martyrology.

Epocha of the olympiads, is the year of the Julian period 3938; answering to the year 776, before Christ, and the year 2985 from the creation; commencing at the full moon next the summer solstice; and each olympiad containing four years.

This *epocha* is very famous in ancient history: it was used principally by the Greeks, and had its origin from the olympic games, which were celebrated at the beginning of every fifth year.

Epocha of the building of Rome, or urbis condita, U. C. is the year of the Julian period 3961, according to Varro; or 3962, according to the Fasti Capitolini; answering to the years before Christ 753, or 752, and beginning on the 21st of April. Hence, if the years of this *epocha* be fewer than 754, subtracting them from 754, or 753; you have the year before Christ. And, on the contrary, if they be more than 745, adding them to the same, the sum is the number of years since Christ. Lastly, adding the year before Christ, to 753, or 752; the sum will give the year of this *epocha*, or the time since the building of Rome. Thus, *e. gr.* the year 1725, according to Varro, is the year of Rome 2488.

Epocha of Nabonassar, is the year of the Julian period 3967; answering to the year before Christ 747; commencing on the 26th day of February.

This *era* takes its denomination from its institutor, Nabonassar king of Babylon; and is that used by Ptolemy in his astronomical observations, by Censorinus and others.

Dionysian Epocha, or *Epocha of martyrs*, is the year of the Julian period 4997; answering to the year of Christ 283; called the *era of martyrs* from the great number of christians, who suffered martyrdom under the reign of that emperor.

The Abyssinians, among whom it is still used in all ecclesiastical computations, call it the *year of grace*. Though they do not reckon their years in a continued series from this *epocha*. But when the Dionysian period of 534 years is expired, they begin their computation afresh from 1, 2, &c.

Epocha of the hegra, or Mahometan Epocha, is the year of the Julian period 5335 answering to the year of Christ 622. It commences on the 16th of July, the day of Mahomet's flight from Mecca to Medina.

This *epocha* is used by the Turks and Arabs, and even all who profess the Mahometan faith: it was first introduced by Omar,

the third emperor of the Turks. The Astronomers, Alfraganus, Albategnius, Alphonbus, and Ulugh Beigh, refer Mahomet's flight to the 15th of July; but all the people who use the *epocha*, agree to fix it on the 16th. See HEGIRA.

Epocha of the Seleucida, which is used by the Macedonians, is the year of the Julian period 4402; answering to the year before Christ 312. See SELEUCIDÆ.

Yezdegerdic, or Persian Epocha, is the year of the Julian period 3545; answering to the year of Christ 632, and commencing on the 16th of June.

This *epocha* is taken from the death of Yezdegerdis, the last king of Persia, slain in battle by the Saracens.

Julian Epocha, or *Epocha of Julian years*, is the year of the Julian period 4668; answering to the year before Christ 45.

This *epocha* had its origin from the year of the reformation of the calendar under Julius Cæsar; called the *year of confusion*.

Gregorian Epocha. See GREGORIAN.

Spanish Epocha, is the year of the Julian period 4676; answering to the year before Christ 38. See HÆA.

Assiac; or Assian Epocha, is the year of the Julian period 4684, answering to the year before Christ 30. Commencing on the 29th day of August.

Other memorable *epocha*'s are, that of the deluge, in the year of the creation 1636; that of the birth of Abraham in 2039: the Israelites exodus or departure out of Egypt, in 2544: the building of the temple of Jerusalem, in 2023; and the destruction of the same in the year of Christ 70: the taking of Constantinople by the Turks, in 1453, &c.

EPODE, ΕΠΟΔΟΣ, in lyric poetry, the third or last part, of the ode; the ancient ode, or song, being divided into strophe, antistrophe, and *epode*.

The *epode* was sung by the priests standing still before the altar, after all the turns and returns of the strophe, and antistrophe.

The *epode* was not confined to any precise number, or kind of verses; as the strophe and antistrophe were. — But when the ode contained several *epodes*, strophes, &c. they were all alike.

As the word *epode*, then, properly signifies the end of the song; and as in odes, what they called the *epode*, finished the singing: it became customary, as M. Dacier shews, for any little verse, which being put after another, closed the period, and finished the sense which had been suspended in the first verse, to be called *epode*, ΕΠΟΔΟΣ.

And hence it is, that the VIth book of Horace's odes is entitled *Liber Epodon*, book of *epodes*; by reason the verses thereof are all alternately long and short; and that the short one, generally, though not always, closes the sense of the long one.

But the signification of the word is extended still further; *epode* being become a general name for all kind of short verses, that follow one or more long ones, of what kind soever they be: and, in this sense, a pentameter is an *epode*, after an hexameter, which in respect thereof is a pro-ode.

EPOMIS *, ΕΠΟΜΙΣ, in anatomy, the upper part of the shoulder, reaching up to the neck.

* The word is Greek, ΕΠΟΜΙΣ; where it primarily signifies a short cloak or mantle made to cover the shoulders.

Some authors apply the word *epomis* to the upper part of the os humeri: but the ancient Greek physicians only use it for the muscular, or fleshy part, placed as abovementioned.

ΕΠΟΡΟΕΙΑ, ΕΠΟΡΟΙΑ, in poetry, the history, action, or fable, that makes the subject of an epic poem.

* The word is derived from the Greek, ΕΠΟΣ, *carmen, versè*; and ΠΟΙΩ, *facio, I make*.

In the common use of the word, however, *epopœia* is the same with *epos*, or *epic poem* it self: in which sense it is defined, a discourse invented with art, or a fable agreeably imitated from some important action, and related in verse, in a probable and surprizing manner; with a view to form the manners, &c. See EPIC POEM.

EPULO, in antiquity, the name of a minister of sacrifice among the Romans.

The pontifices not being able to attend all the sacrifices performed at Rome, to so many Gods, as were adored by that people; appointed three ministers, whom they called *epulones*, by reason they conferred on them the care and management of the *epula*, feasts in the solemn games and festivals.

To them belonged the ordering and serving the sacred banquet, offered on such occasions to Jupiter, &c. They wore a gown bordered with purple, like the pontifices. Their number was at length augmented from three to seven, and afterwards by Cæsar to ten.

Their first establishment was in the year of Rome 558, under the consulate of L. Furius Purpureo, and M. Claudius Marcellus.

EPULOTICS *, ΕΠΟΥΛΩΤΙΚΑ, in medicine, drying, astringent remedies, proper to harden, cicatrize, and incarnate wounds, and ulcers.

* The word is formed of the Greek, ΕΠΙ, *super*, and ΕΠΙ, *cicatrize, eschar*. Whence the verb, ΕΠΟΥΛΩ, *cicatrizeum i sfero, I cicatrize*.

Such are emplaſters of ceruſ, and diapalma; the unguent of pompholyx, &c.

EPULUM, in antiquity, banquet; a holy feaſt prepared for the gods.

The ſtatues of the gods were commonly laid upon a bed, and ſerved in the epula as if they had been very hungry; to perform which, was the function of the miniſters of ſacriſice, hence called epulones.

EQUABLE Motion, is that whereby the moveable body proceeds with the ſame continued velocity; neither accelerated nor retarded.

EQUABLE Pulſe. } See the articles } PULSE.
EQUABLE Style. } STYLE.

EQUAL, a term of relation between two or more things of the ſame magnitude, quantity, or quality.

Wolſius defines equals to be thoſe things which may be ſubſtituted for each other, without any alteration of their quantity. It is an axiom in geometry, that two things which are equal to the ſame third, are alſo equal to each other. And again, if to, or from equals, you add or ſubtract equals, the remainder will be equal.

EQUAL Circles, in geometry, are thoſe whoſe diameters are equal. See CIRCLE.

EQUAL Angles, are thoſe whoſe ſides are inclined alike to each other; or which are meaſured by ſimilar arches of their circles.

EQUAL Arches, See the article ARCH.

EQUAL Figures, are thoſe whoſe area's are equal; whether the figures be ſimilar, or not.

The ſegments of a ſphere, or circle, are of an equal concavity, or convexity, when they have the ſame ratio, or proportion to the diameters of the ſpheres, or circles whereof they are parts.

EQUAL Solids, are thoſe which comprehend, or contain each as well as the other; or whoſe ſolidities, or capacities are equal. See SOLID.

EQUAL Hyperbola's, are thoſe all whoſe ordinates to their indeterminate axes, are equal to each other; taken at equal diſtances from their vertices.

EQUAL Numbers } See the articles } NUMBER.
EQUAL Hours } HOUR.

EQUAL geometrical ratio's, are thoſe whoſe leaſt terms are ſimilar, aliquot, or aliquant parts of the greater.

EQUAL arithmetical ratio's, are thoſe wherein the difference of the two laſt terms, is equal to the difference of the two greater. See RATIO.

EQUAL, in optics.—We ſay, that things ſeen under equal angles, are equal. Equal parts of the ſame interval, or magnitude, if unequally diſtant from the eye, appear unequal.—Equal objects, and at equal diſtances, only the one placed directly, and the other obliquely, ſeem unequal; and that placed directly, the bigger.

Masonry by EQUAL courſes. See MASONRY.

EQUALITY, in aſtronomy. Circle of EQUALITY, or the EQUANT, is a circle uſed in the Ptolemaic aſtronomy, to account for the eccentricity of the planets, and reduce them more eaſily to a calculus. See EQUANT.

Ratio, or Proportion of EQUALITY, in geometry, is that between two equal numbers, or quantities.

Proportion of EQUALITY evenly ranged, or ex æquo ordinata, is that wherein two terms in a rank, or ſeries, are proportional to as many terms in another ſeries, compared to each other in the ſame order, i. e. the firſt of one rank to the firſt of another; the ſecond to the ſecond, &c.

Proportion of EQUALITY evenly diſtributed, called alſo ex æquo perturbate, is that wherein more than two terms of a rank, are as proportional to as many terms of another rank, compared to each other, in a different and interrupted order; viz. the firſt of one rank to the ſecond of another; the ſecond to the third, &c.

EQUALITY, in algebra, is a comparison of two quantities, that are equal both really, and repreſentatively, i. e. which are ſo both in effect and letters.

A comparison of two quantities, equal in effect, but unequal in letters, to render them equal; is called an equation.

Equality, in algebra, is uſually denoted by two parallel lines, as =; thus, 2 + 2 = 4, i. e. 2 plus 2, are equal to 4. This character was firſt introduced by Hariot. Des Cartes, and ſome after him in lieu thereof uſe x: thus, 2 + 2 x 4, ſo x - y = b + c, ſignifies that x minus y, is equal to b plus c.

From an equation we arrive at an equality, by changing an unknown letter into another, whereby the two members of the equation, i. e. the two quantities compared together, and connected by the ſign of equality, are rendered equal. See EQUATION.

Thus, in the equation $2ax = bcd$; ſuppoſing $x = \frac{bcd}{2a}$, we change x into $\frac{bcd}{2a}$ and by this ſubſtitution arrive at the equality $bcd = bcd$.

In the ſolution of a numerical problem which is to be rendered rational; if there be only one power to be equalled to a ſquare, or other higher power; it is called ſimple equality.

When there are two powers to be equalled, each to a ſquare, it is called double equality, &c. Diophantus hath given us a method for double equalities, and Fa. de Billy, another for triple equalities, in his Diophantus Redivivus.

Union of EQUALITY. See the article UNION.

EQUANT, or ÆQUANT, in aſtronomy, a circle, imagined by aſtronomers, in the plane of the deferent, or eccentric; for the regulating, and adjusting of certain motions of the planets. See DEFERENT, EXCENTRIC, &c. See alſo APOGEE, and CIRCLE.

EQUATED Anomaly. See the article ANOMALY.

EQUATION, or ÆQUATION, in algebra, an expreſſion of the ſame quantity, in two different, that is, diſſimilar, but equal terms or denominations.

As, when we ſay, $2, 3 = 4 + 2$; that is twice three is equal to four and two.

Stifelius defines equation to be the ratio of equality between two quantities differently denominated; as when we ſay 3 ſhill. = 36 pence. Or 50 ſhill. = 2 lib. 10 ſhill. = 600 pence, = 2400 farth. Or, $b = d + e$. Or, $12 = a - p$, &c.

Hence, the reduction of two heterogeneous, or diſſimilar quantities to the ſame value, i. e. to an equality, is called the bringing them to an equation. See EQUALITY.

The character, or ſign of an equation, is = or x.

The reſolving of problems, by means of equations, is the buſineſs of algebra.

Terms of an EQUATION, are the ſeveral quantities, or parts, of which an equation is compoſed, connected, together by the ſigns + and -. Thus, in the equation $b + c = d$; the terms are b, c and d. And the tenor or import of the equation is, that ſome quantity, repreſented by d, is equal to two others repreſented by b and c.

Root of an EQUATION, is the value of the unknown quantity in the equation. E. gr. if $a^2 + b^2 = x^2$; the root will be $\sqrt{a^2 + b^2}$. See ROOTS of equations.

Equations are divided with regard to the powers of the unknown quantities, into ſimple, quadratic, cubic, &c.

Simple EQUATION, is that wherein the unknown quantity is only of one dimension, or in the firſt power. As, $x = (a + b) : 2$.

Quadratic EQUATION, is that wherein the unknown quantity is of two dimensions, or in the ſecond power. As, $x^2 = a^2 + b^2$. See QUADRATIC equation.

Cubic EQUATION, is that wherein the unknown quantity is of three dimensions. As $x^3 = a^3 - b^3$, &c. See CUBIC Equation. If the unknown quantity be of four dimensions, as $x^4 = a^4 - b^4$, the equation is called a biquadratic; if of 5, a ſurdeſolid, &c.

Equations are conſidered two ways: either, as the ultimate conſolutions we arrive at in the ſolution of problems; or as means by the help whereof, we arrive at thoſe final ſolutions.

An Equation of the firſt kind, conſiſts only of one unknown quantity, which is intermixed with other known quantities. Thoſe of the latter kind, conſiſt of ſeveral unknown quantities, which are to be compared, and connected together, till out of them all ariſe a new equation, wherein there is but one unknown quantity, mixed with the known. To get the value of which unknown quantity, the equation is generally turned, and transformed various ways, till it be brought as low, and rendered as ſimple as poſſible.

The doctrine and practice of equations, that is, the ſolution of queſtions by equations, conſiſts of ſeveral ſteps, or parts, viz. 1^o. The denominating of the ſeveral quantities, or expreſſing them in proper ſigns, or ſymbols. 2^o. The bringing the quantities thus denoted to an equation. 3^o. The reducing that equation to its loweſt and ſimpleſt terms. To which, 4^o. may be adding the conſtructing of the equation, or repreſenting it in geometrical lines.

With regard to the firſt; a queſtion, or problem, being propoſed; we conceive the thing ſought, or required, as already done: and accordingly note, or expreſs it by one of the vowels, as a, or more uſually, by one of the laſt letters of the alphabet, x, y, or z; noting the other known quantities, by the conſonants, or the beginning letters of the alphabet, b, c, d, &c.

The queſtion being thus ſtated in ſpecies; it is conſidered whether, or no, it be ſubject to any reſtrictions, i. e. whether it be determinate, or no: which is found by theſe rules.

1^o. If the quantities ſought, or required, be more than the number of equations given, or contained in the queſtion; it is indeterminate, and capable of innumerable ſolutions. The equations are found, if they be not expreſly contained in the problem it ſelf, by the theorems of the equality of quantities.

2^o. If the equations given, or contained in the problem, be juſt

just equal in number with the unknown quantities; the question is determinate, or admits but of a limited number of answers.

3°. If the unknown quantities be fewer than the given equations, the question is yet more limited, and sometimes it discovers it self impossible, by some contradiction between the equations.

Now, to bring a question to an EQUATION, that is, to bring the several mediate equations, to one final one; the principal thing to be attended to, is to express all the conditions thereof, by so many equations. In order to which, it is to be considered, whether the propositions, or sentences, wherein it is expressed, be all of them fit to be noted in algebraic terms; as our conceptions use to be in Latin, or Greek characters. And if so, as is generally the case in questions about numbers, or abstract quantities; then let names be given both to the known and unknown quantities, as far as occasion requires: and thus the drift of the question will be couched, as we may call it, in the algebraical language: and the condition, thus translated to algebraic terms, will give as many equations as are necessary to solve it. — To illustrate this by an instance: suppose it required to find three numbers, in continual proportion, whose sum is 20, and the sum of their squares 140; putting x, y, z , for the names of the three numbers sought, the question will be translated out of the verbal to the symbolical expression, thus:

<p>The question in words.</p> <p>Required three numbers, on these conditions.</p> <p>That they be continually proportional.</p> <p>That the sum be 20.</p> <p>And the sum of their squares 140.</p>	<p>In symbols.</p> <p>x, y, z</p> <p>$x : y :: y : z$, or $xz = yy$</p> <p>$x + y + z = 20$</p> <p>$xx + yy + zz = 140$</p>
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Thus, is the question brought to these equations, viz. $xz = yy$, $x + y + z = 20$, and $xx + yy + zz = 140$, by the help whereof, x, y , and z , are to be found, by the rules already laid down.

The solutions of questions are, for the most part, so much the more expeditious and artificial, by how much the unknown quantities, you have at first, are the fewer. Thus, in the question proposed, putting x for the first number, and y for the second, $\frac{yy}{x}$ will be the third continual proportional; which being put for the third number, bring the question into equations as follows:

<p>The question in words.</p> <p>There are sought three numbers in continual proportion.</p> <p>Whose sum is 20.</p> <p>And the sum of their squares 140.</p>	<p>Symbolically.</p> <p>$x, y, \frac{yy}{x}$</p> <p>$x + y + \frac{yy}{x} = 20$</p> <p>$xx + yy + \frac{yy^2}{xx} = 140$</p>
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You have therefore the equations $x + y + \frac{yy}{x} = 20$, and $xx + yy + \frac{yy^2}{xx} = 140$, by the reduction whereof, x and y are to be determined.

Take another example: a merchant increases his estate annually by one third part, abating 100 l. which he spends yearly in his family; and after three years he finds his estate doubled. Query, What is he worth? — To resolve this, it must be observed, that there are (or lie hid) several propositions, which are all thus found out and laid down.

<p>In words.</p> <p>A merchant has an estate</p> <p>Out of which the first year he spends 100 l.</p> <p>And augments the rest by one third.</p> <p>And the second year he spends 100 l.</p> <p>And augments the rest by one third.</p> <p>And so the third year he spends 100 l.</p> <p>And by the rest gains likewise one third.</p> <p>And he becomes at length twice as rich as at first.</p>	<p>Algebraically.</p> <p>x</p> <p>$x - 100$</p> <p>$x - 100 + \frac{x - 100}{3}$, or $\frac{4x - 400}{3}$</p> <p>$4x - 400 - 100$, or $4x - 500$</p> <p>$4x - 500 + \frac{4x - 500}{3}$, or $16x - 2800$</p> <p>$16x - 2800 - 100$, or $16x - 2900$</p> <p>$16x - 2900 + \frac{16x - 2900}{3}$, or $64x - 14800$</p> <p>$64x - 14800 = 2x$</p> <p>$27x = 14800$</p>
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Therefore the question is brought to this equation, $\frac{64x - 14800}{27} = 2x$, by the reduction whereof you will find the value of x .

Viz. Multiply it into 27, and you have $64x - 14800 = 54x$; subtract $54x$, and there remains $10x - 14800 = 0$, or $10x = 14800$; and dividing by 10, you have $x = 1480$. So that the value of his estate at first was 1480 l.

It appears then, that to the solution of questions about numbers, or the relations of abstract quantities; there is scarce any thing more required, but to translate them out of the common, into the algebraic language; i. e. into characters, proper to express our ideas of the relations of quantities. Indeed, it may sometimes happen, that the language wherein the question is stated, may seem unfit to be rendered into the algebraical; though by making a few alterations therein, and attending to the sense, rather than the sound of the words, the translation becomes easy enough. The difficulty here results merely from the difference of idioms, which is as observable between most languages as between the common and symbolical. However, to render the solution of such problems a little more easy and familiar, we shall add an example or two thereof.

1°. Given, the sum of two numbers a , and the difference of their squares b ; to find the numbers themselves. Suppose the lesser, x ; the other will be $a - x$; and their squares xx and $a^2 - 2ax + xx$: whose difference, $a^2 - 2ax$ is called b . Consequently, $a^2 - 2ax = b$. Whence, by reduction,

$$a^2 - b = 2ax; \text{ or } \frac{a^2 - b}{2a} = x = \frac{a^2 - b}{2(a - x)}$$

E. gr. Suppose the sum of the numbers, or a , to be 8, and the difference of their squares, or b , 16: then will,

$$\frac{8^2 - 16}{2 \cdot 8} = x = 4 - 1 = 3 = x. \text{ And } a - x = 5. \text{ Therefore the numbers are } 3 \text{ and } 5.$$

2°. To find three quantities x, y , and z , the sum of each pair whereof is given. Suppose the sum of the pair x and y be a ; that of x and z , b ; and that of y and z , c . To determine the three numbers required, x, y , and z ; we have three equations $x + y = a$; $x + z = b$; and $y + z = c$: now, to exterminate two of the unknown quantities, *e. gr.* y and x ; take away x , both from the first and second equations; and we shall have $y = a - x$ and $z = b - x$. Which values being substituted for y and z in the third equation; there will arise $a - x + b - x = c$; and by reduction $x = \frac{a + b - c}{2}$. Having found x , the former equations, $y = a - x$ and $z = b - x$ will give y and z .

Thus, *e. gr.* if the sum of the pair x and y be 9; of x and z , 10; and of y and z , 13: then, in the value xy , and z , write 9 for a , 10 for b , and 13 for c ; and you will have $a + b - c = 6$; and consequently $x = \frac{a + b - c}{2} = 3$, $y = (a - x) = 6$, and $z = (b - x) = 7$.

3°. To divide a given quantity into any number of parts, so as that the greater parts shall exceed the less by any given differences. Suppose a to be a quantity which is to be divided into four such parts, the first and smallest whereof is x ; the excess of the second part above this, b , of the third, c , and the fourth, d : then will $x + b$ be the second part, $x + c$ the third, and $x + d$ the fourth: the aggregate of all which $4x + b + c + d$ is equal to the whole line a . Now, taking away from each, $b + c + d$, and there remains $4x = a - b - c - d$, or $x = \frac{a - b - c - d}{4}$.

Suppose, *e. gr.* a line of 20 feet, to be divided into 4 parts, in such manner, as that the excess of the second above the first may be 2 feet, of the third, 3 feet, and of the fourth 7 feet. Then the four parts will be $x = \frac{20 - 2 - 3 - 7}{4} = 2$, $x + b = 4$, $x + c = 5$, and $x + d = 9$. And after the same manner, may a quantity be divided into a greater number of parts on the like conditions.

4°. A person disposed to distribute a little money among some beggars; wants eight pence, of three pence for each of them: he therefore gives them two pence a-piece, and has three pence left: the number of beggars is required. Let the number of beggars be called x ; and the person want 8 pence of giving them all 3 pence. Consequently he has $3x - 8$; out of which he gives 2 pence; and the remaining pence $x - 8$ are 3. That is $x - 8 = 3$ or $x = 11$.

5°. The power or strength of one agent being given; to determine how many such agents will produce a given effect a , in a given time b . Suppose the power of the agent such, as that it may produce the effect c , in the time d ; then, as the time d , is to the time b , so is the effect c , which the agent can produce in the time d , to the effect it can produce in the time b ,

which accordingly will be $\frac{bc}{d}$. Then, as the effect of one agent $\frac{bc}{d}$ is to the joint effect of them all, a ; so is that one agent, to all the agents. Consequently the number of agents will be $\frac{ad}{bc}$.

Thus, e. gr. if a clerk, or writer, in 8 days time, transcribe 15 sheets; how many such clerks are required to transcribe 405 sheets in 9 days? *Ans.* 24. For if 8 be substituted for d, 15 for c, 405 for a, and 9 for b, the number $\frac{a d}{b c}$ will become

$$\frac{405 \times 8}{9 \times 15} \text{ that is } \frac{3240}{135} \text{ or } 24.$$

60. The powers of several agents being given; to determine the time x , wherein they will jointly perform a given effect. Suppose the powers of the agents, A, B, C, such as that in the times c, f, g , they would produce the effects a, b, c , respectively: and these, in the time x , would produce effects $\frac{ax}{c}, \frac{bx}{f}, \frac{cx}{g}$; and by reduction $x = \frac{a}{\frac{1}{c} + \frac{1}{f} + \frac{1}{g}}$

Suppose, e. gr. that three workmen could finish a certain work in such and such times, viz. A once in three weeks, B thrice in eight weeks, and C five times in twelve weeks: and it is required, in what time they will finish it together? here, the powers of the agents A, B, C, are such as in the times 3, 8, and 12, respectively produce effects 1, 3, 5; and it is enquired in what time they will produce the effect, 1. For a, b, c, d, e, f, g, write 1, 3, 5, 1, 3, 8, 12; and there will come out $x = \frac{1}{\frac{1}{3} + \frac{1}{8} + \frac{1}{12}}$ or $\frac{24}{11}$ of a week, that is, 6 days, $5 \frac{1}{11}$ of an hour; the time they will finish it in together.

70. Given, the specific gravities of a mixture, and of the several ingredients thereof; to find the proportion of the ingredients therein. Suppose e the specific gravity of the mixture A+B; a that of A, and b that of B: since the absolute gravity, or weight, is compounded of the bulk of the body, and its specific gravity; a A will be the weight of A; b B that of B; and e A+B the weight of the aggregate A+B. Consequently, a A+b B=e A+B; and therefore a A-e A=e B-b B or e-b. a-e::A. B.

Thus, e. gr. suppose the specific gravity of gold to be as 19, that of silver as 10, and that of K. Hiero's crown as 17; then will 10. 3 (:: e-b. a-e:: A. B):: the bulk of gold in the crown, to the bulk of silver: or 190. 31 (:: 19 x 10. 10 x 3):: a x c-b. b x a-e):: the weight of the gold in the crown, to the weight of the silver, and 221. 31:: the weight of the crown to the weight of silver.

To bring geometrical problems to EQUATIONS.—Geometrical questions, or those relating to continued quantities, are sometimes also brought to equations, after the same manner as arithmetical ones. So that the 1st rule to be here prescribed is, to observe every thing directed for the solution of numerical problems. Suppose, e. gr. it were required, to cut a right line, as AB, (Tab. Algebra, fig. 6.) in mean and extreme proportion in C; that is, so as that BE, the square of the greater part shall be equal to the rectangle BD, contained under the whole and the lesser part.

Here supposing AB=a and CB=x; then will AC=a-x; and xx=a into a-x. An equation, which by reduction gives $x = \frac{a}{2} a - \sqrt{\frac{1}{4} a a}$.

But it is very rare, that geometrical problems are thus brought to equation; as being generally found to depend on various complex positions, and relations of lines; so that, here, some further artifice, and certain special rules, will be required, to bring them to algebraic terms. Indeed, it is very difficult to prescribe any thing precise in such cases: every man's own genius should be the rule of his procedure.

Something, however, shall be said in the general, for the sake of such as are nothing versed in such operations, and that principally from Sir I. Newton.

Observe then, 2^o. That problems concerning lines related to each other in any definite manner, may be variously stated, by supposing such or such quæsitæ, or things sought, to be required from such or such data: yet still, with whatever data and quæsitæ the question is proposed, its solution will arise after the very same manner, without the least alteration of any circumstance, except in the imaginary species of lines, or in the names whereby the data are distinguished from the quæsitæ.

Suppose, e. gr. the question were about an Isosceles triangle, BCD, (fig. 7.) inscribed in a circle; whose sides, BC, BD, and base CD, were to be compared with the diameter of the circle AB. Here, the question may be either proposed, of the investigating of the diameter, from the given sides and base; or investigating the base, from the sides and diameter given. Or, lastly, of finding the sides, from the base and diameter given: and propose it under which form you will, it will be brought to an equation, by the same algebraic series.

Thus, if the diameter be sought, put AB=x, CD=a, and BC, or BD=b. Then, drawing AC, as the triangles ABC and CBE are similar; AB:BC::BC:BE, or $x : b :: b : BE$. Wherefore $BE = \frac{bb}{x}$ and $CE = \frac{1}{2} CD$ or $\frac{1}{2} a$. And, by reason the angle CEB is a right angle,

$CE q + BE q = BC q$, that is, $\frac{1}{2} a + \frac{b^2}{xx} = bb$. Which equation being reduced, gives the diameter required, x . Again, if the base be sought, put AB=b, CD=x, and BC, or BD=a. Then drawing AC, as the triangles ABC and CBE are similar; AB:BC::BC:BE, or $c : b :: b : BE$.

Wherefore $BE = \frac{bb}{c}$. And $CE = \frac{1}{2} CD$ or $\frac{1}{2} x$. And since the angle CEB is right, $CE q + BE q = BC q$; that is, $\frac{1}{4} x^2 + \frac{bb^2}{c^2} = bb$; an equation, which reduced, gives the basis sought, x .

Lastly, If the side BC, or BD, were sought, put AB=c; CD=a, and BC or BD=x. Then drawing AC, the triangles ABC, and CBE, being similar; we have AB:BC::BC:BE; or $c : x :: x : BE$. Wherefore, $BE = \frac{xx}{c}$. And $CE = \frac{1}{2} CD$ or $\frac{1}{2} a$; and the angle CEB being right $CE q + BE q = BC q$. That is $\frac{1}{4} a^2 + \frac{xx^2}{cc} = xx$. An equation, which by reduction, gives x required.

Thus, is the calculus for arriving at the equation, as well as the equation it self, the same in all the cases; except that the same lines are designed by different letters, according as they are data, or quæsitæ. Indeed, as the data, or quæsitæ differ, there arises a difference in the reduction of the equation found: but there is no difference in the equation it self. So that we need make no difference between given and sought quantities; but are at liberty to state the question with such data and quæsitæ, as we think most favourable to the solution of the question.

3^o. A problem, then, being proposed, compare the quantities it includes; and, without making any difference between data and quæsitæ, consider what dependances they have on each other; that you may learn which of them will, by composition, give the rest. In the doing of which, it is not necessary you should at first contrive, how some may be deduced out of others, by an algebraic calculus; it suffices you remark in the general, that it may be deduced by some direct connection.

Thus, e. gr. if the question be about the diameter of a circle, AD (fig. 8.) and three lines A B, B C, C D, inscribed in a semi-circle; whereof, the rest being given, BC is required: it is evident at first sight, that the diameter AD, determines the semi-circle; as also, that the lines AB, and CD, by inscription, determine the points B and C, and consequently BC required, and that by a direct connection. Yet does not it appear how BC is deduced from the same data, by any analytical calculus.

4^o. Having considered the several manners, wherein the terms of the question may be explained and decomposed; chuse some of the synthetic methods; assuming some lines, as given, from which there is the most easy access, or progression to the rest, and to which the regression is the most difficult. For, though the calculus may be carried on diverse ways, yet must it begin with these lines. And the question is more readily solved, by supposing it to be of these data, and some quæsitum readily flowing from them; than by considering the question as it is actually proposed.

Thus, in the example already given, if from the rest of the quantities given, it were required to find AD: perceiving that this cannot be done synthetically; yet that if it were so done, I could proceed in my ratiocination on it in a direct connection from one thing to others; I assume AD as given, and begin to compute as if it was given indeed, and some of the other quantities, viz. some of the given ones, as A B, B C, or C D, were sought. And thus, by carrying on the computation, from the quantities assumed to the others, as the relations of the lines to one another direct, there will always be obtained an equation between two values of some one quantity; whether one of those values be a letter set down as a representation, or name, at the beginning of the work, for that quantity; and the other, a value of it found out by computation: or whether both be found by computation made different ways.

5^o. Having thus compared the terms of the question in general, there is some further thought and address required, to find the particular connections, or relations of the lines, fit for computation. For, what to a person who does not so thoroughly consider them, may seem immediately, and by a very near relation, connected together; when we come to express that relation algebraically, are often found to require a longer circuit; and shall even oblige you to begin your schemes a-new, and carry on your computation step by step; as may appear by finding BC, from AD, A B, and C D. For you are only to proceed by such propositions, or enunciations, as can be fitly represented in algebraic terms, whereof there are several arise from Eucl. ax. 19. prop. 4. book 6. and prop. 47. lib. I. Elem.

To facilitate this discovery, of the relations of the lines in the figure, there are several things that contribute; as first, the ad-

addition and subtraction of lines; since from the values of the parts you may find the value of the whole; or from the value of the whole, and one of the parts, you may obtain the value of the other part. Secondly, by the proportionality of lines; since, as above supposed, the rectangle of the mean terms, divided by either of the extremes, gives the value of the other; or, which is the same thing, if the values of all four of the proportionals be first had, we make an equality (or equation) between the rectangles of the extremes and means. But the proportionality of lines is best found out by the similarity of triangles; which, as it is known by the equality of their angles, the analyst ought in particular to be conversant in. In order to which, it will be necessary he be master of Euclid, Prop. 5, 13, 15, 29, and 32, *Lib. I.* and of Prop. 4, 5, 6, 7, 8, *Lib. VI.* and of the 20, 21, 22, 27, and 31, *Lib. III.* To which may be added, the 3d Prop. *Lib. VI.* or the 35th and 36th Prop. *Lib. III.* Thirdly, the calculus is promoted by the addition, or subtraction of squares, *viz.* in right-angled triangles, we add the squares of the lesser sides, to obtain the square of the greater; or from the square of the greater side, we subtract the square of one of the lesser, to obtain the square of the other. On which few foundations, if we add to them Prop. 1. of the 11th Elem. when the business relates to superficies, and also some propositions taken out of the 11th and 12th books of Euclid, when solids come in question: the whole analytic art, as to right-lined geometry, depends. Indeed, all the difficulties of problems may be reduced to the sole composition of lines out of parts, and the similarity of triangles; so that there is no occasion to make use of other theorems; because they may all be resolved into these two, and consequently into the solutions that may be drawn from them.

6°. To accommodate these theorems to the solutions of problems, the schemes are oft times to be farther constructed, by producing out some of the lines, till they cut some others, or become of an assigned length; or by drawing lines parallel, or perpendicular, from some remarkable point; or by conjoining some remarkable points; as also, sometimes, by constructing them after other methods, according as the state of the problems, and the theorems, which are made use of to solve it, shall require.

As for example: if two lines that do not meet each other, make given angles, with a certain third line; perhaps we produce them so, that when they concur, or meet, they shall form a triangle, whose angles, and consequently the ratio of their sides, shall be given; or if any angle be given, or be equal to any one, we often complete it into a triangle given in specie, or similar to some other, and that by producing some of the lines in the scheme, or by drawing a line subtending an angle. If the triangle be an oblique-angled one, we often resolve it into two right-angled ones, by letting fall a perpendicular. If the business concern multilateral, or many sided figures, we resolve them into triangles, by drawing diagonal lines, and so in others; always aiming at this end, *viz.* that the scheme may be resolved either into given, or similar, or right-angled triangles.

Thus, in the example proposed, draw the diagonal BD, that the trapezium ABCD, may be resolved into two triangles, ABD, a right-angled one, and BDC an oblique-angled one, (*fig. 8. n^o. 2.*) then resolve the oblique-angled one into two right-angled triangles, by letting fall a perpendicular from any of its angles B, C or D, upon the opposite side; as from B upon CD, produced to E, that BE may meet it perpendicularly. But since the angles BAD, and BCD, make in the mean while two right ones (by 22 Prop. 3 Eucl.) as well as BCE and BCD, the angles BAD, and BCE are perceived to be equal; consequently the triangles BCE, and DAB to be similar. And so the computation (by assuming AD, AB, and BC, as if CD were sought) may be thus carried on, *viz.* AD and AB (by reason of the right angled triangle ABD) give you BD. AD, AB, BD and BC (by reason of the similar triangles ABD, and CEB) give BE, and CE. BD, and BE (by reason of the right-angled triangle BED) give ED; and ED—EC gives CD. Whence there will be obtained an equation between the value of CD so found out, and the small algebraic letter that denotes it. We may also (and for the greatest part it is better so to do, than to follow the work too far in one continued series) begin the computation from different principles, or at least promote it by diverse methods, to one and the same conclusion; that at length there may be obtained two values of any the same quantity; which may be made equal to one another. Thus, AD, AB, and BC, give BD, BE, and CE as before; then CD—CE, gives ED; and lastly, DB and ED (by reason of the right-angled triangle BED) give BE.

7°. Having concerted your method of procedure, and drawn your scheme; give names to the quantities that enter the computation (that is, from which assumed, the values of others are to be derived, till you come to an equation) chusing such as involve all the conditions of the problem, and seem best accommodated to the business, and which may render the conclusion (as far as you can guess) more simple, but yet

not more than what shall be sufficient for your purpose. Wherefore, do not give new names to quantities, which may be denominated from names already given. Thus, of a whole line given, and its parts, of the three sides of a right-angled triangle, and of three or four proportionals, some one of the least considerable we leave without a name; because its value may be derived from the names of the rest. As in the example already brought, if I make AD=x, and AB=a, I denote BD, by no letter, because it is the third side of a right-angled triangle ABD, and consequently, its value is $\sqrt{xx-aa}$. Then if I say, BC=b, since the triangles DAB, and BCE are similar, and thence the lines AD, AB::BC, CE proportional, to three whereof, *viz.* to AD, AB, and BC, there are already names given; and for that reason I leave the fourth CE without a name, and in its room I make use of $\frac{ab}{x}$ discovered from the foregoing proportionality. And so if DC be called e, I give no name to DE, because from its parts DC, and CE, or c and $\frac{ab}{x}$; its value $c + \frac{ab}{x}$ comes out.

8°. By this time, the problem is almost reduced to an equation. For after the aforesaid letters are set down for the species of the principal lines, there remains nothing else to be done, but that out of those species, the values of other lines be made out, according to a pre-conceived method; till after some foreseen way they come to an equation. And there is nothing wanting in this case, except that by means of the right-angled triangles BCE and BDE, I can bring out a double value of BE, *viz.* BCq—CEq (or $bb - \frac{aabb}{xx}$) = BEq; as also BDq—DEq (or $xx - aa - cc - \frac{2abc}{x} - \frac{aabb}{xx}$) = BEq.

And hence (blotting out on both sides $\frac{aabb}{xx}$) you shall have the equation $bb = xx - aa - cc - \frac{2abc}{x}$; which being reduced, becomes $x^3 = +aa + b^2x + 2abc$, as before, +cc.

9°. For the geometry of curve lines: we use to denote them either by describing them by the local motion of right lines, or by using equations indefinitely expressing the relation of right lines disposed in order, according to some certain laws, and ending at the curve lines.

The ancients did the same by the sections of solids, but they effected it less commodiously. The computations, which regard curves, described after the first manner, are performed as above directed: thus, suppose AKC (*fig. 9.*) a curve line, described by K the vertical point of the square AK ϕ , whereof one leg AK, freely slides through the point A given in position, while the other K ϕ of a determinate length is carried along the right line AD, also given in position; and it is required to find the point C, in which any right line CD, given also in position, shall cut this curve: Draw the right lines AC, C ϕ , which may represent the square in the position sought, and the relation of the lines (without any difference, or regard, of what is given or sought, or any respect had to the curve) being considered, you perceive the dependency of the others upon C ϕ , and any of these four, *viz.* BC, BF, AF, and AC, to be synthetical; two whereof you assume, as CF=a, and CB=x; and beginning the computation from thence, you presently obtain $BF = \sqrt{aa - xx}$, and $AB = \frac{xx}{\sqrt{aa - xx}}$.

by reason of the right angle CBF; and that the lines BF, BC::BC, AB are continual proportionals. Moreover, from the given position of CD, AD is given, which therefore call b; there is also given the ratio of BC to BD, which suppose as d to e, and you have $BD = \frac{ex}{d}$, and

$$AB = b - \frac{ex}{d}$$

Therefore $b - \frac{ex}{d} = \frac{xx}{\sqrt{aa - xx}}$, an equation, which (by squaring its parts, and multiplying by $aa - xx$) will be reduced to this form.

$$x^4 = 2bdex^3 - b^2dd - xx - 2aabdex + aabdd.$$

Whence, lastly, from the given quantities a, b, d, and e; x may be found by rules given hereafter; and at that interval, or distance x or BC, a right line drawn parallel to AD, will cut CD in the point sought, which is C. If, instead of geometrical descriptions, we use equations to denote the curve lines by; the computations will thereby become as much shorter and easier, as the gaining of those equations can make them. Thus, suppose the intersection C, of the given ellipsis ACE *fig. 10.* with the right line CD given in

in position, be sought: to denote the ellipsis, take some known equation proper to it, as $rx - \frac{r}{q}xx = yy$, where x is indefinitely put for any part of the axis Ab , or AB , and y for the perpendicular bc , or BC , terminated at the curve; and r and q are given from the given species of the ellipsis. Since therefore CD is given in position, AD will be also given, which call a ; and BD will be $a - x$; also the angle ADC will be given, and thence the ratio of BD to BC , which call r to c ; and BC (y) will be $ea - cx$, whose square $eeaa - 2eacx + c^2xx$, will be equal to $rx - \frac{r}{q}xx$. And thence by reduction there will arise $xx = \frac{2aecc + rx - a^2cc}{c^2 + \frac{r}{q}}$, or $x = \frac{aecc + \frac{r}{2}r \pm e\sqrt{ar} + \frac{rr}{4ec} + \frac{aar}{q}}$. Add, that though

a curve be denominated by a geometrical description, or by a section of a solid, yet thence an equation may be obtained, which shall define the nature of the curve, and consequently all the difficulties of problems proposed about it, may be reduced hither. Thus, in the former example, if AB be called x , and BC , y , the third proportional BF will be $\frac{yy}{x}$, whose square, together with the square of BC , is equal to CFq ; that is, $\frac{y^4}{xx} + yy = aa$; or $y^4 + xxyy = a^2xx$. And this is an equation, by which every point C , of the curve AKC , agreeing or corresponding to any length of the base, (and consequently the curve it self) is defined; and from whence consequently you may obtain the solutions of problems proposed concerning this curve.

After the same manner almost, when a curve is not given in specie, but proposed to be determined, you may feign an equation at pleasure, that may contain its general nature; and assume this to denote it, as if it was given; that from its assumption you some way arrive at equations, by which the assumptions may be determined.

What remains of the doctrine and practice of equations, relates to their reduction to the lowest and simplest terms, the better to come at the value of the unknown quantity in the equation; and their geometrical construction. See REDUCTION of equations.

Extraction of the roots of EQUATIONS. See EXTRACTION of roots of equations.

Construction of EQUATIONS. See CONSTRUCTION of equations, and CURVE.

Conversion of EQUATIONS. See CONVERSION.

Affected EQUATION. } ADFFECTED.
 Exponential EQUATION. } See the articles { EMINENTIAL.
 Transcendental EQUATIONS. } EXPONENTIAL.

EQUATION of time, in astronomy, denotes the difference between mean and apparent time; or the reduction of the apparent unequal time, or motion of the sun, or a planet, to equable and mean time, or motion.

Time is only measured by motion; and as time, in it self, flows ever equally; to measure it, such a motion must be used as is equable, or which always proceeds at the same rate.

The motion of the sun is what is commonly used for this purpose; as it is the most easy to be observed: yet it wants the great qualification of a chronometer, which is equability. In effect, the astronomers find that the sun's apparent motion is no ways equal, that he now and then slackens his pace, and afterwards quickens it again: and consequently, equal time cannot be measured thereby. See SUN.

Hence, the time which the sun's motion shews, called the apparent time, becomes different from the true and equable time, wherein all the celestial motions are to be estimated, and accounted.

This inequality of time is thus accounted for: the natural, or solar day is measured, not, properly, by one entire revolution of the equinoctial, or 24 equinoctial hours; but by the time which passes while the plane of a meridian passing through the centre of the sun, does, by the earth's conversion round its axis, return again to the sun's centre: which is the time between one mid-day and the next.

Now, had the earth no other motion but that round its axis; all the days would be precisely equal to each other, and to the time of the revolution of the equinoctial: but the case is otherwise; for while the earth is turning round its axis, it is likewise proceeding forward in its orbit. So that when a meridian has completed a whole revolution from the sun's centre, its plane has not yet arrived at the sun's centre again: as will appear from the figure.

Let the sun be S (*Tab. Astronom. fig. 50.*) and let AB be a portion of the ecliptic: let the line MD , represent any meridian, whose plane produced, passes through the sun when the earth is in A . Let the earth proceed in its orbit, and in making one revolution round its axis, let it arrive at B ; then, will the meridian MD be in the position $m d$ parallel to the former MD ; and consequently this has not yet passed through the sun, nor have the inhabitants under that meridian, yet had their mid-day. But the meridian $d m$, must fill preceed with its angular motion, and describe the angle $d B f$ before its plane can pass through the sun.

Hence it appears, that the solar days are all longer than the time of one revolution of the earth round its axis. However, were the planes of all the meridians perpendicular to the plane of the earth's orbit; and did the earth proceed with an equal motion in its orbit; the angle $d B f$ would be equal to the angle BSA , and the arches $A f$ and AB would be similar: consequently, the times would be always equal; the arch AB , and the angle $d B f$, of the same quantity: all the solar days equal to each other; and the apparent and real time agree.

But, as it is, neither of those is the case: for the earth does not proceed in its orbit with an equable motion; but in its apheleon, describes a less arch, and in its perihelion a greater, in the same time; beside, that the planes of the meridians, are not perpendicular to the ecliptic, but to the equator. Consequently, the time of the angular motion $d B f$, which is to be added to the entire revolution in order to make a whole day, is not always of exactly the same quantity.

The same will be found, if setting aside the consideration of the real motion of the earth, we consider the apparent motion of the sun in lieu thereof; as being what we measure time by. On this principle we observe, that the day not only includes the time of one reversion of the globe on its axis, but is increased by so much as answers to that part of the sun's motion, performed in that time. For when that part of the equinoctial, which, with the sun, was at the meridian yesterday at noon, is come thither again to-day; it is not yet noon; the sun not being now at the place where he yesterday was, but gone forward near a degree more or less. And this addition above the 24 equinoctial hours is upon a double account unequal.

1^o. In that the sun, by reason of his apogee and perigee, does not at all times of the year describe an equal arch of the ecliptic in one day; but greater arches near the perigeeum, which is about the middle of December; and lesser nearer the apogeeum, which is about the middle of June.

2^o. In that though the sun should always move equably in the ecliptic, yet equal arches of the ecliptic do not in all parts of the zodiac, answer to equal arches of the equator, by which we are to estimate time; by reason some parts thereof, as the two solstitial points, lie nearer to a parallel position to the equinoctial than others, *e. gr.* those about the equinoctial points, where the ecliptic and equinoctial intersect. Whereupon an arch of the ecliptic, near the solstitial points, answers to a greater arch of the equinoctial, than an arch equal thereto near the equinoctial points.

The apparent motion of the sun to the east, then, being unequal; the natural and apparent days are no ways proper to be applied to measure the celestial motions, which have no dependence on that of the sun.

And hence astronomers have been obliged to invent other days for the use of their calculations: those others are equal; and are a mean between the shortest and longest of the unequal ones.

These are had by considering the number of hours in the whole revolution of the sun in the ecliptic, and dividing the whole time into as many equal parts as there are hours, 24 of which constitute the day: and this reduction of the days constitutes the equation of natural days.

Consequently, computing those motions, according to equal time, it is necessary to turn that time back again into apparent time, that they may correspond to observation: On the contrary, any phenomenon being observed, the apparent time thereof must be converted into equal time, to have it correspond with the times marked in the astronomical tables.

As we do not know of any body in nature that moves equally; yet such a motion is alone proper to measure equal days and hours: it has been thought fit to imagine some body, *e. gr.* a star, moving in the equator, eastward; and never quickening, or slackening its pace, but going through the equator in precisely the same time, as the sun finishes his period in the ecliptic.

The motion of such a star will represent equal time; and its diurnal motion in the equator, will be 59' 8"; the same as the mean, or equated motion of the sun in the ecliptic. Consequently, the mean or equable day, is determined by the arrival of this star at the meridian; and is equal to the time wherein the whole circumference of the equator, or 26^o, pass the meridian, and 59' 8" more. Which addition of 59' 8" remaining always the same, these mean or equated days will be constantly equal.

Since then the sun goes unequally eastwards with respect to the equator; it will sometimes arrive at the meridian sooner than this imaginary star, and sometimes later: the difference is the difference between true and apparent time: which difference is known by having the place of the imaginary star in the equator; and the point of the equator which comes to the meridian with the sun. For the arch intercepted between them, being converted into time, shews the difference between equal and apparent time, which, as before, is called the *equation of time*.

The *equation of time* then, may be defined, the time that flows while the arch of the equator intercepted between the point determining the right ascension of the sun, and the place of the imaginary star, passes the meridian: or, as Tycho, and, after him, Street, state it, it is the difference between the sun's true longitude, and his right ascension.

To EQUATE solar days, that is, to convert apparent into mean time, and mean into apparent time.—1°. If the sun's right ascension be equal to his mean motion, the imaginary and true sun will pass the meridian at the same time: consequently, the true coincides with the apparent time.

2°. If the right ascension be greater than the mean motion, subtract the latter from the former; and turning the difference into solar time, either subtract it from the apparent time, to find the mean time: or add it to the mean time to find the apparent.

3°. Lastly, if the right ascension be less than the mean motion, subtract the former from the latter, and turning the dif-

ference into solar time, either add it to the apparent time, to find the mean time; or subtract it from the mean time to find the apparent.

This method of *equation* obtains, if the calculus be progressive; if it be retrograde, that is, if the time be reckoned backwards, the operation must be just the reverse.

This doctrine of the inequality and *equation* of natural days, is not only of use in astronomical computations, but also in the adjusting and directing of clocks, watches, and other time-keepers: hence we see, why a pendulum, or other movement, which measures equal time, does not keep pace with the sun, which measures apparent time; but is sometimes before, and sometimes later than the same. Whence, such automata and sun-dials, are necessarily found almost perpetually at variance.

The variations of the two kinds of time, are exhibited in the following table, for every day throughout the year. It is borrowed from Mr. Flamsteed; one part of whose praise it is, that he was the first who fully demonstrated and cleared this inequality of natural days: though others, and even Ptolemy, had a partial notion of it.

The use of the table is obvious: a clock or watch, that is to be kept to true or equal time, must be so many minutes and seconds faster or slower than a sun-dial, as is assigned in the table, for the respective day: or, if you would have it go by the sun-dial, it goes well, if it gains or loses each day the number of minutes and seconds in the table.

TABLE of the EQUATION of Natural Days, with the Regulation of a Movement by the same.

DAY	January.		February.		March.		April.		May.		June.		July.		August.		Sept.		Oct.		Nov.		Dec.			
	W. too fast.	W. too fast.	W. too fast.	W. too fast.	W. too fast.	W. too fast.	W. too fast.	W. too fast.	W. too fast.	W. too fast.	W. too fast.	W. too fast.	W. too fast.	W. too fast.	W. too fast.	W. too fast.	W. too fast.	W. too fast.	W. too fast.	W. too fast.	W. too fast.	W. too fast.	W. too fast.	W. too fast.		
	Min. Sec.	Min. Sec.	Min. Sec.	Min. Sec.	Min. Sec.	Min. Sec.	Min. Sec.	Min. Sec.	Min. Sec.	Min. Sec.	Min. Sec.	Min. Sec.	Min. Sec.	Min. Sec.	Min. Sec.	Min. Sec.	Min. Sec.	Min. Sec.	Min. Sec.	Min. Sec.	Min. Sec.	Min. Sec.	Min. Sec.	Min. Sec.		
1	8	59	14	48	10	08	0	48	4	0	1	03	4	43	4	30	3	48	13	14	15	23	5	2		
2	0	21	14	47	9	51	0	33	4	03	0	51	4	51	4	20	4	03	13	28	13	15	5	13		
3	9	43	14	45	9	54	0	16	4	11	0	39	4	58	4	10	4	28	13	42	15	06	4	44		
4	10	04	14	42	9	47	0	01	4	13	0	27	5	05	5	59	4	49	13	55	14	56	4	15		
5	10	22	14	38	8	59	0	* 14	4	12	0	15	5	11	3	48	5	10	14	08	14	45	3	46		
6	11	44	14	33	8	41	0	29	4	11	0	* 02	5	17	3	30	5	31	14	20	14	33	3	17		
7	11	05	14	28	8	23	0	0	44	4	10	0	* 11	5	22	3	24	5	52	14	31	14	20	2	48	
8	11	21	14	22	8	05	0	0	58	4	05	0	24	5	27	3	16	6	6	13	14	42	14	06	2	18
9	11	39	14	16	7	47	1	12	4	06	0	37	5	31	2	58	6	6	14	52	13	52	1	48		
10	11	53	14	10	7	29	1	25	4	0	1	50	5	36	2	44	7	7	15	02	15	37	1	18		
11	11	03	14	07	7	11	1	38	4	01	1	03	5	38	2	30	7	14	15	11	13	21	0	48		
12	11	18	14	05	7	53	1	50	3	57	1	00	5	41	2	16	8	15	19	13	04	0	* 18			
13	11	34	14	03	6	35	2	02	3	55	1	29	5	43	2	01	9	15	20	12	40	0	* 12			
14	12	01	14	01	6	16	2	14	3	47	1	42	5	45	1	46	10	14	15	32	12	28	0	42		
15	12	10	13	24	5	57	2	23	3	41	1	54	5	46	1	30	11	15	38	12	09	1	12			
16	12	22	13	13	5	38	2	39	3	35	1	00	5	46	1	34	11	15	43	11	50	1	42			
17	12	34	13	02	5	19	2	49	3	21	2	18	5	45	0	57	9	14	15	48	11	30	2	11		
18	12	45	12	50	5	00	2	56	3	2	2	30	5	44	0	40	9	33	15	52	11	09	2	40		
19	13	01	12	38	4	41	3	05	3	15	2	42	5	42	0	25	9	57	15	55	10	47	3	09		
20	13	04	12	25	4	22	3	13	3	07	2	53	5	40	0	* 05	10	11	15	58	10	25	3	38		
21	13	14	12	12	4	03	3	21	3	21	2	05	5	38	0	* 13	10	30	10	00	10	02	4	7		
22	13	19	11	58	3	44	3	28	3	28	2	16	5	35	0	31	10	48	16	01	9	38	4	35		
23	14	25	11	43	3	27	3	35	2	40	3	27	5	31	0	56	11	06	16	01	9	14	5	3		
24	14	31	11	28	3	07	3	41	2	31	3	38	5	27	1	09	11	24	16	00	8	49	5	30		
25	14	36	11	13	2	49	3	46	2	27	3	49	5	22	1	28	11	41	15	58	8	24	5	37		
26	14	40	10	57	2	31	3	51	2	12	3	59	5	16	1	48	11	58	15	56	7	53	6	24		
27	14	43	10	41	1	13	3	55	2	00	4	09	5	10	2	08	12	14	15	53	7	52	6	50		
28	14	46	10	25	1	55	3	59	1	49	4	18	5	04	2	28	12	30	15	49	7	05	7	16		
29	14	48			1	38	4	02	1	37	4	27	4	56	2	48	12	45	15	44	6	38	7	41		
30	14	49			1	21	4	05	1	27	4	35	4	48	3	08	13	00	15	38	6	10	8	5		
31	14	49			1	04			1	1			4	37	3	28			15	31			8	20		

Absolute EQUATION. See the article ABSOLUTE. **EQUATION of the centre,** called also *prosthaphæresis*, and *total prosthaphæresis*; is the difference between the true and mean place of a planet; or the angle made by the lines of the true and mean place; or, which amounts to the same, between the mean and equated anomaly.

The motions of the sun and moon, are affected with various inequalities; whence arises the necessity of many *equations*. From these inequalities, the moon's place became exceeding difficult to be determined; to remove which difficulty, is the great design of Sir Isaac Newton's *new Theory of the Moon*; wherein we are furnished with *equations* for all the inequalities of the mean motion. The principal of these are,

Annual EQUATIONS of the mean motion of the sun and moon, and of the apogee and nodes of the moon.

The annual *equation* of the sun's centre being given, the three other corresponding annual *equations* will be also given; and therefore a table of that will serve for all. For if the annual *equation* of the sun's centre be taken from thence, for any time, and be called P; and let $\frac{1}{2}P = Q$, $Q + \frac{1}{2}P = R$, $\frac{1}{2}P = D$, $D + \frac{1}{2}P = E$; and $D - \frac{1}{2}P = F$; then shall the annual *equation* of the moon's mean mo-

tion for that time be R, that of the apogee of the moon will be E, and that of the node F.

Only observe, that if the *equation* of the sun's centre be required to be added; then the *equation* of the moon's mean motion must be subtracted, that of her apogee must be added, and that of the node subtracted. And on the contrary, if the *equation* of the sun's centre were to be subtracted, the moon's *equation* must be added, the *equation* of her apogee subtracted, and that of her node added.

There is also an *equation of the moon's mean motion*, depending on the situation of her apogee in respect of the sun; which is greatest, when the moon's apogee is in an octant with the sun; and is nothing at all, when it is in the quadratures, or syzygies. This *equation*, when greatest, and the sun in perigæo, is 3 min. 56 seconds. But if the sun be in apogæo, it will never be above 3 min. 34 seconds. At other distances of the sun from the earth, this *equation*, when greatest, is reciprocally as the cube of that distance. But when the moon's apogee is any where but in the octants, this *equation* grows less, and is mostly at the same distance between the earth and sun, as the line of the double distance of the moon's apogee, from the next quadrature or syzygy, to the radius. This is to be added to the moon's motion, while her apogee passes

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from a quadrature with the sun to a syzygy; but is to be subtracted from it, while the apogee moves from the syzygy to the quadrature.

There is, moreover, another equation of the moon's motion, which depends on the aspect of the nodes of the moon's orbit with respect to the sun: and this is greatest, when her nodes are in octants to the sun, and vanishes quite, when they come to their quadratures or syzygies. This equation is proportional to the sine of the double distance of the node from the next syzygy, or quadrature; and at the greatest, is but 47 seconds. This must be added to the moon's mean motion, while the nodes are passing from their syzygies with the sun, to their quadratures with him; but subtracted while they pass from the quadratures to the syzygies.

From the sun's true place take the equated mean motion of the lunar apogee, as was above shewed; the remainder will be the annual argument of the said apogee. From whence the eccentricity of the moon, and the second equation of her apogee may be compared.

Excentric EQUATION. See the article **EXCENTRIC**.

EQUATOR, or **ÆQUATOR**, in astronomy and geography, a great moveable circle of the sphere, equally distant from the two poles of the world, or having the same poles with those of the world.

Such is the circle DA, (*Tab. Astronom. fig. 52.*) its poles being P and Q.—It is called the equator, by reason when the sun is therein, the days and nights are equal; whence also it is called the equinoctial; and when drawn on maps and planispheres, the equinoctial line, or simply the line.

Every point of the equator is a quadrant's distance from the poles of the world; whence it follows, that the equator divides the sphere into two hemispheres, in one of which is the northern, and in the other the southern pole.

By the passages, or transits of arches of the equator over the meridian, its equal or mean time is estimated: hence we have frequent occasion for the conversion of degrees of the equator into time; and, again, for the re-conversion of parts of time into degrees, or parts of the equator.

For performance whereof, we subjoin the following table; wherein are exhibited the arches of the equator, which pass the meridian in the several hours, minutes, &c. of equated, or mean time.

Deg. of Equat.	Hours.	I	Hours.	Deg. of Equat.	Hour.	Deg. of Equat.	I
Min.	I	II		Sec.		II	
Sec.	II	III		Third.		III	
Third.	III	IV		Fourth.		IV	
1	0	4	1	15	1	0	15
2	0	8	2	30	2	0	30
3	0	12	3	45	3	0	45
4	0	16	4	60	4	1	0
5	0	20	5	75	5	1	15
10	0	40	6	90	6	1	30
15	1	0	9	135	10	2	30
30	2	0	12	180	20	5	0
60	4	0	15	225	30	7	30
90	6	0	18	270	40	10	0
180	12	0	21	315	50	12	30
360	24	0	24	360	60	15	0

The use of the table is obvious; suppose, *e. gr.* it were required to turn $19^{\circ} 13' 7''$ of the equator into time: against 15 deg. in the first column, we have $1^h 0' 00''$: against 4 deg. we have $16' 0''$: against 10 minutes, $40''$: against 3 minutes, $12' 0''$: against 5 seconds, we have $0' 20''$: and against 2 seconds, $8''$: which added together, give $1^h 16' 52'' 28''$.

Again, suppose it were required to find how many degrees, minutes, &c. of the equator, answer to 23 hours 25 min. 17 sec. and 9 thirds. Against 21^h in the fourth column of the table you have 315° : against 2 hours, 32° : against $20'$, $5''$: against 10 sec. $2' 30''$: against 5 sec. $1' 15'' 0'''$: against 2 sec. $30' 0''$: against 6 thirds, $1' 30'$: which added together give $351^{\circ} 19' 17'' 15'''$.

Elevation, or altitude of the EQUATOR, is an arch of a vertical circle, intercepted between the equator and the horizon.

The elevation of the equator, with that of the pole, is always equal to a quadrant.

EQUERY *, or **ECURY**, a grand stable, or lodge for horses furnished with all the conveniences thereof; as stalls, manger, rack, &c.

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* The word is formed from the French *écurie*, which signifies the same thing. Some, again, derive *écurie* from the Latin *staria*, which not only denotes a place for beasts to be put up in, but also a grange, or barn. But a more probable derivation is from *equus*, a stable for horses, of *equus*, horse.

Some hold that the word *stable*, in propriety, relates only to bullocks, cows, sheep, hogs, &c. And *equery* to horses, mules, &c.

A *simple equery*, is that provided for one row of horses: A *double equery*, that provided for two, with a passage in the middle, or two passages; the horses being placed head to head: as in the little *equery* at Versailles.

Under *equery* are sometimes also comprehended the lodgings, and apartments, of the *equeries*, grooms, pages, &c.

EQUERY, *Ecuyer*, is also an officer, who has the care, and management of the horses of a king, or prince.

EQUERIES, or **EQUERRIES**, popularly called **QUERRIES**, are particularly used among us, for officers of the king's stables; five in number, who when his majesty goes abroad, ride in the leading coach; are in waiting one at a time monthly, and have a table with the gentlemen ushers during the time.

They used to ride on horse-back by the coach-side, when the king travelled; but that being more expensive to them, than necessary to the sovereign, it has been discontinued.

EQUERIES of the crown stable have that appellation, as being employed in managing, and breaking the saddle horses, and preparing them for the king's riding.

There are two in number; whereof one is, or always should be, in close waiting at court; and when his majesty rides, holds the stirrup, whilst the master of the horse, or one of the *equeries*, in his absence, assists in mounting him; and when his majesty rides, they usually attend him.

EQUES Auratus, is used to signify a knight bachelor; called *auratus*, *q. d. gilt*, because anciently none but knights might gilt or beautify their armour, or other habiliments of war, with gold.

In law, this term is not used; but instead of it, *miles*; and sometimes *chevalier*.

EQUESTRI *, **EQUESTRIAN**, a term chiefly used in the phrase, *equestrian statue*, which signifies a statue representing a person mounted on horse-back.

* The word is formed of the Latin, *equus*, knight, horseman; of *equus*, horse.

The *fortuna equestris*, in ancient Rome, was a statue of that goddess on horse-back.—We sometimes also say, *equestrian column*.

EQUESTRIAN order, among the Romans, signified the order of knights, or *equites*.

EQUIANGULAR, or **ÆQUIANGULAR**, in geometry, is applied to figures, whose angles are all equal. See **ANGLE**. A square is an *equiangular* figure. See **SQUARE**.—All equilateral triangles are also *equiangular*.

When the three angles of one triangle, are severally equal to the three angles of another triangle; such triangles are also said to be *equiangular*.

EQUICRURAL, or **ÆQUICRURAL**, *Triangle*, is what we more usually call an *Isosceles*. See **ISOSCELES**.

EQUICULUS, **ÆQUULUS**, or **EQUUS minor**, a constellation of the northern hemisphere. See **EQUULEUS**.

EQUIDIFFERENT, or **ÆQUIDIFFERENT**, in arithmetic. If in a series of three quantities, there be the same difference between the first and second, as between the second and third, they are said to be *continually equidifferent*: but if in a series of four quantities, there be the same difference between the first and second, as between the third and fourth, they are said to be *discretely equidifferent*.

Thus, 3, 6, 7, and 10, are discretely *equidifferent*; and 3, 6, and 9, continually *equidifferent*.

EQUIDISTANT, or **ÆQUIDISTANT**, in geometry, a term of relation between two things, which are every where at an equal, or the same, distance from each other. See **DISTANCE**.

Thus parallel lines are said to be *equidistant*, as they neither approach nor recede.

EQUILATERAL, or **ÆQUILATERAL**, is applied to any thing whose sides are all equal.

Thus, an *equilateral* triangle, is that whose sides are all of equal length.—In an *equilateral* triangle, all the angles are likewise equal.

All regular polygons, and regular bodies, are *equilateral*. See **POLYGON**, **REGULAR**, &c.

EQUILATERAL Hyperbola, is that wherein the conjugate axes, as AB, and DE, are equal.—*Tab. Conics, fig. 20.*

Hence, as the parameter is a third proportional to the conjugate axes, it is also equal thereto. Consequently, if in the equation $y^2 = bx + b^2 x^2$; we make $b = a$; as the equation $y^2 = ax + a^2 x^2$, defines the nature of an *equilateral hyperbola*. See **HYPERBOLA**.

EQUILIBRIUM, or **ÆQUILIBRIUM**, in mechanics, a term implying an exact equality of weight between two bodies, compared with each other.

A balance is in *equilibrium*, when the two ends are so exactly poised, that neither of them ascends or descends, but both retain their parallel position to the horizon. From this circumstance the word is originally taken; as being a compound of *æquus*, equal, and *libra*, balance.—Whence we frequently use the word *balance* in lieu thereof.

The *equilibrium* of fluids makes a considerable part of the doctrine of hydrostatics. See **FLUID**.

EQUILIBRIUM, is also used figuratively on other occasions. A painter must take care to observe the *equilibrium* of his figures, *i. e.* dispose them well on their centre of gravity, that they may not seem ill supported, or ready to tumble.

Thus, *e. gr.* if one arm be moving forward, the other must be proportionably backward, to poise the figure.

In a picture, there should always be an *equilibrium* between one part and another: that is, the objects are to be distributed so, as to balance, and contrast each other; and not too many, *e. gr.* be crowded on one side, and the other left bare.

EQUIMULTIPLE, in arithmetic and geometry, is applied to simple magnitudes, when multiplied equally, *i. e.* by equal quantities, or multipliers.

Thus, taking A as many times as B; or multiplying them equally, there will still remain the same ratio between the magnitudes thus multiplied, as between the primitive magnitudes before multiplication.

Now, those magnitudes, thus equally multiplied, are called *equimultiples* of the original ones A and B: whence we say, that *equimultiples* have the same ratio as the simple quantities. In arithmetic, we generally use the term *equimultiples* for numbers which contain equally, or an equal number of times, their *submultiples*.

Thus 12 and 6 are *equimultiples* of their *submultiples* 4 and 2; inasmuch as each of them contains its *submultiple* three times.

EQUINA Sella. See the article **SELLA**.

EQUINOCTIAL, or **ÆQUINOCTIAL**, in astronomy, a great and immovable circle of the sphere, under which the equator moves in its diurnal motion.

The *equinoctial* or *equinoctial line*, is ordinarily confounded with the equator; but there is a difference: the equator being moveable, and the *equinoctial* immovable; and the equator being drawn about the convex surface of the sphere, but the *equinoctial* on the concave surface of the magnus orbis.

The *equinoctial* is conceived, by supposing a semi-diameter of the sphere, produced through a point of the equator, and there, by the rotation of the sphere about its axis, describing a circle on the immovable surface of the primum mobile.

Whenever the sun, in his progress through the ecliptic, comes to this circle, it makes equal days and nights all around the globe: as then rising due east, and setting due west, which he never does at any other time of the year. And hence the denomination, from *æquus*, and *nox*, night; *quia equat diem nocti*.

The *equinoctial*, then, is the circle which the sun describes, or appears to describe, at the time of the equinoxes; that is, when the length of the day is every where equal to that of the night: which happens twice per annum. See **EQUINOX**.

EQUINOCTIAL, in geography. See the article **EQUATOR**. People who live under this circle, by geographers and navigators called the *line*, have their days and nights constantly equal. And at noon, the sun is in their zenith, and therefore casts no shadow.

From this circle, is the declination, or latitude of places, accounted in degrees of the meridian.

EQUINOCTIAL Points, are the two points wherein the equator and ecliptic intersect each other.—The one, being in the first point of aries, is called the *vernal*; and the other in the first point of libra, the *autumnal point*.

EQUINOCTIAL Colure, is that passing through the *equinoctial* points. See **COLURE**.

EQUINOCTIAL Dial, is that whose plane lies parallel to the *equinoctial*. See **DIAL**.

EQUINOCTIAL Hours. } See the articles. } **HOUR.**

EQUINOCTIAL Line. } **LINE.**

EQUINOCTIAL Orient. } **ORIENT.**

EQUINOX, or **ÆQUINOX**, in astronomy, the time when the sun enters one of the *equinoctial* points.

The time when he enters the vernal point is particularly denominated the *vernal*; and that when he enters the autumnal point, the *autumnal equinox*.

The equinoxes happen when the sun is in the *equinoctial* circle; when, of consequence, the days are equal to the nights throughout the world, which is the case twice a year: *viz.* about the 10th of March, and the 12th of September, the first of which is the *vernal*, and the second the *autumnal equinox*.

As the sun's motion is unequal, that is, sometimes swifter,

and sometimes slower, (from the causes already explained under the article **EQUATION**) it comes to pass that there are about eight days more from the vernal, to the autumnal *equinox*, than from the autumnal to the vernal: the sun spending so much more time in travelling through the northern, than the southern signs.

According to the observations of M. Cassini, the sun is 186^d. 14^h. 53'. in the northern signs; and only 178^d. 14^h. 56'. in the southern. The difference of which is 7^d. 23^h. 57'.

The sun being continually advancing forwards in the ecliptic, and gaining a degree every day; he makes no stay in the *equinoctial* points, but the moment he arrives in them, he so leaves them.

Of course, therefore, though the day the sun enters the *equinoctial* point, is called the *equinox*, as being reputed equal to night; yet is not it precisely so, unless the sun enter the equator at mid-day. For if the sun rising should enter the *vernal equinox*, at setting, he will have departed from it, and have got northwards about 12: consequently, that day will be somewhat longer than 12 hours, and the night proportionably shorter.

The time of the *equinoxes*, *i. e.* the moment in which the sun enters the equator, is found by observation; the latitude of the place of the observation being given.

Thus, in the *equinoctial* day, or near it, take the just meridian altitude of the sun; if this be equal to the altitude of the equator, or the complement of the latitude, the sun is that very moment in the equator. If it be not equal, the difference is the sun's declination. The next day observe the meridian altitude as before, and find his declination: if the declination be of different kinds, *viz.* the one north, and the other south, the *equinox* has happened in the interval of time between them. Otherwise, the sun has either not entered the *equinoctial*, or had passed it at first. From these two observations, a trigonometrical calculus gives the time of the *equinox*.

It is found by observation, that the *equinoctial* points, and all the other points of the ecliptic, are continually moving backward, or in antecedentia, that is, westward. This retrograde motion of the *equinoctial* points, is that famous and difficult phenomenon, called the *precession of the equinoxes*. See **PRECESSION of the equinoxes**.

EQUINUS Venter. See **VENTER Equinus**.

EQUIPAGE, in navigation. See **CAREW**.

EQUIPOLLENCE, in logic, is when there is an equivalence between any two or more terms, or propositions; *i. e.* when they signify one and the same thing, though they express it differently.—Such propositions, &c. are said to be *equipollent*. See **EQUIVALENT**.

EQUIPPE, in heraldry, expresses a cavalier equipped, *i. e.* armed at all points.

EQUITY, **ÆQUITAS**, denotes justice, or right mitigated and tempered by the consideration of particular circumstances; or a correction, and abatement of the severity of some law; or a temperament, which, without being unjust, abates the rigour of some just law.

This is what the Greeks call *επιεικεια*.—The utmost severity of a good law, is frequently contrary to justice; it should always have *equity* for its rule, and guide. *Summam jus, sepe summa injuria*.

The foundation of *equity*, is not, that there is any mistake in the law; but that the law was laid down universally; by reason all circumstances could not be considered, or taken in under one law.

Equity, therefore, is not so much a correction of a law, as an amendment; not yet so properly an amendment of the law it self, as of some conclusion arising from its being ill understood, or ill applied.

In this it is distinguished from a *dispensation*, which takes away the obligation of the law in some particular case; whereas a correction does not take away any thing of the obligation; but only shews in what sense that is to be taken, if there should be imagined any obligation, where there is none.

For an instance, suppose it an express law, that the city being now beset with an enemy, the gates be all shut; and suppose it fall out, that the enemy is then in pursuit after some of the citizens by whom it is defended; so that it would be highly prejudicial thereto, not to open them the gates: *equity* here decrees the gates to be opened, contrary to the express word of the law.

Thom. Aquinas proposes another instance: suppose it law, that whoever refuses to restore what had been committed in trust to him, shall pay a grievous mulct; and suppose some person refuse to restore a sword left with him, to a mad-man. This case is comprehended in the sense and intentment of the law; though not in the words thereof. And the legislator himself, if he were present, would except it. *Equity*, therefore, must here step in, to correct or supply the defect of the judge, and acquit the man of the mulct.

In this view, *equity* is of two kinds, and those of contrary effects, the one abridges, and takes from the letter of the law; and the other enlarges, and adds thereto.

The first is defined, the correction of a law, made generally in that part wherein it fails: as, suppose a statute made, "That whosoever does such a thing, shall be a felon, or suffer death:" yet if a mad-man, or an infant, who hath no discretion, do the same, he shall neither be a felon, nor suffer death.

The other is defined, an extension of the words of the law, to cases which are not expressed, which yet come under the same reason; so that, when one thing is enacted, all other things, which are of the like degree, are so too.

Thus the statute which ordains, that in action of debt against executors, he who appears by distress shall answer; extends by *equity*, to administrators: and such of them as shall appear first by distress, shall answer, by the *equity* of the said act: *quia facti in equali genere*.

EQUITY is also used for the virtue of justice. See *JUSTICE*. *EQUITY*, in our laws, &c. is also frequently used for the court of chancery, where controversies are supposed to be determined, according to the exact rules of *equity* and conscience, by mitigating the rigour of the common law.

Æquitas sequitur legem, is an old maxim in law; but from the great increase of suits in chancery, some have thought fit to give it this construction, that in all causes after a man has been at law, he must go to *equity*.

EQUIVALENT, is understood of something that is equal in value, force, or effect to another.

Equivalence is of various kinds, in *propositions*, in terms, and in things.

EQUIVALENT Terms are, where several words that differ in sound, have yet one and the same signification: as, *every body was there*, and *no body was absent*; *nihil nan, and omne*.

EQUIVALENT Things, are either *moral, physical, or statial*.—*Moral*, as when we say, that the commanding or advising a murderer, is a guilt *equivalent* to that of the murderer.—*Physical*, as when a man, who has the strength of two men, is said to be *equivalent* to two men.—*Statial*, whereby a less weight becomes of equal force with a greater, by having its distance, from the centre, increased.

EQUIVOCAL, EQUIVOCUM, denotes a word, or expression that is dubious, and ambiguous; or that may have several senses, one true, and another false.

Equivocal terms answer to what are otherwise called *homonyma, or homonymous terms*.

Such is the word *emperor*, which is both the name of a dignity, the proper name of a person, and the name of a plant. So also the Latin *gallus*, which stands indifferently for a cock, and a Frenchman.

In these cases one word denotes diverse conceptions, one word diverse things: whence that common definition of *equivocalis* in the schools, *quorum nomen est commune, ratio vero essentialis secundum illud nomen diversa*.

Philosophers distinguish *equivocalis*, into *active and passive*; or *equivoca equivocantia, and equivocata*.

Equivoca equivocantia, or those that denominate and signify things, are words common to several things in a very different signification, *i. e.* to several things which have a similar essence, correspondent to the similar denomination. *E. gr.* The word *taurus*, which stands for a sign, a mountain, and an animal; and in one signifies a lowing animal; in another, a heap of stones and earth; and in the third, a constellation, or system of stars.

Equivoca equivocata, or those that are called or denominated; are the things signified by ambiguous names, *e. gr.* a sign, a mountain, and an animal. Which last species of *equivocalis* alone Aristotle seems to have had in view in his definition, which agrees to these, and these only.

EQUIVOCAL Action. } See the article. } *ACTION*.

EQUIVOCAL Cause. } } *CAUSE*.

EQUIVOCAL Generation, is a method of producing animals and plants, not by the usual way of coition between male and female, but by I know not what plastic power, or virtue in the sun, &c.

Thus insects, maggots, flies, spiders, frogs, &c. have usually been supposed to be produced by *equivocal generation*, *i. e.* by the heat of the sun warming, agitating and impregnating the dust, earth, mud, and purified parts of animals.

This method of generation, which we also call *spontaneous*, was commonly asserted and believed among the ancient philosophers: but the moderns, from more and better observations, unanimously reject it, and hold that all animals, nay and vegetables too, are univocally produced, that is, from parent animals, and vegetables of the same species and denomination.

It were a thing, one would imagine, sufficient to discredit the Aristotelian, or rather the Egyptian doctrine of *equivocal generation*, to find flies, frogs, lice, &c. to be male and female; and accordingly to engender, lay eggs, &c.

To imagine that any of those creatures could be spontaneously produced, especially in so romantic a manner, as in

the clouds, as they particularly thought frogs were, and that they dropped down in showers of rain, were, certainly, highly unphilosophical.

Yet some, even to this day, credit the stories of raining of frogs; and, among the rest, the very curious and learned Dr. Lister, seems inclined to the opinion: infancing in frogs, found on the leads of the lord Aston's gatehouse at Tixel in Staffordshire, which he imagines came there by some such means. But we may make a judgment of this, and a hundred the like reports to be met with in considerable authors, from some other the like relations that have been better inquired into. Such are several reports of the raining of millet-seed, wheat, whittings, &c. An account of which, with the grounds of the deceit, see under *RAIN* and *SHOWERS*.

The doctrine of *equivocal generation* we call an *Egyptian doctrine*, as having, in all probability, had its rise in Egypt, to save the hypothesis of the original production of men, and other animals, out of the earth, by the help of the sun's heat. To prove which, the Egyptians, as Diodorus Siculus observes, produce this observation; that about Thebes, when the earth is moistened by the Nile, and afterwards impregnated by the intense heat of the solar rays, an innumerable swarm of mice, do come forth: whence he infers, that all kinds of animals might equally have arisen out of the earth at the beginning of things. And from these, bishop Stillingfleet takes the other writers and adherents, to the doctrine of *equivocal generation*; Mela, Pliny, Ovid, &c. to have borrowed the hypothesis, without enquiring into its truth. Derham's *Phys. Theol.* lib. IV. c. 15.

EQUIVOCATION, ÆQUIVOCATIO, the using a term, or expression, that has a double signification.

Equivocations are expedients to save telling the truth, and yet without telling a lie for the matter. The fathers are great patrons of *equivocations*, and mental reservations; holding, that the use of such shifts, and ambiguities, is in many cases allowable.

St. Augustin, particularly, is reproached with endeavouring to vindicate Isaac for saving his wife from a crime, by an *equivocation*: *tacuit aliquid veri, & non dixit aliquid falsi*. To advance a dubious proposition, knowing it will be understood in a sense different from that you give it in your mind, is an *equivocation*, and a breach of good faith and sincerity.

EQUIVOCATION, in moral theology, is strictly understood of a term, or phrase, with two different significations; the one common, and obvious; the other more unusual, and remote: the latter of which being understood by the speaker, but the former by the hearers, they conceive something different from one another.

Of this we have an instance in St. John, chap. 11. where our Saviour is represented as saying, *Lazarus sleepeth*: for the disciples who took the word *sleeping* in the usual signification, concluded that Lazarus, whom they had been told was sick, began to take rest, and would soon recover; but Jesus, using the words in a less direct, and usual signification, meant that Lazarus was dead.

When the *equivoque* consists of several words, it is properly called an *ambiphology*: of which we have an instance in St. John, chap. ii. *destroy this temple*, says Jesus Christ, speaking to the Jews, *and I will raise it again in three days*.

The lawfulness of the use of *equivocations* has been greatly disputed among the modern casuists: many grave authors deny that it is allowable to use them on any occasion whatever. Their reason is, that an *equivoque* is to all intents and purposes the same thing with a lie.

Others, on the contrary, particularly Cabassut, a divine famous among the priests of the oratory, hold a world of difference between an *equivocation* and a lie; maintaining that it is always criminal to tell a lie; but that there are some occasions where an *equivocation* may be used innocently: and such, in effect, is the sentiment of St. Thomas, St. Antonin, St. Raymond, and especially St. Augustin, as Fa. Cabassut seems to have demonstrated. Lib. IV. *Theor. de Prox. Jur. Can.* Edit. Lugd. 1685. cap. 4.

EQUULEUS, or ECULEUS, in antiquity, a kind of rack, or engine of torture, used for extorting the truth; as first chiefly on slaves, but afterwards turned against the christians. The patient's arms and legs being fastened on the *equulus* with chords, he was hoisted aloft, and extended in such manner, that all his bones were dislocated. In this state, red hot plates were applied to his body; and he was also goaded in the sides with an iron forked instrument, called *ungula*.

The *equulus* was of wood, and had holes, at certain distances; with a screw, by which the criminal was stretched to the 30, sometimes to the 4th or the 5th hole: at intervals the screw was slackened again; by which he had some respite; but then was he tormented with questions.

Hieronymus Magius, when a prisoner among the Turks, wrote an express treatise de *Equules*; and another of bells; merely, as it is said, from his memory, without any assistance of books. Sigonius had another treatise on the same subject.

ERE

EQUULEUS, in astronomy, a constellation of the northern hemisphere; whose stars in Ptolemy's catalogue are 4; in Tycho's 4; in Mr. Flamsteed's 10. The longitudes, latitudes, magnitudes, &c. whereof are as follow.

Names and situations of the stars.	Sign.	Longit.	Latitude.	Magnit.
		°	North.	"
	♈	14 12 57	20 32 56	5
		15 59 37	23 02 36	6
		16 02 30	21 16 01	6
		16 25 37	21 38 31	6
Preced. of two in the mouth.		19 08 24	25 13 12	4
5				
Subseq. of the same.		19 07 07	25 06 52	6
Preced. of two in the head.		20 07 30	24 46 57	4
		18 47 49	20 09 09	4
		20 51 05	21 42 53	6
Subseq. in the same.	♈	21 07 02	21 03 06	4

EQUULEUS, in the arts and manufactures. See HORSE.

ERADICATIVE, in medicine. See RADICAL.

ERANARCHA *, **EPANAPXHE**, a publick officer among the ancient Greeks, whose business was to provide over, and direct the alms given, and provisions made for the poor.

* The word is formed of the Greek, *εραρος*, alms, contribution, and *αρχη*, command.

The *eranarcha* was properly the administrator, or steward of the poor: when any person was reduced to poverty, taken captive, or had a daughter to marry, which he could not effect for want of money, &c. this officer called an assembly of friends and neighbours, and taxed each, according to his means and estate, to contribute towards his relief. This is what we learn from Corn. Nepos, in his life of Epaminondas.

ERASED, in heraldry, expresses any thing that seems violently torn off from its proper place.—It is used in contra-distinction to *caused*, which signifies a thing clean cut off.—The family of Card bears ermine, a demy lion rampant *erased*, azure, &c.

ERASTIANS, a religious sect, or faction, which arose in England during the time of the civil wars; thus called from their leader Tho. Erastus; whose distinguishing doctrine it was, that the church had no right to discipline, that is, no regular power to excommunicate, exclude, censure, absolve, decree, or the like.

ERECT Flowers, are such as grow upright, without hanging, or reclining the head. See FLOWER.

ERECT Vision. See the article VISION.

ERECT } *Direct*
Declining, &c. } *Dials*. See DIAL.

ERECTION, the act of raising, or elevating a thing, in a right line.

The *erection* a perpendicular on a line given, is a popular problem in geometry.

The term **ERECTION** is also used figuratively.—As, the *erection* of a marquise into a duchy; bishopsricks can only be *erected* by the king.

It was anciently the practice to *erect* statues to great men. Cato, the censor, being asked why a statue was not *erected* him? I had rather, says he, hear that question made, than hear it asked why a statue was *erected* me.

ERECTION, is particularly used in medicine, for the state of the penis, when swelled, and distended by the action of the muscles, called *erectors*.

There is also an *erection* of the clitoris, which is performed by muscles provided for that purpose. See CLITORIS, and ERECTOR.

An alteration of *erection*, and flaccidity in the penis, Dr. Drake observes, is of absolute necessity: the first to the performance of its office; the second for the security of the part. Without an *erection* it were impossible to emit and lodge the seed where it ought to be; and with a constant one, it would be impossible to secure the part from external injuries.—To say nothing of the loss of intigitation, which must be a necessary consequence of constant *erection*.

The *erection* of the penis, consists in a distension of its corpora cavernosa, by an extraordinary quantity of blood pent up therein.

That the blood is the matter which distends the penis in *erection*, is evident from abundance of experiments; though the most convincing is that of firmly tying the penis of an animal (as has been frequently done to a dog) in coitu; wherein, nothing has been found but blood to distend it. Hence, in the bodies of criminals, that hang long after death; the penis becomes *erected*; the blood, in that position, falling to the inferior parts, and stopping there.

By blowing into the blood vessels of the penis after death, the part becomes *erected*. This was first discovered by Mr. Cowper, upon viewing its veins, after he had distended them with wind; whence it plainly appeared, that the external trunks passed, some under its skin only, and some over the ossa pubis; beside, that a vast number of other veins on the dorsum penis, unite and empty themselves into one trunk, called *vena penis*, which passes immediately under a transverse ligament of

ERIS

the ossa pubis, which is compressed by the approximation of the dorsum penis, to the ligament of the pubis. This application of the dorsum penis is effected by its muscular directors pulling down the cars of the corpora cavernosa penis, which are tied up at their juncture in the body of the penis to the os pubis, by the ligamentum suspensorium. Now, this cannot happen to the cavernous body of the urethra, by reason there is no bone, whose position can give rise to a ligament, which can have that effect on its veins: wherefore the musculi acceleratores, embracing the veins of the bulb do that office, though not so effectually as in the penis it self.

Accordingly, the glans is not always perfectly distended with the penis, and it is this part that soonest becomes flaccid on an *erection*.

The blood, by such means, being precluded from its return, the corpora cavernosa must of necessity become distended, if we consider their structure above-mentioned, with respect to the veins: The arteries, which before were flaccid, have now their trunks also distended, and do more plentifully import blood into the corpora cavernosa.

But since it is absolutely necessary some part of the detained blood should be still passing off, lest it become grumous; and unfit for a reflux; the venae præputii communicate with those of the penis it self; whereby part of the blood may be returned from the penis during its *erection*, and give way to a fresh supply from the arteries, and preserve the circulation uninterrupted.

ERECTORES Clitoridis, in anatomy, a pair of muscles arising from the protuberances of the ischium, and inserted into the spongy body of the clitoris; which they serve to erect in coition.

ERECTORES Penis, a pair of muscles arising fleshy from the protuberances of the ischium below the beginning of the cavernous bodies of the yard, into whose thick membranes they are inserted.

Their use is to pull the yard upwards towards the os pubis; whereby its greatest vein is compressed, and the reflux blood denied its passage under those bones; which makes it swell. See ERECTION.

EREMIT. See the article HERMIT.

ERICTHONIUS, in astronomy, a constellation, the same as *auriga*. See AURIGA.

ERIDANUS, in astronomy, a constellation of the southern hemisphere, in form of a river.

The stars in the constellation *eridanus*, in Ptolemy's catalogue are 30; in Tycho's 19; in Mr. Flamsteed's 68; the longitudes, latitudes, magnitudes, &c. whereof are as follow.

Names and situations of the stars.	Sign.	Longit.	Latitude.	Magnit.
		°	South.	"
First from the turn of the river to the breast of cetus.) A second.	♋	27 43 50	32 46 03	4
First in the river before the breast of cetus.)	♋	28 17 41	35 32 44	4
	♋	4 24 50	24 33 58	3
	♋	28 40 53	38 43 48	6
5	♋	7 23 04	18 42 23	6
	♋	28 59 23	38 33 16	6
Preced.	♋	7 31 58	19 10 52	6
Middle.	♋	6 02 44	23 45 20	5
Second before the breast of cetus.	♋	6 26 39	23 54 37	6
10	♋	6 52 09	23 57 16	5
Third of those following turn of riv. Inform. within the last sinus.	♋	0 25 00	39 00 01	3
Third before the breast of cetus.	♋	0 11 14	44 45 01	3
	♋	9 29 25	25 37 22	3
	♋	9 35 13	26 19 06	6
	♋	5 06 42	39 09 28	6
15	♋			
Fourth behind the turn of the river.	♋	5 45 03	38 32 17	4
	♋	14 30 20	23 22 27	4
Fourth before the breast of cetus.	♋	13 35 20	27 46 30	3
Fifth behind the turn.	♋	9 51 32	39 28 14	4
Preced. of two informes over the riv.	♋	17 39 24	18 26 20	5
20	♋			
	♋	12 08 57	35 40 13	5
	♋	17 06 37	24 08 18	5
	♋	16 79 56	23 46 16	3
	♋	19 11 36	20 27 17	3
	♋	19 30 50	19 38 34	6
25	♋			
Subseq. and more south.	♋	16 37 28	31 09 15	4
Sixth behind the turn.	♋	13 04 15	41 53 03	4
More south. but contiguous to this.	♋	13 00 52	42 31 32	6
	♋	20 18 16	24 42 25	7
	♋	20 16 20	25 00 38	6
30	♋			
Subseq. inform. over the river.	♋	21 17 38	22 45 43	4
Eighth behind the turn.	♋	11 31 20	43 40 50	5
In the second bend of the river.	♋	19 31 34	33 13 35	3
	♋	33 32 24	21 47 28	5
	♋	16 38 37	43 30 44	4
35	♋			
North. of two beyond the first bend.	♋	24 40 24	27 29 56	6
	♋	25 05 31	27 50 00	3

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Names and situations of the stars.	Sign.	Longit.	Latitude.	Magn.
			South.	
Next before the second bend.	γ	25 00 50	30 57 28	5
South. beyond the first bend.		26 07 45	28 13 03	4
Preced. of two beyond the 2d bend.		18 07 00	53 58 54	5
Preced. in the first bend.		28 50 47	25 01 01	5
Subseq. beyond the second bend.	II	20 06 13	54 33 15	5
		1 15 15	20 11 27	5
		1 53 24	21 43 53	5
		1 12 38	28 24 50	5
45		1 00 31	29 53 52	4
Subseq. in the first bend.		2 29 15	25 08 39	4
	(west. γ	3 35 35	20 54 06	5
North. in the 2d bend toward the Small one contiguous to the subseq.	II	25 08 20	50 56 43	4
50 (in the 1st bend.		2 59 03	24 20 37	6
South. in the second bend.	γ	25 32 21	51 51 01	3
	II	0 56 10	36 01 48	3
		0 23 41	41 25 03	3
		3 33 10	30 49 18	6
		3 45 58	30 28 21	6
55		5 00 53	25 24 13	4
Preced. before the first bend.		3 11 25	30 01 49	5
		3 36 38	38 27 15	6
		4 07 47	38 24 20	6
Middle before the first bend.		6 43 03	27 50 40	5
60				
Small one contiguous to it.		7 43 46	27 30 49	6
		7 59 51	32 49 13	6
		7 41 00	35 04 52	6
Subseq. before the first bend.		8 53 02	29 48 30	5
That next the rise of the river.		10 41 18	27 16 56	6
65		19 77 20	27 53 48	3
North. in the rise of the river to- wards Orion's leg.)		11 15 23	27 17 50	6
South. in the rise of the river.	II	10 52 55	31 34 10	4

ERIGENS *Penis*. See **ERECTOR** *Penis*.

ERMIN, or **ERMINE**, in heraldry, denotes a white field, or fur, powdered, or interperfed with black spots. See **FUR**.

It is fuppofed to represent the skin of an animal, of the fame denomination; which fome will have a water-rat, others a fort of weazle, and others an armenian moufe. In effect, there is no animal whose skin naturally correponds to the herald's *ermine*.

The animal is milk white; and fo far is it from spots, that the tradition has it, he will rather die, or be taken, than it will fully its whitenefs. Whence its fymbolical ufe.

But white skins having for many ages been ufed for the linings of the robes of magiftrates, and great men; the furriers, at length, to add to their beauty, ufed to few bits of the black tails of thofe creatures upon the white skins; to render them the more confpicious. Which alteration was introduced into armoury. See *Tab. Herald, fig. 57*.

The fable spots in *ermine* are not of any determinate number, but they may be more or lefs, at the pleafure of the painter or furrier.

ERMINE. A *Crofs* **ERMINE**, is a crofs compofed of four *ermine* fpois, placed in the figure represented *Tab. Herald, fig. 58*.

It muft be obferved, that the colours in fuch arms are not to be expreffed; by reafon, neither the crofs, nor the arms, can be of any colour but white and black.

Colombiere blazons it *quatre queues d'ermine en croix*. The editor of Guillim defcribes it thus; a crofs of four *ermine*s; or, more properly, four *ermine* fpois in crofs. It is the coat of Hurton in Cheshire.

Timbre of **ERMINE**. See the article **TIMBRE**.

ERMINEs, is ufed by fome Englifh writers for the reverfe of *ermine*, i. e. for white fpois on a black field: but on what foundation no body can tell; for the French, from whom we have our heraldry, have no fuch term; but call this black powdered with white, *centre-ermine*; as denoting the counter, or reverfe of *ermine*; which is white powdered with black. See *Tab. Herald, fig. 59*.

ERMINITES, fhould feem a diminutive of *ermine*s, and naturally to fignify little *ermine*s; but it is otherwife. *Erminites* expreffes a white field powdered with black; only that every fpois has a little red hair therein.

Some authors ufe the word *erminites*, for a yellow field powdered with black; which the French exprefs much better by *or femé d'ermine de fable*.

EROSION, in medicine, the aft of fharp, acrid fluids, or humours, gnawing and tearing off parts from the flefh, and other fubftances.—Arsenic, and other poifons, make *erofions* in the intefines.

EROTIC *, is applied to any thing which has a relation to the paffion of love.

* The word is derived from the Greek, *eros, love*; whence *eroticus*.

ERR

In medicine, we particularly ufe the phrafe *delirium eroticum*; for a kind of melancholy contracted through excefs of love. Though, among the feveral fpecies of pulfes, there be no amorous pulfe, that is, no pulfe peculiar to that paffion; yet we can certainly difcover where the diforder is *erotic*, by the beating of the pulfe, which, in that cafe, is changeable, unequal, turbulent and irregular. Speak to the patient of the perfon he loves, and his pulfe infantly changes, becoming higher and quicker: and the minute you change the converfation, the pulfe is loft again, and is difturbed a-new.

ERRANT, in law, the fame with *itinerant*; the term is attributed to judges who go the circuit; and to bailiffs at large.

Knight ERRANTS. See the article **KNIGHT**.

ERRATA, a lift ufually placed at the beginning or end of a book, containing the faults that have efaped in the impreffion, and, fometimes, even in the compofition of the work.

Lindenberg has an exprefs difertation on typographical errors, *de erroribus typographicis*; wherein he obferves, that there is no book exempt from them, not even the facred books. He fetts himfelf to enquire into all the caufes thereof; and propofes means to prevent them. But he advances nothing on that article, but what is either common or impracticable. The authors, compofitors, and correctors of the prefs, he fays, muft do their duty; who difputes it? each author muft have his own printing-refs at home, as Calixtus and Opitius had; who can do it?

Fa. Hardouin's book on medals, might be entitled the *errata of the antiquaries*; and the critiques on hiftory by Perizonius, the *errata of the ancient hiftorians*. In the fame fenfe, M. Bayle's dictionary might be called the *errata of Mercuri*.

ERRATIC, in aftronomy, an epithet applied to the planets, which are called *erratic* or wandering ftars, in contra-diftinction to the fixed ftars.

There is alfo a kind of fever called *erratic*. See **FEVER**.

ERRATIC Winds. See the article **WIND**.

ERRHINA, **EPPINA**, in medicine, are remedies taken by the nofe, to enliven the fpirits, flop bleeding, &c. but principally to purge the humidities of the head.

Of thefe, fome are taken in powders, as betony, tobacco, marjoram, iris, white hellebore, euphorbium, &c.—others in a liquid form, made of the juice of marjoram, fage, beet, cyclamen, iris, &c.—Others in form of liniments, incorporated with unguent rofat—Others, folid, formed like pyramids, to flop bleeding at the nofe; compofed of armenian bole, terra figillata, maffic, human or hogs-blood dried, &c. Such *errhines* as are dry, and made up in powders, to excite fneezing, are properly called *sternutatories*.—Some moderns call them *caputurgaria*.

ERROUR, or **ERROR**, a miftake of the mind, in giving affent to a thing, or propofition which is not true. See **FALLACY**.

Some philofophers define *error* an aft of the mind, whereby things that fhould be joined, are feperated; or, things that fhould be feperated, are joined: or a wrong judgment, difagreeing with the things whereon it is paffed.

Error ftands in oppofition to *truth*, which confifts in an agreement between the propofition, and the thing whereof it is affirmed or derived.

However, a bare failure, or non-attainment of truth, does not confitute *error*; that being common both to ignorance and doubting.

Error only ftands diftinguifhed from *falshood*, in that the former is in the mind, and the latter only in the propofition.

The great origin of all *error*, i. e. of believing that to be true, which is falfe, is a liberty, or power in the human mind, of giving its affent to ideas, or propofitions, that are obfcure, as if they were perfpicuous and plain.

Particular caufes of *error* are, 1°. An inadvertency, or negligence, in paffing judgment, without ufe or attending to the means proper to affift the judgment. As if a perfon fhould attempt to judge of the height of the pole, without proper inftruments, or obfervations: or determine about nations, without knowing their hiftory.

2°. Ignorance, in not having informed the understanding by ftudy and application; or furnifhed it with the ideas that have an immediate relation to the matter in hand.

3°. Impatience of the labour and fatigue, of going through a long chain of reafons and arguments; or of waiting for a neceffary number of experiments: with a fondnefs for the opinion of being knowing; and a prejudice for, or againft, fome particular perfon, feft, &c.

4°. The fallacious rules of probability, and opinion. See **PROBABILITY**, and **OPINION**.

5°. Intereft, which makes us incline to believe thofe things true, from which we are like to derive advantage.

6°. Authority: education: and vulgarly received opinions, imbibed ere we were qualified for judging. See **FAITH**.

Againft all which, there is this one general rule or caution

laid

laid down, by Fa. Malebranche and others, viz. never to give our full assent to any proposition, unless the evidence for it be so strong, as that we can no longer withhold it, without incurring the secret reproaches of our own reason.

Mr. Locke reduces the causes of all our errors to these four, viz. 1^o. Want of proofs. 2^o. Want of ability to use them. 3^o. Want of will to use them. And, 4^o. Wrong measures of probability.

F. Malebranche considers five occasional causes of error, or rather five different kinds of errors, accommodated to the different manners we have of perceiving things, 1^o. Errors of sense. 2^o. Of the imagination. 3^o. Of the understanding. 4^o. Of our inclinations. And, 5^o. Of the passions. See SENSE, IMAGINATION, UNDERSTANDING, INCLINATION, and PASSION.

Popular ERRORS. See the article POPULAR.

ERROR, in law, generally denotes a fault, or oversight, either in pleading, or in process; upon either of which is brought a writ, by way of remedy, called a writ of error; in Latin, *de errore corrigendo*.

Fitzherbert defines a writ of error to be, that which lies to redress false judgment given in any court of record, having power by charter, or prescription, to hold plea of debt or trespass above xx sh.—There is also a writ of error for reversing a fine, &c.

To assign ERROR. See the article ASSIGN.

Clerk of the ERRORS. See the article CLERK.

ERUCTION, *Belching*, the same as ructation. See RUCTATION.

ERUDITION, denotes learning, or knowledge; and chiefly that of antiquity.

The Scaligers were men of deep erudition: the writings of M. Launoy, a priest of the oratory, are full of erudition.

Mr. Locke says, it is of more use to fill the head with reflections, than with points of erudition. If the mind be not just and right, ignorance is better than erudition, which only produces confusion and obscurity: M. Balzac calls a heap of ill chosen erudition, the luggage of antiquity.

ERUPTION, a bursting forth, or exclusion of something which was before covered, or concealed.

The eruption of pustles in the small-pox, ordinarily begins on the 4th day.—in the inoculated kind, the eruption often does not begin till the 9th day, or later.

The eruption of volcano's, or burning mountains, is frequently the effect, and issue, of earthquakes. See EARTHQUAKE, &c.

The eruptions of mount *Ætna*, and *Vesuvius*, are observed to be somewhat periodical: they are of two kinds; the one less violent, happening once in 2 or 3 months, and lasting usually three or four days, without much damage to the adjacent country.—The other more furious, and of longer continuance, happening to mount *Vesuvius* about once in 50 years. That in 1632, was so violent, that, by the best of S. Peccacio's observations, it cast the rocks three miles into the air. Hartop in *Philosoph. Transact.* N^o. 202.

M. Oldenburg gives us an historical account of the several eruptions of mount *Ætna*, recorded in authors. The first, whereof we have any credible account, was at the time of the expedition of *Aeneas*, described by *Virgil*, *Æneid*. lib. III. The 2d, described by *Thucydides*, was 476 years before Christ: in the time of Roman consuls there were four: another in *Cæsar's* time, so fierce, that *Diodorus* assures us, the ships near the island of *Lipara* were injur'd with the extreme heat of the water: another under *Caligula*: another at the time of the martyrdom of *St. Agatha*, said to have been stopped at her intercession: another in the year 812: several between the years 1160 and 1169: others in 1284, 1329, 1408, 1444, 1536, 1633, 1650. *Phil. Transact.* N^o. 48.

Another extraordinary eruption happened in 1669, particularly described in the said *Transactions*, N^o. 51. It was preceded for the space of 18 days, with a dark thick sky, thunder, lightning, and frequent concussions of the earth: the place of the eruption was 20 miles from the old mouth.

The matter here yielded, was a stream, or river of melted metals and minerals, rendered liquid by the fierceness of the fire, and boiling up, and gushing forth, as water does at the head of some great river; till, having run in a full body for a stone's cast, or more, the extremity thereof began to crust and curdle, and turned, when cold, into hard, porous stones, called *sciarrs*, as resembling huge cakes of sea-coal, full of a fierce fire. These came rolling and tumbling over one another, and where they met a bank, wall, building &c. would fill up and swell over; by their weight bearing down any common building, and burning up what was combustible. The progress of this inundation was at the rate of a furlong a day; which it continued for 15 or 20 days; running, at first, into the sea, but afterwards into the city of *Catanea*; in its course, it overwhelmed 14 towns and villages, containing three or four thousand inhabitants. The noise of the eruption at the mouth was heard 60 miles.

Dr. St. Clair, in the *Philosoph. Transact.* gives an account of a constant eruption of fire, on one side of one of the *Appenines*,

between *Bologna* and *Florence*: a spot of ground 3 or 4 miles in diameter, he observes, incessantly sends up a flame, rising very high, without noise, fmoak, or smell; though it gives a very great heat. In great rains it sometimes intermits, but rekindles with greater vigour and heat. Within 3 or 4 yards of it, he adds, there grows corn. The flame he conjectures to arise from a vein of bitumen, or naphtha. There are three other such fires on the same hills.

ERUPTIVE Fevers. See the article FEVER.

ERYSIPELAS*, ΕΡΥΣΙΠΕΛΑΣ, in medicine, a disease of the skin; called also *saer ignis*, and *St. Anthony's fire*.

* The word is formed of the Greek, *erys*, trabea, to draw, and *saer*, prop, near, whence it is also called by the Latins, *viciniraba*, and *vicinirubia*.

Its seat is any part of the body, but principally in the face: it shews it self in a ruddy inflammation of the part, with a little swelling of the fame; attended an intense pain, and a crowd of little pustles, which, as the inflammation increases, grow into vesicles.

The disease spreads itself apace; shifting from one place to another, with a fever attending it. It attacks the patient all at once, and chiefly when out in the air; whence the country people call it *blasting*, *sideratio*.

Dr. Quincy accounts for the erysipelas, from a too fix'd blood, which obstructing the capillaries, occasions inflammations: others, from a too sharp and bilious blood, which, on account of its great subtilty, occasions no sensible tumour; but spreads, or diffuses it self all around. Its colour, though red, generally inclines towards a yellow, on account of the mixture of bile; and always the more there is of the bile, the more dangerous the disease.

There is another species of erysipelas, though less usual than the former; most commonly arising from a too copious drinking of spirituous liquors. It begins with a fever, after which there is an universal eruption of pustles, almost over the whole body, much like those after the stinging of nettles, and sometimes rising into vesicles. At going off, they leave an intolerable itching, and as often as scratched return again.

Etmuller gives it as the distinguishing character of an erysipelas, that when pressed very lightly by the finger, there follows a white spot, which presently after becomes red again: which does not happen in an ordinary inflammation, unless when violently pressed. Scorbatic people are most subject to this disease. It is disputed, whether purging be good in the erysipelas? *Sydenham* recommends it the next day after bleeding. Etmuller cautions us against them both; and recommends diaphoretics. Dr. Friend observes, that in the last stage of an erysipelas of the head, attended with a coma, delirium, &c. unless cathartics will do good, the case is desperate. All unctuous, astringent, and cold applications, externally, are dangerous, and sometimes make the erysipelas degenerate into a gangrene.

The erysipelas is either simple, or attended with an ulcer. See Supplement, article ERYSIPELAS.

ERYTHROIDES, ΕΡΥΘΡΟΙΔΗΣ, in anatomy, the first of the proper membranes that inclose the testicles.

It is interspersed with fleshy fibres, derived to it from the cremaster muscle, which make it appear reddish*.

* And hence its name from the Greek, *erythros*, red, and *oidos*, form.

ESCALADE, or SCALADE; a furious attack of a wall, or a rampart; carried on with ladders, to mount by; without proceeding in form, breaking ground, or carrying on regular works to secure the men. See SCALADE.

ESCAMBIO, was anciently a license granted any one for the making a remittance or giving a bill of exchange to another beyond sea.

For, by stat. 5. Rich. II. no person might exchange, or return money beyond sea, without the king's license.

ESCAPE, in law, an evasion out of some lawful restraint, either by violence or stealth.

Escapes are either voluntary, or negligent.

Voluntary, as when one arrests another for felony, or other crime, and afterwards lets him go; in which escape, the party that permits it, is by law guilty of the fault, committed by the person who escapes: be it felony, treason, or trespass.

Negligent escape is, when one is arrested, and afterwards escapes against his will that arrested him; and is not pursued by fresh suit, and taken again, before the party pursued hath lost sight of him.

ESCARTELE', in heraldry, quartered, or quarterly. See QUARTERING, and QUARTERLY.

ESCHAR*, ΕΞΧΑΡΑ, in chirurgery, a hard crust, or scab, formed on the flesh, by means of a hot iron, or a caustic medicine, or some sharp, corrosive humour within.

* The word is Greek, *eschar*, crust, or scab; which some authors derive from *es* and *charo*, I burn; but this comes with some difficulty, by reason *charo* is wrote with a *ch* and *eschar* with a *z*.

The caustic stone, or lapis infernalis, produces a round *eschear* in the place where it has burnt. See **ESCHAROTICS**, **CAUSTIC**, and **CAUTERY**.

ESCHAROTICS *, medicines, which being applied externally, produce *eschars*, or scabs, by burning the flesh. See **ESCHAR**.

* The word is derived from the Greek, *εσχαρα*, *eschara*.

Such are the lapis infernalis, red precipitate, &c.—These are also called *caustics*.

ESCHEAT, in law, signifies lands, or other profits, falling to a lord within his manor, either by way of forfeiture, or the death of his tenant dying without heir general or special, or leaving his heir within age, and unmarried.

The civilians call such *escheats*, or forfeitures, *bona caduca*; and in the same sense as we say, the fee is *escheated*, they say *feudum aperitur*.—

The word *escheata* sometimes also signifies a lawful inheritance descending on the heir. But then, it is usually distinguished by the addition of *recta*: as *recta escheata*.

ESCHEAT, is also used for the place or circuit within which the king, or other lord, hath *escheats* of his tenants.

ESCHEAT is also sometimes used for a writ, lying where the tenant having estate of fee simple, in any lands or tenements holden of a superior lord, dies seized, without heir general, or special: in which case, the lord brings this writ against him that possesses the lands, after the death of his tenant; and thereby recovers the same in lieu of his services.

ESCHEATOR, an officer, who anciently took care of the king's *escheats* in the county, and certified them into the exchequer, or chancery.

He was appointed by the lord treasurer; held his office only for one year; nor could any person be *escheator* above once in three years. But this office having its chief dependance on the court of wards, is now out of date.

ESCHEQUER. See the article **EXCHEQUER**.

ESCHEVIN, or **ECHÉVIN**, *Seabins*, in the French and Dutch polity, a magistrate elected by the inhabitants of a city, to take care of their common concerns, the good order, conveniency, and decoration of the city, &c.

At Paris, there is a *prevot*, and four *eschévins*; in most other cities, a *maire*, or *mayor*, and *eschévins*.—In Languedoc, Provence, and Dauphiné, they are called *consuls*: at Toulouse, *capitoul*: and *jurats* at Bourdeaux.

Anciently, the *eschévins* were the assessors, and counsellors of the *comites*, or judges of cities: on which account they were called in some places, *pairs*, *parés*: they even took cognizance of petty causes themselves.

Du Cange observes, that the judges, and their assessors, who were chose by the inhabitants, were called *scabini*, *eschévins*, and their college, *scabinatum*, or *eschévinage*. He adds, that some authors call them *pactarii*, by reason their office and jurisdiction extended to the securing peace in their city and banlieue, called *pax ville*.

In Holland, the *scabins*, or *eschévins*: judge of all civil affairs at first hand. They also take cognizance of criminal matters, and if the criminal confess himself guilty, they can see their sentence executed without appeal. They can even give torture.—The number is not the same in all cities: at Amsterdam there are nine, at Rotterdam seven, &c.

ESCHRAKITES, or **ESRAKITES**, a sect of philosophers, among the Mahometans; who adhere to the doctrines and opinions of Plato.

* The word is derived from the Arabic *سركا*, *sebraka*, which in the fourth conjugation *سركا* *esbraka*, signifies *to shine, glitter like the sun*: so that *esbrakite* seems to import *illuminated*.

The *Esbrakites*, or Mahometan platonists, place their highest good and happiness in the contemplation of the divine majesty; despising the gross imaginations of the Alcoran touching paradise. See **MAHOMETANISM**.

They are very careful in avoiding all vice, they preserve an equal and easy temper, love music, and divert themselves with composing little poems, or spiritual songs.—The *Seiches*, or priests, and the chief among the preachers of the imperial mosques, are *Esbrakites*.

ESCHYNOMENOUS plants. See **ÆSCHYNOMENOUS**.

ESCLAIRCISSEMENT, a French term, which we find retained in some late English writers: It properly signifies the act, or effect of clearing a thing, or rendering it more bright and transparent; being formed from the verb *éclaircir*, to clear, &c.

It is chiefly used in a figurative sense, for an explication of an obliquity, or difficulty.—The *esclaircissement* of difficult passages in the bible, is to be fought for from similar passages, or passages of the like kind occurring in other places.

ESLATTE, in heraldry, is applied to a thing violently broke.—Thus a bend, or other partition, *eslaté*, is represented torn, or broke off like a shield shattered with the stroke of a battle ax.

ESCORT *, a French term, sometimes used in English authors, to denote a convoy, or company of armed men, attend-

ing some person or thing, in a journey or voyage, to defend or secure it from insults.

* Some derive the word from the Latin *coloris*.

A supply was sent to the camp before Arras, with an *escort* of 1200 men. In times of war, merchant vessels seldom stir much abroad without an *escort* of men of war. People that travel in Turkey generally take Janizaries to *escort* them. After the victory, the general sent the prisoners under a strong *escort* into the neighbouring towns.

ESCOUADE, is usually the third part of a company of foot; so divided for mounting guards, and for the more convenient relieving of one another.—It is equivalent to a brigade of a troop of horse. See **BRIGADE**.

ESCROL, or **SCROLL**, in heraldry, a long slip, as it were of parchment, or paper, whereon a motto is placed.

Leigh observes, that no person, under the degree of a knight, might, long after king Henry V. place his crest on a wreath, as is now usually done, but only on an *escrol*.

ESCU, or **EGU**, the French crown, of 60 sols, or three livres. The *escu* was thus called by reason the *escutcheon*, or arms of France, which they call *escu*, was struck thereon.

Emaux de P. Escu. See the article **ÉMAUX**.

ESCUAGE, or **SCUTAGE**, an ancient kind of knight's service, called also *service of the shield*; the tenant holding by which, was obliged to follow his lord to the Scottish or Welsh wars, at his own expence. See **SCUTAGE**.

He who held a whole knight's fee, was bound to serve with horse and arms for 40 days; and he who held half a knight's fee, 20 days.

ESCUAGE, is also used for a sum of money, paid by such as held by this tenure, when they neither attended the wars, nor provided another in their room.

ESCUAGE, was also a reasonable aid, demanded by the lord of his tenants, who held of him in knight's service *. See **AID**.

* *Concesserunt domino regi ad maritandum filium suum de unitibus qui tenent de domino regis in capite de Anglia scutis 20 solidos saluenda*. Matt. Paris. Anno 1242.

ESCULENTS, a term usually applied to vegetables which are fit for food, as artichokes, carrots, turnips, parsnips, cabbages, colliflowers, &c.

ESCURIAL, by the Spaniards wrote **ESCORIAL**, a term that occurs pretty frequently in our gazettes, and news papers, for a place of residence of the kings of Spain.

Escorial, originally denotes a little village in Spain, situate in the kingdom of Toledo, seven leagues to the west of Madrid, and nine to the east of Avila; on the side of a chain of mountains, called by some the *Carpetane*, or *Carpetanian* mountains, and by others the *Pyreneans*, as being the branch of the Pyrenean ridge.—Here king Philip II. built a stately monastery of the order of St. Jerom, held by the Spaniards for one of the wonders of the world, and called the *escorial*.

Fa. Francisco de los Padros, in a description thereof, entitled, *descripción breve del monasterio de S. Lorenzo el real del Escorial*, &c. assures us it was built by that prince in memory of the battle of S. Quintin, gained on the day of S. Lawrence, Lorenzo, a famous Spanish Saint, and at his intercession.

The king and queen have their apartments therein; the rest being possessed by the monks.—Whence, many of the great transactions of that court, are dated from the *escorial*.

The *escorial* has a very fine church, to which Philip IV. built a beautiful chapel, called the *pantheon*, or *rotondo*, wherein the kings and queens of Spain, who leave any posterity, are interred. The rest being laid in another vault of the same church, together with the infants and other princes.

ESCUTCHEON *, or **SCUTCHEON**, in heraldry, the shield, or coat, wherein the bearing, or arms of any person is represented.

* The word *escutcheon* is formed of the French *escuffin*, and that from the Latin *scutum*, shield; which was the place arms were originally bore on, before ever they came on banners; and still, wherever they are placed, it is on something representing the form of a shield.—The Latin *scutum*, no doubt, came originally from the Greek, *εσσι*, *esxi*, leather, wherein the shields were usually covered. See **SHIELD**.

The *escutcheon* is of a square figure, excepting the bottom part, which is usually a little rounded, ending in a point in the middle.—See *Tab. Herald. fig. 38*.

Till within a few hundred years, the *escutcheons* of the French and English were triangular: those of the Spaniards, are still quite round at bottom without any point: those of the Italians, are oval: and those of the Germans, in form of cartoons.

The ancient *escutcheons* were generally couched, or inclined; and they only began to place them upright, when crowns, &c. were put over them by way of crest.

In France *escuffin*, *escutcheon*, was formerly restrained to a shield, or coat, pointed at bottom; by which it was distinguished from the *escu*, which was quite square, and was only allowed to be bore by the counts and viscounts. Those of

Inferior quality were confined to the escuffion, or pointed escu.

The several parts, and points of the *escutcheon*, have their feveral names: the point A, for instance, is the *dexter chief point*; B the *middle chief*; and C the *finifler chief point*; D is the *honour point*; E the *feffe point*; F the *nombriil point*; G the *dexter base*, H the *middle*, and I the *finifler* base point.

The *escutcheon* is diversely denominated, according to its divisions. It is called *dexterad*, when the perpendicular line that divides it, is to the right of a third part of the *escutcheon*, *finiflered*, when on the left: *tierced in pale*, when this line is double, and divides the whole *escutcheon* into three equal parts: *paled*, when increased to the number of fix, eight, or ten. A horizontal line makes the *chief*, when at one third part from the top; the *plein*, when at a third from the bottom: and when double, in the middle, at an equal distance from both extremes, it makes the *feffs*, and the *tierced in feffs*: when it is multiplied, it denominates it, *feffed*: when there are 8, or 10 equal spaces, *burrellé*: a diagonal from the dexter point, of the chief, to the finifler of the base makes it *tranché*; the contrary, *double*. If it be doubled at equal distances, the first makes *bandé*, and the *tierce in bend*; and the other *barré*, or *tierce in bar*: increasing the number of the first makes *bandé and cettée*; and increasing that of the second, *barré and traversé*.

ESCUTCHEON, of *pretence*, is an *escutcheon*, or little *escutcheon*, which a man, who has married an heiress, and has issue by her, may bear over his own coat of arms; and in it the arms of his wife: and, in this case, the surviving issue will bear both coats quarterly. See *Tab. Herald. fig. 63*.

ESCUTCHEON-GRAFTING, in gardening. See **ENGRAFTING**.

ESDRAS. See the article **EZRA**.

ESPALIER, in the French gardening, a wall-tree; or a fruit-tree, which is not left to grow at liberty in full air, but has its branches nailed or fastened to a wall, or some other flat surface, near which it is planted; and thus growing, it is made to conform it self to the flat, though unnatural, figure thereof. See **FRUIT-TREE**, **WALL**, &c.

ESPALIERS, in our gardening, are rows of trees, planted regularly round the outside of a garden, or plantation, for the general security thereof, from the violence and injury of the winds; or else only round some part of a garden, for the particular security of a plantation of orange trees, lemon trees, myrtles, or other tender plants; or, lastly for the bounding of borders, walks, avenues, &c.

Espaliers are now come into mighty use, with respect to the first of these intentions: in effect, it is found by experience, that the best brick, or stone walls, are not of themselves sufficient security to fruit-trees, from the ravages of blighting winds.

The reason may be, that being built close and compact, they repel the winds, and by that means damage the tender plants, that lie within the reach of the repulsion. But these *espaliers* serve to deaden the violence of the winds, so as the tender greens, or plants, encompassed by them, rest serene and quiet.

Thus, if the *espaliers*, for instance, be of spruce, fir, holly, or yew, they give way to the force of tempestuous winds beating against them, without occasioning any reliction thereof. Mess. London, and Wife, direct them to be planted at some distance, without the outmost bounds, or walls of gardens, &c. Two, or three rows of trees, they think sufficient, from 18 or 20 to 25 foot a-part. And as to the method, or order, of disposing the trees, the most commodious is where the middle row makes every where equilateral triangles with the extreme rows, in the following manner. See **QUINCUNX**.

* * * * *

The trees recommended for making, or planting, these *espalier* fences, are the elm, lime, beech, Scotch fir, oak, pine and sycamores; but particularly the two first. For the method of planting them.

As for *espalier hedges*, or hedge rows for defence of tender greens, and plants from destructive winds in the summer season; if there be occasion to use them the first or second year after they are planted, a substantial frame of wood must be made, seven or eight feet high, with posts and rails. And to this *espalier* frame, must the side boughs of the young trees be tied, to cause the *espalier* to thicken the sooner.

For the form of such an *espalier*, it must be oblong, running north and south.—It may be planted with apples, pears, holly, laurel, lime, maple, white-thorn, yew, &c.

To prevent the disorders that might befall *espalier* fruit trees when in blossom, Mr. Bradley mentions a nursery man at Brentford, who having most sorts of fruit in *espaliers*, had portable hedges made of reeds in frames, which he set both at the back, and front of his *espaliers*, as he saw occasion. See **Supplement**, article **ESPALIER**.

ESPAULE, **ESPAULEMENT**, &c. in fortification. See **ESPAULE**, **ESPAULEMENT**, &c.

ESPLANADE, in fortification, called also *glacis*; a part which serves the counterfarp, or covert way, for a parapet; being a declivity, or slope of earth, commencing from the top of the counterfarp, and losing itself insensibly in the level of the campaign.

ESPLANADE, also signifies the ground which has been levelled from the glacis of the counterfarp, to the first houses; or the vacant space between the works and the houses of the town.

The term is also applied in the general to any piece of ground which is rendered flat or level, and which before had some eminence that incommoded the place.

ESQUADRIBLE, } See the articles { **QUADRIL**.

ESQUADRON, } See the articles { **SQUADRON**.

ESQUINANCY, in medicine, a disease called also *angina*; *quinancy*, and popularly *quinzy*.

ESQUIRE, a title of nobility, next below that of knight, and above that of a simple gentleman.

The origin, both of the name, and the thing, *esquire*, is very dark; the English denomination is confessedly borrowed from the French, *escuyer*; and that from the Latin, *scutum*, shield, as some will have it; or as others, from *scutarius*, or *scutiger*, shield bearer, or from *scuria*, stable, or from *equis*, groom. So many different opinions of the formation of the word, have given rise to as many about the primitive office of *esquires*; unless, perhaps, the latter hath given occasion to the former. Paquier, in his *Recherches*, L. II. C. 15. maintains the title of *esquire*, *escuyer*, *scutarius*, to be very ancient. From the time of the declension of the Roman empire, he observes; there were two extraordinary kinds of soldiery, in the Roman army; the one called *gentiles*, and the other *scutarii*.

Ammian. Marcellin, L. XIV. C. 7. and L. XVI. C. 4. speaks of these *scutarii* as men of redoubted prowess; and even deemed invincible. It is added, that Julian the apostate set a mighty value on those troops, when he was in the Gauls: and hence, probably, it was, that the Gauls, or perhaps, only the Franks, finding the bravest among the Roman forces were called *gentiles*, and *scutarii*, gave the like names to the boldest and bravest among themselves: such, according to that curious antiquary, is the origin of *esquires*.

Esquire, however, afterwards came to be used in a somewhat different sense, *viz.* for a gentleman who attended a knight in the wars, and on other military occasions; bearing his shield, *scutum*, before him (whence he was called *scutarius*, *scutiger*, or *scutifer*) as also his lance, and other weapons: whence his other Latin appellation, usual among us, *armiger*, q. d. armourer-bearer.—And hence likewise it is, that in all our ancient romances, the hero is constantly attended by a gentle, and trusty *squire*.

After all, the most probable derivation of *escuyer*, is not from *escu*, *scutum*, as is the common opinion, but from *equus*, horse, the primitive *esquires* being no other than what the Latins call *equifones*, who had the care and intendance of the equeries, or stables only.

Be this as it will, the title *esquire*, *armiger*, as now established among us, is the next below that of knight, *equus*. They who bear this title, are all younger sons of noblemen, and the eldest sons of such younger sons; the eldest sons of knights, and their eldest sons successively; the four *esquires* of the king's body; and *esquires* created by the king, by putting about their necks a collar of S S's, and bestowing on them a pair of silver spurs. Lastly, diverse others in the superior public offices, are reputed *esquires*, or equal to *esquires*; as sheriffs of counties, serjeants at law, justices of peace, mayors of towns, counsellors at law, bachelors of divinity, law, physick, &c. though none of them are really so: lastly, the heads of some ancient families are likewise *esquires* by prescription.

ESQUISSE, in the French painting, a term signifying the first slight sketch, or draught of a picture; the first thought of a design drawn hastily with a crayon, or in colours on paper, canvas, or the like; in order to be finished, and painted or engraven afterwards.

He had not the trouble of making a finished, and correct design; but went to work upon the *esquisse*.—The word is formed of the Italian *schizzo*, a splash; by reason an *esquisse* of a painting only represents, as it were splashes, or dabs of colours.

ESRAKITES. See the article **ESCHRAKITES**.

ESSÉANS. See the article **ESSENI**.

ESSART *, or **ASSART**. See the article **ASSART**.

* Du Cange derives the word from some of the Barbarous Latin words, *exartus*, *exartum*, *essartum*, *essartum*, *essartum*, and *essartus*; which all signify a forest cut down, or dug up: though Spelman chuses to deduce it from the Latin *exerium*, torn up, or unrooted: others from *javris*, to weed. And others, lastly, from *exaro*, I plow, whence *exarare*, and, by contraction, *exartum*. In our ancient law books, *exartum facere in sylva*, is to *essart* a place in a forest.

To *essart*, is to grub up, or extirpate bushes, trees, old roots, stumps, or the like; in order to fit the ground for tillage.

ESSAY *, a trial, or experiment, to prove whether a thing be of the requisite quality, or goodness.

* The word is French, *Essai*, which some authors derive farther from the Latin *examen*.

ESSAY is also used for an attempt, or tentative, to learn whether or no a thing will succeed.

Essays of machines should be made in large; it is not enough that they succeed in little.

ESSAY, in monasteries, is particularly used for a trial which a person makes of the monastic life, in a secular habit.

This *essay* is of one, two, and in some monasteries, of three months.—The *essay* is not reckoned in the noviciate. See PROBATION.

ESSAY, or ASSAY, or simply SAY in coinage. See ASSAY.

ESSAY, in matters of learning, is a peculiar kind of composition; whose character is to be free, easy, and natural; not tied to strict order, or method, nor worked up and finished, like a formal system.

The matter of an *essay* is supposed to consist principally of sudden and occasional reflections, which are to be wrote much at the rate, and in the manner a man thinks; sometimes leaving the subject, and then returning again, as the thoughts happen to arise in the mind.

At least, this has hitherto been the practice; and Mountaign, who has got no small reputation by this way of writing, seldom keeps many lines to the subject he proposes: though it is our opinion, that my lord Bacon, in many of his works, is a better pattern in the *essay* kind.

Mr. Locke, however, and a few other authors use *essay* in a severer sense: the *essay* of human understanding, every body knows is a regular, artful and laboured work.

ESSAY-Master. See the articles MINT, and ASSAY.

ESSE *, in the school philosophy, is used in the same sense with essence: principally for that which is actual, or actually existing.

* The word is pure Latin, being the infinitive of the verb *sum*, I am; whence *esse*, to be.

From *esse* arises *essatum*, a barbarous term, now almost obsolete, signifying that which is ended with essence, or nature; or affected with the virtue or efficacy of another. Some distinguish *esse* into *real* and *intentional*; and again into *essatum* and *volutum*.

ESSENCE, that which constitutes, or determines the nature of a thing; or which is absolutely necessary to its being what it is.

In philosophy, the *essence* of a thing is defined to be that whereby a thing is distinguished from every other thing.

The Cartesians hold the *essence* of matter to consist in extension; and on that principle, deny that there is any such thing as mere space, or vacuity: but the hypothesis is false, as is shewn under the articles MATTER, SPACE, VACUITY, PLENUM, &c.

Cassendus, and most of the corpufcular philosophers, hold the *essence* of matter to consist in solidity, or impenetrability, or resistance, or, more adequately, in a solid impenetrability resisting the touch; which, it must be allowed, of all the properties of matter, seems to have the fairest title to it.

The school philosophers give us two significations of the word *essence*: the first denotes the whole essential perfection of a being, and consequently its entity, with all its intrinsic, or essential, and necessary attributes taken together. In which sense, *essence* may be defined to be all that whereby a thing is, and is what it is. In which case, the *essence* of a thing, is to the thing itself, what humanity, *e. gr.* is to man.

The second signification of *essence*, is that whereby it denotes the principal, and most intimate of all the attributes of a thing; or that which agrees to every such thing, and such alone, and that always, and in such manner, as that the mind, with all its attention, cannot perceive any thing prior thereto. By which, *essence* is distinguished from the essential attributes, *i. e.* from such as flow from its *essence*, or first attribute. Thus, the *essence* of the human mind is commonly supposed to consist in the power of thinking; by reason all its other perfections seem to pre-suppose this; but this pre-supposes none. And thus, the powers of understanding, doubting, assenting, willing, &c. do all flow from the power of thinking; and cannot exist without it, though this may without any of them.

It must be allowed, however, that the essential properties of a thing do so closely cohere, nay, and inhere in the *essence* itself, that it is scarce possible to distinguish the one from the other. Hence, what some urge, that setting aside all the attributes and properties of a thing, and what remains is its *essence*; is a mere chimera. For set aside, *e. gr.* from the mind, the powers of understanding and willing, with the rest of its attributes: and what will there remain to call its *essence*?

It is greatly disputed in the schools, whether the *essences* of created things be eternal: or, whether the *essences*, as well as the existences, had their origin in time? The Cartesians hold, that the *essences* of things depend absolutely on the free concurring will of God.

ESSENCE, in medicine and chymistry, denotes the purest, most subtle and balsamic part of a body, extracted from the rest by means of fire.

Of these there are a great variety, drawn from flowers, fruits, and the like, used on account of their agreeable smells, and tastes, by the apothecaries, perfumers, &c.—The principal are *essence* of rosemary: of turpentine: of anise: of cloves: of cinnamon; and of citron.

The *essences* commonly sold by the perfumers: are only the distilled oils of behn, and of bitter almonds; to which they give the smell of certain flowers, or spices, as violets, jessamy, cinnamon, &c.

The *essences* to be drunk, or mixed with liquors, are of a more elaborate composition: the most usual and best, is prepared with spirit of wine, cloves, cinnamon, mace, long-pepper, and coriander: the whole being put up in a very close vessel, is exposed to the sun for six weeks, or two months, during the day time, and in the night set near the fire.

In winter they use the fire alone: this *essence* being exceedingly strong; it is frequently used only to give a strength to other weaker liquors. After the same manner may the *essences* of ambergrise, musk, &c. be drawn.

The *essence* of odoriferous flowers, to give a fine smell to liquors, are drawn by disposing frata, or lays of the flowers, and of sugar alternately, in a proper vessel, and leaving them to infuse in a cellar for 24 hours; and after that as long in the sun; and lastly, straining or percolating the whole through a sieve, without squeezing the flowers.

ESSENI, ESSENES, or ESSÆANS, an ancient sect among the Jews.

Josephus making mention of the several sects among his countrymen; distinguishes three; *viz.* the Pharisees, Sadducees, and *Esseni*: which last he prefers to the two former, as to their manner of life. He assures us, further, that they were Jews by original; from which it should appear, that S. Epiphanius was mistaken, in ranking them among the Samaritans.

In effect, the *Esseni* appear to have been true Pythagorean philosophers, in every thing that related to their manner of living. For they greatly affected solitude and retirement, and avoided all conversation with women, to devote themselves more entirely to the contemplative life.

The *Esseni* seem to have been among the Jews, what the most retired and austere monks are, or were, among the Christians; which was what gave them their denomination of *Ἰουδαϊκοὶ ἀσκηταί*, *Jewish ascetics*.

Many catholic writers have even deduced the origin of monks from them: building, principally, on what Philo relates of them, who divides them into two branches or sects: the one who married, and the other who lived in celibate.

Josephus seems likewise to have had an eye to these two sorts of *Esseni*. Serrarius, who has wrote very amply on the subject, follows Philo, in making two classes of *Esseni*: the first, are those whom he calls *practici*, and who lived in community: the second, those called *theoretici*, who lived in solitude, and led a life of pure contemplation. He adds, that Josephus only makes mention of the first; passing, untouched, over the contemplative kind, whom Philo calls *Therapeutæ*, and who were principally found in Egypt. See THERAPEUTÆ.

Grotius will have the *esseni* the same with the ancient *ἠθῆσι* *hæsim*, or *hæsimæ*, thus called, according to Philo, from their singular piety, humility, and devotion. Among these, Gale observes, it was, that the Hebrew philosophy chiefly flourished. Porphyry is very prolix in his praises of the *esseni*; *Ἐσοὶ τῶν αἰσθησῶν Ἰουδαίου μὴ τοῦ γυνεῖ, φιλαλληλαί*, &c. He depicts them as despisers of pleasure, riches, glory, and delicacy, and strenuous retainers to continency, austerity, study, &c. He adds, they decline marriage, and adopt and educate other peoples children in the principles of religion and philosophy: they are all on a level, hold every thing in common. neither buy nor sell, &c. By long habit, they arrived at such a degree of patience, that Porphyry assures us, flames and tortures had not the least effect on them. They scorned to intreat their torturers; nor ever shed a tear; but would smile under all their agonies, &c. As to their learning, Philo Judæus, in his treatise, *That every good man is free*, tells us, that they despised logic, as useless to the acquiring of virtue: physics, they left to the sophists and disputers, as judging it to transcend the human faculties; and applied themselves wholly to morality. Porph. *de Abst.* l. IV. §. 11, *seqq.* Gale, *Philos. Gener.* l. I. c. 1. §. 11.

Eusebius holds, that the *Esseni* called *Therapeutæ*, were real Christians, or Jews converted by St. Mark, who had embraced this kind of life. Scaliger, on the contrary, maintains, that these *Therapeutæ* were no Christians, but real *Esseni*, who made profession of Judaism. However, he allows of the two kinds of *Esseni* abovementioned. But Valesius, in his notes on Eusebius, absolutely rejects any such distinction: he denies, that the *Therapeutæ* were any real *Esseni*; and that, chiefly, on the authority of Philo himself, who never calls them *Esseni*, and who places the *Esseni* in Judæa and Palestine; whereas

whereas the *Therapeutæ* were spread throughout Greece, Egypt, and other countries.

ESSENTIAL, something that is necessary to constitute a thing, or that has such a connexion with the nature and reason of a thing, that it is found, or supposed, wherever the thing is felt.

Thus, it is *essential* to God to be just. Mt. Locke has overturned that great principle of the Cartesians, that thinking is essential to the soul.

The heart, brain, and spinal marrow, are parts ordinarily supposed *essential* to life, or without which life cannot be; yet we have instances in history, of children being found, and alive, without almost any of those parts. See **BRAIN, &c.**

ESSENTIAL Oils, are such as are really contained in a plant, and are drawn from it by distillation, in an alembic, with water; they are thus called in contra-distinction to empyreumatic oils, which are raised by a naked fire without water.

ESSENTIAL Properties, are such as necessarily depend on, and are connected with, the nature and *essence* of any thing, so as to be inseparable from it: in distinction from *accidental*.

ESSENTIAL Salts, are those prepared from decoctions; or those which are found crystallized in the juices or infusions of plants; in contra-distinction from those made by incineration. See **SALT**.

ESSENTIAL Fever, }
ESSENTIAL Form, } See the articles }
ESSENTIAL Mode, } FEVER.
ESSENTIAL Part, } FORM.
ESSENTIAL Perfection, } MODE.
ESSOIN *, or **ESSOIGN**, in law, an excuse for him who being summoned to appear and answer to an action real, or to perform suit to a court baron, &c. cannot attend by reason of some legitimate hindrance.

* The word is formed of the French *essoin*, or *exoine*, and that from the barbarous Latin *essonia*, or *exonia*, which signifies the same.

The causes that serve to *essoin*, are diverse; yet they may be reduced to five heads: the first is, *essoin de ultra mares*, when the party is beyond sea: the second, *de terra sancta*, when on an expedition in the holy land: the third, *de malo veniendi*, when he is infirm of body, and cannot come; which is also called, the *common essoin*: the fourth, *essoin de malo lecti*, when the defendant is sick a-bed: the fifth, *de servicio regis*, when he is in the king's service. Horn mentions several other *essoins* touching the service of the king celestial, &c.

CLERK of the ESSOINS. See the article **CLERK**.

ESSORANT*, in heraldry, a term used to express a bird standing on the ground with the wings expanded, as if it had been wet, and were drying itself.

STANDARD. See the article **STANDARD**.

ESTATE, in law, the title, or interest a man hath in lands, or tenements.

Estate is either *simple* or *conditional*.

ESTATE simple, called also *fee simple*, is where a man by deed indented, enfeoffes another in fee, reserving to him and his heirs a yearly rent; with this proviso, that if the rent be behind, &c. it shall be lawful for the feoffor and his heirs, to enter.

ESTATE conditional, is such as hath a condition annexed to it, though it be not specified in writing; e. gr. if a man grant to another, by his deed, the office of park-keeper for life; this *estate* is upon condition in law, *viz.* if the park-keeper shall to long well and truly keep the park.

ADDITIONS of ESTATE. }
BASE ESTATE, } See the articles }
PERSONAL ESTATE, } ADDITION.
QUE ESTATE, } BASE.
REAL ESTATE, } PERSONAL.
REAL ESTATE, } QUE ESTATE.
REAL ESTATE, } REAL.

ESTATE, or simply **STATE**, denotes also the empire, kingdom, provinces, or extent of lands under the government of any sovereign.

The *estates* of the grand seignior, of the king of Spain, &c. are very extensive; those of the king of France are compact, and well peopled. Italy is cantoned out into a great number of petty *estates*.—We say, ministers of *estates*, secretaries of *estate*, &c.

ESTATE is more particularly applied to the several ranks, or classes of a people assembled together, for concerting measures, reforming public abuses, or composing the disturbances of a state.

In England, the three *estates*, *viz.* kings, lords, and commons, meet ordinarily in parliament.—In France, the *estates* consist of the churchmen, the nobility, and the people or third *estate*.

Some will have these assemblies of *estates* to be a very ancient constitution: all we know is, that there were general assemblies held in the Gauls, before Cæsar's conquest. But then the people, or third *estate*, had no share in them. Under the 1st and 2d race of the French kings, that were also solemn convocations, called *parliaments*; but it was only the great lords of the realm that were called to them. See **PARLIAMENT**.

ESTATES General, } See { **STATES General**, &c.
ESTATES of Holland, }

ESTERLING, or **EASTERLING**. See **STERLING**.

ESTETE*, in heraldry, is used by the French to signify a beast whose head has been, as it were torn off by force; and consequently the neck left rough and rugged: in contra-distinction to *deffait*, or *decapite*, where the neck is left smooth; as if the head had been cut off.

ESTHER, a canonical book of the Old Testament; denominated from a celebrated Jewish captive of that name, in Persia, whose beauty preferred her to the bed of Ahasuerus, and the throne of Persia; and who, in that quality, saved her countrymen the Jews, from the death to which Ahasuerus had doomed them, by the councils of his favourite Haman: the history of which transaction makes the subject of the book of *Esther*.

The critics are divided about the author of this book: S. Epiphanius, S. Augustin, and Isidore, attributes it to Ezra; but Eusebius will have it to be of a later date. Some ascribe it to Joachim, high-priest of the Jews, and grand-son of Josedek. Others will have it composed by an assembly, or synagogue of the Jews, to whom Mordecai wrote letters, informing them of what happened. *Efib.* ix. 29.

But the generality of interpreters, both Hebrew, Greek, Latin, &c. ascribe the book to Mordecai himself: Elias Levita, in his *Mafs. banum*, pref. 3. mentions this opinion as unquestionable.

It is chiefly founded on that passage, ch. ix. ver. 20. where it is said, *That Mordecai wrote these things, and sent letters unto all the Jews, That were in all the Provinces*, &c. It is also supposed, that queen Esther herself, might have some share therein; it being expressed in the same chapter, ver. 29. that Esther and Mordecai wrote a second letter by the king's authority, to ordain the solemnizing a yearly feast, called *purim*, that is, day of lots, in commemoration of the Jews being delivered from the lots, or sortes, whereby they had been condemned.

Some will have this book to be only deutero-canonical, or apocryphal. Others contend for its being canonical, as far as chap. x. ver. 3. inclusive; and all the rest deutero-canonical. Of this sentiment are St. Jerom, De Lyra, Dionysius the Carthusian, Cajetan, and others. The council of Trent turned the scale for its being canonical throughout: so that the matter is determined for the catholic countries.

But as to the protestants, they retain to the old opinion, and only admit it as far as the 3d verse of the xth chapter: the rest, to the end of the xvth chapter, is thrown among the apocryphal books. See **DEUTEROCANONICAL**, and **APOCRYPHA**.

ESTIVAL, or **ÆSTIVAL Solstice**. See **SOLSTICE**.

ESTOILE. A *Cross Estoile**, is a star with only four long rays, in manner of a cross; and accordingly broad in the centre, and terminating in sharp points.

ESTOPPEL*, in law, an impediment, or bar of action growing from a man's own act, or deed; against which a man is forbidden by law to speak, though it be to say the truth. See **BAR**.

* The word is formed of the French, *estopper*, *opistare*, *obstipare*, to stop, or block up.

Goddard defines an *estoppel* to be any bar, or hindrance, to one to plead the truth; and extends it not only to the impediment given by his own act; but by another's also.—There are three kinds of *estoppel*, *viz.* *matter of record*; by *matter in writing*; and by *matter in pais*.

ESTOVERS, in law, is used by Bracton, for that sustenance, which a man committed for felony, is to have out of his lands, or goods; for himself and his family, during imprisonment.

In stat. 6, Edw. I. it is used for an allowance in meat or clothes.—In some manors, the tenants have *common of estovers*; that is, necessary botes or allowances out of the lord's wood.—In which last sense, *estovers* comprehends *house-bote*, *hay-bote*, and *plow-bote*: so that if a man have in his grant these general words, *de rationabili estoveria in bosis*, &c. he may thereby claim all three.

ESTRADE*, a French term, literally signifying a public road, or high-way. Hence the military phrase, *battre l'estrade*, to beat the *estrade*, that is, to send scouts, or horsemen, to get intelligence, to learn the dispositions of the enemy, and inform the general of every thing like to fall in the way. An army never marches, without sending *battens d'estrade* on every side.

* The word is formed of the Italian *strada*, street, or road, which is derived from the Latin *strata*, a paved street. Some derive it from *estradioti*, who were cavaliers anciently employed in beating the *estrade*.

ESTRADE is also used, for a little elevation on the floor of a room, frequently encompassed with an alcove, or rail, for the placing a bed in; and sometimes, as in Turkey, only covered with fine carpets, to receive visitors of distinction in.

ESTRANGEL, **ESTRANGELUS** in the Syriac grammar. **ESTRANGEL character**, is a particular species, or form of Syriac letters; serving as the masculine letters in that language.

Abraham Ecchellenfis, takes the *eftrangel* character, for the true, ancient, Chaldee character. And it is certain, the Abyſſinians, who call themſelves Chaldeans, ſtill occaſionally uſe the *eftrangel* character; if we may credit Hottinger in his *Theſaur. Philol.* p. 286. Biſhop Walton, in his *Prolegomena*, gives us an *eftrangel alphabet*.

ESTRAY, or **STRAY**, ſignifies any tame beaſt found within a lordſhip, and not owned by any man; in which caſe, being cried, according to law, in the market adjoining, if it be not claimed by the owner within a year and a day, it becomes the lord's of the ſoil where found.

ESTREAT, in law, is uſed for the true copy, or duplicate of ſome original writing; eſpecially of ameracements, or penalties, ſet down in the rolls of a court, to be levied by the bailiff, or other officer, on every offender.

Clerk of the ESTREATS. See the article **CLERK**.

ESTREPEMENT *, in law, an impoveriſhing, or making of land barren, by continual ploughing and ſowing, without due manuring, reſt, and other huſbandry.

* The word is derived from the French, *eftrouper* to maim; or the Latin *extirpare*, to extirpate, root up.

ESTREPEMENT is alſo uſed, for any waſt, or ſpoil made by the tenant for life, upon lands, or woods, to the prejudice of him in reversion; as the cutting down of trees, or lopping them further than the law allows, &c.

ESTREPEMENT, is alſo a writ which lies in two caſes; the one, when a man having an action depending, as a formedon, writ of right, or the like; ſues, to inhibit the tenant from making waſte during the ſuit.

The other is for the demandant who is adjudged to recover ſeiſin of the land in queſtion; and before execution, for fear of waſte to be made ere he can get poſſeſſion, ſues out this writ.

ESULA, or *cortex eſulae*, in medicine, the bark of a little reddiſh root, which produces green, narrow, ſucculent leaves.—It is a kind of rithymal or ſpurge, and is found chiefly in France: ere they uſe it, it is infuſed in vinegar; after which, they draw extracts from it, of uſe in the dropſy.

ESURINE Salts, in ſome authors, denote thoſe of a fretting, eating, or corroding nature; which chiefly abound in places near the ſea ſide, and where great quantity of ſea-coal is burnt, as appears from the ſpeedy ruſting of iron in ſuch places.

ETAPPE, in war, an allowance of provisions, and forage made to the ſoldiers, upon march through a kingdom or province, to or from winter quarters.

Hence, he that contracts with the country, or territory, for furniſhing the troops, in their march, is called *etappier*.

ETCHING, a method of engraving on copper; wherein the lines, or ſtrokes, inſtead of being cut with a tool, or graver, are eat with aqua fortis.

Etching was invented much about the ſame time with *engraving* on copper, properly ſo called, by Alb. Durer, and Lucas. It has ſeveral advantages over that art; as, that it is done with more eaſe and expedition; that it requires fewer inſtruments; and even, that it repreſents diverſe kinds of ſubjects better, and more agreeably to nature, as landſcapes, ruins, grounds, and all ſmall faint, looſe, remote objects, buildings, &c.

The method of *etching* is thus:—the plate being well poliſhed, is heated over the fire; and when hot, covered over with a peculiar ground, or varniſh. When cold again, the ground is blackened with the ſmoak of a candle; and on this ground, thus blackened, the back of the deſign, or draught, is laid.

This done, the deſign remains to be calked, or transferred upon the plate; which is more eaſily effected, than in the common graving; for the back of the deſign having been before rubbed over with red chalk, nothing remains but to trace over all the lines and ſtrokes of the draught with a needle or point; which preſſing the paper cloſe down to the ground, occasions the wax therein to lay hold of the chalk, and to bring off the marks of the ſeveral lines: ſo as at length, to ſhew a copy of the whole deſign in all its correctneſs.

The draught thus calked, the artiſt proceeds to draw the ſeveral lines, and contours with a point, through the ground, upon the copper.

To finiſh his work, he makes uſe of points of diverſe ſizes, or bigneſſes; and preſſes on them ſometimes more ſtrongly, and ſometimes more lightly, accordingly as the ſeveral parts of the figures, &c. require a greater or leſs ſtrength or boldneſs; ſome of the points being as fine as needles, for the tender hair ſtrokes, and the remoter, fainter objects; and others again, as big as bodkins, made oval-wiſe, for the deeper ſhadows, and the figures in the front of the work.

Things thus prepared, a rim, or border of wax, is raiſed round the circumference of the plate, and aqua-fortis poured on; which, by the ſaid border, is kept from running off at the edges.

The ground being impenetrable to that corroſive water, the plate is defended from it every where but in the lines, or hatches, cut through it with the points; which, lying open, the water paſſes through them to the copper, and eats into the ſame, to the depth required: which done, it is poured off again.

Of *etching* grounds, it muſt be obſerved, there are two kinds; the one ſoft, and the other hard. There are alſo two kinds of

aqua fortis: the one white, which is only uſed with the ſoft ground, and is applied as above directed: the other green, made of vinegar, common ſalt, ſal ammoniac, and verdegreaſe. This is uſed indifferently with either kind of ground: its application is ſomewhat different from that of the white.

Without making any border, they pour it on the plate, which is placed for that purpoſe a little inclined; and as the water runs off, it is received in a veſſel placed underneath. This they repeat, pouring it again and again, till it has eaten deep enough.

Add, that the aqua fortis, of which kind ſoever it be, muſt not continue equally long, or be poured equally often, on all the parts of the deſign. The remote parts muſt be bitten more ſlightly, than thoſe which are nearer to the view.

To manage this, they have a compoſition of oil and greaſe, wherewith they cover the parts that are to be bitten no further. Or elſe they lay the compoſition on as a deſenſitive at firſt, and take it off again when they find proper. In effect, they are every now and then covering and uncovering this or that part of the deſign, as occaſion requires; and the conduct of the aqua fortis being one of the principal concerns in the whole art, and that on which the effect of the whole very much depends. The operator is alſo to be very attentive to the ground, that do not fail or give way, in any part to the water; and where it does, to ſtop up the place with the compoſition aforeſaid.

Laſtly, it is to be remembered, that a freſh dip of aqua fortis be never given, without firſt waſhing out the plate in fair water, and drying it at the fire.

The aqua fortis having done its part, the ground is taken off, and the plate waſhed and dried; after which nothing remains but for the artiſt to examine the work with his graver in his hand, to touch it up, and heighten it, where the aqua fortis &c. has miſſed.

ETERNITY, an attribute of God, whereby the duration of his exiſtence is conceived incommenſurable with time, and excluſive of beginning, progreſs, ending, &c.

Authors are terribly frightened for a proper and juſt definition of *eternity*: that of Boethius *de Conſol. Philoſ.* l. v. Pr. 6. viz. *interminabilis vita, tota ſimul & perfecta poſſeſſio*, i. e. a perfect poſſeſſion of a whole endleſs exiſtence all together, though retained by S. Thomas, and others, is faulty in diverſe reſpects.

Conſorinus, *de Die Natali*, defines *eternity*, by infinite duration, that is, duration which has always been, and always will be.—Others, more fully deſcribe it by, a duration that exiſts all together, without any flux or ſucceſſion of parts, prior, or poſterior to each other: where, the word *duration*, taken abſtractedly, imports no more than the perfeverance of a thing in its exiſtence; the *to durare*, being here oppoſed to the *to ceſſare*, in exiſtendo.

But ſoften the word duration how you will, it is ſcarce conceivable, but by conceiving a quantity thereof; nor a quantity, without conceiving a ſucceſſion.—Others, therefore deſine *eternity* by a *perpetuum nunc*, a *perpetual now*; or a *nunc ſemper ſtans*, an *ever-ſtanding now*: but neither are theſe un-exceptionable; the words *perpetuum*, and *ſemper ſtans*, importing an obſcure fort of duration. See **DURATION**.

ETESIAE, or **ETESIAN Winds**. See **WIND**, and **MONSOON**.

ETHELING, or **ÆTHELING**. See the article **ÆTHELING**.

ETHER. See the article **ÆTHER**.

ETHERIAL Oil. See **ÆTHERIAL Oil**.

ETHICAL Good. } See the articles } **GOOD**.

ETHICAL Poſſible. } See the articles } **POSSIBLE**.

ETHICS *, **ἠθικῆ**, the doctrine of manners; or the ſcience of moral philoſophy. See **PHILOSOPHY**, and **MORALITY**.

* The word is formed from *ἠθικός*, *ἠθῆ*, *mores*, manners; by reaſon the ſcope, or object thereof, is to form the manners.

Gale makes *ethics* only the firſt part, or branch of moral philoſophy, viz. that which regards private perſons, or in a private capacity.

By manners, or morals, is here meant a way, or manner of living, confirmed by cuſtom, or habit; or certain habitudes of doing; or actions which are often repeated; which, if they be according to right reaſon, the morals, or manners, are ſaid to be good; otherwiſe evil and vicious.

Hence, the object of *ethics*, is the exerciſe of right reaſon in all our affairs, actions and relations; or it is man himſelf conſidered as dirigitable, and to be conducted according to reaſon: and the end of *ethics*, is to make him good and happy. For that if a man conduct himſelf, according to right reaſon, in all the circumſtances of his actions, affairs and relations, he will arrive at the higheſt pitch of moral perfection and beatitude.

Whence, *ethics* may be defined, a right manner of thinking, in order to attain to human felicity; or a ſcience whereby man is directed to conduct his will, and the actions thereof, ſo as to live well and happily. See **WILL**.

The principal, nay, the only topics thereof, are happineſs and manners; whence ariſe two parts, or branches of *ethics*; the firſt on moral happineſs, conſidered as the end; and the ſecond

Second on moral virtues, or good manners, as the means to arrive therat.

ETHICOPROSCOPTÆ *, in antiquity, the name of a sect.—Damascenus, in his treatise of heresies, tells us, that the denomination *Ethioproscoptæ* was given to such as erred in matters of morality, and things relating to practice, that were to be done, or be avoided, &c. who blamed things laudable, and good in themselves, or recommended or practised things evil.—On this footing the *Ethioproscoptæ*, though a numerous body, were no particular sect.

* The word is formed of the Greek, ἠθῶν, manners, and προσκοπῆ, offends, I offend.

ETHIOPIC Year. See the article YEAR.

ETHMOIDAL, ETHMOIDALIS, in anatomy, a denomination given to one of the futures of the human cranium.

The common futures are those which separate the bone of the cranium from those of the cheeks; and are four: the transversal, ethmoidal, sphenoidal, and zygomatical. See **SUTURE**. The ethmoidal takes its denomination from its turning round the os ethmoides.

ETHMOIDES *, ΕΘΜΟΙΔΗΣ, in anatomy, a bone situate in the middle of the basis of the forehead, or os frontis, and at the top of the root of the nose; filling almost the whole cavity of the nostrils.

* It has its name from ἠθῶν, cribrum, sieve, and εἶδος, form, because all spongy, and porous.

By its cribrous part it is joined to the head; by the spongy part, to the cavity of the nostrils; and by the plain and broad part, to the orbits of the eyes.

In the cribrous part is an apophysis, which jets out, in a point, into the cavity of the skull; called from its figure, *crista galli*, or the cock's comb. From its under side, there goes a thin bone, which divides the cavity of the nostrils into two, called the *vomer*. It is perforated by a number of small holes, through which the fibres of the olfactory nerves pass.

J. Philip Ingrassias, a Sicilian, who flourished about the year 1546, was the first who gave a just account of the structure of the os ethmoides or cribrosum.

ETHNARCHA *, ΕΘΝΑΡΧΗ, a governor, or ruler of a nation.

* The word is Greek, formed of εἶνος, nation, and ἀρχή, command.

There are some medals of Herod I. surnamed the great, on one side whereof is found ΗΡΩΔΟΥ, and on the other ΕΘΝΑΡΧΟΥ, q. d. Herod the ethnarch. Now, after the battle of Philippi, we read that Anthony passing over into Syria, constituted Herod and Phasael his brother tetrarchs, and in that quality committed to them the administration of the affairs of Judea, Jos. Ant. L. XIV. C. 23. Herod therefore had the government of the province before ever the Parthians entered Syria, or before Antigonus's invasion, which did not happen till six or seven years after Herod was commander in Galilee. Jos. L. XIV. C. 24. —Consequently, Herod was then truly ethnarch; for he can be no other wise denominated: so that it must have been in that space of time that the medals were struck which only give him this title. Which medals are a confirmation of what we read in history of the government that prince was intrusted withal before he was raised to the royalty.

Josephus gives Herod the appellation of tetrarch, in lieu of that of ethnarch; but the two terms came so near to each other, that it was very easy to confound them together.

Though Herod the great left by will, to Archelaus, all Judea, Samaria, and Idumæa; yet, Josephus tells us, he was then only called ethnarch.

ETHNOPHRONES *, in antiquity, a sect of heretics in the VIIth century, who made a profession of christianity, but joined thereto all the ceremonies and follies of paganism, as judicial astrology, fortileges, auguries, and other divinations.

* And hence their denomination; from εἶνος, nation, and φρονήσις, thoughts, sentiments, q. d. paganism, or persons, whose thoughts, or sentiments were still heathen or gentile.

They practised all the expiations of the gentiles, celebrated all their feasts, and observed all their days, months, times, and seasons. See Damascenus, *Harref.* N. 94.

ETHOPEIA *, or ΕΤΗΡΕΙΑ; in rhetoric, called also **ETHOLOGY**, a draught, or description, expressing the manners, passions, genius, tempers, aims, &c. of another person.

* The word is of Greek original, being formed of ἠθῶν, mores, consuetudo, and ὄψις, facies, sive, descriptio. Quintilian, L. IX. C. 2. calls this figure *imitatio morum alterorum*; and in Greek, ἠθῶν, imitation.—In English we denominate it a picture, or charalter.

Such is that beautiful passage in Sallust, in his *Bellum Catilinarium*, wherein he gives us a picture of Catiline: *sunt magna vi et animi et corporis sed ingenio malo pravoque huic*, &c. He had an uncommon strength both of body and mind; but an ill-turned, and wicked disposition. When a very V. O. I.

boy, his great pleasure was in intestine broils, rapine; slaughter, and civil discord. His body was formed to undergo fasting, cold, and watching, beyond all belief. His mind was daring, deceitful and various; and could imitate, or accommodate itself to every body; he was extremely covetous of other people's goods; and profuse of his own. His lusts and desires were very high; his stock of eloquence considerable; but his discretion scarce any.

The *ethopeia* is divided into *protoprographia*, and *ethopeia* properly so called; the former of which is a picture of the body, countenance, make, dress, gait, &c. and the latter of the mind.

ETYMOLOGY *, ΕΤΥΜΟΛΟΓΙΑ, that part of grammar which considers, deduces, and explains the origin, reason, and derivation of words; in order to arrive at their first, and primary signification.

* The word is formed of the Greek, εἶμι, verus, true, and λογία, dico, I speak; whence λογία, discorsio, &c. and thence Cicero calls the etymology, *notatio*, and *veriloquium*; though Quintilian chuses rather to call it *originatio*.

In all ages there have been people curious in *etymologies*: Varro has wrote on the *etymology* of the Latin words; and we have a Greek *etymologicon*, under the name of Nicas.

The *etymologies* of our English words have been deduced from the Saxon, Welsh, Walloon, Danish, Latin, Greek, &c. by Sumner, Camden, Verlegan, Spelman, Casaubon, Skinner, Henflaw, Junius, &c.

Those of the French and Italian words; by Menage, in what he calls his *origines*: Henry Stephens, Tripot, Borel, Cafa-neuve, &c. have also laboured on the French *etymologies*. Guichard, and Fa. Thomassin, have carried the *etymologies* of abundance of French words as high as the Hebrew. Postel had the same design before them.

We have a Latin *etymologicon* of Gerard Vossius; another of Martinius, &c. Octavio Ferrari has given a body of *etymologies* of the Italian tongue: and Bernard d'Aldretta, another of the Spanish.

Fa. Dom. Pezron, abbot of Charrove, and priest of the Sorbonne, has traced up to the Celtic Language the *etymologies* of abundance of Greek, Latin, German, French; and other words used by Plato, Servius, Donatus, and other Latin authors, without knowing their true origin, and *etymology*, for want of being acquainted with the roots of the Celtic tongue, from which abundance of Greek, Latin, &c. words are derived. It must be added, that his *etymologies* are frequently so far fetched, that one can scarce see any resemblance, or correspondence at all.

A strict, and solicitous enquiry into *etymologies*, is no frivolous and impertinent design; but has considerable uses: Nations, who value themselves on their antiquity, have always looked on the antiquity of their language as one of the best titles they could plead. The *etymologists*, by seeking the true, and original reason of the notions and ideas annexed to each word, and expression, may often furnish an argument of antiquity from the vestigia, or traces remaining thereof; and from the indices still subsisting in the present use of the words, compared with the ancient uses.

Add, that *etymologies* are necessary to the thorough understanding of a language: for, to explain a term precisely, there seems a necessity of recurring to its first imposition, in order to speak justly and satisfactorily thereof. The force and extent of a word is generally better conceived, and entered into, when a person knows its origin and *etymology*.

It is objected, however, that the art is arbitrary, and built altogether on conjectures and appearances; and the *etymologists* are charged with deriving their words from where-ever they list. But the science is certainly real, and as regular as diverse others; having its proper principles, and method.

It must be owned, indeed, that it is no easy matter to return into the ancient British, and Gaulish ages; to follow, as it were by the track, the diverse imperceptible alterations a language has undergone from age to age. A sober *etymologist* has need of all the lights he can come at, to conduct and bring down words variously disguised in their passages, and remark all the changes that have befallen them. And as those alterations have sometimes been owing to caprice, or hazard, it is easy to take a mere imagination, or conjecture, for a regular analogy; so that it is nothing strange the public should be prejudiced against a science which seems to stand on so precarious a footing.

EVACUANTS, in medicine, remedies proper to expel, or carry off any ill, peccant, or redundant humours, in the animal body; by the proper outlets, or emunctories.

Evacuants, there are diverse kinds, distinguished according to their various humours, and emunctories. Some *e. gr.* carry off their matters by stool, called *purgatives*, or *cathartics*. Others by urine, called *diuretics*. Others by perspiration, called *diaphoretics*. (See **DIAPHORETICS**.) Others by sweat, called *sudorifics*. Others by the mouth, called *vomitories*, or *emetics*. Others by the salival glands, as *salagogues*; and others;

others, lastly, by the menfes and Lochia, as *Emmenagogues* and *aristobolus*.

EVACUATION, in medicine, a diminution of the animal fluids, in order to a difcharge of some morbid, or redundant matters therein; or only for the fake of thinning, attenuating, and promoting the motion, and circulation thereof. The matter of a difease, or what is prefcribed by art to remove or ease it, is evacuated two ways.—1°. By the naturalemuncionofes, or out-lets of the skin; the nostrils, mouth, fauces, oesophagus, stomach, intestines, bladder, and urethra. And 2°. by artificial out-lets, made either in the blood-vessels; as by phlebotomy, arteriotomy, scarifications, and leaches. Or, in the lymphatic vessels; as by caustics and vesicatories. Or, lastly, in both, as by issues, fetons, ulcers, fistula's, &c. Hence, the first division of *evacuants* is derived from the different emunctories; and the second, from the diversity of matters evacuated through them.

Most of the chronic diseases, the infirmities of old age, and the short periods of the lives of Englishmen, Dr. Cheyne observes, are owing to repletion. This is evident from hence; that *evacuation* of one kind or another, is nine parts in ten of their remedy: for not only cupping, bleeding, blistering, issues, purging, vomiting and sweating, are manifest *evacuations*, or drains, to draw out what has been superfluously taken down; but even abstinence, exercise, alteratives, cordials, bitters, &c. are but several means to dispose the gross humours, to be more readily evacuated by insensible perspiration. *Essay on health.*

For the periodical *evacuations* of women. See **MENSES**.—For the *evacuations* of women after delivery. See **LOCHIA**.

EVACUATION is likewise used in the art of war: where, to *evacuate a place*, is to make the garrison quit, or march out of it, in order for another power to take possession of it; or to make room for another garrison.

EVANGELICAL Harmony, } See } **HARMONY**,
EVANGELICAL Oeconomy, } } **OECONOMY**.

EVANGELISTS *, the inspired authors of the Gospels.

* The word is derived from the Greek, *εὐαγγελιστορ*, formed of *eu*, bene, well, and *αγγελια*, angel, messenger.—*O suaves epistolas tuas uno tempore mihi datas duas! quibus evangelia quæ reddam nescio; deberi quidem plane fateor.* Cic. ad Attic.

The denomination *evangelists* was likewise given, in the ancient church, to such as preached the gospel up and down; without being attached to any particular church.

In which sense, some interpreters think it is, that St. Philip, who was one of the seven deacons, is called the *evangelist*, in the 21st chapter of the *Acts of the Apostles*, ver. 8. Again, St. Paul writing to Timothy, Ep. 2. C. IV. v. 5. bids him do the work of an *evangelist*.—The same Apostle, Eph. IV. 11. ranks the *evangelists* after the apostles, and prophets. Hence, M. Tillemont takes the liberty to use the word *evangelist* in the same sense. ‘Most of those who then embraced the faith, being filled with the love of a holy philosophy, began to distribute their goods to the poor, and after that went into diverse countries to do the office of *evangelists*, to preach Christ to such as had not yet heard of him, and to furnish them with the sacred writings of the gospel.’

EVANID, a name which some authors give to those colours which are transient, or not of long duration—As those in the rain-bow, in clouds before and after sun-set, &c.

Evanid colours are the same with those otherwise called *fantastical*, and *emphatical* colours. Some authors also use the same term to express those flowers of plants whose retals fall off as soon as they are opened.

EVANTES *, in antiquity, the priestesses of Bacchus; thus called, by reason, in celebrating the Orgia, they ran about as if distracted, crying *evan, evan, obé evan!*

* The word is formed from *Evar*, a title, or appellation of Bacchus.

EVAPORATION, in philosophy, the act of exhaling the humidity of a body; or of dissipating it in fumes, or vapour.

Common salt is formed by evaporating all the humidity in the salt-water, or brine; which *evaporation* is either performed by the heat of the sun, as in the salt-works by the sea-coast, &c. or by means of fire, as at the salt springs, &c.

By the observations of M. Sedileau it appears, that what is raised in vapour, exceeds that which falls in rain.

Though the *evaporation* of fluids be generally looked on as an effect of the heat, and motion of the air; yet M. Gaucheron, in the *Memoires de l'Acad. des Scienc.* An. 1705. shews, that a quite opposite cause may have the same effect; and that fluids lose a deal more of their parts in the severest frost, than when the air is moderately warm. In the great frost of the year 1708, he found, that the greater the cold, still the more considerable the *evaporation*; and that ice it self lost full as much as the warmer liquors that did not freeze.

Dr. Halley furnishes us with some experiments of the quantity, or measure of the *evaporation* of water.—The result is contained in the following articles:

1. That water salted to about the same degree as salt water, and exposed to a heat equal to that of a summer's day, did, from a circular surface of about eight inches diameter, *evaporates* at the rate of 6 ounces in 24 hours. Whence, by a calculus, he finds, that the thickness of the pellicle, or skin of water, *evaporated* in two hours, was the 53d part of an inch: But, for a round number, he supposes it only a 60th part; and argues thence, that if water as warm as the air in summer, evaporates the thickness of one 60th part of an inch in two hours, from its whole surface; in twelve hours it will exhale one tenth of an inch. Which quantity, he observes, will be found abundantly sufficient to furnish all the rains, springs, dews, &c.

In effect, on this principle, every ten square inches of the surface of the water, yield in vapour, *per diem*, a cubic inch of water; and each square foot half a wine pint; every space of four foot square, a gallon; a mile square 6914 tons; and a square degree, suppose of 69 English miles, will *evaporate* 33 millions of tons a day.

2°. A surface of eight square inches *evaporated*, purely by the natural warmth of the weather without either wind or sun, in the course of a whole year, 16292 grains of water, or 64 cubic inches; consequently, the depth of water thus *evaporated* in one year amounts to 8 inches. But this being much too little to answer the experiments of the French, who found that it rained 19 inches of water in one year at Paris; or those of Mr. Townley, who found the annual quantity of rain in Lancashire, above 40 inches: He concludes, that the sun and wind contribute more to *evaporation*, than any internal heat, or agitation of the water.

3°. The effect of the wind is very considerable, on a double account. For the same observations shew a very odd quality in the vapours of water, *viz.* that of adhering and hanging to the surface that exhales them, which they clothe, as it were, with a fleece of vaporous air; which once investing the vapour, it thenceforwards rises in much less quantity. Whence, the quantity of water lost in 24 hours, when the air was very still from winds, was very small; in proportion to what went away when there was a strong gale of wind abroad to dissipate the fleece, and make room for the emission of vapour: and this, even though the experiment was made in a place as close from the wind as could be contrived.

Add, that this fleece of water hanging on the surface of waters in still weather, is the occasion of very strange appearances, by the refraction of the vapour's differing form, and exceeding that of common air. Whence every thing appears raised, as houses like steeples, ships as on land above the water, the land raised and as it were lifted from the sea, &c.

4°. The same experiments shew, that the *evaporation* in May, June, July, and August, which are nearly equal, are about three times as great as those in the months of November, December, January, and February.

EVAPORATION, in pharmacy, denotes an operation by which the more aqueous and volatile parts of fluids are spent, or drove away in steam; so as to leave the remaining part stronger, or of a higher confidence than before.

Evaporation differs from *exhalation*, in that the former is practised on moist things, and the latter on dry.

Evaporation is effected by setting a liquor over a gentle heat, to carry off the most fluid, and volatile parts, without lessening the quantity of the other matters the liquor is impregnated withal.

EVATES, a branch, or division of the ancient celtic philosophers the druids.

Strabo distributes the philosophers among the Britons and Gauls, into three sects: *Bardæ*, *hardi*, *Ovætes*, *evates*, and *Druidæ*, druids. He adds, that the *bardi* were poets and musicians: the *evates*, priests and naturalists; and the *druidæ*, moralists as well as naturalists.—But Marcellinus, Vossius, and Hornius, reduce them all to two sects, *viz.* *bardi* and *druidæ*.—Lastly, Cæsar lib 6. comprehends them all under the names of *Druidæ*.

The *evates*, or *vates*, of Strabo, might probably be what other authors, and particularly Ammian. Marcellin. calls *evages*; but Mr. Bouche, in his *Hist. de Provence*, L. II. c. 2 distinguishes between them. The *vates*, he says, were such as took care of the sacrifices, and other ceremonies of religion; and the *evages*, those who spent their time in the search and contemplation of the great mysteries of nature.

EUBAGES, an order of priests, or philosophers, among the ancient Cætes, or Gauls.—Chorier takes the *evages* to be the same with the druids and *baronidæ* of Diodorus: others will have, the *evages* to be those whom Strabo, L. IV. p. 197. calls *Ovætes*, *evates*, or *vates*: on which principal there

there is room to conjecture, that the word should be wrote *Oualis*; it being easy to mistake a T for a U.

Be this as it will, the *eubages* appear to have been a different order from the druids. See **DAVID**.

EUCCHARIST *, *eucharistia*, the sacrament of the supper; or a participation of the body, and blood of Christ, under the species, or figures of bread and wine. See **COMMUNION**, **SACRAMENT**, **SPECIES**, **TRANSUBSTANTIATION**, and **CONSUBSTANTIATION**.

* The word in its original Greek, *Eυχαριστια*, literally imports *thanksgiving*; being formed of *ευ*, *bene*, well, and *χαρις*, *gratia*, thanks.

EUCHITES, or **EUCHITÆ**, a sect of ancient heretics, thus called, by reason they prayed without ceasing; imagining that prayer alone was sufficient to save them.

Their great foundation, were those words of St. Paul, *Epist. I. to the Theffalon. C. 5. V. 17. pray without ceasing.*

The word is formed of the Greek, *ευχη*, *prayer*; whence *ευχιστα*, the same with the Latin *precatores*, prayers. They were also called *Entusiastæ* and *Masalianæ*.

St. Cyril of Alexandria, in one of his letters, takes occasion to censure certain monks in Egypt, who, under pretence of resigning themselves wholly to prayer, led a lazy, scandalous life. The orientals, however, lay a further charge on the *Euchitæ*, or *Masalianæ*.

EUCHOLOGIUM, **ΕΥΧΟΛΟΓΙΟΝ**, a Greek term, signifying, literally, a *discourse on prayer*.

The word is formed of *ευχη*, *prayer*, and *λογος*, *discourse*.

The *euchologium* is properly the Greek ritual, wherein is prescribed the order, and manner of every thing relating to the order and administration of their ceremonies, sacraments, ordinations, &c.

Fa. Goa has given us an edition of the Greek *euchologium* in Greek and Latin, with notes, at Paris.

EUCRASIA, an agreeable, well proportioned mixture of qualities; whereby a body is said to be in good order, and disposed for a good state of health.

EUDOXIANS, a party or sect of heretics, in the IVth century, so denominated from their leader *Eudoxius*, patriarch of Antioch and Constantinople, a great defender of the Arian doctrine.

The *Eudoxians* adhered to the errors of the Arians and Eunomians; maintaining, that the son was created out of nothing; that he had a will distinct and different from that of the father, &c.

EVE. See the article **VIGIL**.

EVECTION, is used by some astronomers for the liberation of the moon. See **LIBRATION**.

EVEN *foot* in poetry. See **FOOT**.

EVEN *number*, is that which may be divided into two equal parts, or moieties. See **NUMBER**.

EVENLY *even* number, is that which is exactly divisible by an even number taken an even number of times; such is 32; since divisible by eight, taken four times.

EVENLY *odd* number, is that which an even number measures by an odd one; as 30, which is measured by 6, taken five times.

EVERARDS *sliding* rule. See the article **SLIDING**.

EVERGETES, **ΕΥΡΕΤΗΣ**, a Greek term, signifying *benefactor*; being formed of *ευ*, *bene*, well, and *εργον*, *opus*, work.—It is still retained in our language, by way of addition, or epithet, given to two princes, or kings of Syria, and Egypt, who succeeded Alexander. Thus we say, Ptolemy *Evergetes* king of Egypt; Antiochus *Evergetes* king of Syria ascended the throne 120 years before Christ.

EVER-GREENS, a class of perennials, which continue their verdure, leaves, &c. all the year.

Of these, our gardeners reckon twelve, which are peculiarly fit for English air, *viz.* the alaternus, arbutus, bay-tree, box-tree, holly, juniper, laurustinus, phyllirea, pyracantha or ever-green thorn, italian green privet, and the yew-tree.

EVIDENCE, a quality in things whereby they become visible, and apparent to the eyes, either of the body, or the mind.

The schoolmen distinguish *evidence* into *formal* and *objective*.

Formal *EVIDENCE*, is the act of the intellect, considered as clear and distinct.

Objective *EVIDENCE*, consists in the clearness, and perspicuity of the object; or it is the object itself, so constituted, as that it may be clearly, and distinctly known.

Others divide *evidence* into *moral*, *physical*, and *metaphysical*.—A thing is said to be *morally evident*, so far as I have a distinct notion, or knowledge thereof, by unexceptionable witnesses: *physically*, so far as natural sense and reason pointing out any thing, convinces me thereof: *metaphysically*, when I enter so fully and clearly into the essence of any thing, that nothing can be clearer.

Evidence, is the essential and infallible character, or criterion of truth; and is that, in effect, which with us constitutes truth.

If *evidence* should be found in propositions that are false, we

should be compelled into error; since the assent we give to *evidence* is necessary. Whence would follow this impious position, that God who made us, is the author of our errors, as he has constituted us so, as to put us under a necessity of falling into them.

It may be added, that as we necessarily love truth, and hate error, it seems inconsistent with the nature of a beneficent being, to form us with a love of what we could not obtain, or not know whether we did obtain it or not: beside, that if we should err in things that are *evident*, as well as in those that are not so, we should sometimes find contradictions in *evident* propositions, as we commonly do in things that are obscure.

Evidence therefore must be allowed the mark of truth; and those things must be allowed true, which carry with them such a degree of *evidence*, as obliges us to assent to them. Whatever we see *evidently* agreeable to things whereof we speak, that we must acknowledge to be true.

The Epicureans allow of no other *evidence* but that of sense or that arising from sense, (it being a fundamental with them, that sense is the first and primary criterion of all truth.)

By *evidence* of sense, they mean that species, or image exhibited by the sense, or phantasm; which, when all impediments to a just judging, as distance, motion, medium, &c. are removed, cannot be contradicted, or gain-said. Wherefore, the question being put, whether or no a thing be such as it appears; the answer is not to be given, till it have been tried and examined all the ways, and by all the senses, that it can be an object of.

EVIDENCE, in law, is any proof, whether by testimony of men on oath, or by writings and records.

It is thus called, because the point in issue is hereby made *evident* to the jury.

Sir Tho. Smith refrains *evidence* to authentic writings of contracts, written, sealed, and delivered. *De Rep. Angl.* lib. II.

EVIUM, *Malum*, in ethics, a privation, or absence of some proper, or necessary good; or of some due measure, or degree thereof.

The schoolmen deny, that any thing is every way *evil*; and refrain all *evil*, to be only so, *quoad hoc*; i. e. as the thing wants this, or that degree of a certain quality, necessary to constitute it, in that respect good. There is nothing *evil*, by they, without some good in it, wherein the *evil* relieves as in its subject, for, as every being depends on the supreme being, it cannot but be good, as flowing from the supreme good.

Evil is either *natural* or *moral*; between which there is this relation, that moral *evil* produces natural.

Moral *EVIL*, is defined a deviation from right reason, and consequently from the will and intention of the great legislator, who gave us that as a rule.—This the philosophers call *inhonestum* and *turpe*, as staining the image of God, and fulfilling our original beauty; likewise *malum culpæ*.

Natural *EVIL*, is a want of something necessary to the *bonæ esse*, or perfection of a thing, or to its answering all its purposes.—Such are defects of the body, blindness, lameness, hunger, diseases, death.—This species is denominated, *triste*, *injunctum*, *noxium*; and *malum pœnæ*.

Again, *evil* is either *absolute*, as envy, impiety, &c. or *relative*, as meat, which in it self being good, may be *evil* to a man on account of some disease; as wine to a feverish person, &c.

Thus far the schools have gone in the nature and reason of moral and natural *evil*: a late ingenious author sets the thing in another light, and furnishes a much finer, and more adequate theory of moral good and *evil*, in his inquiry into the origin of our ideas of beauty and virtue.

Moral *evil*, according to this philosopher, denotes our idea of a quality apprehended in actions which excites aversion and dislike towards the actor, even from persons who receive no disadvantage thereby: as moral goodness denotes our idea of a contrary quality which procures approbation and love towards the actor, even in persons unconcerned in its natural tendency. This notion supposes an universally acknowledged difference of good and *evil*, from natural. Moral good, we all know, procures love towards those we apprehend possessed of it: whereas natural good does not. How differently, for instance, are we affected towards those we suppose possessed of honesty, faith, generosity, &c. when we expect no benefit from those qualities: and those possessed of the natural goods, as houses, lands, gardens, health, strength, &c. So, whatever quality we apprehend morally *evil*, raises our hatred towards the person in whom we observe it; as treachery, cruelty, ingratitude, &c. Whereas we love and pity many exposed to natural *evils*, as pain, hunger, sickness, &c.

The origin of these different ideas of actions, has greatly puzzled the moralists: the generality make self-interest, or self-love, the source of them all; we approve the virtue of others,

as it has some small tendency to our happiness, either from its own nature, or from this general consideration, that a conformity to nature and reason is in the general advantageous to the whole, and to us in particular: and, on the contrary, disapprove the vice of others, as tending at the long run to our particular detriment.

Others suppose an immediate *natural evil*, in the actions called *virtuous*; that is, that we are determined to perceive some deformity or displeasure in such actions, without reflecting on any disadvantage that may any way redound to us from the action; and that we have a secret sense of pleasure accompanying such of our own actions as are called *virtuous*, when we expect no further advantage from them; but then they add, that we are excited to perform those actions, even as we pursue or purchase pictures, statues, landscapes, &c. from self-interest, to obtain the pleasure which accompanies the action.

But the author just mentioned has shewn the mistake: some actions, he proves, have to men an immediate goodness, and others an *immediate evil*, i. e. we perceive pleasure in some, and pain in others, and are determined to love, or hate the doers, without any view of natural advantage, without any view to future rewards or punishments, or even without any intention to obtain the sensible pleasure of the good; but from a very different principle, *viz.* an internal moral sense, or a natural determination of the mind to receive amiable, or disagreeable ideas of actions, when they shall occur to our observation, antecedently to any opinion of advantage or loss to redound to our selves from them; even as we are pleased with a regular form or an harmonious composition, without any knowledge of the mathematics, or seeing any advantage in that form or composition, different from the immediate pleasure. See farther under the articles *SENSE*, *GOOD*, *VIRTUE*, and *VICE*.

EVIL, or *Kings-Evil*, in medicine, a disease by the physicians called *Struma*, and *Scrophula*, consisting in scirrhous tumours, arising most commonly about the neck, but some also on the other glandulous parts, as the breast, arm-pits, groin, &c. The kings of England and France, have, of a long time, pretended to the privilege of curing the *kings-evil* by *touching*. The right, or faculty, it is said by some, was originally inherent in the French kings; and those of England only claimed it, as an appendage, or appurtenant to that crown, to which they laid a claim. But some of our own monkish writers set the thing on a different footing; and will have it to have been practised by our kings, as early as Edward the confessor; which opinion the ingenious Mr. Becket has abundantly overthrown.

Raoul de Pruelles addressing his translation of St. Augustin *de civitate Dei*, to Charles V. of France, says expressly, *vos devanciers, & vous avez telle vertu & puissance que vous est donnie & attribuee de dieu, que vous faites miracles en votre vie, telles, si grandes & si apertes que vous guerisses d'une tres horrible maladie que s'appelle les escrouelles* [i. e. the *kings-evil*] *de laquelle nul autre prince terren ne peut guerir hors vous.*

Steven de Conti, a religious of Corbie, who lived in the year 1400, and wrote a history of France still preserved in MS. in the library of St. Germain des Prez, describes the practice of touching for the *evil*. After the king had heard mass, a vessel of water was brought him, and his majesty having put up his prayers before the altar, touched the diseased part with his hand, and washed it with water.

Matthew Paris will have S. Louis the first who practised it: others contend, that king Robert was the first who was gifted this way. It is certain, we find no mention of any such prerogative, before the kings of the 11th century, when that prince reigned. Fa. Daniel, *hist. de France*, T. I. p. 1032. Polydore Virgil strains hard to prove the same virtue in the kings of England. Favyn *hist. de Navarre*, 1062.

The continuer of Monstrelet, observes, that Charles VIII. touched several sick persons at Rome, and cured them, *dont ceux des Italiens, says he, voyant ce mystere ne furent onques si émerveillés.*

The same virtue, we know not on what grounds, is commonly attributed to a seventh son, born without any daughter between; as also to the chiefs of certain particular families; particularly, to the eldest person of the house of Aumont in Burgundy.

Hungry Evil. See the article *HUNGRY*.

EULOGY *, *EULOGIA*, in church-history. — When the Greeks have cut a loaf, or piece of bread, to consecrate it, they break the rest into little bits, and distribute it among the persons who have not yet communicated, or send it to persons that are absent; and these pieces of bread are what they call *eulogies*.

* The word is Greek, *εὐλογία*, formed of *ευ*, bene, well; and *λεγω*, dico, I say, speak, q. d. *benedictum*, blessed.

The Latin church has had something like *eulogies* for a great many ages; and it was thence arose the use of their holy bread. The name *eulogy*, was likewise given to loaves, or cakes brought to church by the faithful, to have them blessed.

Lastly, the use of the term, passed hence to mere presents made a person, without any benediction. See the Jesuit Greger, in his treatise *de Benedictionibus & Maledictionibus* l. II. c. 22, 24, &c. whereof he treats *eulogies* thoroughly.

From a passage in Bollandus, on the life of S. Melaine, c. 4. it appears, that *eulogies* were not only of bread, but any kind of meat blessed, and hallowed for that purpose. Add, that almost every body blessed and distributed *eulogies*; not only bishops and priests, but even hermits, though laymen, made a practice of it. Women also would sometimes send *eulogies*, as appears from the life of S. Waulry, c. 3. N^o. 14. in the Bollandists, *Acta Sancti Jan. T. 1. p. 20.*

The wine sent as a present, was also held an *eulogy*. Bollandus remarks further, that the eucharist it self was called *eulogy*. *Act. Sancti Jan. T. 2. p. 199.*

EUNOMIANS, a sect of heretics, denominated from *Eunomius*, bishop of Cyzicus, who, in the IVth century, maintained most of the errors of Arius, and added others to them; as, particularly, that he knew God, as well as God knew himself.

He re-baptized such as had already been baptized in the name of the trinity: he had dissembled his errors for some time, but having at length made a discovery, he was expelled his see.

The Arians endeavoured to have put him into that of Samosata, but could not effect it: in lieu thereof, the emperor Valens restored him to Cyzicus.

EUNOMIOFUSYCHIANS, a sect of heretics of the IVth century, mentioned by Nicephorus, l. XII. c. 30. being the same with those called *Eutybians* by Sozomen, l. VII. c. 17.

The author hereof, according to Sozomen, was an Eunomian, named Eutyuchus, and not Euphytichus, as Nicephorus has it: and yet this latter writer only copies Sozomen in this passage; so that it is past doubt, they both speak of the same sect. But on whose side the error lies, is not easy to decide: Valesius durst not undertake to shew it; but contented himself to mark the difference in his notes on Sozomen, as Fa. Fronto has done on Nicephorus.

EUNUCH *, *ΕΥΝΟΥΧΟΣ*, a term applied, in the general, to all who have not the faculty of generating, either through imbecility, or frigidity; but more particularly to such as have been castrated, or have lost the parts necessary thereto.

* The word is formed of *ευνν* *εγχε*, q. d. *lecti curam habet, guardian, or keeper of the bed.*

In England, France, &c. *eunuchs* are never made but on occasion of some disease, which renders such an operation necessary; but in Italy, they make *eunuchs*, for the sake of preferring the voice; and, in the east, they make *eunuchs* to be guards, or attendants on their women.

Great numbers of children, from one to three years of age, are yearly castrated in Italy, to supply the operas and theatres, not only of Italy, but other parts of Europe, with singers: though it is not one in three, that after having lost their virility, have a good voice for a recompence.

Tavernier assures us, that in the kingdom of Boutan in the East-Indies, there are every year made twenty thousand *eunuchs*, and sold thence into other countries.

The seraglio's of the eastern emperors, are chiefly served, and guarded by *eunuchs*. And yet we have very good testimonies, that the rich *eunuchs* in Persia and other countries, keep seraglio's for their own use.

By an arret of the grand chamber of Paris in 1665, it is adjudged, that an *eunuch* could not marry, not even with the consent of the woman and all the parties on both sides.

Claudian has a very severe satyr against the *eunuch* Eutropius, who had been elected consul of Rome. He represents him as an old woman, dressed up in the honours of the consulate.

The story of Origen is notorious: that learned and pious father upon a too literal interpretation of that passage in St. Matthew, c. xix. ver. 12. where mention is made of, *eunuchs so born from their mother's womb*, — *eunuchs who were made so of men* — and *eunuchs who made themselves eunuchs for the kingdom of heaven*: castrated himself.

In the council of Nice, those were condemned, who, out of an indiscreet zeal, and to guard themselves from sensual pleasures, should make themselves *eunuchs*: such as thus mutilated their bodies, were excluded from holy orders: witness Leon-tius bishop of Antioch, who was deposed for having practised this cruelty on himself. And the bishop of Alexandria excommunicated two monks, who had followed his example on pretence of securing themselves from the impetuous motions of concupiscence. Several of the emperors made very severe prohibitions against the making of *eunuchs*, or peoples castrating themselves.

EUNUCHS, *ΕΥΝΟΥΧΙ*, is also the denomination of a sect of heretics in the 3d century, who had the folly, or madness, to castrate not only those of their own persuasion, but even all they could lay hands on.

They took their rise from the example of Origen, who, upon a misunderstanding of our Saviour's words in St. Mat-

shew, made himself an *evanch*, by cutting off the offending part, as some say; or, as others, particularly S. Epiphanius, by the use of certain medicines.—These heretics were also called *Valisians*.

EVOLVENT, in geometry, a term which some writers use for the curve resulting from the evolution of a curve; in contra-distinction to the *evolute*, which is the curve supposed to be opened or evolved.

The *evolute* always both touches and cuts the *evolvent* at the same time: the reason is, that it has two of its infinitely small sides in common with the *evolvent*, or rather exactly placed on two equal sides thereof: one of them within side that of the *evolvent*, i. e. on the concave side thereof; and the other, on the convex side of its correspondent side. So that the *evolute* touches the *evolvent* in two points; whence, instead of being a tangent, it is said to osculate the *evolvent*, and hence it is also called *osculator*, and *circulus osculator*.

There is one, and but one osculator, to each point of the *evolvent*; but to the same point there are an infinity of other circles, which only touch, and do not osculate. The osculator and the *evolute* make no angle in the place where they touch and cut: nor can any curve line be drawn between; as there may betwixt a tangent and a curve.

EVOLUTE, *EVOLUTA*, in the higher geometry, a curve first proposed by Mr. Huygens, and since much studied by the later mathematicians.

The *evolute* is a curve, supposed to be evolved, or opened; and which in opening, describes other curves.

To conceive its origin and formation; suppose a flexible thread, wound exactly over the convexity of any curve, as ABCG, (*Tab. Geometry, fig. 20.*) and suppose the thread fixed in G, and every where else at liberty, to A. Now, beginning to unwind the thread from the point, and continuing it to D, and throughout keeping it tight on the curve surface ABCG; when the thread is become quite straight, and is only a tangent, FG, to the curve in the point G; it is evident the extremity A, in its progress to G, has described another curve line ADEF.

Here, the first curve ABCG is called the *evolute*: each of its tangents BD, CE, &c. comprehended between it, and the curve ADEF, is called a *radius of the evolute*, or *radius of curv*, or *radius osculator* of the curve ADEF, in the respective points D, E, &c. And the circles whose radii are the tangents BD, CE, &c. are radii, are called *circuli osculator* of the curve ADEF, in D, E, &c. And lastly, the new curve resulting from the evolution of the first curve, begun in A, is called the *curve of evolution*, or *curve described by evolution*.

The *radius of the EVOLUTE*, then, is the part of the thread comprized between any point where it is tangent to the *evolute*, and the correspondent point where it terminates in the new curve. Which appellation *radius* is the more proper, as one may actually consider this part of the thread in every step it takes, as if it described an arch of an infinitely small circle, making a part of the new curve, which thus consists of an infinite number of such arches, all described from different centres and with different radii.

Every curve, therefore, may be conceived as formed by the evolution of another. And we are to find that whose evolution formed it, which amounts to the finding the *radius of the evolute* in any point. For, as it is always a tangent to the generating curve, it is properly no more than one of its infinitely small parts, or sides prolonged; and all its sides, whose position are determined of course, are no other than the generating curve itself.

The same thread is also called *radius curvædinis*, or *radius osculi*, by reason a circle described hereby, from the centre G, is said to osculate or kiss it; as both touching and cutting at the same time, i. e. touching both the inside and the out.

Hence, 1°. The *evolute* BCF, (*fig. 21.*) is the place of all the centres of the circle that osculate the curve AM described by evolution. 2°. When the point B, falls on A, the *radius of the evolute* MC, is equal to the arch BC; or to the aggregate of AB, and the arch BC. 3°. Since the element of the arch Mm, in the curve described by evolution, is an arch of a circle described by the radius CM; the *radius of the evolute* CM is perpendicular to the curve AM. 4°. Since the *radius* by the *evolute* MC, is always a tangent to the *evolute* BCF; curves by evolution may be described through innumerable points, if only tangents be produced in their several points of the *evolute*, till they become equal to their correspondent arches.

The finding of the *radii of evolutes*, is a thing of great importance in the higher speculations of geometry; and even, sometimes, is of use in practice, as the inventor of the whole theory, Huygens, has shewn in applying it to the pendulum. *Horol. Oscill. part 3.*—The doctrine of the *oscula of evolutes*, is owing to M. Leibnitz; who first shewed the use of *evolutes* in the measuring of curves.

To find the *radius of the evolute* in the diverse kinds of curves, with equations to the *evolutes*. See Wolf, *Elem. Math.*

Vo L. I.

Tom. I. p. 524, *seqq.* Or the *Infinim. Petites of M. le Marquis de l'Hopital.*

Since the *radius of an evolute* is either equal to an arch of the *evolute*, or exceeds it by some given quantity; all the arches of *evolutes* may be rectified geometrically, whose radii may be exhibited by geometrical constructions; whence we see why an arch of a cycloid is double its chord: the *radius of the evolute* being double the same; and the *evolute* of a cycloid, being it self a cycloid.

M. Varignon has applied the doctrine of the *radius of the evolute* to that of central forces; so that having the *radius of the evolute* of any curve, one may find the value of the central force of a body, which moving in that curve, is found in the same point where that *radius* terminates: or reciprocally, having the central force given, the *radius of the evolute* may be determined. *Hist. de l'Acad. Roy. des Sciences, An. 1706.*

Imperfect EVOLUTE. M. Reaumur has given a new kind of *evolute* under this denomination. Hitherto, the mathematicians had only considered the perpendiculars let fall on the points of the convex side of the curve: if other lines, not perpendicular, were drawn upon the same points, provided they were all drawn under the same angle, the effect would be the same; that is, the oblique lines would all intersect within the curve, and by their intersections, form the infinitely small side of a new curve, whereof they would be so many tangents.

This curve would be a sort of *evolute*, and would have its radii; but, an imperfect *evolute*, since the radii are not perpendicular to the first curve. *Hist. de l'Acad. &c. An. 1709.*

EVOLUTION *, in geometry, the unfolding, or opening, of a curve, and making it describe an *evolvent*. See **EVOLVENT**.

* The word is Latin, *evolutio*, formed of the preposition *ev*, out, and *volvo*, I roll or wind, *q. d. an unwinding, or unravelling.*

The equable *evolution* of the periphery of a circle, or other curve, is such a gradual approach of the circumference to rectitude, as that all its parts do all concur, and equally evolve, or unbind; so that the same line becomes successively a less arch, of a reciprocally greater circle, till at last they change into a straight line. In *Philos. Transact. N.º 250.* a new quadratrix to the circle, is found by this means, being the curve described by the equable *evolution* of its periphery.

EVOLUTION is also used for the extraction of roots out of powers.

In which sense it stands contrary to *involution*.

EVOLUTION, in the art of war, is a term applied to the diverse figures, turns, and motions, made by a body of soldiers, either in ranging themselves in form of battle, or in changing their form; and this whether in the way of exercise, or in time of an actual engagement.

It is by the *evolutions*, that the form, and posture of a battalion, squadron, &c. are changed; either to make good the ground they are upon, or to possess themselves of another, that they may attack the enemy, or receive an onset more advantageously.

The *military evolutions*, are conversions, countermarches, or wheelings, doublings of rank or file, &c.

Fa. Hofte, a Jesuit in 1697, printed a treatise of *naval evolutions*, in folio:—By *naval evolutions* he means the motions made by a fleet, squadron, or naval armament, in order to put themselves into a proper disposition for attacking the enemy, or defending themselves with the most advantage.

EUPHONY *, *ΕΥΦΩΝΙΑ*, in grammar, an easiness, smoothness, and elegance of pronunciation:

* The word is Greek, formed of *eu*, *len*, well; and *φων*, *vox*, voice. Quintilian calls *euphonia*, *suavitas*; Scaliger, *facilis pronuntiatio*.

Euphonia is properly a kind of figure, whereby we suppress a too harsh letter, or convert it into a smoother, contrary to the ordinary rules. There are examples enough in all languages.

EUPHORBIVM, *ΕΥΦΟΡΒΙΟΝ*, in pharmacy, a kind of gum, brought from Africa, in little roundish pieces, whitish when new, and yellowish when old, very pungent to the taste, but void of smell.

The principal use of *euphorbium*, is external; it is a great ingredient in diverse resolute plasters, as well as in tincture, and powder for stopping of gangrenes, cleaning of foul ulcers, and exfoliating carious bones.

Internally taken, it is a purgative, but so violent a one, that it is almost out of use, as tearing off the necessary mucus or covering of the stomach and bowels, and occasioning dysenteries. Yet we are told the Africans use it very commonly; but they first quench its fire in purlain water.

Its powder is a violent sternutatory, and to be used very cautiously, and never alone, but mixed with a small quantity of some other powder, to guard against its intolerable acrimony.

The gum we call *euphorbium*, is formed of the juice of a

plant, of the same name, pretty frequent in Mauritania; though the species of the plant, has been greatly controverted. The generality of our latest botanists, make it a thorny, succulent plant; and Mr. Professor Hermannus calls it the *tibymalus mauritanicus aphyllus angulosus & spinosus*. *Hort. Acad. Lug. Batav.* 598.

It has no leaves; but in lieu thereof puts forth along its stem a kind of long prickly eyes, or buds. Which buds, it is, that yield that gummy juice, called *euphorbium officinarum*. See *Bradl. Hist. of Succul. Plants*, dec. 2. p. 4. and dec. 5. p. 12.

Some authors will have it, that the gum is drawn from the plant by incision; others, on the contrary, say it oozes spontaneously: the juice, we are told, is so very subtle, and penetrating, that the person who taps the plant, is forced to stand at a good distance, and make the incision with a long pike; otherwise it gets to the brain, and occasions dangerous inflammations. It oozes out in great abundance, and is gathered in a sheep's skin, wrapped round the plant.

Pliny tells us, that the first discovery of *euphorbium* is attributed to Juba king of Lybia, who denominated it from *Euphorbus* his physician, brother of Musa, physician to Augustus. Emuller assures us, that the plant, which yielded the *euphorbium* of the ancients, is now unknown to us; but if we go by Pliny's description, the plant called *schadida calli*, in the *Hortus malabaricus*, must be the ancient *euphorbium*. This discovery is owing to Commelinus, a burgher-master of Amsterdam, and professor of botany.

EUPHORY, signifies the same as *eucrasia*. See **EUCRASIA**.

EUPSYCHIANS. See **EUNOMIOEUPSYCHIANS**.

EURIPUS, ΕΥΡΗΠΟΣ, in hydrography, properly signifies a certain freight of the sea, between Bœotia, and Eubœa; where the currents are so strong, that the sea is said to ebb and flow seven times a day: in which place, as the story commonly goes, Aristotle drowned himself, out of chagrin, for not being able to account for so unusual a motion.

EURIPUS has since become a general name for all freights where the water is in great motion, and agitation.

The ancient circus's had their *euripi*, which were no other than pits, or ditches, on each side of the course; into which it was very dangerous falling with their horses and chariots, as they run races. The term *euripus* was more particularly applied by the Romans to three canals, or ditches, which encompassed the circus on three sides; and which were filled occasionally, to represent Naumachia, or sea battles.

The same people called their smaller fountains, or canals in their gardens, *euripus's*; and their largest, as cascades, &c. *niles*.

EURUS.

EURO-Auster. } See the article **WINDS**.

EURO-Notus. }

EUROPEAN Hours. See the article **HOURLY**.

EUROPEAN Ocean. See the article **OCEAN**.

EURYTHMY *, ΕΥΡΥΘΜΙΑ, in architecture, painting, and sculpture, a certain majesty, elegance, and easiness appearing in the composition of diverse members, or parts of a body, building, or painting; and resulting from the fine proportions thereof.

* The word is Greek, and signifies literally a consonance, or fine agreement, or as we may call it, a harmony of all the parts; being compounded of *eu*, well, and *ρυθμος*, rhythmus, cadence, or agreement of numbers, sounds, or the like things.

Vitruvius ranks *eurythmia* among the essential parts of architecture: he describes it as consisting in the beauty of the construction, or assemblage of the several parts of the work, which render its aspect, or whole appearance graceful: *e. gr.* when the height corresponds to the breadth, and the breadth to the length, &c.

From these three ideas, (or designs, *viz.* orthography, scenography, and profile) it is, that same *eurythmy*, majestic, and *venusta species edificii*, does result; which creates that agreeable harmony between the several dimensions; so as nothing seems disproportionate, too long for this, or too broad for that, or corresponds in a just and regular symmetry, and is consistent of all the parts with the whole. Evelyn's *Account of Archit.* &c.

EUSEBIANS, a denomination given to the sect of Arians, on account of the favour and countenance, which *Eusebius* bishop of Cæsarea shewed, and procured for them at their first rise. See **ARIANS**.

EUSTATHIANS, a name given to the Catholics of Antioch, in the IVth century; on occasion of their refusal to acknowledge any other bishop beside *S. Eustathius*, deposed by the Arians.

The denomination was given them during the episcopate of Paulinus, whom the Arians substituted to *S. Eustathius*, about the year 330, when they began to hold their assemblies apart. About the year 350, Leontius of Phrygia, called the *enuch*, who was an Arian, and was put in the see of Antioch, desired the *Eustathians* to perform their service in his church; which they accepting, the church of Antioch served indifferently both the Arians and Catholics.

This, we are told, gave occasion to two institutions, which have subsisted in the church ever since: the first was psalmody in two choirs; though, *M. Baillet* thinks, that if they instituted an alternate psalmody between two choirs, it was between two Catholic choirs; and not by way of response to an Arian choir. The second was the doxology, *Glory be to the Father, and the Son, and the Holy Ghost*.

This conduct, which seemed to imply a kind of communion with the Arians, gave great offence to abundance of Catholics, who began to hold separate meetings; and thus formed the schism of Antioch. Upon this, the rest, who continued to meet in the church, ceased to be called *Eustathians*, and that appellation became restrained to the dissenting party.

S. Flavianus, bishop of Antioch in 381, and one of his successors, Alexander in 482, brought to pass a coalition, or reconciliation, between the *Eustathians* and the body of the church of Antioch, described with much solemnity by Theodoret, *Ecll.* I. III. c. 2.

EUSTATHIANS, was also a sect of heretics, in the IVth century; denominated from their author *Eustathius*, a monk so foolishly fond of his own profession, that he condemned all other conditions of life.

He excluded married people from salvation; prohibited his followers from praying in their houses; and obliged them to quit all they had, as incompatible with the hopes of heaven.

He drew them out of the other assemblies of Christians, to hold secret ones with him; and made them wear a particular habit: he appointed them to fast on Sundays; and taught them that the ordinary fasts of the church were needless, after they had attained to a certain degree of purity, which he pretended to. He shewed a world of horror for chapels built in honour of martyrs, and the assemblies held therein. Several women, seduced by his reasons, forsook their husbands, and abundance of slaves deserted their masters houses. He was condemned in the year 342, at the council of Gangra, in Paphlagonia.

EUSTYLE *, in architecture, a kind of edifice, where the columns are placed at a most convenient distance one from another; the intercolumniations being all just two diameters and a quarter, of the column; except those in the middle of the fronts before and behind, which are three diameters distant. — See *Tab. Archit. fig. 44*.

* The word is Greek, being formed of *eu*, well, and *στυλ*, column.

The *style* is a medium between the pycnostyle, and argostyle.

Vitruvius, I. III. c. 2. observes, that the *style* is the most approved of all the manners of intercolumniation; and that it surpasses all the rest, in convenience, beauty, and strength.

EUTYCHIANS, ancient heretics, who denied the duplicity of natures in Christ; thus denominated from *Eutyches* the archimandrite, or abbot of a monastery at Constantinople.

The aversion *Eutyches* bore to the heresy of Nestorius, threw him into another extreme, not less dangerous than that he so warmly opposed; though some passages in *St. Cyril*, which raised the unity of the person of Jesus Christ very high, contributed, likewise, to his delusion.

At first he held, that the *logos*, word, brought his body down with him from heaven: which was a near approach to the heresy of Apollinarius; and though he afterwards testified the contrary in a synod at Constantinople, wherein he was condemned; yet he could not be brought to acknowledge, that the body of Jesus Christ was consubstantial with ours.

In effect, he did not seem quite steady, and consistent in his sentiments; for he appeared to allow of two natures, even before the union; which was apparently a consequence he drew from the principles of the platonic philosophy, which supposes a pre-existence of souls: accordingly, he believed that the soul of Jesus Christ had been united to the divinity before the incarnation; but then he allowed no distinction of natures in Jesus Christ, since his incarnation.

See the dissertation of *Fa. Hardouin*, de *Sacramento Altaris*, wherein that jesuit endeavours to unfold all the sentiments of the *Eutychiens*.

This heresy was first condemned in a synod held at Constantinople, by *Flavianus* in 448: and re-examined, and fulminated in the general council of Chalcedon in 451. The legates of pope Leo, who assisted thereat, maintained, that it was not enough to define that there were two natures in Jesus Christ, but insisted strenuously, that to remove all equivocations, they must add these terms, *without being changed, or confounded, or divided*.

But this decree of the council of Chalcedon, at which assisted upwards of 360 prelates, did not stop the progress of *Eutychanism*: some bishops of Egypt, who had attended at the council, upon their return, proclaimed openly, that *St. Cyril* had been condemned, and Nestorius acquitted therein: which occasioned great disorders; several persons, under pretence of contending for the sentiments of *St. Cyril*, making no scruple of weakening the authority of the council of Chalcedon.

The heresy of the *Eutychiens*, which made a very great progress

gress throughout the east, at length became divided into several branches. Nicephorus makes mention of no fewer than twelve: some called *Schematici*, or *Apparentes*, as only attributing to Jesus Christ, a phantom, or appearance of flesh, and no real flesh: others *Theodosians*, from Theodosius bishop of Alexandria; others, *Jacobites*, from one James. *Jacobus*, of Syria; which branch established it self principally in Armenia, where it still subsists.

Others were called *Acephali*, q. d. without head, and *Severians*, from a monk called *Severus*, who seized on the see of Antioch in 513.

These last were subdivided into five factions, viz. *Agnoetae*, who attributed some ignorance to Jesus Christ: the followers of Paul: *Maarioni*, that is, the black Angelites, thus called from the place where they were assembled: lastly, *Adrites*, and *Conovites*.

EUTYCHIANS, was also the name of another sect half Arian, half Eunomian; which arose at Constantinople, in the IVth century.

It being then a matter of mighty controversy among the Eunomians at Constantinople, whether or no the Son of God knew the last day and hour of the world, particularly with regard to that passage in the gospel of St. Matthew, c. xxiv. ver. 36. Or rather that in St. Mark, xiii. 32. where it is expressed, that *the Son did not know it, but the Father only*: *Euty chius* made no scruple to maintain, even in writing, that the Son did know it: which sentiment displeasing the leaders of the Eunomian party, he separated from them, and made a journey to Eunomius, who was then in exile.

That heretic acquiesced fully in *Euty chius's* doctrine, that the Son was not ignorant of any thing the Father knew, and admitted him to his communion; *Eunomius* dying soon after, the chief of the Eunomians at Constantinople, refused to admit *Euty chius*; who, upon this, formed a particular sect of such as adhered to him, called *Euty chiusians*.

This same *Euty chius*, with one *Theophrastus*, as was said in *Sozomen's* time, were the occasion of all the changes made by the Eunomians in the administration of baptism; which consisted, according to *Nicephorus*, in only using one immersion, and not doing it in the name of the trinity, but in memory of the death of Jesus Christ.

Nicephorus calls the chief of this sect, not *Euty chius*, but *Euphy chius*, and his followers *eunomioeuphy chiusians*.

EWRY, an office in the king's household, where they take care of the linen for the king's table; lay the cloth, and serve up water in silver *ewers* after dinner: whence the office takes its name.

EXACERBATION, the same as *paroxysm*. See **PAROXYSM**.

EXACHORD. See the article **HEXACHORD**.

EXACTION, in law, a wrong done by an officer, or one pretending to have authority, in taking a reward or fee, for that which the law allows not.

The difference between *exaction* and *extortion* consists in this, that *extortion* is where the officer takes more than his due; and *exaction*, where he wrests a fee or reward, where none is due.

EXAGON. See the article **HEXAGON**.

EXERESIS*, in chirurgery, an operation whereby something foreign, useless, and even pernicious, is taken from the human body.

* The word is Greek, *ἐξέρσις*, which signifies the same.

The *exeresis* is performed two ways.—By *extradion*, when something formed in the body is drawn out of the same.—And by *detradion*, when something is taken away, that had been introduced into the body from without. See **LITHOTOMY**, &c.

EXAGGERATION*, in rhetoric, a figure, whereby we enlarge, or heighten things; making them appear more than they really are, whether as to goodness, badness, or other qualities.

* The word is formed of the Latin, *exaggero*, I exaggerate: which is a compound of *ex*, and *agger*, a mound, or elevation of earth.

EXAGGERATION, in painting, is a method of representing things, wherein they are loaded too much, or marked too strongly; whether in respect of the design, or the colouring.

Exaggerating differs from *caricaturing*, in that the latter perverts, or gives a turn to the features, &c. of a face, which they had not; whereas the former only improves, or heightens upon what they had.

The latter is a kind of burlesque on the object, and is generally meant to ridicule. The former is usually an exalting, or enlivening of the beauties of the object beyond what nature allows. The painter is obliged to have recourse to an *exaggeration* of colours, both on account of the surface of his ground, the distance of his work, and of time and the air which diminish and weaken the force of the colours. But this *exaggeration* must be conducted in such manner, as not to put the objects out of their natural characters. De Piles.

EXALTATION, *Elevation*, is chiefly used in a figurative sense, for the raising, or advancing a person to some ecclesiastical dignity; and particularly, to the papacy.

The term *exaltation*, is in some measure appropriated to the pope, and expresses his inauguration, coronation, taking possession, and the beginning of his pontificate.

EXALTATION of the Cross, **EXALTATIO CRUCIS**, is a feast of the Romish church, held on the 14th of September; in memory, as is generally supposed, of this, that the emperor *Heraclius* brought back the true cross of Jesus Christ on his shoulders, to the place on mount Calvary, from which it had been carried away fourteen years before, by *Colosseus* king of Persia, at his taking of Jerusalem, under the reign of the emperor *Phocas*.

The cross was delivered up, by a treaty of peace made with *Siroe*, *Colroe's* son.—The institution of this feast is commonly said to have been signalized by a miracle; in that *Heraclius* could not stir out of Jerusalem with the cross, while he had the imperial vestments on, enriched with gold and precious stones; but bore it with ease in a common dress.

But long before the empire of *Heraclius*, there had been a feast of the same denomination observed both in the Greek and Latin churches, on occasion of what our Saviour said in St. John xii. 32. *And I, if I be exalted, or lifted up, will draw all men unto me.* And again, in ch. viii. ver 26. *When ye have exalted, or lift up the son of man, then shall ye know that I am he.* *Fa. Du Soulier* assures us, that *M. Chastelain* was of opinion, this feast had been instituted, at least at Jerusalem, 240 years before *Heraclius*.

The feast of the dedication of the temple built by *Constantine*, was held, says *Nicephorus*, on the 14th of September, the day the temple had been consecrated on, in the year 335; and this feast was also called, the *exaltation of the cross*; by reason it was a ceremony therein, for the bishop of Jerusalem to ascend a high place built by *Constantine* for that purpose, in manner of a pulpit, called by the Greeks, the *sanctified mysteries of God, or the holiness of God*; and there hoist up the cross for all the people to see it.

EXALTATION, in physics, denotes the act, or operation of elevating, purifying, subtilizing, or perfecting any natural body, its principles and parts; also, the quality, or disposition, which bodies acquire by such operation.

The term *exaltation*, is peculiarly affected by the chymists and alchymists, who imagining it to have some extraordinary emphasis, are employing it at every turn.—Most sulphurous matters, much *exalted*, are observed to be of a red colour.

It is this *exaltation* of the sulphurous part in straw berries, that gives them their agreeable, vinous taste. *Lemery*.—A gentle and temperate heat of the body, *exalts* and disengages the more volatile parts of our food, and disposes them for nutrition.

EXALTATION, in astrology, is a dignity which a planet acquires in certain signs, or parts of the zodiac; which dignity is supposed to give it an extraordinary virtue, efficacy, and influence.—The opposite sign, or part of the zodiac, is called the *dejection* of the planet.

Thus, the fifteenth degree of *Cancer*, is the *exaltation* of *Jupiter*, according to *Albumazar*, by reason it was the ascendant of that planet at the time of the creation: that of the sun is in the 19th degree of *Aries*; and its *dejection* in *Libra*: that of the moon, is in *Taurus*, &c.—*Ptolemy* gives the reason hereof in his first book *de Quadrup.*

EXAMEN, or **EXAMINATION**, an exact, and careful search, or inquiry; in order to discover the truth, or falsehood, of a thing.

The way of authority is, without comparison, more easy, and better proportioned to the reach and capacity of simple man, than the way of discussion and *examen*. *Nicole*.

Such a person had his house robbed; and has made a severe *examination* of all his domestics, to find out the criminal. A student stands a rigorous *examination* to be admitted to a degree of matter, bachelor, doctor, &c.

Self-EXAMINATION, is a point much insisted on by divines, and particularly the ancient fathers, by way of preparation to repentance. *S. Ignatius* reduces it to five points, viz. 1°. A returning of thanks to God for his benefits. 2°. A begging of grace and light to know and distinguish our sins. 3°. A running over all our actions, occupations, thoughts and words, in order to learn what has been offensive to God. 4°. A begging of pardon, and conceiving a sincere sorrow for having displeased him. And, 5°. Making a firm resolution not to offend him any more, and taking the necessary precautions to preserve our selves from it.

EXAMILLION, &c. See the article **HEXAMILLION**, &c.

EXAMINERS, in chancery, are two officers, whose business is to examine, on oath, the witnesses produced on both sides; upon such interrogatories, as the parties to the suit do exhibit for the purpose.

EXAMPLE, in rhetoric, denotes an imperfect kind of induction, or augmentation; whereby it is proved that a thing which has happened on some other occasion, will happen again on the present one; from the similitude of the cases.

As, "The war of the Thebans, against their neighbours the Phocians, was ruinous; consequently, that of the Athenians against their neighbours, will likewise be fatal."

XANTHEMA *, **ΞΑΝΘΗΜΑ**, in medicine, a preternatural eruption, or efflorescence on the skin.

* The word is formed of the Greek, *ξανθεον*, *ξανθησιον*, *ξανθησιον*, I flower, or work out.

Exanthemata are of two kinds: the one only a discolouring of the skin; such are the measles, the purple spots in malignant fevers, &c.—The other are little eminences, or papillæ standing out from the skin; such are pustules, small-pox, &c.

EXARCH, **EXARCHUS**, in antiquity, an appellation given, by the emperors of the east, to certain officers sent into Italy, in quality of vicars, or rather prefects, to defend that part of Italy which was yet under their obedience, particularly the city of Ravenna, against the Lombards, who had made themselves masters of the greatest part of the rest.

The residence of the *exarch* was at Ravenna; which city, with that of Rome, were all that was left the emperors.

The first *exarch* was the patrician Boetius, famous for his treatise, *de Consolatione Philosophiæ*; appointed in 568 by the younger Justin. The *exarchs* subsisted about 185 years; and ended in Eutychius; under whose *exarchate*, the city of Ravenna was taken by the Lombard king Astolphus, or Astolphus.

Fa. Papebroch, in his *Propylæum ad Acta Sancti Maii*, has a dissertation on the power and office of the *exarch* of Italy, in the election and ordination of the pope.

The emperor Frederic created Heraclius archbishop of Lyons, a descendant of the illustrious house of Montboisier; created him, we say, *exarch* of the whole kingdom of Burgundy: a dignity, till that time, unknown any where but in Italy, particularly in the city of Ravenna. Menestrier. *Hist. de Lyons*.

Homer, Philo, and other ancient authors, give, likewise, the name *exarchus* to the choragus, or master of the singers, in the ancient choruses; or him who sung first: the word *αρχος*, or *αρχουσι*, signifying equally to begin, and to command.

EXARCH of a diocese was, anciently, the same with *Primate*.

This dignity was inferior to the patriarchal, yet greater than the metropolitan.

EXARCH, also denotes an officer still subsisting in the Greek church; being a kind of deputy, or legat *à latere* of the patriarch; whose office it is to visit the provinces allotted him, in order to inform himself of the lives and manners of the clergy; take cognizance of ecclesiastical causes, the manner of celebrating divine service, the administration of the sacraments, particularly confession; the observance of the canons, monastical discipline, affairs of marriages, divorces, &c. But above all, to take account of the several revenues, which the patriarch receives from several churches; and particularly as to what regards the collecting the same.

The *exarch*, after having greatly enriched himself in his post, frequently rises to the patriarchate itself.

EXARCH, is also used, in the eastern-church antiquity, for a general, or superior over several monasteries; the same that we otherwise call *archimandrite*: being exempted, by the patriarch of Constantinople, from the jurisdiction of the bishops, as are now the generals of the Romish monastic orders.

In 493, Sebas was established *exarch*, or chief of all the anchorites within the territory of Jerusalem. Du Bois.

EXARTICULATION, a dislocation of some of the jointed bones; or a breach of articulation. See **LUXATION**, and **DISLOCATION**.

EXCALCEATION, *Discalceation*, or the act of putting off the shoes.

Among the Hebrews, there was a particular law, whereby a widow, whom her husband's brother refused to marry, had a right to summons him into a court of justice; and upon his refusal, might *excalceate* him, i. e. pull off one of his shoes, and spit in his face: which were both actions of great ignominy among that people.

The house of the person who had undergone them, was thenceforward called *the house of the excalceated*.

EXCAMBIATOR. See **ESCAMBIATOR**, and **EXCHANGE**.

EXCAVATION *, the act of hollowing, or digging a cavity; particularly in the ground.

* The word is originally Latin, *excavatio*, formed of *ex* and *cavus*, hollow, or *cavata*, a pit, &c.

The *excavation* of the foundations of a building, by the Italians called *cavafione*, is settled by Palladio at a sixth part of the height of the whole building. Unless there be cellars under ground, in which case he would have it somewhat more. See **FOUNDATION**.

EXCELLENCY, a quality, or title of honour, given to ambassadors, and other persons, who are not qualified for that of highness; as not being princes; and yet are to be elevated above the other inferior dignities.

In England and France, the title is now peculiar to ambassadors; but it is very common in Germany and Italy. Those it was first appropriated to, were the princes of the blood, of the several royal houses; but they quitted it for that of highness, upon several great lords assuming *excellency*.

The ambassadors have only bore it since the year 1593, when Henry IV. of France sent the duke de Nevers, ambassador to the pope; where he was first complimented with *excellency*. After that, the same appellation was given to all the other ambassadors residing at that court: from whence the practice spread through the other courts.

The ambassadors of Venice have only had it since the year 1636, when the emperor and king of Spain consented to allow it them.

The ambassadors of crowned heads, dispute the giving that title to the ambassadors from the princes of Italy; where the practice is not established.

The court of Rome never allow the quality of *excellency* to any ambassador who is a churchman; as judging it a secular title.

The common rules and measures of *excellency* are a little varied with respect to the court of Rome.—The ambassadors of France, at Rome, anciently give the title *excellency* to all the relations of the pope then reigning; to the constable Colonna, to the duke de Bracciano, and the eldest sons of all those lords; as also the dukes Savelli, Cesarini, &c. But they are now more reserved in this respect; though they still treat all the Roman princesses with *excellency*.

The court of Rome in their turn, and the Roman princes, bestow the same title on the chancellor, ministers, and secretaries of state, and presidents of the sovereign courts of France, the presidents of the councils in Spain, the chancellor of Poland, and those on the first dignities of other states, if they be not ecclesiastics.

The word *excellency*, was anciently a title of kings and emperors; accordingly, Anastasius the library-keeper, calls Charlemain, his *excellency*. The same title is still given to the senate of Venice; where, after saluting the doge under the title of *serenissimo*, the senators are addressed to under *your excellencies*. The *Liber Diurnus Pontif. Rom.* gives the title *excellency* to the Exarchs and Patricians.

The Italians and French have improved on simple *excellency*; and made *excellētissime*, and *excellētissimo*, which have been bestowed on certain popes, kings, &c.

EXCELSIS. See **GLORIA** in *excelsis*.

EXCENTRIC, in geometry, is applied where two circles, or spheres, though contained, in some measure, within each other, yet have not the same centre; and consequently are not parallel: in opposition to *concentric*; where they are parallel, have one and the same common centre.

The sun's orbit is *excentric*, with regard to the globe of our earth; Mars is very *excentric*, with regard to the sun, that is, his motion is about a very different centre.

EXCENTRIC, in the new astronomy, or *excentric circle*, is a circle, as P D A E, (*Tab. Astronom. fig. 1.*) described from the centre of the orbit of the planet C, with half the axis CE, as a radius.

EXCENTRIC, or *excentric circle*, in the ancient Ptolemaic astronomy, was the very orbit of the planet it self, which it was supposed to describe about the earth; and which was conceived *excentric* thereto; called also the *deferent*. See **DEFERENT**.

In lieu of *excentric circles* round the earth; the moderns make the planets describe elliptic orbits round the sun; which accounts for all the irregularities of their motions, and their different distances from the earth, &c. more justly and naturally.

Anomaly of the EXCENTRIC, is an arch of the *excentric circle* as AK, intercepted between the aphelion A, and the right line KL, which passing through the centre of the planet K, is drawn perpendicularly to the line of the apsidæ AP.

EXCENTRIC Equation, in the old astronomy, is an angle made by a line drawn from the centre of the earth, with another drawn from the centre of the *excentric*, to the body or place of any planet; the same with the prosthaphæresis; and equal to the difference, (accounted in an arch of the ecliptic) between the sun's, or a planet's, real, and apparent place.

EXCENTRIC Place of a planet, in its orbit, is the place wherein the planet is seen from the sun. See **PLACE**.

EXCENTRIC Place, in the ecliptic, is the point of the ecliptic to which the planet viewed from the sun, is referred. This coincides with the heliocentric place.

EXCENTRICITY, the distance between the centres of two circles, or spheres, which have not the same centre.

EXCENTRICITY, in the old astronomy, is the distance of the centre of the orbit of a planet, from the centre of the earth.

That the five planets have such an *eccentricity*, is allowed on all sides, and may be evinced from several considerations; chiefly this, that Saturn, Jupiter, Mars, Venus, and Mercury, at some times appear larger, and at others less; which can only proceed from hence, that their orbits being *eccentric* to the earth, in some parts thereof they are nearer us, and in others more remote.—But as to the *eccentricities* of the sun and moon, some dispute has been made.

The moderns many of them hold, that the sun and moon appear sometimes larger, and sometimes less; not that they are nearer us at one time than another, but because they are viewed through different columns of air, which producing a difference in the refraction of their light, may occasion those different appearances. Accordingly, we find very sudden alterations of the apparent magnitude of the moon; where nothing but a change in the air can take place.

Thus Kepler, on the 2d of March, in the year 1588, found the moon's apparent diameter 31 minutes, presently after 32', 2", then 30' 3"; and the preceding day it had been 33'. And again, on the 22d of February, 1591, he observed the moon's diameter twice 31', six times 32', seven times 33', and six times 34'.

They add, that when the sun and moon are in the southern signs, and consequently lower, being then seen through a longer column of dense air, they must appear bigger: consequently, in the winter time, when the sun is in capricorn, being seen through a greater quantity of air, he must appear larger than in summer; when, being nearer our zenith, the quantity of air he is seen through is lesser. And the like may be said of the moon.

But others take the *eccentricities* of the sun and moon to be sufficiently proved, both from eclipses; from the moon's greater and less parallax, at the same distance from the zenith; and from the sun's being observed to continue longer in the northern hemisphere, than in the southern, viz. 186 or 187 days in the first, and only 178 or 179 days in the latter.

ECCENTRICITY, in the new astronomy, is the distance of the centre of the orbit of a planet, as C, from the centre of the sun S, i. e. the distance between the centre of the ellipsis and the focus thereof: called also *simple*, or *single eccentricity*.

DOUBLE ECCENTRICITY, is the distance between the two foci in the ellipsis; which is equal to twice the *single eccentricity*.

To find the *eccentricity* of the sun: since the sun's greatest apparent semi-diameter is to his least, as 32' 43" to 31' 38", or as 1953" to 1898"; the sun's greatest distance from the earth will be to his least, as 1063 to 1898. Since then, $PS + SA = PA = 3861$; (*Tab. Astron. fig. 1.*) the radius of the *eccentric* CP, will be found 1930; and consequently $SC = PC - PS = 32$. Wherefore, CP being 10000, CS will be found = 1658.

Hence, as the earth's *eccentricity* SC, is scarce the sixteenth part of the radius of the *eccentric* CP; the earth's elliptic orbit does not deviate much from a circular one. So that it is no wonder a calculus, made on the foot of an *eccentric* circle, should answer near enough to observation. And since the *eccentricity*, determined from the difference of the apparent diameters, (in observing which, an error of some minutes cannot easily be avoided) does not seem exact enough; nothing hinders but that the *eccentricity*, and the place of the apogee, may be determined on the hypothesis of the *eccentric* circle.

EXCEPTION, something reserved, or set aside, and not included in a rule.

It is become proverbial, that there is no rule without an *exception*; intimating, that it is impossible to comprehend all the particular cases under one and the same maxim. But it is dangerous following the *exception*, preferably to the rule.

EXCEPTION, in law, is a stop, or stay to an action.

The term is used indifferently both in the civil, and common law; and in each, *exceptions* are divided into *dilatory* and *peremptory*.

Exception, in a general sense, includes all the kinds of defence, or vindication, which a person, against whom a process is brought, makes use of to prevent, or retard its effect.

The civilians reckon three kinds of *exception*; viz. *declinatory*, whereby the authority of the judge, or court, is disallowed; *dilatory*, intended to defer, or prevent the thing from coming to an issue; and *peremptory*, which are proper and pertinent allegations, founded on some prescription that stands for the defendant; as want of age, or other quality in the party; or other matter, that may be decided without entering into a full discussion of the merits of the cause.

EXCEPTIVE CONJUNCTIONS. See the article CONJUNCTION.

EXCEPTIVE PROPOSITIONS, are those wherein something is affirmed of a whole subject, abating some one of the parts thereof, which is *excepted* by a particle, thence called an *exceptive* particle, or particle of *exception*.

Thus, "all the sects of the ancient philosophers, *except* the

"Platonists, held God to be corporeal: covetousness is inexcusable in respect of every thing, but time."

EXCESS, is distinguished into *natural* and *moral*: the *first*, is a part whereby one quantity is greater than another.—Thus, we say, this line is longer than that; but the *excess* is inconsiderable.

The *latter*, is an intemperance, or going beyond the just bounds and measures prescribed for any thing.—Thus, we say, *excess* in wine, women, &c. is prejudicial to the health.

EXCHANGE, *Permutation*; an agreement, whereby one thing is trucked, or given for another.

The first commerce carried on among men, was by *exchange*; people furnishing each other mutually with what things they wanted: but such *exchanges* were clogged with two considerable difficulties. 1^o. On account of the unequal values of commodities: and, 2^o. In that every body had not just what might accommodate him he would *exchange* withal.

To remove these inconveniencies, money was invented for a common medium; and instead of *exchanging*, buying and selling was introduced.

Yet there are nations among whom the primitive way of *exchange* still obtains: and even among the most civilized people, there are frequent occasions, whereon they have recourse to this method.—Such, for instance, is the trade of several cities of the north, and Baltic sea, where the French *exchange* their wines and brandies for woods, metals, hemp, and furs.

The commerce of bills of *exchange* is, it self, a mere trading by *exchange*; a truck of money for money; of money, for instance, which I have here at London, for what a merchant, or banker, has at Venice, Rome, Amsterdam, or Constantinople. In this sense,

EXCHANGE properly denotes the business, or trade of money, as carried on between one place and another, by means of bills of *exchange*, i. e. by giving money in one city, and receiving a bill to entitle the giver to receive the value in another city. See **BILL** of *Exchange*.

There is also another species called *dry exchange*, *cambium fictum*, or *usurer's exchange*, which consists in giving money at one place to be repaid it, after a certain time, in the same place, with a certain sum over, which is usually more than common interest.

The ceremony of a real *exchange* is observed in this fictitious kind, which is only a method of borrowing money.—The borrower draws a bill of *exchange* on any imaginary person, perhaps at Amsterdam, at the price the *exchange* then goes at, and delivers it to the lender. After the time affixed comes a protest from Amsterdam for non-payment, with the *re-exchange* of the money from thence to London; all which with costs, besides a deduction perhaps at the making of the bargain, must the borrower pay.

EXCHANGE, is also used for the profit, which a merchant, negotiant, or broker, makes of a sum of money received, and for which a bill of *exchange* is drawn payable in some other place, and by some other person; for the interest of his money, or the salary and reward of his negotiation.

This profit is exceedingly various; being sometimes 2, sometimes 3, 4, or even 10 and 15 per cent. according as the alloy of the species differs, or as money is more or less plentiful, or hills of *exchange* more or less scarce in the places.—This kind is ordinarily called *real exchange*, and sometimes *mercantile* and *mix'd exchange*.

The price of *exchange* is regulated according to the course of the place where the bill is drawn, or that of the place where the remittance is to be made: some pretend that it is the city of Lyons gives the law, or rule, for the price of *exchange* to most of the other cities of Europe.

The word *exchange*, according to some, is derived from that perpetual alteration observed in the price of this *exchange*, which is sometimes higher, and sometimes lower; there being sometimes somewhat to get, and sometimes to lose thereby; and sometimes nothing to be either got or lost: as is the case when the *exchange* is at par.

From this diversity in the price of *exchange*, arises that common proverb, *The exchange, and the wind are often varying*.—But the more natural way of deriving the word *exchange*, is from this, that a man here *exchanges* his money for a bill; or that he changes present money for absent money; or changes his debtor.

Exchange is not to be looked on as a loan; from which it differs, in that in the one, the risk, or danger, lies on the person who borrows; and in the other, on him who lends. It likewise differs from interest, in that *exchange* is not paid in proportion to the time, which interest is. See **INTEREST**.

EXCHANGE, is also used in diverse places for the profit allowed for exchanging one sort, or species, of money for another.

This is particularly called *small exchange*, *natural exchange*, *pure exchange*, &c.

EXCHANGE, is sometimes also used for the agio, or profit allowed for the monies advanced in any one's behalf. See **AGIO**.

EXCHANGE also denotes a public place, in most considerable cities, wherein the merchants, negotiants, agents, bankers, brokers, interpreters, and other persons concerned in commerce, meet, on certain days, and at certain times thereof; to confer, and treat together of matters relating to *exchanges*, remittances, payments, adventures, assurances, freightments, and other mercantile negotiations both by land and sea.

In Flanders, Holland, and several cities of France, these places are called *burses*; at Paris and Lyons, *places de change*; and in the hanse towns, *colleges of merchants*.

These assemblies are held with so much exactness, and merchants and negotiants are so indispensably required to attend at them; that a person's absence alone, makes him be suspected of a failure or bankruptcy.

The most considerable *exchanges* in Europe, are that of Amsterdam; and that of London, called the *Royal Exchange*. See **ROYAL EXCHANGE**.

That of Antwerp was little inferior to either of them; till the port of that city was rendered impracticable by the Hollanders, to bring the commerce thereof to themselves.

Even in the time of the ancient Romans *, there were places for the merchants to meet, in most of the considerable cities of the empire. That said by some to have been built at Rome, in the year of the city 259, 493 years before our Saviour, under the consulate of Appius Claudius, and Publius Servidius, was called *collegium mercatorum*; whereof 'tis pretended there are still some remains, called by the modern Romans *loggia*, the lodge; and now, usually, the *place of St. George*.

* This notion of a Roman *exchange* is supposed to be founded on the authority of Livy; whose words are as follow, *viz. Certamen consulibus incidit uter dedicaret Mercurii ædem. Senatam se rem ad populum rejecit: utri eorum dedicatio iussa populi data esset, eum præesse annonæ, mercatorum collegium instituire iussit.* Liv. lib. 2.—But it must be here remarked, that *collegium* never signified a building for a society in the purer ages of the Latin tongue: so that *collegium mercatorum instituire* must not be rendered to build an *exchange* for the merchants, but to incorporate the merchants into a company. As Mercury was the god of traffick, this *ædes Mercurii* seems to have been chiefly designed for the devotions of this company or corporation.

EXCHANGES, in law, denotes the compensation which the warrantor must make the warrantee, value for value, if the land warranted be recovered from the warrantee. See **BRADEN**. I. II. See **WARRANTY**.

The king's **EXCHANGE**, is the place appointed by the king for *exchange* of plate, or bullion for the king's coin. See **BULLION**. These places have formerly been diverse; but now there is only one, *viz.* that of the tower of London, joined with the mint.

Bill of EXCHANGE, is a writing given by a merchant, or other negotiant, to procure a sum of money to be paid the bearer thereof, in some distant place; in consideration of a like sum paid the writer, by the person in whose behalf the bill is drawn. See **BILL of exchange**.

What we call *re-exchanges*, is the due, or premium of a second *exchange*, when a bill is protested. See **RE-EXCHANGE**.

EXCHANGE-BROKERS, are persons who make it their business to know the alteration of the course of *exchange*, to inform merchants how it goes, and to notify to those who have money to receive or pay beyond sea, who are proper persons for the *exchanging* and doing thereof.

When the matter is accomplished, that is, the money paid, they are to have for brokerage 2 shillings per 100 pound sterling. Though of late, the humour of gaining, and dealing in stocks, hath so prodigiously increased the number of persons who act as brokers, that their business, and their pay is very uncertain.

EXCHANGERS, are those who return money beyond sea, by bills of *exchange*, &c. called anciently also *excambiators*, and since *remitters*.

EXCHEQUER *, or simply **CHEQUER**, originally denotes a chess-board; or a frame divided into 64 squares, of two colours, whereon to play at draughts, chess, &c. See **CHESS**, &c.

* The word is formed from the French *eschiquier*, which signifies the same. Hence, trees are said to be planted *chequer-wise*, in *quinquangens*, when disposed so as to form diverse squares representing a *chequer*.

EXCHEQUER, is more particularly used for a chamber, or apartment in Westminster-hall, consisting of two parts; the *court of exchequer*, and the *lower exchequer*.

Court of EXCHEQUER, is a court wherein are tried all causes relating to the king's treasury, or revenue; as, touching accounts, disbursements, customs, fines, &c.

It consists of seven judges, *viz.* the lord treasurer, the chancellor of the *exchequer*, the lord chief baron, and three other barons of the *exchequer*, with one curitor baron.

The lord chief baron is the principal judge of the court. See **BARONS of the exchequer**.

The court of *exchequer* is divided into two: the *one of law*, the other of *equity*.

All judicial proceedings according to law, are filed, *coram baronibus* only: but the court of equity held in the *exchequer*

chamber, is *coram thesaurario, cancellario, & baronibus*; before the treasurer, chancellor, and barons.

For a long time after the conquest, there sat in the *exchequer*, both spiritual and temporal barons of the realm: but of later times, there have sat in their places other judges, who, though no peers of the realm, yet retain the original denomination.

The common opinion of our historians is, that this court was erected by William the conqueror, soon after his having obtained the kingdom: and that it took its form from the *eschiquier*, or *scaccarium*, established in Normandy long before that time. In effect, the two *exchequers* have this in common, that the *Norman* was the supreme court of that dutchy, or a general assize whereat all the great lords attended, to judge finally of all concerns of the greatest importance; and was ambulatory: and that the *English exchequer* was a court of the highest jurisdiction; that the acts thereof were not to be examined by any of the ordinary courts; that it was the repository of the records of all the other courts; and that it was to be held in the king's court, and before him; and that it was concerned in the prerogative, as well as the revenue of the crown.

The immediate profits of the crown, as of franchises, lands, tenements, hereditaments, debts, duties, accounts, goods, chattels, all disbursements, seizures, and fines imposed on the subjects, &c. are all within the jurisdiction of the *exchequer*. And the king's attorney may exhibit bills, for any matter concerning the king in inheritance, or profits; so also may any person who finds himself aggrieved in any cause prosecuted against him on behalf of the king, or any patent by grant of the king, exhibit his bill against the king's attorney, &c. to be relieved by equity in this court.

To this court belong two officers, the king's remembrancer's office, and that of the lord treasurer's remembrancer. See **REMEMBRANCER**.

Authors are divided about the origin of the denomination of this court, *exchequer*. Du Cange is of opinion, it came from a *chequer*-wrought carpet, covering the great table in that court; or from the pavement of the court, which was *chequer-wise*: others, from the accountants in this office using *chequers*, or chess-boards, in their computations: Nicod, from the court's being composed of persons of different qualities, as the pieces or partitions in a chess-board: others, by reason people pleaded here, ranged, as it were, in battle array, as they do at chess. Menage, after Pithou, &c. derives the word from the German, *schicken*, to send; by reason this court succeeded those commissi-ficers called in ancient titles, *missi dominici*. Skinner, &c. derives it from *schatz*, which signifies, treasure: whence Polydore Virgil also writes it, *scattarium*, instead of *scaccarium*. Lastly, Somner derives it from *schaken*, to ravish; which, according to him, is the character of the treasury.

The **lower EXCHEQUER**, called also the *receipt of the exchequer*, is the place wherein the king's revenue is received and disbursed.

The principal officers hereof are, the lord treasurer, a secretary of the treasury, a chancellor of the *exchequer*, two chamberlains of the *exchequer*, an auditor of the receipts of the *exchequer*, four tellers, a clerk of the pells, an usher of the receipt, a tally cutter, &c. See farther under the articles **TREASURER**, **CHANCELLOR of the exchequer**, **SECRETARY**, **CHAMBERLAIN**, **UNDERCHAMBERLAIN**, **TELLER**, **PELLS**, **TALLY**, &c.

Messengers of the EXCHEQUER, See **MESSENGER**. **Black book of the EXCHEQUER**, is a book under the keeping of the two chamberlains of the *exchequer*; said to have been composed in 1175, by Gervais of Tilbury, nephew of king Henry II. and divided into several chapters.

Herein is contained a description of the court of England, as it then stood, its officers, their ranks, privileges, wages, perquisites, power, and jurisdiction; and the revenues of the crown, both in money, grain, and cattle.

Here we find, that for one shilling, as much bread might be bought, as would serve a hundred men a whole day; that the price of a fat bullock was only twelve shillings; and a sheep, four, &c. Larrey, P. I. p. 394. See also **DOMESDAY**.

EXCISE, a duty, or imposition, charged on beer, ale, cyder, and other liquors made for sale, within the kingdom of England, Wales, and town of Berwick upon Tweed.

The duty of *excise*, was first granted to king Charles II. by act of parliament, in the year 1660; during the life of that prince: it has been since continued and augmented by diverse parliaments, under the several succeeding princes, and extended to Scotland.—This duty, as it now stands, on strong beer and ale, is at the rate of 4s. and 9d. per barrel; and upon small beer 1s. 6d.

Now, brewers being allowed for leakage of beer, 3 barrels in 23; and of ale, 2 in 22; the neat *excise* of a barrel of strong beer amounts to 4s. 1d. and $\frac{1}{2}$; of a barrel of ale, 4s. 3d. 3q; and of a barrel of small beer, 1s. 1d. 1q. $\frac{1}{2}$.

The *excise* is one of the most considerable branches of the king's revenue.—It was formerly farmed out: but is now managed for the king by seven commissioners, who sit in the *general excise-office*, receive the whole product of the *excise* of beer,

beer, ale, and other liquors, and malt, collected all over England, and pay it into the exchequer. See *EXCHEQUER*.

Their salary is 800 l. per annum each, and they are obliged by oath, to take no fee, or reward, but from the king only. From the commissioners of *excise* there lies an appeal to five others, called *commissioners of appeals*.

The number of officers employed in this branch of the revenue, is very great. Beside the commissioners abovementioned, and their subordinate officers, as registers, messengers, &c. there is an auditor of the *excise*, with his clerks, &c. A comptroller with his clerks; a register; secretary; solicitor; cashier; teller; clerk of securities; housekeeper; doorkeeper; an accountant for the imprest money; general gauger; general accountants, with their assistants; messengers; a clerk for stationary wares; examiners; clerks for supervisors diaries; accountants, examiners, &c. for the London distillery, vinegar, cyder, &c. also examiners for malt; general and other surveyors of the London brewery: with assistants, and other officers, to the number of an hundred: general and other surveyors of the London distillery, with other officers, to the number of forty; a collector, and surveyor, of imported liquors; with a land surveyor at the customhouse, &c.

The yearly salaries of all the officers in the *excise* office, as computed by Mr. Chamberlayne amount to 23650 l.

Beside which, there are in the country fifty collectors; and one hundred and fifty supervisors; with a great number of inferior officers, called *gaugers*, or *excisemen*; which may make the number of persons employed in this revenue about 2000.

The *excise* on beer, ale, and other exciseable liquors, even during a time of war, is computed to amount to 1100000 l. per annum, and is collected from above 300000 people.

The duty on malt, with the additional duty on cyder, &c. amount to betwixt six and seven hundred thousand pound per annum; and are collected from more hands than the former. And yet the whole charge of the managing all these duties, does not amount to twenty pence per pound; which, considering every thing, is esteemed an exactness and frugality, not to be paralleled in any revenue levied in this or any other country.

The rates, with the neat produce of the several impositions of *excise*, are as follow:

1 ^o . A duty of 2s. 6 d. per barrel, whereof 15 d. per barrel during his majesty's life; and the other 15 d. hereditary; appropriated to the civil government, after a deduction of 3700 l. per week for annuities.	L. 269837
Neat produce,	
2 ^o . A duty of 9 d. per barrel, granted 4 Will. and M. for 99 years, commencing Jan. 1692, charged with 124866 l. per ann. for annuities, and 7567 l. per ann. on survivorship. Neat produce,	150106
3 ^o . Another 9 d. per barrel perpetual, 5 W. and M. for payment of 100000 l. per ann. to the bank, as also several annuities on lives. Neat produce,	150094
4 ^o . Another 9 d. per barrel, for 16 years, continued 4 Ann. from May 1713, for 95 years, for paying 140000 l. per ann. on million lottery tickets; with annuities of 99 years, &c. Neat produce 159898; —which, with some additional duties granted in a later act may amount to	184898
5 ^o . A duty on low wines, and spirits of the first extraction, continued to the 24th of June 1710. Neat produce,	25267
6 ^o . The <i>excise</i> on ale and beer in Scotland, is farmed at	33500
Total L. 1006102	

EXCLAMATION, in rhetoric, a figure, wherein, by raising the voice, and using an interjection either expressly or understood, we testify an uncommon warmth, and passion of mind; and express the magnitude of the thing, and the importance of the occasion.

Such is, O heavens! O earth! &c. such also is that of Cicero against Catiline, O times! O manners! this, the senate knows, the consul sees: and yet he lives. Lives paid I? nay, and comes into the senate! Or that for Cælius, *pro dii immortales! cur interdum in hominum sceleribus maximis aut comvictis, aut presentis fraudis poenas in diem referatis!* —*Oh præclarum custodem ovium, ut aiant, lupum!*

In English, the interjections O! or oh! alas! or good God! are generally adjoined in an *exclamation*. In Latin they use O! heu! eheu! ah! vab! pro superi! pro superum atque hominum fidem! sometimes, however, the interjection is understood, as, wo is me! *miserum me!* *boccine læculum!*

EXCLUSION, that whereby a thing is excluded, i. e. shut out, or set aside.—A crown imports an *exclusion* from the papacy: he appointed a stranger his heir, in *exclusion* of his own relations.

Great efforts were made towards the close of the reign of K. Charles II. to procure a *bill of exclusion*, for setting aside the duke of York, the king's brother, on account of his being a papist.

EXCLUSIONS, in mathematics. The *method of Exclusions*, is a way of coming at the solution of problems (in numerical cases) by previously excluding, or excluding out of consideration, such numbers, as are of no use in solving the question; whereby, of consequence, the process may be regularly, and judiciously abbreviated.

EXCLUSIVE, is sometimes used adjectively, for the force, or power of *excluding*: as, a patent carries with it an *exclusive* privilege; sovereign princes have *exclusive* voices in the election of popes.

Sometimes it is also used adverbially: as, marriage is allowed at all times, the first day of lent *exclusive*; i. e. Ash-Wednesday is not comprised in the permission.—He sent him all the Gazettes, from N^o. 195, to N^o. 300, *exclusive*; i. e. all between those two numbers, which themselves were excepted.

EXCLUSIVE Propositions, are those wherein the predicate agrees with its subject, as to agree with no other. See *PROPOSITION*.—*E. gr.* Virtue alone makes nobility: nothing else renders a man truly noble.

EXCOMMUNICATION, an anathema, or ecclesiastical censure, and punishment; whereby a heretic is cut off from the society of the faithful; or an obstinate sinner from the communion of the church, and the participation of the sacraments.

The power of *excommunication* properly belongs to the bishop; but he may delegate it to any grave priest, with the chancellor.

Every *excommunication* should be preceded by three public admonitions, two days, at least, distant from each other: but this is to be understood of *excommunications* imposed by the ecclesiastical judge; for those imported by the law, are incurred to all intents and purposes the moment the action is committed.

These latter are called *excommunications by the canon*, or *late sententia*: and are so very numerous, that it would be difficult, even for the best canonists, to give an exact list of them: there are 50 in the clementines; 20 in the bull *cæna domini*, &c.

Rebuffe on the concordat, reckons up 60 penalties accruing upon *excommunication*.

Excommunication is founded on a natural right which all societies have, of excluding out of their body, such as violate the laws thereof.

Excommunication is either *major* or *minor*, i. e. *greater* or *less*: the first, which is that understood when we say, simply, *excommunication*, separates, or cuts off the delinquent from all communion and fellowship with other Christians; disables him from defending his rights, bringing an action at law, &c.—The second, or lesser, only excludes from the communion of the Lord's Supper.

The greater *excommunication*, called also *ab homine*, is when a prelate, or his deputy, *excommunicates* any man personally, and interdicts him all society with the faithful, all use of sacraments, &c.

The lesser *excommunication* is incurred *pleno jure*, by having any communication with a person *excommunicated* in the greater *excommunication*.—And this too imports a deprivation of communion, but not an interdiction from entering the church, nor having commerce with the faithful.

Anciently, the *excommunicated* were obliged to procure absolution from their bishop, and make satisfaction to the church in forty days time; otherwise they were compelled to it by the secular judge, by a seizure of their effects, imprisonment of their persons, &c. In France they were allowed a whole year.

By an edict of S. Louis, in the year 1228, vassals, tenants, &c. were dispensed, or freed from the oath of fidelity, homage, &c. they had taken to their lords, or superiors, when *excommunicated*, till they had made their submission.

In Spain, to this day, a person who is not absolved from his *excommunication* in a year's time is deemed a heretic.

There was a time, when the people were fully convinced, that the bodies of *excommunicated* persons, unless they were first absolved, could not rot, but remained entire for several ages, a horrible spectacle to posterity; as is attested by Matthew Paris, and other writers. And the Greeks are still of the opinion; and affirm, they have infinite proofs thereof; as is shewn by Du Cange, from the testimony of a vast number of authors.

By the laws, an *excommunicated* person was not to be buried, but the body flung into a pit, or covered with a heap of stones; which was called *imblocare corpus*. See *FUNERAL*, &c.

In the ancient church, there were diverse degrees of *excommunication*: in effect, *excommunication* did not always import an interdiction of the sacraments; but frequently, a separation, or kind of schism between the several churches; or a suspension of spiritual communication between the bishops.

But, afterwards, the occasions of *excommunications* growing more frequent, they began to use it with less circumspection and reservedness.

In the IXth century, the ecclesiastics were continually making use of this spiritual weapon, to repel any violences, or affronts, offered them; and time and familiarity rendering offenders more and more obdurate, they proceeded, by degrees, to rigorous unknown to antiquity; as the *excommunicating* of whole families, or provinces; prohibiting the exercise of all religion therein; and even accompanying the *excommunications* with horrible ceremonies, and direful imprecations.

In the Xth and XIth centuries, the severity against the *excommunicated* was carried to its highest pitch: no body might come near them, not even their own wives, children, or servants: they forfeited all their natural and legal rights and privileges; and were excluded from all kind of offices. Thus was an *excommunicated* king reduced to the condition of a private man. By thus stretching the power of the church to extravagance, they rendered it contemptible. Gregory VII. tempered it a little; exempting the wives and children of *excommunicated* persons, from incurring *excommunication*, by holding conversation with their husbands and parents.

To render the *excommunicated* still more odious, the priest was obliged to stop, and break off divine service, if an *excommunicated* person entered the church. Nothing of which aversion is any where discovered in the practice of the primitive church. At present we have but little of the terror or respect of our fore-fathers, for *excommunication*; and it is even judged, and proclaimed an abuse, whenever impertinently employed.

Thus, the official of Tholouse having *excommunicated* the officers of the Seuechauffé of Tholouse, on occasion of their refusing to deliver up a prisoner; the official was condemned to take off, and revoke the *excommunication*. It is judged an abuse to fulminate an *excommunication* against a king, or kingdom, or the officers thereof, for any thing relating to the discharge of their offices.

The form of *excommunication* in the Romish church, as related by Fevret, is to take lighted torches, throw them on the ground with curses and anathemas, and trample them out under foot to the ringing of the bells.

— *Auctoritate dei patris omnipotentis & filii, & spiritus sancti, & beate dei-genericis Mariæ, omniumque sanctorum, excommunicamus, anathematizamus, & a limitibus sanctæ matris ecclesie sequestramus illos malefactores, N. consentaneos, quoque & participes & nisi respuerint, & ad satisfactionem venerint sic ex-tinguetur lucerna eorum ante viventem in secula seculorum. Fiat: Amen: Amen: Amen: Ex Emendat. Leg. Will. Conquest.*
We have now none of this folly; the sentence is gravely read, and the person remains *excommunicated* without farther ceremony.

Petrus Blesensis assures us, that in England it was anciently the practice, only to *excommunicate* such as had killed an ecclesiastic; whereas they were put to death who had killed a lay-man.— But the reason was, they held *excommunication* a greater punishment than death.

We have instances of bishops, who have pronounced formal *excommunications* against caterpillars, and other insects, after a formal, juridical process against them, wherein those animals were allowed an advocate and proctor, to defend their cause. See EXORCISM.

Fevret relates diverse instances of such *excommunications*, against rats, mice and other animals, for infecting a country. See the form of these *excommunications* in that author, *Traite de l'Albus*.

In the ancient church there were two different kinds of *excommunications* in use: the one called *medicinal*, whereby persons convicted of a crime by their own confession, were removed from communion: the other called *mortal*, was fulminated against rebels, who persisted obstinately in their errors and impieties.

The power of *excommunicating* was lodged in the whole church in general: that is, the bishops and priests had the administration thereof, by and with the consent of the people; which was practised even in St. Cyprian's time. But afterwards they ceased to consult the people about the matter: the bishop and clergy arrogated the whole power to themselves. Recourse, however, might still be had to a synod of the province, to judge of the validity of an *excommunication*.

It frequently happened, that churches *excommunicated* each other, that is, broke off all communion with each other. In which case, Du Pin observes, it might be dubious, which of the two parties was *excommunicated* and cut off from the body of the church.

EXCOMMUNICATION was also practised among the Jews, who used to expel from their synagogue, such as had committed any grievous crime. See the gospel according to St. John, ix. 22. xii. 42. xvi. 2. And Joseph. Antiq. Jud. l. IX. c. 22. and l. XVI. c. 2.

The Esseni, when *excommunicated*, durst not so much as receive food at any person's hand, for fear of violating their oath, but contented themselves to live on herbs; inasmuch that they frequently perished, and died for want. See Joseph. de Bell. l. II. c. 12.

Godwyn, in his Moses and Aaron, distinguishes three degrees, or kinds of *excommunication* among the Jews. The first, he

finds intimated in St. John, ix. 22. The second in St. Paul, epist. 1 Cor. v. 5. And the third, in the 1st ep. to Corinth. xvi. 52.

The rule of the Benedicins, gives the name EXCOMMUNICATIO, to the being excluded from the oratory, and the common table of the house, call'd in our inns of court called *dishommoting*. This was the punishment of such monks as came too late.

EXCOMMUNICATIO, or a being secluded, or cut off from a participation in the mysteries of religion, was also in use under paganism.

Such as were thus *excommunicated*, were forbid to assist or attend at the sacrifices, or to enter within the temples; and were afterwards delivered over to the demons and furies of hell, with certain imprecations; which was called among the Romans, *divis devovere*.

The Druids among the ancient Britons and Gauls, likewise, made use of *excommunication* against rebels; and interdicted the communion of their mysteries, to such as refused to acquiesce in their decisions. See DRUIDS.

EXCOMMUNICATO *Capiendo*, a writ directed to the sheriff, for the apprehension of one who stands obstinately *excommunicated* the space of forty days.

Such an one not seeking absolution, hath, or may have, his contempt certified into the chancery; whence this writ issues for laying him up, without bail, or main-prize, until he conform himself.

EXCOMMUNICATO *Deliberando*, is a writ directed to the under-sheriff, for the delivery of an *excommunicated* person out of prison; upon certificate of the ordinary, of his conformity to the ecclesiastical jurisdiction.

EXCOMMUNICATO *Recipiendo*, is a writ whereby persons *excommunicated*, being for their obstinacy committed to prison, and unlawfully delivered thence before they have given security to obey the authority of the church, are commanded to be fought for, and laid up again.

EXCORIATION *, the act of rasing, or tearing off the skin from any part of the body. See SKIN.

* The word is Latin, *excortatio*, formed of *ex*, of, and *corium*, skin, leather, &c.

He had a grievous *excortiation* behind, with riding post:—We also say, an *excortiation* in the throat, &c. when the membrane that covers, or lines it, is torn by the acrimony of a humour, a medicine, or the like; which is ordinarily the case in what we call a *sores throat*.

EXCORTICATION, the act of stripping off the cortex, or bark, from any thing; called also *decortication*. See BARK, and DECORTICATION.

EXCREMENT, that which is evacuated, or *excreted*, out of the body of an animal, after digestion; being what in other respects is superfluous and prejudicial thereto. See EXCRETION. *Excrement*, is all that matter taken in by way of food, which cannot be assimilated; and which, of consequence, not growing or adhering to the body, wanders about through the laxer, and more patent parts thereof, till it be ejected.

The urine and feces or faecal matter, are the *great excrements*, expelled from the bladder and the intestines, by stool, &c.

The matter of insensible perspiration is also an *excrement*, and a more considerable one than either of the others.

Among *excrements* are likewise ordinarily ranked, diverse humours and matters, separated from the blood by the several strainers, or emunctories of the body, though far from being useless, but serving diverse valuable purposes of the economy. Such are the cerumen, or ear-wax; the mucus of the nose; lacrymæ, or tears; saliva, bile, lymphæ, menfes, lochia, &c. See each of these under its several head, CERUMEN, MUCUS, TEARS, SALIVA, BILE, MENSES, &c. Some hold ambergrease an *excrement* of the whale; others an *excrement* of the sea.

All foods consist of two sorts of parts, the one nutritious, the other *excrementitious*.

EXCREMENT, is also attributed, by way of analogy, to plants. — Thus gums, diverse juices, balsms, &c. issuing spontaneously from their respective trees, are sometimes called *excrements*.

EXCRESCENCE *, in chirurgery, denotes superfluous, or luxuriant flesh, or other matter, growing on certain parts of the bodies of animals, contrary to, or beyond the ordinary structure, and disposition of nature.

* The word is formed of the Latin, *ex*, and *creſco*, I grow; *q. d.* something that grows from, or out of another.

Such are wens, warts, fucus's, polypus's, &c.—Such also are the woman's horn lately shewn in London; a parallel case to which, see in the *Philosoph. Transact.* N^o. 297. Natural, or customary *excreſcences*, as those of bones, &c. are called by physicians *apophyses*.

EXCRETION *, in medicine, the act of expelling or ejecting out of the body, some humour that is useless, or even hurtful thereto.

* The word is formed of the Latin, *excernere*, to excern, separate.

Most crises are effected by *excrescens*; as fluxes of blood and urine, sweat, vomitings, loosenesses, &c.

EXCRETORY, in anatomy, is applied to certain little ducts, or vessels, in the fabric of the glands.

Excretory ducts are the tubes through which the humours separated in the several glands, are emitted, or discharged out of the gland, into some convenient receptacle, or emunctory. A capillary artery, to which a capillary vein is joined; with an excretory duct, convolved, or wound together, make up the body of the glands, the organs of secretion. The excretory ducts spring from the extremities of the arteries and veins, and carry off a liquor separated from the blood. Drake.—The lymphatic glands, have either lymphaducts for their excretory ducts, or lacteal vessels, as in the mesentery. Id.—The muscles of these two bones being contracted, they compress the bag, and squeeze out the liquor through two excretory ducts, terminating in the two gums of the great teeth of the viper. Lemery.

EXCURSION, in astronomy. See the article **ELONGATION**.

Circles of Excursion, are circles parallel to the ecliptic, at such distance from it, as is capable of bounding, or comprehending the greatest digressions, or *excursions*, of the planets from the same; which is commonly fixed at 10 degrees.

EXEAT, in church discipline, a Latin term, used for a permission, which a bishop grants a priest to go out of his diocese; or an abbot, to a religious, to go out of his monastery.

The word is also used in several great schools, for leave given a scholar, a student, to go out. His master has given him an *exeat*.

EXECUTED *Fine*. See the article **FINE**.

EXECUTION, the act of *executing*. i. e. of accomplishing, finishing, or achieving any thing, to be done.

We say, the *execution* of a testament; of a law; of a treaty; of a building, or the like.

EXECUTION is particularly used in the French music, for the manner of singing, or of the performance of a song. As to the manner of singing, called in France, *execution*; no nation may, with any probability, dispute it with the French. If the French, by their commerce with the Italians, have gained a bolder composition; the Italians have made their advantage of the French, in learning of them a more polite, moving, and exquisite *execution*. St. Evremont.

EXECUTION, in common law, signifies the last performance of an act; as of a writ, a judgment, or the like.

EXECUTION of a judgment, is the obtaining the possession of any thing recovered by judgment of law.

There are two sorts of *executions*: one *final*; another *with a quousque*, as only tending to an end.

EXECUTION final, is that which maketh money of the defendant's goods, or extendeth his lands, and delivers them to the plaintiff; for this the party accepts in satisfaction: and this is the end of the suit, and all that the king's writ commands to be done.

EXECUTION with a quousque, is that which only tends to an end; as in the case of a *capias ad satisfaciendum*, &c.

This is not final, but the body of the party is to be taken, to the intent and purpose to satisfy the plaintiff; and his imprisonment is not absolute, but till he doth satisfy: so that the body is but a pledge for the debt.

Tenant by EXECUTION. See **TENANT**.

Military EXECUTION, is the pillage, or plundering of a country by the enemies army.

The towns and villages of the province were required to pay contribution, on penalty of military *execution*.

EXECUTIONE facienda, a writ commanding *execution* of a judgment.

EXECUTIONE facienda in withernamium, lies for taking his cattle, who had formerly conveyed out of the county the cattle of another.

EXECUTOR *, a person nominated by a testator, to take care to see his will, and testament, *executed* or performed; and his effects disposed of according to the tenor of the will.

* The testaments made in Latin in the XIVth century, call *executors, procuratores testamentarii*.

An *executor* is either *universal*, as having the charge and disposal of the whole; or, only *particular*, entrusted with some particular branch thereof.

By the French law, an *executor* should be seized of all the moveables of the deceased during one year; at the end whereof he is to account for them. To the validity of a testament, it is not necessary there be an *executor* nominated therein.

EXECUTOR de son tort, or of his own wrong, is he who takes on him the office of an *executor* by intrusion, not being constituted thereto by the testator, or deceased, nor authorized by the ordinary to administer.

EXECUTORY, that which has, or carries with it a sufficient authority for being *executed*.

A contract is only *executory*, when it is in form, and sealed: the great seal of England is *executory* throughout the whole island.

EXECUTORY Fine. See the article **FINE**.

EXEDENS Herpes. See the article **HERPES**.

EXEDRÆ *, among the ancients, were places wherein the philosophers, sophists, rhetors, &c. used to hold their conferences and disputes.

* The word is pure Greek, *ἔδρα*, which signifies the same.

M. Perrault is of opinion, the *exedrae* were a sort of little academies, where the men of learning met together. See **ACADEMY**.

Budæus rather thinks, that what the ancients called *exedrae*, might answer to what we call *chapters* in the cloisters of monks, or collegiate churches.

EXEGESIS, ΕΞΗΓΗΣΙΣ, a term sometimes used by the learned, to signify *explication*.

Several interpreters of the Bible are of opinion, that in the passages of scripture, where we meet with Abba Pater, two words, the first Syriac, and the second Greek or Latin, but both signifying the same thing; the second is only an *exegetis*, or explanation of the first.

EXEGESIS is also used for an entire discourse by way of *explication*, or comment, on any thing.

EXEGESIS Numerosa, or Linealis, signifies the numeral, or lineal solution, or extraction of roots, out of adjected equations; first invented by Vieta.—Ozanam calls it *la rhetique*. See **EXTRACTION of Roots**.

EXEGETES *, among the Athenians, persons learned in the laws, whom the judges us'd to consult in capital causes.

* The word is Greek, *Ἐξεγῆτις*, formed of *ἐξηγεῖσθαι*, *to explain*.

EXEGETICA, in algebra, the art of finding, either in numbers or lines, the roots of the equation of a problem, according as the problem is either numerical, or geometrical. See **ROOT**, and **EQUATION**.

EXEMPLAR, a model or original, to be imitated, or copied. See **MODEL**.

EXEMPLAR also denotes the idea, or image, conceiv'd, or formed in the mind of the artist, whereby he conducts his work.

Such is the idea of Cæsar, which a painter has in his mind when he goes to make a picture of Cæsar.

The *exemplar* is ordinarily number'd among the causes. See **CAUSE**.

EXEMPLIFICATION of letters patent, denotes an *exemplar*, or copy of letters patent, made from the enrolment thereof; and seal'd with the great seal of England.

Such *exemplifications* are as effectual to be shew'd, or pleaded, as the letters patent themselves.

EXEMPTION, a privilege, or dispensation, whereby a person is excepted out of some general rule.

Exemption is particularly applied to churches, chapels, and monasteries, which have a privilege given them by the popes, or princes, whereby they are exempted from the jurisdiction of the bishop, or ordinary.

The council of Constance revoked all *exemptions*, to restore to the general law, weakened and diminished by a relaxation of several ages, its ancient force and vigour; and make it every where obtain in all its latitude.

The first *exemptions* granted to monks were only for the liberty of electing their abbot, independently on the bishop; and not to screen them from the regular jurisdiction of the bishops. The pretence for these *exemptions* was, that the bishops abused their authority, and exacted extravagant dues on the monasteries in their dependence. But the real cause was, rather, that the monasteries, being fallen from the severity of their rules, did not care for inspectors so near at hand, and therefore solicited *exemptions* at Rome.

As this was to derogate from the common laws, the popes were a good while very reserved in the point; and seldom granted them, but with the consent of the bishops themselves. But, by degrees, the popes began to assume a power of granting such *exemptions* at pleasure; and made their account of the indulgence of the bishops, who were not sufficiently apprehensive of all the consequences. Accordingly, they favoured whole orders with the privilege of *exemption*, as the Cistercians, Dominicans, Carthusians, Jesuits, &c.

Things, at length, were brought to such a pass, that there was a necessity for putting a check to *exemptions*; accordingly, the council of Trent prohibited, and declared them null for the future; confirming only such as were well founded, on legal concessions from the holy see.

EXERCISE, a repetition of any operation, for the strengthening, or retaining of a habit.

Thus, we use *exercise* of the body, for the acquiring, or maintaining of health; as it contributes both to the expulsion of the excrements, and preserving the tone, and spring of the solids.

People who live a sedentary life, and do not use *exercise*, are liable

liable to defluxions, which bring on other disorders.—Games of hazard are to be discouraged, and those of *exercise* to be promoted.

Exercise and quiet make one of the physicians non-naturals. See NON-NATURALS, and GYMNASTICS.

Labour, or *exercise*, Dr. Cheyne observes, is indispensibly necessary to preserve the body any time in due plight. Let what diet will be pursued, however adjusted both in quantity and quality; let whatever evacuations be used to lessen the malady, or any succedaneum be proposed to prevent the ill effects; still, our bodies are so made, and the animal economy now so contrived, that without due labour and exercise, the juices will thicken, the joints will stiffen, the nerves will relax, and on these disorders, chronic diseases, and a crazy old age, must ensue. *Essay on Health*, p. 90.—Of all the *exercises* that are or may be used for health, as walking, riding a horseback, or in a coach, fencing, dancing, bowling, digging, pumping, ringing, &c. walking is the most natural, and would be the most useful, if it did not spend too much of the spirits of the weakly. But riding is certainly the most manly, the most healthy, and is less laborious and expensive of spirits than any. *Id.* p. 94, &c.—Those organs of the body that are most used, always become strongest; so that we may strengthen any weak organ by *exercise*: Thus the legs, thighs, and feet of charmen; the arms and hands of watermen; the backs and shoulders of porters, grow thick, strong, and brawny by time and use. It is certain also, that speaking strong and loud, will strengthen the voice, and give force to the lungs. *Id.* p. 96.—To the asthmatic, therefore, and those of weak lungs, I would recommend talking much and loud; walking up easy ascents, &c. To those of weak nerves, and digestion, riding on horseback: To those troubled with the stone, riding over rough causeways in a coach: To those troubled with rheumatic pains, playing at billiards, cricket, or tennis: To those of weak arms or hams, playing at tennis or football: To those of weak backs, or breasts, ringing a bell, or working at the pump. Walking through rough roads, even to lassitude, will best recover the use of the limbs to the gouty; though riding will best prevent the disease. But the studious, the contemplative, the valetudinary, and those of weak nerves, must make *exercise* a part of their religion.—A condition necessary to render *exercise* as beneficial as may be, is that it be used on an empty stomach.—Under the head of *exercise*, cold bathing, and the flesh-brush, come also to be recommended.—*Id.* *Ibid.* p. 103, 104, &c.

EXERCISES, in the plural, are particularly understood of what is taught young gentlemen in the academies, or riding schools, &c.—As, riding the great horse, dancing, fencing, vaulting, drawing fortifications, &c.—This young nobleman went through all his *exercises* with great applause.

EXERCISE, in the art of war, denotes the ranging a body of soldiers in form of battle, and making them practise the several motions, and military evolutions, with the diverse management of their arms, &c. to make, or keep them expert thereat against occasion.

This is what Vegetius, and other Latin writers call *meditatio*.

EXERGUM *, **EXERGUE**, or **EXERGE**, among medalists, a word, motto, date, or the like, sometimes found under the ground, whereon the figures are represented.

* The word is derived from the Greek, $\epsilon\gamma\gamma\omega$, *opus*, work. Evelyn often writes it *exurge*.

Exergues are most commonly placed on the reverses, though sometimes also on the fronts, or face-sides of medals.

EXFOLIATION *, in chirurgery, the scaling of a bone; or its rising, and separating in leaves, or laminae.

* The word is compounded of the Latin *ex*, and *folium*, leaf.

Any part of the surface of the cranium that has been bared, is liable to *exfoliation*. The use of a cephalic powder avails nothing for promoting the *exfoliation*. Dionis. The wound must not be stopp'd too much, but the bone left at liberty to recover itself, which it sometimes does, without *exfoliating*, particularly in children.

EXFOLIATIVE.—An **EXFOLIATIVE Trepan**, is a trepan proper to scrape, and at the same time pierce, a bone, and so to *exfoliate*, or raise several leaves, or scales, one after another.

The use of the *exfoliative* trepan is very dangerous; as being apt to shake and disorder the brain.

EXHEREDATIO. See DISHERISON, ABDICATION.

EXHALATION; a fume, or steam, *exhaling*, or issuing from a body, and diffusing itself in the atmosphere.

The terms *exhalation* and *vapour*, are ordinarily used indifferently; but the more accurate writers distinguish them: appropriating the term *vapour* to the moist fumes raised from

water, and other liquid bodies; and *exhalation* to the dry ones emitted from solid bodies; as earth, fire, minerals, sulphurs, salts, &c.

In this sense, *exhalations* are dry, subtle corpuscles, or effluvia, loosened from hard terrestrial bodies, either by the heat of the sun, or the agitation of the air, or some other cause; and emitted upwards to a certain height of the atmosphere, where mixing with the vapours, they help to constitute clouds, and return back again in dews, mists, rains, &c.

Nitrous, and sulphurous *exhalations* are the chief matter of thunder, lightning, and diverse other meteors generated in the air.

Sir Isaac Newton takes true and permanent air to be formed from the *exhalations* raised from the hardest and most compact bodies. See AIR.

EXHAUSTED, *Receiver*, a glass, or other vessel, applied on the plate of an air-pump, and the air extracted out of the same by the working of the engine. See AIR-PUMP.

Things placed in an *exhausted Receiver*, are said to be in *vacuo*. See VACUUM.

EXHAUSTIONS, in mathematics.—*Method* of **EXHAUSTIONS**, is a way of proving the equality of two magnitudes, by a *reductio ad absurdum*; shewing, that if one be supposed either greater or less than the other, there will arise a contradiction.

The *method* of *exhaustions*, was of frequent use among the ancient mathematicians, as Euclid, Archimedes, &c.

It is founded on what Euclid says in his tenth book, *viz.* that those quantities, whose difference is less than any assignable quantity, are equal; for if they were unequal, be the difference never so small, yet it may be so multiplied, as to become greater than either of them; if not so, then it is really nothing.

This he assumes in the proof of prop. 1. of book X. which imports, that if from the greater of two quantities, you take more than its half, and from the remainder more than its half, and so continually, there will at length remain a quantity less than either of those proposed.

On this foundation it is demonstrated, that if a regular polygon of infinite sides be inscribed in, or circumscribed about, a circle, the space, which is the difference between the circle and the polygon, will, by degrees, be quite exhausted, and the circle become equal to the polygon.

EXHEREDATIO, **EXHEREDATIO**, in the civil law, with us ordinarily called *disinheriting*, is the father's excluding his son from inheriting his estate.

There are fourteen causes of *exheredation* expressed in Justinian's novel; without some one of which causes, he decrees the *exheredation* null, and the testament inofficious, as the civilians call it.

Indeed, by the ancient Roman law, the father might pronounce *exheredation* without any cause; but the rigour of this law was restrained, and moderated by Justinian.

EXHIBIT, in law.—When a deed, acquaintance, or other writing, is in a chancery suit *exhibited* to be proved by witness; and the examiner writes on the back, that it was shewed to the witness at the time of his examination: This is called an *exhibit*.

EXHIBITION, a producing, or shewing of titles, authorities, and other proofs of a matter in contest.

The parties have *exhibited* their titles and pretensions before the arbitrators.

Anciently, they used the phrase, *exhibition* of a tragedy, comedy, or the like; but now we say *representation* in lieu thereof.

EXHUMATION *, the act of digging up a body interred in holy ground, by the authority of the judge.

* The word is compounded of the Latin *ex*, out of, and *humus*, ground.

In France, the *exhumation* of a dead body is order'd upon proof that he was killed in a duel.—By the French laws, a parson has a right to demand the *exhumation* of the body of one of his parishioners, when interred out of the parish, without his consent.

EXIGENCE, or **EXIGENCY**, that which a thing requires, or which is expedient and suitable thereto.—The criminals were remitted back to the judges, to be punished according to the *exigency* of the case.

EXIGENT, in law, a writ which lies where the defendant in a personal action cannot be found, nor any thing of his within the county, whereby to be attached, or distrained.

It is directed to the sheriff, ordering him to proclaim and call the party five county days successively, and charge him to appear under pain of outlawry.

The same writ also lies in an indictment of felony, where the party indicted cannot be found.

It is called an *exigent*, by reason it *exigit*, i. e. *exalts* or requires the party to appear, or by forthcoming, to answer the law.—If he appear not at the last day's proclamation, he is said to be *inquies exadatus*, and then is outlawed. See OUT-LAWRY.

EXIGENTERS, four officers of the court of common pleas, who make all *exigents* and proclamations, in all actions, where the profits of superfeudas lies.

Anciently, the making writs of superfeudas upon such *exigents* as passed in their offices, did likewise belong to them; but this branch of business was taken from them under king James I. and committed to a particular officer in the court of common pleas, created by patent. See SUPERSEDEAS.

EXILE, *Banishment*. See the article BANISHMENT.

Among the Romans, the word *exile*, *exilium*, properly signified an introduction, or exclusion from water and fire; the necessary consequence of which was, that the interdicted person must betake himself into some other country, since there was no living without fire and water.—Thus, Cicero *ad Herenn.* observes, that the form of the sentence did not express *exile*, but only *aqua & ignis interdictio*. See INTERDICTION.

The same author remarks, that *exile* was not properly a punishment, but a voluntary flying, or avoiding the punishment decreed: *Exilium non esse supplicium sed persequium, portusque supplicii.* Pro *Cecinna*.

He adds, that there was no crime among the Romans, as among other nations, punished with *exile*; but *exile* was a resource people flew voluntarily to, in order to avoid chains, ignominy, starving, &c.

The Athenians frequently sent their generals, and great men into *exile*, out of envy of their merits, or distrust of their too great authority.

EXILE, is sometimes also used for the regulating a person into a place, whence he is obliged not to stir without leave.

The word is derived from the Latin *exilium*, or from *exul*, a banished person; and that, probably, from *extrajulum*, out of his native soil.

Figuratively, we use the phrase *honourable exile* for an office, or employment which obliges a man to reside in some remote, or disagreeable place.

Under the reign of Tiberius, remote employments were a kind of mysterious *exiles*.—A bishopric, or even a lord lieutenancy, in Ireland, has been sometimes deemed a kind of *exile*. A residence, or embassy, in some barbarous country, is also a sort of *exile*.

EXINATION, the same as *evacuation*. See EVACUATION.

EXISTENCE, that whereby a thing has an actual essence: or is said to be, *esse*.

This notion of *existence*, is applicable not only to a created, but an uncreated substance.—But it must be added, that the *existence* of created substances, and especially corporeal ones, implies a respect to place, time, and even an efficient cause; whence the schoolmen generally define it; That whereby a thing is formally and extrinsically without [extra] its causes, and that here, and now.

Existence, and essence, come very near the nature of each other: in effect, they only differ in that we have different manners of conceiving the same thing.

For, 1°. Essence is usually explained either by the first, noblest, and radical attribute of the thing, *e. gr.* That of body, by extension; that of mind, by thinking, &c. or by specifying all the intrinsic attributes: and *existence*, either by specifying all place, and all time, as in that of God; or by specifying some definite place, and time, together with the cause, as in the creatures.

2°. The foundation, and occasion of this distinction, is this; that essence belongs to the question, what is it? *quid est?* but *existence* to the question, is it? *an est?*

3°. *Existence* necessarily presupposes essence, and cannot be conceived without it: but essence may be conceived without *existence*; in that essence belongs equally to things that are in potentia, and in actu; but *existence*, only to those in actu. Note, however, that this does not obtain in God; about whose nature and essence the mind cannot think, without conceiving his *existence*.

We have diverse ways of arriving at the knowledge of the *existence* of things.—Our own *existence* we know by intuition; the *existence* of a God, by demonstration; and that of other things, by sensation.

As for our own *existence*, we perceive it so plainly, that it neither needs, nor is capable of any proof. I think, I reason, I feel pleasure and pain: can any of these be more evident to me than my own *existence*? If I doubt of all other things, that very doubt makes me perceive my own *existence*, and will not suffer me to doubt of that. If I know I doubt, I have as certain a perception of the thing doubting, as of that thought which I call doubt. Experience then convinces us, that we have an intuitive knowledge of our own *existence*, and an in-

ternal, infallible perception that we are. In every act of sensation, reasoning, or thinking, we are conscious to our selves of our own being, and in this matter come not short of the the highest degree of certainty.

As to our knowledge of the *existence* of a God; though he has given us no innate ideas of himself, yet having furnished us with faculties of sense, perception and reason, we can never want a clear proof thereof.

The knowledge of the *existence* of other things, i. e. of external objects, bodies, a world, &c. we only have by sensation; for there being no necessary connexion of real *existence* with any idea a man hath in his memory; nor of any other *existence* but that of God, with the *existence* of any particular man; no particular man can know the *existence* of any other being, but only, when by actually operating upon him, it makes it self be perceived by him. The having the idea of any thing in our mind, no more proves the *existence* of that thing, than the picture of a man evidences his being in the world; or the visions of a dream make a true history. It is therefore the actual receiving of ideas from without, that gives us notice of the *existence* of other things, and makes us know that something doth *exist* at that time without us, which causes that idea in us, though we neither know, nor consider how it doth it.

This notice which we have by our senses of the *existing* of things without us, though it be not altogether so certain as intuition and demonstration, yet deserves the name of knowledge, if we persuade our selves, that our faculties act and inform us right, concerning the *existence* of those objects that affect them.

Now, besides the assurance of our senses themselves, that they do not err in the information they give us of the *existence* of things without us, we have other concurrent reasons: as 1°. It is plain those perceptions are produced in us, by exterior causes affecting our senses, because those that want the organs of any sense, never have the ideas belonging to that sense produced in their minds. 2d°. Because we find we cannot avoid the having those ideas produced in our minds: when our eyes are shut, we can at pleasure recal to our mind the ideas of light, or the sun, which former sensations had lodged in our memories; but if we turn our eyes towards the sun, we cannot avoid the idea, which the light or the sun then produces in us; which shews a manifest difference between those ideas laid up in the memory, and such as force themselves upon us, and we cannot avoid having. Besides, there is no body who doth not perceive the difference in himself between actually looking upon the sun, and contemplating the idea he has of it in his memory; and therefore he hath certain knowledge, that they are not both memory or fancy. 3°. Add to this, that many ideas are produced in us with pain, which we afterwards remember without the least offence: thus, the pain of heat or cold, when the idea of it is received in our minds, gives us no disturbance; which when felt, was very troublesome; and we remember the pain of hunger, thirst, head-ach, &c. without any pain at all, which would either never disturb us, or else constantly do it, as often as we thought of it, were there nothing more but ideas floating in our minds, and appearances entertaining our fancies, without the real *existence* of things affecting us from abroad. 4°. Our senses, in many cases, bear witness to the truth of each others report, concerning the *existence* of sensible things without us: he that doubts, when he sees a fire, whether it be real, may feel it too, if he pleases, and by the exquisite pain may be convinced, that it is not a bare idea or phantom.—Such is Mr. Lock's demonstration of the *existence* of external bodies.

The most ingenious Dr. Berkeley has a quite different system: external bodies, he contends, have no *existence* but in a mind perceiving them, that is, they only *exist*, *quatenus*, they are perceived. And of this he has given us what he and many others account a demonstration.

In reality, "that neither our thoughts, passions, nor ideas formed by the imagination, exist without the mind, he observes is allowed; and that the various sensations impressed on the mind, whatever objects they compose, cannot exist otherwise than in a mind perceiving them, is not less evident: this appears from the meaning of the term *exist*, when applied to sensible things. Thus, the Table I write on exists; i. e. I see and feel it: and were I out of my study, I should say it existed; i. e. that were I in my study, I should see and feel it as before. There was an odour; i. e. I smelt it, &c. But the *existence* of unthinking beings, without any relation to their being perceived, is unintelligible; their *esse* is *percipi*."—The notion of bodies, he endeavours to shew, is founded on the doctrine of abstract ideas: "What are light and colour, heat and cold, extension and figure, in a word, the things we see and feel, but so many sensations, notions, ideas, or impressions on the sense? And is it possible to separate, even in thought, any

any of these from perception? The several bodies then, that compose the frame of the world, have not any subsistence without a mind; their *esse* is to be perceived or known: and as long as they are not perceived by me, nor any other thinking being, they have no shadow of *existence* at all.—The things we perceive, are colour, figure, motion, &c. that is, the ideas of those things: but has an idea any *existence* out of the mind? To have an idea, is the same thing as to perceive: that therefore wherein colour, figure, &c. exist, must perceive them. It is evident, therefore, there can be no unthinking substance, or substratum of those ideas.—But you may argue, if the ideas themselves do not exist without the mind, there may be things like them, whereof they are copies or resemblances, which exist without the mind: It is answered, an idea can be like nothing but an idea; a colour or figure can be like nothing else but another figure or colour.—It may be farther asked, whether those supposed originals, or external things whereof our ideas are the pictures, be themselves perceivable or not? If they be, they are ideas: if they be not, I appeal to any one, whether it be sense to say, a colour is like something which is invisible: hard or soft, like somewhat intangible, &c.—Some distinguish between primary and secondary qualities; the former, *viz.* extension, solidity, figure, motion, rest and number, they maintain have a real *existence* out of the mind: for the latter, under which come all other sensible qualities, as colours, sounds, tastes, &c. they allow the ideas we have of them, are not resemblances of any things existing without the mind, or unperceived; but depend on the size, texture, motion, &c. of the minute particles of matter: now it is certain, that those primary qualities are inseparably united with the other secondary ones, and cannot even in thought be abstracted from them; and therefore must only exist in the mind. Can any man conceive the extension and motion of a body, without it's other sensible qualities? for my part, I find it impossible to frame an idea of a body extended and moving, without giving it some colour, &c. In effect, extension, figure and motion, abstracted from all other qualities, are inconceivable: where the others, therefore, are, there these two must be; *i. e.* in the mind, and no where else. Again, great and small, swift and slow, are allowed to exist no where without the mind; being merely relative and changing, as the frame or position of the organ changes: the extension therefore that exists without the mind, is neither great nor small, the motion neither swift nor slow; *i. e.* they are nothing.—That Number is a creature of the mind, is plain (even though the other qualities were allowed to exist) from this; that the same thing bears a different denomination of number, as the mind views it with different respects: Thus the same extension is 1, or 3, or 36, as the mind considers it, with reference to a yard, a foot, or an inch. Nay, many of the modern geometicians hold, that a finite line may be divided into an infinite number of parts, and each of those infinitesimals into an infinity of others; and so on, *in infinitum*: so that the same thing is either unity or infinity; either no number or all number. In effect, after the same manner as the modern philosophers prove colours, tastes, &c. to have no *existence* in matter, or without the mind; the same thing may be proved of all sensible qualities whatsoever. Thus, they say, heat and cold are only the affections of the mind, not at all patterns of real beings existing in corporeal substances; for that the same body which seems cold to one hand, seems warm to another. Now why may we not as well argue, that figure and extension are not patterns or resemblances of qualities existing in matter; because to the same eye, at different stations, or to eyes of different structure at the same station, they appear various? Again, sweetness, it is proved, does not exist in the thing *sapid*; because the thing remaining unaltered, the sweetness is changed to bitterness, as in a fever, or by an otherwise vitiated palate. Is it not as reasonable to say, that motion does not exist out of the mind? since, if the succession of ideas in the mind become swifter, the motion, it is acknowledged, will appear slower, without any external alteration.—Again, were it possible for solid figured bodies to exist out of the mind, yet it were impossible for us ever to know it: our senses, indeed, give us sensation of ideas, but do not tell us that any things exist without the mind, or unperceived, like those which are perceived: this the materialists allow. No other way therefore remains, but that we know them by reason's inferring their *existence* from what is immediately perceived by sense. But how should reason do this, when it is confessed, there is not any necessary connection between our sensations and these bodies? It is evident from the phenomena of dreams, phrensies, &c. that we may be affected with the ideas we have now, though there were no bodies existing without them: nor does the supposition of external bodies at all forward us, in conceiving how our ideas should come to be produced. The materialists own themselves unable to conceive in what manner body can act on

spirit, or how it should imprint any idea on the mind. To suppose, therefore, bodies existing without the mind, is little else than to suppose, God has created innumerable beings entirely useless, and serving to no purpose at all. On the whole, it appears that the *existence* of bodies out of a mind perceiving them, is not only impossible, and a contradiction in terms; but were it possible, may real, it were impossible we should ever know it. And again, that supposing there are no such things, yet we should have the very same reason to suppose there were, that we now have: suppose, *e. gr.* an intelligence affected with the same train of sensations, impressed in the same order, and with the same vividness; would it not have all the reason to believe the *existence* of bodies represented by his ideas that we have?—All our ideas and sensations are visibly inactive; nay, the very being of an idea implies passiveness and inertness: so that it is impossible for an idea to do any thing; or, in strictness, be the cause of any thing: it cannot therefore be the resemblance or pattern of any active being; unless opposites can be said to resemble one another. Now we find a continual succession of ideas in the mind; but these, it has been proved, do not depend on any external body as their cause: it remains therefore, that their cause is an incorporeal active substance or spirit. For that I am not the cause of my own ideas, is plain from this, that when I open my eyes in broad day-light, I cannot help seeing various objects. Now the fixed Rules or methods wherein the mind we depend on excites in us the ideas of sense, are called *laws of nature*: these we learn by experience; which teaches us, that such and such ideas are attended with such and such other ideas in the ordinary course of things. Ideas are not any how, and at random produced; there is a certain order and connexion established among them, like that of cause and effect: and there are several combinations of them made in a very regular artful manner, which we call *ideas*; and the system of those, *the world*. In strictness, however the connexion of ideas does not imply the relation of cause and effect, but only of a mark or sign of the thing signified: the fire I see is not the cause of the pain I feel, but the mark that forewarns me of it. The noise I hear, is not the effect of this or that motion or collision of natural bodies, but the sign thereof. The Cartesians own somewhat like this: the action of bodies on our organs, say they, is not the efficient cause of our ideas and perceptions, but only the occasional cause, which determines God to act on the mind, according to the laws of the union of the soul and body. See CAUSE. Dr Berkeley, indeed, taking away bodies, takes away what these philosophers account the occasions of their ideas: by an occasion, he says, must either be meant the agent that produces an effect, or something observed to accompany or go before it, in the ordinary course of things: but matter is allowed to be passive and inert, and cannot therefore be an agent or efficient cause; and this matter primitively and in it self, is allowed imperceivable, and devoid of all particular sensible qualities; *i. e.* it has not this or that particular colour, this or that particular figure, &c. but has colour in the general, figure in the abstract, &c. but an abstract is no object of sense: matter therefore cannot be the occasion of our ideas in the latter sense." See BERKEL, *Princip. of Hum. Knowl.*

How far the great argument of the maintainers of a material world, from the impossibility of God's deceiving us, and from the evidence that he does so, if there be no such thing, will go against this reasoning, we leave to the reader. See STANL. *Hist. Philos.* P. XII. p. 816. where the objections of the ancient Pyrrhonist to the *existence* of bodies are recited. As to the *existence* of spirits, M. Locke allows, that any having ideas of them, does not make us know, that any such things do exist without us; or that there are any finite spirits, or any other spiritual beings, but God. We have ground from revelation, and several other reasons, to believe with assurance, that there are such creatures; but our senses being not able to discover them, we want the means of knowing their particular *existence*: for we can no more know that there are finite spirits really existing by the idea we have of such beings, than by the ideas any one has of fairies, or centaurs, he can come to know that things answering to those ideas do really exist.

EXIT, properly expresses the departure of a player from off the stage, when he has acted his part.

The word is also used in a figurative sense to express any kind of departures, even death.

EXITUS, in law, *issues*; the yearly rents, or profits of lands, or tenements. See ISSUE, &c.

EX MERO MOTU, formal words used in the king's charters, and letters patent; signifying that he does what is contained therein of his own will, and motion.

The effect of these words is to bar all exceptions that might be taken to the instrument, by alleging that the prince, in passing such charter, was abused by false suggestion.

EXOCATACOELUS*, in antiquity, a general denomination, under which were included several grand officers of the church at Constantinople. As, the—grand oeconomus, grand facellarius, grand master of the chapel, grand scevo-phylax, or keeper of the vessels, grand chartophylax, the master of the little chapel, and the protedictus, or first advocate of the church.

* The critics are not at all agreed about the origin of the word exocatacali: Junius, in his edition of Codin, breaks the word into two, and reads εξ Κατακαλιθ, q. d. six catacali; but this reading, though authorized by several MSS. is faulty, the generality of copies only making one word: beside that they are called exocatacali, even when there were only five of them. The same Junius derives catacalus hence, that these officers dwelt in the valleys, κατα τας κοινας. Pet. Gregor. Tolofan, takes the word to have been formed from κατακαλιθ, permulco, suavitate animo delinco: but Gretser rejects this etymology, as without any foundation. In lieu thereof, he proposes another conjecture, though with a good deal of timidity: he reads εξωκατακαλιθ, instead of εξωκατακαλιθ, as if they were thus called by reason they lodged, or lived out of the patriarchal palace.—Fa. Goar rejects this opinion, and had rather we should read εξωκατακαλιθ as intimating they were thus called in opposition to the syn-cel-lus, who lay in the patriarch's apartment, which the rest did not; but he is far from being of the opinion that officers of so much eminence, should take their denomination from a thing which testifies a want of privilege. He chafes, therefore, to imagine that all the inferior priests were called Κατακαλιθ, catacali, q. d. people of a low condition; and that their superiors were called exocatacali, q. d. people out of the number of catacali, or above them.—Upon the whole, however, he adheres to the sentiment of G. Coreus, who says, that the patriarchal palace, and the apartments of the syn-cel-lus, and of the monks in the patriarch's service, were in a very low part of the city, which with regard to the rest seemed a valley or pit; and that the offices above-mentioned had their several houses or palaces, εξω, out of the valley: whence the name exocatacali. The opinion of M. du Cange is the last we shall name, he derives the appellation from their being above the level, or rank of the other clerks; and seated at church, &c. in more honourable places erected for that purpose, on either side the patriarch's throne: these two last sentiments seem the most probable.

The exocatacali were of great authority: in public assemblies they had the precedence of bishops; and in the patriarchate of Constantinople did the office of deacons; as the cardinals originally did in the church of Rome. Accordingly, in the letter of John IX. to the emperor Basilus Leo, they are called cardinales.

At first they were priests; but some patriarch of Constantinople, whom Codin does not mention, would have them for the future to be no more than deacons. The reason was, that being priests, each of them had their several churches, wherein they were to officiate on all the grand festival days; so that it unhappily fell out, the patriarch on the most solemn days was deserted by all his chief Ministers.

EXOCIONITE, EXOCIONITES, in church antiquity.—Meursius tells us, that there was a monastery at Constantinople, called exocionium; and that the first who were called exocionites, were the monks thereof.—But this is a mistake. It was the Arians who were first called exocionites; by reason, when expelled the city by Theodosius the great, they retired into a place called exocionium*, and there held their assemblies. Justinian gave the orthodox all the churches of the heretics, excepting that of the exocionites. Cedrenus.

* The word is derived from εξωκισμος, or εξωκισμος, the name of the place above-mentioned.—Codin, in his Origines, says, that the exocionium was a place encompassed with a wall, built and adorned by Constantine; and that without the circumference of this wall, there was a column, with a statue of that emperor, whence the place took its name, viz. from εξω, without, and κισμος, column.

Gothofred holds, that Theodoret was mistaken, in saying that the Arians were called exocionites, or exocionites, from the name of the place where they assembled; and takes the denomination to be the same with that of exocionians, which was attributed to the Arians, by reason they held that the son was made out of nothing, εξ εκ οντων. But a mere conjecture of Gothofred is not sufficient to make us set aside the authority of so able a person as Theodoret.

EXODIARY, EXODIARIUS, in the ancient Roman tragedy, was a droll, or mime, who appeared on the stage, when the tragedy was ended, and performed what they called the exo-dium, or conclusion of the show; to divert the company.

EXODIUM*, Εξοδιον, in the ancient Greek, drama, was one of the four parts, or divisions of a tragedy.

* The word is formed from the Greek, εξοδηθ, going out, digressum, going aside out of the way, of εξ and οδ, away, road. Festus, Lib. V. calls it exitus.

The exodium, according to Aristotle, was so much as was rehearsed after the chorus had ceased to sing for the last time; VOL. I.

so that exodium with them, was far from being what the epilogue is with us, as several people have imagined it was.

The exodium was so much of the piece as included the catastrophe and unravelling of the plot; which catastrophe, &c. in pieces regularly composed, always begun after the last singing of the chorus; answering nearly to our 4th and 5th acts. See M. Dacier's Comment. on Aristotle's Poetics, c. 12. See also the articles CATASTROPHE and CHORUS.

Among the Romans, the exodium was a different thing; it was pretty nearly what farces are with us. After the tragedy was over, came a pantomime on the stage, called the exodiarus, who by his grimace, jesting, and buffoonry, diverted the people, composed their minds, and wiped away the tears which the tragic spectacle had occasioned to be shed.—This was his office, as related by the ancient scholiast on Juvenal: exodiarus, apud veteres in sine ludorum intrabat, quod ridiculus foret, ut quidquid lacrymarum atque tristitiae cepissent ex tragicis affectibus, hujus spectaculi risu detergeret.—At least this was the original intention of the exodium: but it afterwards degenerated into a bitter, malicious kind of raillery.

Viginere on T. Livy, says the exodium consisted of certain humorous, drolling verses, rehearsed by the youth at the end of the fabula atellanæ, and answering to our farces. In another place, the same author says, that the exodia were a kind of interludes, in the intervals between the acts, partly false and pleasurable, partly music, &c. to give time both for the spectators and actors to recover breath.—The passage in Livy, whence he takes the notion, is lib. VII. Dec. 1. Ridicula intexta versibus, quæ juvenis inter se more antiquo jaculare cepit, eaque conferta sunt fabulis potissimum atellanis. So also Juvenal,

Urbicus exodio risum movet atellanæ
Gestibus Antonæ.

EXODIUM*, in the septuagint, signifies the end, or conclusion of a feast.

* The Hebrew text calls the Day פרוש, which the seventy render Εξοδιον.

In particular, exodion is used for the eighth day of the feast of tabernacles, which, it is said, had a special view to the commemoration of the Exodus, or departure out of Egypt. Though there is nothing of it expressed in scripture.

EXODIUM, was also the name of a song, sung at the conclusion of a meal, or feast.

EXODUS, the second of the five books of Moses.

The word in its original Greek, Εξοδος, literally imports a going out, or journey; and was applied to this book, by reason the history of the Israelites passage out of Egypt is related therein.—Beside this, it contains the story of what was transacted in Egypt, from the Death of Joseph, to the delivery of the Jews; as well as what passed in the wilderness, and particularly at mount Sinai, to the building of the tabernacle.

The Hebrews call it velle smath, q. d. hæc nomina, these are the initial words of the book: for the same reason they call Genesis, beresith, q. d. in principio, In the beginning.

EX OFFICIO, denotes the power a person has in virtue of his office, to do certain things without being applied to. By a Branch of a statute, i. Eliz. the queen, by her letters patents, might authorize any persons exercising ecclesiastical jurisdiction, to administer an oath ex officio; whereby supposed offenders were forced to confess, accuse, or clear themselves of any criminal matter, &c.—But this branch relating to this oath, is repealed by 17 Car. I. cap. 11.

EXOMOLOGESIS*, Εξομολογησις, a term little used but in speaking of the ancient ceremonies of repentance; whereof the exomologesis, by us called confessions, was a part.

* The word is Greek, formed of εξομολογησα, I confess.

Some of the ancients, and particularly Tertullian, de penit. c. 9. use the word in a greater latitude, as comprehending the whole of repentance.

A publick exomologesis was never commanded by the church for secret sins; as may be seen in the capitulars of Charlemain, and the canons of diverse councils.

EXOMPHALUS, Εξομφαλιθ, in medicine, a general name, comprehending all kinds of navel ruptures.—The first are tumors, or swellings of the solid parts; whereof there are three varieties, denominated from the several parts affected, as the enteromphalus, epiphomphalus, and entero-epiphomphalus.—The second are, tumors formed by collections, or gatherings of humours; of which there are four varieties, distinguished by the particular humours they are formed of, as the hydromphalus, pneumatomphalus, sarcemphalus, and uricemphalus: The third are those compounded of both the other, viz. the enterohydromphalus, and epiphysarcemphalus. See each species under its several heads, ENTEROMPHALUS, &c.

EXORCISM *, *Ἐξορκισμὸς*, prayers, or conjurations, wherewith to *exorcise*, i. e. drive out devils from persons possessed, or to preserve from danger.

* The word is derived from the Greek, *ἔξορκίζω*, *adjurare*, *conjurare*, to adjure, or conjure.—In most dictionaries, *exorcism* and conjuration are used as synonymous: but, in reality, conjuration is only a part of the *exorcism*; and the *exorcism* the ceremony entire.—The conjuration is properly the formula, where the devil is commanded to come forth, &c.

Exorcisms are of great use in the Romish church; their prelates, &c. are frequently exorcising demoniacal persons. The priests make holy water, by exorcising common water a certain number of times.—In reality, the *exorcism* is a part in most of their consecrations.

It must be allowed, the use of *exorcisms* is almost as ancient as the church: recourse was had to such means to drive away diseases both of men and beasts, to expel and destroy vermine, and other animals noxious to the earth, and the fruits thereof. M. Thiers, in his *Traité de Superstitions*, gives divers formula's of such *exorcisms*; and quotes, particularly, the one of St. Grat, who, by means of *exorcisms*, obtained for instance the favour, that there should be no rat found in the country of Aost, nor three miles round the same.

The same author pretends, that such *exorcisms* may be still used to good purpose, against rats, mice, locusts, caterpillars, storms, &c. But in order to perform any thing of this kind, he observes, a man must have the proper quality and character, and be approved of by the church; and must likewise use words and prayers authorized thereby: otherwise, his *exorcisms* will be damnable superstitions.

Exorcisms had anciently another and further purpose, being applied by way of trial, or purgation, to extort the truth from the accused.

The *exorcism*, in this sense, was a sort of bread conjured and exorcised for the purpose: and the opinion was, that if the person were criminal, he could not swallow the bread.

This, it seems, was a frequent practice in the time of our Edward III. and the bread thus exorcised, was said to be *confined*.

Linderbroeck gives instances of *exorcisms* with barley bread, and others with cheese. And hence, probably, might arise that popular imprecation, “may this bread choke me, if I “tell a lye.” See *ORDEAL*, and *JUDICIUM DEI*.

EXORCIST, in the Romish church, a priest, or tonsured clerk, who has received the four lesser orders, one of which is that of *exorcist*.

The term is likewise applied to a prelate, who actually exorcises a person possessed.

It is a dispute among divines, whether ever the Greeks had properly any such order, as that of *exorcist*: Fa. Goar, in his notes on the Greek euchologion, has made it probable they had from several concurring passages in St. Dionysius, and St. Ignatius Martyr.

The ordination of *exorcists* is performed in the time of mass: their principal office being to expel devils. The IVth council of Carthage, can. 7. appoints, that in the ordination of *exorcists*, the bishop putting the book of *exorcisms* in their hands, shall say these words, “receive it, and keep it in “remembrance, and have power to lay hands on energu- “men, whether baptized, or catechumens:” which form still obtains.

M. Fleury mentions certain people among the Jews, who travelled round the country, making profession of driving out devils by invocations, which they pretended had been taught them by Solomon: These were also called *exorcists*. See Joseph. *Antiq. Jud.* l. VIII. c. 2. Origen. *Tracl.* XXXV. in Matt. XXVII. 63.

EXORDIUM *, in oratory, the preamble, or beginning of a discourse, or speech; serving to prepare the audience, and introduce the matter in hand.

* The word is formed of the Latin, *ordiri*, to begin; by a metaphor taken from the weavers, who are said *ordiri telam*, to begin, or warp a web, by disposing and ordering the threads in a certain manner for the future work. See *WARP*.

The *exordium* on other occasions is called the *prologue*, *prælud*, and *præm*.

Cicero defines *exordium*, a part of an oration, whereby the minds of the audience are duly prepared for what remains to be said.—The *exordium* is a part of principal importance, and is to be laboured with extraordinary care; whence Tully calls it, *difficilima pars orationis*.

Exordiums are of two kinds: either just, and formal; or vehement and abrupt. In the first, the audience is prepared and conducted, by due and easy steps: in the second, the orator, as if seized with some sudden passion, breaks out upon his audience at once. Such is that *exordium* of Isaiah, *hear, oh heavens, and give ear, oh earth*. Or that of Cicero against Catiline, *quisque tandem abutere patientia nostra Catilina?*

Abrupt *exordium* are the most suitable on occasions of extraordinary joy, indignation, or the like; though we have instances of pangs of the greatest orators begun abruptly without any such occasions: such is that of Corgias, who began his eulogy of the city and people of Elis, with *HAEC, MAIUS SUBJUGAVIT, ELIS, BEATA CIVITAS*: or that of Greg. Nazianzen, in praise of Athanasius, *ASSEMANUS ET AVANUS APTAVIS, ATHANASIVM LAUDANS VIRTUTEM LAUDABO*. Abrupt, hasty *exordiums*, were more to the taste and manner of the Greeks than the Latins.

The requisites in an *exordium* are, 1^o. *Propriety*, whereby the *exordium* becomes of a-piece with the whole discourse, and matches it, as a part does a whole; so that it could not be accommodated to any other, or perhaps a contrary occasion. The ancient orators were very defective in this point: their *exordiums* had frequently nothing in common with the subject. 2^o. *Care*, accuracy, and magnificence, as being the part most minded, and most expected to view. Thus Tully, *vestibula, aditusque ad causam facios illustres*.

3^o. *Modesty*, or an ingenious bashfulness, which recommends the orator exceedingly to the favour of his audience. This is what Cicero extols so much in L. Crassus, *sunt enim in L. Crasso pudor quidam, qui non modo non abesse ejus orationi, sed etiam probitatis commendatione prodesse*. The same Tully owns, of himself, that at the beginning of his orations, he trembled every limb, and his whole mind was in a flutter.

And, 4^o. *Brevity*, not amplified, or swelled with a detail of circumstances, or a long circuit of words: such as that must be of the lawyer, who being to speak of a difference between two neighbours, deduced his *exordium* from Adam.

The *exordium* appears an essential part of an oration: though, anciently, in the areopagus, Julius Pollux tells us, they spoke without any *exordium*, any passions, and any peroration, or epilogue. The like is said to have been done by Xenophon, who began thus, *Darius & Parisatis duos habuerit filios*.

EXOSTOSIS, *Ἐξοστῶσις*, an unnatural protuberance of a bone, frequent in venereal cases. See *BONE*.

EXOTIC *, *Ἐξωτικὸς*, a term properly signifying *foreign*, or extraneous, i. e. brought from a remote, or strange country. In which sense we sometimes say, *exotic*, or barbarous terms, or words, &c.

* The word is derived from the Greek, *ἔξω*, *ἔξωθεν*, *extra*, without, on the outside.

EXOTIC is chiefly applied to plants which are natives of foreign countries; particularly those brought from the East and West-Indies: and which do not naturally grow in Europe. The generality of *exotics*, or *exotic* plants, do not thrive in England, without some peculiar care and culture: they require the warmth of their own climates; whence the use of hot-beds, glass-frames, green-houses, &c. See *Supplement*, article *STOVE*.

The green-house is properly a conservatory of *exotics*.

Dr. Lister has a discourse in the *Philosoph. Trans.* on *exotic diseases*, i. e. such diseases as are never bred among us, but brought from time to time by infection from other countries. Such, according to this author, are, 1^o. *The plague*, which is properly a disease of Asia, where it is epidemic. 2^o. *The small-pox*, which is an oriental disease, and not known to Europe, or even Asia minor, or Africa, till a spice trade was opened to the remotest part of the Indies; whence it originally came, and where it still rages more cruelly than among us. 3^o. *The griping of the guts*, which he takes for a disease peculiar to the West-Indies, and yearly received from thence. For this, he adds, is a quite different disease from the tormina ventris of the ancients; and is scarce ever known in the mid-land countries, or far in the North of England.

EXPANSION, in metaphysics, expresses the idea we have of lasting or persevering distance; i. e. of distance, all the parts whereof exist together.

EXPANSION, in physics, is the dilating, stretching, or spreading out of a body; whether from any external cause, as the cause of rarefaction; or from an internal cause, as elasticity. Bodies naturally *expand* by heat, beyond their dimensions when cold; whence their specific gravities are different, as the different seasons of the year.

Air compressed, or condensed, as soon as the compressing, or condensing force is removed, *expands* itself by its elastic power, to its former dimensions.

Dr. Halley found by experiment, that water *expands* itself by one twenty-sixth part of its bulk, when made to boil: but a moderate heat does not induce any sensible *expansion* at all.—Mercury, with a very gentle heat, *expands* itself one seventy-fourth part of its ordinary dimensions.

Spirit of wine, with a heat less than that of boiling water, *expanded* itself by one twelfth part of its bulk; and then fell a boiling. The most sensible *expansion* of water, is in freezing; M. Boyle, in his *Hist. of Cold*, assures us, that ice takes up one twelfth part more space than water.

Dr. Gregory, in his *Astron.* p. 407. proves, that a globe of our air, of an inch diameter, if it were removed to the distance of a semi-diameter of the earth, would expand it self so, as to fill all the planetary region, as far as, may, far beyond, the sphere of Saturn.

EXPANSUM *Foliaceum.* See FOLIACEUM.

EXPARTE, *i. e. partly, or of one part.*—A commission *ex parte*, is that taken out, and executed by one party only: where both parties join, it is called a *joint commission.* See COMMISSION.

EXPECTANT-*Fee*, in law, where lands are given to a man and his wife, and the heirs of their bodies: in which sense it differs from *fee simple*, where lands are given to a man and his wife, in frank marriage, to hold to them and their heirs.

EXPECTATIVE, in the canon law, a hope, founded on a promise, of obtaining the next benefice that shall become vacant; or a right to the reversion of the next. See BENEFICE.

EXPECTATIVE *Canon.* See the article CANON.

EXPECTATIVE *Graces.* EXPECTATIVE, called also *preventions*, were bulls frequently given by the popes, or kings, for future benefices.—The bishops were exceedingly mortified with them; by reason they encroached on their privileges: besides that such *expectatives* are odious, as they induce people to wish for the death of others.

The use of *expectatives* is very ancient, though it was not near so frequent in the first ages, as afterwards. Originally they were no more than simple roquets made on the part of kings, or popes, which the bishops consented to with the more willingness, as they only presented to them persons fit to serve the church. But the frequent exercise of this privilege, made it at length be deemed a matter of obligation and necessity. The council of Trent annulled all *expectatives*; but the canons relating thereto were never admitted in France; where the right of conferring *expectative* graces, is looked on as one of the regalia. See GRACE.

EXPECTORATION, the act of evacuating, or bringing up phlegm, or other matters, out of the trachea, lungs, &c. by coughing, hawking, spitting, &c. See COUGH. *Expectoration* eases the lungs of the viscid, or putrid matters, which obstruct their vessels, and straiten the breast.

EXPEDITATION, in the forest laws, signifies a cutting out the balls of a dog's fore-feet, for the preservation of the king's game.

Every one that keeps any great dog not *expeditated*, forfeits three shillings and four-pence to the king. In mastiffs, not the ball of the feet, but the three claws, are to be cut to the skin. *Instit.* P. IV. p. 308. *Nullo dominico canes abbatis & monachorum expeditari cogat.* Chart. Hen. 3. *Et sint quieti de expeditamentis canum.* Ex. Mag. Rot. Pip. de Ann. 9. Ed. 2.

This *expeditation* was to be performed once in every three years; and was done to every man's dog who lived near the forest, and even the dogs of the foresters themselves.

EXPEDITION, the march of an army to some place, with a view of hostilities.

Such were the *expeditions* of Cyrus against Xerxes, and of Bacchus and Alexander from the Indies.—The *expedition* of Xerxes against Greece, was unhappy: Cæsar himself, in the middle of his *expeditions* in the Gauls, composed two books of the analogy of words.

Expeditions for the Recovery of the Holy Land, were called *croisades.*

EXPENCES, in book-keeping. See book of *expences.*

EXPENSIS *militum levandis*, is a writ directed to the sheriff, for levying allowance for the knight of parliament. See PARLIAMENT, and REPRESENTATIVE.

EXPERIENCE, a kind of knowledge acquired by long use, without any teacher.

Experience consists in the ideas of things we have seen, or read, which the judgment has reflected on, to form it self a rule, or method.

Authors make three kinds of *experience*: the 1st. is the simple use of the external senses, whereby we perceive the phenomena of natural things, without any direct attention thereto, or making any application thereof.

The 2^d. is, when we premeditatedly, and designedly, make trials of various things, or observe those done by others; attending closely to all effects and circumstances.

The 3^d. is that preceded by a fore-knowledge, or at least, an apprehension of the event; and determines whether the apprehension were true or false.—Which two latter kinds, especially the third, are of great service in philosophy.

EXPERIMENT, in philosophy, a trial of the effect or result of certain applications, and motions of natural bodies; in order to discover something of the laws and relations thereof, or to ascertain some phenomenon, or its cause.

The schoolmen define *experiment*, a comparison of several things before observed by the senses, and retained in the memory; in some one similar convenient instance.

The nature of *experiment*, therefore, according to them, consists in comparing several things by one act; whence they distinguish two things in every *experiment*, the one *material*, viz. the several ideas remembered: the other *formal*, viz. the comparing of these ideas in the mind.

This will be illustrated by an example: a physician gives a quantity of rhubarb to ten several persons, and remembers each of them: now, coming afterwards to compare the several remembrances together, and finding the effect of the exhibition of rhubarb to be the same in all, viz. a purging; this is an *experiment* of rhubarb.

The making of *experiments*, is grown into a kind of formed art; and we now abound in systems of *experiments*, under the denomination of *courses of experimental philosophy.* Sturmius has made a curious collection of the principal discoveries and *experiments* of the last age, under the title of *collegium experimentalis.* The chemists chuse to call their *experiments*, by way of distinction, or eminence, *processes, or operations.*

TORRICELLIAN EXPERIMENT. See TORRICELLIAN.

EXPERIMENTAL *Philosophy*, by the Greeks called *ἐμπειρική*, or *ἐμπειρία*; is that which proceeds on *experiments*, or which deduces the laws of nature, and the properties and powers of bodies, and their actions upon each other, from sensible *experiments* and observations.

Experiments are of the utmost importance in philosophy; and the great advantages the modern physics have above the ancient, is chiefly owing to this, that we have a great many more *experiments*; and that we make more use of the *experiments* we have.

Their way of philosophizing was, to begin with the cause of things, and argue to the effects and phenomena; ours, on the contrary, proceeds from *experiments* and observations alone.

My lord Bacon first paved the way for the new philosophy, by setting on foot the making of *experiments.* His method has been prosecuted with laudable emulation by the academy del Cimento, the Royal Society, Royal Academy at Paris, and by Mr. Boyle, Sir Isaac Newton, and many others.

In effect, *experiments*, within these 50 or 60 years, are come into such a vogue, that nothing will pass in philosophy, but what is founded on *experiment*, or confirmed by *experiment*, &c. So that the new philosophy is almost altogether *experimental.*

Indeed, the ancients, whatever we commonly say to the contrary, seem to have thought as well of the *experimental* way, as the moderns. Plato misses no occasion of speaking of the advantages of the *ἐμπειρία*; and as to Aristotle, his history of animals may bear witness for him. Democritus's great business was to make *experiments*; and even Epicurus himself owes part of his glory to the same cause. Plato calls it, in respect to its subject, *εὐαθηρία*, subtlety of sense.

Yet there are some, even among the learned, who conceive of *experiments* in a different manner.—Dr. Keil allows, that philosophy has received very considerable advantages from the makers of *experiments*; but he complains of their dissingenuity, in too often wresting and distorting their *experiments*, and observations, to favour some darling theories they had espoused.—But this is not all: M. Hartsoecker, in his *Recueil de plusieurs pieces de physiques*, undertakes to shew, that they who employ themselves in the making of *experiments*, are not properly philosophers, but, as it were, the labourers, or operators of philosophers, who work under them, and for them, furnishing them with materials to build their systems and hypotheses upon.

The learned M. Dacier, in the beginning of his discourse on Plato, at the head of his translation of the works of that philosopher, deals still more severely with the makers of *experiments.* He breaks out with a sort of indignation, at a tribe of stily curious people, whose sole employ consists in making *experiments* on the gravity of the air, the equilibrium of fluids, the loadstone, &c. and yet arrogate to themselves the noble title of philosophers. See PHILOSOPHY.

EXPERIMENTAL *Physics.* See the article PHYSICS.

EXPERIMENTUM *Crucis*, denotes a capital, leading, or decisive experiment; thus called, either as, like a cross, or direction-post placed in the meeting of several roads, it guides and directs men to the true knowledge of the nature of the thing they are enquiring after: or, as it is a kind of torture, whereby the nature of the thing is as it were extorted by violence.

EXPIATION, the act of suffering the punishments adjudged to a man's crimes, and thus paying off, and discharging the debt, or guilt.

The Romanists hold, that souls, after death, are sent to purgatory, to *expiate*, or atone for their sins.

EXPIATION is also applied to sacrifices offered to the deity, to implore his mercy, and forgiveness.

The feast of EXPIATION, among the Jews, called by our translators the *day of atonement*, was held on the tenth day of the

7th month of the Jewish year, answering to our September.—It was instituted by God himself, Levit. xxiii. 27, &c. On that day, the high-priest, the figure or type of Jesus Christ, confessed his sins; and after several ceremonies, made an atonement for all the people to wash them from their sins.

EXPIATION, among the heathens, denoted a purification used for effacing, or abolishing a crime. It was practised with diverse ceremonies: the most usual was absolution.

Expiations were performed for whole cities, as well as particular Persons.—After the young Horatius had been absolved by the people from the murder of his sister; he was further purified by several *expiations* prescribed by the laws of the pontifices for involuntary murders. Halicarnass.

EXPIATION, in the civil law, the act of withdrawing, or diverting some thing belonging to an inheritance, before any body had declared himself heir thereof.

This made a peculiar species of theft: for there could not properly be a theft in taking a thing not possessed by any body; or ere the inheritance was accepted.

For this reason, the Roman legislature introduced the action of *expiation*, for the punishment of this crime.

EXPIRATION, in medicine, that motion in an animal, whereby the air, inspired into the lungs, is expelled, or thrown out of the fame, and the cavity of the breast contracted.

Respiration consists of two alternate motions, or actions of the lungs, corresponding to those of a pair of bellows; *inspiration*, whereby the air is drawn in; and *expiration*, whereby it is driven out again.

By means of this alternation, the circulation of the blood, and the motion of the heart are maintained.

EXPIRATION, is also used figuratively, for the end of a term of time granted, agreed on, or adjudged.

It is not above eight days, till the *expiration* of the term of his imprisonment: the time of such a bill of exchange is *expired*, i. e. it is fallen due. See BILL.

EXPLICITE, in the schools, something clear, distinct, formal, and unfolded.

The will, or intention, is said to be *explicite* when it is fully explained in proper terms; and *implicite*, when it is only to be learnt by deductions, and consequences.

The Jews had not all an *explicite* knowledge of Jesus Christ, but they had at least an *implicite* one.

Such a testator has declared his will *explicite*, i. e. in formal terms; there is no need to have recourse to explanations.

EXPLOSION, in physics, the act of a thing which drives another out of the place it before possessed.

The term is chiefly used for the going off of gun-powder, and the expulsion of the ball, shot, or the like, consequent thereon.

Hence, **EXPLOSION** comes likewise to be figuratively used to express such sudden actions of bodies, as have some resemblance hereto: *e. gr.* those which ferment with violence, immediately upon their mixture, and occasion a crackling sound.

Some writers have likewise applied *explosion* to the excursions of the animal spirits, and instantaneous motions of the nervous fibres arising without the direction of the mind: but the term here seems too figurative to express any determinate idea, so as really to inform the understanding.

EXPOLITION, in rhetoric, a figure, whereby we explain the same thing in different phrases, and expressions, in order to shew it more fully.

Expolition was the favourite figure of Balzac.—A man, but moderately versed in the style of scripture, will perceive that this is no more than an *expolition*; that is, a figure whereby the sacred author explains the same thing in different terms. The scriptures are full of such figures; and I scarce think there is any one more ordinary. Souciet.

EXPONAS Venditioni. See VENTIONI.

EXPONENT, in arithmetic. **EXPONENT of a power**, denotes the number which expresses the degree of the power; or which shews how often a given power is to be divided by its root, ere it be brought down to unity.

Thus the *exponent*, or index of a square number is 2; of a cube 3: the square being a power of the second degree; the cube of a third, &c.

EXPONENT, is also used in arithmetic, in the same sense with index, or logarithm.

Thus a series of numbers in arithmetical progression, being placed under another series in geometrical progression, are called the *exponents, indices, or logarithms* thereof.—*E. gr.* In the two progressions,

Geom. 1, 2, 4, 8, 16, 32, 64, 128, 256, 512

Arith. 0, 1, 2, 3, 4, 5, 6, 7, 8, 9

0 is the *exponent, index, or logarithm*, of the first term 1; 5 that of the 6th, 32, &c.

Hence, unity is the *exponent* of a power, as the logarithm of

the root, to the logarithm of its power: consequently, the logarithm of the power is had, by multiplying the logarithm of the root by its *exponent*; and the logarithm of the root is had, by dividing the logarithm of the power by its *exponent*.

EXPONENT of a ratio, is the quotient arising upon dividing the antecedent by the consequent.

Thus, in the ratio 3 to 2, the *exponent* is $1\frac{1}{2}$; and the *exponent* of the ratio 2 to 3, is $\frac{2}{3}$. See RATIO.

Hence, 1°. If the consequent be unity, the antecedent is the *exponent* of the ratio. Thus, *e. gr.* the *exponent* of the ratio 4 to 1, is 4.—And again: the *exponent* of a ratio is to unity, as the antecedent to the consequent,

2°. Since, in a rational ratio, the *exponent* of a ratio is had by dividing a rational number by another rational; the *exponent* of a rational ratio, is a rational number.

EXPONENTIAL Calculus, Calculus EXPONENTIALIS, is a method of differencing *exponential* quantities, and of summing up the differences of *exponentials*. See CALCULUS.

EXPONENTIAL Curve, is that which is defined by an *exponential equation*.

Exponential curves partake both of the nature of algebraic and transcendental ones; of the former, because they consist of a finite number of terms, though those terms themselves are indeterminate; and of the latter, because they cannot be algebraically constructed.

EXPONENTIAL Equation, is that wherein there is an *exponential* quantity. See EQUATION, &c.

EXPONENTIAL Quantity, is a power whose *exponent* is an indeterminate, or variable quantity.

Exponential quantities are of several degrees and orders; when the *exponent* is a simple indeterminate quantity, it is called an *exponential of the first or lowest degree*.

When the *exponent* it self is an *exponential* of the first degree, then the quantity is an *exponential of the second degree*.

Thus xy is an *exponential* of the first degree, because the quan-

ty y is a simple flowing quantity. But xy is an *exponential* quantity of the second degree; because y^2 is an *exponential* of

the first degree. So also xy is an *exponential* of the third de-

gree, the *exponent* yx being one of the second.

EXPORTATION, in commerce, the act of sending commodities out of one country into another. See COMMERCE.

The merchandizes yearly *exported* from England are immense.—The principal articles are corn, cattle, cloth, iron, lead, tin, leather, coal, hops, flax, hemp, hats, malt liquors, fish, watches, ribbands, &c.

The woollen manufactures alone, yearly *exported*, is computed to amount to 2000000 pound sterling; and lead, tin, and coals, to 500000 pound.

Wool, fullers earth, &c. are contraband goods, *i. e.* they are prohibited to be *exported*.—For the duties of *exportation*, see DUTY.

EXPOSING, the act of setting a thing to public view.

Perjury, forgery, libelling, false weights and measures are punished by *exposing* the criminal in the pillory, to the derision of the people.

In the Romish church, the sacrament is said to be *exposed*, when it is shewn in public, uncovered, on festival days, and during the time of plenary indulgences.

EXPOSING is also used with a further latitude: thus, we say, it is prohibited to *expose* false and clipped money.

Children are sometimes *exposed* in the streets; *i. e.* they are left in the streets, with design to be lost.

Such a house stands very high, and as a delicious prospect, but it is *exposed* to all the four winds. Such a city being on the frontiers, and not fortified, is *exposed* to the insults of every party of forces.

EXPOSITION, the act of *exposing*. See EXPOSING.

EXPOSITION is likewise applied to the interpretation, or explanation of an author, or a passage therein. See EXEGESIS.

Thus we say, an *exposition* of the 39 articles; of the Lord's Prayer, &c. See COMMENTARY, ANNOTATION, &c.

In this sense we do not say, *exposing*, but *expounding*.

EXPOSITION, in gardening. See EXPOSURE.

EXPOSITOR, or **EXPOSITORY**, a title which some writers have given to a lesser kind of dictionaries, or vocabularies, serving to expound, or explain the meaning of the hard words of a language.

EXPOSURE, or **EXPOSITION**, in gardening, the aspect, or situation of a garden, wall, building, or the like, with respect to the sun, wind, &c.

There are four regular kinds of *exposures*, *viz. east, west, north, and south*: but it must be observed, that among gardeners, these terms signify just the contrary to what they do among geographers.

The gardeners, in effect, do not give the names *east*, *west*, &c. to the places where the sun is; but to those whereon he shines; and they consider the manner wherein he shines, whether as to the whole garden, or some one of its sides. If they find, that the sun at his rising, and during the first half of the day, continues to shine on one side of a garden or wall; they call that an *eastern exposure*, or *east wall*, &c. And if the sun begin to shine later, or end sooner, it is not a proper *eastern exposure*.

For the same reason, they call the *west*, the side the sun shines on in the latter half of the day, *i. e.* from noon to night. And accordingly, the *south*, or *southern exposure*, is the place whereon he shines, from about nine o'clock in the morning, till night; or which, in the general, he shines longest on in the whole day: and the part he shines least on, is the *north*, or *northern exposures*, at what hour soever it begin or end, being usually from 11 o'clock to 1.

Such is the gardeners language with regard to the *exposures*, and particularly those of walls; by which we are let into the signification of this or the like expression, usual among them.—My east wall proves, hits, or thrives better, than my west. My eastern fruit-trees have had fewer flowers than my western, &c. The *eastern* and *southern exposures* are, by common consent of all gardeners, the two principal; and have a considerable advantage above the rest. A *west exposure* is not much amiss; at least, it is better than a northern one, which is the worst of all. Each has its inconveniencies.

The eastern, commencing differently at different seasons of the year and ending about noon, subjects the trees, &c. to the N. E. winds, which wither the leaves and new shoots, blow down the fruit, &c. beside that it has little benefit of rains, which come mostly from the west. Yet does the reverend Mr. Lawrence judge the east, better than the west wall, for all kinds of fruit: not that it has more hours of sun, or that there are any peculiar virtues in the eastern rays, but because the early rays of the sun do sooner take off the cold chilly dews of the night.

M. Gentil recommends the *eastern exposure* as best for all kinds of peaches; adding, that they ripen sooner, grow bigger, are better coloured, and of a finer taste than in any other: But Mr. Carpenter restrains the rule to the early and middle sorts: for the backward, he rather chuses a *southern*, or *south-east exposure*, which is best for all late fruits; because the influence of the sun is strongest, and continues longest therein.

The *western*, accounted from half an hour past 11, till sunset, is backwarder than an *eastern* one by 8 or 10 days; but it has this advantage, that it receives little damage from the frosts, which melt before the sun comes to shine upon the fruit, and fall off like dew, without doing any prejudice: so that it may bear apricots, peaches, pears, and plums. But it is incommoded with north west winds in the spring, as also with the autumnal winds, which blow down a deal of fruit.

The *northern exposure* has less sun than the west; yet is it not without its advantages. In the northerly parts of England, it bears little but pears, cherries, and plums. But in the warmer parts it serves for apricots, which have the advantage of continuing later, than in any other *exposure*, besides being free from insects.

The *southern exposure*, accounted from about 9 till 4, is recommended for peaches, pears, grapes, and plums.

EXPRESS, something that is precise, in formal terms, or for some particular design.—I told him as much in *express* terms: he gave me a commission *express*: he had *express* orders. A courier was dispatched *express*.

We also say, somewhat abusively, to send an *express*, meaning a courier.

EXPRESSED Oils, are such as are procured from bodies only by pressing; as the oils of olives, almonds, and the like. See **OIL**.

EXPRESSED Species. See the article **SPECIES**.

EXPRESSON, in medicine, chemistry, &c. the act of *expressing*, or extracting the juices of plants, fruits, or other matters, by squeezing, wringing, or pressing them in a press. After having let the herbs infuse a due time, their juice must be drawn by *expression* in a linen cloth, or by a press.

EXPRESSION, in oratory, denotes the manner of delivering, or conveying a man's ideas to another.

EXPRESSION is more particularly used for the elocution, diction, and choice of words in a discourse.

It is not enough a poet, or orator, have fine thoughts, he must likewise have a *happy expression*: defects in the *expression* ordinarily arise from defects in the imagination: abundance of the beauties of the ancient writers, are annexed either to *expressions* which are peculiar to their language; or to relations, which not being so familiar to us as to them, do not give us the same pleasure. De la Motte.

EXPRESSION, denotes in painting, a natural and lively representation of the subject, or of the several objects intended to be shewn.

of the subject, or of the several objects intended to be shewn.

The *expression* consists principally in representing the human body, and all its parts in the action suitable to it; in exhibiting in the face, the several passions proper to the figures; and observing the motions they impress on the other external parts. The term *expression*, is ordinarily confounded with that of *passion*: but they differ in this, that *expression* is a general term, implying a representation of an object, agreeably to its nature and character, and the use, or office it is to have in the work; whereas *passion*, in painting, denotes a motion of the body, accompanied with certain dispositions, or airs of the face, which mark an agitation in the soul. So that every passion is an *expression*; but not every *expression* a passion.

Laws, or rules of EXPRESSION in painting.—*Expression*, we have said, is a representation of things according to their character; and may be considered either with respect to the subject in general; or to the passions peculiar thereto.

I. With regard to the subject, it is to be observed, 1^o. That all the parts of the composition are to be transformed, or reduced, to the character of the subject: so as they may conspire to impress the same sentiment, passion, or idea: thus, *e. gr.* in a representation of joy and peace, every thing is to appear calm and agreeable; of war, turbulent, and full of terror, &c.

2^o. In order to this, if any circumstance occur in history, or description, that would invert, or take from the idea; it must be suppressed; unless essential to the subject.

3^o. To this end, the history, or fable, is to be well studied in the authors who describe it, in order to conceive its nature and character truly, and impress it strongly on the imagination; that it may be diffused and carried through all the parts of the subject.

4^o. A liberty is to be taken of chusing favourable incidents, in order to diversify the *expression*; provided they be not contrary to the principal image of the subject, or the truth of history.

5^o. The harmony of the *tout ensemble* to be particularly regarded, both with regard to the actions, and the light and colour.

6^o. The modes and customs to be observed; and every thing made conformable to time, place, and quality.

7^o. The three unities of time, place, and action, to be observed: that is, nothing to be represented in the same picture, but what passes at the same time, and may be seen at the same view.

II. With regard to the particular passions and affections of the subject; the rules are, 1^o. That the passions of brutes are few and simple, and have almost all an immediate respect, either to self-preservation, or the propagation of the kind: but, in men, there is more variety; and accordingly, more marks and *expressions* thereof. Hence, man can move his eye-brows, which, in brutes, are immovable: and can likewise move the pupil every way, which brutes cannot.

2^o. Children, having not the use of reason, act much on the footing of brutes; and *express* the motions of their passions directly, and without fear or disguise.

3^o. Though the passions of the soul may be *expressed* by the actions of the body; it is in the face they are principally shewn; and particularly in the turn of the eye, and the motion of the eye-brows.

4^o. There are two ways of lifting up the eye-brows, the one at the middle, which likewise draws up the corners of the mouth, and argues pleasant motions: the other at the point next the nose, which draws up the middle of the mouth, and is the effect of grief and sadness.

5^o. The passions are all reducible to joy and sadness; each of which is either simple, or mixed and passionate.

6^o. Simple joy causes a dilatation of all the parts: the eye-brows rise in the middle, the eyes half open, and smiling, the pupil sparkling and moist, the nostrils a little open, the cheeks full, the corners of the mouth drawn a little upwards, the lips red, the complexion lively, and the forehead serene.

7^o. Passionate joy proceeding from love, shews the forehead smooth and even, the eye-brows a little elevated on the side the pupil is turned to, the eyes sparkling and open, the head inclined towards the object, the air of the face smiling, and the complexion ruddy.—That proceeding from desire, shews itself by the body, the arms being extended towards the object, in uncertain and inquiet motions.

8^o. Simple sadness, is *expressed* by the body being cast down, the head carelessly hanging aside, the forehead wrinkled, the eye-brows raised to the midst of the forehead, the eyes half shut, the mouth a little open, the corners downwards, the under lip pointing and drawn back, the nostrils swelled, and drawn downwards.—Sadness mixed with fear, causes the parts to contract and palpitate, the members to tremble and fold up, the visage to be pale and livid, the point of the nostrils elevated, the pupil in the middle of the eye, the mouth open

at the sides, and the under-lip drawn back.—In that mixed with anger, the motions are more violent, the parts all agitated, the muscles swelled, the pupil wild and sparkling, the point of the eye-brows fixed towards the nose, the nostrils open, the lips big, and pressed down, the corners of the mouth a little open and foaming, the veins swelled, and the hair erect.—That with despair, resembles the last, only it is more excessive and disordered.

9°. The hand has a great share in the *expression* of our sentiments and passions: the raising of the hands conjoined towards heaven, *expresses* devotion; wringing the hands, grief: throwing them towards heaven, admiration: fainting, and dejected hands, amazement and despair: holding the hands, idleness: holding the fingers indented, musing: holding forth the hands together, yielding and submission; lifting up the hand and eye to heaven, calling God to witness: waving the hand from us, prohibition: extending the right hand to any one, pity, peace, and safety: scratching the head, thoughtfulness and care: laying the hand on the heart, solemn affirmation; holding up the thumb, approbation: laying the fore-finger on the mouth, bidding silence: giving with the finger and thumb *parce dare*: and the fore-finger put forth, the rest contracted, *monstrari & dicere hic est*.

10°. The sex of the figure is to be regarded; and man, as he is of a more vigorous and resolute nature, is to appear in all his actions freer and bolder than women, who are to be more reserved and tender.

11° So also the age, the different stages whereof incline to different motions both of body and mind.

12° The condition, or honours, a person is invested withal, render their actions more reserved, and their motions more grave; contrary to the populace, who observe little conduct or restraint; giving themselves, for the most part, up to their passions: whence their external motions become rude and disorderly.

Lastly, in spirits we must retrench all those corruptible things, which serve only for the preservation of life, as veins, arteries, &c. only retaining what may serve for the form and beauty of the body.—In angels, particularly, as being symbolical figures, we are to mark out their offices and virtues, without any draught of sensual passions; only appropriating their characters to their functions of power, activity, and contemplation.

EXPULSION, the act of driving a man by force out of a city, community, or the like.

We say, *expulsion* out of parliament.—Milton is upbraided by archbishop Bramhall, with his *expulsion* from the university of Cambridge; but he shews it a groundless suggestion.—Mr. . . . was expelled from Cambridge, on suspicion of heresy, &c.

EXPULSION, is also used in medicine, for the act of driving out a foreign body with violence, from the place it was in.

The uterus has the chief office in the *expulsion* of the fœtus: if the *expulsion* of the fœtus happen very soon after conception, it is called a *false birth*. See **FŒTUS** and **DELIVERY**.

EXPURGATION, in astronomy, is used by some authors, for that state or action of the sun, wherein, after having been eclipsed and hid by the interposition of the moon, it begins to appear again.

Later astronomers call this *emersion*, not *expurgation*.

EXSICCATION*, in chemistry, &c. the act of drying up, or evaporating the moisture of a thing.

* The word is Latin, formed of *ex*, and *sicca*, dry.

EXSORS *Particula*. See the article **PARTICULA**.

EXTANT, something that still subsists, or is in being.

It is but part of the history of Livy, of the writings of Cicero, Cæsar, &c. that are *extant*; the rest are lost. We have nothing *extant* of Socrates; though he wrote a great deal.

EXTASY, *Extasis*, a rapture, or removal of the mind out of its natural state and situation: or, a transport, whereby a person is hurried out of himself, and the office of his senses are suspended.

In ecclesiastical history, we read of diverse monkish saints being in *extases* for several days successively.—St. Paul's being taken up into the third heaven, was what we call an *extasy*.

EXTASY, in medicine, is considered as a disease, near a-kin to a catalepsy; only differing from it in this, that the cataleptic patient has no perception of what passes in his paroxysm, nor any remembrance thereof when it is over; whereas the *extatic* is taken up with a very lively idea, or imagination, which he remembers afterwards.

In an *extasy*, there must be an unusual tension of the fibres of the sensory, as in most deliriums, &c.

EXTEMPORANEOUS *Prescription*. See **PRESCRIPTION**.

EXTENDENDA *Terra*. See the article **TERRA**.

EXTENDING, in a legal sense, signifies the valuing of lands and tenements, of one bound by statute, &c. and who hath forfeited his bond, at such an indifferent rate, as that by the yearly rent, the obligator may, in time, be fully paid his debt. See **EXTENT**.

EXTENSION, in physics, that whereby a thing is constituted long, broad, or thick, &c.

Extension is usually described, as consisting in the situation of parts, beyond parts; which some authors cavil withal, as holding, that we can conceive absolute *extension*, without any relation to parts.

If a man consider the distance between two bodies, abstractedly, and without any regard to bodies which may fill that interval, it is called *space*: and when he considers the distance between the extremes of a solid body, it is called *extension*.

Extension is frequently confounded with quantity and magnitude; and, for what we can perceive, without much harm: the thing signified by them all appearing to be the same. Unless we admit a distinction made by some authors, that the *extension* of a body is something more absolute; and its quantity and magnitude more relative, or implying a nearer relation to much and little. See **QUANTITY**, **MAGNITUDE**, and **MASS**.

EXTENSOR, in anatomy, a name common to diverse muscles, serving to extend, or stretch out the parts; and particularly the hands and feet: such are the

EXTENSOR Carpi Ulnaris, called also *cubiteus internus*, a muscle, which coming from the internal protuberance of the humerus, and passing tendinous under the ligamentum annulare, is inserted into the upper part of the bone of the metacarpium, which answers to the little finger. This, and the ulnaris flexor, moving together, draw the hand side-wise towards the ulna.—See *Tab. Anat. (Myol.) fig. 8. n. 16*.

EXTENSOR Carpi Radialis, called also *radiceus externus*, and *bicornis*, is really two distinct muscles. The first arises from above the external protuberance of the humerus; and the second from the lowermost part of the external protuberance. They both lie along the external part of the radius, and passing under the annular ligament, one is inserted into the bone of the metacarpus, that sustains the fore-finger; and the other to that which sustains the middle-finger. These two extend the wrist.—See *Tab. Anat. (Myol.) fig. 1. n. 19*.

EXTENSOR Communis digitorum manus, arises from the external protuberance of the humerus, and at the wrist divides into three flat tendons, which pass under the annular ligament, to be inserted into all the bones of the fore, middle, and ring-finger.—See *Tab. Anat. (Myol.) fig. 1. n. 36. fig. 6. n. 26*.

EXTENSOR Primi internodii pollicis, arises from the upper and external part of the ulna, and passing obliquely over the tendon of the *radiceus externus*, is inserted near the second joint of the thumb.

EXTENSOR Secundi internodii pollicis, arises from the upper and internal part of the radius, and is inserted into the upper part of the second bone of the thumb.

EXTENSOR Tertii internodii pollicis, arises from the ulna, a little below the first extensor, and is inserted into the third bone of the thumb.

EXTENSOR Indicis, comes from the middle and external part of the ulna, and passing under the annular ligament, is inserted into the third bone of the fore-finger, where it joins the extensor communis.

EXTENSOR Minimi digiti, arises from the external protuberance of the humerus, and from the upper part of the ulna; and passing under the annular ligament, is inserted the third bone of the little finger.—See *Tab. Anat. (Myol.) fig. 1. n. 37. and fig. 6. n. 17*.

EXTENSOR Digitorum pedis longus, is a muscle derived from the fore part of the upper epiphysis of the tibia, and growing tendinous about the middle thereof, it runs in four tendons under the annular ligament, to the third bone of every toe, except the pollex.—See *Tab. Anat. (Myol.) fig. 2. n. 45. fig. 1. n. 64*.

EXTENSOR Digitorum pedis brevis, comes from the exterior and fore part of the calcaneum, and goes to the second joint of the toes.—See *Tab. Anat. (Myol.) fig. 1. n. 73*.

EXTENSOR Pollicis pedis longus, rises large and fleshy from the fore part of the scapula, a little below its upper process; whence, passing under the annular ligament, it is inserted into the upper part of the second bone of the great toe.—See *Tab. Anat. (Myol.) fig. 1. n. 71*.

EXTENSOR Pollicis pedis brevis, springs fleshy from the fore part of the os calcis, and after a short belly, is contracted into a slender tendon; which running obliquely over the upper part of the foot, is inserted into the second bone of the great toe.—See *Tab. Anat. (Myol.) fig. 1. n. 75. fig. 2. n. 51*.

EXTENT, in law, sometimes denotes a writ, or commission to the sheriff, for the valuing of lands and tenements: sometimes the act of the sheriff upon this writ; and sometimes the estimate, or valuation of lands, *per proprios viros*. *Fleta*, l. 2.

EXTENUATION, the act of diminishing, or lessening the bulk, or substance of a thing, especially of the human body. Fevers, agues, long abstinences, &c. occasion great *extenuations*, or emaciations.

EXTENUATION, is also a figure in rhetoric, opposite to the hyperbole.—The Greeks call it *ἀλλομ.*

EXTERIOR Polygon. } See the articles { **POLYGON.**
EXTERIOR Talus. } **TALUS, &c.**

EXTIRPATION *, the act of *extirpating*, or totally destroying a people, race, family, &c.

* The word is Latin, formed of *ex* and *terminus*, boundary.

The Jews have been *exterminated* out of Portugal; the Moors out of Spain; the Albigenes out of France, &c. Philip the Fair of France, to be revenged on the Knights Templars, took a resolution in 1307, to *exterminate* them.

EXTERNAL, or **EXTERIOR**, a term of relation, applied to the surface, or out-side of a body; or that part which appears, or presents it self to the eye, touch, &c.

In which sense it is exposed to *internal*, or *interior*.

External medicines are also called *local medicines*, and *topics*.

The senses are divided into *external*, which are those whereby we perceive ideas, or have the perception of *external* objects; as seeing, hearing, &c. and *internal*. See **SENSE**.

EXTERNAL, is also used to express any thing that is without-side a man, or that is not within him, and particularly in his mind. In which sense, we say *external objects*, &c.

The existence of an *external world*, i. e. of bodies and objects, out of the mind, is a thing has been greatly called in question of late. See **EXISTENCE**, and **BODY**.

In reality, 'were it possible for bodies, i. e. solid, figured, &c. substances to exist without the mind, corresponding to those ideas we have of *external* objects, yet how were it possible for us to know it? either we must know it by sense, or reason: as for our senses, by them we have only the knowledge of our sensations or ideas: they do not inform us that things exist without the mind, or unperceived, like those which are perceived. It remains, therefore, that if we have any knowledge at all of *external* things, it must be by reason, inferring their existence from what is immediately perceived by sense. But how shall reason induce us to believe the existence of bodies without the mind, when the patrons of matter themselves deny that there is any necessary connection betwixt them and our ideas. In effect, it is granted on all hands, that what happens in dreams, phrenzies, deliriums, extasies, &c. puts it beyond dispute, that we might be affected with all the ideas we have now, though there were no bodies existing without, resembling them.

Hence, it is evident, the supposition of *external* bodies is not necessary for the production of our ideas.' Berkel.

Princ. of Human Know. p. 59.

Granting the materialists their *external* bodies, they by their own confession, are never the nearer knowing how our ideas are produced; since they own themselves unable to comprehend in what manner body can act upon spirit; or how it is possible it should imprint any idea in the mind. Hence, the production of ideas, or sensations, in our minds, can be no reason why we should suppose matter, or corporeal substances; since that is equally inexplicable with or without the supposition. In short, though there were *external* bodies, it is impossible we should ever come to know it; and if there were none, we should have the same cause to think there were that we now have.' *Id. Ibid.* p. 60, 61.

Try, whether you can conceive it possible for a sound, or figure, or motion, or colour, to exist without the mind, or unperceived. This may perhaps convince you, that what you contend for, is a downright contradiction.—I am content to put the whole upon this issue: if you can but conceive it possible for one extended, moveable substance, or, in general, for any one idea to exist otherwise than in a mind perceiving it; I shall readily give up the cause.' *Id. Ibid.* p. 63.

It is worth while to reflect a little on the motives which induced men to suppose the existence of material substance; that so, having observed the gradual ceasing and expiration of those motives, we may withdraw the assent grounded on them. First, therefore, it was thought that colour, figure, motion, and the rest of the sensible qualities, did really exist without the mind; and for this reason, it seemed necessary to suppose some unthinking substratum, or substance, wherein they did exist, since they could not be conceived to subsist by themselves. Afterwards in process of time, men being convinced that colours, sounds, and the rest of the sensible secondary qualities had no existence without the mind; they stripped this substratum of these qualities, leaving only the primary ones, figure, motion,

&c. which they still conceived to exist without the mind; and consequently to stand in need of a material support.

But having shewn above, that none, even of these, can possibly exist otherwise than in a spirit, or mind, which perceives them, it follows, that we have no longer any reason to suppose the being of matter.' *Id. Ibid.* p. 118, 119. See **QUALITY**.

EXTERNAL Denomination. } See { **DENOMINATION.**
EXTERNAL Modes. } **MODE.**
EXTERNAL Place. } **PLACE.**

EXTERNAL Angles, are the angles of any right-lined figure formed without it, when all the sides are severally produced. These are all, taken together, equal to four right angles.—Particularly, in a triangle, the *external* angle DOA (*Tab. Geometry, fig. 76.*) is equal to both the internal and opposite ones z and y. See **TRIANGLE**.

EXTERNAL Beauty. } See { **BEAUTY.**
EXTERNAL Ear. } **EAR, and AURICLE.**

EXTERNUS Auris, in anatomy, a small muscle coming from the side of the meatus auditorius, to the short process of the malleus; serving to draw the handle thereof downwards, and so to relax the membrana tympani. See **EAR**.

EXTERNUS Brachiius. } **BRACHIIUS.**
EXTERNUS Cubiti. } **CUBITUS.**
EXTERNUS Gastrocnemius. } **GASTROCNEMIUS.**
EXTERNUS Iliacus. } **ILIIACUS.**
EXTERNUS Orbitis. } **ORBITER.**
EXTERNUS Pterygoideus. } **PTERYGOIDEUS.**
EXTERNUS Vastus. } **VASTUS.**
EXTERNUS Rectus Capitis. } **RECTUS.**

EXTINCTION, the act of *extinguishing*, that is, of putting out, or destroying fire, flame, or light.

Boerhaave denies, that there is properly any such thing as *extinguishing* of fire: it is a body *sui generis*, of an immutable nature, and we can no more *extinguish*, or destroy it, than we can create it.

The Aristotelians account for the *extinction* of fire from the principle of contrariety; thus say they, water puts out fire, by reason the qualities of water are contrary to those of fire; the one being cold, and moist, and the other, hot and dry. But how far this will go, may appear hence, that fire is extinguished by hot water as readily as cold; may even by oil, earth, &c.

Some of the moderns offer two more plausible causes of *extinction*, viz. *dissipation*, as when the next, immediate fuel of the flame, is dispersed and blown off by too forcible a wind: and *suffocation*, when it is so compressed, as that its free motion cannot be maintained; as happens upon throwing water &c. thereon.

EXTINCTION, in chemistry, and pharmacy, is when a metal, mineral, or the like body, after having been heated red-hot in the fire, is plunged in some fluid; either to soften or temper its acrimony, as tully in rose-water; or to communicate its virtue to the liquor, as iron or steel to common water; or, lastly, to give it a temper, as in the *extinction* of steel in water, or some other preparation.

EXTINGUISHMENT, in law, is used for a *consolidation*. Thus, if a man, having a yearly rent due to him out of my lands, afterwards purchase the same lands; both the property and rent becoming consolidated, or united in one possessor, the rent is said to be *extinguished*.

So, where a man has a lease for years, and afterwards buys the property, there is a *consolidation* of the property, and an *extinguishment* of the lease.

So also if there be lord mesn, and tenant, and the lord purchase the tenancy, the mesnalty is *extinct*.

EXTIRPATION *, the act of pulling up, or destroying a thing to the very roots.

* The word is formed of the Latin *ex*, and *stirps*, root.

Dogs grass is a weed very difficult to *extirpate*.—Among the prayers of the Romish jubilee, there is one for the *extirpation* of heresy.

EXTIRPATION, is also used in chirurgery, for the cutting off any part entirely; as a wen, &c. or the eating it away, as a wart, &c. by corrosive medicines. See **AMPUTATION**, and **CORROSION**.

EXTISPEX *, in antiquity, an officer who viewed, and examined the entrails of victims; in order to draw presages therefrom as to futurity.

* The word is formed of the Latin *exta*, and *spicere*, of *spicio*, I view, consider.

This kind of divination, called *extispicium*, was mightily in vogue throughout Greece, where there were two families, the Jamidae and Clytidae, consecrated, or set apart, peculiarly for it.

In Italy, the first *extispices* were the Hetrurians; among whom,

whom, likewise, the art was in great repute. Lucan gives us a fine description of one of these operations in his first book.

EXTORTION, in law, an illegal manner of wresting any thing from a man, either by force, menace, or authority.

If an officer, by terrifying, or spurning upon another on pretence of his office, takes more than his ordinary fees, or dues, he commits, and is indictable for *extortion*.

So the exacting of unlawful usury, winning by unlawful game, and, in time, all taking of more than is justly due by colour, or pretence of right, as excessive tolls in millers, excessive prices of ale, bread, victuals, wares, &c. come under *extortion*.

Crompton says, that wrong done by any man, is properly a trespass, but excessive wrong is *extortion*; which is most properly applicable to sheriffs, mayors, bailiffs, and other officers, who, by colour of their office, greatly oppress and wrong the king's subjects, by taking excessive rewards, or fees, for executing their office.

EXTRA-JUDICIAL, something done out of the proper court, or the ordinary course of law.—As when judgment is given in a cause, or case, not depending in that court where such judgment is given, or wherein the judge has not jurisdiction.

EXTRA-PAROCIAL, a place out of the bounds of any parish; or privileged, and freed from the duties of a parish.

EXTRACT, **EXTRACTUM**, in pharmacy, the purest, and finest part of a vegetable, or other body, separated from the coarser, by dissolution and digestion with a proper menstruum; and afterwards reduced into a thick, moist consistence by distillation, or evaporation of the humidity of the menstruum.

EXTRACT, in matters of literature denotes a short abridgement of a book, or paper, or of some of the matters thereof. The journals, nouvelles, biliotheques, memoirs, and other monthly or quarterly accounts of the affairs of learning, consist principally of *extracts* of the most material passages, doctrines, &c. found in the several books, published in that time.

EXTRACTI ab Ecclesia. See **RESTITUTIONE Extracti**.

EXTRACTION, in pharmacy and chemistry, an operation, whereby essences, tinctures, &c. are drawn from natural bodies.

Some will have *extraction* to signify any solution made by menstrua: but, in strictness, there is this difference; that in *solution* the menstruum absorbs the whole substance of the body, but in *extraction* it carries off only a certain part of it; and in this sense, camphire is dissolved in spirit of wine, but jalap is more properly said to be *extracted*; for the resin is only taken out by the menstruum, the other particles being left untouched.

EXTRACTION also frequently signifies such an inspissation, or thickening of a solution, so that a certain quantity of the menstruum being drawn off, the remaining mixture is reduced to the consistency of honey; as in the *extracts* of saffron, gentian, and the like.

Extracts are chiefly made from vegetables, and require different menstrua, according to the different nature of the plants; especially the gummy kind: for such as are mucilaginous, as gum arabic, and tragacanth, &c. are not easily dissolved but in aqueous liquors; whereas resinous gums, as galbanum, scammony, &c. must have burning spirits to dissolve them.

There are others again of a middle nature, which may be dissolved in either sort of menstrua, though not so easily in one as the other: thus aloes, and rhubarb, which are somewhat resinous, are better made into *extracts* of spirit of wine, than water: but plants, which abound less with resin, such as hellebore, &c. are more commodiously *extracted* with water.

To perform *extraction* therefore aright, a proper menstruum is necessary, and one which is as near a-kin as possible to the body to be *extracted*.

EXTRACTION, in chirurgery, denotes an operation whereby some foreign matter lodged in the body, contrary to the order of nature, is drawn out of the same by manual application, or the help of instruments.

Such is the *extraction* of a stone, formed in the bladder, or in the kidneys, &c.

Extraction belongs to the *exarsis*, as a species to its genus. See **EXARESIS**.

EXTRACTION, or **Descent**, in genealogy, denotes the stock, or family which a person is descended from.

In some military orders, chapters, &c. a candidate must make proof of the nobility of his *extraction* before he is admitted.

EXTRACTION of Roots, the method of finding the roots of given numbers, or quantities. See **ROOT**.

The square, cube, and other powers of a number, or root, are formed by multiplying the given number into itself a greater, or less number of times, as the power required is higher or lower. See **POWER**.

This multiplication compounds the powers; and the *extraction* of the root decomposes them again, or reduces them

to their first principles or roots. So that the *extraction* of the root is to the multiplication of the power, what the analysis is to the synthesis.

Thus, 4, multiplied by 4, produces 16; which is the square of 4, or the factum of 4 by it self: and 16, multiplied by 4, makes 64, which is the cube of 4, or the factum of 4 by its square:—Such is the composition of powers.

Again, the square root of 16 is 4, by reason 4 is the quotient of 16 divided by 4; and the cube root of 64 is likewise 4, by reason 4 is the quotient of 64 divided by the square of 4:—Such is the *extraction* of roots.

Hence, to *extract* the root out of a given power, is the same thing as to find a number, *e. gr.* 4, which being multiplied a certain number of times into itself, produces the given power, *e. gr.* 16 or 64.

For the *extraction* of square and cube roots, it is necessary to have the squares, and cubes of all the digits in readiness; as exhibited in the following table.

Roots	1	2	3	4	5	6	7	8	9
Square	1	4	9	16	25	36	49	64	81
Cubic	1	8	27	64	125	216	343	512	729

To extract the square root out of a given number.—1°. Divide the given number into classes, of two figures a-piece; and include each class between two dots, commencing with the place of units, or the right hand figure: the root will consist of so many parts, or figures, as you have classes.—By the way observe, it may happen that for the last class on the left hand there shall only be one figure left.

2°. Then the left hand class being the square of the first figure of the root sought; look in the table of roots for the square root answering to that number: or, if that square number be not precisely there, to the next lesser number: this root write down for the first figure of the quotient: and subtract its square from the left hand class.—2° the remainder, bring down the next class toward the right.

3°. Write down the double or the quotient-figure under the left hand figure of the second class; and seek how oft this decuple is contained in the figure over it: the quotient gives the second figure of the root.

4°. Write the same quotient under the right hand figure of the same class; and subtract the product of the whole number underwritten, multiplied by the first figure of the root, from the number over it, as in division.

5°. The operation being repeated according to the third and fourth steps, *i. e.* the remainder being still divided by the double of the root so far as *extracted*, and from the remainder, the square of the figure that last came out, with the decuple of that foresaid divisor augmented thereby, being subtracted; you will have the root required.

E. gr. To *extract* the root of 99856, point it after the following manner, 99856, then seek a number, whose square shall equal the first figure 9, *viz.* 3, and write it in the quotient; then having subtracted from 9, 3 x 3, or 9, there will remain 0; to which set down the figures as far as the next point, *viz.* 98 for the following operation.

Then, taking no notice of the last figure 8, say, how many times is the double of 3, 99856 (316
9
098
61
3756
3756
0
31, or 62, contained in 375 (which may be guessed at from the initial figures 6 and 37, by taking notice how many times 6 is contained in 37?) Answer 6; and writing 6 in the quotient, subtract 6 x 626, or 3756, and there will remain 0; whence it appears, that the business is done, the root coming out 316.
Otherwise, with the divisors set down, it will stand thus:

99856 (316
9
6) 98
61
62) 3756
3756
0

o. And so in others. Again,

E X T

E X T

Again, if you were to *extract* the root out of 22178791 : 22178791 (4709, 43637, &c.

16
 617
 609

 88791
 84681

 411000
 376736

 3426400
 2825649

 60075100
 56513196

 356190400
 282566169

 73624231

the root, *viz.* neglecting the last figure 7, say, how many times 8 is contained in 61? Answer, 7; wherefore write 7 in the quotient, and from 617, take the product of 7 into 87, or 609, and there will remain 8, to which join the two next figures 87, and you will have 887; by the division whereof by the double of 47, or 94, you are to obtain the third figure; in order to which say, how many times is 94 contained in 88? Answer 0; wherefore write 0 in the quotient, and adjoin the two last figures 91, and you will have 88791, by whose division by the double of 470, or 940, you are to obtain the last figure, *viz.* say, how many times 940 is in 8879? Answer 9; wherefore write 9 in the quotient, and you will have the root 4709. But since the product 9 x 9409, or 84681, subtracted from 88791 leaves 4110, the number 4709 is not the root of the number 22178791 precisely, but a little less.

If then it be required to have the root approach nearer; carry on the operation in decimals, by adding to the remainder two cyphers in each operation. Thus the remainder 4110, having two cyphers added to it, becomes 411000; by the division whereof, by the double of 4709, or 9418, you will have the first decimal figure 4. Then having writ 4 in the quotient, subtract 4 x 94184, or 376736, from 411000, and there will remain 34264. And so having added two more cyphers, the work may be carried on at pleasure, the root at length coming out 4709, 43637, &c.

But when the root is carried on half way or above, the rest of the figures may be obtained by division alone: as in this example, if you had a mind to *extract* the root to nine figures, after the five former 4709,4 are *extracted*, the four latter may be had, by dividing the remainder by the double of 4709,4.

Thus, if the root of 32976, were to be *extracted* to five places, in numbers; after the figures are pointed, write 1 in the quotient, as being the figure whose square is 1 x 1, or 1, is the greatest that is contained in 3, the figure to the first point; and having taken the square of 1 from 3, there will remain 2; then having set the two next figures, *viz.* 29 to it, (*viz.* to 2) seek how many times the double of 1, *viz.* 2, is contained in 29, and you will find indeed that it is contained more than 10 times; but you are never to take your divisor 10 times, no, nor 9 times in this case; because the product of 9 x 29, or 261, is greater than 299, from which it would be to be taken, or subtracted: wherefore write only 8. And then having wrote 8 in the quotient, and subtracted 8 x 28, or 224, there will remain 5; and having set down to this the figures 76, seek how many times the double of 18, or 36, is contained in 57; and you will find 1, and so write 1 in the quotient; and having subtracted 1 x 361, or 361, from 576, there will remain 215. Lastly, to obtain the remaining figures, divide this number 215, by the double of 181, *viz.* 362, and you will have the figures 59, which being writ in the quotient, give the root 181, 59.

After the same manner are roots *extracted* out of decimal numbers.—Thus the root of 32976 is 181,59; and the root of 3,2976 is 1,8159; and the root of 0,032976, is 0,18159, and so on. But the root of 3297,6 is 57, 4247; and the root of 32,976 is 5,74247. And thus the root of 9,9856 is 3,16.

To *extract* the other, or higher root, out of a given number.—The *extraction* of the cubic root, and of all other roots may be comprehended under one general rule, *viz.* every third

figure, beginning from unity, is first to be pointed; if the root to be *extracted* be a cubic one; or every fifth, if it be a quadrato-cubic, (or of the fifth power) and then such a figure is to be writ in the quotient, whose greatest power (that is, whose cube, if it be a cubic power, or whose quadrato-cubic, if it be the fifth power, &c.) shall either be equal to the figure, or figures, before the first point, or next less under them; and then having subtracted that power, the next figure will be found by dividing the remainder augmented by the next figure of the resolvend, by the next left power of the quotient multiplied by the index of the power to be *extracted*, that is, be the triple square, if the root be a cubic one; or by the quintuple biquadrate (that is, five times the biquadrate) if the root be of the fifth power, &c. And having again subtracted the power of the whole quotient from the first resolvend, the third figure will be found by dividing that remainder, augmented by the next figure of the resolvend, by the next lesser power of the whole quotient; multiplied by the index of the power to be *extracted*.

Thus, to *extract* the cube root of 13312053, the number is first to be pointed after this manner, *viz.* 13312053, then you are to write the figure 2, whose cube is 8, in the first place of the quotient, as, that which is the next lesser cube to the figures 13, (which is not a perfect cube number) or as far as the first point; and having subtracted that cube, there will remain 5;

which being augmented by the next figure of the resolvend 3, and divided by the triple square of the quotient 2, by seeking how many times 3 x 4, or 12 is contained in 53, it gives 4 for the second figure of the quotient. But since the cube of the quotient 24, *viz.* 13824, would come out too great to be subtracted from the figures 13312 that precede the second point, there must only 3 be writ in the quotient: then the quotient 23 being in a separate place multiplied by 23, gives the square 529, which again multiplied by 23, gives the cube 12167, and this taken from 13312, will leave 1145; which augmented by the next figure of the resolvend 0, and divided by the triple square of the quotient 23, *viz.* by seeking how many times 3 x 529, or 1587, is contained in 11450, it gives 7, for the third figure of the quotient. Then the quotient 237, multiplied by 237, gives the square 56169, which again multiplied by 237, gives the cube 13312053, and this taken from the resolvend, leaves 0. Whence it is evident, that the root sought is 237.

So also, to *extract* the quadrato-cubical root of 36430820, it must be pointed over every fifth figure; and the figure 3, whose quadrato-cube, or fifth power 243, is the next lesser to 364, *viz.* to the first point, must be writ in the quotient. Then the quadrato-cube 243, being subtracted from 364, there remains 121, which augmented by the next figure of the resolvend, *viz.* 3, and divided by five times the biquadrate of the quotient, *viz.* by seeking how many times 5 x 81, or 405, is contained in 1213, it gives 2 for the second figure. That quotient 32, being thrice multiplied by it self,

makes the biquadrate 1048576; and this again multiplied by 32, makes the quadrato-cube 33554432, which being subtracted from the resolvend, leaves 2876388. Therefore 32 is the integer part of the root, but not the true root; wherefore, if you have a mind to prosecute the work in decimals, the remainder, augmented by a cypher, must be divided by five times the aforelaid biquadrate of the quotient, by seeking how many times 5 x 1048576, or 5242880, is contained in 2876388, 0, and there will come out the third figure, or the first decimal 5. And so by subtracting the quadrato-cube of the quotient 32,5 from the resolvend, and dividing the remainder by five times its biquadrate, the fourth figure may be obtained. And so on *in infinitum*.

In some cases, it is convenient only to indicate the *extraction* of a root; especially where it cannot be had exactly. Now, the sign, or character, whereby roots are denoted, is √: To which is added the exponent of the power, if it be above a square, and even sometimes if it be not. *E. gr.* √2 denotes the square root. √3 the cube root &c. See ROOT.

When a biquadratic root is to be *extracted*, you may *extract* twice the square root, because √4 is as much as √2 x 2. And when the cubo-cubic root is to be *extracted*, you may first *extract* the cube root, and then the square root of that cube root, because the √6 is the same as √2 x 3; whence some have called these roots, not cubo-cubic ones, but quadrato-cubic ones.

3 F f f

drato-

EXT

drato-cubes. And the same is to be observed in other roots, whose indexes are not prime numbers.

To prove the extraction of roots—1°. For a square root: multiply the root found by it self, and to the product add the remainder, if there were any: if the sum be equal to the number given, the operation is just.

2°. For a cube root: multiply the root found by it self; and the product, again, by the same root. To the last product, add the remainder if there were any. If the sum come out the number first given, the work is just.

After the like manner may the extraction of the other roots be proved.

To extract the roots of equations, or algebraic quantities.—The extraction of roots out of simple algebraic quantities, is evident, even from the nature, or marks of notation it self; as that \sqrt{aa} is a , and that \sqrt{aacc} is ac , and that $\sqrt{9aacc}$ is $3ac$; and that $\sqrt{49a^2xx}$ is $7aax$. And also that $\sqrt{\frac{a^2}{cc}}$ or $\frac{\sqrt{a^2}}{\sqrt{cc}}$ is $\frac{a}{c}$, and that $\sqrt{\frac{a^2hb}{cc}}$ is $\frac{a\sqrt{hb}}{c}$, and that $\sqrt{\frac{9aazz}{25bb}}$ is $\frac{3az}{5b}$, and that $\sqrt{\frac{8b^6}{27a^2}}$ is $\frac{2bb}{3a}$, and that \sqrt{aabb} is \sqrt{ab} . Moreover, that \sqrt{aaec} , or b into \sqrt{aaec} , is equivalent to b into ac , or abc . And that $3c\sqrt{\frac{9aazz}{25bb}}$, is equivalent to $3c \times \frac{3az}{5b}$, or $\frac{9ac z}{5b}$.

And that $\frac{a+rx}{c} \sqrt{\frac{4bbx^2}{81aa}}$ is equivalent to $\frac{a+rx}{c} \times \frac{2bx}{9a}$, or to $\frac{2ahxx+6hx^2}{9ac}$. I say these are all evident, because it will appear at first sight, that the proposed quantities are produced, by multiplying the root, into themselves (as a from a into a ; aac from ac into a ; $9aacc$ from $3ac$ into $3ac$, &c.) But when quantities consist of several terms, the business is performed as in numbers.

Thus to extract the square root out of $a^2+2ab+bb$; in the first place, write the root of the first term a , viz. a in the quotient, and having subtracted its square $a \times a$, there will remain $2ab+bb$ to find the remainder of the root by. Say therefore, how many times is the double of the quotient, or $2a$, contained in the first term of the remainder $2ab$? I answer b [times] therefore write b in the quotient, and having subtracted the product of b into $2a+b$, or $2ab+bb$, there will remain nothing. Which shews that the work is finished, the root coming out $a+b$.

And thus to extract the root out of $a^2+6a^2b+5aab-12ab^2+4b^3$, first set in the quotient the root of the first term a^2 , viz. a , and having subtracted its square $a \times a$, or a^2 , there will remain $6a^2b+5aab-12ab^2+4b^3$ to find the remainder of the root. Say therefore, how many times is $2a$ contained in $6a^2b$? Answer $3a$; wherefore write $3a$ in the quotient, and having subtracted the product of $3a$, into $2a+3a$, or $6a^2b+9aab$, there will yet remain $-4aab-12ab^2+4b^3$ to carry on the work. Therefore, say again, how many times is the double of the quotient viz. $2a+6a$ contained in $-4aab$ — $12ab^2$, or, which is the same thing, say, how many times is the double of the first term of the quotient, or $2a$, contained in the first term of the remainder $-4aab$? Answer— $2b$. Therefore having writ $-2b$ in the quotient, and subtracted the product— $2b$ into $2a+6a$ — $2b$ in, or $-4aab$ — $12ab^2+4b^3$, there will remain nothing.

Whence it follows, that the root is $a+3a-2b$. $a^2+6a^2b+5aab-12ab^2+4b^3$ ($a+3a-2b$) bb a^2 $-6a^2b+9aab-12ab^2+4b^3$ $o+6a^2b+9aab$ o $-4aab-12ab^2+4b^3$ $-4aab-12ab^2+4b^3$ o o

And thus the root of the quantity $xx-ax+\frac{1}{4}aa$ is $x-\frac{1}{2}a$; and the root of the quantity y^2+4y^2+8y+4 is $y+2y-2$; and the root of the quantity $16a^2-24aax+9x^2+12bxx-16abh+4b^2$ is $3x-4a+2bb$, as may appear underneath.

$$\begin{array}{r} xx-ax+\frac{1}{4}aa \\ \frac{1}{2}x-\frac{1}{2}a \\ \hline o \end{array}$$

$$\begin{array}{r} y^2+4y^2+8y+4 \\ y+2y-2 \\ \hline o \end{array}$$

$$\begin{array}{r} 16a^2-24aax+9x^2+12bxx-16abh+4b^2 \\ 3x-4a+2bb \\ \hline o \end{array}$$

EXT

$$9x^2-24aa+16a^2+12bbx^2-16aab+4b^2 \left(3x^2-4aa+2bb \right)$$

$$\begin{array}{r} 9x^2 \\ o \\ -24aa+16a^2 \\ +12bbx^2-16aab+4b^2 \\ \hline o \end{array}$$

$$\begin{array}{r} y^2+4y^2-8y+4 \\ y^2 \\ \hline o \end{array}$$

$$\begin{array}{r} 4y^2+4yy \\ o \\ -4yy-8y+4 \\ \hline o \end{array}$$

If you would extract the cube root out of $a^3+3aab+3abb+b^3$, the operation is performed thus:

$$\begin{array}{r} a^3+3aab+3abb+b^3 \\ a^3 \\ \hline 3aa \quad o+3aab \quad (b \\ \hline a^3+3aab+3abb+b^3 \end{array}$$

Extract first the cube root of the first term a^3 , viz. a , and set it down in the quotient: then subtracting its cube a^3 , say, how many times is its triple square, or $3a$, contained in the next term of the remainder $3aab$; and there comes out b ; wherefore write b in the quotient, and subtracting the cube of the quotient $a+b$, there will remain o ; therefore $a+b$ is the root. After the same manner, if the cube root is to be extracted out of $z^3+6z^2-40z^2+96z-64$, it will come out $z+2z-4$. And so likewise in higher root.

EXTRANEOUS Motion. See the article MOTION.

EXTRAORDINARY, something out of the common course. EXTRAORDINARY Couriers, are those sent express on some urgent occasion.

Embassador, or Envoy EXTRAORDINARY, is such a one as is sent to treat, or negotiate some special and important affair, as a marriage, a treaty, confederacy, &c. or even on occasion of some ceremony, as condolance, congratulation, &c. A Gazette, Journal, or other News-paper extraordinary, is that published after some great and notable event, containing the detail, or particulars thereof, which were not found in the ordinary papers.—Our news writers generally use postscripts, or supplements, instead of extraordinary.

EXTRAORDINARY Culverin. See the article Culverin.

EXTRAVAGANTES, a part of the canon law, containing diverse constitutions of the popes, not included in the body of the canon law.—Whence the nomination *extravagantes*: quasi extra corpus juris vagantes.

The *extravagantes* are divided into two parts: the first contains XX constitutions of John XXII: and the second, other later constitutions of the said John and his successors.

EXTRAVASATION *, in medicine, a motion of the blood, whereby it breaks out of its ordinary vessels, the veins or arteries, and either gathers, and stagnates in some soft part, or is thrown quite out of the body.

* The word is formed of the Latin, *extra*, without, and *vas*, vessel.

The ordinary causes of *extravasations*, are unnatural rep lctions and distentions of the vessels; or lacerations, and erosions thereof. There is a necessity for bleeding, to prevent the blood's growing to such a head as to *extravasate*.

—In wounds of the head, particularly, bleeding is necessary, to prevent the *extravasation* of the blood in the brain.

EXTRAVASATION, is sometimes likewise used in speaking of other humours beside the blood; as the lymph, urine, &c. The gardeners use the term in speaking of gums, juices, &c. which ooze out of their trees either spontaneously, or at incisions.

EXTREAM, or EXTREME, is applied to the last and outermost part of any thing; or that which finishes, and terminates it on that side.

The *extremis* of a line are points.—There is no passing out of one *extream*, into the other, without going through the middle.—*Extream* remedies must only be had recourse to in *extream* necessity.

Some anatomists apply the denomination *extreams*, or *extremities*, to the arms and legs.

The arms, or upper EXTREMITIES, consist of sixty-two bones; thirty-one in each, viz. the omoplate, humerus, cubitus, radius, eight in the carpus, four in the metacarpus, and fifteen in the fingers.

The *latter* EXTREMITIES, or legs, consist of sixty; thirty in each, *viz.* the femur, rotula, tibia, fibula, seven in the tarsus, five in the metatarsus, and fourteen in the toes.

EXTREMES, in logic, denote the two *extremum* terms of the conclusion of a syllogism, *viz.* the predicate and subject.

They are called *extremes*, from their relation to another term, which is a medium, or mean between them.

The predicate, as being likewise had in the first proposition, is called the *minus extremum*, greater *extremum* and the subject, as being put in the second, or minor proposition, is called the *minus extremum*, lesser *extremum*.

Thus, in the syllogism, man is an animal, Peter is a man; therefore Peter is an animal: the word animal is the greater *extremum*; Peter the less *extremum*; and man the medium. See SYLLOGISM.

EXTREMUM and mean proportion, in geometry, is when a line is so divided, that the whole line is to the greater segment, as that segment is to the other.

Or, as Euclid expresseth it, when the line is so divided, that the rectangle under the whole line and the lesser segment, is equal to the square of the greater segment.

The invention of this division is thus: let the given line be AB=a, (*Tab. Geometry, fig. 64. N^o. I.*) and for the greater segment put x; the lesser will be a-x. Then by the hypothesis, a : x :: x : a-x. Therefore a x - a x = x x, consequently a a = a x + a x. And by adding $\frac{1}{2}$ a a on each side, to make x x + a x + $\frac{1}{2}$ a a a complete square, the equation will stand thus $\frac{3}{2}$ a a = x x + x a + $\frac{1}{2}$ a a.

Now since the latter is exactly a square, its root x + $\frac{1}{2}$ a = $\sqrt{\frac{3}{2}$ a a, and by transposition it will be $\sqrt{\frac{3}{2}$ a a - $\frac{1}{2}$ a = x; which last equation is a canon to find x.

For at the right angles CB = $\frac{1}{2}$ a: then draw CA, the square of which is equal, AB q + CB q = $\frac{3}{2}$ a a. And therefore AC = $\sqrt{\frac{3}{2}$ a a; make CD = CA. From whence CB = $\frac{1}{2}$ a being taken, as the case requires, there remains BD = x; which transferred into AB, shall give the point E, where AB is cut according to *extremum and mean proportion*.

This cannot be exactly done in numbers; but if you would have it tolerably near, add together the square of any number, and the square of its half, and extract as near as you can, the square root of the sum; from whence taking half, the remainder is the greater part.

EXTREAM-UNCTION, one of the sacraments of the Romish church, the fifth in order, administered to people dangerously sick, by anointing them with holy oils, and performing several prayers over them.

It is called *extream unction*, as being only given to persons in *extremity*.—In the XIIIth century, it was called the *unction of the sick*, and not *extream unction*: for in the earlier ages, it was given before the viaticum; which practice, according to Fa. Mabillon, was not changed till the XIIIth century.

The reasons he assigns for the change are, that in that age there arose diverse mistaken opinions, several of which we find mentioned and condemned in the English councils. Among the rest, it was held, that such as had received this sacrament, in case they recovered, might not make use of their wives, nor eat meat, nor go bare-footed: whence, they chose to forbear using it till the last extremity; which practice prevailed. See the councils of Worcester and Exeter, in the year 1287; that of Winchester in 1308; and Fa. Mabillon, *Acta. Sancti. Benedicti. Sæc. III. p. 1.*

The form of *extream unction* is now deprecativè, as the divines call it; formerly it was absolute and indicative.

This sacrament is not only in use in the Latin, but also in the Greek church, and throughout the east, though under another name, and with some difference in the circumstances; in that the orientals do not wait till their sick are come to extremity, in order to anoint them: but the sick generally go to church themselves; and it is administered to them as often as they are indisposed: the Greeks taking that direction of St. James, C. V. ver. 14. which is the foundation of the practice, in a general sense: *Is any sick among you? let him call for the elders of the church, and let them pray over him, anointing him with oil.* Fa. Danlinien distinguishes two kinds of *unction* among the Maronites: the one called, *unction with the oil of the lamp*; but this, he suggests, is not the sacramental *unction*, ordinarily administered to such as are in extreme sickness; for that the oil is only consecrated by a priest, and that it is given to all who are present, not to the sick only, but also to the healthy: even the priest who officiates partakes of it. The other kind of *unction*, according to that father, is only for the sick; this is performed with oil consecrated by the bishop alone, on Holy Thursday. And this, it seems, is their sacramental *unction*.

The *unction* with lamp oil, is in use not only among the Maronites, but throughout all the eastern church, who use it

very religiously. The truth is, they do not seem to have any other sacrament of *extream unction* beside this.—Yet Fa. Goar observes, though it be only a ceremony, with regard to those in health, it is a real sacrament to those that are sick.

In their great churches they have a lamp, wherein this oil for the sick is preserved: this lamp they call, *Καθηδρα του ιεροδιδασκαλου*; that is, the lamp of oil joined with prayer: for what the Latins call *extream unction*, the Greeks call, *καθηδρα, or αγιου πνευματος*, that is, oil with prayer, or holy oil.

EXTREMUM *Clasifi. Diem.* See the article DIEM.

EXTRINSIC, is applied in the schools in various senses.— Sometimes it signifies a thing's not belonging to the essence of another: in which sense the efficient cause, and the end or scope of a thing, are said to be *extrinsic*, or *extrinsic causes*: Sometimes it implies a thing's not being contained within the capacity of another.—In which sense those causes are said to be *extrinsic*, which introduce something into a subject from without: as when fire introduces heat, &c.

Sometimes it denotes a thing added, or applied to another.— Thus, accidents and adherences are said to be *extrinsic* to the subject; and thus vision is *extrinsic* to the object seen.

EXTRINSIC Argument. } See } ARGUMENT.
EXTRINSIC Service. } See } SERVICE.

EXUBERANCE *, in rhetoric, &c. a redundancy. See REDUNDANCE, and PLEONASM.

* The word is compounded of the Latin *ex* and *uber*, plentiful, of *uber*, udder.

EXUDATION, the act of sweating out.—In which manner, gums, balsams, &c. are usually produced from trees.

EXULCERATION, in medicine, the act of causing, or producing ulcers.

Thus, ardenic *exulcerates* the intestines: corrosive humours *exulcerate* the skin.

EXULCERATION is sometimes also used for an ulcer itself; but more generally for those beginning crochons, which wear away the substance, and form ulcers.

Exulcerations in the intestines, are marks of poison. See POISON.

EXUSTION, the act of burning with fire; used in some operations by surgeons. See BURN.

EXUVIÆ *, in physiology, transient parts of certain animals, which they put off, or lay down, and assume new ones.

* The word is Latin, formed from *exuere*, to put off, to divest.

Such, especially are the skins, or sloughs of serpents; shells of lobsters, and the like, which are annually changed, and renewed in the spring.

EXUVIÆ is also used for some shells, and other marine bodies frequently found in the bowels of the earth: supposed to have been deposited there at the deluge; as being the real spoils of once living creatures. See SHELL, FOSSIL, and DELUGE.

EY E, the organ, or part of the body, whereby vision is effected, *i. e.* whereby visible objects are represented to the mind.

The *eye*, or organ of sight, is generally divided into *internal* and *external* parts; or into the *eye properly so called*, and the *appendages* thereof.

Under the latter class, come the *orbit*, or cavity wherein the *eye* is placed; the *supercilium*, or *eye-brow*, whereby sweat, and other nufances, are prevented falling down into it: the *palpebræ*, or *eye-lids*, which cover and defend it in time of sleep; with their *cilia*, or fringes of hair, to break the too fierce impression of the light, and keep off flies and moats: and the *canthi*, or angles.

The *eye properly so called*, is of a globular form, and consists of tunics, humours, and vessels.

In some parts it is lined with fat; and it is moved with muscles; which two latter are by some anatomists, though somewhat inaccurately, reckoned among the constituent parts of the *eye*.

The *tunics*, coats, or *membranes of the eye* are six: *viz.* 1^o.

The *adnata*, or conjunctiva, covering the whole ball of the *eye*, except the fore-part, called the *sight*; and making what we popularly call the *white of the eye*: though this is not reckoned as a proper tunic of the *eye*. 2^o. Immediately under the *adnata* is the *sclerotica*, which covers the whole globe of the *eye*; being opaque every where but in the fore-part, which covers the *sight* and is transparent like horn; which has occasioned anatomists to account this a distinct membrane, the 3d in number, and to denominate it the *cornea*. The 4th is the *choroides*, situate immediately under the *sclerotica*. Its fore-part, like the former, is transparent, and therefore accounted a distinct, or 5th coat, and called the *uvæa*. Of the duplicature of this part of the tunic, is formed a striped, variegated circle, called the *iris*, which, in different subjects, is of different colours, and gives the denomination of this or that colour to the *eye*. In its middle is an aperture, or perforation, called the *pupil*, or *apple of the eye*, about which the *iris* forms a ring. From the inside of this tunic, spring certain fibres, which spreading round the crystalline humour, form the ligamentum ciliare. The 6th tunic, which some only make the

3d, is the *retina*, so called, as resembling a net, and covering only the fund, or bottom of the *eye*, opposite to the sight.

Of the three proper tunics, the *sclerotica*, *choroides*, and *retina*, the first is derived from the *dura mater*, being detached from the brain as an outer coat, or cover of the optic nerve, till arriving at the ball of the *eye*, it is there expanded into a tunic: the second is derived from the *pia mater*, and transmitted likewise from the brain, along with the optic nerve; the third may be said to be derived from the brain, or medulla itself, as being an expansion of the medullary substance of the optic nerve. See each tunic described under its proper article, CONJUNCTIVA, SCLEROTICA, CORNEA, CHOROIDES, UVEA, and RETINA. See also IRIS, and PUPILLA.

The *humours of the eye*, inclosed between these tunics, are three: *viz.* 1^o. The *aqueous*, a limpid, transparent humour, situate in the fore-part of the *eye*, immediately under the cornea, and occasioning its protuberance. 2^o. The *crystalline*, situate immediately under the aqueous, behind the uvea, opposite to the pupil. 3^o. The *vitrious*, or glassy humour, which fills all the hind-part of the cavity of the globe; and is that which gives the spherical figure to the *eye*. On its back part is the retina spread. See each humour under its proper article, AQUEOUS, CRYSTALLINE, and VITRIOUS.

Some authors finding these humours covered with proper membranes, have given distinct names to them, as the *aqueous*, *crystalline*, and *vitrious tunics*; but these being only productions of the other coats abovementioned, the distinction is not much regarded.

The *vessels of the eye* are nerves, glands, arteries, and veins. 1^o. The nerves are the optic pair, which situate through a perforation in the skull, behind the orbit, enter the ball of the *eye*, and diffuse and lose themselves therein; the outer coat, as already observed, going to form the *sclerotica*, the inner to the *choroides*, and the medulla to the retina.

Besides which, the *motorii*, *pathetici*, the first branch of the fifth pair, called *ophthalmici*, and the 6th pair are bestowed on the muscles of the *eye*.

2^o. On the upper part of the ball of the *eye*, near the lesser or outer canthus, is the *glandula inornata*, or *lachrymalis*, which separates the matter of the tears, to be discharged, by the continual motion of the *eye-lid*, upon the cornea, to moisten it, and facilitate its motion. The tears falling down the cornea, are stopped by the edge of the under *eye-lid*, along which they run, till they fall into two small holes in the great angle, one in each *eye-lid*, called *puncta lacrymalia*, which lead to a small bag, from the bottom of which a small tube arising, opens into the nose. Between the two puncta, is a caruncle, or eminence which serves to separate and keep them open, and which was anciently taken for the *glandula lachrymalis*.

3^o. The *eye* receives arteries, both from the internal and external carotids, and returns the blood by veins that go to the jugulars.

The *muscles of the eye* are six; four of which are from their situation called *recti*, or straight muscles; and two, *obliqui*. The *recti* come from several points of the bottom of the orbit, and run immediately between the *sclerotica* and *adnata*: they derive several denominations from their several offices, *viz.* *attollens*, or *superbus*, which draws the *eye* upwards: *deprimens*, or *humilis*, which casts it down: *adducens*, and *psotator*, which draws the *eye* towards the nose: and *abducens*, or *indignator*, which draws it the other way towards the lesser angle. The two oblique muscles are, the *superior*, called also *rotator*, and *trochlearis*; and the *inferior*. See each muscle in its proper place, ATTOLLENS, DEPRIMENS, ADDUCENS, ABDUCENS, OBLIQUUS, and TROCHLEARIS.

The whole structure and apparatus of the *eye* tends to this, that there be produced a distinct and vivid collection in the bottom of the *eye*, directly under the pupil, of all the rays, which proceeding from any point of an object, and entering the *eye*, penetrate the crystalline humour; and that so many points be painted in the bottom of the *eye*, as are conspicuous in an object, that so a small image like thereto, may be represented on the retina.

In order to this, the rays from any radiant or reflecting point, striking on the cornea, are refracted towards the perpendicular, and thus determined to proceed through the aperture of the pupil to the surface of the crystalline: while other rays, which entered so obliquely as to be thrown upon the iris, are reflected out again, that they may not disturb the distinctness of the sight: and others whose less obliquity threw them between the uvea and vitrious humour, are distinguished in the darkness thereof: that none can be propagated through the vitrious, but such as passing through the pupil, strike on the crystalline.

In the mean time the iris, contracting by its circular, or dilating by its right fibres, the pupilla of the *eye*; admits fewer or more rays, as the object is nearer or more vivid; or remoter and more languid. See PUPIL.

Now, the flatter the figure of the cornea is, the less does it collect the rays emitted from any lucid point; whence fewer arrive at the crystalline, and those more diverging: unless

when they come from a very remote object: on the contrary, the rounder it is, the more of the rays from any point does it collect, and throw on the crystalline; and those the more converging: whence one great cause of the defects in the *eyes* both of old men and myopes. Again, the rays transmitted through the pupil to the crystalline, are there refracted a-new, further collected, and rendered converging; so as that those which came from the same point of the object, are now thrown in one point through the vitrious, upon the retina; where they point or exhibit that precise point of the object whence they flowed. Accordingly, if the crystalline be very dense, or spherical, the focus, or the point wherein they are united, will be too near; and if too flat, or rare, the point will be too remote: the effect of both which is confusion. And hence another cause of the defects of myopes and presbyte.

It is not, however, myopes and old men alone, that would labour under these defects, and have their vision, in most cases confused, as in objects very near, or very remote, very small, or very great: but those would be the common condition of vision. Distinct vision, depending absolutely on the union of all the rays coming from the same point of the object, on the same precise point of the retina; and rays from objects at different distances, being united at different distances behind the crystalline; it were impossible, *a. gr.* for the same *eye* to see distinctly any two objects differently distant from it. But nature has made a provision against these defects; and that principally, by bringing the crystalline nearer to the cornea, or further from it, occasionally; which is effected two ways, *viz.* either by compressing the bulb of the *eye* by the four muscles all strongly contracted at once, which changes the figure of the aqueous humour, and renders the *eye* oblong; or by the ligamentum ciliare, augmenting and diminishing the convexity of the crystalline, and setting it nearer or further from the retina. As complex as the mechanism of the *eye* may seem, and as manifold as the parts are which have a relation hereto: the justness of vision seems to require an exact habitude in them all.—Thus, though the pupil be no substantial part of the *eye*, but only an aperture of the uvea almost perpetually changing its bigness according to the different degrees of light the *eye* chances to be exposed to; and therefore should seem, while this hole remains open, to perform its office, by giving entrance to the incident rays of light: yet Mr. Boyle saw a woman, who, after a fever, not being able to dilate the pupillæ of her *eyes*, as before, though they were little narrower than ordinary; yet had she thereby almost lost her sight.—And on the other side, though a competent wideness of the pupil be requisite to a clear and distinct vision, yet if its dilatation exceeds the due limits, there is thereby produced a considerable distemper of sight. It may seem also but a slight circumstance, that the transparent coats of the *eye* should be devoid of colour; and of as little moment, that the cornea should be very smooth, provided it remain transparent: yet when either of these circumstances is wanting, the sight is greatly vitiated.—Thus we see, that in the yellow jaundice, the adventitious colour wherewith the *eye* is tinged, makes the patient think he sees many objects yellow, which are of contrary colour.

It has of late been an opinion, that though both *eyes* be open, and turned towards an object, yet only one of them at a time is effectually employed in giving the representation of it: so that the having of two *eyes* should seem in some sort a redundancy.—But Mr. Boyle furnishes several considerations which invalidate this opinion, and shew that both the *eyes* are of use at the same time.—He assures us, he has found by frequent experiment, that his two *eyes* together, beheld an object in another situation, than either of them apart would do.—He adds, that he has met with a person, who had a cataract in his *eye*, for two or three years, without finding any impediment in his sight, though others had, during that time, taking notice of a white film that had crossed his *eye*: till, at length happening to rub his found *eye*, he was surprized to find himself in the dark: and that a very ingenious person, who by an accident had one of his *eyes* struck out, told him, that for some months after, he was apt to mistake the situation and distances of things; for having frequent occasion to pour liquors out of one vial into another, after this misfortune he often split them, and let them run quite besides the necks of the vials, which he thought he was pouring them directly into.

The like was related to him by another person, who had, by a wound, lost the use of one of his *eyes*; *viz.* that for some time after, he often, in pouring out his wine, missed the mouth of the bottle, or glass.

A yet more considerable instance of this kind, the same author gives us, of a noble person, who, in a fight, had one of his *eyes* strangely mangled by a musket ball, which came out at his mouth; after which accident, he could not well pour drink out of one vessel into another; but had broken many glasses by letting them fall out of his hand, when he thought he had given them to another, or set them down on the table: he added, that this aptness to misjudge of distances and situation, continued with him, though not in the same degree, for two years.

The comparative structure, and anatomy of the *eye*, is very curious: the situation, number, contraction, &c. of this organ, in different animals, being finely and wonderfully adapted to their different circumstances, occasions, and manners of living.

In man, and some other creatures, an ingenious author observes, the *eye* is placed chiefly to look forward; but withal is so ordered, as to take in nearly the hemisphere before it.—In birds, and some other creatures, the *eyes* are so seated, as to take in near a whole sphere, that they may the better seek their food and escape danger.—In others they are seated so as to see behind them, or on each side, whereby to see the enemy profuing them: Thus, in hares and conies, the *eyes* are very protuberant, and placed so much towards the side of the head, that their two *eyes* take in nearly a whole sphere: whereas in dogs, that pursue them, the *eyes* are set more forward in the head, to look that way more than backward.

Generally, the head is contrived to turn this and that way, chiefly for the occasions of the *eyes*; and generally the *eyes* themselves are moveable upwards, downwards, backwards, and sidewise, for the more commodious reception of the visual rays. Where nature deviates from these methods, she always makes use of very artful expedients to answer the same end. Thus, in some creatures, the *eyes* are set out at a distance from the head, to be moved here and there, the one this way, and the other that; as in snails particularly, whose *eyes* are contained in their four protuberances, like atramentous spots fitted to the end of their horns, or rather to the ends of those black filaments, or optic nerves, sheathed in the horn. Power, *Esper. Phil. Obj. 31.*

And in other creatures, whose *eyes* or head is without motion, and in diverse insects, that defect is sometimes made up by their having more *eyes* than two; as in spiders, which having no neck, and consequently the head being immovable, the defect is supplied by the situation and multiplicity of their *eyes*; some having four, some six, and others eight, all placed in the fore-front of the head, which is round, like a locket of diamonds. The reason Dr. Power gives, is, that being to live by catching so nimble, and fly a prey as flies, they ought to see every way, and so take them *per saltum*, without any motion of the head to discover them.

Again, men, and most quadrupeds, are found to have several muscles belonging to their *eyes*, by help whereof they can turn them any way, and so obvert the organ of sense to the object.—But nature not having given that mobility to the *eyes* of flies, she in recompence furnishes them with a multitude of little protuberant parts, finely ranged upon the convex of their large bulging *eyes*; so that by means of these numerous little studs, numerous rays of light are deflected from objects placed on either hand, above, or beneath the level of the *eye*, and conveniently thrown upon that organ, to render the objects they come from, visible to the animal; and by the help of a good microscope, and a clear light, some hundreds of these little round protuberances may be discovered, curiously ranged on the convexity of a single *eye* of an ordinary flesh-fly.

So scorpions are found to have above an hundred *eyes*; and Swammerdam has observed no less than two thousand in the little insect called *epimeron*.

In other creatures, the like deficiency is supplied by having their *eyes* nearly two protuberant hemispheres, each consisting of a prodigious number of other little segments of a sphere.

The *eyes* of a camelion, Dr. Goddard observes, resemble a lens, or convex glass, set in a versatile globular socket, which she turns backward and forward without stirring the head; and ordinarily the one a contrary way to the other.

Lastly, the mole, which the antients, Aristotle, Pliny, Alb. Magnus, &c. supposed to have no *eyes* at all, is now found to furnish a notable instance of the diversity of the apparatus of vision. For that animal living altogether underground, sight would generally be useless to it, and so tender a part as the *eye* troublesome. It has therefore *eyes*, but those so exceedingly small, and wital situate so far in the head, and covered so strongly over with hair, that they cannot ordinarily be either of service or difference to it. Yet, to guide and secure it a little when it chances to be above ground, Borrichius, Blasius, Shenelder, Mr. Derham, and others, observe, that it can pretend, or put them forth beyond the skin, and again draw them back at pleasure, somewhat after the manner of snails.

In the *eyes* of nocturnal animals is a part not yet mentioned, viz. a sort of tapetum at the bottom of the *eyes*, which gives a kind of radiation on the pupil, enabling them to see and catch their prey in the dark. Thus, Dr. Willis: *bijus usus est oculi pupillam quasi jubeo insto illuminare—quare in se plurimum illuminis est, at omni, avibus & piscibus desit.* De Anima Brutor.

He adds, that in some persons the iris has a faculty also of darting out light: and instances in a man of a hot head, who after a plentiful drinking of generous wine, could see to read in the darkest night. *Ibid.*

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The like Pliny tells us of Tib. Cæsar, that upon his first waking in the night, he could see every thing for a little while, as if in broad day light. *Nat. Hist. L. XI. C. 37.* And, Dr. Briggs gives a parallel instance of a gentleman in Bedfordshire. *Ophthalm. C. 5. §. 12.*

Frogs, beside the parts of the *eye*, which they have in common with men, and most quadrupeds, have a peculiar membrane, or cartilage, which is not commonly perceived, where-with they can, at pleasure, cover the *eye*, without too much hindring the sight; because the membrane is both transparent and strong, so that it may pass for a kind of moveable cornea, or occasional safeguard to the *eye*.

In furnishing frogs with this strong membrane, the providence of nature seems very conspicuous; for they being amphibious creatures, designed to pass their lives in watery places, which for the most part abound in plants endowed with sharp edges, or points; and the progressive motion of this animal, being not by walking, but by leaping; if his *eyes* were not provided with such a case, he must either shut them, and so leap blind-folded, or by leaving them open, must run the risque of having the cornea cut, pricked, or otherwise offended: but this membrane, like a kind of a spectacle, covers the *eye*, without taking away the sight; and as soon as the occasion for it is over, the animal withdraws it into a little cell, where it rests, till its use be again required. This membrane becomes visible, by applying the point of a pin, or any such sharp thing, to the *eye* of a frog, whilst his head is held steady; for to screen his *eye*, he will presently cover it therewith, and afterwards withdraw it, upon a removal of the suspected danger.—And because many birds are destined to fly among the branches of trees and bushes, left by this means the prickles, twigs, leaves, &c. should wound or offend the *eye*, nature has also given them such another kind of horny membrane as we see in frogs.

Naturalists relate wonders of the sharpness and accuracy of the *eye* of some animals, as the eagle, &c. beyond those of men.

Yet do those of men seem improvable to a surprising degree.—Mr. Boyle instances in a major of a regiment of King Charles I. who being afterwards forced abroad, ventured at Madrid, to do his king a piece of service of an extraordinary nature and consequence; which being there judged very irregular, he was committed to an uncommon prison, or rather dungeon; having no window belonging to it, only a hole in the wall, at which the keeper put in provisions, and presently closed it again on the out-side, but not perhaps very exactly.

—For some weeks this gentleman continued utterly in the dark, very disconsolate; but afterwards he began to think he saw some little glimmering of light, and this, from time to time, increased, so that he could not only discover the parts of his bed, and other such large objects, but at length, amidst this deep obscurity, could perceive the mice that frequented his chamber, to eat the crumbs of bread which fell upon the ground, and discern their motions very well.

The author just mentioned, in his *Observations on vitiated sight*, gives us some uncommon phenomena, that regard the *eyes*.—He furnishes several instances of nyctalopias, or people whose *eyes* in the day-time were quite dark, or at least so dim, that they could hardly discern their way; who yet, soon after sun-set, and during twilight, saw very clearly.

This brings to mind an odd case of an old learned divine, who complained, that during the day-time, his right-hand shook so much, that he could not manage his pen; and therefore was forced to make use of it only by candle-light.

But, which is yet more strange, one of these patients who could only see by night, could distinguish some colours, viz. black and white, but not others, especially red and green.

The meadows to this person did not appear green, but of an odd, darkish colour; and when she had a mind to gather violets, though she kneeld in the place where they grew, she could not distinguish them by the colour from the grass about them, but only by their shape or touch.

Artificial Eye, is an optical machine, wherein objects are represented after the same manner as in the natural *eye*; of considerable use in illustrating the nature and manner of vision.

Its construction is thus: provide two hollow hemispheres of hard, dry wood, well cemented together, to represent the ball of the *eye*: Let the interior, or fore-hemisphere, be perforated with a round hole in C, (*Tab. Optics, fig. 9.*) to supply the place of a pupil; and therein fit a thin, plane glass, or, which amounts to the same, a concavo-convex glass, to serve for the cornea. In the inside, have a short draw-tube G, with a lens convex on both sides, to do the office of the crystalline therein. In the hind, or posterior hemisphere, fit another draw-tube E F, with a plain glass therein, having its inner surface smooth, though not polished, representing the retina and optic nerve.

If now the aperture C, be turned towards any object; and the draw-tube E F be gradually pulled out; you will have the

the object beautifully and strongly represented, in all its colours, on the retina, only in an inverted order. See VISION.

It being of no consequence what the figure of the inner cavity is; any room, or chamber, so darkened as only to receive light from a single hole, with a glass convex on both sides fitted therein; will do the office of an *artificial eye*, and exhibit all the objects opposed to the aperture, on a wall, or a white cloth, stretched at a proper distance from the aperture: with this circumstance, that the less sphere the glass is a segment of, the larger will the figures appear. And this is the celebrated *camera obscura*. See CAMERA OBSCURA.

Eye in Perspective. See the article PERSPECTIVE.

Altitude of the Eye. See the article ALTITUDE.

Eye, in architecture, is used in any round window made in a pediment, an attic, the reins of a vault, or the like.

Bullocks-EYE, *Ocullus de bouis*, denotes a little sky-light in the covering, or roof, intended to illumine a granary, or the like.

The same term is applied to the little lutherns in a dome, as in that of St. Peter's at Rome, which has 48 in three rows. See LUTHERN.

Eye of a Dome, denotes an aperture at the top of the dome; as that of the Pantheon at Rome, or of St. Paul's at London.—It is usually covered with a lantern.

Eye of the Volute, in architecture, is the centre of the volute, or that point wherein the helix, or spiral, whereof it is formed, commences.—Or, it is the little circle in the middle of the volute, wherein are found the thirteen centres for describing the circumvolutions thereof. See *Tab. Archit. fig. 41. lit. b. and fig. 42.*

Eye, in agriculture and gardening, denotes a little bud, or shoot, inserted into a tree by way of graft. See ENGRAFTORY. The term *eye*, *oculus*, is also used for a gem, or bud, as it stands on the parent tree.—A tree with fine, strong, healthy *eyes*. La Quintin. P. I. C. 3. Art. 6. The good branches are those which come in the order of nature, and that have large *eyes* pretty near each other. *Id.* This branch must be cut off at the third *eye*. Liger. See BUD and PRUNING.

Eye, among naturalists, is sometimes also used for a hole, or aperture.—Whence it is that the first of the larger intestines is called *cæcum*, or the blind gut, as having no *eye*, or perforation.—For a like reason the chemists call a close vessel, used in distillation, a *blind head*.

Eye, in printing, is sometimes used for the thickness of the types, or characters, used in printing: or, more strictly, it is the graving in relieve, on the top of the letter; otherwise, called its *face*.

It is the *eye* or *face* that makes the impression; the rest, which they call the *body*, serving only to sustain it.

The *eye* of the *e*, is the little aperture at the head of that character, which distinguishes it from the *c*. See *E*.

Eye, is also used among jewellers, for the lustre, and brilliance of pearls and precious stones; more usually called the *water*.

Eye-brow. } See { SUPERCILIUM.

Eye-lids. } See { PALPEBRÆ.

Eye-Water. } See { WATER.

White of the Eye. } See { WHITE.

Bulls-EYE, in astronomy, a star of the first magnitude, in the constellation taurus; by the Arabs called *aldouran*.

Its longitude, latitude &c. See among those of the other stars in the constellation TAURUS.

Cats-EYE, *Oculus Cati*, in Nat. Hist. a precious stone; called also *sun's eye*, *oculus solis*: and taken by Dr. Woodward, for the alterias of the antients.

It is transparent, of a glittering grey, interchanged with a straw-colour: usually oblong as to figure, and not unlike the opal, only much harder.—It is found in diverse parts of the East-Indies, but those of the island of Ceylon are the most prized. See Supplement, ARTICLE, ASTERIAS.

Crabs-EYE, *Oculus Cancrum*. See CRABS-EYES.

Goats-EYE, *Oculus Caprinus*, is when there is a white speck on the pupil of the eye, as is seen in the eye of goats. Physicians call it *Ægias*.

Hares-EYE, *Oculus Leporinus**, in medicine, a disease arising from a contraction of the upper eye-lid, which prevents its being able to cover its part of the eye: so that the patient is obliged to sleep with the eye half open, after the manner of *hares*.

* Physicians call it *logophthalmia*, a Greek word signifying the same thing; being compounded of *λογος* *hore*, and *ὀφθαλμος* *eye*.

EYRE*, or EIRE, in law, signifies the court of justices itinerant.

* The word seems formed of the old French, *irre*, *it. r.* way, track.

Hence, justices in *eyre*, are those whom Bracton calls, *justiciarii itinerantes*.

EYRE of the forest, is otherwise called *justice seat*; which by the antient customs was to be held every three years, by the justices of the forest journeying up and down for that purpose.

EYRIE, or AYRIE, among falconers, the nest where hawks sit, and hatch, and feed their young.

Hence, a young hawk newly taken from the nest, is called an *eyrie*.

EZECHIEL's *Reed*, or *Rod*, a scripture measure, computed by late writers to amount to 1 English foot, 11 inches, $\frac{1}{4}$ of an inch.

EZRA, or ESDRAS, in divinity.—The Books of EZRA, are two books of holy scriptures, composed by EZRA, or ESDRAS, the high-priest of the Jews during the captivity; and particularly about the time when they returned to Palestine, under the reign of Cyrus.

The original of the books of EZRA is in Hebrew; and the second is particularly called by the Hebrews, and from them by the English translators, *Nehemiab*.

The two contain the history of the return of that people from the Babylonish captivity, and their re-establishment in the holy land. They are canonical, and are allowed as such both by the church and the synagogue.

The third and fourth books of EZRA, called in the English version, the first and second books of *Esdra*; though held by some, particularly the Greeks, for canonical; are thrown by the English church into the number of apocryphal books: being only extant in Greek.

The Canon of EZRA, is the collection of the books of scripture made by that pontiff.—It appears, however, that the synagogue added other books to EZRA's canon; witness the book of EZRA itself, and that of Nehemiah.

F.

F

F, The sixth letter of the alphabet, and the fourth consonant.

The letter *F* may be either considered absolutely, and in itself; or with regard to the particular languages where it is found. In the first view, *F* is generally placed by grammarians among the mutes, like the ϕ among the Greek grammarians: though others give it the quality of a semi-vowel. Joh. Conrad. Amman. (in his dissertation *de Loquela*) divides the consonants into single, and double; and the single into hissing and explosive. Among those called hissing, there are some pronounced by the application of the upper teeth to the lower lip; and these are the *F* and the *ph*. — The reason why some account the *F* a semi-vowel, and Amman places it among the hissing, is, that one may pronounce a little sound, without any other motion of the organs, than what is necessary to the pronunciation of the *F*.

This letter is derived to us from the Romans, who borrowed it from the ϕ olians; among whom it is called digamma, or double gamma, as resembling two γ 's, one over the other. Add, that the digamma seems in its origin to have been no other than the Greek ϕ , which being made at three strokes, degenerated at length into the figure *F*. For the letter ϕ being compounded of an omicron, with a perpendicular drawn through it, if that perpendicular be made first, and the ϕ at two strokes afterwards, *viz.* first the upper, then the under part, it may happen, especially in writing fast, that the two parts shall not join; and even, instead of two arches of circles, haste and convenience may naturally enough make two straight lines.

Thus it is that the transverse stroke of the letter ϕ , is frequently seen straight; and the letter in the form of a cross \dagger . And what confirms this transmutation of the ϕ into *F* still further, is, that on the medals of Philip, and the kings of Syria, in the words ΕΠΙΦΑΝΟΥΣ and ΦΙΛΑΔΕΛΦΟΥ , the ϕ is frequently seen in the form just mentioned, *i. e.* it has no circle or omicron; but a cross the middle of the perpendicular is a kind of right line, formed only of two dots, the one on the right side, and the other on the left, representing a cross, \dagger . Such appears to be the origin of the letter *F*; which, of consequence, is no other than a corruption of the Greek ϕ : And accordingly, on the medals of the Palisci, the *F* is ordinarily put in lieu of the Greek ϕ . But it must be added, that though the Greek and Latin letter were thus the same things, yet the sound was much softer among the Latins, than among the Greeks; as was long ago observed by Terentianus.

The Romans, for some time, used an inverted *F*, \mathfrak{F} , in lieu of an *V* consonant, which had no peculiar figure in their alphabet: thus in inscriptions we meet with $\text{TERMINA}\mathfrak{I}\text{I}$, $\text{D}\mathfrak{I}\mathfrak{I}$, &c. Lipsius (in his comment on the annals of Tacitus, l. xi.) Covarruvias, and Dauquius (in his treatise of orthography) hold that it was the Emperor Claudius who first introduced this use of the inverted digamma, or \mathfrak{F} ; which they call the invention of a letter, as being equivalent to the invention of the letter *V*. — In effect, Tacitus (in the 4th chapter of the said book) and Suetonius (in his life of Claudius, c. 41.) assure us, that the emperor invented three letters; one of which, Lipsius shews, must be the inverted ϕ olic digamma: But before Claudius, Varro made an attempt to introduce the same thing, but could not succeed. All the authority of an emperor was necessary to make it take; nor did it subsist long; for after Claudius's death it was thrown by again; as we are told by the same Tacitus: And Quintilian observes, it did not subsist in his time. So far is the custom of a language from being subject even to the masters of the world.

It may be added, that the pronunciation of the *F* is almost the same with that of the *V*; as will be evident by attending to the manner of pronouncing the following words, Favour, Vanity, Felicity, Vice, Foment, Vogue, &c. The French particularly, in borrowing words from other languages, usually turn the final *v* into an *f*, as *chetif* of *cattivo*, *neuf* of *novus*, *nef* of *navis*, &c.

In the later Roman writers we find the Latin *F* and Greek ϕ , *ph*, frequently confounded; as in Falanx, for *Phalanx*; Filosophia, for *Philosophia*, &c. Which abuse is still retained by many French writers, who write Filosophie, Philippe, Epifane, &c. and even sometimes by the English, as in Fantasy, Filtre, &c.

F, in the civil law. Two *ff*'s joined together, signify the Pandects: See the reason thereof under the article **PANDECT**.

F A B

F, or **FA**, in music, denotes the bass-clef; being placed on the fourth line upwards.

Indeed the character or sign by which the *f* and *c* clefs are marked, bear no resemblance to those letters. Mr. Malcolm thinks it were as well if we used the letters themselves, but custom has carried it otherwise. The ordinary character of the *F* or bass-clef is $\text{}$: which Kepler takes a deal of pains to deduce, by corruption, from the letter *F* itself.

F, in our ancient customs, was a stigma or brand.

He that shall maliciously strike any person with a weapon in church or church-yard, or draw any weapon there with intent to strike, shall have one of his ears cut off; and if he have no ears, he shall be marked on the cheek with an hot iron, having the letter *F*, whereby he may be known for a fray-maker, or fighter.

F, in physical prescriptions, stands for *fiat*, let it be done: as *F. S. A.* denotes as much as *fiat secundum artem*.

F, among such as give us the numeral value of letters, signifies 40, according to the verse,

Sexta quaterdenas gerit quæ distat ab alpha.

And when a dash was added a-top, **F**, it signified 40 thousand. **FA** is one of the notes of music; being the fourth, rising in the order of the gammut, *ut, re, mi, fa*. See **NOTE**.

FABIANUS, **FABII**, in antiquity, a part of the Luperici. See **LUPERCI**.

These priests consisted of two colleges, the first of which was called the *Fabii*, and the second the Quintilii, from their respective chiefs. — The *Fabii* were for Romulus, and the Quintilii for Remus.

FABLE, a tale, or feigned narration, designed either to instruct or divert: or, as Monf. de la Motte defines it, an instruction disguised under the allegory of an action.

Fable seems to be the most antient way of teaching: The principle difference between the eloquence of the antients, and that of the moderns, consists, according to Pere Bossu, in this, that our manner of speaking is simple and proper; and theirs full of mysteries and allegories. With them, the truth was usually disguised under those ingenious inventions, called by way of excellence *parbes*, *Fabules*, *Fables*, that is, words; as intimating, that there was the same difference between these *fabulous* discourses of the learned, and the common language of the people, as between the words of men, and the voices of beasts.

At first, *Fables* were only employed in speaking of the divine nature, as then conceived: whence, the antient theology was all *Fable*. The divine attributes were separated as into so many persons; and all the economy of the God-head laid down in the feigned relations and actions thereof: either by reason the human mind could not conceive so much power and action in a single and indivisible being; or, perhaps, because they thought such things too great and high for the knowledge of the vulgar. And as they could not well speak of the operations of this Almighty Cause, without speaking likewise of its effects; natural philosophy, and at length human nature and morality itself, came thus to be veiled under the same *fabulous* allegoric expression; and hence was the origin of poetry, and particularly of epic poetry.

The critics, after Aphthonius and Theon, reckon three kinds of *Fables*, rational, moral, and mixed.

Rational FABLES are called also parables; these are relations of things supposed to have been said and done by men; and which might possibly have been said, or done, though in reality they were not. — Such, in the sacred writings, as those of the ten virgins; of Dives and Lazarus; the prodigal son, &c. Of these rational *Fables*, we have likewise about a dozen in Phædrus.

Moral FABLES, called also apologues, are those wherein beasts are introduced as the actors, speakers, &c. These are also called *Ætopic Fables*: not that Ætop was their inventor, for they were in use long before him, *viz.* in the times of Homer and Hesiod; but because he excelled therein. In this kind, not only beasts, but even sometimes trees, instruments, &c. are supposed to speak.

The *rational* differs from the *moral Fable* in this; that the former, though it be feigned, might be true: but the latter is impossible; as it is impossible for brutes or stocks to speak.

Mixed FABLES, are those composed of both sorts, rational and moral; or wherein men and brutes are introduced conversing together. — Of these we have a fine instance, in Justin,

l. xxxiii. c. 4. made by a petty king, to alarm the antient Gauls against the Massilians, who arriving out of Asia, in Spain, charmed with the place, begged leave of the inhabitants to build a city. To this effect:

A bitch big with young, begged of a shepherd a place to lay her whelps in; which when she had obtained, she further begged for leave to rear them in the same. At length, the whelps being now grown up, depending on the strength of her own family, she claimed the property of the place.—So the Massilians, who are now only strangers, will hereafter pretend to be masters of this country.

As to the laws of *Fable*; the principal are; 1st, that to every *Fable* there be some interpretation annexed, to shew the moral sense, or design thereof. This interpretation, if it be placed after the *Fable*, is called *επιμυθιον*, or *affabulatio*; if before it *προμυθιον*, *præfabulatio*.—2^{dly}, that the narration be clear, probable, short, and pleasant. To preserve this probability, the manners must be expressed, and closely kept to, as in poetry.

M. de la Motte has some fine remarks on the subject of *Fables*, at the beginning of his *Fables nouvelles, dédiées au Roi, 1719*. A *Fable*, according to this polite writer, is a little epic poem; differing in nothing from the great one, but in extent, and in that, being less confined as to the choice of its persons, it may take in all sorts at pleasure, as gods, men, beasts, or geni; or even, if occasion be, create persons, *i. e.* personify virtues, vices, rivers, trees, &c. Thus M. de la Motte very happily introduces virtue, talent, and reputation, as persons making a voyage together.

That author suggests two reasons why *Fables* have pleased in all ages and places. The first is, that self-love is spared in the instruction. The second, that the mind is exercised by the allegory. Men do not love direct precepts; too proud to condescend to those philosophers who seem to command what they teach, they will needs be instructed in a more humble manner: and they would never amend, if they thought, that to amend were to obey. Add, that there is a sort of activity in the mind, which must be humoured. It pleases itself in a penetration, which discovers more than is shewn; and in apprehending what was hid under a veil, fancies itself in some measure the author of it. The *Fable* must always imply or convey some truth: in other works, delight alone may suffice; but the *Fable* must instruct. Its essence is to be a symbol, and of consequence to signify somewhat more than is expressed by the letter. This truth should for the generality be a moral one; and a series of fictions conceived and composed in this view, would form a system of morality preferable to any more direct and methodical treatise: Accordingly, Socrates, we are told, had a design to compose a course of morality in this way. The truth should be concealed under the allegory; and in strictness, it ought not to be explained either at the beginning or end.

The truth, or idea intended, should arise up in the reader's mind from the *Fable* itself. However, for the convenience of the less discerning readers, it may be a good way to point out the truth or moral in precise terms. In this case, to have the moral at the end of the *Fable*, seems much better than at the beginning: The mind is apt to be forestalled in the latter case; I carry the key all along with me, so that there is no room to exercise my mind, in finding any thing myself.

The image, M. de la Motte observes, must be just, and express the thing intended, directly and without any equivocation: It must be one, that is, all the parts must be visibly accessory to one principal end; and it must be natural, that is, founded on nature, or at least opinion.

The writers of *Fables* are not many. If there were any before *Æsop*, his success has quite effaced their memory; and even occasioned all the good things of that kind to be ascribed to him. His life, as wrote Planudes, is itself a thorough *Fable*. It must be owned to be very happily imagined, to make the inventor of *Fables* a slave, and his master a philosopher. The slave has his master's pride and ill humour to deal with, throughout. His lessons were all contained in the *Fables* themselves; and the readers were left the pleasure of picking them out themselves.

It is generally allowed among the learned, that though the matter and invention of the *Fables* be *Æsop's*, the turn and expression is not. The Greek is of Planudes, and bad Greek it is, in the judgment of F. Vavafor, *de Ludicra Dist.* Some authors will have Socrates the author of the *Fables* of *Æsop*; others attribute them to Solomon; and others to Homer.

Phædrus was once a slave too, and afterwards a freed-man; but he had the advantage over *Æsop* in education. He is only a fabulist, as he translates and copies. Though his *Fables* be generally short, yet is he prolix, compared to his author. His style however is always florid, his descriptions concise, and his epithets suitable: He frequently adds graces never dreamt of by the inventor; and every where enriches the simplicity of *Æsop*, in the most delicate manner.

Pilpay, another fabulist, governed Indostan a long time under a powerful emperor: but he was not the less a slave; for the prime ministers of such princes are always more so than their meanest subjects. Pilpay comprized all his politics in his *Fables*; and accordingly his work long continued the book of state, or the discipline of Indostan. It was translated into Persian and Arabic, and since into the European languages. His *Fables*, M. de la Motte observes, are rather famous than good: but he is an inventor, and the merit of invention will always compensate for a great many faults. His *Fables* are often wild, and artless; and the collection is a sort of romantic assemblage of men and geni, composed, in its kind, like *Cyrus* or *Orlando*; where the adventures are continually thwarting and clashing with each other.

We say nothing of the *Fables* of *Gabrias*, or *Babrius*, *Avienus*, *Abstemius*, &c.

Among the moderns, we have none that deserve to be seen in the company above mentioned, except, perhaps, *Mess. de la Fontaine*, and *de la Motte*. The first of whom has picked out all the best things in *Æsop*, *Phædrus*, and *Pilpay*, and given them a-new in French with a delicacy and simplicity peculiar to himself; and which, in the judgment of his countrymen, sets him even above *Phædrus*.

The latter, rather than take up with what *de la Fontaine* had left, chose to be an inventor himself. He has succeeded. His *Fables* are many of them very happy, though some think them too full of thought and reasoning. His verification is infinitely more correct than that of *la Fontaine*; and more suitable to the subject than that of *le Noble*.

F A B L E, is also used for the plot of an epic, or dramatic poem; or the action which makes the subject of such poem, or romance.

The *Fable*, according to Aristotle, is the principal part, and as it were the soul of a poem. It must be considered as the first foundation of the composition; or the principle, which gives life and motion to all the parts.—In this sense, the *Fable* is defined “A discourse invented with art, to form the manners by instructions disguised under the allegory of an action.”

The epic *Fable*, according to *Bossu*, is confined to the rational kind, *i. e.* the actors and persons are to be gods and men. And yet it admits of a great deal of latitude; it may be either grave, illustrious, and important; or low, and popular; either whole, or defective; in verse, or in prose; much episodified, or plain and brief; rehearsed by an author, or represented by actors on the scene: all which are only many circumstances, which do not make any alteration in the nature and essence of the *Fable*.

The characters that specify the epic *Fable* are these: 1. It is rational and probable; it imitates a whole, and an important action; and it is long, and related in verse. None of which properties affect the nature of the *Fables*; or make it less a *Fable* than those of *Æsop*.

The *Fable*, according to Aristotle, consists of two essential parts, *viz.* truth, as its foundation; and fiction, which disguises the truth, and gives it the form of *Fable*. The truth is the point of morality intended to be inculcated; the fiction is the action, or words the instruction is covered under.

To make a plot or *Fable*; the first thing, according to the great critic just mentioned, is to pitch on some moral instruction to be exemplified.

E. gr. I would exhort two brothers, or other persons, who have some common interest, to live in amity, in order to preserve it. This is the end of the *Fable*, and the first thing I have in view. In order to this, I endeavour to impress this maxim on their minds, that “ill understanding ruins families, and all kinds of society.” This maxim is the moral, or truth which is to be the ground of the *Fable*: which moral truth is now to be reduced into action; and a general action is to be framed from several final, and real actions of such as were ruined by ill understanding.

Thus, *e. gr.* I say, that certain persons united together for the preservation of something that belonged to them in common, coming to disagree; their division left them open to an enemy, who ruined them.—Such is the first plan of a *Fable*. The action presented by this narration has four conditions: It is universal, imitated, feigned, and contains a moral truth under an allegory. The names given to the several persons, begin to specify the *Fable*. *Æsop* uses those of brutes. Two dogs, says he, appointed to watch a flock, fall out, fight and leave all open to the wolf, who carries off what he pleases.

If you would have the action more singular, and render the *Fable* rational, take the names of men. *Pridamant* and *Orontes*, brothers by a second venter, were left very rich by their father's will: but disagreeing about the partition of their effects, they engaged themselves so far against each other, that they took no care of their common interest, against *Clitander*, their eldest brother by the first venter; which last, artfully inflaming their quarrel, and feigning he had no view but to some moderate augmentation, which might be made him without pressing them; he, in the mean time, gets the judges on his side and the other persons intrusted with the affair, procures the will to be annulled, and becomes

becomes entitled to the whole estate which the brothers were at variance about.

Now, this *Fable* is rational; but the names being feigned, as well as the things, and, besides, the persons being only of a private rank, it is neither epic, nor tragic. However, it may be employed in comedy: it being a rule laid down by Aristotle, that epic and tragic poets only invent things; but comic poets invent both names and things.

To accommodate this comic *Fable* more to the mode, and taste of the town, some Dorinda must be imagined to have been promised to Citander; but her father, finding him disinherited by the will, changes his resolution, and will have her marry one of the rich, senseless, younger brothers, whom she despised, &c.

But to return. A fiction may be so disguised with the truth of history, that there shall not appear to be any fiction at all. To effect this, the poet looks back into history, for the names of some persons to whom the feigned action either really or probably did happen; and relates it under those known names, with circumstances which do not change any thing of the ground of the *Fable*.

Thus, in the war of 1302, between king Philip the fair, and the Flemish: The French army was under the command of Robert earl of Artois, as general, and Ralph de Nesle, his constable. Being in the plain of Courtray, in fight of the enemy, the constable was of opinion it were easy to starve them; and that it was not worth while to hazard so many of the nobles, against a base and desperate populace. This advice the earl rejected with scorn, taxing the constable with cowardice and infidelity. It shall be seen, answers the constable, which of us two is the bravest, and the most faithful; and clapping spurs to his horse, he led the whole French cavalry precipitately to the charge. This precipitation, with the dust they raised, prevented their seeing a large deep ditch, behind which the Flemish were posted. The cavalry therefore plunging into it, perished miserably; and the infantry, astonished with the loss, let themselves be cut in pieces by the enemy. Thus may fiction be made to consist with truth.

As for the *Fable*, it matters but little, whether the persons be called dogs; or Orontes and Priamant; or Robert of Artois, and Ralph de Nesle; or Achilles and Agamemnon.

The epic *Fable* we shall now propose in its just extent, under these two names, last mentioned. It is too short for the epopee, in the two preceding ones. We chuse the *Fable* of the Iliad, as being the finest plan of an epic poem in the world, and at the same time the most useful system of the precepts of the art; it being hence that Aristotle was furnished with all his reflexions.

In every discrete undertaking, the end is the first thing proposed; and by this the whole work and all its parts are regulated: Consequently, the design of the epopee being to form the manners, it is with this first view that the poet must begin. Now, the philosopher dwelling on virtues and vices in general, the instructions he gives, serve equally for all states and all ages; but the poet has a more immediate regard to his countrymen, and the pressing occasions of his fellow citizens. On this view it is that he chuses his moral, which he is to insinuate into the people, by accommodating himself to their peculiar customs, genius, and inclinations. See how Homer has acquainted himself of all this.

He saw the Greeks, for whom he wrote, divided into as many states as cities; each whereof was a body apart, and had its government independent of the rest. Yet were these different states frequently obliged to unite into one body against their common enemies. Here then were two sorts of government, too different to be commodiously treated in one poem: the poet accordingly had recourse to two *Fables*; the one for all Greece, considered as confederated together, only consisting of independent parts; the other, for each particular state, such as they are in time of peace, and without the first relation. The first is the subject of the Iliad, the second of the Odyssie.

For the first kind of government, all experience agrees, that the only thing which can render it happy, and its design successful, is a good understanding, and due subordination among the several chiefs that compose it; and that misunderstanding, a desire of sway, &c. are the inevitable bane of such confederacies. The best instruction therefore that could be given them, was to set before their eyes the destruction of the people, and even of the princes themselves, through the ambition and discord of these latter. Homer therefore, for the ground or moral of his *Fable*, chose this great truth, That the misunderstandings of princes ruin their states. "I sing, says he, the wrath of Achilles, so fatal to the Greeks, and which destroyed so many heroes, occasioned by a disagreement between king Agamemnon and that prince."

To enforce this truth, he represents divers confederate states first at variance, and unprosperous; then reconciled, and victorious. All which he thus includes in one universal action. Several independent princes league against a common enemy: He whom they chuse as their leader, affronts the bravest of

all the confederacy; upon which the offended prince withdraws, and refuses any longer to fight for the common cause. This misunderstanding gives the enemy so much advantage, that the confederates are ready to relinquish the enterprise. The disaffected person himself becomes a sharer in the calamities of his allies; one of his chief friends and favourites being killed by the chief of the enemies. Thus, both parties, grown wise at their own costs, are reconciled. Upon which the valiant prince again joining in the war, turns the scale to his own party, and kills the enemy's chief.

Such is the first general plan of the poem. To render this probable and more interesting, circumstances of time, place, persons, &c. are to be added; that is, the poet looks into history, or tradition, for persons, to whom such actions may with truth or probability be attributed.

He pitches on the siege of Troy, and supposes the action to have passed there. The brave, choleric character he calls Achilles; the general is Agamemnon; the chief of the enemies, Hector, &c. To insinuate himself unto his readers, he accommodates himself to their manners, genius, views, &c. and, to render his *Fable* the more interesting, makes his chief persons, and those who remained at length victorious, to be Greeks, the fathers of those very people. The course of the work is filled up, and extended with other useful lessons and instructions.

That the epopee in all its glory is still justly and strictly a mere *Fable*, in the same sense as the fictions of Æsop are, is shewn by F. Bossu, in a parallel between the *Fable* of the Iliad, and that of Æsop already mentioned. The moral instruction is visibly the same in both: So is the fiction. All the difference lies in the names and qualities of the persons.

Homer's are kings; he calls them Achilles, Patroclus, &c. and the general good to be preserved, he calls the Greeks. Æsop, after this manner, gives his persons the names of beasts.

The dogs are confederated, the wolf is their enemy; and what Homer calls the Greeks, Æsop calls sheep. One says, that while the confederate princes are at variance, Hector rushes on the Greeks, and makes them pay dear for the folly of their sovereigns (*delirant reges, plectuntur Achivi*.) But that the allies, brought by misfortunes to themselves again, reunite, repulse Hector, and kill him. The other, that while the dogs are together by the ears, the wolf falls on the sheep; and that the dogs, seeing the havoc he makes, join together, drive him away, and kill him.

The two *Fables* were capable of a still nearer resemblance. Homer has extended his by long speeches, descriptions, comparisons, and particular actions; and that of Æsop might be amplified after the like manner, without corrupting or altering it.

There needs only to relate what cause set the dogs at variance, and shew the rise of the fatal wrath in all its circumstances; to make fine descriptions of the plain wherein the sheep fed, and of some neighbouring wood, where the wolf was sheltered: To give this enemy whelps to rear; make them follow their fire in search of prey; and describe the carnage they made at divers expeditions. Nor would the genealogy of the heroes be forgotten: The wolf should boast himself a descendant of Lycaon; and one of the dogs be sprung in a direct line from Canicula. Which last would be the proper hero of the poem, as being hot, and apt to be enraged. He would represent the person of Achilles to admiration; and the folly of some Ajax his cousin, would afford a good proof of so divine an extraction. Nothing more were required to engage heaven in the cause, and divide the gods; which, no doubt, have as much right in Æsop's republic, as in the states of Homer. Witness Jupiter taking care to give a king to the nation of the frogs.

The reader has here field enough for an epopee; if he have any thing of fancy and expression, and do but take care to repeat, as often as Homer does,

Τὸν δ' ἀπαμειβόμενον προσέφη ποδάριος—

FABRICK *, the structure, or construction of any thing, particularly of a building.

* The word is formed of the Latin *fabrica*, which originally signifies a smith's shop, or forge.

In Italy, the word *Fabrick* is applied to any considerable building: In France it rather signifies the manner of building.

FABRICK Lands, are lands given towards the maintenance, rebuilding, or repair of cathedrals, or other churches; mentioned in the act of oblivion, 12 Car. II. cap. 8.

In ancient time almost every one gave by his will more or less to the *Fabrick* of the cathedral, or parish-church where he lived.

FABULOUS, denotes something that has a relation to fable.

Varro divides the duration of the world into two earlier states, or periods. The first, *αἰὼλον*, the obscure or dark, including all the time before the deluge: for the heathens had some faint idea of a deluge, and a sort of tradition founded thereon; but knew nothing of what had passed before.

The second period he calls *μυθικόν*, *fabulous* age, including the time from the deluge to the first olympiad; and making accord-

according to Petavius, 1552 years; or to the destruction of Troy, which was 1164 years after the deluge, or 308 after the delivery from Egypt.

This Period is called sometimes *Fabulous*, and sometimes heroic: The first on account of the fables wherein the history and learning of those ages are veiled: The second, from the heroes, or sons of the gods, whom the poets feign to have lived in those days.

FACE, the surface, or first side which a body presents to the eye. See *SURFACE*.

We say, the *Face* of the earth, of the waters, &c. Polyhedrons have several *Faces*.

A die, or cube, has six *Faces*.

FACE, is particularly used for the visage of an animal, and especially of a man; as being in him the only part of the body that ordinarily appears to the eye.

The Latins call it *facies, vultus, os*, &c.

The great variety observable in mens *Faces*, voices, and hand-writings, furnishes a noble argument of a providence.

The human *Face* is called the image of the soul, as being the seat of the principal organs of sense; and the place where the ideas, emotions, &c. of the soul are chiefly set to view. Pride and disdain are shewn in the eye-brows, modesty on the cheeks, majesty in the forehead, &c. It is the *Face* which shews the sex, age, temperament, health, or disease, &c.

The *Face*, considered as the index of the passions, habits, &c. of the person, makes the subject of physiognomy.

Anatomists usually divide the *Face* into two parts, the upper, and lower: The upper is the front, or forehead; the lower includes the eyes, nose, ears, mouth, and chin. See each part described under its respective article.

FACE, or **FACADE**, is sometimes used for the front of a building; or the side on which the chief entrance is: As also for the side it presents to a street, garden, court, &c. And sometimes for any side opposite to the eye.

FACE, **FACIA**, or **FASCIA**, in architecture, denotes a flat member, having a considerable breadth and but a small projection.

Such are the bands of an archdrave, larmier, &c.

FACE of a stone, is the surface or plain part, which is to lie in the front of the work.—The *Face* is easily known when the stone is squared, as being always opposite to the back; and the back going rough as it comes from the quarry.

The workmen generally chuse to make one of those sides the *Face*; which when in the quarry lay perpendicular to the horizon; and consequently the breaking, and not the cleaving way of the stone.

FACES of a bastion, are the two foremost sides, reaching from the flanks to the point of the bastion, where they meet.

These are commonly the first undermined, by reason they reach farthest out, and are the least flanked, and therefore weakest. They are represented by the lines BC, and SC, *Tab. Fortif. fig. 1.*

FACE of a place, denotes the interval between the points of two neighbouring bastions, containing the curtain, the two flanks, and the two *Faces* of the bastions that look towards one another.

This is otherwise called the *tenaille* of the place.

FACE prolonged, in fortification, is that part of a line of defence rampant, which is between the angle of the epaule, or shoulder of a bastion and the curtain: or the line of a defence rampant diminished by the *Face* of the bastion.

FACE, in astrology, is used for the third part of a sign. Each sign is supposed to be divided into three *Faces*: The ten first degrees compose the first *Face*; the ten following ones the second; and the last ten the third. Venus is in the third *Face* of Taurus, that is, in the last ten degrees thereof. See **SIGN**.

FACET, or **FACETTE**, a little face, or side of a body cut into a great number of angles.

Multiplying glasses are cut in *Facets*, or *Facet-wise*. Diamonds are also cut in *Facets*, or tables.

FACIA, in architecture. See the article **FASCIA**.

FACIES Hippocratica, in medicine, is when the nostrils are sharp, the eyes hollow, the temples low, the tips of the ears contracted, the forehead dry and wrinkled, and the complexion pale or livid.

The *Facies Hippocratica* is chiefly observed toward the period of phthises, and other consumptions: And is held a sure prognostic of death.

FACTION, a cabal, or party, formed in a state to disturb the public repose.

The most celebrated *Factions* are that of the Guelphs and Ghibelins, who kept Italy in alarm for many ages; and with us that of the Whigs and Tories.

FACTION was originally an appellation given the divers troops, or companies of combatants in the games of the Circus. See **CIRCUS**.

Of these there were four, viz. the green *Faction*, the blue *Faction*, the red *Faction*, and the white *Faction*.

These *Factions*, with their liveries and badges, were at length abolished: The emulation which was at first between them, growing to such a height, that in Justinian's time they came to blows about it.

FACTITIOUS signifies any thing made by art; in opposition to what is the produce of nature.

Distilled waters are *factitious* liquors. See **WATER**.

Cinnabar is divided into natural and *factitious*. See **CINNABAR**.

De FACTO, see the article **DE-FACTO**.

FACTOR, in commerce, an agent, or person who acts, and negotiates for a merchant, by commission; called also commissioner, and on some occasions broker, and throughout the Levant, *coagis*.

Factors are either charged with the buying, or the selling of goods; or with both.

Those of the first kind are usually established in places of considerable manufactories, or cities of great trade. Their office is to buy up commodities for merchants residing elsewhere; to see them packed, and send them to the persons for whom they were bought.

FACTORS of sale, are usually fixed in places where there is a great vent. To these, merchants and manufacturers send their goods to be sold for them according to the price, and other conditions expressed in the orders deliver'd them.

The wages, or allowances for selling, are usually clear of all expences of carriage, exchange, remittances, &c. excepting postage of letters, which are never put to account.

FACTORS, in arithmetic, is a name given to the two numbers which are multiplied into one another; that is, the multiplicand and multiplier: so called by reason they are to *facere productum*, make or constitute the product.

FACTORAGE,

The *Factorage*, or wages, called also commission, is different, at different places, and for different voyages: At a medium it may be fixed at about three *per cent.* of the value of the goods bought; beside the charge of package, which is paid over and above.

At Virginia, Barbadoes and Jamaica, the *Factorage* is from three to five *per cent.* and the like throughout the greatest part of the West-Indies. In Italy it is two and a half. In Holland one and a half. In Spain, Portugal, France, &c. it is two *per cent.*

FACTORY, a place where a considerable number of factors reside, to negotiate and officiate for their masters or principals.

The term is chiefly used in speaking of the East-Indies, and other parts of Asia, whither the European nations send their ships every year, and where they keep factors to buy the commodities of the country, and sell those brought from Europe.

The greatest and noblest *Factory* in the world, is that of the English at Smyrna. It usually consists of 80 or 100 persons, most of them young gentlemen of the best families, and frequently younger sons of peers. It is a sort of seminary of merchants. As there is a necessity for serving an apprenticeship of seven years, to be entitled to trade to the Levant; the custom is for persons of fortune to bind their younger sons to some merchant, who, in consideration of 3 or 400 pounds sterling, agrees, after the three first years of their apprenticeship are expired, to send them to Smyrna: where they have not only the management of their masters affairs with very plentiful allowances, but are likewise permitted to trade for themselves; whereby they are enabled to live splendidly the rest of their apprenticeship, and at length come out the best qualified for business of any young persons in the world.

FACTUM, in arithmetic, the product of two quantities multiplied by each other.

FACULÆ * in astronomy, a name given by Scheiner, and others after him, to certain spots on the Sun's disk, that appear brighter, and more lucid than the rest of the body.

* The word is pure Latin; being a diminutive of *fax*, torch; and supposed to be here applied from their appearing and dissipating by turns.

The *Faculae* or bright spots differ very considerably from the macule or dark spots, both in light, colour, figure, magnitude, and duration,

Hevelius assures us, that July the 20th, 1674, he observed a *Facula* that took up a third part of the sun's diameter. And from the observations of the same Hevelius, we learn, that the macule frequently change into *Faculae*; but the *Faculae* into macule rarely, if ever. Some authors even contend that all the macule degenerate into *Faculae*, before they quite disappear.

Huygens, however, declares he was never able to discover any *Faculae*; though the macule occurred to him very frequently. All the foundation he could see for the notion of *Faculae*, he says, was, that in the darkish clouds which frequently surround the

macule, one sometimes discerns little points or sparks brighter than the rest.

Many authors, after Kircher and Scheiner, have generally represented the sun's body full of bright, fiery spots, which they conceive to be a sort of volcano's in the body of the sun. But Huygens, and others of the latest and best observers, finding that the best telescopes discover nothing of the matter, agree to explode the phenomena of *Facule*. Their cause, these authors attribute to the tremulous agitation of the vapours near our earth; the same as sometimes shews a little unevenness in the circumference of the sun's disk, when viewed through a telescope. Strictly then, the *Facule* are not eruptions of fire and flame, but refractions of the sun's rays in the rarer exhalations, which being condensed in the neighbourhood of that shade, seem to exhibit a light greater than that of the sun. See SUN.

FACULTY, a power, or ability, of performing an action.

The term is much used by the ancient philosophers, and still retained in the schools, to explain the actions of natural bodies by.

Thus to account for the act of digestion, they suppose a digestive *Faculty* in the stomach; to account for motion, they imagine a motive *Faculty* in the nerves, &c. which is only a substituting of one name of an unknown phenomenon for another.

Yet this practice of attributing effects to their respective virtues or *Faculties*, still obtains in divers things, which our philosophy has not yet afforded us a better account of. Thus, say our medicinal writers, fenna and rhubarb have a purgative *Faculty*; barberries a cooling *Faculty*, &c. which amounts just to this, that fenna purges, and barberries cool.

The human *Faculties* are divided into those of the soul, and of the body.

The *FACULTIES* or powers of the soul, are commonly reputed two, viz. understanding, and willing.

The *FACULTIES* of the body are usually distinguished with regard to their several functions, into *vegetative* and *animal*.

Under the *vegetative Faculty*, are comprehended the divers subaltern ones, whereby nutrition and generation are effected.

Under the *animal Faculties*, are comprehended those relating to sense and motion.

The *vegetative Faculty* is subdivided into *nutritive* and *generative*; and the nutritive is again subdivided into *natural* and *vital*.

To the first, belong the functions of the lower belly, relating to the preparation of the food; to the latter, the actions of the heart and lungs, wherein life is chiefly concerned.

Others subdivide the *vegetative Faculty* into *attractive*, *retentive*, *coactive*, and *expulsive*.

The animal *Faculties* being those whereby an animal perceives and moves, become divided into *sensitive* and *locomotive*.

FACULTY is also applied in the schools to the divers parts or members of an university, divided according to the arts, or sciences taught, or professed therein.

There are four *Faculties* in most universities: That of Arts, which includes the humanities and philosophy, and is much the most antient, and extensive: The second is that of Theology: The third, Medicine: And the fourth, Jurisprudence, or Laws. See each under its proper article.

The degrees in several *Faculties* in our universities are, those of Bachelor, Master, and Doctor.

The **FACULTY** is frequently used absolutely, and by way of eminence, for that chiefly studied and taught in that place.

Thus, the *Faculty* of London and Montpellier, is Medicine: that of Paris, Theology: that of Orleans, Law, &c.

FACULTY, in law, denotes a privilege or special power granted to a man by favour, indulgence, and dispensation, to do that which regularly, and by law he cannot: As to eat flesh upon days prohibited; or to marry without bans first asked.

The court of *FACULTIES* in England belongs to the archbishop of Canterbury, and his officer is called *magister ad Facultates*. His power is to grant dispensations, as to marry, for the son to succeed his father in his benefice, one to have two or more benefices incompatible, &c.

The office where such dispensations are taken out, is also called the *Faculty-office*.

FÆCAL, or **FÆCAL** matter, a term used by physicians, particularly the French, for the *Fæces* or great excrements of a man, i. e. those discharged by stool.

The *Fæcal matter* is become famous for a chemical operation thereon, by M. Homberg, related at length in the *Mém. de l'Acad. R. An 1711*. He had a notion suggested to him, that the *Fæcal matter*, by distillation, yielded an oil clear as water, without any smell, and which had the property of fixing mercury into fine silver. Upon this, he went to work; and because he would have as laudable and pro-

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ving a matter as he could, he hired four robust healthy young fellows, whom he shut up for three months, and agreed with them, that they should eat nothing but the finest bread, which he supplied them withal fresh every day, and drink the best Champaign wine as long as they would. After a long process, and numerous essays on the excrements they made, he at length got the clear, inodorous oil; but it had no effect at all on mercury, which was the great point aimed at.

However, missing of what he expected, he fell on something he never dreamt of, viz. a Phosphorus. The caput mortuum of the oil, he found to have a surprizing property of taking fire without any motion, or the application of any other fire; in-fomuch, that it might deserve a place in the first rank of the known Phosphori.

The quantity of a pea of this taken out of the matras, and laid on a paper, or other combustible matter, begins to smoke immediately, and sets the paper on fire.

FÆCES, or **FECES**, the dregs, sediment, or impurities remaining of a mixt body, after the purer, more volatile and fluid have been separated therefrom by evaporation, distillation, decantation, derivation, or the like.

Thus we say the *Fæces* of wine, of oil, &c. Those of wines are properly called *lees*. Those of oil, *amara*; those of malt-liquors, *grounds*.

FÆCES, in chemistry, denotes the lees, refuse, dirt, mud, impurities, and heterogeneous matters remaining in the alembic after the distillation of any body. What remains in the retort, instead of *Fæces*, is properly denominated *caput mortuum*, or *terra dammata*.

FÆCES is particularly used in medicine, &c. for the gross, impure matters found at the bottom of the compositions and preparations of either pharmacy.

FÆCES is also used for the excrements of an animal, voided by stool. See EXCREMENT.

FÆCULA, or **FECULA**. See the article FECULA.

FÆTOR, stench. See the article FOETOR.

FAGGOT *, or **FAGOT**, in fortification. See FASCINE.

* Menage derives the word from the Latin *facotus*, which was formed of the Greek φακος. Nicod borrows it from *faciculus*, a bundle: Du Cange from the base Latin *facotum*, and *facotum*.

FAGGOT of steel, expresses the quantity of 120 lb. weight.

FAGGOT, in the times of popery in these kingdoms, was a badge worn on the sleeve of the upper garment, by such as had abjured heresy; being put on after the person had carried a *Faggot*, by way of penance, to some appointed place of solemnity.—The leaving off this badge was sometimes construed apostasy.

FAGGOTS, among the military men, are ineffective persons, who receive no regular pay, nor do any regular duty, but are hired occasionally to appear at a muster, to fill up the companies, hide the real deficiencies thereof, and cheat the king of so much pay, which goes into the officers pocket.

FAGONA, in anatomy, a conglomerate gland, called also *thymus*. See THYMUS.

FALLIS, in heraldry, a French term, denoting some failure or flaw in an ordinary, as if it were broke, and a splinter taken from it.

FAILURE, or **FAILING**, a species of bankruptcy; popularly called breaking, or stopping payment.

FAINT, or **FAINT-ACTION**, is as much as *feigned Action*; that is, such an action, as though the words of the writ be true, yet, for certain causes, the party has no title to recover thereby.

By which it differs from a false action, which is that where the words of the writ are false. Coke on Littl. fol. 361.

Yet sometimes the two are confounded. See ACTION.

FAIR *, a public place, where merchants, traders, and other persons from divers parts meet, on some fixed day of the year, to buy and sell commodities, and to partake of the diversions usually accompanying such assemblies.

* The Word *Fair* is formed of the French *faire*, which signifies the same thing: And *faire* some derive from the Latin *forum*, market: Others from the Latin *ferie*, by reason *Fairs* were antiently always held in the places where the wake, or feasts of the dedications of churches, called *ferie*, were also held. The Romans called them *nundine*. Eric Puteanus has a pretty little treatise on the *Fairs* of the Romans, *De nundinis Romanorum*, which he calls *Nova fassorum facula*.

Fairs are either free, or charged with tolls and impositions. The privileges of free *Fairs* consist chiefly, 1° In that all traders, &c. whether natives, or foreigners, are allowed to enter the place, and are under the royal safeguard and protection in coming and returning, they and their agents, with their goods, &c. 2° In that the said persons, and their effects, are exempt from all duties, impositions, tolls, and servitudes. 3° That merchants in going to, or returning from the *Fair*, &c. cannot be arrested, or their goods stopped, &c.—It is the sovereign alone that has a right, by

his letters patent, to establish *Fairs*, whether free, or subject to duties, and the other ordinary laws and penalties.

Several *Fairs* are held in the open fields, or on heaths and commons, under tents, booths, and barracks erected for the purpose: as *Scarbridge Fair, &c.* Others in places walled in for the purpose; and formed into regular streets, lanes, &c. for the occasion: as the *Fair of St. Laurence at Paris*. Lastly, others are held in the open places and streets of cities, as *Bartholomew Fair, Bristol Fair, the Fair of St. Germain, &c.* *Fairs*, particularly free *Fairs*, make a very considerable article in the commerce of Europe, especially that of the Mediterranean or inland parts, as Germany, &c. where the continual passage and repassage of vessels is impracticable.

The most celebrated *Fairs* in Europe are those, 1^o of *Frankfort*, held twice a year, in spring and autumn: the first commencing the Sunday before Palm-Sunday, and the other on the Sunday before the eighth of September. Each lasts fourteen days, or two weeks, the first of which is called the week of acceptance, and the second the week of payment. They are famous for the sale of all kinds of commodities, but particularly the immense quantity of curious books, no where else to be found, and whence the booksellers throughout all Europe used to furnish themselves. Before each *Fair* there is a catalogue of all the books to be sold thereat, printed and dispersed, to call together purchasers; though the learned have generally complain'd of divers unfair practices therein; as fictitious titles, names of books purely imaginary, &c. beside great variety in the names of the authors, and the titles of the real books. — 2^o The *Fairs of Leipzig*, which are held thrice a year: one beginning on the first of January; another three weeks after Easter; and a third after Michaelmas. They hold twelve days apiece, and are at least as considerable as those of Frankfort. 3^o The *Fairs of Novi*, a little city in the Milanese, under the dominion of the republic of Genoa. There are four of these in the year, commencing on the second of February, the second of May, the first of August, and second of September. Though the commodities bought and sold here be very considerable; yet, what chiefly contributes to render them so famous, is the vast concourse of the most considerable merchants and negotiators of the neighbouring kingdoms for the transacting of affairs, and settling accounts.

4^o The *Fairs of Riga*, whereof there are two in the year: one in May, and the other in September. They are much frequented by the English, Dutch, and French ships, as also by others from all parts of the Baltick. The best time for the sale of goods at Riga, is during the *Fairs*. Since the building of the famous city of Petersburg, these *Fairs* have suffered some diminution. 5^o The *Fair of Archangel*, during which all the trade foreigners have with that city, is managed. It holds a month, or six weeks at most, commencing from the middle of August. The Muscovite merchants attend here from all parts of that vast empire; and the English, Dutch, French, Swedish, Danish, and other ships in the port of that city, on this occasion, ordinarily amount to three hundred. But this is no free *Fair*, as the rest are: The duties of exportation and importation are very strictly paid, and on a very high footing. 6^o The *Fair of St. Germain*, one of the suburbs of Paris, commencing on the third of February, and holding till Easter; though it is only free for the first fifteen days. 7^o The *Fairs of Lyons*, which, Monf. du Chesne, in his antiquity of cities, would insinuate, from a passage in Strabo, were established by the Romans: though it is certain, the *Fairs*, as they now stand, are of a much later date. There are three in the year, each lasting twenty days, and free for ever. They begin on Easter Monday; the 26th of July; and the first of December. 8^o *Fair of Guibray*, a suburb of the city of Falaise, in the lower Normandy. It is said to have been established by our William the conqueror, in consideration of his being born at Falaise. It commences on the 16th of August, and holds fifteen days, free by charter, and longer by custom. 9^o *Fair of Beaucaire*, held partly in a city of that name, in Languedoc, and partly in the open country, under tents, &c. It commences on the 22d of July, and only holds for three days; yet it is the greatest and most celebrated of all the *Fairs* in that part of Europe, both for the concourse of strangers from all parts of the world, and for the traffic of all kind of goods: the money returned in these three days amounting sometimes to above six millions of livres.

The *Fairs* of Porto-bello, Vera-Cruz, and the Havana, are the most considerable of all those in America. The two first last as long as the flota and gallions continue in those parts; and the last is opened as soon as the flota or gallions arrive there upon their return for Spain; this being the place where the two fleets join.

FAIR Pleading. See the article **BEAU-PLEADER**.

FAIRY, a term frequently occurring in ancient traditions and romances, denoting a kind of genit or imaginary deities, conversant on earth, and distinguished by abundance of fantastical actions and offices, either good or evil.

The *Fairies*, according to these Traditions, are a peculiar species of divinities, that have but little relation to any of those of the ancient Greeks and Romans; unless perhaps to the *Larvæ*. Though others, will not have them ranked among deities; but suppose them an intermediate kind of beings, neither gods, nor angels, nor men, nor devils.

They are of oriental extraction, and seem to have been invented by the Persians and Arabs, whose history and religion abound with tales of *Fairies* and dragons. The Persians call them *Peri*, and the Arabs *Ginn*, having a peculiar country, which they suppose them to inhabit, called *Ginnistan*, and by us *Fairy-land*.—Our famous countryman Spencer's masterpiece, the *Fairy-queen*, is an epic poem under the persons and characters of *Fairies*.

Naude, in his *Malcurat*, derives the origin of the fables of *Fairies*, from those of the *Parcæ* of the antients; and supposes both the one and the other to have been a kind of envoys, or interpreters of the will of heaven to men. But then, by *Fairies* this author means a sort of witches, famed for foretelling future events, by means of some communication with the genii above-mentioned. The silly superstitious notions of the antients, he observes, were not near so formidable as ours; nor their hell and furies any thing comparable to our devils. Accordingly, in lieu of our hags and witches, who do nothing but ill, and are employed in the lowest, and basest offices, they had a finer sort of goddesses, called by Latin authors *albas dominas*, who scarce did any thing but good, and took pleasure in noble, and honourable deeds: Such were their *Lamia*, and nymph *Egeria*; from whom the later *Fairy* queens, *Morga*, *Alcina*, *Fata Manto* of Ariosto, *Gloriana* of Spencer, and other machines in English and French fable, were, no doubt, derived. Some of them are usually made to attend the births of young princes and cavaliers, to inform them of their destiny, as was antiently done by the *Parcæ*: witness *Hyginus*, c. 174, and 174.

But, with Naude's leave, the antients were not without witches; as wicked as our own; witness the *Canidia* of Horace, *od. v. & satyr. l. 5. l. 1. 10.* Nor did the *Fairies* succeed the *Parcæ*, or even *Veneficæ* of the antients; but rather the *Nymphæ*; for such were *Lamia*, and *Egeria*.

FAIRY circle, or *rings*, is a phenomenon pretty frequent in the fields, &c. being a kind of round, supposed, by the vulgar, to be traced by the *Fairies* in their dances.

There are two kinds; one of them seven or eight yards in diameter, containing a round bare path, a foot broad, with green grass in the middle: the other of divers sizes; being incompass'd with a circumference of grass, much thicker and greener than that in the middle.

Mr. Jessop and Mr. Walker, in the *Philos. Transf.* ascribe them to the lightning; which is confirmed by their being most frequently produced after storms of that kind; as well as by the colour and brittleness of the grass roots, when first observed. It is no wonder that lightning, like all other fires, moves round, and burns more in the extremity than the middle.

According to those gentlemen, the second kind of circle arises originally from the first: the grass burnt up by the lightning, using to grow the more plentifully afterwards.

Other authors have asserted, that these *Fairy* rings are formed by ants; by reason those insects are sometimes found travelling in troops therein. See Supplement article **FAIRY CIRCLE**.

F A I T H, in philosophy, *belief*; or that assent which we give to a proposition advanced by another, the truth of which we do not immediately perceive from our own reason or experience, but believe it discovered and known by the other.

Faith is a judgment or assent of the mind, the motive whereof is not any intrinsic evidence, but the authority or testimony of some other, who reveals or relates it.

Hence, as there are two kinds of authorities and testimonies; the one of God, and the other of man; *Faith* becomes distinguished into *human* and *divine*.

Divine FAITH is that founded on the authority of God; or it is that assent we give to what is affirmed by God.

The objects of this *Faith* are matters of revelation. See **REVELATION**.

Human FAITH is that whereby we believe what is told us by men.

The object hereof is matter of human testimony and evidence.

Faith again, may be distinguished into *implicit*, and *scientific*.

Implicit or blind FAITH is that whereby we give our assent to a proposition advanced by another, of whose knowledge and veracity we have no certain and evident reason or proof. This is only opinion, under another name.

Scientific or seeing FAITH, is that by which we give our assent to a proposition advanced by one who can neither deceive, nor be deceived; which may be properly referred to science and knowledge.

Divine Faith, *ceteris paribus*, is stronger than human. When we are fully convinced that any proposition comes from God, *Faith* becomes assurance, or science; it being an ingredient

ingredient in our idea of God, that he can neither deceive nor be deceived: But when there is any doubt, whether the proposition is declared by God, or whether he has commanded that we should believe such a thing; the *Faith* can be no stronger, or weaker, than the reasons on which it is founded: Divine *Faith*, therefore, may either be strong, weak, or none at all.—Again, the reasons or motives of believing men, may be of such weight and force, that being perfectly understood, they may equal a mathematical evidence: And then the human *Faith* is scarce inferior to the divine; there being, as it were, an equal necessity of giving our assent on each side.

Hence it is easily observed, that all our *Faith* or belief has its foundation on reason, which cannot deceive us, if we make a due use of our liberty, and do not acquiesce, till that necessarily compels us.

Strictly, and philosophically speaking, no man can have what we call a divine *Faith*, except a prophet, to whom God has immediately spoken.

All our present religious *Faith* is really human, as depending on the secondary testimony of men; of whose veracity, however, we have the strongest proofs. The prophets, or those to whom God immediately revealed his will, believed him, for that they knew he could not deceive. We, at this day, believe them, or rather their writings, for other reasons, viz. the fame which obliges us to believe all well attested histories.

FAITH, in theology, makes the first of the theological virtues, or graces.

Faith, in this sense, is a gift of God, whereby we are led to give a firm assent to the truths he has revealed to his church: or, *Faith* is a gift or impression, which leads us to give our assent to certain things relating to God, his nature, attributes, worship, &c. the evidence of which things, we do not see and understand clearly enough, to have given our assent on the common footing of reason, and conviction.

St. Paul defines *Faith* the substance or support of things hoped for, and the evidence of things not seen.—The life of *Faith* consists in serving God without knowing him in any sensible manner. Nicole.

Beside the two species of *Faith*, human and divine; the Romanists make a third, or intermediate kind, called

Ecclesiastical FAITH, which is the assent orthodox persons give to certain events decided by the church, and enjoined to be believed by all.

As when the church declares that such a book contains heretical doctrine, that such a person is in heaven, &c.

This term, ecclesiastical *Faith*, was first introduced by Mr. Perreux, to distinguish the *Faith* whereby we believe matters of divine revelation, from that whereby we believe matters of ecclesiastical determination.

Confession of FAITH, is a creed or formula containing all those articles, the belief whereof is esteemed necessary to salvation.

FAITH and HEMAGE, in the feudal law. See **FEALTY**.

FAKIR, or **FAQUIR**, a kind of dervise, or Mahometan religious, who travels the country, and lives on alms.

* The word *Fakar* is Arabic, and signifies a poor or needy person. It is formed of the word **فقر**, *fakara*, to be in need.

D'Herbelot makes *Fakir* and dervise the same thing. The Turks and Persians use the name dervise for any poor person, whether he be so out of necessity or choice: And the Arabs apply *Fakir* in the same sense. Whence, in some Mahometan countries, the religious are called dervises; and in others, particularly throughout the states of the great Mogul, *Fakir*.

The *Fakirs* sometimes travel singly, and sometimes in companies. When they go in companies, they have a superior, who is distinguished by his habit. Each *Fakir* bears a horn, which he blows at his arrival in any place, as also at his departure; and a kind of scraper or trowel, to scrape the earth in the place where he sits or lies down. When they go together, they divide their alms equally amongst them; give what is left every night to the poor, and never reserve any thing for the morrow.

There are also a kind of idolatrous *Fakirs*, who follow much the same trade. D'Herbelot reckons in the Indies eight hundred thousand Mahometan *Fakirs*; and twelve hundred thousand idolatrous ones: to say nothing of divers extraordinary species of *Faquirs*, particularly penitents, whose mortification and penance consists in very odd observances. Some, *v. gr.* remain night and day, for many years, in certain uneasy postures. Others never sit or lay down to sleep, but sustain themselves by a rope, hung down for that purpose. Others bury themselves in a ditch, or pit, for nine or ten days, without eating or drinking. Others keep their arms lifted up to heaven, so long, till they cannot let them down again, if they would. Others lay fire on their heads, and burn the scalp to the very bone. Others roll themselves naked on thorns. Tavernier, &c.

Another class of *Fakirs* retire unto mosques, live on alms, and devote themselves to the study of the law, the reading of

the Alcoran, &c. to fit themselves for moulas, or doctors. People of quality sometimes assume the character of *Fakirs*. The famous Aurangzeb himself, before he ascended the throne, gave out, that he intended to commence *Fakir*.

FALCATED, one of the phases of the planets, popularly called horned.

The astronomers say the moon, or any planet, is *Falcated*, when the enlightened part appears in form of a sickle, or reaping-hook, by the Latins called *fals*.

The moon is *Falcated*, whilst she moves from the conjunction to the opposition, or from new moon to full; from full to a new again, the enlightened part appears gibbous, and the dark *Falcated*. See **MOON**.

FALCON*, or **FAUCON**, a bird of prey, of the hawk-kind, superior to all others for courage, docility, gentleness, and nobleness of nature.

* Jo. de Janu, and several others, take the name *Falcon* to have been occasioned by its crooked talons, or pounces, which resemble a *fals* or sickle. Giraldus derives it a *falconis*, because it flies in a curve.

The *Falcon*, or *Falcon Gentle*, is both for the fist, and the lure: Its feet are yellow, its head black, and its back spotted. In the choice, observe that the head be round, the beak thick and short, the neck long, the shoulders broad, thighs long, legs short, feet large, the feathers of the wings slender, and the pounces black.

The *Falcon* is excellent at the river, brook, and even field; and flies chiefly at the larger game, as wild-geese, kite, crow, heron, crane, pyc, shoveler, &c.

It must be added, that the name *Falcon* is restrained to the female; for as to the male, it is much smaller, weaker, and less courageous than the female, and is denominated a *Tafjel*, or *Tireedat*.

As in the course of this work, the several terms of falconry are explained, it may be here necessary to say something in the general, of the management and discipline of the *Falcon*, as being the foundation of the art of falconry. For the rest, the reader may have recourse to the Heads **HAWKS**, and **HAWKING**.

When a young *Falcon* is first taken, she must be seeled, and the seeling at length gradually slackened, that she may be able to see what provisions are brought her. Her furniture is to be jesses of leather, mailed leafies, with buttons at the end, and bewets. Beside a small round stick hanging in a string to stroke her frequently withal; which, the oftner it is done, the sooner and better will she be manned: she must have two bells on her legs, that she may be the more readily found, or heard when she sits, scratches, &c. and a hood raised, and hoisted over her eyes. Her food is to be pigeons, larks, and other live birds, of which she is to eat twice or thrice a day, and till she be full gorged. When the falconer is about to feed her, he must hoop and lure, that she may know when to expect it. Then unhooding her gently, he gives her two or three bits, and putting her hood on again, gives her as much more; but takes care she be close seeled, and after three or four days lessens her diet. At going to bed, he sets her on a perch by him, that he may awake her often in the night; continuing to do so till she grow tame and gentle. When she begins to feed eagerly, he gives her sheep's heart; and now he begins to unhood her by day, but it must be done far from company: feeds her and hoods her again, as before, but takes care not to fright her with any thing when he unhoods her, and, if he can, reclains his when without over-watching. The *Falcon* must be born continually on the fist, till she be thoroughly manned, and induced to feed in company: for two or three days give her washed meat, and then plumage, according as you esteem her foul within; if she cast, hood her again, and give her nothing till she gleam after her casting: but when she has gleamed and cast, give her a little hot meat in company; and towards evening let her plume a hen's wing, likewise in company: cleanse the feathers of her casting, if foul and slimy: if she be clean within, give her gentle casting; and when she is well reclaimed, manned, and made eager and sharp set, venture to feed her on the lure.

But three things are to be considered before your lure be shewed her. 1^o That she be bold and familiar in company, and not afraid of dogs and hortes. 2^o Sharp-set and hungry, having regard to the hour of morning and evening when you would lure her. 3^o Clean within, and the lure well garnish'd with meat on both sides. When you intend to give her the length of a leafe, you must abscond yourself: she must also be unhooded, and have a bit or two given her on the lure, as she sits on your fist. That done, take the lure from her, and so hide it that she may not see it: when she is unseled, cast the lure so near her, that she may catch it within the length of her leath; and as soon as she has seized it, use your voice as falconers do, feeding her upon the lure on the ground.

After having lured your *Falcon*, in the evening give her but little meat, and let this luring be so timely, that you may give

give her plumage, &c. next morning on your fist: when she has cast and gleaned, give her a little beaching of warm meat: about noon, tie a creance to her lease, go into the field, there give her a bit or two upon the lure, and unfeel her. If you find she is sharp-set, and has eagerly seized on the lure, let a man hold her, to let her off to the lure; then unwind the creance, and draw it after you a good way, and let him who has the bird, hold his right hand on the tassel of her hood readily to unhood her as soon as you begin to lure; to which if she come well, stoop roundly upon it, and hastily seize it, let her cast two or three bits thereon. That done, take her off the lure, and deliver her again to the person that held her; and going further off the lure, feed her as before; and so daily farther and farther off the lure. Afterwards, you may lure her in company, but do not fright her: and having used her to the lure on foot, do it also on horseback; which may be sooner accomplished, by causing horsemen to be about you, when you lure her on foot; 'tis also sooner done, by rewarding her upon the lure on horseback among horsemen. And when she is grown familiar this way, let somebody a-foot hold her, and he that is on horseback must call, and cast the lure about his head, while the holder takes off the hood by the tassel; and if she seize eagerly on the lure, without fear of a man or horse, then take off the creance, and lure at a greater distance. Lastly, if you would have her love dogs as well as the lure, call dogs when you give her plumage.

FALCON, in gunnery. See FAUCON.

FALCONER, a person who brings up, tames, and makes, that is, tutors and manages birds of prey; as falcons, hawks, &c. The grand seignor usually keeps six thousand Falconers in his service.—The French king has a grand Falconer, which is an office dismembered from that of great hunt, grand veneur. Historians take notice of this post as early as the year 1250.

One great business of the Falconer, is to consider the quality and mettle of the birds, to know which to fly early, and which late. He must also be busy and cleanly in freeing them of lice, nits, and vermin. Every night after flying, he should give his bird casting; nor must he forget to water her, unless she have been bathed. After this, she must be put in a warm room, having a perch, with a candle burning by her; where she is to sit unhooded, that she may prune and pick herself. Next morning she should be weathered, &c.

FALCONET, in gunnery. See FAUCONET.

FALCONRY*, or FAUCONRY, the art of taming, managing, and tutoring birds of prey, particularly falcons and hawks; and employing them with advantage in the pursuit of game: called also hawking.

* The word is formed from *falco*, falcon, or faucon, the bird of most use and esteem in this kind of sport. See FALCON.

Falconry, as now practised, was unknown among the Greeks and Romans. All their writings do not furnish so much as a proper name to call it by; so far are they from teaching us the terms. It is the French language alone, that has particular words for all the parts of Falconry and hunting; and from them most of our terms, as well as what we know of the art itself, are borrowed.

The writers of reputation on Falconry, are Desparon, Franchiere, Tardiffe, Artelouche, Dalagona, Latham, &c. M. de S. Martha has put the principles of the art into fine Latin verses, in his *Hieracosphion, sive De re accipitraria, libri tres*.

FALDAGE*, an ancient privilege which several lords reserved to themselves of setting up sheep-folds, or pens, in any fields within their manors, the better to manure them; and this not only with their own, but with their tenants sheep.

* This was also termed *sceta Faldae*; and in some old charters *Fald-foca*; in some place a fold-courie, or freefold.

FALL, *Descent*, in physics, the tendency of any heavy body towards the center of the earth.

Galileo first discovered the ratio of the acceleration of falling bodies, *viz.* That dividing the whole time of falling into equal parts, the body will fall thrice as far in the second moment, as in the first; five times as far in the third; seven times in the fourth, &c. and so on in the order of the uneven numbers. See ACCELERATION.

For the cause of the FALL of bodies, see GRAVITY.

For the laws of FALLING bodies, see DESCENT.

Water-FALL. See the article CATARACT.

FALL, is also used in a moral sense: as, the Fall of Adam; see ORIGINAL SIN: the Fall of the Roman empire, &c.

Authors contend, that Plato had a notion of Adam's Fall, which he had learnt from Moses. Euseb. *De preparat. evangl.* l. xii. c. 11. quotes a fable from Plato's *Sympos.* wherein he thinks he finds the whole history allegorically related.

FALL, in music and poetry. See CADENCE.

FALLACY, FALLACIA, a deception, or false appearance, or report.

The Epicureans deny that there is any such thing as a Fallacy of the senses. According to them, all our sensations, and all our perceptions both of sense and phantasia, are true; they add, that sense itself is the first grand criterion of truth. That the senses are never deceived, they argue from their being incapable of all ratiocination and remembrance: hence they can

neither add, take away, couple, nor disjoin; they cannot, therefore, infer, conclude, or invent; and consequently they cannot deceive by any inference or invention. This the mind may do, but not the sense, whose business is only to apprehend what is present, *e. gr.* colours; not to discern or distinguish between this body and that. But a thing that barely apprehends, without pronouncing any thing, cannot deceive. Add, that there is nothing to convict our senses of fallhood. The right eye, *e. gr.* cannot convict the left; nor Plato's eyes, those of Socrates; since the reasons or pretensions of each are equal; and the pur-blind person sees what he sees as much as the Lynceus. Nor can a sense of one kind convict another; as the sight, the smell; by reason their objects are different; and consequently their reports or judgments are not of the same things. Thus again, if I see a stick straight when out of the water, but when in it, crooked; my perception is altogether as true in the latter, as in the former case, *i. e.* it is as true that I have the perception or idea of the crooked stick, as of the straight one. And this idea is all that the sense suggests, so that it does not deceive. Lastly, reason cannot shew our senses mistaken, since all reasoning depends on previous sensations, and the senses must first be true, before any reasoning founded thereon can be so.—Thus the Epicureans: whose system is strongly confirmed by what we have already laid down from Mr. Berkeley, concerning the EXTERNAL world.

The Cartesian, on the other hand, are continually crying out against the senses, as the great sources of all deception. Every thing which our external senses present us, they say, should be suspected as false, or at best dubious, till our reason has confirmed the report. They add, that our senses, as being fallacious, were never given us by nature, for the discovery of truth, but only to point out what things are convenient, or hurtful to our bodies.

The Peripatetics keep a middle course: they hold, that if a sensible object be taken in its common, or general view, the sense cannot be deceived about it; for the light can see nothing but what is visible, nor can it err in perceiving what is visible *quatenus* such. But they add, that if the object be taken under its specific view, the sense may be mistaken about it, *viz.* from a want of the dispositions necessary to a just sensation, as a disorder of the eye, or something uncommon in the medium, &c.

FALLACY, in logic, or *sylogistic* FALLACY, is a captious argument, called also a sophism. See SOPHISM.

Fallacia either arise from words, or things; the foundation of all illusion and Fallacy in words, is ambiguity, which is of two kinds, *viz.* simple homonymia and amphibology.

The kinds of Fallacy in things are very numerous, but they may be reduced to seven general heads, *viz.* *ignoratio elenchi, petitio principii, falsa causa, interrogatio multiplex, limitatio vitiosa, accidens, & consequens.*

FALLING-sickness*. See the article EPILEPSY.

* Dr. Tuberville, in the philosophical transactions, gives the history of a patient much troubled with the Falling-sickness, in whose urine he observed a great number of short worms, full of legs, and like millepedes. While these continued lively, and full of motion, the fits returned daily; but upon prescribing her half an ounce of oxymel helleboratum in tany water, the worms and the distemper were both effectually destroyed.

FALLOPIAN tubes, in anatomy, two ducts arising from the womb, one on each side of the fundus thereof, and thence extended to the ovaries; having a considerable share in the affair of conception.

They are called *tube.* *i. e.* trumpets, in respect of their form; for that in their rise, or opening into the womb, they are exceeding small, so as scarce to admit a knitting-needle, but in their progress towards the ovaries they grow much bigger, and at length are capable to receive the finger; from whence they contract again, and at the extremity next the ovaries, are expanded into a sort of foliage, which is fringed round with innumerable little fibres, bearing some resemblance to the mouth of a trumpet.

The Fallopian tubes are four or five inches long; they consist of a double membrane, derived from the outer and inner membranes of the uterus. The extremity next the ovary, at the time of impregnation, at which time the whole tube is expanded, reaches to, and embraces the ovary; though at other times it fees to fall a little short of it, and is only slightly tied by the fringe to the under-side of the ovary.

The use of the tubes, is to convey the seed, or rather ova of women, and other animals, from the testicles or ovaries, into the uterus or womb. See OVARY and UTERUS.

Their inner substance is composed, in good measure, of ramifications of veins and arteries, which form a kind of reticular or cavernous body, not unlike that of the clitoris. This structure makes them capable of dilatation, and contraction, according to the quantity and stop of the blood; and consequently, of being, as it were, erected, *in coitu*, and of embracing the ovary at that time, which in their state of flaccidity they did not. See GENERATION.

They

They take their denomination, *Fallopiian*, from Gabriel Fallopius, a Modenese, who died in 1562, and who is commonly reputed their first observer of them; though we find them described long before him in Rufus of Ephesus.

The ova or embryos, are sometimes detained in the *tuba Fallopiana*, and cannot make their way into the womb. Instances of this kind have been frequently met with in dissections. One of the most remarkable, is that related by Abraham Cyprianus, a celebrated physician of Amsterdam, in a letter, addressed to Sir Tho. Millington, wherein he describes the manner in which he drew a fetus, twenty one months old, out of the tuba of a woman, who lived and had several children after the operation. See *Tab. Anat.* (Myol.) fig. g. c. c. and fig. 11. e. c.

FALLOW, a colour of a palish red, like that of a brick half burnt: as a *Fallow deer*, &c.

FALLOW field, or *Fallow ground*, is land laid up, or that has lain untilled for a considerable time.

To FALLOW, is to prepare land by plowing, long before it be plowed for seed. To do this twice, is to *twifallow*, and thrice, to *trifallow*.

FALSE arms, in heraldry, are those wherein the fundamental rules of the art are not observed: as if metal be put on metal, or colour on colour. See **ARMS**.

FALSE attack, in war, a feigned attack, intended to draw all the enemy's force to one side, in order to favour a real attack, intended in another part. See **ATTACK**.

FALSE birth. See the Article **ABORTION**.

FALSE broys, in fortification. See **FAUSSEBRAYE**.

FALSE claims, in the forest laws, is where a man claims more than his due, and is amerced or punished for the same.

FALSE conception. See **CONCEPTION**.

FALSE diamond, a diamond counterfeited with glass.

FALSE flower, a flower which does not seem to produce any fruit, as those of the hazel, mulberry-tree, &c.

A flower of this kind does not arise from any embryo, and does not knit; such are the male flowers of the melon, cucumber, &c. See **FLOWER**.

FALSE imprisonment, is a trespass committed against a man, by imprisoning him without lawful causes.

It is also used for the writ brought upon this trespass.

FALSE keel, in a ship, is a second keel, which is sometimes put under the first, to make the vessel deeper. See *Tab. Ship.* fig. 2. n. 54 and n. 118. See also the article **KEEL**.

FALSE money. See the article **MONEY**.

FALSE muster, is when such men pass in review, as are not actually listed as soldiers. See **FAGGOT**, &c.

FALSE, or falsa positio, in arithmetic. See **POSITION**.

FALSE prophecies. See **PROPHECIES**.

FALSE ribs. See **SPURIOUS RIBS**.

FALSE roof of a house, is that part between the upper rooms and the covering.

FALSE weights, &c. See **WEIGHT**, &c.

FALSEHOOD, **FALSITY**, in philosophy, an act of the understanding, representing a thing otherwise than it is, as to its accidents — Or a false enunciation, or judgment of any thing: as if a person should judge that the king of Spain is in America. The circumstance, as to its accidents, is of absolute necessity in the definition, inasmuch as a thing cannot be represented otherwise than it is to essentials; for in such case the essence of the thing would not be represented: and since the essence is the thing itself, it would not be that thing which is represented, but another.

There is no *Falseness* in apprehension or sensation; our ideas of sense are all just and true so far as they go, and all our deductions arise from our reasonings and conclusions from them.

CRIMEN FALSI, in the civil law, is a fraudulent subornation or concealment, with design to darken or hide the truth, and make things appear otherwise than they are.

The *crimen Falsi* is committed three ways. By words, as when a witness swears falsely. By writing, as when a man frames or alters something, antedates a contract, or the like. And by deed, as when he sells by false weights and measures, debases the coin, &c.

FALSO judicio, a writ, which lies for false judgment, given in the county-court, court-baron, or other court, not of record.

FALSO retorno brevium, a writ, which lies against the sheriff, who has execution of process, for making false returns of writs.

FALK, in anatomy, a part of the dura mater, descending between the two hemispheres of the brain, and separating the fore-part from the hinder.

It is called *Falk*, i. e. *fickle*, by reason of its curvature, occasioned by the convexity of the brain. It divides the brain as low as the corpus callosum.

FAMES canina, by the Greeks called *Cynodes Oresis*, *g. d.* dog appetite, is such an insatiable hunger, as is not to be satisfied with eating, but continues even when the stomach is full. This is a case much talked of by the antients, and sometimes met with amongst us. It may be supposed to arise from sharp fretting juices in the stomach, which by their continual velications excite a sense like that of hunger.

FAMILIA, **FAMILY**, commonly implies all the servants belonging to a particular master.

In another sense, *Family* is taken for a portion of land, *viz.* so much as is sufficient to maintain one *Family*.

The term *hide* is by our writers sometimes rendered a *manse*, sometimes a *Family*, and sometimes *carucata*, or plough-land; containing as much as one plough and oxen could cultivate in a year. See **HIDE**.

FAMILY of curves, is a class of curves of different orders or kinds; all which are defined by the same indeterminate equation, but in a different manner, according to their different orders.

Suppose, *e. gr.* the indeterminate equation, $a^m - 1x = y^m$, If $m=2$, $ax=y^2$. If $m=3$, $a^3x=y^3$. If $m=4$, $a^4x=y^4$, &c. in infinitum. All which curves are said to be of the same *Family*. See **CURVE**.

FAN, a machine used to raise wind, and cool the air by agitating it.

The custom which now prevails among the ladies, of wearing *Fans*, was borrowed from the East, where the hot climate renders the use of *Fans* and umbrellas almost indispensable. It is not long since the European women first began to use a kind of *Fans* made of leather, in the summer-time; but they are now found of necessity even in winter.

In the East they chiefly use large *Fans*, made of feathers, to keep off the sun and the flies. In Italy and Spain they have a huge sort of square *Fans*, suspended in the middle of their apartments, and particularly over the tables: these, by a motion at first given them, and which they retain a long time, by reason of their perpendicular suspension, help to cool the air, and drive off flies.

In the Greek church, a *Fan* is put into the hands of the deacons in the ceremony of their ordination, in allusion to a part of the deacon's office in that church, which is to keep the flies off the priests during the celebration of the sacrament. —

Wicqufort, in his translation of the embassy of Garcias de Figueroa, gives the name *Fans* to a kind of chimneys or ventilators in use among the Persians, to furnish air, and wind, into their houses; without which the heats would be insupportable. See the description thereof in that author, p. 38.

At present what is called a *Fan* amongst us, and throughout the chief part of Europe, is a thin skin, or piece of paper, taffaty, or other light stuff, cut semicircularly, and mounted on several little sticks of wood, ivory, tortoise-shell, or the like. *Fans* are either made with a double or single paper.

If the paper be single, the sticks of the mounting are pasted on the least ornamental side; if double, the sticks, are placed betwixt them. Before they proceed to place the sticks, which they call *mounting the Fan*, the paper is to be plaited in such manner, as that the plaits may be alternately inward and outward.

It is in the middle of each plait, which is usually about half an inch broad, that the sticks are to be pasted; and these again are to be all joined and riveted together at the other end: they are very thin, and scarce exceed one third of an inch in breadth; and where they are pasted to the paper, are still narrower, continuing thus to the extremity of the paper. The two outer ones are bigger and stronger than the others. The number of sticks rarely exceeds twenty-two. The sticks are usually provided by the cabinet-makers or toy-men; the *Fan-painters* plait the papers, paint, and mount them. —

The common painting is either in colours or gold leaf, applied on a silvered ground, both prepared by the gold-beaters. Sometimes they paint on a gold ground, but it is rarely; true gold being too dear, and false too paltry. To apply the silver leaves on the paper, they use a composition, which they pretend is a great secret, but which appears to be no other than gum arabic, sugar-candy, and a little honey melted in common water, and mixed with a little brandy. This composition is laid on with a sponge; then laying the silver leaves thereon, and pressing them gently down with a linen ball stuffed with cotton, they catch hold, and grow together. When instead of silver, gold ground is laid, the same method is observed.

The ground being well dried, a number of the papers are well beaten together on a block, and by this means the silver, or gold get a lustre, as if they had been burnished.

FANATICK, a wild, extravagant, visionary, enthusiastic person; who pretends to revelation and inspiration, and believes himself possessed with a divine spirit.

Such were the Anabaptists, Quakers, &c. at their first rise, and such are still the modern prophets, Muggletonians, &c.

Weigelius and Behmen, were the leaders of the *Fanatics* of Germany, and both came out of the school of Paracelsus. Weigelius is held the father of the Rosycrucians.

The word is formed of the Latin *fansum*, a heathen temple; for which reason the Christians called all the Gentiles *Fanatics*. And accordingly, the ancient chronicles of France call Clovis, *Fanatic* and pagan. But the word is yet of higher original. Among the heathens themselves, there were a sort of prophetic priests, called *Fanatici*; from whom the denomination since passed

passed to all the rest. They had their name from the Latin *fanum*, temple, by reason they lived altogether in temples. Struv. *Antiq. Rom. Synt.* c. 6. p. 312.

Of this kind, particularly, were the priests of Isis, of the mother of the gods, of Bellona, and some others, who were called *Fanatici*. In Gruter, p. 312. n. vii. we have an inscription, wherein one L. Cornelius Januarius, is called *Fanaticus* AB ISIS. SERAPIS. ARAEDEM BELLONE. And p. 654. n. vii. *Fanaticus* de *ade Bellone*.

What might give occasion to the appellation of *Fanaticus*, was, that they performed their sacrifices in a wild, enthusiastical manner. —

FANATIO, in our antient customs, the fawning time, or fence-month in forests. See FENCE.

FANCY, see PHANTASY, and IMAGINATION.

FANTASTICAL colours, are the same with those called *emphatical colours*. See EMPHATICAL colours.

FAPESMO, in logic, one of the moods of syllogisms.

A syllogism in *Fapesmo*, has its first proposition an universal affirmative, the second an universal negative, and the third a particular negative.

FAQUIR. See the article FAKIR.

FARCE *, was originally a droll, petty shew, or entertainment, exhibited by charlatans, and their buffoons, in the open street, to gather the croud together.

* The word is French, and signifies literally, force-meat or stuffing.

It was applied on this occasion, no doubt, on account of the variety of jests, gibes, tricks, &c. wherewith the entertainment was interlarded. Some authors derive *Farce* from the Latin *facetia*; others from the Celtic *farca*, mockery; others from the Latin *farciare*, to stuff.

At present, *Farce* is of a little more dignity. It is removed from the street to the theatre; and instead of being performed by jack-puddings, to amuse the rabble, is now acted by our comedians, and become the entertainment of the poliest audiences.

The poets have reformed the wildness of the primitive *Farces*; and brought them to the taste and manner of comedy. The difference between the two on our stage, is, that the latter keeps to nature and probability; and, in order to that, is confined to certain laws, unities, &c. prescribed by the antient critics.

The former disallows of all laws, or rather sets them all aside on occasion. Its end is purely to please, or to make merriment; and it sticks at nothing, which may contribute thereto, however wild and extravagant. Hence the dialogue is usually low, the persons of inferior rank, and the fable or action, trivial or ridiculous; and nature, and truth are every where heightened and exaggerated, to afford the more palpable ridicule.

FARCIN *, FARCY or FASHIONS, a disease in horses, and sometimes in oxen, &c. somewhat of the nature of a scabies, or mange.

* *Fesner* derives the word from *varices*, by changing the *v* into a digamma or *f*.

The *Farcin* is infectious, and spreads like a true plague. Vegetius calls it *morbus farcinimosus*. It consists in a corruption of the blood, which shews itself in eruptions of hard pustules, knots, or strings along the veins, and in ulcers, which are not cured without great difficulty, by running hot irons into them. — There is a *spreading Farcin*, which diffuses itself over the whole body; an *inner Farcy*; a *stringed Farcy*, &c.

The *Farcy* is ordinarily occasioned by over-heats and colds, sometimes by spur-galling with rusty spurs, snaffle-bit, or the like; or by the bite of another horse, infected with it; or if in the leg, by cutting, or interfering.

The *Water-Farcin* proceeds from a horse's feeding on low watery grounds, and in pits or holes, where the grass grows above the water; for the horse, in picking out the grass, licks up the water, which occasions him to swell under the belly or chaps. The best cure is by a red-hot iron.

FARDEL of land, is, according to some authors, the fourth, according to Noy, only the eighth part of a yard-land. See YARD-LAND.

FARDING-Deal, or FARDING-LAND, in our antient customs, signifies the fourth part of an acre, now called a rood. In the register of writs, we have also *denariata*, *abolata*, *solidata*, and *librata terra**, which must probably rise in proportion of quantity from the *Farding-deal*, as an half-penny, penny, shilling, and pound rise in value; on which footing *abolata* must be half an acre; *denariata*, an acre; *solidata*, twelve acres; and *librata*, twelve score acres.

* Yet we find, *viginta librata terre, vel redditus*. Reg. fol. 94. a, and 284. b. where *librata terra* should seem to be as much as yields *xxs. per annum*; and *centum solidatas terrarum tenementorum & reddituum*, fol. 249. a. Others hold *abolata* to be but half a perch; and *denariata*, a perch.

FARE, a voyage or passage, or the money paid for passing by water, &c.

For the *Fares* of hackney coachmen, watermen, &c. see COACHMAN, &c.

FARINA *, the flower or powder of some sort of grain, or pulv ground, and sifted from the bran.

* The word is pure Latin, *farina*, formed of *far*, corn, wheat; and *far*, according to Guichard, comes from the Hebrew $\bar{\text{ב}}\bar{\text{ר}}$ bar, signifying the same thing.

FARINA *secundans*, among naturalists, is a fine dust prepared in the male flowers, or the male parts of flowers of plants; which being afterwards shed on the female, does the office of a sperm or semen, by impregnating the same.

The *Farina fecundans*, called also the *male-dust*, and *male-seed*, is formed and secreted in the apices or tops of the stamina; where, when it becomes mature, and copious enough, bursting its capsula, it is split on the head of the pistil, and thence conveyed to the matrix, or utericle thereof, to fecundify the ova, or female seed contained therein.

This dust, in any one plant, being viewed with a microscope, every particle thereof appears of the same size, and figure; but in different plants, the figure, size, colour, &c. of the dust are very different. Some *Farinae* are clear and transparent as crystal; as those of the maple, borrag, and hemlock; others are white and opaque, as those of henbane, and balsamins; others blue, as those of flax; others purple, as of some tulips; others flesh-coloured, as in some species of lychinis; and others red, as those of the geum.

It may be observed, however, that the colour of the *Farina* varies in the same species, according to the colour of the flower; and even sometimes the *Farina* of the same flower is of different colours, as is easily observed in the caryophyllus arvensis.

The figures of the divers kinds of *Farinae* are much harder to describe. The most general figure is the oval, more or less sharp at the ends, with one or more channels or furrows running length-wise; so that through the microscope they look not unlike the stone of a date, a grain of wheat, a coffee berry, or an olive: Such are those of the polygonatum, bugles, briony, tithimal, &c. Those of the mellot are cylinders; those of the pansley, are prisms with four irregular sides; those of the great confolida, represent two crystal globules closely fastened to each other; those of the fycamore, represent two cylinders placed across; those of the jonquille, are in form of a kidney; those of the campanule, passion-flower, &c. are nearly round, but unequal in their surfaces; those of caryophyllus sylvestris are round, and cut in facets; those of the geranium, and some other species, are round, with a kind of umbilicus, or indentation, as in an apple; Bradley says they are perforated quite through, like the bead of a necklace, which we doubt; those of the caltha, corona folis, &c. are little globes, set with prickles, &c.

Of these *Farinae*, some are very hard, others soft and easily broke. They all contain a great deal of sulphurous matter, more than the other parts; whence they are very odorous. Those of the lily are so full of oil, that they grease the paper they are put in, as if it had been oiled. The *Farinae* of most aromatic plants swim in an essential oil, or sort of liquid turpentine; others are involved in a dry resin, as those of the lycopodium, or muscus terrestris clavatus. Others, as those of fumitory, are inclosed in a little, viscid, mucilaginous matter; and all, in effect, have something of glutinous, that they stick to any thing that touches them, so that it is difficult to separate the grains from each other.

Some have imagined, that these *Farinae* were only particles of wax or resin; but the contrary is easily proved; for they neither dissolve in water, nor spirit, nor oils, even when assisted with fire.

Mr. Bradley supposes a magnetic virtue lodged in the *Farina secundans*, or male dust; by means whereof, when deposited in the utericle of the female, it draws the nourishment from the other parts of the plant into the ova, or rudiments of the fruit, and makes them swell. The reality of this virtue, he argues from the same being found in wax, which is chiefly or wholly gathered hence by the bees.

Some, against the great use of the *Farina secundans* in generation, may object, that in flowers which hang downwards, as the cyclamen, &c. the *Farina secundans* cannot be cast on the orifice of the pistil. — To which it may be answered, that the pistils of such flowers, hanging lower than the dusty apices which surround them, the glutinous matter, and the velvet covering the extremity of the pistil, may be capable of receiving and retaining some of the *Farina* as it falls; and without any intromission of the *Farina*, its lodgment on the mouth of the pistil, may by virtue of its attractive power fecundify the seed in the uterus.

FARM, or FERM, FIRMA, in law, signifies a little country messuage, or district; containing house, and land, with other conveniences; hired, or taken by lease, either in writing, or by word, under a certain yearly rent.

This in divers parts is called diversly: In the north, it is a *Fack*; in Lancashire, a *Fermholt*; in Essex, a *Wike*, &c.

In the corrupted Latin, *firma* signified a place inclosed, or shut in: whence, in some provinces, Menage observes, they call closteric, or closter, what in others they call *Farm*.

Add, that we find *locare ad firmam*, to signify to let to *farm*; probably on account of the sure hold the tenant here has in comparison of tenants at will.

Spelman, and Skinner, however, chuse to derive the word *Farm*, from the Saxon *Fearne*, or *Fiorne*, that is, *viscus*, or provision; by reason the country-people and tenants antiently paid their rents in victuals, and other necessaries; tho' this was afterwards converted into the payment of a sum of money.

Whence a *Farm* was originally a place that furnished its owner or lord with provisions. And among the Normans, they still distinguish between *Farms* that pay in kind, *i. e.* provisions; and those which pay in money; calling the former simply *Ferme*, and the latter *blanche Ferme*, white *Farm*.

Spelman shews, that the word *Firma* antiently signified not only what we now call a *Farm*, but also a lease, or entertainment, which the farmer gave the proprietor or landlord, for a certain number of days, and at a certain rate, in consideration of the lands, &c. he held of him.

Thus, *Farm*, in the laws of king Canutus, is rendered by Mr. Lambard, *viscus*; and thus we read of *reddere firmam unius noctis*; and, *redderet unam diem de firma*; which denote provision for a night, and day; the rents about the time of the conquest being all reserved in provisions: The custom whereof is said to have been first altered under Henry I.

We also say, to *farm* duties, imposts, &c. The duty of excise in Scotland was farmed, or let to *farm*, for 33500 l. per annum.

FARREATION, **FARREATIO**, in antiquity, the same with *confarreatio*. See **CONFARREATION**.

FARRIER, a person, whose office is to shoe horses, and cure them when diseased, or lame.

FARTHING, a small English copper coin, amounting to one fourth of a penny.

It was antiently called *Fourthing*; as being a fourth of the integer, or penny.

FASCE, *Fascia*, in heraldry. See the article **FESSE**.

FASCES, in antiquity, axes tied up together with rods, or staves, and bore before the Roman magistrates, as a badge of their office, and authority.

Florus, l. i. c. 5. assures us, that the use of *Fasces* was introduced by the elder Tarquin, the fifth king of Rome; and that they were then the mark of the sovereign dignity. In after times, they were bore before the consuls, but by turns only, each his day; *ne si ambo fasces haberent duplicatus terror videretur*. Livy, l. ii. c. 1. They had each of them twelve, bore by so many ushers, called *Lictors*. See **LICTOR**. Dionys. Halicarn. l. iii. c. 84.

Others will have Romulus the author of the institution, and ascribe the number twelve, to the number of birds, which foretold him his kingdom. Others hold, that he borrowed it from the *Hetrurians*; and that the number twelve answered to the twelve nations of *Hetruria*, who in creating him king, gave him each an officer, to serve him as *Lictor*. Silius Italicus ascribes their first invention to a city of *Hetruria* called *Vetulonia*.

These *Fasces* consisted of branches of elm; in the middle whereof was a securis, or ax, the head whereof stood out beyond the rest. Plutarch relates the reasons of this disposition. *Publicola* took the ax out of the *Fasces*, as *Plutarch* assures us, to remove from the people all occasion of terror. After the consuls, the praetors assumed the *Fasces*. *Censorin*. *De die natali*. observes, that the praetors had only two; though *Polypbius* and *Plutarch* give them six.

In the government of the *Decemviri*, it was the practice, at first, for only one of them to have the *Fasces*. Afterwards, each of them had twelve, in the same manner as the kings.

FASCIA, in architecture, by the workmen called **FACIA**, **FATIO**, or **FACE**, a broad list, fillet, or band; particularly used in architraves, and pedestals.

The architrave consists of three *Fasciae*, or bands; thus called by *Vitruvius*, as resembling swaths, called in Latin *Fasciae*.

That author admits no *Fasciae* in the *Tuscan* and *Doric* architrave, *i. e.* he makes it all plain, without any division, or cantoning into parts or *Fasciae*: But the modern architects take the liberty to differ from him herein. See *Tab. Archit.* fig. 28. lit. N.

In brick-buildings, the juttings out of the bricks, beyond the windows, in the several stories, except the highest, are called *Fasciae*; or *Fasciae*.

These are sometimes plain, and sometimes moulded; but the moulding is only a *cima reversa*, or an **O G**, at the bottom, with two plain courses of bricks over it; then an astragal; and lastly a boustife.

FASCIA lata, in anatomy, a muscle of the leg; called also *membranofus*. See **MEMBRANOSUS**.

FASCIAE, in astronomy, two rows of bright spots, observed on Jupiter's body; appearing like swaths, or belts.

The *Fasciae*, or belts of Jupiter, are more lucid than the rest of his disk, and are terminated by parallel lines. They are sometimes broader, and sometimes narrower; nor do they always possess the same part of the disk.

FASCIA, likewise, observed a very large kind of *Fascia* in Mars; but it was darker than the rest of the disk, and took up the middle part thereof.

FASCIA LIS, in anatomy, a muscle of the leg; called also *far-torius*. See **SARTORIUS**.

FASCICULUS, in medicine, a term sometimes used to express a certain quantity, or measure of herbs. By *Fasciculus* is meant so much, as may be held in the arm when bent, and rested on the top of the hip. Physicians note it in prescription by *Fase*.

FASCINATION*, **FASCINATIO**, denotes a sort of witchcraft, supposed to operate by the influence either of the eye, or the tongue. See **WITCHCRAFT**.

* The word is Latin, formed from the Greek *φαρμακον*, which signifies the fame.

Antient writers distinguish two sorts of *Fascination*; one performed by looking, or the efficacy of the eye. Such is that spoke of by *Virgil*, in his third eclogue:

Nescio, quis teneros oculus mihi fascinat agnos.

The second by words, and especially malignant praises: Such is that mentioned by the same poet, in his seventh eclogue:

Aut si ultra placitum laudavit baccare frontem
Civitate, ne vati noccat mala lingua futuro.

Horace touches on both kinds in his first book of epistles:

Non istis obliqua oculo mea commoda quisquam
Limat, non odio obscuro, morsuque venenat.

FASCINES, in fortification, *Faggots*; small branches of trees, or havins, bound up in bundles, which being mixed with earth, serve to fill up ditches, to screen the men, make the parapets of trenches, &c. See *Tab. Fortif.* fig. 24.

Some of them are dipped in melted pitch or tar; and being set on fire, serve to burn the enemy's lodgments, or other works.

A pitched *Fascine* is a foot and a half about: a *Fascine* for defence, two or three foot.

In the corrupt Latin, they use *Fascenina*, *Fascennia*, and *Fascinata*, to signify the pales, *Fascines*, &c. used to enclose the antient castles, &c.

FASHION*.

* The word is French, *façon*, which signifies making.

FASHION is particularly used among artificers, for the trouble, time, and labour, employed in a piece of work; particularly any silver, or gold utensil, instrument, toy, or the like.

It is by the *Fashion*, that the workmens wages, or salary is regulated. We paid so much a-piece for the *Fashion* of these spoons, exclusive of the matter, or silver. That weaver has so much a-piece for the *Fashion* of the stuffs we give him to weave.

FASHION-Pieces, in the sea-language, two pieces of timber which form the breadth of a ship, at the stern; and are the outmost timbers of the stern, on each side, except aloft, where the counters are. See **STERN**.

FAST, a space of time, wherein a person takes little, or no food.

The advantages of *Fasting*, with regard to health, with extraordinary instances of long *Fasting*, see under the article **ABSTINENCE**.

The *Bramins* never bleed their sick, but make them *fast* in lieu thereof.

FAST, is peculiarly used for an abstinence on account of religion; or a space of time, wherein the church prohibits the use of food; or at least restrains it to certain kinds, and to certain hours.

The strict, canonical *Fast* only allows of one meal in twenty-four hours. *F. Thomassin* observes, that the antient *Fast* was, to sup, without dining, *i. e.* only to take one meal, and that not till after noon: Adding, that to dine, though without supping, was a breach of the *Fast*. The practice of the Latin church, was to *fast* thirty-six days in the year; which is, as it were, the tithes of the year.

Tertullian wrote an express treatise *de jejuniis*, of *Fasts*; to support the new laws of *Fasting*, which the *Montanists* were for imposing.

The antient catholics allowed of no obligatory or commanded *Fasts*, beside that preceding *Easter*, since called *Lent*; the terms of which were to forbear eating till the evening.

The other *Fasts* observed were only of devotion: Such were the fourth and sixth *Perse*, *i. e.* Wednesdays, and Fridays.

This *Lent Fast* was called *Station*. Besides these there were occasional *Fasts*, enjoined by the bishops, &c.

In the book of *Hermas*, called the *Pastor*, the angel tells him, the day thou *fastest*, thou shalt take nothing but bread and water; and having computed the usual expences of each day, thou shalt lay aside so much for the widow, the orphan, or the poor.

In the same passage, the *Fast* is called *Station*, and the person who *fasted*, is enjoined to begin early in the morning to retire to prayer.

St. Fructuosus, *Fleury* tells us, going to suffer, some people, out of a principle of charity, offered him drink, to support him; but he refused it, saying, It is not yet time to break *Fast*; for it was but ten in the morning, and it was Friday,

Station-

Station-day. Which shews the exactness of the primitive christians, in this point; and that drinking was held breaking of *Fast*. Some introduced the xerophagy into *Fasts*; that is, the use of dried fruits for their meals; and made a practice of abstaining not only from all meats, and wines, but also from succulent fruits, for the whole twenty-four hours: and some reduced themselves to bread and water. But this was more than was commanded.

The practice of *Fasting* is more antient than christianity. The Israelites *fasted* often, and had their stated *fast-days*. The day of atonement, which they called Kippurim, was a day of *fasting*, enjoined in *Levit. xxiii. 27, &c.* Some will have this the day St. Paul refers to in *Acts xxvii. 9.* The Jews had likewise *Fasts*, instituted by precept of the synagogue: such were those of the fourth, fifth, and tenth of the month, mentioned by *Zechariah, vii. 3. and viii. 19.*

The heathens adopted the same custom, in all probability, from the people of God; though their religion inclined them more to feasting, than to *fasting*; as appears from the long list of *feasts*, enumerated under the article *FEAST*.

Yet they *fasted* in the Eleufinia; as appears from Arnobius, and Clemens Alexand. See Salmastius, p. 150. and Scaliger, *Poetic. l. i. c. 32.*

The *Fasts* of the Calogeri are so severe, that they remain seven days without eating at all. For the *Fasts* of the Greeks, see *Spon. Voyag. p. ii.*

The Turks are so scrupulous on the point of *fasting*, that they will not at those times so much as take the smell of any perfume, by the nose. They hold that odors themselves break *Fast*. If they bathe, it is forbid to put the head under water, for fear of swallowing any of it: and as for women, they are forbid to bathe at all on *Fast-days*, for a reason peculiar to the sex.

FASTERMANS, or **FASTING-MEN**, *q. d. homines habentes*, was used in our antient customs, for men of repute, and substance; or rather for pledges, sureties, or bonds-men, who, according to the Saxon polity, were *fast* bound to answer for one another's peaceable behaviour.

FASTI, in antiquity, the Roman calendar; wherein the several days of the year, with their feasts, games, and other ceremonies, were expressed. See *CALENDAR*.

The Romans had their *greater*, and *lesser Fasti*.—The *greater Fasti* were called, the *Fasti* of the magistrates; and the *lesser*, the *Fasti calendares*.

The *Fasti calendares*, which were, what was properly, and primarily called *Fasti*, are defined by Festus Pompeius to be books containing a description of the whole year; *i. e.* ephemerides, or diaries, distinguishing the several kinds of days, *Festi*, *Profesti*; *Fasti*, *Nefasti*, &c. See *FESTI*, &c. The author hereof was Numa, who committed the care and direction of the *Fasti* to the Pontifex Maximus; whom the people used to go and consult on every occasion. This custom held till the year of Rome 550. when C. Flavius, secretary of the pontifices, exposed in the forum a list of all the days, whereon it was lawful to work; which was so acceptable to the people, that they made him Curule *Ædile*. *Liv. l. ix. c. 46.*

These *lesser Fasti*, or *Fasti calendares*, were of two kinds: *urbani*, and *rustici*.—The *Fasti urbani*, or *Fasti* of the city, those, which obtained, or were observed in the city. Some will have them thus called, by reason they were exposed publicly in divers parts of the city; though by the divers inscriptions, or gravings thereof on antique stones, one would imagine, that private persons had them likewise in their houses. It was these *Fasti urbani* Ovid undertook to illustrate, and comment on, in his *Libri Fastorum*; whereof we have the six first books still remaining; the six last, if ever they were wrote, being lost. Beside Ovid, several other authors had undertaken the same subject, particularly L. Cincius Alimentatus, Fulvius Nobilior, Maffurius Sabinus, Cornelius Labeo, C. Licinianus, and Nisus: Of all whom Macrobius makes mention, in his *Saturn*, and preserves fragments of each; beside a work of one Bæbius Marcus, entitled, *De Fastis diebus*, quoted by Fulgentius, *De prisca sermone*.

In the *greater Fasti*, or *Fasti* of the magistrates, were expressed the several feasts, with every thing relating to the gods, religion, and the magistrates; the emperors, their birth-days, offices, days consecrated to them; and feasts, and ceremonies established in their honour, or for their prosperity, &c.

With a number of such circumstances, did flattery, at length, swell the *Fasti*! whence they became denominated *magni*, to distinguish them from the bare calendar, or *Fasti calendares*.

In the *Fasti rustici*, or country *Fasti*, were expressed, the several days, feasts, &c. to be observed by the country people; for as these were taken up in tilling the grounds, fewer feasts, sacrifices, ceremonies, and holidays were enjoined them, than the inhabitants of cities: and they had also some peculiar ones, not observed at Rome.

Those rustic *Fasti* contained little more than the ceremonies of the calends, nones, and ides; the fairs, signs of the zodiac, increase and decrease of the days; the tutelary

gods of each month, and certain directions for rural work; to be performed each month.

FASTI, was also a chronicle, or register of time, wherein the several years were denoted by the respective consuls, with the principal events that happened during their consulates: these were called also *Fasti consularæ*, or *consular Fasti*.

Onuphrius Panvinius, Pighius, and Janfen d'Almeooven, have given us the *Fasti consularæ*; the two first, with long, and learned comments, wherein are expressed, not only the consuls, but also the dictators, magistri equitum, triumphs, and ovations. Pighius even adds as many of the other officers, as he could find, *viz.* prætors, tribunes, &c. D'Almeooven confines himself to the consuls alone.

FASTI, is still applied to the archives, and public records, wherein are kept historical memoirs of public, and remarkable things befallen a people.

In the like sense, the martyrlogy is called the sacred *Fasti* of the church.

The jesuit Du Londel has compiled the *Fasti* of Louis le Grand, &c.

FASTI, or *dies Fasti*, also denoted court-days. See *DAY*.

The word *Fasti*, *fastorum*, is formed of the verb *fari*, to speak; by reason, during those days the courts were open, causes might be heard, and the prætor was allowed *fari*, to pronounce the three words, *do, dico, addico*: the other days, wherein this was prohibited, were called *Ne-fasti*. Thus Ovid:

Ille Nefasti erit per quem tria verba silentur,

Fastus erit per quem lege licetis agi.

These *dies Fasti* were noted in the calendar, by the letter *F*. But observe, that there were some days, *ex parte Fasti*, partly *Fasti*, partly *Ne-fasti*, *i. e.* justice might be distributed at certain seasons of the day; and at others not. These days were called *interfici*. They were marked in the calendar thus, *F. P. fastus primo*, where justice might be demanded during the first part of that day.

FASTIDIUM cibi. See the article *NAUSEA*.

FASTIGIUM, in architecture, the same with pediment. See *PEDIMENT*.

FAT, in an animal body, a white, oily, sulphurous substance, collected in little membranous loculi, or cells, in divers parts of the body; serving to keep the parts warm, and to soften and temper the sharp salts in the mass of blood.

Physicians distinguish two kinds of *Fat*; the first, called in Latin *pinguedo*, and in English, absolutely, and by way of eminence, *Fat*, is a soft, lax, whitish, or rather yellowish, oily matter, which is easily melted; found immediately under the cutis, inclosed in little bags, called *cellulæ adiposæ*, adhering to the outer surface of a membrane, called *adiposa*, all over the body, except on the forehead, eye-lids, penis, and scrotum.

This *Fat* is nothing but the oily part of the aliment, or chyle, separated from the arterial blood, by the adipose glands, and carried by peculiar ducts to the membranous cells; whence it is transmitted again to the blood by the veins. Dr. Grew takes it to be a coagulum of the oily parts of the blood, made, either by some of its own saline parts, or by the nitrous particles of the air mingled therewith in the lungs; which sentiment is confirmed by an experiment of that learned person, who made an artificial *Fat*, by only mixing oil of olives with spirit of nitre for some days.—And hence it is, that divers animals, as rabbits, hares, &c. grow *fat* in winter, and particularly in severe frosty weather; the air then abounding most in nitre. Hence also it is, that the *Fat* of land-animals is much firmer than that of fishes; the watry element containing less nitrous matter than the air.

In some subjects the cellulæ are so full and distended, that the *Fat* is above an inch thick; in others they are almost flat; and in emaciated subjects, instead of *Fat*, we find a sort of flaccid transparent substance; which is nothing but the bare membrane; the cells being all exhausted.

A second kind of *FAT*, called *adeps*, *sebum*, *seorum*, and sometimes *axungia*, is whiter, harder, more brittle, and less easy to liquify than the former; being found in the cavities of the abdomen, omentum, &c.

The *Fat* of both kinds serves as a natural balsam, to preserve the body; and by mixing with, and enveloping the salts wherewith the blood and serum are highly saturated, it keeps them from fretting and corroding the parts of the body through which they pass.

It is thought likewise, and not without probability, to make a considerable part of the nourishment of our bodies; whence, the *fasti* persons, falling into an atrophy, gradually lose all their *Fat*, which is always quite expended in such cases, before the disease becomes fatal.

Too much *Fat* is usually attended with heaviness, and drowsiness, not only from the unwieldiness of an overgrown body, nor from the stuffing of the cavities and thorax alone, which sometimes obstructs the expansion of the diaphragm and lungs, and produces a dyspnœa, or an orthopnœa; but it is likewise probable, that the abundance of *fats*, or oily particles

ticles, returned into the blood, and implicating the more subtle and active parts, may hinder the necessary secretions in the brain.

The *Fat* of animals, for the generality, is not reckoned good food; as being hard of digestion, and producing a thick, viscid chyle. But it is of good use in medicine.

Calves Fat is used in pomatums, and unguents; being resolute, and emollient. — That of *hogs* and *boars*, has the same qualities, and is strengthening besides. — *Deers grease* is accounted good to fortify the nerves against the rheumatism, sciatica, gout, and fractures. — *Hares grease*, applied externally, promotes digestion, and a suppuration of abscesses. — That of *rabbits*, is nervous and resolute. — That of *cats*, and *hens*, resolves and softens indurations. — That of *geese* has the same qualities; and likewise abateth hemorrhoids, assuages pains in the ear, being applied within the same; and opens the belly, being taken inwardly. — *Eels fat*, is esteemed good against the hemorrhoids and deafness; to take away pits of the small-pox, and to make the hair grow. — That of the *trout*, beside its being emollient, is said to be good in distiches of the anus, and in ulcers of the breast.

FAT, in the sea language, denotes the same with *brood*.

Thus, if the trussing in, or tuck of a ship's quarter under water be deep, they say, she hath a *fat* quarter.

FAT, see the article **VAT**.

FAT, or *vat*, also expresses a large wooden vessel, which among brewers and maltsters is used to measure malt for expedition; containing a quarter, or eight bushels. See **MALT**.

FAT is likewise a vessel, or pan of lead, used in the making salt, &c. See **SALT**.

FATE, **FATUM**, in a general sense, denotes an inevitable necessity, depending on some superior cause.

Fate is a term much used among the ancient philosophers. It is formed a *fabula*, from speaking; and primarily implies the same with *effatum*, viz. a word, or decree, pronounced by God; or a fixed sentence, whereby the Deity has prescribed the order of things, and allotted every person, what shall befall him.

The Greeks call it, *εναγωγος, quasi enagos, nexus*, a chain, or necessary series of things, indissolubly linked together; and the moderns, *providentia*.

But, beside this sense of the word, wherein it is used, sometimes to denote the connection of causes in nature, and sometimes in the divine appointment; the word *Fate* has a further intention, being used to express, I know not what necessity, or eternal designation of things, whereby all agents, both necessary and voluntary, are swayed, and directed to their ends. See **NECESSITY**.

Some authors divide *Fate* into *Astrological* and *Stoical*.

Astrological FATE, denotes a necessity of things and events, arising, as is supposed, from the influence and positions of the heavenly bodies, which give law, both to the elements, and mixed bodies, and to the wills of men.

In which sense the word is often used by Manilius: *Certum est & inevitabile fatum: materiaque datum est cogi, sed cogere stalis*.

Stoical FATE, or *Fatality*, is defined by Cicero, an order, or series of causes, wherein cause being linked to cause, each produces other; and thus all things flow from the one prime cause. Chrysippus defines it a natural invariable succession of all things *ab aeterno*, each involving other.

To this *Fate* they subject the very gods. Thus the poet: The parent of all things made laws at the beginning, by which he not only binds other things, but himself. So Seneca: *Eadem necessitas & deos alligat. Irrevocabilis divina pariter & humana curfus vobis. — Ipse illi omnium conditor & rector scripsit quidem Fata, sed sequitur: semel scripsit, semper parat*.

This eternal series of causes, the poets call *parce*, and *parca*, or destinies.

Fate is divided, by some later authors, into *physical* and *divine*. *Physical FATE* is an order and series of natural causes, appropriated to their effects.

This series is necessary; and the necessity is natural. The principle, or foundation of this *Fate*, is nature, or the power and manner of acting, which God originally gave to the several bodies, elements, mixts, &c. By this *Fate* it is, that fire warms; bodies communicate motion to each other; the sun and moon occasion the tides, &c. And the effects of this *Fate* are all the events and phenomena in the universe; except such as arise from the human will. See **NATURE**.

Divine FATE, is what we more usually call *providentia*. See **PROVIDENCE**.

Plato, in his *Phædo*, includes both these in one definition; as intimating, that they were one and the same thing actively and passively considered: Thus, *Fatum est ratio quædam divina, læque natura comæ, quæ transiri nequeat, quippe a causa pendens, quæ superior sit quibusvis impediementis*. Though that of Boetius seems the clearer and more just: *Fatum, says he, est inærens rebus mobilibus dispositio, per quam Providentia suis quæque necit ordinibus*. —

FATHER, *Pater*, a term of relation, denoting a person who beget a child, either male or female.

VOL. I.

Among the ancient Romans, the *Fathers* of three children had very considerable privileges allowed them, as such. By the law of Romulus, a *Father* had an absolute and unlimited power over his children.

Adoptive FATHER, is he who takes the children of some other, and owns them as his own.

Putative FATHER, is he who is only the reputed, or supposed *Father*; Joseph was *putative Father* of our Saviour.

Natural FATHER, is he who has legitimate children.

FATHER-in-law, is a person married to a woman, who has children by a former husband, &c.

FATHER, is also used in theology, for the first person in the Trinity.

God *the Father*, is the proper *Father* of Jesus Christ; with regard to men, he is called *heavenly Father*.

FATHER, is also used in a figurative sense, on divers moral and spiritual occasions. Thus, it is applied to the patriarchs; as we say, Adam was the *Father* of all mankind; Abraham the *Father* of the faithful, &c.

In an ecclesiastical sense, **FATHERS**, denote the ancient prelates and doctors of the church.

The *Fathers* assembled at the council of Nice: Chrysostom, St. Basil, &c. were Greek *Fathers*; and St. Augustin, St. Ambrose, &c. were Latin *Fathers*.

The *Fathers*, say Messieurs de Port Royal, are the proper interpreters of the gospel; and are only honoured with that sacred appellation, as their works are, in some measure, a patrimony or inheritance, left to the faithful, as their proper children.

Scalger observes, that the *Fathers* were good people, but not learned ones. To which St. Evremond subjoins, that when a man comes to look nearly at the *Fathers*, he loses a great part of that veneration, which time and opinion had procured them: the great distance between them and us, makes them appear much greater than they really are.

The *Fathers*, says the same author, had more imagination and vivacity of mind, than judgment and good sense. They gave altogether into allegories, and affected the brilliant to an excess. Justness of mind was a thing they valued themselves the least on.

FATHER, is also a title of honour, given to prelates and dignitaries of the church. The right reverend *Father* in God, Isaac, lord bishop of, &c.

FATHER, is also applied to the superiors of convents, &c. See **ABBOT**. The *Father* general; *Father* provincial, exprovincial; *Father* prior, subprior; *Father* definitor, in the order of Benedictines; *Father* guardian, in that of the Franciscans; *Father* corrector among the Minims, &c.

FATHERS, is also applied plurally to all congregations of ecclesiastics, whether regular, or secular. — As, the *Fathers* Cordeliers, Capuchins, Augustins, Jacobins, &c. The *Fathers* Jesuits, *Fathers* of the oratory, Barnabites, Theatins, of the mission, &c. See each under the proper article.

FATHERS, is also used for persons venerable for their age, or quality, or the services they have done the public.

Thus, at Rome, the senators were called *conscripti Fathers, patres conscripti*, &c.

FATHIMITES, or **FATHEMITES**, the descendants of Mahomet, by *Fathima*, or *Fathema*, his daughter.

The dynasty of *Fathimites*, that is, of princes descending in a direct line from Ali, and *Fathima* his wife, Mahomet's daughter, commenced in Africa, in the year of the Hegira, 296; of Jesus Christ, 908.

The *Fathimites* afterwards conquered Egypt, and established themselves therein, in quality of caliphs.

The *Fathimites* of Egypt ended in Abed, in the year of the Hegira, 567; 268 years after their first establishment in Africa, and 208 after the conquest of Egypt.

FATHOM, a long measure, containing six feet; taken from the utmost extent of both arms, when stretched into a right line.

The *Fathom* is used at sea, in estimating the lengths of cables, and other ship-ropes, with the depths and soundings of the sea: as also in mines, quarries, wells, and works of fortification.

There are three kinds of *Fathoms*, accommodated to the different ranks of vessels. The *first*, which is that of men of war, contains six feet; the *middle*, or that of merchant ships, five feet and a half; and the *small Fathom*, used in fluyets, fly-boats, and other fishing vessels, only five feet.

FATHOM is also used in several countries, particularly Italy, for the common yard, or ell, whereby things are ordinarily measured, in commerce.

In this sense it is more commonly called *braccio*, or *braccio, q. d. arm*.

FATNESS, in medicine, *Carpulenty*; or the state of a person too much loaded with flesh and fat.

FATUARI, in antiquity, were persons, who appearing in fire, foretold things to come.

The word is formed of *Fatua*, wife of the god Faunus, who was supposed to inspire women with the knowledge of futurity;

as Faunus himself did the men. — *Fatua* had her name from *fari*, *q. d. vaticinari*, to prophesy.

FATUUS *Ignis*. See *IGNIS Fatuus*.

FAUCON, or FALCON, a small piece of cannon, whose diameter is 2½ inches; weight, 750 pound; length, 7 feet; load, 2½ pound; shot, 2½ inches diameter; and 2½ pound weight. See *CANNON*.

FAUCONET, or FALCONET, a very small piece of ordnance, whose diameter at the bore is 2½ inches; weight, 400 pounds; length, 6 feet; load, 1½ pound; shot, something more than 2 inches diameter; and 1½ pound weight. See *ORDNANCE*.

FAVISSA *, among antiquaries, a hole, pit, or vault, under ground, wherein is kept something of great value.

* The word seems formed of *fovisſa*, a diminutive of *fovea*, a pit or ditch.

The *Faviſſa*, according to A. Gellius, and Varro, was much the same with what the ancient Greeks and Romans called, *Συναγωγῆς, theſaurus*; and what in some of the modern churches is called *archives* and *treasury*.

In the capitol there were divers *Faviſſæ*. They were subterraneous places, walled and vaulted; having no entrance, or light, but by a hole a-top, which was usually stopped up with a huge stone.

They were chiefly destined for keeping the old, worn statues, and other ancient moveables, formerly used in the temple; so religiously did that people respect, and preserve whatever was consecrated. Catullus would have lowered the floor of the capitol, but that the *Faviſſæ* prevented him.

Festus, however, gives us a different account of the *Faviſſæ*. According to that author, they were wells, or pits of water, near the temples, and for the use thereof: the same with what the Greeks called *ῥοδῶν, νεωλ*, as being round, &c. Gellius likewise gives them the name of cisterns, as well as Festus; but it is apparently for no other reason, than that they bore a resemblance thereto in figure.

In effect, the two notions are pretty easily reconciled: It being certain, that the treasures of some of the ancient Greek temples were the cisterns or reservoirs of water, wherein people used also to wash themselves, before they entered the temple.

FAUNALIA *, in antiquity, feasts celebrated by the Romans, in honour of the god Faunus.

* The deity *Faunus*, to whom the solemnity was devoted, and from whom it was denominated, was the same among the Romans, with the Pan of the Greeks.

The *Faunalia* were held on the day of the nones of December, *i. e.* on the fifth day of that month. The principal sacrifice was a roe-buck; or rather, according to Horace, a kid, attended with libations of wine, and burning of incense.

It was properly a country festival; being performed in the fields and villages with peculiar joy and devotion.

Horace gives us a very gay description thereof, in the xviiith ode of his iii^d book.

— Tener pleno cadit hædus anno:
Læva nec desunt Veneris fœdali
I na crateræ: vetus ara multo
Famat odore.

Struvius, in his Roman calendar, marks the feast of Faunus on the day of the ides of February, which is the 13th day of that month; and the *Faunalia* he places on the 5th of the ides of December, or the 9th of that month. And in c. ix. he shews, that there really were two *Faunalia*; the one in February, mentioned by Ovid, *Faſt.* l. vi. § 246; the other, on the 9th of December, mentioned by Horace, in the place just cited.

FAUNS, FAUNI, among the antients, were a species of demi-gods, inhabiting the forests; called also *Silvans, Sylvani*.

They were represented as half men, half goats; having the horns, ears, feet, and tail of a goat, a very flat nose, and the rest human.

The Roman *Faunus*, we have observed, was the same with the Greek *Pan*. Now, in the poets we find frequent mention of *Fauns* and *Panes* in the plural number; in all probability, therefore, the *Fauns* were the same with the *Panes*. See *PANES*.

The reason was, that there were several *Faunus*'s and *Panes*; though all descended from one principal one. Thus Ovid:

Aut quas semideæ Dryades, Fœmque bicornes
Nunquæ contactas attonuere suo.

The Romans called them *Fauni, Fœarii, and Fœni fœarii*. The denomination *fœarii* was derived, not from the Latin *ficus, ficks*, a fig, as some have imagined; but from *ficus, fici*, a sort of fleshy tumor or excrescence, growing on the eyelids, and other parts of the body; with which the *Fauns* were represented.

Though the *Fauns* were held for demi-gods; yet were they supposed to die, after a long life. Arnobius shews, that their father, or chief, *Faunus* himself, only lived 120 years.

FAVOUR, in commerce, see the article *GRACE*.

FAUSSE-BRAYE, in fortification, an elevation of earth, two or three fathoms broad, round the foot of the rampart on the outside, defended by a parapet which parts it from the berme, and the edge of the ditch: its use is for defence of the ditch.

The *Fausſe-braye* is the same with what is otherwise called *Chemin des rades*, and *Baſſe enceinte*.

It is of little use where ramparts are faced with wall, because of the rubbish which the cannon beats down into it. For this reason, engineers will have none before the faces of the bastions, where the breach is commonly made; because the ruins falling, the *Fausſe-braye* makes the ascent to the breach the easier: besides, that what flies from the faces often kills the soldiers placed to defend it.

FAWN, among hunters, is a buck, or doe, of the first year; or the young one of the buck's breed, in its first year.

FEALTY, an oath taken at the admittance of every tenant, to be true to his lord, while he holds his land.

Fealty is usually mentioned as synonymous with *homage*; but it differs from it, as *homage* consists in taking an oath, when the tenant comes to his land; and is done but once; being an obligation, which is permanent, and binds for ever: which *Fealty* does not.

They differ also in the manner of the solemnity; for the oath of *homage* is taken by the tenant kneeling; but that of *Fealty* is taken standing, and includes fix things, which are comprised in the words, *incham, tutum, utile, honestum, facile, possibile*.

incham, that he do no bodily injury to the lord: *tutum*, that he do him no secret injury in any thing, which is for his defence; as in his house, or castle: *honestum*, that he do him no injury in his reputation: *utile*, that he do not damage him in his possessions: *facile*, and *possibile*, that he make it easy, and not difficult for the lord to do any good, which otherwise he might do.—All which is likewise comprised in *Leg. Hen. I. cap. 5*.

He that holds land by this only oath of *Fealty*, holds in the freest manner; for all, even those that have see, hold *per fidem & fiduciam*, that is, by *Fealty* at the least.

This *Fealty* is also used in other nations; as in Lombardy, and Burgundy.

Indeed, as the very first creation of this tenure grew from the love of the lord towards his followers; so did it bind the tenant to fidelity; as appears by the whole course of the feuds; and the breach thereof is loss of the fee.

Hottoman, in his commentaries *de verbis feudaliſibus*, shews a double *Fealty*: the one *general*, to be performed by every subject to his prince; and the other *special*, required only of such, as in respect of their fee are tied by this oath towards their lords. We read of both also in the *Grand customary* of Normandy, &c.

Fealty special was with us performed, either by freemen, or villsains. The form of both in Ed. II.'s Time, was in these words: When a freeman shall do *Fealty* to his lord, he shall hold his right hand upon a book, and shall say thus: "Hear you, " my lord R. that I, P. shall be to you, both faithful and " true, and shall owe my *Fealty* to you, for the land that I " hold of you, on the terms assigned. So help me God, " and all his saints."—When a villain shall do *Fealty* to his lord, he shall hold his right hand over the book, and say thus: "Hear you, my lord A. that I, B. from this day forth, unto " you shall be true and faithful, and shall owe you *Fealty*, for " the land that I hold of you in villinage, and shall be justified by you in body and goods. So help me God, and all " the saints."

FEAST, or FESTIVAL, a church-solemnity, or rejoicing, in honour of God, or a saint.

* The word is formed of the Latin *festum*, which some derive *a friari*, to keep holiday; others from the Greek *ἑρως, I feast*, or entertain, of *ἑρως, heartis, fire*.

Feasts, and the ceremonies thereof, have made great part of the religion of almost all nations, and sects: witness those of the Greeks, Romans, Hebrews, Christians, and Mahometans.

Feasts, among us, are either *immovable*, or *moveable*. *Immovable FEASTS*, are those constantly celebrated on the same day of the year: The principal of these are, Christmas-day, or the Nativity; the Circumcision, Epiphany, Candlemas, or the Purification; Lady-Day, or the Annunciation, called also the Incarnation, and Conception; All Saints, and All Souls: besides the days of the several Apostles, St. Thomas, St. Paul, &c. which with us are *Feasts*, though not *feriæ*. See each *Feast* under its proper article.

Moveable FEASTS, are those which are not confined to the same day of the year. Of these the principal is Easter, which gives law to all the rest; all of them following, and keeping their proper distance therefrom: Such are, Palm-Sunday, Good-Friday, Ash-Wednesday, Sexagesima, Ascension

tion-day, Pentecost, and Trinity Sunday. See EASTER, SEXAGESIMA, PENTECOST, TRINITY, &c.

Beside these *Feasts*, which are general, and enjoined by the church, there are others, *Local* and *Occasional*, enjoined by the magistrate, or voluntarily set on foot by the people: Such are the days of thanksgiving for delivery from wars, plagues, &c. Such also are the vigils, or wakes, in commemoration of the dedications of particular churches. See VIGIL, &c.

The Romans had abundance of fixed *Feasts*, in honour of their deities and heroes: Such were the Saturnalia, Cerealia, Lupercalia, Liberalia, Neptunalia, Consualia, Portunalia, Vulcania, Palilia, Divalia, &c. See SATURNALIA, &c.

They had also *Feasts*, instituted occasionally, as Carmentalia, Quirinalia, Terminalia, Floralia, Compitalia, Lemuria, Vernalia: Beside other moveable, and occasional ones; as to give thanks to the gods for benefits received; to implore their assistance, or to appease their wrath, &c. as the Paganalia, Ferialia, Bacchanalia, Ambarvalia, Amburbalia, Suovetaurilia; and divers others, particularly denominated *feriae*; as Semetinae, Latinae, &c. See each of these *Feasts* and *feriae*, in its proper place.

The *Feasts* were divided into days of sacrifice, and days of feasting or banqueting; days of games, and days of rest or *feriae*.

There being but little history wrote, or at least published in those days, one end of *Feasts* was to keep up the remembrance of things, in lieu of reading and books.

The principal *Feasts* of the Jews were, the *Feast* of trumpets, that of the expiation, of tabernacles, of the dedication, of the passover, and that of pentecost.

FEAST is also used for a banquet, or a sumptuous meal, without any immediate view to religion.

The use of the word in this sense, arises hence, that a part of the ceremony of many of the ancient festivals, both those of the Heathens, and the ages of the Christians, was good eating; though M. Huet chules to derive the word from *festinare*, which in an ancient Latin version of Origen's comment on Matthew, signifies to *feast*. *Ut veniens illic Jesus festinet cum discipulis suis*.

In all antiquity, both sacred and prophane, sacrifices were little more than religious *Feasts*.

It has been often observed by authors, that there is no nation in the world comes near the English in the magnificence of their *Feasts*. Those made at our coronations, infantals, consecrations, &c. transcend the belief of all foreigners: and yet it is allowed, that those now in use are no way comparable to those of our forefathers.

The Persians never discourse, and deliberate of their most important affairs, but in the middle of their *Feasts*—

FEATHER, *Pluma*, that part in birds which covers them, and by which they are enabled to fly.

Feathers make a considerable article in commerce, particularly those of the ostrich, heron, swan, peacock, goose, &c. for plumes, ornaments of the head, filling of beds, writing-pens, &c.

Some of our latest naturalists contend for *Feathers* being a species of plants, as having the two great characters of vegetables, &c. that they grow, and are not sensible. They add, that the growth of *Feathers* is not performed with leis art or apparatus than that of plants; and that they have all the essential, or characteristic parts thereof, as a root, stem, branches, and leaves: but these authors forget, that they have not the flowers and parts of fructification of plants, which are the most essential parts of all.

Others take *Feathers* to be that on birds, which leaves are on trees.

Others seem to be nearer to nature, in making *Feathers* to be what hairs are on other animals.

Others will have *Feathers* a kind of zoophytes, or plant-animals; such as the fetus is in the womb. Accordingly, in *Feathers*, especially those of unfledged birds, the stem, or quill, is found full of blood; which argues, that there is some umbilical nodus, whereby the first rudiment of the *Feather* was connected to the extreme fibres, i. e. to the veins and arteries of the bird.

In effect, *Feathers* seem only productions and expansions of the last extreme fibrillae of the cutis; and hence, upon stripping off the cutis, the *Feathers* are likewise always taken away: just as the leaves and fruit follow, upon peeling the bark off a tree. Add, that *Feathers*, as well as hairs, arise out of pores in the cutis; which pores are not mere apertures, or foramina, but a kind of vaginal; wove of the fibres of the skin; which terminate in the ocella or anatomies of the internal fibres of the *Feather*.

Feathers, Mr. Derham observes, are a very commodious dres for the inhabitants of the air, being not only a guard against wet and cold, and a means for the hatching and brooding their young, but most commodious for flight; to which purpose, they are nicely placed over the body, to give an easy passage, and every where neatly poised from the head towards the tail in close uniform order: so that being pruned and dressed by an unctuous matter, secreted in a proper gland, and de-

posited in an oil-bag, placed therein for that purpose; they afford as easy a passage through the air, as a boat new cleaned and dressed, has through the waters. Without all this nicety, they would have been apt to be ruffled and discomposed; and would have gathered air, and proved an obstruction to the passage of the body.

Most of the *Feathers* tend backwards, and are laid over each other in exact method, armed with a warm and soft down next the body, and more strongly made, as well as more curiously clofed, next the air and weather. To which purpose the apparatus nature has made, and the instinct she has given them to prune or dres their *Feathers*, are admirable.

The mechanism of the *Feather* is wonderful: the shaft, or rib is exceeding strong, but hollow below, for strength and lightness's sake, and above, not much leis strong; and filled with a parenchyma, or pith, both strong and light.

But the vanes or webs in the flag part of the wing are incomparable; these are nicely gauged, broad on one side, and narrower on the other: the edges of the exterior vanes bending downwards, and those of the interior, or wider, upwards; by which means they catch hold, and tie close to each other, when the wing is spread; so that not one *Feather* may mis its full force and impulse upon the air: the tips are all made sloping; those of the interior vanes sloping to a point towards the outer part of the wing, and the exterior v nes towards the body; so that the wing, whether extended or shut, is as neatly sloped and formed, as if constantly trimmed with a pair of scissars.

Mr Derham has several new observations on the mechanism of the vane or webs of the *Feathers*, as they present themselves to the microscope, by which the wonderful care and acuracy of the Creator in so small a part, are excellently illustrated.

The vane consists not of one continued membrane (because, if once broken, it would then be scarce repairable); but of many laminae, admirably contrived to hook and hang together. On the under-side they are thin and smooth; but on their upper, outer edge (represented *Tab. Nat. Hist. fig. 3.*) they are parted into two hairy edges; each side having a different sort of hairs, laminated, or broader at bottom, and slender, and bearded towards the top. Those bearded hairs on one side the laminae, have straight beards, as represented in *fig. 4.* Those on the other, have hooked beards on one side the slender part of the bristle, and straight ones on the other, as in *fig. 5.*

Both kinds are represented as they grow on the upper edge of the lamina, in *fig. 3.* In the vane, the hooked beards of one lamina always lie next the straight beards of the next lamina; by which means they lock, and lay hold of each other; and by a pretty mechanism, brace the laminae close to one another.

FEATHER-bed,

Dry-pulled FEATHERS, } See the article BED.
Scalded FEATHERS, }

FEATHER-edged boards and planks, are those which are thicker on one side, than on the other.

FEATHER, in a horse's forehead, &c. is a turning or parting of the hair; which in some resembles an ear of barley, and in others, a kind of coil-hole.

FEBRIFUGE*, in medicine, a remedy efficacious for the cure of fevers. See FEVER.

* The word is a compound of *febris* and *fugo*, I drive away.

The quinquina, or jesuit's bark, is the greatest and surest of all the clafs of *Febrifuges*.

The little century is sometimes also called *Febrifugum*, on account of its virtues.

The Chinese ginseng is also particularly famed as a *Febrifuge*. For such as cannot take the Peruvian bark in substance, Dr. Fuller prescribes a *Febrifuge* glyster, made of a decoction thereof. The inner bark of the ash-tree, with a little salt of wormwood, taken like the Peruvian bark, is said to equal, or even exceed it, as a *Febrifuge*.

The like is asserted of the bark of the elm near the root. The flowers of sal armoniac are held an excellent *Febrifuge*, especially in intermitting fevers. Cold water has been lately much extolled as a *Febrifuge*. Dr Handcock gives it the emphatical denomination of *Febrifugum magnum*.

Mr. Reneaume, in the *Hist. de l'Academ. R. de sciences*, an 1711. proposes a new *Febrifuge* of his own discovery, viz. galls. From a great number of experiments he has learnt, that galls alone will frequently cure an intermitting fever, as well as the quinquina, over which this medicine has some advantages in other things; in that it is not so bitter, does not heat so much, is taken in a lesser dose, and seldom, and is cheaper. At his motion, several other physicians tried it with success, particularly Mr. Homberg; though it did not succeed so well with M. Boulduc, Lemery, and Geoffroy.

FEBRIS, in medicine. See the article FEVER.

FEBRUARY, in antiquity, a feast, held by the Romans, in the month of February; in behalf of the manes of the deceased. See MANES.

Macrobius tells us, that sacrifices were here performed; and the L.R. offices paid the shades of the detunct: *Saturn. l. i.*

c. 13. And from this feast it was, that the month of February took its name.

The design of these sacrifices is somewhat controverted: Pliny says, they were performed to render the infernal gods propitious to the deceased; though some of the moderns have imagined, that they were intended to appease the deceased themselves, and were offered immediately to them, as a sort of deities. What confirms the former sentiment, is, that Pluto himself is surnamed *Februus*. They lasted twelve days.

The word is of an ancient standing in the *Latin* tongue: from the very foundation of the city, we meet with *Februa*, for purification; and *Februare*, to purge or purify. Varro, *de Ling.* l. v. derives it from the Sabins: Vossius and others, from *fervus*, I am hot; by reason purifications were chiefly performed with fire and hot water. Some go higher, and even deduce the words from פֶּבַר *plur.*, or *phavar*, which in Syriac and Arabic has the same signification with *feruit*, or *effervuit*; and might probably likewise signify, to purify: for *phavar* in Arabic, denotes a preparation given to women in child-bed, to bring away the after-birth, and other impurities remaining after delivery; much as among the Romans, who gave the name *Februa* to the goddess supposed to preside over the delivery of women. Ovid. *Fast.*

FECAL matter, and } See { FÆCAL Matter.
FECES, } FÆCES.

FECIALES*, or FOECIALES, an order of priests or officers among the ancient Romans, appointed to proclaim war, negotiate peace, &c.

* Festus derives the word from *ferio*, I strike, as *ferire fœdus*, signifies to conclude a treaty: and accordingly, instead of *Feciales*, he would have it wrote *feriales*. Others derive it from *fœdus*, which was antiently wrote *fedus*, or from *fides*, faith; others from *facio*, *faci*, I make, &c. because they made war and peace. Vossius chuses to derive it from *fatu*, of the verb *fari*, to speak; in which sense the *Feciales* should be the same with *oratores*; which sentiment is also confirmed by the authority of Varro, who says, they were called indifferently, *Feciales* and *oratores*. *De Vita Popul. Roman.* l. ii.

The *Feciales* were a sort of heralds, or kings at arms, who, when the Romans had any dispute with their neighbours, were sent, first, to demand the thing pretended to be usurped, or require satisfaction for the injury alleged to be done. If an answer was not returned by them, that was satisfactory to the people and the senate; they were dispatched again to declare war: and the like in treating of peace, the *Feciales* being the only persons appointed to negotiate between the senate, &c. and the enemy.

Plutarch, in the life of Numa, and Halicarnassus, l. ii. observe, that they were first instituted by that prince. The latter adds, that they were chosen out of the best families in Rome; that their office, which was reputed a sort of sacerdotium or priesthood, only ended with their life; that their persons were sacred and inviolable, as those of other priests; that they were even charged to see the republic did not declare war unjustly; that they were to receive the complaints and remonstrances of nations, who pretended to have been any way injured by the Romans; that if those complaints were found just, they were to seize the criminals, and deliver them up to those they had offended; that they were invested with the rights and privileges of ambassadors; that they concluded treaties of peace, and alliance, and took care they were executed, and, lastly, abolished them, if they were found not to be equitable.

But Varro assures us, that in his time most of these functions of the *Feciales* were set aside; as those of the antient heralds at arms are among us at present: though Plutarch observes, that they had still some authority in his time.

The *Feciales* were crowned with *verbera*, vervain, when they went to declare war; their head was covered with a veil, over which the crown was applied. In this equipage they proceeded to the frontiers of the new enemy's country, and threw a bloody dart or javelin into the ground, within the same. In Livy, and other antient authors, we have the formula used in such declarations.

FECULA*, or FÆCULA, in pharmacy, a white, mealy substance, or powder, which subsides and gathers at the bottom of the express'd juices of divers roots; as those of briony, arum, iris, &c.

* The word *Fæcula* is a diminutive of *feces*. See FÆCES.

This substance, or sediment, they dry in the sun, after having poured off the liquors, and it serves for divers remedies, &c.

FÆCULENT, or FÆCULENT, is applied to the blood, and other humours, when they abound in fæces or dregs, or have not the proper and usual degree of purity.—

FÆCUNDITY, or FOECUNDITY, Fertility; or that quality of a thing, which denominates it fruitful.

The *Fæcundity* of divers plants is very extraordinary. M. Dardart has an express'd discourse thereof in the *Memoirs of the academy of Sciences*; wherein, he shews, that at a moderate computation, an elm, one year with another, yields 329000

grains or seeds, each of which, if properly lodged, would grow up into a tree. Now, an elm ordinarily lives an 100 years; consequently, in the course of its life, it produces near 33000000 seeds, all which arise from one single seed. He shews farther, that the same elm, by frequently cutting off its head, &c. might be brought to produce 1584000000 seeds; and consequently that there are so many actually contained in it.

FEE*, FEUD, FEUDUM, FEODUM, or FIEF, an estate, land, tenement, lordship, or the like, held of a superior lord, on condition of fealty, homage, or other acknowledgment.

* The word is derived by some authors from *fedus*, as arising from a treaty, or alliance, made with the lord; others, as Cujas, &c. fetch it from *fides*, on account of the faith the person is obliged to bear his lord; others derive it from the Saxon *feh*, hire, or wages, *g. d. status beneficiarius*. Bodin takes the Latin *fedus* to be formed by abbreviation of the initial letters of *fidelis ero domino viro meo*, which is an antient formula of fealty and homage. Hottoman derives it from *fiel*, a German word, signifying war; Pontanus from the Danish *fiel*, militia; others from the Hungarian *fiel*, land; others from *fidus*, to feed. But the opinion of Selden seems the best authorized, who brings it from the Saxon *feh*, stipendium; the *Fe* being a kind of prebend to live upon; and accordingly we find, that in antient times it was used for the wages, and appointments of officers.

The term *Fee* is properly applied to lands and tenements, which we hold in perpetual right, on condition of an acknowledgment of superiority in a higher lord. See TENURE.

The writers on this subject, divide all lands and tenements, wherein a man has a perpetual estate to him and his heirs, into *allodium*, and *feudum*.

Allodium is defined to be a man's own land, which he possesses merely in his own right, without acknowledgment of any service, or payment of any rent, to another; and this is property in the highest degree.

Feudum is that which we hold by the benefit of another, and for which we do service, or pay rent, or both, to the chief lord.

Originally, a *Feud* was only an estate for life; and those to whom it was granted, were called *Vassalli*, who, by such means, were brought to a stricter discipline and obedience to the princes, and were bound to serve them in wars.

The origin of *Fees* or *Feuds*, is one of the darkest and most intricate points in modern history: some attribute the invention to the Lombards, others find some appearance of the duties of a vassal to his lord, in the antient relations between the patron, and his client; and others look for its rise in the Roman beneficia.

The emperors, it seems, distributed lands among the antient legions, on condition of their holding themselves ready, at all times, to take up arms, in defence of the frontiers of the empire; which affords us a good image enough of *Feuds*; and in all probability, their first origin was no otherwise: But in process of time their nature was changed, and duties were annexed to them, which originally were not.

Du Moulin makes no doubt, but that these distributions of lands, called *benefices*, were the first matter of *Fees*; for which reason he uses the terms *benefice* and *Feud* promiscuously, as if they were the same thing: And yet, there was a good deal of difference between them; as there was neither fealty, nor homage, nor the other *feudal* rights annexed to the *benefice*; and that the *benefice* was not hereditary.

Probably, *benefices* began then to be called *Feuds*, when they became hereditary; and when those, of whom the *benefices* were held, began to demand feith, or fealty, from them. This fealty seems to constitute the *Fee*; the word *Fee* itself signifying, in the antient Norman language, *feith*.

There is no fixing the precise era, when these changes commenced; for *Fees*, such as they now are, were not established all at once; but in different countries they took place at different times, and in different manners. The great lords, after the destruction of the Roman empire, having in several parts usurped the property of their *benefices*, laid likewise hold of the jurisdiction; and made their vassals their subjects, so that each became a sort of petty sovereign in his own territory.

Mezeray observes, that the donation of *Fees* to the nobles of France, commenced under the reign of Charles Martel.

Hugh Capet, when he came to the crown, was himself so little established, that he durst not oppose those usurpations; and was forced to suffer, what he could not redress. See Le Fevre de *Lorigina des Fiefs*, and Altierra's *Origines Feudorum pro moribus Gallie*.

The origin of *Fees* in England, Camden carries as far back as the time of Alexander Severus: that prince having built a wall in the North of England, to prevent the incursions of the Picts; he some time after began to neglect the defence thereof, and gave, as Lampridius assures us, the lands con-

quered

quered from the enemy, to those of his captains and soldiers, whom that author calls *limitarios duces, & milites*, i. e. captains and soldiers of the frontiers; but it was on this condition, that their heirs should continue in the service; and that the lands should never descend to private persons, i. e. to such as did not bear arms. That prince's reason was, that people, who in serving defended their own, would serve with a great deal more zeal than any others. Such, according to Cambden, was the rise of *Fees* in our nation, *Britan. p. 651.*

All our lands in England (the crown-land, which is in the king's own hand in right of his crown, excepted) are of the nature of *Feud*, or *Fee*. For though many have land by descent from their ancestors, and others have bought lands; yet cannot land come to any, either by descent or purchase, but with the burden that was laid on him who had the novel *Fee*, or who first received it as a benefice from his lord to him, and such as should descend from him, or to whom it should be otherwise conveyed and transferred: so that no man has *directum dominium*, i. e. the very property, or demain in any land, but the prince, in right of his crown. *Camb. Britan. p. 93.*

Though he who has *Fee*, has jus perpetuum, and utile dominium, yet he owes a duty for it; so that it is not strictly his own. Indeed, as much is imported by the terms in which we express our highest right in lands, &c. the most a man can say, is, "I am seized of this land, in my demain, as of *Fee*." In the stat. 37 Hen. VIII. c. 16. *Fee* is also used for lands vested in the crown: but it is from ignorance of the import of the word; for *Fee* cannot be without fealty sworn to a superior: but the king 'owns fealty to no superior, but God alone.

Fee is divided, in our laws, into *Fee absolute*, called also *Fee simple*; and *Fee conditional*, also called *Fee tail*.

Fee-Simple, *feudum simplex*, is that, whereof we are seized to us and our heirs for ever.

Fee-Tail, *feudum talitatum*, is that, whereof we are seized with limitation to us and the heirs of our body. See *TAIL*.

Fee-Tail, is of two kinds, *general* and *special*.

Fee-Tail general is, where land is given to a man, and the heirs of his body. — So that if a man seized of such land by such gift, marry one or more wives, and have no issue by them, and at length marry another, by whom he hath issue, this issue shall inherit the land.

Fee-Tail special is, where a man and his wife are seized of lands to them, and the heirs of their two bodies. — Where, in case the wife die without issue, and he marry another by whom he have issue, this issue cannot inherit the land.

This *Fee-tail special* has its origin from the stat. of *Westm. 2. c. 1.* Before that statute, all land given to a man, and his heirs, either general or special, was reputed in the nature of a *Fee*; and therefore so firmly held to him, that any limitation notwithstanding, he might alienate it at pleasure. For redress of which inconvenience, the statute provides, that if a man gives lands in *Fee*, limiting the heirs to whom it shall descend, with a reversion to himself, and his heirs, for default of such former heirs; that the form and meaning of the gift shall be observed. See *ENTAIL*.

Fee-Expendants, *feudum expeditivum*. See *EXPECTANT*.

Fee-Farm, or *Fee-Farm*, *feudi-firma*, or *fee-firma*, signifies lands holden to a man and his heirs for ever, under a certain yearly rent.

Fee-Farm arises, when the lord upon creation of a tenancy reserves to himself, and his heirs, either the rent for which it was before let to farm, or at least a fourth part of the rent; and that without homage, fealty, or other services more than are especially comprised in the seoffment.

Though, by Fitz-herbert, it appears, that the third part of the value may be appointed for the rent, or the finding of a chaplain to say divine service, &c. And the nature of it is this, that if the rent be behind, and unpaid for the space of two years, then the seoffer or his heirs have action, to recover the lands as their demesnes.

Fee is also used for the compass or circuit of a manor, or lordship: Thus Bracton, in *eodem villa, & de eodem feodo*. —

Fee is also used for a perpetual right incorporated: as to have the keeping of persons in *Fee*; rent granted in *Fee*; and office held in *Fee*, &c.

Fee also signifies a reward, or ordinary due, given a person for the execution of his office, or the performance of his part, in his respective art or science.

Thus, the lawyer, and physician, are said to have their *Fees*, i. e. considerations for the pains taken with the client, or patient. A barrister, and physician, are supposed to receive their *Fees* from time to time, as their service is performed; they cannot make a bill.

Fees also denote settled perquisites or allowances, paid to public officers, by persons who have business with them.

The smallness of the salaries of divers of the king's servants, is compensated by the perquisites, or *Fees* of honour.

The *Fees* paid to the several officers by every person, upon his being knighted, amount to 78*l.* 13*s.* 4*d.* And if it be done

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within the verge of the court, there is 3*l.* more to the six pages of the bed-chamber: which brings it to 81*l.*

FEELING, *Touching*, one of the external senses, whereby we get the ideas of solid, hard, soft, rough, hot, cold, wet, dry, or other tangible qualities; as also of distance, itching, pain, &c.

Feeling is the grossest, but at the same time the most extensive of our senses, having more objects than all the rest taken together; and some even reduce all the other senses to this one of *Feeling*.

Aristotle is express, that all sensation is only *Feeling*; and that the other senses, as seeing, hearing, tasting, and smelling, are only the more exquisite species, or degrees thereof. *De Anim. l. iv. c. 3. and l. iii. c. 12.*

Naturalists are divided as to the organ, or instrument of *Feeling*. Aristotle takes this sense to reside in the flesh, quatenus flesh, in as much as all flesh is, in some measure, capable of *Feeling*; *Hist. Anim. l. i. c. 4.* Others will have it in all the parts that have nervous fibres, which extends it to the skin, flesh, muscles, membranes, and parenchyma's; others restrain it to the skin or cutis; it being observed, that only those parts covered with a cutis, have properly the faculty of touching or perceiving tangible qualities.

But what part of the cutis to assign immediately for this office, is again disputed. Some will have it the membranous parts; others the carnosus; and others the medullary part, derived from the nerves.

Malpighi, and, after him, all our latest and best authors, hold the immediate organ of the sense of *Feeling*, to be the pyramidal papillæ under the skin.

These papillæ are little, soft, medullary, nervous prominences, lodged every where immediately under the cuticula. They are formed of the subcutaneous nerves, which in order hereto, first lay aside their outer membrane, and are left exceedingly soft and sensible; are continually moistened by a thin subtle humour; and only covered over, and defended by the cuticle or scarf skin. They are largest and most conspicuous in those parts chiefly designed for the office of *Feeling*, viz. the tongue, the tips of the fingers, and toes; and are contractile, and again expansive at pleasure.

Feeling, then, is thus effected: the tip of the finger, for instance, being applied to an object to be examined; by that intention of the mind, the papillæ are emitted or elevated, and being lightly rubbed over the surface of the object, a motion is impressed on them; which being thence propagated by the nerves communicating with them, to the common sensory, excites the perception of heat, cold, hardness, or the like.

Hence we see, why *Feeling* becomes painful, when the cuticle is wore off, burnt, macerated, &c. And why, when the cuticle becomes thick, hard, callous, or cicatrized, &c. the sense of *Feeling* is lost: else whence the numbness impressed by the torpedo; why that exquisite painfulness under and at the roots of the nails, &c.

Feeling is, on many accounts, the most universal of our senses: there being no animal without it. Pliny observes, that all animals have the sense of *Feeling*; even those that are generally thought to have no other sense, as oysters and earth-worms. —

That naturalist declares it his own opinion, that all have the sense of tasting likewise: *Existimaverim omnibus sensum & gustatus esse. Nat. Hist. l. x. c. 71.*

The other senses are confined to narrow bounds; *Feeling* only is co-extended with the body, as being necessary to the well-being of every part. Hence Cicero, *Feeling* is equally diffused throughout the whole frame, that we might be sensible of all impulses in every part, and feel all the degrees of heat, cold, &c. *De Nat. Deor. l. ii. c. 56.*

Naturalists observe, that spiders, flies, and ants have the sense of *Feeling* in a much greater perfection than men, though we have instances of persons, who could distinguish colours by their *Feeling*; and of others, who could perceive what people said, by the same sense.

FEINT, in music, a semi-tone; the same with what we also call *Diessis*. See *DIESES*.

FEINT, in rhetoric, a figure whereby the speaker touches on something, in making a shew of passing it over in silence. The Latins call this *praetermissio*.

FEINT, in fencing, a false attack, or a shew of making a stroke, or push in one part, with design to bring the enemy to guard that part, and leave some other part unguarded, where the stroke is really intended.

Foints are either single or double, high or low, without or within, &c. in prime, in tierce, in quart, in demi, and in the whole circle; of one, two, or three measures.

The *simple Feint* is a mere motion of the wrist, without stirring the foot, &c.

FELAPTON, in logic, one of the moods of syllogisms.

In a syllogism in *Felapton*, the first proposition is an universal negative; the second, an universal affirmative; and the third, a particular negative.

FELLING of timber, see the article *TIMBER*.

FELLOWS, in fortification, are six pieces of wood, each of which forms an arch of a circle, and these joined all together by duleddges, make an entire circle; which with a nave and twelve spokes, form the wheel of a gun-carriage. Their thickness is usually the diameter of the ball of the gun they serve for, and their breadth something more.

FELLOWSHIP, *Company, or Partnership*, in arithmetic, is a rule of great use in balancing accounts amongst merchants, and owners of ships; where a number of persons putting together a general stock, it is required to give every one his proportional share of his loss, or gain.

The *golden rule* several times repeated, is the basis of *Fellowship*, and fully answers all questions of that kind: for, as the whole stock is to the total thereby gained, or lost; so each man's particular share is to his proper share of loss, or gain. Wherefore, the several sums of money of every partner are to be gathered into one sum, for the first term; the common gain, or loss, for the second; and every man's particular share for the third; and the golden rule is then to be wrought so many times as there are partners.

There are two cases of this rule, the one *without*, the other *with time*.

FELLOWSHIP without time, is where the quantity of stock, contributed by each person, is alone considered; without any particular regard to the length of time that any of their monies were employed.—An example will make this process easy.

A. B. and C. freight a ship with 212 tun of wine; A. laying out 1342 l. B. 1178 l. and C. 630 l. towards the same; the whole cargo is sold at 32 l. per tun. Query, what shall each person receive?

Find the whole produce of the wine by multiplying 212 by 32, which yields 6784. Then, adding together the several stocks, 1342, 1178, and 630, which make 3150, the work will stand thus:

$$\begin{array}{r} 1342 \text{—Ans\w.} \text{—} 2890 \\ 1178 \text{—} \text{—} 2537 \\ 630 \text{—} \text{—} 1350 \\ \hline \text{Proof } 3150 \qquad 6783 \end{array}$$

FELLOWSHIP with time, is where the time wherein the money, &c. was employed, enters into the account.—An example will make it clear.

A. B. C. commence a partnership the first of January, for a whole year. A. the same day disbursed 100 l. whereof he received back again, on the first of April, 20 l. B. pays, on the first of March, 60 l. and more, the first of August, 100 l. C. pays, the first of July, 140 l. and, the first of October, withdraws 40 l. At the year's end their clear gain is 142 l. Query, what is each person's due?

A's 100 l. multiplied by three months, the time it was in, makes 300 l. and the remaining 80, by nine months = 720, in all 1020 l. of *A's* contribution. For *B.* 60 into 10, gives 600; and 100 into 5, 500; in all 1100 l. for *B.* For *C.* 140 into 3, gives 420; and 100 into 3, is 300; in all 720 l. for *C.* Now, 1020, 1100, 720 = 2840 for the common antecedent, and the gain 142, is for the general consequent; then the rule will stand thus:

$$\begin{array}{r} 1020 \text{—Ans\w.} 51 \\ 1100 \text{—} \text{—} 55 \\ 720 \text{—} \text{—} 36 \\ \hline \text{Proof } 2840 \qquad 142 \end{array}$$

FELON-de-se, is he that commits felony, by willingly and deliberately killing himself. The Saxons call him *Self-bane*.

A Felon-de-se is to be interred without christian burial, with a stake driven through his corps; and is to forfeit his goods.

FELONY, FELONIA *, was antiently used for a violent and injurious action of a vassal, or tenant, against his lord.

* *Ménage* derives the word from *felsonia*, formed of *felo*, or *fello*, which occurs in the capitulars of Charles the Bald, and is supposed to come from the German *fehlen*, or Saxon *faelen*, to fall or be delinquent. Others derive it from the barbarous Latin *vilania*. My lord Coke, Nicod, &c. derive it a *felle*, gall, as being supposed to be done maliciously. Lastly, others derive it from the Greek *phanos*, to deceive.

In this sense *Felony* was equivalent to petty treason, or it was a crime next below high-treason. The crime of *Felony* imported confiscation of the fee, to the profit of the lord.

FELONY was also applied to an injury of the lord to his vassal, which imported a forfeiture of the homage and service thereof, and made it revert to the sovereign.

Fidelity and *Felony* are reciprocal between the lord and the vassal. See **LORD**.

FELONY, is also used in common law, for any capital offence, perpetrated with an evil intention.

In a stricter sense, *Felony* denotes an offence next below that of petty treason.

Felony includes several species of crimes, whose punishment is the same, viz. death: such as murder, theft, suicide, sodomy, rape, wilful burning of houses, receiving of stolen goods; and divers others found in the statutes, which are daily making crimes *Felony*, that were not before.

Felony is easily distinguished from treason.

From lesser crimes, it is distinguished by this, that its punishment is death, though not universally; for petty-larceny, i. e. stealing of a thing under the value of twelve-pence, is *Felony*, according to Brook; though the crime be not capital, but only a loss of goods. The reason Brook gives for its being *Felony*, is that the indictment runs, *Felonice capti*.

Till the reign of Henry I. *Felonies* were punished by pecuniary fines; that prince first ordered *Felons* to be hanged, about the year 1108.

Felony is of two kinds; the one *lighter*, which for the first time is intitled to the benefit of the clergy; as manslaughter. The other more *crying*, is not allowed the privilege.

Felony is also punished by loss of all lands, not intailed; and all goods and chattels, both real and personal; though the statutes make a difference in some cases concerning lands, as appears by stat. 37 Hen. VIII.

Felony ordinarily works corruption of blood, unless the statute, ordaining the offence to be felony, provide otherwise; as the stat. 39 Eliz. c. 17.

FELT, a kind of stuff, either of wool alone, or of wool and hair; neither spun, crossed, nor woven, but deriving all its consistence from its being wrought, and filled with lees and size, and afterwards fashioned on a block or mould, by help of fire and water.

Castors, camels, and coney hair, lambs and sheeps wool, &c. are the most usual ingredients of *Felts*; and hts of all kinds, are the works they are chiefly employed in.

The *Felt* intended for a hat, being sufficiently filled, and prepared, is reduced into one piece, somewhat in the figure of a large funnel; in which state it remains ready to be put into form, and become a hat. See **HAT**.

FELUCCA *, or **FELUCCO**, a little vessel with six oars, not covered over, much used in the Mediterranean.

* The word is formed from the Arabic *Felkon*, a ship.

It has this peculiarity, that the rudder may be applied either in the head or stern; there being dispositions in both to receive it. For size, it may be compared to a sloop or shallop.

FEMALE, the sex that conceives, and bears fruit.

An animal that generates within itself, is called *Female*; and that which generates in another, male. See **MALE**.

The *Female*, in quadrupeds, and even in birds, is usually smaller and weaker than the male; though in birds of prey, as the falcon, hawk, &c. it is otherwise; the *Female* being bigger, stronger, bolder, hardier, and more courageous.

The like is observed in most insects, particularly spiders; to that degree, that M. Homberg assures us, he has weighed five or six male garden-spiders against one *Female* of the same species, which has been equal to them all.

For the numeral proportion of males to *Females*, see **MARRIAGE**.

Naturalists also distinguish male and *Female* plants; male and *Female* flowers, &c.

FEMALE screw. See the article **SCREW**.

FEMME covert, in law, denotes a married woman; who is also said to be under covert-baron.

FEMININE, or **FOEMININE**, in grammar, one of the genders of nouns.

The *Feminine* gender is that which denotes the noun or name to belong to a female. In the Latin, the *Feminine* gender is formed of the masculine, by altering its termination; particularly by changing us into a. Thus, of the masculine *bonus equus*, a good horse, is formed the *Feminine*, *bona equa*, a good mare; so, of *parvus homo*, a little man, is formed, *parva femina*, a little woman, &c.

In French, the *Feminine* gender is expressed, not by a different termination; but a different article: thus, *le* is joined to a male, and *la* to a female.

In English, we are generally more strict, and express the difference of sex, not by different terminations, nor by different particles, but different words; as boar and sow, boy and girl, brother and sister, &c. — though sometimes the *Feminine* is formed by varying the termination of the male into *ess*; as in abbot, abbess, &c.

FEMININE Rims, see the article **RIME**.

FEMUR *, or **OS FEMORIS**, in anatomy, the thigh-bone. See *Tab. Anat. (Myol.)* fig. 3. n. 20. and fig. 7. n. 22.

* *Dionis* derives the word *Femur* from *fero*, by reason it bears the whole weight of the body.

The *Femur* is the largest and strongest bone in the body, and its articulations are proportioned to its bulk and strength. Its upper part is jointed with the ischium, by enarthrosis, the head of the *Femur* being received into a cavity of the ischium; and the two kept together by a strong cartilage or bandage. The lower end is articulated with the tibia by ginglymus, two heads of the *Femur* being received into two cavities of the tibia; beside a cavity between the two heads, which receives a process of the tibia.

The *Femur* is pretty much incurvated, or bent, the convex part being before, and the concave behind. It is divided into three parts; the *upper*, the *middle*, and the *lower*.

The *upper* consists of a head and a neck, in which are contained three epiphyses, *viz.* the extremity or head, which is round and big, and received into the acetabulum of the coxendix, wherein it is tied by two ligaments; the one from the top, the other from the bottom of the acetabulum, but both inserted into the middle of the head. Immediately under the head, is the neck of the *Femur*, which is small, long, and a little oval, and makes an angle with the body of the bone; by means whereof the thighs and feet are kept at a due distance from each other, to make our standing the firmer; beside that the obliquity of the neck conduces to the strength of the muscles, which must otherwise have passed too near the centre of motion. The other two epiphyses are called the greater and less *trochanters*.

The *middle* part or shank of the *Femur*, is round, smooth, and polished on its fore-side, and rough on the hind-side; along which there runs a small ridge, the whole length of the bone, called *Linea aspera*, serving for the insertion of muscles.

The *lower* part of the *Femur* is divided by a sinus in the middle, into two heads or apophyses, called *Condylis*, which make the ginglymus abovementioned; being both received into the sinus of the tibia.

Between the hind-parts of the head is a space for the passage of the great vessels and nerves, which go to the leg.

The *Femur* has a very large cavity, running its whole length, filled, like the rest, with marrow. The curvity of the *Femur* makes it serve as a buttress to the body, to prevent its falling, or bearing too much forward.

Surgeons and bone-setters should take care, that in fractures of the *Femur*, they do not endeavour to set it straight, which is against nature.

FEN, in geography, a kind of wet land, or rather, morass.

Fens are of two sorts: The first of a boggy consistence, composed of water and earth intermixed; scarce firm enough to sustain the tread of a man.

The second are pools, or collections of waters, with pieces of dry land raised here and there, above the surface thereof.

The former kind neither receive, nor emit any river; but the latter are frequently the heads or springs of rivers; such is the head of the Tanais, &c.

FENCE-Month (*mensis prohibitionis, or mensis vetitus*) is a month wherein the female deer fawn; for which reason it is unlawful to hunt in the forest during that time.

It begins fifteen days before midsummer, and ends fifteen days after; being in all thirty days.

There are also certain *Fences, or defence* months, or seasons for fish, as well as wild beasts; as appears by *stat. Westm.* 2. cap. 13. in these words:

“ All waters, where salmon are taken, shall be in *defence* for taking of salmon, from the nativity of our lady, unto St. Martin’s day. And likewise, young salmon shall not be taken or destroyed by nets, &c. from the midst of April, to the nativity of St. John Baptist, &c.”

FENCE-Walls, are walls of brick, or stone, made around gardens, &c.

FENCING, the art of defence; or of using the sword, to wound an enemy, and preserve one’s self from his attacks.

Fencing is one of the exercises learnt in the academics, &c.

The art of *Fencing* is acquired by practising with foils, called in Latin, *rudis*; whence *Fencing* is also denominated *gladiatura rudiarum*.

Pyrard assures us, that the art of *Fencing* is so highly esteemed in the East Indies, that none but princes and noblemen are allowed to teach it. These masters wear a badge or cognizance on their right arms, called in their language *Ejaru*, which is put on with great ceremony, like the badges of our orders of knighthood, by the kings themselves.

Montaigne informs us, that when he was a youth, the nobility all shunned the reputation of being good *Fencers*; as something too subtle, and designing, and apt to corrupt virtuous manners.

Fencing is divided into two parts, *simple*, and *compound*.—

Simple is, that performed directly and nimbly, on the same line; and is either *offensive*, or *defensive*.—The principal object of the first is whatever may be attempted, in pushing or making passes from this or that point, to the most uncovered part of the enemy. The second consists in parrying, and repelling the thrusts aimed by the enemy.

The *Compound*, on the offensive side, includes all the possible arts and inventions to deceive the enemy, and make him leave that part we have a design on, bare, and unguarded, upon finding we cannot come at it by force, nor by the agility of the simple play.

The principal means hereof are feints, appeals, clashings, and intanglings of swords, half-thrusts, &c. and in the defensive, to push in parrying.

FEND, in the sea language, imports the same as *defend*.

Hence the phrase, *Fending the boat*, &c. that is, saving it from being dashed against the rocks, shore, or ship’s side.

Hence also

FENDERS, any pieces of old cable ropes, or billets of wood,

hung over the ship’s side, to *find* or keep other ships from rubbing against her.

FENDUE en Pal, in heraldry, a French phrase, applied to a cross, to denote it cloven down from top to bottom, and the parts set at some distance from one another.

FENESTRA, in anatomy, a name applied to two holes, or apertures in the inner ear. See **EAR**.

The *Fenestra* are two openings in the labyrinth; the first of them is inclosed by the basis of the stapes, and from its oval figure denominated *Fenestra ovalis*.

The latter, called *rotunda*, is inclosed with a transverse transparent membrane, placed a little within the surface of its aperture.

These *Fenestrae*, with the whole labyrinth, are comprehended in that part of the os temporum, properly called from its hardness *petrosum*.

FENNEL-Seed, in commerce, &c. a longish, striated seed, flat on one side, and roundish on the other; of a sweetish taste, not unlike that of annis-feed; being the produce of an umbelliferous plant of the same name, well known as a Kitchen-herb; by botanists, called *Feniculum vulgare*, or common *Fennel*, or *finckle*.

Fennel-Seed makes part of the commerce of the druggists and apothecaries. It is esteemed a carminative, and used like annis-feed, to dispel wind in the body; and correct fenna, and the rest of the vegetable purgatives.

There is also a strong water, or brandy, made of the seeds of *Fennel*, called *Fennel-water*. The ingredients are *Fennel-Seed*, liquorice, brandy, and white wine, which are distilled together; and to the essence thereof are added spirit of wine, sugar, and sweet almonds; the whole is then strained, &c. The seed of the sweet *Fennel* is used in this and many other compositions, not that of the common *Fennel*.

FENUGREEK, *FENUM GRÆCUM*, or **FENNIGREEK**, a medicinal plant, thus called, because antiently brought from Greece, though now cultivated in several parts of Europe.

Its stem is about a foot high; its leaves are small, and disposed somewhat like those of trefoil. It has a little white flower, from whence arises a long, pointed pod, shaped not unlike a bullock’s horn.

The grain, or seed is inclosed in this pod, which bears the name of the plant itself; it is less than mustard-seed, very hard and solid, of a triangular form, and a strong disagreeable smell; when new, it is of a yellow gold colour, but when long kept, ruddy, or brown.

The farina or flower of these seeds is esteemed good to ripen and digest; and as such, is used in cataplasms of those intentions; as also in emollient clysters, decoctions, &c. It yields a mucilage used in inflammations of the eyes, and on other occasions.

FEODARY, FEUDARY, or FEUDATARY, an officer antiently made and authorized by the master of the court of wards.

His office was to be present with the escheator, at the finding any office; and to give evidence for the king, concerning the tenure and the value thereof; to survey the land of the ward after the office found, and rate it. He also assigned the kings widows their dowers, and received the rents of wards lands. This office is taken away by stat. 12 Car. II.

FEODER, a measure for liquids, used throughout Germany. See **MEASURE**.

FEODUM, or FEUDUM, the same with *seif* or *see*. See **FEE**.

FEOFFMENT, in common law, signifies a gift or grant of honours, castles, manors, messuages, lands, or the like corporeal or immovable things, to another in fee-simple: that is, to him, and to his heirs for ever, by the delivery of seisin, and the possession of the thing given. See **FEE**.

When this is done by writing, it is called the *deed of Feoffment*.

In every *Feoffment*, the giver is called the *Feoffor*, or *Feoffator*; and he that receives, the *Feoffee*.

The proper difference in our law, between a *Feoffor*, and a donor, is, that the *Feoffor* gives in fee-simple; and the donor in fee-tail.

FERALIA*, in antiquity, a feast held by the Romans, on the twenty-first of *February*, in honour of the dead.

* Varro derives the word from *inferi*, or from *fero*: on account of a repast, carried to the sepulchres of such as the last offices were that day rendered to. Festus derives it from *feris*, on account of the victims sacrificed. Vossius observes, that the Romans called death *fero*, *cruel*, and that the word *Feralia* might arise thence.

Macrobius, *Saturn.* l. i. c. 13. refers the origin of the ceremony to Numa Pompilius. Ovid in his *Fasts*, goes back as far as Æneas, for its institution. He adds, that on the same day, a sacrifice was performed to the goddesses Muta, or dumb; and that the persons who officiated, were an old woman, attended with a number of young girls.

FER de Fourchette, Croix a Fer de Fourchette, in heraldry, is a cross, having a forked iron at each end, like that formerly used by soldiers to rest their muskets on; by which it is distinguished

guished from the cross *Furche*; the ends whereof turn forked: whereas in this, the fork is fixed on the square end; as represented in *Tab. Herald. fig. 20.*

FER de Moulin, *q. d.* iron of the mill, is a bearing in heraldry; supposed to represent the iron ink, or ink of a mill, which sustains the moving mill-stone. See a representation of it in *Tab. Herald. fig. 21.*

FERD-wit*, or **FIRD-wite**, in our ancient customs, a formula, by which the king pardoned manslaughter, committed in the army.

* The word is formed of the Saxon *Fird*, army, and *wite* punishment.

FERENTARI*, or **FERENDARI**, among the Romans, were auxiliary troops, lightly armed; their weapons being a sword, bow and arrows, and a sling; which were much less cumbersome, than a buckler, battle-ax, pike, &c.

* The name seems to have been derived a *ferendo auxilio*; these being auxiliary forces: Though Varro thinks they might be so called, by reason, the sling and stones *ferentes*, *non trahuntur*.

We have also mention of another sort of *Ferentarii*, whose business was, to carry arms after the armies, and to be ready to supply the soldiers therewith in battle.

Lydius uses the name *Ferentarii* for the *cataphracti equites*, *i. e.* cavaliers, armed cap-a-pee.

FERIÆ, among the Romans, were holidays; or days wherein they abstained from work.

The word *Feriæ*, is usually derived a *ferendis victimis*, on account of the victims killed on these days. Martinius says, that *Feriæ* were so called *velut ipsæ hæcæ, dies sacri*, holy days. Others observe, that all days in general, though they were not feast-days, were antiently called *Festæ*, or as Vossius reads it, *Festæ*; whence, according to that author, was formed the word *Feriæ*.

The *Feriæ*, or *dies feriati*, were observed and distinguished chiefly by rest; whereas the *festæ*, or *dies festi*, beside a cessation from labour, were celebrated with sacrifices and games; so that there were *Feriæ*, which were not feast-days. Though authors frequently confound the *Feriæ*, and *Festi*.

Others confound the *Feriæ* with the *dies nefasti*, or non-court-days.

The Latin *Feriæ*, amounts to the Sabbath of the Hebrews.

The Romans had divers kinds of *Feriæ*: Their names, at least the principal thereof, are, *Æstivales*, or summer *Feriæ*; *Annoversaria*, yearly *Feriæ*; *Compitalitiæ*, *Feriæ* of the streets, and cross-ways; *Conceptivæ*, votive *Feriæ*, which the magistrates promised every year; *Donicales*, for the expiation of a family polluted by the death of any one; *Imperativæ*, or *Indictivæ*, those decreed by the magistrate; *Latine*, the Latin *Feriæ*, instituted by Tarquin the proud, for all the Latin people, amounting to above fifty nations, being celebrated on M. Alba, in memory of the peace, concluded by Tarquin, with the people of Latium; *Mæstis Feriæ*, those of harvest; *Paganalis Feriæ*, or *Paganalia*, an account of which is given under **PAGANALIA**; *Præcidantæ*, which were, what we properly call the vigils, or eves of the feasts; *Privatæ*, or *Propriæ*, those peculiar to the several families; as the *Familia Claudicæ*, *Æmilicæ*, *Julicæ*, &c. *Publicæ*, those observed by all in general, or for the public weal; *Sementinæ*, those held in seed-time; *Stativæ*, those kept constantly to the same day of the year; *Saturnales*, whereof we shall speak in their place; *Stultorum Feriæ*, or *Quirinaliæ*, the *Feriæ* of fools, held on the seventeenth of February; *Victoriæ Feriæ*, those of victory, in the month of August; *Vindemiæ*, those of the vintage, from the twentieth of August, to the fifteenth of October; *Vulcani Feriæ*, those of Vulcan, which fell on the twenty-second of May.

FERIÆ was also used among the Romans for fair-days; by reason it was the custom to hold their fairs on the *dies feriati*, or holiday. *Struv. Synt. Antig. Rom. c. ix. p. 425, 443, &c.*

FERIA* is still retained in the Romish breviary, though in a sense somewhat different from the *Feriæ* of the antients; being applied to the several days of the week, beginning with Sunday; provided none of those days be a feast or fast day. Thus, Monday is the second *Feria*; Tuesday the third, &c.

* The word *Feria*, in this sense, is doubtless borrowed from the antient *Feria*, a day of rest. Accordingly, Sunday is the first *Feria*: For antiently, all the days of Easter-week were accounted festival days, by a decree of Constantine; whence those seven days were called *Feriæ*: Sunday being the first, Monday the second, &c. And this week being then accounted the first of the ecclesiastical year, they afterwards accustomed themselves to call the days of the other weeks after the same manner, *first, second, third, &c. Feriæ*. Though others will have it, that the days of the week were not called *Feriæ*, from the people's resting, that is, on account of being obliged to abstain from servile works; but to advertise the faithful, that they ought to abstain from sin. See Durand, *de Off. Div. l. viii. c. 1.*

These are the ordinary *Feriæ*: — But besides these, they have extraordinary, or greater *Feriæ*, *viz.* the three last days of pas-

sion week; the two days following Easter-day, and Wit Sunday; and the second *Feriæ* of rogation.

FERIAL Days, *dies FERIALES*, or **FERIÆ**, among the antients, signify holidays, or days vacant from labour, and pleading.

But in the Stat. 27 Hen. VI. c. 5. and in Fortescue, *De Laudibus LL. Anglæ*, *Ferial days*, they are taken for working days. S. Silvester ordained—*Sabbati & dominici dies nomine retentis, reliquis hebdomadæ dies feriarum nomine distinctis, ut jam ante in ecclesiâ vocari ceperant, appellari.*

So that *Ferial days* are properly all the days of the week, except Saturday, and Sunday.

FERM, FIRMA, in law. See the article **FARM**.

FERMENT, in physics, any body, which being applied to another, produces a *fermentation* therein: or, any thing capable of exciting an intestine motion, in the parts of another; and of swelling, or dilating the same.

Thus, the acid in heaven is a *Ferment*, which makes bread rise or swell. And the moisture in hay is a *Ferment*, which heats, and makes it smoko. Thus also, rennet is a *Ferment*, which curdles and breaks milk: And barm, or yeast, is the *Ferment* that sets wort a working, &c. See Supplement, article **FERMENT**.

The force or effect of a *Ferment* arises hence, that by its more penetrative and moveable parts, it dissolves and breaks the texture or combination of the component parts or principles of the body, gives them a new motion, and disposes them to take a new arrangement, or to combine again in a new manner; and so to constitute a new species of body.

Thus, the bite of a mad dog excites a slow fermentation in the blood, whereby the divers liquors, or matters it consists of, lose that nexus, or union, necessary to a state of health; and occasion an irregularity in the spirits, from which arise the horrors, and other symptoms of the disease.

One way of accounting for digestion, is by supposing a certain *Ferment* in the stomach. But what this *Ferment* is, or whence it should be derived, is greatly disputed. Some will have it an acid, others alcalious, others sulphureous, others alcalin-sulphureous, others muriatic, &c. as by their own fancies suggest to them.

FERMENTARI, or **FERMENTACE**, a denomination which those of the Latin church have given to the Greeks, on account of their confectioning and using leavened, or fermented bread in the eucharist.

As the Greeks call the Latins *Azymites*, the Latins, in return, call them *Fermentarii*.

FERMENTATION, an intestine motion, or commotion of the small, insensible particles of a mixed body, arising without any apparent mechanical cause, and producing a considerable alteration therein.

Or, it is an easy, slow, gentle motion of the intestine particles of a body, arising usually from the operation of some active, acid matter; which rarifies and subtilizes the softer yielding particles thereof.

Fermentation differs from dissolution, as the latter is only a result, or effect of the former: *Fermentation* is frequently without dissolution, *i. e.* the fermentative motion frequently does not go so far as to dissolve the body; but dissolution always supposes an antecedent *Fermentation*.

Fermentation differs from ebullition and effervescence in this, that the motion, which in the first is slow, in the two latter is violent; and that in the first, the motion is restrained to the minute particles of the body; but in the latter it extends to large masses thereof.

Indeed it must be observed, that authors usually allow of divers kinds of *Fermentation*, *viz.* an insensible one, which is only known from its effects; and a sensible one; a violent and a moderate one; a hot, and a cold one; a natural, and an artificial one.

Plants bruised, and left a certain time in a close vessel, ferment of themselves; and if let alone, the *Fermentation* will proceed to putrefaction.

In order to *Fermentation*, it is necessary, the ferment have something acid and spirituous in it; that its motion be tumultuous; that it be an open, spacious place, and assisted by the air; and that it tend to exalt and purify the body, and produce vinous, or inflammable spirits.—These are the particular properties and conditions of *Fermentation*; though in the general, all required to effect a *Fermentation*, in a body, or liquor, which is not homogeneous, that is, which consists of different principles; is that there be a strong attraction between the particles of the *Ferment*, and the body; that the parts of this latter be moved and agitated irregularly; and that this motion produce some alteration in the mixt.

Fermentation is one of the most obscure processes in all nature. The generality of our later philosophers allow it in great measure a mystery, to which their principles will not fully reach. Dr. Morgan attempts to account for it, on the Newtonian system. His principle is, that the expansive force of air, rarified by the action of fire, or the mutual

action of fire and air, is the universal natural cause of *Fermentation* and dissolution.

To shew this, he considers two great powers, or principles in bodies, *viz.* an attractive, cohesive power, in the small particles of matter, as the principle of all rest, concretion, &c. And the expansive force of heated air, as the principle of *Fermentation*. On the different proportion and adjustment of these two opposite forces, with respect to each other, the constitution, texture, and cohesion of bodies are said to depend.

By the attractive force, acting alone, the constituent parts of compound bodies, must be brought to their nearest and greatest contacts, and remain there in a degree of firmness, and cohesion, proportional to the quantities of contact.

On the other hand, by the repulsive, expansive force, acting alone, all bodies, even the most compact and solid, must be dissolved and diffused into one perfectly fluid, incoherent mass.

If both be found in the same body, and equal in degree, such a body must continue in its present state of fluidity, or cohesion; if the attractive power prevail, the quantity of contact, or degree of cohesion will be continually increased to a certain pitch, where it will rest: on the contrary, if the expansive force of the fire and air, included in any body, or mass of matter, prevail against the attractive power of the contiguous parts, the parts must necessarily recede from their points of contact.

And this happening through all the subdivisions of which the body or mass is capable, every small part must be divided and separated into other smaller parts; and these again into others, and so on, till we come to the first constituent particles or atoms, which are supposed to be perfectly solid, and indivisible.

This recedes of the parts of bodies from their points of contact, and the separation and division consequent thereon, is what we call *Rarefaction*; as, on the contrary, the approach of the parts nearer to the points of contact, is called *Condensation*. Now from the contrary effects of these two forces, there necessarily arises an intestine commotion, collision, and natural struggle of the parts among themselves, *i. e.* the parts acted on by two such opposite forces, will fly off, and recoil, recede and accede, in proportion to the strength and energy of the opposite powers, till one or the other prevail, either to fix and condense, or to dissolve and diffuse it; which alternate motion is what we call *Fermentation*.

If the attractive force prevail, the most fluid body will be consolidated, as water into ice.

On the contrary, if the expansive force prevail, the firmest body will be broke and dissolved.

Fermentation is a point of the utmost consequence in medicine; it is one of the principal means, or instruments we have for altering, exalting, or calling forth the properties and powers of bodies. To get an idea of these changes, we cannot consider it better, than in the procuring of a spirituous liquor from malt, by means thereof.

It is to be observed then, that the malt being made, as shewn under the article *MALT*; and then laid to infuse or mash in hot water, the rest of the process of brewing is nothing but a raising and directing of a *Fermentation*, or intestine motion.

How such motion is mechanically effected, and how it brings forth such a spirit, may be conceived from what follows; supposing the reader acquainted with these common propositions in hydrostatics; *viz.*

1° That a body immersed in any fluid, specifically lighter than itself, will sink; otherwise, it will emerge and get to the top.

2° That if two equal bodies of different specific gravities be immersed in a fluid, lighter than either of them, the celerities of their descents will be as their gravities.

3° That if two unequal bodies of unequal specific gravities be immersed in a fluid, lighter than either, the celerities of their descents will be compounded of their gravities and dimensions together.

The same laws, by which bodies descend, hold good in the ascent of those specifically lighter than the fluid.

Hence in all heterogeneous fluids, the constituent parts of which are not fitted to associate and cohere, so as to form what is called an uniform homogeneous fluid, the heavier may be accounted as solid bodies immersed in a fluid specifically lighter; and the lighter parts, as such bodies in a fluid specifically heavier; since it may be demonstrated, that the component parts of all fluids, separately considered, are solid.

The liquor, therefore, called *wort*, which is a decoction of malt, may be considered as such an heterogeneous fluid, whose parts cannot be interchanged in their positions, till each has obtained such an elevation as corresponds to its proper gravity; but lest this alone should fail of the intention, by not being sufficient to break those molecule and viscidities, which entangle the spirituous parts, and likewise to prevent their flying off at the surface, some portion of an already fermented substance is mixed with it.

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This substance, termed *larm*, or *yeast*, consists of a great quantity of subtle spirituous particles, wrapped up in such as are viscid. Now, when this is mixed with such a liquor, it cannot but much contribute to that intestine motion which is occasioned by the intercourse, and occurions of particles of different gravities; as the spirituous particles will be continually striving to get up to the surface, and the viscid ones continually retarding such an ascent, and preventing their escape.

So that by these two concurring causes the particles extracted from the grain, will by such frequent occurions be so comminuted, as continually to increase the more subtle and spirituous parts, until all that can be made so by attrition, be set loose from their former viscid confinements; and this appears by the warmth of the liquor, and the froth drove to the top; just at which time, if it be thrown into the still, it affords some quantity of an highly inflammable spirit.

Moderate warmth much hastens this process, as it assists in opening the viscidities, in which some of the spirituous parts may be entangled, and unbends the spring of the included air, which cannot but contribute to the rarefaction and comminution of the whole.

The viscid parts, which are raised to the top, not only on account of their own lightness, but by the continual efforts and occurions of the spirit to get uppermost, both shew when the ferment is at the highest, and prevent the finer spirits making their escape; for if this intestine lucus be permitted to continue too long, a great deal will get away, and the remaining liquor will grow flat, and vapid, and raise little besides phlegm in the still.

The greatest use of this theory in medicine, will be in teaching what parts of the materia medica are most properly brought under this procedure; and how such intestine motion does, in some things, destroy their virtues: for by some medicines an intention is aimed at, which is not to be procured, but by their being spirituous; whereas in others the very contrary property is required: in such cases therefore, when by any adventitious cause those medicines get into a *Ferment*, they are destroyed, and should not be administered.

FERNAMBU, see the article *BRASIL wood*.

FERRUGINOUS, denotes a thing to partake of the nature of iron, or to contain particles of that metal.

It is particularly applied to certain mineral springs, whose water in their passage along the strata of the earth meets with the ore of this metal, or with pyrites containing it, part of which they wash off, and carry with them; and thus become impregnated with the principles thereof. Such are what we call *chalybeate waters*.

The waters of Tunbridge, those of Forges, and of the iron spring at Bourges, and many others, are *ferruginous*.

FERRUGO, the rust of iron; or a kind of calx found on the surface thereof.

FERRUM, *Iron*, see the article *IRON*.

FERTILITY, FRUITFULNESS; that quality, which denominates a thing fertile, or prolific.

The Egyptian nitre, or naron, renders the ground exceedingly fertile. M. de la Chambre observes, that the plants grow in such abundance in Egypt, that they would choke one another, if they were not hindered, by throwing sand upon the fields; inasmuch that the Egyptians must take as much pains to lessen the richness of their soil, as other nations do to increase that of theirs. *Philos. Transact.* N^o 160.

Nothing is more fertile than wheat, which faculty was given it by the Creator, in regard that it was to be the principal food of men; thus a single measure of that grain, sown in a proper soil, will yield a hundred and fifty measures.—One of Augustus's procurators sent him four hundred ears, all produced from one seed. And Nero had three hundred and forty ears sent him, arising also from a single seed. *Plin. Nat. Hist.* l. xviii. c. 10.

FERULA*, a little wooden pallet, or slice; repared the schoolmaster's sceptre, wherewith he chastises the boys, by striking them on the palm of the hand.

* The word is pure Latin, and has also been used to denote the prelate's crozier and staff. It is supposed to be formed of the Latin *ferire*, to strike; or, perhaps, *Ferula* in this sense may be derived from the name of a plant, called in Latin *Ferula*, in English *Fennel-giant*; the stem whereof was anciently used to correct children with; though others think, the plant took its name from the instrument, or rather from its use, *ferire*.

Under the eastern empire, the *Ferula* was the emperor's sceptre, as is seen on divers medals; it consists of a long stem or shank, and a flat, square head. The use of the *Ferula* is very ancient among the Greeks, who used to call their princes *κρονοβοι*, q. d. *Ferula* bearers.

In the ancient eastern church, *Ferula* or *Narthex*, signified a place separated from the church, wherein the penitents, or the catechumens of the second order, called *Auscultantes*, *αυκουσταντοι*, were kept; as not being allowed to enter the church. Whence the name of the place; the persons therein being under penance, or discipline: *sub Ferula erant ecclesie*.

FERULÆ, among chirurgeons, called also **SPLINTERS**; are little chips of different matter, as woods, barks, leather, paper, &c. applied to bones that have been disjoined, when they are set again.

The bark of the herb fennel-giant, called by some in Latin *Ferule*, was antiently much used on this occasion; whence the name *Ferula* became common to all.

FESCENNINE *, in antiquity, **FESCENNINE verses** were a kind of satirical verses, full of wanton, and obscene expressions, sung or rehearsed by the company, at the solemnizing of a marriage among the Romans.

* The word is borrowed, according to Macrobius, from *Fescinum*, a charm; the people taking such songs to be proper to drive away witches, or prevent their effect: But its more probable origin is from *Fescennium*, a city of Campania, where such verses were first used.

FESSE, one of the nine honourable ordinaries of the escutcheon, which it divides horizontally in the middle, and separates the chief from the point. It is supposed to represent a broad girdle, or belt of honour, such as knights at arms were antiently girded withal.

It possesses the centre of the escutcheon, and contains in breadth one third part thereof.—Thus, he beareth azure, a *Fesse* or, by the name of Elliott. See *Tab. Herald.* fig. 22. When the *Fesse* takes up less than its proper breadth, it is called a *Bar*.

FESSE-point, is the exact centre of the escutcheon.

It is thus called, as being the point, through which the *Fesse* line is drawn from the two sides; and accordingly it divides the escutcheon into two equal parts, when the escutcheon is parted *Per fesse*.

FESSE-ways, or in **FESSE**, denotes things borne after the manner of a *Fesse*, i. e. in a line, or range, a-cross the middle of the shield; which the French call on *Fesse*.

Party per FESSE, implies parted a-cross the middle of the shield from side to side, through the *Fesse* point.

This the French express by one word, *caupé*.

FESTI Dies, among the antients, were *Festj*-days, or holiday-days.

Numa distinguished the days of the year into *Festi*, *profesti*, and *interesti*.—The first were those dedicated to the gods; the second were those allowed to men, for the management of their own affairs; the third were shared between the gods and men.

The *Festi dies*, again, were divided, according to Macrobius, *Saturn.* c. 16. into sacrifices; epulæ, or banquets; ludi, or games; and lertie; see **FERIÆ**, &c. and the *profesti* into *Festi comitiales*, *compendini*, *stati*, and *præliari*. See **FASST**, &c.

FESTINO, in logic, one of the moods of syllogisms.

In a syllogism in *Festino*, the first proposition is an universal negative; the second, a particular affirmative; and the third, a particular negative.

FESTIVAL, see the articles **FEAST**, and **FESTUM**.

FESTOON, in a general sense. See **GARLAND**.

FESTOON *, in architecture, and sculpture, is a decoration in form of a garland, or cluster of flowers.

* The word is French, *Festoon*, which signifies a garland, formed of the Latin *festum*, feast.

It consists of a string, or collar of flowers, fruits, and leaves tied together, somewhat biggest in the middle, and suspended by the two extremes; from which, beside the main part which falls down in an arch, two lesser parts hang perpendicularly.

This ornament is made in imitation of the *Festoons*, or long clusters of flowers, hung by the antients on the doors of their temples, &c. on festival occasions.

Festoons are now chiefly used in freezes, and other vacant places, required to be filled up and adorned.

FESTUM, in a general sense. See the article **FEAST**.

FESTUM, in our law books, is frequently used for a general court, or assembly; in regard such were antiently always kept on the great festivals of the year.

Thus, in our chronicles, we read, that in such a year the king kept his *Festum* at Winchester, &c. that is, he kept a court there at that time: *Rex apud Winton. maximum Festum & conviviium celebravit, tempore natalis Domini, convocatis ibidem principibus & baronibus totius regni.*

FÊT-Loek, in the menage, a tuft of hair growing behind the pattern joint of horses.

Hence, the joint where it grows, is called the *Fetlock-joint*.

FETUS, see the article **FOETUS**.

FEUD, **FEODUM**, the same with *fief*, or *fee*. See **FEU**.

FEUD is also used in our antient customs, for a capital quarrel, or enmity, not to be satisfied but with the death of the enemy.

Feud, called also *Feida*, and *Faida*, in the original German signifies *guerram*, i. e. *bellum*, war: Lambert writes it *Fetb*, and *faitb*, it signifies *capitales inimicitias*, or implacable hatred.

In Scotland, and the north of England, *Feud* is particularly used for a combination of kindred, to revenge the death of

any of their blood, against the killer and all his race, or any other great enemy.

FEUDAL, or **FEODAL**, of, or belonging to a *Feud*, or *Fee*.

We say, a *Feudal matter*, *Feudal jurisprudence*, *Feudal seizure*, &c. A *Feudal lord*, in default of fealty and homage from his vassal, may seize the fruits of the fee. A Neapolitan lawyer, called *Caracita*, has a Latin treatise of the *Feudal law*, entitled, *Prælectiones Feodales*.

When once the use of fees was thoroughly established in France, they would need extend it much further; and almost all the great offices of the crown thus became *Feudal*; even the courts of justice were drawn in; in order to which they were annexed to certain lands, or revenues.

The design of these infeodations was to render the offices hereditary, after the manner of fees, which were now become so. And thus the offices of the grand chamberlain, grand builer, &c. came to be held by hereditary right.

FEUDATARY, or **FEODATARY**, a vassal, or person who holds of a superior in fee, i. e. on condition of yielding him fealty, and homage, or other service.

The electors, princes, and free cities of Germany, are all *Feudataries* of the emperor.

F. Daniel observes, that Charles VII. forbade the count d'Armagnac to call himself in his titles, by the grace of God count d'Armagnac; such terms, which seem to exclude all dependence, except on God, being an innovation prejudicial to the right of the sovereign, and which had never been allowed to any duke, or count, who was a *Feudatary* of any crown. *Histoire de France*, t. ii. p. 1162.

FEUDBOTE, a recompence for engaging in a feud, or faction, and for the damages consequent thereon; it having been the custom of antient times for all the kindred to engage in their kindsmen quarrels, according to that of Tacitus de *Morb. Germanor.* *Suscipere tam inimicitias seu patris, seu propinqui quam amicitias necesse est.*

FEUDIST, a lawyer, or doctor learned, or much conversant in *feuds*, or *fees*.—Du Moulin is reckoned a great *Feudist*.

FEVER, **FEBRIS**, in medicine, a disease, or rather class of diseases, whose characteristic is a præternatural heat felt through the whole body, or at least the principal parts thereof; attended with other symptoms.

Sydenham defines a *Fever* a strenuous endeavour or effort of nature, to throw off some morbid matter, that greatly incommodates the body.—Quincy defines it an augmented velocity of the blood: others, a fermentation of the blood accompanied with a quick pulse, and excessive heat.

The causes of *Fevers* are innumerable; and the disease even often arises in the soundest bodies, where there was no previous morbid apparatus; as *Cachymia*, *Plethora*, &c. but merely from a change of air, food, or other alteration in the non-naturals.—A *Fever*, Boerhaave observes, is an inseparable companion of an inflammation.

The symptoms are many: every *Fever* arising from any internal cause, is attended with a quick pulse and an unusual heat, at different times, and in different degrees. Where these are intense, the *Fever* is acute; where remiss, it is call'd flow.

The disease begins almost always with a sense of chillness; and in its progress is chiefly distinguished by the velocity of the pulse: so that a too quick contraction of the heart, with an increased resistance or impulse against the capillaries, furnishes the proper idea of a *Fever*; and the health of the patient is the scope nature chiefly aims at in the disease.—Other attendant symptoms are usually a laborious and disturbed respiration; an uniform, high-coloured urine; a parchedness and dryness of the tongue, mouth, &c. a clamminess of the saliva; thirst; and wakefulness; and a nausea against every thing but thin diluting liquors.

From these symptoms, Dr. Morgan lays it down as a principle, that in every *Fever*, there is a general obstruction, and diminution of the glandular secretions; that is, a great part of the lymph, or serum of the blood, which ought to be continually drained off by the glands, is, during the *Fever*, so retained in, and closely united to, the mass, that it circulates together with it in the veins and arteries. This he endeavours to prove to be the state and condition of the blood in the production of a *Fever*, by accounting for all the above-mentioned phenomena from it, as the just and adequate effects of such a cause. How he does this, see in his *Philos. Princ. of Med.* p. 207, &c.

The general indication in the cure of *Fevers*, is, to restrain the commotion of the blood within the bounds agreeable to the end nature had in raising it, i. e. neither to let it rise too high, for fear of the consequence; nor yet keep it too low, for fear of frustrating the endeavour of nature. And hence is to be deduced the rule and measure of letting more, or less blood, or none at all.

The cure of *Fevers*, Boerhaave summarily comprehends in correcting the sharp, irritating *febrile* matter, diffusing the lentor, and mitigating the symptoms. If nature seem to carry the *Fever* too high, it must be moderated by abstinence, thin diet, drinking of water, bleeding, and cooling clysters:

if the bring it on too slowly, it must be excited by cardiacs, aromatics, volatiles, &c. The cause removed, the symptoms cease of course; and if they can be bore without much danger of life, it were best not to enter into any particular cure thereof; if they be unreasonable, or too severe, they are each to be abated with the proper remedies.

Sydenham recommends an emetic in the beginning of a *Fever*; or, if it have been then omitted, in any other stage thereof; especially where there is a propensity to vomiting: for want of this, a diarrhoea frequently succeeds, which is often exceedingly dangerous. After this, he uses a paretic; and the following days, if there be no indication to repeat the venesection, nor any diarrhoea, he prescribes every other day an enema, till the twelfth day, when matters usually coming to a crisis, he has recourse to hotter medicines, in order to promote and accelerate it. He adds, that if the disease proceed well, and the fermentation be laudable, there is no occasion for any phlyc at all. About the fifteenth day, if the urine be found to separate, and give a sediment; and the symptoms be abated, a cathartic is usually ordered, lest the sediment returning into the blood again, occasion a relapse. Nothing cools the patient, and abates the *Fever*, so much as a cathartic after venesection.

The more acute the *Fever*, the thinner, according to Etmuller, must be the diet. It is no matter, if the patient should fast for several days running; for never did *feverish* persons die of hunger: eating always expedites the disease. Emetics, he allows the principal place in the cure of all *Fevers*; but, as a patron of the hot regimen, he assigns sudorifics the second. Spirit of sal ammoniac, or its sal volatile, he observes, is an universal febrifuge, and rarely fails: all figured things are hurtful.

Hippocrates, in all *Fevers*, prescribes wines; Dr. Hancock, water.

So long as the urine remains crude, that is, does not give a sediment, the patient's case is dubious: but when once the coction commences, and the urine separates, the great danger is generally over.

Among the signs of death, the same author adds, there is none more certain, than a frequent blowing of the nose, without any discharge of matter. A strong, equable pulse, with deliria, tremors, twitches of the tendons, and other symptoms, fatal in diseases of the nervous kind, always preface well in *Fevers*: on the contrary, a quick, weak, faltering pulse, howsoever favourable the other symptoms may seem, infallibly proclaim death at hand. Morton.

It appears, by observation, that a frequent letting of blood, renders persons more inclinable to *Fevers*.

Fevers are of various kinds, denominated and distinguished from the particular causes that produce them; the time they continue; their accessions, and returns; and their different symptoms.—The most general and genuine division of *Fevers*, is into *essential*, and *symptomatic*.

Essential FEVER, is that whose primary cause is in the blood itself; and which does not arise as an effect, or symptom from any other disease in the solids, or other parts.

This is what we absolutely and properly call a *Fever*.

Symptomatic FEVER is that which arises as an accident, or symptom of some other antecedent disorder, as an inflammation, phlegmon, erysipelas, imposthume, small-pox, pleurisy, &c.

Whence it is peculiarly denominated inflammatory, erysipelatous, purulent, variolous, or pleuritic *Fever*.

Essential Fevers are generally distinguished into *continued* and *intermitting*: others chuse to divide them into *diary*, *intermitting*, *continent*, and *continued*.

Continual FEVER is that which gives the patient no respite, or intermission; but sticks to him from its first seizure, to its final period.

This is subdivided into *putrid*, and *not putrid*.

Continual FEVER not putrid, is that wherein the parts of the blood are not so dissolved and broke, as to give occasion for the principal parts thereof to be secreted; or that, wherein there is not any discharge of putrid, purulent matter into the blood.

Of this there are two kinds, the *diary*, and *synochus*; to which some add the *hectic*.

Diary FEVER, is that, which does not ordinarily hold beyond twenty-four hours. It is the gentlest of all *Fevers*; is frequently got by too much exercise, or other external accidents. It is cured by rest alone, and keeping in bed: if it remain for several days, it is either called a *continual ephemera*, or simple *synochus*.

Hectic FEVER is a slow, durable *Fever*, which extenuates and emaciates the body by insensible degrees.

It has three stages; the first, while it consumes the juices of the body: the second, when it exhausts the fleshy substance of its humidity: and the third, when it lays hold of, and destroys the solids themselves; in which last stage it is reputed incurable. Its effect is somewhat like that of a flame; first consuming the oil of the lamp; then the moisture of the wick; and lastly the wick itself. But this *Fever* is frequently

considered as of the *symptomatic*, or *secondary* kind, arising in phthises, &c.

Continual putrid FEVER, is that wherein the texture of the blood is rendered so lax, or even dissolved, that its parts or principles separating, some of the principal of them are secreted, and lost.

Putrid Fevers are frequently considered as *secondary* ones, arising from the discharge of putrid, purulent matter from some morbid part, as an ulcer in the lungs, &c. They are divided into *simple*, and *compound*, or *remitting*.

Simple continual putrid FEVER, or a *continent FEVER*, properly so called, by the Greeks, *Συνεχης*, is that which continues uniformly from first to last, without any fits or periods of exacerbation and remission of heat, and the other symptoms.

Willis divides the *putrid Fever* into four *stadia*, or stages. The beginning, which is attended with a chilliness, shivering, weariness, thirst, wakefulness, pain in the head and loins, nausea, and vomiting. The increase, wherein the former symptoms are heightened, with the addition of deliria, convulsive motions, foulness of the mouth, and high turbid urine without any laudable sediment, or hypostasis. The state, which contains the crisis, which in this disease is much what the paroxysm is in *intermittents*: for as that returns at certain hours, so do the critical motions in continued *Fevers* happen on the fourth, fifth, sixth, or seventh day.

The last stage is the declension, which ends either in recovery, or death.

These *Fevers* are subdivided into *burning* and *slow*.

Ardent, or *Burning FEVER*, called by the Greeks *καυη*, is a very acute *Fever*, attended with a vehement heat, intolerable thirst, a dry cough, delirium, and other violent symptoms.

It frequently kills on the third, or fourth day; and rarely exceeds the seventh. It often goes off in a hemorrhage, on the third, or fourth day; which, if it prove too sparing, is usually fatal. Sometimes it goes off by stool, vomiting, &c. and sometimes it ends in a peripneumony.

To the class of *burning Fevers* are reducible, the *Lipytia*, *Affodes*, *Helodes*, &c.

The *Lipytia* is a burning *Fever*, wherein the heat is very intense within side, and at the same time the external parts are cold.

The *Affodes* is a burning *Fever*, attended with great inquietudes, nausea, vomiting, &c.

The *Helodes* is a *Fever*, wherein the patient sweats continually.

The *Synopal Fever* is that attended with frequent swoonings.

The *Epiolos* is that wherein both heat and cold are felt in the same part at the same time.

Slow FEVERS are gentle, but durable ones, they consume the patients by degrees. They usually arise from disorders in the lymphas, or pituita; whence Sylvius calls them *Lymphatic Fevers*.

The principal of these are the catarrhal, attended with a catarrh, cough, hoarseness, &c. And the scorbutic *Fever*, into which acute *Fevers*, and sometimes intermittent kinds degenerate. To this class are also reducible,

Colligative FEVERS, wherein the whole body is consumed and emaciated in no long time; the solid parts, with the fat, &c. melted down, and carried off by a diarrhoea, sweat, urine, &c.

Remitting FEVER, called also a *Continual Fever*, *Συνεχης*, and a *compound continual Fever*, is that which continues some time, without any gradual increase of heat; yet is liable to alternate fits of remission and aggravation; either stated and periodical, or irregular.

Of this there are divers kinds, denominated from the periods of returning; as the *Remitting*, *continual Quotidian*, *continual Tertian*, *continual Quartan*, &c. which are only a continued *Fever*, whose accessions or severer fits return every day, or every other day; or every third day; or every fourth day.

Some enumerate divers other more complicated continual *Fevers*; as the *double* or *triple Quotidian*, which has two or three paroxysms every day: the *double* or *triple Tertian*, or *Quartan*, which have two or three every third or fourth day: the *Semi-Tertian*, by the Greeks called *μισσηρα*, which consists of a *continual*, and two intermitting *Fevers*, of different kinds, viz. a *Quotidian*, and *Tertian*. The patient, beside a continual *Fever*, having an extraordinary fit every day; and every other day two.

Others divide the *remitting*, *Συνεχης*, or *compound continual Fever*, into *simple*, and *spurious*.

The *simple Remitter* returns regularly, and is only distinguished from an intermitter, in that the febrile heat in the intervals of this latter is never quite extinguished; and that the paroxysms do not begin with so much chilliness and horror; and go off in profuse sweats.

The *spurious Remitter* is attended with grievous symptoms in the nervous kind, resembling those of the rheumatism, cholice, pleurisy, and other inflammatory and spasmodic diseases; beside immoderate excretions, vomitings, diarrhoeas, &c. Whence its returns are uncertain, and variable.

The *simple* rarely, if ever, kills; the *spurious*, frequently. Sometimes it degenerates into a malignant *typhus*.

The first is cured with the cortex peruv. almost as infallibly as an intermitter; the *febrile ferment* being much the same in both; and the same medicine is found almost a sure, though not so speedy a remedy of the *spurious*, if properly applied.

Intermitting FEVER, is that which ceases, and returns again alternately, at stated periods; and is called also an *Ague*.

In this kind, cold and heat, shivering and sweating, succeed each other. The paroxysms are attended with sickness, nausea, vomitings, head-ach, pain in the back and loins, &c. The paroxysms are acute, but the disease usually more or less chronic.

Nobody was ever killed by an *intermitting Fever*, except in the first stage of the paroxysm, during the shivering caused by the oppression of the spirits. But when the disease becomes of a very old standing, it sometimes degenerates into other fatal ones.

As to the cure, it is found by abundant observations, that neither bleeding, nor emetics, nor cathartics, nor any other remedy administered during the fit, avail any thing. A just dose of vinum benedictum, three hours before the paroxysm, Morton assures us, has often cured it: antimonium diaphoreticum, a little before the paroxysm, has sometimes had the like effect: and salt of wormwood is commended on the same occasion Docteur mentions lapis lazuli taken in spirit of wine before the fit, as admirable.

Several bitters, as carduus benedictus, gentian root, camomile flowers, the pulvis febrifugus, &c. were much valued before the invention of the cortex peruv. But that bark has almost thrown them all out of use; being by the general consent of physicians allowed a specific for intermitting *Fevers*, in all seasons, ages, and constitutions.

Intermitting *Fevers* are of divers kinds, as the

Quotidian FEVER, where the paroxysm returns every day.

Duple Quotidian, which returns twice in twenty-four hours.

Tertian FEVER, which only returns every other day; which again is either *legitimate*, or *spurious*.

The *legitimate Tertian* only holds twelve hours, and is followed by an absolute intermission.

The *spurious Tertian* exceeds twelve hours, and sometimes holds eighteen or twenty.

Double Tertian, is that which returns twice every other day.

The name *Double Tertian* is also used, where the *Fever* returns every day; like a quotidian; only at different times of the day; the third fit answering to the time of the first; the fourth to that of the second, &c.

Quartan FEVER, is that which only returns every third day, leaving two days intermission between every two fits.

Double Quartan, is that which has two fits every fourth day.

The same name is also given to a *Fever*, which returns two days successively; only leaving one day's intermission.

Triple Quartan Fever, is that which has three fits every fourth day; or that which returns every day like a quotidian, only at different seasons of the day; the fourth fit answering to the time of the first; the fifth to the second, &c.

There are also intermitting *Fevers*, which only return every fifth day, or every sixth, or every seventh, and at other intervals.

Lastly, there are some extraordinary species of *Fevers*, not reducible to any of the forementioned classes; as *malignant*, *eruptive*, and *pestilential Fevers*.

Malignant Fevers are those wherein the usual regular symptoms do not appear (nature being oppressed with the malignity of the *febrile matter*) but other foreign symptoms arise; as a pain about the stomach, and præcordia; a livid complexion, with the face much disfigured, &c. and sometimes efflorescences on the skin, &c.

Some authors, from microscopical observations affirm, that in all malignant *Fevers* the blood is so corrupted, that swarms of little worms are generated therein, which occasion most of the symptoms.

In all malignant *Fevers* the blood is too fluid. Blood-letting has here no place; emetics do well at first, afterwards sudorifics and alexipharmics; blisters are commended in the progress of the disease.

Eruptive Fevers are those, which, beside the symptoms common to other *Fevers*, have their crises attended with cutaneous eruptions. Such are those of the small-pox, measles, the petechial, the purple or scarlet *Fever*, and the miliary *Fever*: the other symptoms are, a grievous oppression of the breast, laborious short breath, obstinate waking, spasms, sore throat, cough, &c.

Pestilential Fevers, are acute, contagious, and mortal diseases. Some will have the *Fever* to be the disease or plague itself; others only account it a symptom of the plague. See *PLAGUE*.

Petechial FEVER is a malignant *Fever*, wherein, beside the other symptoms, on the fourth, or more frequently on the seventh day,

petechiæ, or red spots, like flea-bites, appear, chiefly on the breast, shoulders, and abdomen. The spots afterwards turn paler, then yellow, and so disappear. When they grow livid, or black, they usually prove fatal.

This *Fever* is contagious, and often epidemical. It is treated much as those just mentioned.

FEUILLANS, an order of religious, clothed in white, and going bare-foot; who live under the strict observance of the rule of St. Bernard.

The name was occasioned by a reform of the order of Bernardines, first made in the abbey of *Feuillans*, a village in France, five leagues distant from Thoulouse, by the Sieur Barriere, who was abbot thereof in 1589.

It was approved of by pope Sixtus V, and the popes Clement VIII, and Paul V, granted it its particular superiors. King Henry II. founded a convent of *Feuillans*, in the Fauxbourg St. Honore, at Paris.

There are also monasteries of nuns, who follow the same reform, called *Feuillantines*.

FEUILLE de siec, in heraldry, expresses that an ordinary, as a fesse, pale, or the like, is indented only on one side; in regard it then looks like the leaf of a saw, as the French phrase imports.

F E W E L, or *FUEL*, in philosophy, the pabulum of fire, or whatever receives and retains fire, and is consumed, or rendered insensible thereby.

Pure fire, if left to itself, would disperse and disappear; to preserve it, it is necessary there be some *Fuel*, to sustain and keep it together.

The only proper *Fuel* known in all nature, is oil, commonly called sulphur; and all bodies, whether vegetable, fossil, or animal, are only inflammable, as they contain oil in them.

Oil feeds and sustains fire by virtue of its ramose, tenacious particles, which are disposed to be put into a most vehement, rotatory motion, before they will let each other go. But, by this rotatory motion, the fire at length breaks and comminates the ramose particles of the *Fuel*; till, ceasing to cohere, they are no longer able to sustain the fire.

In the popular sense of the word, *Fuel* is any body, which contains this pabulum, or oil, in such quantity, as to fit it for culinary uses.

Such, 1^o, Are dry or green vegetables; especially those abounding in oil; as the resinous and balsamic woods.

2^o, Coals, whether vegetable, or animal; as being little else, but the oily part of the vegetable, or animal, purged of the salt, water, &c. so that the blacker they are, the better.

3^o, Fossil and bituminous earths, as turf and peat, which are a fatty earth, dug out of the ground.

4^o, All mineral sulphur, whether pure, or mixed with earth, stone, &c.

5^o, The fat and dungs of animals, dried.

And, 6^o, The productions of chemistry, which are either coals, or oil, or oily bodies; as inflammable spirits, produced by fermentation, putrefaction, &c.

FIBRA auris, see the article *EAR*.

FIBRE, in anatomy, a similar part of the animal body, called also *Filament*; and when very small, *Fibrilla*, or *Capillamentum*.

A *Fibre* is a long, slender, white thread; which being variously interwove, or wound up, forms the various solid parts of an animal body: so that the *Fibres* are the stamens, or matter of the animal.

Anatomists usually distinguish four kinds of fibres, viz. *carneous*, or *fleshy*, *nervous*, *tendinous*, and *ossious* or *bony*; of one or other of which all the other parts consist. See *FLESH*, *NERVE*, *TENDON*, *BONE*, *MUSCLE*, and *SENSATION*.

Fibres again are divided, with respect to their situation, into *direct* or *longitudinal*, which proceed in right lines; *transverse*, which cut, or go across the former, at right angles; and *oblique*, which intersect, or cross them at unequal angles.

Some anatomists reduce the animal *Fibres* to two species, viz. *muscular* or *motive*, and *nervous* or *sensitive*.

Nervous Fibres are the minute threads, whereof the nerves are composed. They arise from the medulla of the brain, as that does from the cortex, and that again from the last finest ramifications of the carotid and vertebral arteries; so that it is probable, these nerves are in reality only continuations of those arteries.

From every point of the cortex there arises a fine, medullary *Fibrilla*: these uniting in their progress, form the medulla of the cerebrum, cerebellum, and oblongata; and *Fibrille* arising from each point of these again, form the spinal marrow.

From the medullary substance of all these parts, arise nerves; which are combinations or assemblages of a number of these minute medullary *Fibres* inclosed, after they are got out of the cranium, in a common membrane, or coat from the pia mater: and it is probable, that to each nerve, there concur *Fibres* from all three; as also that these *Fibres* are so many fine hollow tubuli or canals, for the conveyance of a fine juice or spirit from the brain throughout the body. See *NERVE*.

Muscular

Muscular FIBRES are those whereof the muscles, or fleshy parts of the body are composed. Every muscle is divisible into other less ones; and these into others, still less, beyond all imagination. The last and smallest are the muscular *Fibres*; which whether or no they be vascular, is some question.

Now, there are nerves propagated to every muscle, and distributed through the body thereof; so that there is no assignable point wherein there is not somewhat of a nerve. Add, that all the nerves here disappear; and that in other parts of the body, the extremities of the nerves are expanded into membranes. It is therefore probable, that the muscular *Fibres* are only continuations of the nervous ones.

The animal *Fibres* have different properties; some are soft, flexible, and a little elastic: and these are either hollow, like small pipes; or spongy, and full of little cells, as the nervous and fleshy *Fibres* above mentioned.

Others are more solid, flexible, and endowed with a strong elasticity, or spring; as the membranous and cartilaginous *Fibres*.

A third sort are hard, and inflexible; as the *Fibres* of the bones. Of all these, some again are very sensible, and others wholly destitute of sense: some so very small, as not to be easily perceived; and others, on the contrary, so big, as to be plainly seen: and most of them, when examined with a microscope, appear to be composed of still smaller *Fibrille*.

These *Fibres* first constitute the substance of the bones, cartilages, ligaments, membranes, nerves, veins, arteries, and muscles. And again, by the various texture, and different combination of some, or all of these parts, the more compound organs are framed; such as the lungs, stomach, liver, legs, and arms, the sum of all which make up the body.

The great property of *Fibres*, is elasticity, or a power of contraction, after the distending force is removed; upon the knowledge of which that of the animal mechanism greatly depends.

To understand this, it may be observed, that any membrane or vessel may be divided into very small *Fibres*, or threads; and that these threads may be drawn out into a very considerable length, without breaking; and that when such external force is removed, they will again restore themselves to their proper dimensions. It is farther also manifest, that this property is preserved to them by a convenient moisture; because if one of those threads be dried, it immediately loses it; so that upon the application of any force to stretch it, it will break; its lying soaked in liquor too much, will on the other hand, render it flaccid, and destroy all its power of restitution, when distended.

Now some hints of that configuration of parts, upon which this property depends, Dr. *Quincy* maintains, may be had from the contrivance and properties of a syringe; with the reason, why it is so difficult to draw back the embolus, when the pipe is stopped; and the necessity of any liquor's following it, wherein the pipe is immersed.

All that is necessary hereto, is, that the embolus be so exactly adapted to the inner surface of the barrel, as to prevent any air passing between them, when it is drawn up: it matters not what figure the barrel is of, so that the embolus be well fitted to it. A case of syringes therefore might be contrived, wherein every barrel may also serve as an embolus to the exterior one, which immediately includes it.

In this manner it is not difficult to imagine a continued series of particles, so put together, that they may be moved, and drawn upon one another, without suffering the air immediately to enter into the interstices made by their distraction; whereupon as soon as that force, which drew them, is removed, they will, for the very same reason as the embolus of a syringe, rush up again into their former contacts.

As suppose A B (*Tab. Nat. Hist.* fig. 23.) two particles touching one another in *e f*, and C D two others, covering the opposite sides of their contacts. It is also to be supposed, that on the other sides they are covered with other particles in the same manner, as by C D, so that the places of their contacts are on all sides covered from the air, or the insinuation of any fluid body.

If now A B by an external force, greater than that of their cohesion, be drawn from each other, as far as G I and H K (*fig. 24.*) as soon as that force is removed, they will again run into their former contacts in *e f* (*fig. 23.*) that is, if they be not so far separated as to bring their transverse surfaces to coincide with C and D; for then the air, or circum-ambient fluid will interpose and prevent their reunion: so that by this contrivance, so much of A and B as is inclosed by other surrounding particles, is as the embolus of a syringe, and the particle surrounding them as its barrel. And therefore when A and B are distracted from their contacts in *e f*, it will be with some difficulty; and when the distracting force is taken away, they will again run into their former contacts; just as the embolus of a syringe, and for the same reason.

It is not rigidly considered that this must exactly be the texture of a *Fibre*, but only something like this; whereby the interstices of the interior orders are covered by the exterior in such a manner, that when the thread is distended, that is, when its constituent parts are drawn from their

transverse contacts, neither the air, nor any other external fluid can get between them, so as to hinder their re-union as soon as such force is withdrawn; that is, if their distraction, as was before said, be not so far as to bring their transverse surfaces to a co-incidence with one another; for then the circum-ambient fluid will interpose, that is, the thread will be broke.

But besides this peculiar arrangement of a determinate set of particles to compose the main substance of an animal *Fibre*, endowed with the properties abovementioned; it seems not at all unreasonable to conjecture, that into their composition there also enters a common capsula, or covering, which assists in the wrapping up, and holding together those fasciculi, or assemblages of particles already described; not much unlike the periosteum of the bones; the contexture of which covering, resembling that of a net, cannot any ways hinder, either the transverse, or longitudinal distractions of the other parts.

Supposing this, then, the contexture of a *Fibre*, it will be necessary to consider, what farther requisites are needful to put them into that state, which they are in, in a living body; to shew how they are maintained in continual motion; and what are the consequences of it.

And, 1^o It is necessary to take notice, that all the *Fibres* in a living body are in a state of distention; that is, they are drawn out into a greater length than they would be in, if separated from the part, and taken out of the body; which is demonstrable upon any solutio continui, as in the transverse division of a nerve, or artery; for immediately the divided parts run up, and leave a great distance between them; and the fluids contained between them, upon such contraction are squeezed out. This also shews, that their natural distractions are owing to some fluids being propelled into the vessels which they compose, with a force greater than their endeavours of restitution, so far as to obtain a close contact of all their transverse surfaces; but yet less than that which is necessary to distract them, so as to bring them into a co incidence; for then the vessels would break.

2^o This state of distraction must necessarily leave vacuola between all the transverse surfaces, as between G I and H K (*in fig. 24.*) which may be represented by the several series of particles (*fig. 25.*) which vacuola will continue as long as the longitudinal surfaces of the component parts continue so close to one another, as to prevent the insinuation of any foreign matter, how subtle soever, between them.

For the same reason therefore, as when the embolus of a syringe is drawn, and the pipe is stopped; there must be continually a nifus restituendi, or an endeavour of contraction.

There is also this farther necessity of their being continued in a state of distraction; because if they were closely to touch one another in all parts, they could not be put into, and continue in those undulatory motions, which they are always in, in a living body, without being altered in their figures and contextures.

3^o It being manifest, that all animal *Fibres* are continued by the perpetual successive impulse of the fluids, in such undulatory motions; besides this necessity of their distraction, they must also necessarily be continually moistened with some convenient fluid; because otherwise their continual attritions against one another would wear them out, as well as render it difficult to move them: the fluid also for this purpose, must be very soft and subtle, because otherwise it could not insinuate itself into all the interstices of the *Fibres*, without so far separating their parts, as is inconsistent with that texture and mechanism here laid down.

Upon this view there arises a very natural explication of several terms, much used by mechanical writers; such as *distraction*, *contraction*, *vibration*, *undulation*, *tonic motion*, *concussion*, *relaxation*, *corrugation*, and *elasticity* of the solids; all which are but different ways of expressing the various modifications and dispositions of those machinulae whereof all the *Fibres* are composed.

Thus much being granted of the texture of a *Fibre*, and the requisites for its office, it is to be considered, how it comes first to be set in motion, and by what mechanism that motion is afterwards carried on. Suppose then the *Fibre* (*fig. 25.*) in such a state of distraction, as before-mentioned; it is certain by *reg. 2.* that in all its parts there is a nifus restituendi: where, then, any external impulse is made against it from R to S, successively, thrusting it from P towards Q, it is certain that against I for instance, the thread will be more distracted than in any other part; and thereby will there be a greater endeavour of restitution. And therefore the impulse passing on towards S, all the constituent machinulae, 1, 2, 3, 4, will successively move one after another.

To make this matter still more plain, let a portion of an artery be represented by *fig. 26.* through which the blood is continually propelled in a direction parallel to its axis: nothing is more certain, than that if it were not for the resistance of the sides of the artery at E, F, the blood setting out at A, B, would go on by the pricked lines C, D; and therefore it cannot but strike against the sides of the artery at E, F, and distract them there more, than any where else; whereby their endeavours of restitution will be there the greatest: and therefore, when the impulse of the blood has raised them to a certain measure, wherein their endeavours

vours of restitution will exceed the impulse which raised or distracted them, their contractile powers will draw them again into the same dimensions; and consequently the blood will be thrust forward into the next section of the artery, and so on successively from one to another, through the whole course of its circulation; the contraction of one section of an artery being the true cause of the blood's impulse against, and raising the next.

FIBRE is also applied in physics, to those long, fine parts, or threads, wherof other natural bodies are composed, and which prevent their being friable or brittle.

Trees, plants, and fruits have their *Fibres*, or capillaments; which are modifications of their woody substance, penetrating and terminating in the parenchyma, or pith.

In the common sense, *Fibre* is chiefly applied to the slender capillary roots of plants.

Kepler even gives *Fibres* to the stars; and explains several of their motions from the situation of their *Fibres*.

FIBRILLA*, a little *Fibre*, or capillament. See **FIBRE**.

* The word is a diminutive of *Fibra*. Each *Fibre* is divisible into a number of lesser threads, called *Fibrille*.

FIBULA, in anatomy, one of the bones of the leg, called also *Perone*, *Sura*, and *Facile minus*.—See *Tab. Anat. (Osteol.) fig. 3. n. 24. 24. fig. 7. n. 27. 27.*

The *Fibula* is the outer, and slenderer of the two bones of the leg; and yet, notwithstanding its being more exposed, and its being much weaker than the inner bone, or tibia, it is not so often broken, as being more pliant and flexible; whence the tibia often breaks, leaving the *Fibula* entire.

The *Fibula* is joined or articulated with the tibia, at both ends, by a kind of close arthrodia. It is divided into three parts: the upper, which is a round head, terminating a little below the knee, and receiving a lateral protuberance of the tibia into a small sinus, by which the articulation of this part is effected. The middle is very slender, long, and triangular, like the tibia, but somewhat more irregular. The lower part is received into a sinus of the tibia, and then shoots out into a large process, called the *Malleus internus*, or inner ankle: it is a little hollow on the inside, to give liberty for the astragalus to move; and a little convex on the out-side, that it may have the more strength, to retain the astragalus.

The tibia and *Fibula* only touch at the two extremes, like the radius, and ulna: the space between them is filled up with a strong membranous ligament, which ties them together, and strengthens the articulation.

FIBULA, in surgery, an instrument in use among the ancients, for the closing of gaping wounds.

Celsus speaks of the *Fibula*, as to be used when the wound was so patent as not easily to admit of being sewed.

Authors are somewhat at a loss as to the form of the ancient *Fibulae*. Guido says, they were iron circles, or semicircles bent backwards both ways; the hooks wherof being fastened on both sides to the wound, answered exactly to each other: but, as this must have been an insupportable pain to the patient, this description is generally set aside.

Fallopian, Sanctorius, and others, take the word *Fibula* to have signified, in reality, no more than the sewing up of the wound with a needle and thread, as used at this day.

FIBULÆUS, in anatomy, a muscle of the leg, called also *Peronæus primus*. See **PERONÆUS**.

FICUS, a kind of fleshy excrescence, growing sometimes on the eye, or eyebrows, or chin; but more usually on the anus, or at the fingers ends.

It is also called *Sycosis*, *Sycoma*, *Ficatio*, *Ficosis tumor*, and *Marrisca*. See Supplement, article **FICUS**.

FICHANT*, *Figens*, a French term, used in fortification: thus, a flank *Fichant*, or a line of defence *Fichant*, is a place, whence the shots made, do not only raze the opposite face to be defended, but also enter within it.

* The word is formed of *fichers*, to rick a thing in.

FICHE, in heraldry; see **FITCHEE**.

FICTIO, see **FABLE**.

FIDDLE, see the article **VIOLIN**.

FIDE-JUSSOR, in the civil law, is a surety; or one that obliges himself in the same contract with a principal, for the greater security of the creditor, or stipulator.

FIDEI-COMMISSUM, in the Roman law, the appointing of an heir, or bequeathing a legacy to a person, on this condition, that he surrender the inheritance or legacy to another person, for whom the same is originally meant: or, it is an inheritance left in trust with any one, for the use of another.

Fidei-Commissa were much used among the Romans. In the French law the thing is become odious; as being, ordinarily, no other than an expedient in favour of persons to whom the laws forbid any thing to be given. In order to this some trusty friend is chosen to be made legal heir, under a tacit agreement, to deliver the inheritance to the person incapacitated by law. But of later times the same expedient has come in use with regard to persons capable of inheriting;

to whom the testator, for particular reasons, does not care to leave the inheritance directly.

As it happened that the *Fidei-commissioners* did not always faithfully restore what was trusted to them, Augustus took proper measures to oblige them thereto: to this end a prætor was created, whose business was restrained to the single matter of *Fidei-commissionis*. *Inst. lib. ii. tit. 23.*

As a testament was null without the institution of an heir; and it frequently happening that the *Fidei-commissioner* refused to accept the trust, upon which the testament fell to the ground; to engage somebody to accept it out of the consideration of advantage, the Paganian senatus-consultum decreed, that the *Fidei-commissioner* should be at liberty to retain a fourth of the *Fidei-commissum*.

FIDICINALES, in anatomy, a name given to several muscles of the fingers, called also *Lumbricales*. See **LUMBRICALES manus**.

FIEF, the same with *Fend*, or *Fee*. See **FERE**.

FIELD, in agriculture, a piece of land inclosed, and fit for tillage, to bear corn, hay, &c.

FIELD, *Campus*, in antiquity, is frequently used for a publick place, or square in a city, &c.

Such were the *Field of Mars*, *Campus Martius*; and *Field of Flora*, *Campus Floræ*, in Rome; and the *Field of May*, *Campus Maii*, among our ancestors, &c. See **CAMPUS**.

FIELD of Mars, was denominated from a temple of that deity, built therein: it was the scene, or place of the assemblies called *Comitia*. Tarquin the Proud at length appropriated it to his own uses:—But after the expulsion of the kings, the consuls Brutus and Collatinus restored it to the publick use again, for assemblies and elections.

Originally it was no more than a meadow on the banks of the Tiber, where horses grazed, and the Roman youth were exercised to war. But it was afterwards erected into a magnificent square, adorned with statues, &c.

FIELD of Flora, was the place, where the laws, edicts, and constitutions were published.—

For **FIELD of May**, see **CAMPUS Maii**.

FIELD, in heraldry, is the surface, or face of the shield, or escutcheon; thus called, as containing the achievements antiently acquired in the *Field of battle*.

The *Field* is the ground whereon the colours, bearings, metals, furs, charges, &c. are represented. In blazoning a coat, we always begin with the *Field*: he bears sable, &c.

Among the more modern heralds, *Field* is less frequently used than shield, or escutcheon.

FIELD of painting, &c. is more usually called the *ground* thereof. See **GROUND**.

FIELD, in war, the place where a battle was fought.—The general remained master of the *Field of battle*.—

Close FIELD, was antiently a place inclosed, or railed in with a barrier, for jousts and tournaments to be performed in.

FIELD Colours, are small flags about a foot and a half square, which are carried along with the quarter-master-general for marking out the ground for the several squadrons and battalions of an army. See **FLAG**.

FIELD Pieces, are small cannon, usually carried along with an army in the *Field*: such as three pounders, minions, sakers, six pounders, demi-culverins, and twelve pounders; which being light, and small, are easily carried.

FIELD Staff, is a staff carried by the gunners: it is about the length of a halbert, having a spear at the end, which on each side has ears screwed on, like the cock of a match-lock.

In these the gunners screw lighted matches, when they are on command; which is called, arming the *Field Staffs*. See **LIN-STOCK**.

FIELD Works, in fortification, are those thrown up by an army, in the besieging of a fortress; or else by the besieged, in defence of the place. Such are the fortifications of camps, those of high-ways, &c.

Elysian Field, see **ELYSIAN Field**.

FIERI Facies a judicial writ, which lies at all times within the year and days, for him that hath recovered in an action of debt and damages: it is directed to the sheriff, commanding him to levy the debt, and damages on him, against whom the recovery was had.

FIFTEENTH, *Decima quinta*, or *Quinzième*, an ancient tribute, or imposition of money, laid upon any city, borough, or other town through the realm; not by the poll, or upon this or that man, but in general upon the whole city, or town.

It is so called, because amounting to a *Fifteenth* part of that which the city hath been valued at of old; or to a *Fifteenth* part of every man's personal estate, according to a reasonable valuation.

This was imposed by parliament, and every town through the realm knew what a *Fifteenth* for themselves amounted to, because it is always the same: whereas the subsidy, which is raised of every particular man's lands, or goods, must needs be uncertain.

The *Fifteenth* seems to have been a rate, antiently laid upon every town, according to the land or circuit belonging to it.

it. Camden mentions many of these *Fifteenth* in his *Britan. viz.* pag. 171. *Batb geldabat pro viginti bidis, quando sehirra geldabat, &c.* And p. 181. *Old Sarum pro quinquaginta bidis geldabat, &c.* Which rates are according to *Domejday*. But in after-times the *Fifteenth* came to be understood as imposed only on goods and chattels, not on lands.—It was first granted by parliament, 18 Edw. I. *viz.* *Computus quintae decimae Regi, an. 18. per archiepiscopos, episcopos, abbates, priores, comites, barones, & omnes alios de regno, de omnibus bonis mobilibus concessit.*—The city of London paid that year for the *Fifteenth*, 2860 l. 13 s. 8 d. and the abbot of St. Edmund's 666 l. 13 s. 4 d. which was by composition; and thereupon had all the temporal goods of their district discharged of the *Fifteenth*.

The way of collecting it was by two assessors appointed in every county by the king, who appointed twelve more in every hundred to make a true valuation of every man's personal estate upon which the fifteenth part was levied.

FIFTH, in music, one of the harmonical intervals, or concords.

The *Fifth* is the third in order, of the concords. The ratio of the chords that produce it, is 3 : 2.

It is called *Fifth*, because containing five terms, or sounds between its extremes, and four degrees : so that in the natural scale of music, it comes in the *fifth* place, or order, from the fundamental.

The antients called this interval, *diapente*.

The imperfect, or defective *Fifth*, by the antients called *semi-diapente*, is less than the *Fifth* by a mean semi-tone.

FIG*, **FIGUS**, a soft, sweet, delicious fruit; the produce of a tree of the same name.

* The word is formed of the Latin *Ficus*; and that of the Greek *φίσι*, I produce, by reason the *Fig-tree* is a great bearer.

There are *Figs* of divers kinds; chiefly denominated from their colours; pale, violet, black, purple, green, and ruddy. The pale are esteemed the best: the black and violet coloured are the worst.

They are gathered in autumn, and laid on a rack, or hurdle, to dry in the sun.

Figs contain a deal of phlegm, a little volatile, alcali salt, and a moderate quantity of oil.

They are very nourishing, and soften the asperities of the breast, &c. and accordingly are used in medicine, to make gargarisms against disorders of the throat and mouth. They are also applied externally, to soften, digest, and promote maturation.

Figs are dried, either by a furnace, or in the sun. The Latins call them *Caricæ*, or *Ficus passæ*, when thus dried. In this condition they are used both as medicine and food; being both the wholesomer, and easier of digestion, being thus cleared of a deal of their aqueous and viscid parts.

The best *Figs* are the produce of Italy, Spain, Provence, &c. The islands of the Archipelago yield *Figs* in great abundance; but they are much inferior in goodness to those of Europe. Yet the Greeks in those islands cultivate them with wonderful care and attention; as making the principal food, and a considerable part of the riches of the country.

They have two kinds of *Fig-trees*; the first called *Ornas*, or the wild *Fig-tree*; the second, the domestic *Fig-tree*.

The wild, called by the Latins *Caprificus*, yields successively three sorts of fruits, called *Fornites*, *Cratitites*, and *Orni*; none of which are of any use as foods; but all absolutely necessary in their manner of ripening the fruits of the domestic *Fig-tree*. The method of cultivating and ripening these *Figs*, makes a peculiar art, by the antients called *Caprificatio*; often spoke of among them in terms of admiration. Some of the modern naturalists have looked on it as a chimera; but Monsr. Tournesort has assured us of the contrary, and given us that process, as he learned it upon the spot; which see under the article **CAPRIFICATIO**.

The generation of the *Fig* is somewhat anomalous; the parts subservient to the office in other plants, i. e. the flower, not being here apparent. But the anatomy of the fruit helps us out of the difficulty.

Monsr. de la Hire the younger, in the *Memoirs* of the French academy, shews that the *Fig* is a flower, as well as a fruit. By dissection, it discovers all the essentials of a flower, viz. stamina, apices, and farina succundans.

To shew this, that ingenious author divides the length of the *Fig* into three parts or spaces, A, U, X, (*Tab. Nat. Hist.* fig. 16.) the first of which, A, being the next the pedicle, and much the greatest, contains the grains, or seeds of the *Fig*. These seeds are little stones, represented by A, (fig. 17.) within which are kernels. Each stone is half encompassed with a parenchyma, B, supported by a calyx laid on the parenchyma. This calyx is fixed to a pretty long pedicle, which grows to the inner rind of the *Fig*, as represented in the figure.—The division X of the *Fig*. (fig. 16.) is full of little leaves, like those represented in fig. 18. which are fastened by their bases to the rind or skin of the *Fig*. In this division there is a hole, B, (fig. 16.) called the *umbilicus*, or navel, whose outer, or

upper edge is furnished with little leaves, which close the aperture.—Lastly, the space V is full of little whitish bodies (represented fig. 19.) which arise from the internal parietes of the *Fig*, by a large pedicle A, at whose extremity is a calyx, BC; from the divisions whereof arise three other bodies, D, E, F. These bodies terminate in little eminences in E, F, &c. which are capsulæ, that include an infinite number of little grains, easily perceivable by the microscope, and all alike and of a size perfectly similar to the farina in the apices or capsulæ of other flowers. Whence it follows, that the bodies contained in the space V (fig. 16.) of the *Fig*, are real *Fig* flowers; though several naturalists have taken these in the divisions A and X, for the flowers, which have no essential marks of flowers at all.

FIGURATE, or **FIGURATIVE**, that which has a relation to figure, or that teaches under some obscure resemblance.

Thus a *Figurative style* is that which abounds in figures.

The *figurative style*, F. Bouhours observes, is neither the most just, nor the best. For this reason Cicero directs us to the antients, who, not having yet bethought themselves to use *figurative* expressions, but keeping to the most proper and natural way, have almost all wrote well. *Sunt enim illi veteres, quia nondum ornare poterant ea, quæ dicebant, omnes prope præclare loquuti.*

Long use, say the grammarians, renders that proper in all languages, which at first was *figurative*.—The same thoughts appear more lively when expressed by a figure, than when in simple terms. The reason is, that *figurative* expressions denote not only the principal matter, but also the emotion and passion of the person who speaks.

FIGURATIVE is also much used in speaking of the mysteries and figures of the old law. In this sense manna is said to be figurative of the eucharist.

FIGURATIVE is also used in the Greek grammar for what we otherwise call characteristic, viz. a letter that characterizes certain tenses of the Greek verbs; or that distinguishes and specifies them.

In the first conjugation of the barytonous verbs, the φ is characteristic, or *figurative* of the præter tense; and the ψ of the future.

FIGURATIVE, or **FIGURATIVE Counter-point**, in music, is that wherein there is a mixture of discords along with the concords. See **COUNTER-POINT**.

Figurative Counter-point is of two kinds: that wherein the discords are introduced occasionally, to serve only as transitions from concord to concord; and that, wherein the discords bear a chief part in the harmony.

It is a rule in composition, that the harmony must always be full on the accented parts of the bar, or measure, i. e. nothing but concords are allowed in the beginning and middle; or the beginning of the first half of the bar, and the beginning of the latter half thereof in common time; and the beginning, and first three notes in triple time. But upon the unaccented parts, this is not so necessary: but discords may transiently pass there without any offence to the ear.

This the French call *Supposition*, because the transient discord supposes a concord immediately to follow it. See **SUPPOSITION**.

Where the discords are used as a solid and substantial part of the harmony, the *Counter-point* is properly called the harmony of discords.

FIGURE, **FIGURA**, in physics, denotes the surface or terminating extremes of a body.

All bodies have some *Figure*; whence, figurability is generally ranked among the essential properties of body, or matter. A body without *Figure*, would be an infinite body.

The corpufcular philofophers account for every thing from the *Figure*, bulks, and motions of the atoms, or primary corpufcules of bodies.

The earth is of a spherical, or rather a spheroidal *Figure*. Saturn sometimes appears of an elliptical, or oblong *Figure*. For the *Figures* of bodies, considered as objects of sight, see **VISION**.

The author of a collection of dissertations, printed at Paris, in 1715, shews, in the first dissertation on the Hebrew medals, p. 66. that the Jews were allowed to make any kind of *Figures*, or images of trees, plants, flowers, buildings, &c. but not those of animals, or of the sun, moon, and stars.

The schoolmen dispute, whether or no the quality of *Figure* be the same with that of form; and if they differ, what it is that constitutes the difference? Boethius will have *Figure* only predicated of inanimate bodies, and form of animate. Others extend *Figure* to all natural things, and form to all artificial ones; Whence the verse,

Formam viventis, pili dic esse figuram.

Others apply *Figure* indifferently to all kinds of bodies, but not in all relations. If only the bare circumference, or circumscription be considered, they call it *Figure*; but if the circumference be considered as endowed with colour, then they call it form. See **FORM**.

FIG

FIGURE is also applied to representations, or images of things, in prints, &c.

Such a book is printed with *Figures*. The *Figures*, or schemes in mathematical and physical writings, should be made to fold out of the book.

Some readers chuse to have the *Figures*, especially the mathematical ones, in wood, for the convenience of having them immediately annexed to the matter they refer to: others, rather chuse to be at the pains of turning over, and having recourse to another part of the book, that they may have the *Figures* more neat and accurate on copper.

FIGURE, in geometry, denotes a surface inclosed, or circumscribed with one or more lines.

Such are triangles, squares, polygons, circles, ellipses, &c.

Wolfius defines *Figure* a continuum terminated by a perimeter. In which sense *Figure* is applicable both to superficies and solids.—In the former case, the perimeter is lines; in the second, surfaces.

Figures, are either rectilinear, curvilinear, or mixt, according as the perimeter consists of right lines, curve lines, or both.

The superficial parts of a *Figure* are called its *sides*; the lowest side, its *base*; and the angle opposite to the base, the *vertex*.

The height of a *Figure* is the distance of the vertex from the base.

EQUILATERAL FIGURE is that whose sides are equal.

FIGURE circumscribed, and inscribed, see CIRCUMSCRIBED, and INSCRIBED.

Similar FIGURES, see SIMILAR Figure.

All similar *Figures*, both regular and irregular, are in a duplicate ratio of the homologous sides.

Regular FIGURE is that which is equilateral, and equiangular.

Irregular FIGURE is that which is not both. See **REGULAR and IRREGULAR.**

FIGURE, in conics, denotes the rectangle, made under the latus rectum, and transversum in the hyperbola, and ellipsis.

FIGURE of the diameter—The rectangle under any diameter, and its proper parameter, is in the ellipsis and hyperbola called the *Figure of that diameter*. See **DIAMETER.**

FIGURE, in painting and designing, denotes the lines and colours, which form the representation of a man, or other animal.

There are above an hundred *Figures* in such a piece; such a *Figure* is lame, &c.

But the term *Figure* is in a more immediate and peculiar manner understood of human personages; thus, a painting is said to be full of *Figures* when there are abundance of representations of men; and a landscape is said to be without *Figures*, when there is nothing but trees, plants, mountains, &c.

FIGURES, in architecture and sculpture, denote representations of things made in solid matters; such as statues, &c.

We say, *Figures* of brass, of marble, of stucco, of plaster, &c.

But in this sense too, the term is more usually applied to human representations, than to other things. Thus we say, an equestrian *Figure*, for a man on horseback.

Daviler observes, that those, either represented sitting, as popes, &c. or kneeling, as on monuments, &c. or laid all along, as rivers, &c. are more properly called *Figures* than statues.

FIGURE, in heraldry, a bearing in a shield, representing, or resembling a human face; as a sun, a wind, an angel, &c.

FIGURES among the masters of defence, are the divers guards, postures or dispositions of the body, arm, or sword.—

FIGURE of an eclipse, in astronomy, denotes a representation of the path or orbit of the sun and the moon, during the time of the eclipse, upon paper; with the number of digits eclipsed, and the beginning, middle, and end of darkness.

FIGURE, or Delimitation of the full moon, such as viewed through a telescope with two convex glasses, is of considerable use in observations of eclipses, and conjunctions of the moon with other luminaries. In this *Figure* of the moon, are represented the macule, or spots of the moon, marked by numbers; beginning with the spots, which usually enter first within the shade at the time of the great eclipses, and also emerge the first.

FIGURE, in astrology, a description, or draught of the state and disposition of the heavens, at a certain hour; containing the places of the planets and stars, marked down in a *Figure* of twelve triangles, called *Houses*.

This is also called a *Horsoscope* and *Theme*. See **HOROSCOPE, &c.**

FIGURE, in geomancy, is applied to the extremes of points, lines, or numbers, thrown, or cast at random; on the combinations or variations whereof the sages of this art found their fantastical divinations.

FIGURE, in fortification, is the plan of the fortified place; or the interior polygon, See **POLYGON, &c.**

When the sides and angles are equal, it is called a *regular*; when unequal, an *irregular Figure*.

FIG

FIGURE, in dancing, denotes the several steps which the dancers make in order, and cadence; considered as they mark certain *Figures* on the floor.

FIGURE, in the manufactures, is applied to the various designs represented or wrought on velvets, damasks, taffaties, satins, and other stuffs and cloths.

The most usual *Figures* for such designs are flowers, imitated from the life, or grotesques and compartments of pure fancy. Representations of men, beasts, birds, and landscapes, have only been introduced since the taste for the *Chinese* stuffs, particularly those called *Furres*, began to prevail among us.

It is the woof of the stuff that forms the *Figures*; the warp only serves for the ground. In working figured stuffs, there is required a person to shew the workman how far he must raise the threads of the warp, to represent the *Figure* of the design with the woof, which is to be passed a-cross between the threads thus raised. This some call *reading the design*.

For the *Figures* on tapestry, brocade, &c. see **TAPESTRY, &c.**

For those given by the *calenders, printers, &c.* see **CALENDER, &c.**

FIGURES, in arithmetic, are the numeral characters; or the characters whereby numbers are expressed, or wrote.

Thus the number four hundred and fifty, is wrote, or expressed by three *Figures* 450.

For the antiquity, use, &c. of the numeral *Figures*, see **NUMERAL CHARACTER.**

The *Figures* in arithmetic, are the nine digits; 1, 2, 3, 4, 5, 6, 7, 8, 9, and 0.

FIGURE, in logic, denotes a certain disposition of the terms of a syllogism; particularly of the medium, with regard to the extremes.

Chavuin defines it, a proper placing or connecting of the middle term with the extremes, so as to have the force and effect of a proof, or conclusion. See **MODE, and EXTREME.**

Hence it follows, that there are as many *Figures* of syllogisms, as there are different connections of the extremes with the medium: so that, though the school-men ordinarily only reckon three, yet a fourth might be admitted.

For the medium may be either prefixed to both extremes, or subjoined to both; or it may be before the major, and after the minor, or before the minor, and behind the major.

If it be after the major, and before the minor, it is usually called the *first Figure*; this seeming the nearest way of arguing to the natural way.

If it be before the major, and after the minor, it is called the *fourth and last*; and by the Peripatetics, the *indirect*, and by others, the *galenical Figure*; as varying too far from the natural form.

If it precede both, it is called the *second Figure*.

And if it follow both, the *third Figure*; as in the following technical distich:

Prima infra, & supra: supraque bis altera: bisque
Tertia vult infra medium: supra, ultima, & infra.

A syllogism, therefore, of the *first Figure*, is that wherein the medium is severally joined with both extremes of the conclusion, so as to be predicated of the lesser; the conclusion being sometimes affirmative, and sometimes negative. In that of the *second Figure*, the medium is predicated of both; and the conclusion is always negative. In the *third Figure*, the conclusion, which in the former cases is sometimes general, sometimes special, is always special.

The *fourth*, called the *indirect Figure*, some prefer before all the others; by reason it is in this alone, that the medium or mean term has its natural situation, *viz.* in the middle, between the extremities; it being in the rest no more than a medium by office; but in the *fourth Figure*, the medium is in the middle place. See **MEDIUM.**

E. gr. Take the two terms, *man*, and *living*, for extremes, and *animal* for the medium. The mind argues thus, there is a connection between *man* and *animal*; and between *animal* and *living*; therefore the order is, *man, animal, living*, and by animal, as a *medium*, the two extremes are conjoined, as the extremes of a line are connected by the middle.

A	A	B	C
B			

FIGURE, in rhetoric, is a phrase, or turn of speech or discourse, finer and nobler than what is used in common or ordinary speaking.

Figures, by the *Greeks* called *schemata*, are the enrichments of discourse, and we only use them when raised and moved with the consideration of something extraordinary.

There are two kinds of *Figures*; the one of *sentences*, and contained in the sense itself, without any immediate dependence on any particular words: the other are only in the *words* themselves.

Of the *FIGURES of sentences*, some are designed to move; others to teach; and others only to delight.

Of the first kind, the most considerable are, exclamation, imprecation, obsecration, interrogation, doubting, preterition, expolition, and epiphonema.

Those of the *second*, are the antithesis, correction, communication, and suspension.

Those of the *third*, the apostrophe, hypotyposis, profopocopia, ethopoeia, and profopographia. See each under its proper head, EXCLAMATION, &c.

OF FIGURES OF WORDS, some are *tropes*, i. e. translations of words from their proper signification, to some more remote and extraordinary one.

The principal of these are, the metaphor, allegory, metonymy, synecdoche, irony, and sarcasm, metalepsis, antonomasia, and syllepsis.

Others are *Figures of words*, more properly so called, and not tropes; being so inherent in the words, that upon changing of those, the *Figure* is destroyed: as in *amantes sunt amentes*, where the *Figure* would be lost, if instead of *amantes* you should put *fulsi*.

Of these the principal are, repetition, conversion, complexion, gradation, synonymy, polyindeton, and polyptoton, reticency, disjunction, similitude, paranomasy, and transition. See each *Figure* under its proper article, as METAPHOR, &c.

TO FIGURES OF PROSE belong the synalepha, ecclipsis, crasis, diæresis, systole, and diafole.

FIGURE, in grammar, is an expression that deviates from the common and natural rules of grammar; either for the sake of elegance or brevity.

The best grammarians only reckon four *Figures*; the ellipsis, pleonasm, syllepsis, and hyperbaton. Others add two more, viz. antiphrasis and enallage. See each in its place, ELLIPSIS, PLEONASM, &c.

FIGURE is also used among divines, for the mysteries represented or delivered obscurely to us under certain types or actions in the Old Testament.

Thus manna is held a *Figure* or type of the eucharist: and the death of Abel a *Figure* of the suffering of Christ.

Many divines and critics contend that all the actions, histories, ceremonies, &c. of the Old Testament are only *Figures*, types, and prophecies of what was to befall under the New. The Jews are supposed to have had the *Figures* or shadows, and we the substance.

FIGURE is also applied in a like sense to profane matters; as the emblems, enigmas, fables, symbols, and hieroglyphics of the ancients.

FIGURED, in the manufactures. A *figured* camlet, stuff, tabby, &c. is that whereon there are divers designs of flowers, figures, branches, &c. impressed by means of hot irons. See CAMLET.

FIGURED Ribbands, first came into fashion about the year 1680. The method of performance was by successively applying steel plates engraven with divers ornaments, as flowers, birds, grotesques, &c.

But one Chandelier, a ribband-maker of Paris, invented a much better and readier way of doing it; by a machine not unlike the flatter used in coining to flatten the pieces of metal: only much simpler.

The principal parts thereof were two steel cylinders, engraven with the figures intended to be represented. These cylinders were placed over each other like the rolls of a rolling-press; having each of them, at one of its extremes, a little dented wheel, one of which catching into the other, the whole was put in motion, by means of a winch, or handle, fastened to the first.

The machine thus prepared: the workman heats the cylinders, and places the ribband in the little place remaining between the two, which he contracts yet further by a screw, that presses the upper down upon the lower; then turning the rolls by the handle, a whole piece of ribband was *figured* in less time than a single yard could be done in the ordinary way. See RIBBAND.

FIGURED Velvet, see the article VELVET.

FILAMENT, in medicine, anatomy, natural history, &c. a term used in the same sense with *fibres*, for those fine threads, whereof flesh, nerves, skins, plants, roots, &c. are composed. See FIBRE.

FILANDERS*, in falconry, a disease in hawks, &c. consisting of filaments, or strings of blood, coagulated and dried; occasioned by a violent rupture of some vein, by which the blood extravasating, hardens into the figures abovementioned; to the great annoyance of the reins, hips, &c.

* The word is French, *Filandes*, formed from *fil*, thread.

FILANDERS are also a sort of fine, small worms, which greatly incommode the hawk in the gorge and about the heart, liver, and lungs; but which, on some occasions, are supposed to be of service, and to feed on the superfluities of certain parts.

There are four kinds of these *Filanders*, or vermiculi. The first, in the gorge, or throat; the second, in the belly; the third in the reins; the fourth are called needles, on account of their exceeding fineness. The symptoms that discover the disease, are, the bird's gaping frequently; straining the fist or perch with her pounces; croaking in the night; ruffling her train;

rubbing her eyes, wings, nostrils, &c. As the worms are very restless, the bird is frequently endeavouring to cast them up; and in opening its mouth you will readily discover them. From the throat, &c. they will ascend to the larynx, brain, &c. and finally over the whole body.

The ordinary cause is bad food. The proper remedy they say is, not by killing them, for fear of impossibilities from their corruption; but chiefly by stupifying them, that they may be offensive but seldom.

This is best effected by making the bird swallow a clove of garlick; after which she will feel nothing of the *Filanders* for forty days. Others use rue, worm-seed, aloes, vervain, saffron, &c.

FILAZER, or FILACER, an officer in the court of Common Pleas, so called, because he *files* the writs, whereon he makes out process.

Of these there are fourteen, in the several divisions and counties of England. They make out all writs, and process upon original writs, issuing out of the chancery, as well real, as personal and mixed, returnable in that court.

In actions merely personal, where the defendants are returned summoned, they make out *pones* or attachments; which being returned and executed, if the defendant appears not, they make out a *distringas*, and so ad infinitum, or till he does appear.

If he be returned nihil, then process of *capias* infinite, if the plaintiff will; or after the third *capias*, the plaintiff may proceed to outlawry, in the county where his original is grounded, and may have an exigent with proclamation.

The *Filazers* likewise make out all writs of view in real actions, where the view is prayed; and upon *replevins* or recordari's, writs of *retorno habendo*, second deliverance, and writ of *witneman*. In real actions they make out writs of grand and petit *cape* before appearance.

They enter all appearances, and special bails, upon any process made by them. They make the first *seire facias* upon special bails, writs of *habeas corpus*, *distringas nuper vice comitem vel balivum*, and *duces tecum*; and all *superfedeas*'s upon special bail or appearance, &c. Writs of *habeas corpus cum causa* upon the sheriff's return that the defendant is detained with other actions, and writs of adjournment of a term, in case of pestilence, war, or public disturbance.

Till an order of court made 14 Jac. I. which limited the *Filazers* to all matters and proceedings before appearance, and the prothonotaries to all after, they also entered declarations, impanelances, judgments, and pleas, whereat a serjeant's hand was not requisite, and made out writs of execution, and divers other judicial writs after appearance.

FILBERDS, or FILBUDS, the best-sort of small nuts, proper for planting in orchards, or gardens.

They are raised from nuts set in the earth, or suckers from the roots of an old tree; or they may be grafted on the common hazel nut.

They delight in a fine, mellow, light ground, but will grow almost any where, especially if defended from violent and cold winds.

The tree is easily propagated, bears well, and is of two sorts, the *white*, and the *red*; but the former is the best. See Supplement, article FILBERT.

FILE*, an instrument of steel, cut in little hatches, or furrows, used by the workmen in metals, to smooth, polish, and otherwise fashion the same.

* The word is French, *file*, literally signifying a long series or succession of any kind of things; of *fil*, thread.

Files bear a near resemblance to rasps; the only difference between them, is, that the former are cut with edged tools; and the latter are punched with pointed ones. See RASP.

The *File* is a principal instrument in all the kinds and parts of smithery. It should be forged of the best steel; after which, rubbing it with greafe, to make it more soft under the chissel, they cut it with chissels and a mallet, this and that way, and of this or that depth, according to the grain or tooth required.

After cutting the *File*, it remains to be tempered; which being the principal mystery in the making of *Files*, will deserve to be particularly described.

Files, then, are tempered with a composition of chimney foot, very dry and hard, diluted and worked up with urine and vinegar; to which is added common salt: the whole is to be reduced to the consistence of mustard.

The *Files* being cut, and rubbed over with vinegar and salt, to scour off the greafe laid on for the cutting, they cover them over with this composition; and having laid several of them together in a packet, and covered them in loam, they put them in a charcoal fire: from which they are taken out again, by that time they have acquired a cherry-colour, which is known by a little rod of the same steel, put in along with them. Upon taking them out, they cast them into the coldest spring water they can get.

Iron *Files* require a more intense heat, than steel ones. When the *Files* are cold, they clean them with charcoal, a rag, &c.

to take away any of the foot or feces left in the cuttings: Then drying them before the fire, they put them up carefully in a box of wheat bran, to keep them from rusting.

Files are of different forms, according to the different uses and occasions they are made for: Those in common use are the square, flat, triangular, half-round, round, thin file, &c. all which are made of different sizes, as well as different cuts, and degrees of fineness, to take place, according as the work is more or less advanced: some cutting faster, as the *rough tooth'd File*, &c. others more slowly, as the *fine tooth'd File*, &c.

FILE, is also a thread or wire, whereon writs, or other exhibits in courts, or offices, are fastened or filed, for the more safe keeping and ready turning to the same.

FILE, or *label*, in heraldry, a bearing represented in *Tab. Herald.* fig. 23. though sometimes of more, and sometimes of fewer points, being the difference or distinction of a second son. It is sometimes also born as a charge in a coat armour, of which Guilleim gives many instances: but it is oftener the difference or mark of distinction, which the elder brother bears in his coat, during his father's life.

Some distinguish *Files*, and *label*, calling the *File* the upper horizontal line, and the *label* the points which issue from it.

FILE of three or more labels. See **LABEL**.

FILE, in a military sense, is a row of men standing one behind, or below, another, from front to rear.

Or, *File* is a line, or series of soldiers, placed one before another; and thus composing the depth of a battalion or squadron, which in the infantry ordinarily consists of six soldiers in a *File*; and in the cavalry, of three.

They say, *close the Files*, that is, bring the men nearer each other: *double the Files*, i. e. double the depth of the battalion; and diminish its breadth or front, by one half. — The last or hindermost person is said to *bring up the File*.

FILIAL, something belonging to the relation of son.

The divines usually distinguish between a fervile, and a *filial* fear. The most abandoned may have a fervile fear of God, such as that of a slave to his master; but not a *filial* fear, i. e. a fear resulting from love and respect.

FILIGRANE *, or **FILIGREE** work, a kind of enrichment on gold, or silver, wrought delicately in manner of little threads, or grains, or both intermixed.

* The word is a compound of *fil*, or *filum*, thread, and *granum*, grain.

In Latin it is called *flatim elaboratum opus, argentum, aurum*. This cabinet is ornamented with divers fine pieces of *filigree* work.

We have vases, torches, &c. of *filigree* work.

FILING one of the principal operations in smithery, &c. succeeding to forging.

The coarser cut files are always to be succeeded by finer; and in all the kinds the rule is, to lean heavy on the file in thrusting it forward, because the teeth of the file are made to cut forwards: but in drawing the file back again for a second stroke, it is to be lightly lifted just above the work, by reason it cuts not coming back.

The rough or coarse tooth'd file (which when large, is called a *rubber*) serves to take off the unevenness of the work, left by the hammer in forging.

The bastard-toothed file is to take out the too deep cuts, and file strokes made by the rough file. The fine tooth'd file takes out the cuts or file strokes, the bastard file made. And lastly, the smooth file those left by the fine file.

In this order the files of several cuts are to succeed each other, till the work is as smooth as it can be filed. After which it may be made yet smoother with emery, tripoli, &c. See **POLISHING**.

FILIUS ante patrem, q. d. the son before the father, a denomination applied by botanists and florists, to plants, whose flowers come out before their leaves. Such are the several species of colchicum, or meadow saffron, the coltsfoot, butterbur, &c.

FILLET *, in anatomy, see the article **FRÆNUM**.

* The word is French, *Fillet*, formed of *fil*, thread.

FILLET, in botany, see the article **THREAD**.

FILLET, *Teniola*, in heraldry, a kind of orle, or bordure, containing only a third or fourth part of the breadth of the common bordure. See **BORDURE**.

It is supposed to be withdrawn inwards; and is of a different colour from the field. It runs quite round, near the edge, as a lace over a cloak.

FILLET is also used for an ordinary, drawn, like the bar, from the sinister point of the chief a-cross the shield; in manner of a scarf: though it is sometimes also seen in the situation of a bend, fess, cross, &c.

According to Guilleim, the *Fillet* is a fourth part of the chief; and is placed in the chief point of the escutcheon.

FILLET, or **FILET**, in architecture, denotes a little square member or ornament, used in divers places, and on divers occasions; but generally as a sort of corona, over a greater moulding. — See *Tab. Archit.* fig. 1. and fig. 26. lit. *l, a, t.* fig. 28. lit. *b, P.* fig. 32. lit. *e.* fig. 24. lit. *c, e.*

The *Fillet* is the same with what the French call *Reglet*, *Bande*, and *Bandelette*; the Italians, *Lissa*, or *Listella*.

FILLET is also used among painters, gilders, &c. for a little rule, or reglet of leaf gold, drawn over certain mouldings; or on the edges of frames, pannels, &c. especially when painted white; by way of enrichment.

FILLETS, in the manage, are the loins of an horse; which begin at the place where the hinder part of the saddle rests.

FILM, a thin skin, or pellicle.

In plants, it is often used for that thin woody skin, which separates the seeds in the pods, and keeps them apart.

FILTER, or **FILTRE**, in chemistry, &c. a piece of cloth, linen, paper, or other matter, used to filtrate or strain liquors through. The *Filtre* has the same use and effect, with regard to liquids, that the sieve, or searce, has in dry matters.

Filtres are of two sorts. — The first, are simple pieces of paper, or cloth, through which the liquor is passed without further ceremony.

The second are twisted up like a skain or wick, and first wetted, then squeezed, and one end put in the vessel that contains the liquor to be filtrated. The other end is to be out, and hang down below the surface of the liquor. By means hereof the purest part of the liquor distils drop by drop out of the vessel; leaving the coarser part behind.

This *Filter*, or *Philter*, acts as a siphon.

FILTER * is also a charm, supposed to have a virtue of inspiring love.

* The word is derived from the Greek *φίλτρον*, which signifies the same thing; of *φίλος*, amo, I love.

FILTRATION, the act of passing a thing through a filter; called also *Calature*, *Percolation*, and *Transcolation*. See **FILTER**.

Filtration is a kind of separation; performed by straining a liquor through a cloth, bag, linen, or brown paper, in order to clarify, or purify it.

The most commodious way of *filtrating*, is by whitey-brown paper fastened over the mouth or aperture of a funnel; the smallness of the pores of this paper admits only the finer parts through, and keeps the rest behind.

There are also *Filtrations* through sand, pulverized glass, &c. Spirits of vitriol, salt, and nitre, are *filtrated* through a quantity of beaten glass, in the bottom of a funnel.

The secretion of the divers juices in the body, from the mass of blood, seem to be little else but *Filtration*. Pitcairn, and other late authors, hold that the diversity of *Filtrations* does not depend on the different configurations of pores, but on their different sizes or diameters.

Springs also seem to be raised from the ocean by the same principle of *Filtration*.

Filtration, in pharmacy, is chiefly concerned in tinctures; as when some portion is drawn from the ingredients, or suspended in the tincture, which is not necessary thereunto; but disturbs and renders the rest unpleasent, both to the palate, and sight.

Besides this, there is a *Filtration*, which has much tortured the philosophy of some ages to account for; with this that performed by the ascent of the finer parts of a liquor, up a cord, or skain of cotton, or such like matter, which is contrived to drop over another vessel, and leave the grosser behind.

Some say that the cause of this ascent is, because the liquor swells those parts of the filter, that touch it; by entering into the pores of the threads, which compose it, whereby they rise up, touch, and wet those next above them; and these again the next threads; and so on, to the brim of the vessel; when the liquor runs over, and descends in the other part of the filter, which hangs down, by its own natural gravity.

But this account is liable to many objections; especially as liquors rise after the like manner in glass tubes, much above the surface of the liquor they are immerged in; where the glass cannot be imagined thus to swell.

Others account for it, by considering every filter, as composed of a great number of long, small, solid bodies, which lie very close together; so that the air getting in between them, loses much of its pressure, and cannot gravitate so strongly as it doth on the fluid without them: The consequence is, that the parts of the water between the threads of the filter must be pressed upwards, and ascend till they come so high, as by their weight to counter balance the general pressure on the other parts of the surface of the water.

Lastly, the retainers to Sir Isaac Newton's philosophy deduce the phenomenon from the principle of attraction. According to them, the cause of this *Filtration* is doubtless the same with that whereby fluids ascend up heaps of ashes, sand, &c. the same with that, whereby water is raised in form of vapour; the sap rises in vegetables; and the blood circulates through the capillary arteries, and the extremely minute glandular strainers. See **ASCENT of liquors**.

FIMBRIÆ, fringes. The extremities or border of the tubeæ fallopianæ were formerly thus called; the word signifying a fringed border, which that part resembles. See *Tab. Anat.* (Splanch) fig. 9. lit. *dd*.

FIMBRIATED, a term in heraldry, signifying that an ordinary is edged round with another of a different colour.

Thus, he beareth, or, a cross pattee, gules, *fimbriated* sable.

FIN, a part of a fish, made in fashion of a feather.

The office of the *Fins* has commonly been supposed to be analogous to that of feathers in fowls; and to assist the fish in its progressive motion, or swimming: But the latter naturalists find this a mistake.

It is the tail that is the great instrument of swimming: The *Fins* only serve to keep the fish upright, and prevent vacillation, or wavering. See Supplement article PINNÆ.

Whale FINS are commonly taken for that part of the whale, which the populace call *whale-bone*; but whence the mistake should arise, is not easy to determine.

It is certain, that fibrous, flexible matter is not the *Fins* of that fish, but rather its teeth; that species of whales wherein these *Fins* are found, having no other teeth. They are taken out of the mouth, and are usually about a span broad, and fourteen or fifteen long. See WHALE-BONE.

These whale *Fins* are the most valuable part of the animal. See WHALE FISHERY.

FINAL, that which terminates, or comes last in any thing; as, a final judgment; final sentence, &c.

Divines call the impenitence of the reprobate *final*, as supposing it to continue to the end of their lives.

FINAL Cause, is the end for which any thing is done. The *final cause* is the first thing in the intention of a person who does a thing; and the last, in the execution.

Final Causes are of good use in ethics; but mischievous in physics, and by no means to be allowed: yet Mr. Boyle proposes some views and regulations, under which they may be admitted, in an express inquiry into the Final Causes of natural things.

FINAL Letters, are those which close words. The figure called *Apocope*, consists in retrenching final letters.

The Hebrews have five final letters; which, when at the end of a word, have a different figure from what they have at the beginning, or in the middle thereof. These are the ך, ם, ן, ף, ץ, caph, mem, nun, pe, tade, which every where but at the ends of words are wrote כ, מ, נ, פ, ט.

FINANCES *, in the French polity, denote the revenues of the king, and state: Much the same with the treasury, or exchequer of the English, and the *stictus* of the Romans.

* The word is derived from the German *Finantz*, scraping, usury. Though *Du Cange* chuses rather to deduce it from the barbarous Latin *financie*, *prestatio pecuniaria*.

Council of the *Finances*, corresponds to our lords commissioners of the treasury: The comptroller general of the *Finances*, to our lord high treasurer, &c.

The French have a peculiar kind of figures, or numeral characters, which they call *Chiffre de Finance*. See CHARACTER.

FINE, that which is pure, and without mixture. The term is particularly used in speaking of gold, and silver.

Fine gold should be of twenty-four carats; but there is little, if any, that rises to such a degree of fineness.

Gold thus *fine*, is soft, and improper to work; for which reason they always mix a certain quantity of alloy of copper with it. *Fine* silver is that of twelve-penny weights. See SILVER.

FINE, in law, denotes a covenant made before justices, and entered on record, for conveyance of lands, tenements, or any thing inheritable, being in *esse tempore finis*; in order to cut off all future controversies.

A *Fine*, then, appears to be a concord, acknowledged and recorded before a competent judge, touching some hereditament or thing immovable, that was in controversy between the parties to the same concord; and for the better credit of the transaction, it is supposed to be made in the presence of the king, because levied in his court.

Hence it binds women covert, being parties, and others whom ordinarily the law disables to transact, only for this reason, That all presumption of deceit or evil-meaning is excluded, where the king and his court of justice are supposed to be privy to the act.

Originally this *final* concord was instituted and allowed, in regard that by the law and ancient course of proceedings, no plaintiff could agree or end the cause without licence of the court. So as *Fines* have been antiently levied in personal actions; and for no greater a sum of money than 11 l.

But time has produced other uses of *Fines*, viz. To cut off entails, and with more certainty to pass the interest or title of any land or tenement, though not controverted, to whom we think good, either for years, or in fee: Inasmuch that the passing a *Fine* in most cases now is but a *factio juris*, supposing an action or controversy, where in truth none is; and so not only operating a present bar and conclusion against the cognizor or person who passes the *Fine*, and his heirs; but at five years end, against all others, not expressly excepted, and not claiming (if it be levied upon good consideration, and without covin) as women covert, persons under twenty-one years, prisoners, or such as are out of the realm at the time of its acknowledging.

This *Fine* hath it in five essential parts. 1^o The original was taken out against the cognizor. 2^o The king's licence giv-

ing the parties liberty to accord; for which he hath a *Fine*, called the *king's silver*; being accounted part of the crown revenue. 3^o The concord itself, which begins thus, *Et est concordia talis*, &c. 4^o The note or abstract of the *Fine*, beginning thus, *K. inter R. querentem, et S. et T. uxorem ejus deservientes*, &c. (where instead of *deservientes*, antiently *impedientes* was used.) 5^o The foot of the *Fine* (*Hæc est finalis concordia facta in curia domini regis apud West. a die pasche in quindecim dies, anno, &c.*) concludes all, containing the day, year, and place, and before what justice the concord was made.

Fines are either *single*, or *double*.

Single *FINE* is that, by which nothing is granted or rendered back again by the cognizees to the cognizors, or any of them.

Double *FINE* contains a grant and render-back, either of some rent, common, or other thing out of the land, or of the land itself, to all or some of the cognizors for some estate, limiting thereby remainders to strangers not named in the writ of covenant.

Sometimes also a *double Fine* is, when the lands lie in several counties.

Fines with regard to their effect, are divided into *executed* and *executory*.

FINE executed, is such, as, of its own force, gives a present possession (at least in law) to a cognizee, so that he needs no writ of *habere facias seisinam*, for execution of the same: of which sort is a *Fine sur cognizance de droit come ceo*, &c. that is, upon acknowledgment that the thing mentioned in the concord is *jus ipsius cognizati, ut illa quæ idem habet de dono cognitoris*. West. sect. 51. K.

The reason is, because this *Fine* passeth by way of release of a thing which the cognizee hath already (at least by supposition) by virtue of a former gift of the cognizor; which is in truth the surest *Fine* of all.

Fines executory are such, as for their own force do not execute or give the possession to the cognizee without entry or action, but require a writ of *habere facias seisinam*: as a *Fine sur cognizance de droit tantum*.

Fines are now only levied in the court of common-pleas at Westminster, in regard of the solemnity thereof, ordained by the statute of 18 Edw. I. before which time they were sometimes levied in the country courts, court-barons, and in the exchequer; as may be seen in *Origines jurisdictionales*, &c. Plowden says, that there were *Fines* levied before the conquest: Fulbeck assures us also, that he has seen the exemplification of one of Henry the III's time: Though Dugdale affirms, there were none till Henry the III.

FINE also, according to Cowel, signifies a sum of money, paid as an income for lands or tenements let by lease; antiently called *gerfuma*.

FINE is also used to denote an amend, pecuniary punishment, or recompence, for an offence committed against the king, and his laws; or against a lord of a manor.

In which case a man is said, *facere Finem de transgressione cum rege*, &c.

In all the diversities of the use of the word *Fines*, it hath but one signification; and that is, a *final* conclusion, or end of differences between parties.—In the last sense, where it denotes the ending and remission of an offence, it is used by Bracton, who speaks of a *common Fine* that the country pays to the king for false judgments, or other trespasses, which is to be assessed by the justices in eyre before their departure, by the oaths of knights, and other good men, upon such as ought to pay it.

There is also a *common Fine* in courts leet.

FINES for Alienation, are reasonable *Fines* formerly paid to the king by his tenants in chief, for licence to alienate their lands; according to the statute 1 Edw. III. cap. 12. but taken away by statute 12 Car. II. cap. 24.

FINE-drawing, or *rentering*, a very nice way of sewing up, or rejoining the parts of any cloth, stuff, or the like; torn or rent in the dressing, wearing, &c.

It is prohibited to *fine-draw* pieces of foreign manufacture, upon those of our own; as has formerly been practised.

FINERS of gold and silver, are those who purify, and part those metals from other coarser ones, by fire and acids. They are also called *Parters* in our old law-books, and sometimes *Departers*.

FINESSÉ, a French term, of late current in English. Literally, it is of no further import than our English *Finesse*: But among us, it is chiefly used to denote that peculiar delicacy, or subtlety perceived in works of the mind; and the nicest and most secret and sublime parts of any science, or art.

A person of taste can never be fond of a pun, where all the *Finesse* lies in an equivocal, or in an ambiguity. This man understands all the *Finesse* of his art. The substance and necessary part of a language is learnt at a little expence: It is the *Finesse* and delicacies that cost the most.

FINGERS, *Digiti*, the extreme part of the hand, divided into five members. See HAND.

The *Fingers* consist of fifteen bones, disposed in three rows, or ranks; each *Finger* having three bones.

The joints or jointures are called *Candyls*, and *Internodia*; and their arrangement or rows, *Phalanges*: The uppermost of which is the longest and largest; the second less, but yet longer and larger than the third.

The first *Finger* is called the *pallus*, or the thumb: the second, *index*, sometimes *salutaris digitus*, and sometimes *numerus*: the third, the middle *Finger*, *infamis*, *absensus*, *impudicus*, and *famosus*, because used in mocking and derision: the fourth, *annularis*, the ring *Finger*, *medio proximus*, and *medicus*, by reason the antients used to stir and mix their medicines therewith: the fifth, the little *Finger*, *auricularis*, by reason the ear is picked therewith.

FINGER's Breadth, a measure, of two barley-corns in length, or four laid side to side.

FINING, see **REFINING**.

FINISHING, in architecture, &c. is frequently applied to the crowning, or acroter over a piece of building; placed there to terminate, and finish it. See **CROWNING**.

FINITE, something bounded, or limited; in contradiction to infinite.

The school-men make two kinds of *Finite*:

The one as to *extension*, which is applied to things that have not all possible or conceivable extension.

The other as to *perfection*, applied to things, which have not the last perfection.

To get an idea of a thing *finite* in point of perfection, we first conceive the thing as having certain perfections; and then conceive some other perfection, which it has not, or some perfection in a farther degree.

Thus, when I say that three is a *finite* number, I first conceive a number, consisting of three units; then conceive other units beyond these three. Thus it is I conceive my mind *finite*, by observing certain perfections beyond what I find in my mind.

After the same manner I conceive a room to be finite, by having an idea of extension beyond what is contained therein.

FINITOR, in astronomy, the horizon; thus called, by reason it finishes, or bounds the sight, or prospect. See **HORIZON**.

FIOL, or **FIAL**, see the article **PHIAL**.

FIRE, in physiology—The most universal and sensible character of *Fire*, and that which best defines and distinguishes it from every other thing, is its giving heat.

Fire, therefore, may be generally defined to be whatever warms, or heats bodies.

Again, as heat is something, whose presence we best perceive by the dilatation of the air or spirit in the thermometer; *Fire* may be defined to be that whose presence we perceive by the expansion of the air, or spirit in the thermometer.

Whence it follows, that *Fire* is a body, and a body in motion.—Its motion is argued from its expanding the air; which is not effected without communicating motion thereto: and its corporeity is proved by experiment. For pure mercury being inclosed in a phial with a long neck, and kept in a gentle heat for the space of a year, is reduced into a solid; and its weight is considerably increased; which increase can arise from nothing but the accession of *Fire*.

Fire makes one of the vulgar, or peripatetic elements, defined to be hot, and dry; or, it is that part, or ingredient in all bodies, which is hot in the highest degree, and dry in an inferior one.

What the school-philosophers add further, as to the nature of *Fire*, is, that it is a simple body; as not including any contrariety of qualities; and a body absolutely light, as tending naturally upward: for which reason they hold its natural place to be above all the other elements, between the extremity of our atmosphere and the moon; and the fund of *Fire* is supposed to reside in that sphere, which they call *elementary Fire*.

Fire, according to the Cartesians, is an assemblage of the more solid, earthy particles, which swimming in the rapidly fluid matter of the first element, become vehemently agitated thereby; and by this intense agitation or motion are disposed to give the sensation of heat, light, &c.

Fire, according to Sir I. Newton, is a body heated so hot, as to emit light copiously; for what else, says that philosopher, is red-hot iron, but *Fire*? And what else is a fiery coal, than red-hot wood? By which he suggests, that bodies which are not *Fire*, may be changed and converted into *Fire*.

It is a dispute of some standing among philosophers, whether *Fire* be any specific substance, originally distinct from all other; or whether it be of the common matter of other bodies, only under certain peculiar modifications: i. e. whether *Fire* be such by its own nature, or by motion?

According to some of the latest philosophers, *Fire* is a certain substance, or body sui generis, originally such; and not producible by any motion, or alteration of other bodies.

These authors describe *Fire* as a very subtle, moveable, penetrating body, the cause or instrument of heat and light. Some of them add, that when *Fire* enters the eye in right lines, it produces or excites the idea of light; which rectilinear motion they account absolutely necessary to the idea of light.

Whereas, to produce heat, and the other effects of *Fire*, such rectilinear motion is not required; but on the contrary, an irregular, various motion is fitter to produce the same.

The nature of *Fire* is so wonderful, and abstruse, that the antients generally revered it as a God: among the moderns, we can scarce name one point in all philosophy of more importance, or one that is less understood.

Fire, in effect, is the universal instrument of all the motion, and action in the universe: without *Fire*, all bodies would become immovable; as in a severe winter we actually see our fluids become solid, for want thereof. Without *Fire*, a man would harden into a statue; and the very air would cohere into a firm, rigid mass.

Fire, then, is the universal cause of all mutation, or change; for all mutation is by motion; and all motion by *Fire*.

Several authors have laboured to set this grand agent in its just light; and particularly the excellent Boerhaave, in a new course of experiments, and lectures expressly on the subject, *De Igne*. The sum of his doctrine we shall here subjoin.

Fire, then, is distinguished into two kinds: as it is in itself, called *Elementary Fire*; and as it is joined with other bodies, called *Culinary Fire*.

Pure, or *Elementary FIRE*, is such as exists in itself; which alone we properly call *Fire*.

Common, or *Culinary FIRE*, is that existing in ignited bodies, or excited by the former in combustible matters, the minute particles whereof joining with those of the pure *Fire*, constitute pure flame.

This latter is improperly called *Fire*; in regard only a small part of it is real, or pure *Fire*.

Pure *Fire*, such as collected in a burning glass, yields no flame, smoke, ashes, or the like; consequently, in ignited bodies, that which flames, smokes, &c. is not simply *Fire*.

The effects, nature, properties, &c. of each shall be considered.

I. *Pure*, or *Elementary Fire*, of itself, is imperceptible; and only discovers itself by certain effects, which it produces in bodies; which effects are only learnt, by observing the changes that arise in those bodies.

The first effect of *elementary Fire* on bodies, is *heat*; which arises wholly from *Fire*; and in such manner as that the measure of heat is always the measure of *Fire*; and that of *Fire*, of heat. So the heat is inseparable from *Fire*.

The second is, *dilatation* in all solid bodies; and *rarefaction* in all fluids.

That both these are inseparable from heat, is evident from numerous experiments. An iron-rod, or bar, being heated, increases in all its dimensions; and the more so, as it is further and further heated: upon exposing it to the cold again, it contracts and returns successively through all the degrees of its dilatation, till it arrive at its first bulk; being never two minutes successively of the same magnitude.

The like is observed in the heaviness of all bodies, gold; which, when fused, takes up more space than before: so mercury, the heaviest of all fluids, we have known to ascend in a narrow tube over the *Fire*, to above thirty times its height.

The laws of this expansion, are 1^o That the same degree of *Fire* rarefies fluids sooner, and in a greater degree than it does solids. Without this, the thermometer would be of no use; since the cavity of the tube would then be dilated in the same proportion, as the fluid is rarefied. 2^o The lighter the fluid, the more it is dilated by *Fire*. Thus air, the lightest of all fluids, expands the most; and next after air, spirit of wine.

The third effect of *Fire* on bodies, is *motion*: for *Fire*, in warming and dilating bodies, must of necessity move their parts.

In effect, all the motion in nature arises from *Fire* alone; and taking this away, all things become immovable. Upon the absence of only a certain degree of *Fire*, all oils, fats, waters, wines, ales, spirits of wine, vegetables, animals, &c. become hard, rigid, and inert: and the less the degree of *Fire*, the sooner, and more violently is this induration made.

Hence, if there were the greatest degree of cold, and all *Fire* were absolutely taken away, all nature would grow into one concrete body, solid as gold, and hard as diamond. But upon the application of *Fire*, it would recover its former mobility.

Consequently, every diminution of *Fire* is attended with a proportionable diminution of motion: and vice versa.

This *Fire*, whose effects we have been relating, needs no air, or pabulum to sustain or preserve it.

For putting some calx of tin or lead, in the exhausted receiver of an air pump; and applying a burning glass so as the focus shall fall on the calx; the consequence will be a vehement dilatation of the calx, from the centre towards the circumference, whereby the receiver will be broke into a thousand pieces. And if a quantity of any essential aromatic oil be poured in vacuo, upon spirit of nitre, there will immediately arise a violent *Fire*, to the great danger of the bystanders.

All the above mentioned effects of *elementary Fire* may be increased divers ways, *viz.*

1^o. By *Attrition*, or a swift agitation, or rubbing of one body against another. This is apparent in solids: a vehement attrition of a flint, and steel, every body knows, will produce sparks. So also in fluids, cream, by long churning to separate the butter, will grow sensibly warm; the barometer renders this effect still more discernable.

In effect, all the heat of an animal is owing to the agitation and attrition of the parts of its juices against each other, and against the sides of the vessels.

The more solid, hard, and elastic the bodies thus agitated are, the more points of contact they have: the more intense the force whereby they are struck against each other, is, the greater is their motion: and the quicker the returns of the strokes, and the longer they are continued, the greater is the heat produced.

Thus, a piece of sponge rubbed lightly, and for a little while against another, acquires no sensible heat: but a large, heavy piece of iron briskly rubbed against another in a cold season (when bodies are the densest) will presently acquire an intense heat, sufficient to fire sulphur, gun-powder, or the like.

So a knife whetted briskly on a dry rough stone, shall yield sparks of *Fire*; but if oil, or any other fatty matter be interposed, no sensible heat shall arise: and the points of two needles rubbed against each other ever so strongly, or so long, will never grow warm; as only touching in a few parts.

Hence, 1^o. The globules of the cruor, or red blood, drove by the force of the heart against each other, or against the sides of the arteries, excite more heat than the globules of the serum, or any other humour in the animal. Hence, 2^o. Those parts abounding most with these globules thus agitated, as the heart, liver, and head, will be the hottest of all others: and the denser the blood, cæteris paribus, the greater the heat, &c. 3^o. The quicker the contractions of the heart are repeated, the greater will the heat be.

The second manner of increasing the effect of *elemental Fire*, is by throwing a quantity of moist or green vegetables, cut down while full of sap, into a large heap, and pressing them close down; the result of which, is, that they grow warm, hot, smoky, and finally will break out into flame.

The third way is, by the mixture of certain cold bodies. Thus, water and spirit of wine, first warmed, grow much hotter by the mixture: so, any of the heavy aromatic oils, as of cloves, cinnamon, salisfras, guaiacum, &c. mixed with spirit of nitre, grow exceedingly hot, and burst forth like volcano's. And the same may be said of spirit of nitre, and steel filings.

The like effect may be had from dry bodies. Thus, pure sulphur and steel filings, well ground and mixed in equal quantities, with water enough to make them into a dry paste, and laid an hour or two any where, even under ground, will smoke and emit flame; and that with the greater vehemence, as it is more strongly pressed down.

The fourth is by phosphorus, which is a kind of fire magnet prepared from the parts of animals, that imbibes and retains *Fire* for many years.

But in all these manners, it does not appear, that any *Fire* is excited, or generated of what was not *Fire* before: for, if in a severe winter's day you rub a plate of gold briskly against another, they will both grow hotter and hotter by degrees, till at length they become red hot, and at the point of melting: and yet all this time the plates lose nothing of their weight, but swell and grow bigger in all their dimensions.

Hence it follows, that the particles of the gold are not converted by the friction, into *Fire*; but that the *Fire* existed before; and all the effect of the friction, &c. is to collect, or bring together a quantity thereof before dispersed throughout the atmosphere.

In effect, there is no making or producing of *Fire* de novo. All we can do, is, of insensible, to render it sensible, *i. e.* to collect it out of a greater space into a lesser; and to direct and determine it to certain places. This is effected, as above-mentioned, by motion, attrition, &c.

The sun also contributes very much to the bringing of *Fire* to light, by means of his rapid motion round his axis; whereby the fiery particles, every where diffused, are directed and determined in parallel lines towards certain places, where their effect becomes apparent.

Whence is it that we perceive the *Fire* or heat when the sun is above the horizon; but that, when he disappears, his impulse or pressure being then taken away, the *Fire* continues dispersed at large through the ethereal space?

In effect, there is not less *Fire* in our hemisphere in the night time, than by day; only it wants the proper determination to make it perceived.

Another way of rendering it sensible, is, by collecting the parallel rays into a less compass, by means of convex glasses, or concave specula.

This *elementary Fire* is present every where, in all bodies, in all space, and at all times; and that in equal quantities: for, go where you will, to the top of the highest mountain, or descend into the lowest cavern; whether the sun shine, or not; in the coldest winter, or the most scorching summer; by one or other, or all of the means above-mentioned may *Fire* be collected. In a word, there is no assignable physical point without *Fire*; no place in nature, where the attrition of two sticks will not render it sensible.

So long as *Fire* remains equally, and undetermined in any place, it does not discover itself by any effect. In the severest weather we perceive no influence or effect of *Fire*, when, at the same time being collected and determined by attrition, it becomes manifest.

By changing *Fire* out of its indeterminate state, and impelling it in converging lines, its momentum is increased. Witness the phenomena of burning glasses.

But, how attrition, crude vegetables, &c. contribute towards altering the direction, &c. of *Fire*, does not easily appear.

On this *Fire*, and the effects thereof above-mentioned, depends all fluidity of humours, juices, &c. also all vegetation, putrefaction, fermentation, animal heat, and a thousand other things.

II. But in what manner soever *Fire* is collected in bodies; upon a cessation of the collecting cause, it soon disappears again, unless it be supplied with a *Pabulum*, or *Fuel*. And in this case it becomes *Culinary Fire*.

By *Pabulum*, or *Fuel* of *Fire*, we mean whatever receives, and retains *Fire*; and is consumed, or at least rendered insensible thereby.

The only pabulum of *Fire*, in all nature, is the oil, sulphur, or fat of bodies: and bodies are only fuel, on account of the oil they contain.

Hence, 1^o. All vegetables, not too moist, nor too dry, afford such a pabulum; particularly those, which contain the greatest quantity of oil; as balsamic and resinous woods, &c. 2^o. All vegetable and animal coals are a proper pabulum for maintaining of *Fire*; as being only the parts of vegetables and animals, which have exhaled their water and salt, and retained the oil alone inhering, in a black form, in their earth.

3^o. All fossil and bituminous earths, turfs, &c. 4^o. All mineral sulphur, whether pure or joined with earth, stone, or metals; as pit-coal, &c. 5^o. The fat and dung of animals. And 6^o. Several productions of chemistry; as oils, inflammable spirits, &c. afford also a pabulum for *Fire*.

This *Fire*, which burns combustible bodies, requires air, to sustain it: which taken away, the *Fire* is immediately dissipated: as appears from the experiments in vacuo.

And yet, *Fire* does not immediately bear, or endure the air; but always repels it: and by that means forms a kind of vault, or aerial furnace all round; which by its weight, and the pressure of the incumbent air, acts on all the particles, or corpuscles that would make their way through it; and thus retains the *Fire*, and applies it to the combustible matter.

Hence, the heavier the air, the more vehement the *Fire*: and accordingly, in still cold weather we observe the *Fire* to act with more violence than in warm weather.

But whether the air retains *Fire* by its weight alone (which water itself would do) may be questioned: and whether its elasticity does not contribute something thereto; as also, whether there be not some further unknown property in the air, that has a share in this effect, may be doubted. Something of this kind one would suspect from hence, that all air is not proper to maintain flame.

This *Fire*, in burning a combustible matter, affords a *shining Fire*, or a flame, or both, according to the diversity of fuel; and frequently also, smoke, soot, and ashes.

Shining, or *luminous Fire*, seems to be *elementary Fire*, attracted towards the parts of the sulphur, or oil, with such force and velocity, as to move, and shake them very violently, whirl them about, divide, and attenuate them, and thus render them volatile, and ready to be expelled: while, in the mean time, the air, making its vault all round, restrains and keeps them in, directs them to the sulphur, and keeps them still collected in their place or pabulum, while the combustible matter is diffused all round.

Flame seems to be nothing but a thick sulphur agitated, as before, by *elementary Fire*; so as the *Fire* is driven with a great motion around the revolving particles of the sulphur.

Soot, seems to be produced, when *Fire* and sulphur cannot break into a flame; being a sort of coal, consisting of a thick sulphur, and an attenuated oil with earth and salt.

Smoke seems to be the combustible matter, when it begins to be relinquished by the elementary *Fire*: for, if this smoke be afterwards passed through a flame, it will itself become flame, as before.

Lastly, ashes are the earth, and salt; which the *Fire* leaves untouched.

Fire may be distinguished into *shining*, and *not shining*: for, that there is *Fire* which does not emit light, is evident hence, that a piece of iron taken out of the *Fire*, before it be red-hot, shall yet give *Fire* to sulphur.

Shining Fire again may be subdivided into two kinds: that which *warms*, as red-hot iron; and that which does *not warm*, as that observed in putrid fishes, rotten wood, &c. the oil whereof beginning to be agitated, and attenuated, produces light, without any heat, so far as the thermometer may be a rule of judging.

Of *shining*, and at the same time *warming Fires*, the principal is that of the sun, as it is called; though, whether the *Fire* be really emitted from the body of the sun; or whether it be only the common, vague, universal *Fire*, determined by the sun, is not easy to say. This *Fire* we more usually consider under the denomination of light.

This solar *Fire*, in calcining certain bodies, makes some addition to the weight thereof.

Thus, antimony exposed in the focus of a burning glass, will smoke a considerable time; and the greatest part of it will seem to evaporate in fumes: but, if afterwards tried by the balance, it will be found to have gained in weight. And if it be again applied in the focus of a larger glass, it will again emit fumes; and yet still be increased in weight.

Beside the solar, there is likewise a subterraneous *Fire*.

This appears in digging under ground: for the first glebe, next to the surface, is warmed by the heat of the sun; and as you go deeper, you will find it colder; whence even in hot countries they have conservatories of ice at some depth under ground; till, arriving at a certain depth, *viz.* forty or fifty foot, it begins to grow warmer, so that no ice can there subsist: and at a yet greater depth, it is so hot, as to take away respiration, extinguish candles, &c. And if the miner will venture further, and carry a candle along with him, he frequently sets the whole place in a flame, the sulphurous fumes, rendered volatile by the subterraneous *Fire*, catching flame from the candle.

Whence it appears, that there is another source of *Fire*, or as it were another sun, in the bosom of the earth, which gives motion and life to every thing growing in, or upon the globe; and even, that the centre of the earth is mere *Fire*; which *Fire* is likewise argued to be perpetual, from volcano's, or burning mountains, which have been known to cast up *Fire* from the earliest account of time. See VOLCANO.

There are two great *Fires* therefore, the higher, or solar; and the lower, or subterraneous; and these are in every other respect perfectly alike.

FIRE, in chemistry, is the great instrument, by which most of the operations of that art are performed.

The kind, degree, direction, &c. of *Fire*, are things the chemist is principally to attend to. The diversity of *Fire* makes a great difference in the result of the experiment; so as, the same effect, *e. gr.* shall not arise, if an experiment be made with the *Fire* of spirit of wine, and that of pitcoal.

And to this cause, Mr. Boyle, in his treatise of the unexpected failure of experiments, attributes it, that a great many experiments successfully tried by some, have not succeeded to others.

The *Fires* chiefly required by the chemists, are such as yield no fumes or remains; no salt, or smoke: and such alone are those of the sun, and of spirit of wine. Those which come next in purity, are oils distilled per vesicam; which lose their earth and salt, by their boiling and agitation in the water; so that the oftener the distillation is repeated, the purer they are rendered: after these the best is turf.

Indeed, the very manner wherein the *Fire* is blown, is found to have some effect: Thus, Acofta, lib. iv. c. 5. relates, that in Peru, when they would melt and separate their silver from the earth, &c. if the *Fire* be blown up with bellows, the fusion will not succeed: nor will any other *Fire* do but that blown by the wind raised from the fall of some water; so that they are forced to have recourse to large tubes laid to the feet of large mountains, where there are cataracts to convey the wind generated by the fall of water to their works.

The degree of *Fire*, or the collection and direction of *Fire*, to the degree proper for each operation, is almost the whole art of chemistry: the *Fire*, *e. gr.* requisite to melt metals, is by no means proper for the distilling of spirit of wine.

Now, the greater or less force of *Fire* depends altogether on a greater or less quantity thereof collected into a focus: for,

as to its motion, it does not seem in our power to alter it; or to make any increase or diminution of the force of the *Fire* on that account.

The chemists use four principal degrees of *Fire* in their operations.

The first is equal to the natural heat of the human body; or rather to that of a hen, brooding on her eggs; which is the standard: and accordingly this first degree is best measured by applying a thermometer to a hen; and some chemists by keeping a *Fire* continually to this degree, by means of a thermometer, have hatched chickens.

By this degree all their digestions, easy separations, and solutions, and gentle distillations, with all fermentations and putrefactions are performed.

The second degree of *Fire* is that which gives a man pain, but does not destroy, or consume the parts: like the heat of a scorching summer's sun, which chafes and inflames the skin; and even sometimes raises blisters.

A *Fire* of this degree is used in making separations of the more ponderous bodies, which the first degree is not equal to; as also in some fixations, particularly that of mercury, which is rendered fixed by a gradual introduction of such *Fire* among the parts of the mercury.

This degree makes the serum of the blood, and white of an egg coalesce, and so occasions deadly inflammations; and is too intense for any digestion, putrefaction, or fermentation to be effected by it.

The third degree of *Fire* is that of boiling water, which separates and destroys the parts of bodies. This degree is perfectly stable; for water, when once it boils, is at its utmost degree of heat, and cannot be raised a whit further, by any augmentation of *Fire*, or fuel; as was first observed by M. Amontons.

This degree serves to attenuate, separate, fix and perform other operations, where the two former would not be effectual.

The fourth degree is that which melts metals, and destroys every thing else.

This degree is too vehement to be estimated by the thermometer; that instrument not being able to endure it: so that it is only determinable by its effect in the fusion of metals: as the heat of boiling water cannot be increased, so neither can that of melted metals.

This degree is used in abundance of operations, and particularly about minerals, where the three preceding degrees are insufficient. This is the last degree known to the ancient chemists.

The latest chemists reckon a fifth degree of *Fire*, *viz.* that whereby gold is made to emit fumes, and evaporate.

This was first discovered in the year 1690, by Mr. Tschirnhausen, whose burning glass rendered every thing, even gold itself volatile.

Besides these five degrees, the chemists have several intermediate ones; all which however may be easily reduced to the former.

As, the *digesting Fire*, or venter equi, which is the heat of a dunghill.

The *Balneum Mariae*, *Arenosum*, &c. explained under the article BALNEUM.

The *naked*, or *immediate Fire*, which is the common *Fire* applied under a vessel.

The *Fire of a Lamp*, which is moderate and equal, and may be increased by the addition of more wick; used by enamellers, &c.

The *Wheel Fire*, which is lighted all round a crucible, or other vessel, to heat it all alike.

That called by *Suppression*, which is when the vessel is not only encompassed round, but covered over with *Fire*.

The *Reverberatory Fire*, when it is in a furnace close a-top, by which the *Fire* is reflected back, and all round upon the vessel.

The *melting*, or *fusing Fire*, for the solution and calcination of metals and minerals.

The *Glass-house Fire*, for the vitrifying of the ashes of vegetables.

And the *Olympick Fire*, which is that of the sun collected in the focus of a burning mirror, &c.

To the several degrees of *Fire* required, several forms of furnaces are accommodated; which see under the article FURNACE.

There are five principal ways of altering the degree of *Fire*. For *Fire* differs, 1^o According to the weight of the pabulum, or fuel; it being a rule, that the heavier the fuel or combustible matter is, the more vehement, *cæteris paribus*, is the *Fire*. Thus, spirit of wine affords a weaker and less destructive *Fire* than oil; and this, than pitch, and so on; the heavier and grosser, still the fiercer.

2^o According to the quantity of the pabulum, or fuel.

3^o According to the distance of the *Fire* from the object; it being a rule, that the heat of the *Fire* at different distances is reciprocally, as the squares of those distances.

4° By the introducing or blowing of air into the *Fire*; it being a rule, that the stronger the current of air, or wind is, provided it be not so strong as to break the aerial fornix or vault incumbent on the *Fire*, the more is the *Fire* encreased. For a brisk blowing puts the minute parts of the pabulum into a greater motion, whence the greater attrition arises, and of consequence, more *Fire* is collected.

5° According to the solidity, or resistance of the medium between the *Fire* and the object; for the more solid the medium, the greater quantity of heat, ceteris paribus, does it receive from the *Fire*, and communicate to the object.

Thus, a vapour-bath communicates much less heat to the bodies distilled by it, than a water-bath; and this, less than a sand-bath; and this again less than a bath of steel-filings: for all bodies exposed to the *Fire*, grow hot in proportion to their specific gravities.

Thus, if a piece of metal be put in water, and both set over the *Fire*; while the water only grows lukewarm, the metal shall be so hot, as to be pelt touching: and thus a key in a person's pocket sitting near the *Fire*, shall frequently be very hot, while his clothes themselves have not any sensible warmth — Indeed, this rule admits of some exceptions; for we have oils, lighter than water, which yet admit of triple its degree of heat, before they boil.

It is a great controversy in chemistry, whether *Fire*, when applied to bodies, only separates and dissolves them; or whether it does not also really and absolutely change them.

Mr. Boyle, in his *Scottical Chemistry*, we think, has abundantly proved, that *Fire* really alters bodies; and that the parts or elements procured from bodies by *Fire*, did not exist such in the bodies themselves.

Add, that *Fire* does not only separate and decompose; but it also compounds and mixes bodies. This no body can doubt of, who knows that *Fire* in acting on many bodies, insinuates and fixes itself among them, and so constitutes one body together with them.

This is the case in dissolving of lead by *Fire*; as is evident from the increase of the weight of the lead: The like is observable in salt of tartar, which when first melted, loses somewhat of its weight; but as it is calcined further and further, it grows still heavier and heavier. In like manner, antimony calcined by a burning glass, as before observed, receives a notable accession of weight.

To say no more, the phosphorus must derive its shining matter from the fiery particles it imbibes in the distillation: For no body will imagine that any of that shining matter before existed in the human body.

FIRE, in medicine and chirurgery, is used in the same sense with cautery; and is distinguished into *actual*, and *potential*.

Actual FIRE is a hot iron. — There are several diseases, only to be cured by the application of *actual Fire*; which method of cure is practised with great success in the East-Indies. See **BURNING**.

Potential FIRE is that contained in caustic medicines. See **CAUSTIC**.

Fire also gives the denomination to divers diseases, as

St. Anthony's FIRE, by physicians more usually called *erysipelas*. See **ERYSIPELAS**.

St. Anthony's Fire is also called *holy Fire*, or *sacer Ignis*; and in an ancient instrument, belonging to the hospital in the church of St. Anthony at Marcellis, it is called *Fire of bell*, or *Ignis infernalis*.

This distemper made great ravages in France, in the XIth and XIIth century; and it was for the relief of persons labouring under it, that the religious order of St. Anthony was founded, in the year 1093, under the pontificate of Urban II.

Walking FIRE, called also *Will-with-a-whisp*, *Jack-in-a-lantern*, *Ignis fatuus*, &c. See **IGNIS FATUUS**.

FIRE, in theology, is frequently understood of the punishment of the wicked after death.

It is supposed the world will perish at last by *Fire*.

God has made several revelations of himself, under the appearance of *Fire*: He appeared to Moses under the form of a *Fire* burning in a bush: The Holy Ghost descended on the apostles in tongues of *Fire*; and the camp of the Israelites was guided and conducted in the night-time by a pillar of *Fire*.

The Persians adored God under the image or representation of *Fire*; by reason it is *Fire*, that gives motion to every thing in nature. They are said to have in that empire *Fires* still subsisting, which have burnt above a thousand years.

The Hebrews kept up the *holy Fire* in the temple; and the vestals were appointed express, to keep up the sacred *Fire* of the Romans.

Vulcan was worshipped among the antients, and particularly the Egyptians, as the inventor of *Fire*: And Boerhaave has made it highly probable, that the Vulcan of the heathens was the Tubal Cain of the Hebrews, the first who appears to have known the use of *Fire*, and to have applied it in the fusion of metals, and other preparations of chemistry.

FIRE, in the military language, is sometimes applied to the *Fire* lighted in an army in the night-time.

Thus, the enemy's *Fires* were seen on the top of the mountains.

But, the term *Fire* or *Firing*, is more frequently used for the discharge of the *Fire-arms*; or the shot made on the enemy from the artillery, &c.

The horse suffered extremely from the *Fire* of the foot, which took them in flank: the trench was exposed to the *Fire* of the place: In this assault the curtain was all on *Fire*.

In fortification, the *Fire of the place* denotes the flank; or that part of the curtain where the line of defence terminates; from whence they *fire*, to defend the opposite face of the bastion.

The best way of fortifying is that which gives the most *Fire*.

FIRE-ARMS are those charged with powder and ball: Such are canons, mortars, and other ordnance; musquets, carabines, pistols, and even bombs, granado's, carcasses, &c.

For the rebound or restitution of *Fire-arms*, see **REBOUND**.

In the history of the Royal Academy for the year 1707, we have an account of some experiments made with *Fire-arms* differently loaded, by M. Cassini. Among other things he observes, that by loading the piece with a ball which is somewhat less than the calibre; and only laying a little gunpowder below the ball, and a good deal above it, it will yield a vehement noise, but have no sensible effect or impulse on the ball.

This he takes to have been all the secret of those people who pretended to sell the art of rendering one's self invulnerable, or shot proof.

FIRE-BOTE, fuel for necessary firing, which by the common law, tenants may take out of the lands granted to them.

FIRE-EATER. — We have a great number of charletans, who have procured the attention and wonder of the public, by eating of *Fire*, walking on *Fire*, washing their hands in melted lead, and the like tricks.

The most celebrated of these was our countryman Richardson, much talked of abroad. His secret, as related in the *Journal des Savans*, of the year 1680, consisted in a pure spirit of sulphur wherewith he rubbed his hands, and the parts that were to touch the *Fire*; which burning and cauterizing the epidermis, hardened and enabled the skin to resist the *Fire*.

Indeed this is no new thing: Amb. Paré assures us he had tried on himself, that after washing the hands in one's own urine, and with unguentum aureum, one may safely wash them in melted lead.

He adds also, that by washing his hands in the juice of onions, he could bear a hot shovel on them, while it melted lard.

FIRE-MASTER, in our train of artillery, is an officer who gives the directions, and the proportions of the ingredients, for all the compositions of *Fire-works*, whether for service in war, or for rejoicings and recreations.

His orders are given to the *Fire-workers*, and bombardiers, who are obliged to execute them.

FIRE-OFFICE, an office of insurance from *fire*. See **ASSURANCE**.

FIRE-STONE, a kind of stone, called also *Rygate-stone*, from the place whence it is chiefly brought; it is very good, and much used for chimneys, hearths, ovens, stoves, &c.

Will FIRE, is a kind of artificial or factitious *Fire*, which burns even under water; and that with greater violence than out of it.

It is composed of sulphur, naphtha, pitch, gum, and bitumen; and is only extinguishable by vinegar, mixed with sand and urine; or by covering it with raw hides.

Its motion or tendency is said to be contrary to that of natural *Fire*, and that always follows the direction in which it is thrown; whether it be downwards, sidewise, or otherwise.

The French call it *Greek Fire*, or *Feu Gregeois*, because first used by the Greeks, about the year 660; as is observed by the jesuit Petavius, on the authority of Nicetas, Theophanes, Cedrenus, &c.

The inventor, according to the same jesuit, was an engineer of Heliopolis, in Syria, named Callinicus, who first applied it in the sea-fight commanded by Constantine Pogonates against the Saracens, near Cyzicus, in the Hellespont; and with such effect, that he burnt the whole fleet therewith, wherein there were thirty thousand men.

But others will have it of a much older date; and hold Marcus Gracchus the inventor; which opinion is supported by several passages, both in the Greek and Roman writers, which shew it to have been antiently used by both those nations in the wars. See Scaliger against Cardan.

Constantine's successors used it on divers occasions, with equal advantage, as himself; and what is remarkable enough is, that they were so happy as to keep the secret of the composition to themselves; so that no other nation knew it in the year 960.

Hugh, king of Burgundy, demanding ships of the emperor Leo, for the siege of Freine, desired likewise the *Greek Fire*. Chorier, *Hist. de dauph.*

F. Daniel gives us a good description of the *Greek Fire*, in his account of the siege of Damietta, under St. Louis. Every body, says that author, was astonished with the *Greek Fire* which the Turks then prepared; and the secret whereof is now lost. They threw it out of a kind of mortar; and sometimes shot it with an odd sort of cross-bow, which was strongly bent by means of a handle, or which, of much greater force than the bare arm. That thrown with the mortar, sometimes appeared in the air of the size of a tun, with a long tail, and a noise like that of thunder. The French by degrees got the secret of extinguishing it; in which they succeeded several times.

FIRE-WORKS, or artificial FIRES, are preparations made of gunpowder, sulphur, and other inflammable and combustible ingredients, used on occasion of public rejoicings, and other solemnities.

The principal of these are rockets, serpents, flars, hail, mines, bombs, garlands, letters, and other devices. See ROCKET, STAR, BOMB, &c.

The art of preparing and managing *Fire-works*, is called *pyrotechnia*.

FIRE-WORKERS, are subordinate officers to the *Fire-masters*, who command the bombardiers.

These receive the orders from the *Fire-masters*, and see that the bombardiers execute them.

FIRKIN, an English measure of capacity, for things liquid; containing the fourth part of the barrel.

The *Firkin of Ale* contains eight gallons; and that of *Beer*, nine: Two *Firkins* of beer make the kilderkin; two kilderkins the barrel; and two barrels the hoghead.

The *Firkins of Sops* and *Butter* are on the footing of the *Firkin of ale*, viz. a gallon per *Firkin*, less than that of beer.

FIRMAMENT, in the antient astronomy, the eighth heaven, or sphere; being that wherein the fixed stars were supposed to be placed.

It is called the *eighth*, with respect to the seven heavens or spheres of the planets, which it surrounds.

It is supposed to have two motions: A diurnal motion, given it by the primum mobile, from east to west, about the poles of the ecliptic: And another opposite motion from west to east;

which last it finishes, according to Tycho, in 25412 years; according to Ptolemy, in 36000; and according to Copernicus, in 258000: In which time the fixed stars return to the same precise points wherein they were at the beginning. This period is commonly called *Plato's year*, or the great year. See PRECESSION of the equinox.

In divers places of scripture the word *Firmament* is used for the middle region of the air. Many of the antients allowed, with the moderns, that the *Firmament* is a fluid matter; though they, who gave it the denomination of *Firmament*, must have taken it for a solid one.

FIRMAN, in the East-Indies, and particularly in the territories of the Great Mogul, is the passport, or permit, granted to foreign vessels, to trade within their jurisdiction.

FIRMNESS, FIRMITAS, in philosophy, denotes the consistence of a body; or that state, wherein its sensible parts cohere, or are united together, so that the motion of one part induces a motion of the rest.—In which sense, *Firmness* stands opposed to fluidity.

Some authors confound *Firmness* with density; as thinking the same state or property of body implied by both; or at least, that *Firmness* follows density: But this is a mistake. For mercury, the densest body in nature excepting gold, is yet one of the most fluid: And even gold itself, with all its density, when fused, wants *Firmness*, or cohesion.

Many of the Cartesians and others, hold *Firmness* to consist in the mere quiet of the particles of the body, and their mutual immediate contact; urging, that a separation of parts can only arise from some matter interposed between them, which is excluded by the notion of contiguity.

But the insufficiency of this hypothesis is evident: For mere simple rest has no force, either to act or resist; and consequently two particles only joined by rest and contiguity, would never cohere so as that a motion of the one should induce a motion of the other. This is obvious in the case of two grains of sand, which however contiguous, and at rest, will never constitute a *firm* coherent body.

The *Firmness* of bodies, then, depends on the connection or cohesion of their particles. Now, the cause of cohesion, Sir I. Newton and his followers hold to be an attractive force, inherent in bodies, which binds the small particles thereof together; exerting itself only at, or extremely near, the points of contact, and vanishing at greater distances.

The *Firmness* of bodies, therefore, follows the laws of the cohesion of bodies; which see under COHESION.

Hence, *Firmness* in all bodies must be on the surfaces, and contacts of the component parts: Thus a body, whose parts

are by their peculiar shapes capable of the greatest contacts, is most *firm*; and that, whose parts are capable of the least contact, will be most soft.

In the former, the greatest requisite is to be as near to cubes as possible, and in the latter to spheres. And in the same manner are to be accounted for, not only all the intermediate degrees between the most *firm*, and the most *soft* bodies, but those different consistences, which are distinguished by other names, as friable, tenacious, glutinous, and the like: For the greater are the solidities of the component parts of any body, in proportion to their surfaces, though that body, by the aptitude of the contacts, may be what we call *very hard*; yet it will be most friable or brittle. And where the surfaces of the component particles are much extended upon a small quantity of matter, the bodies they compose, though they may be light and soft, yet they will be tenacious or glutinous: For although the flexibility of their compounding parts admits of their easy changing of figure by any external force, yet by their touching one another in so many points, they are very difficultly separated.

The former is the case in crystallized salts, resins, and the like; the latter in turpentine, gums, and all of that sort.

FIRST-FRUITS, Annates or Primities, the profits of a benefice for the first year after avoidance.

The *First-Fruits* were originally reserved for the pope's benefit, and were accordingly, before the reformation, paid to him; but the parliament under king Henry VIII. translated them to the crown, 25 Hen. VIII. c. 20.

Queen *Anne*, in the third year of her reign, made a grant of the whole revenue of *First-Fruits* and tenths, to settle a fund for the augmentation of the maintenance of the poor clergy. By the act 25 Henry VIII. he, who enters on any spiritual living, before he pays, or compounds for the *First-Fruits*; on conviction, forfeits double the value thereof.

Every clergyman therefore before his induction, or soon after, should go himself with one friend, or send two friends for him, to the *First-Fruits* office, and there enter into bond to pay the *First-Fruits* of his benefice, within two years next ensuing, at four equal half-yearly payments. Only, one tenth of the whole yearly sum, entered in the king's books, is to be deducted; because that must be paid by itself the first year.

Formerly, four bonds were given for the four several payments; but by statute 2 and 3 of queen *Anne*, one bond only is appointed to be given; and the rates of all benefices, according to the king's books, are declared unalterable.

The successor is chargeable with arrears of tenths, due from his predecessor; and consequently, by 27 Henry VIII. c. 8. is impowered to distrain his predecessor's goods, being upon the benefice; and hath likewise a good action at law against him or his executors.

FISCUS, in the civil law, the treasury of a prince, or state; or that to which all things due to the public, do fall.

* The word is derived from the Greek *φισκος*, a great basket, used when they went to market.

By the civil law, none but a sovereign prince has a right to have a *Fiscus*, or public treasury.

At *Rome*, under the emperors, the term *avararium* was used for the revenues destined for support of the charges of the empire; and *Fiscus* for those of the emperor's own family.—Thus the treasury, in effect, belonged to the people, and the *Fiscus* to the prince.

FISCAL, something relating to the pecuniary interest of the king, the public, or a private person.

The emperor *Adrian* erected the office of *Fiscal* advocate in the *Roman* empire.

FISH, in natural history, an animal that has scales, and fins, and that lives in the waters, as its proper place of abode. See Supplement article PISCIS.

Naturalists observe a world of wisdom, and design in the structure of *Fishes*, and their conformation to the element they are to reside in.

Their bodies are clothed and guarded in the best manner, with scales, &c. suitable to their respective circumstances, the dangers they are exposed to, and the motion and business they are to perform.

The centre of gravity is placed in the fittest part of the body for swimming; and their shape is the most commodious for making way through the water, and most agreeable to geometrical rules.

They have several parts peculiar to themselves; as fins, to balance and keep them upright. See FIN.

And an air-bladder, or swim, to enable them to rise and sink to any height and depth of water, at pleasure.

They have also gills or branchia, whereby they respire; as land animals do by the lungs.

The tail is the instrument of progressive motion, and serves to row them forward.

Their

Their eyes are peculiarly formed to enable them to correspond to all the convergences and divergencies of rays, which the variations of the watery medium, and the refractions thereof, may occasion; in which respect they bear a near resemblance to those of birds.

Fishes are distinguished into *sea*, or *salt-water fish*, *pisces marini*; as the whale, herring, mackerel, &c. — *river*, or *fresh-water fish*, *pisces fluviatilis*; as the pike, trout, &c. — and *pond*, or *lake-fish*; as the carp, tench, &c. to which may be added, others which abide indifferently in fresh water or salt; as salmon, shad-fish, &c.

Aristotle, and after him Mr. Willoughby, more accurately distinguish *Fishes* into *cetaceous*, *cartilaginous*, and *spinous*.

The *cetaceous* kind, called also *belluæ marine*, have lungs and breathe like quadrupeds; they copulate also like them, and conceive and bring forth their young alive, which they afterwards suckle with their milk.

The *cartilaginous* sort are produced from large eggs, like those of birds; and are also excluded the womb, like those of birds.

The *spinous* kind are also oviparous; but their eggs are smaller, and they have spinæ up and down in their flesh, to strengthen it.

Willoughby thinks it would be yet more proper to divide *Fishes* into such as *breathe with lungs*, and such as *breathe with gills*; and then to subdivide those that breathe with gills, not into cartilaginous and spinous, but into *oviparous* and *oviparous*.

The *oviparous* kind that breathe with gills, he subdivides into *long*; such as the *galei* and *cætes*, or sharks and dog-fish; and *bread*; such as the *passinaca*, *raja*, &c. the subdivisions of each whereof, he gives in his chapter of cartilaginous *Fishes* in general.

The *oviparous* kind that breathe with gills, are the most numerous; and these he subdivides into such as are what we usually call *Flat-Fish*; and such as swim with their back upright, or at right angles to the horizon.

The *plain* or *flat-fish* kind, called usually *plani spinosi*, are either *quadrati*, as the rhombi and passeres; or *longiusculi*, as the soleæ.

Such as swim with their backs erect, are either long and smooth, and without visible scales, as the eel-kind, or shorter and less smooth; and these have either but one pair of fins at their gills, or else another pair of fins also on their bellies; which latter kind he subdivides into two kinds. — 1^o, Such as have no prickly fins on their backs, but soft and flexible ones. 2^o, Such as have prickly fins upon their backs.

Those *Fishes* which have only soft and flexible fins on their backs, may be divided into such as have *three*, *two*, or but *one* single fin there.

No *Fish* but the *stelli* have *three* fins on their backs. See Supplement, article FINS.

Fishes with *two* fins on their backs, are either the truttaceous, trout kind; or the gobionites, loch, or gudgeon kind.

Fishes with but *one* soft back fin, are of three sorts. — The first kind have one long continued fin, from head to tail, as the hipparous of Rondeletius, &c.

The second have their fins but short, and placed just in the middle of their back: and these are either *marine*, as the herring kind; or *fluviatilis*, as those which we call *leather-mouthed Fishes*; such as carp, tench, &c.

Fishes which have prickly fins on their backs, are of two kinds. — 1^o, Such as have *two* prickly fins on their backs; and in these the anterior radii of their fins are always prickly. — 2^o, Such as have but *one* prickly fin there.

The English *FISHES*, according to Willoughby's catalogue, are as follow —

I. Of the *long cartilaginous* kind we have, 1. The *Canis carcharias*, or *lamia*, the white shark. 2. *Galeus glaucus* Rondeletii, the blue shark. 3. *Canis galeus* Rondeletii, called a *sepe* in Cornwall. 4. *Galeus acanthias* sive *spinax*, the prickled dog, or hound-fish. 5. *Galeus seu muskela levis*, the smooth, or unprickled hound-fish. 6. *Catulus major*, vulgo *cunicula Aristoteli*, the rough hound, called in Cornwall the *bounce*. 7. *Catulus minor*, the lesser hound fish, or *morgay*.

II. Of the *plain cartilaginous* kinds we have, 1. The *Raja levis undulata*, the skate or flare. 2. *Raja clavata*, the thorn-back. 3. *Raja aspera nostras*, the white-horse. 4. *Squatina*, the angel, or monk-fish. 5. *Rana piscatrix*, the toad-fish, or sea-devil.

III. Of the *plain spinous* kind, 1. *Rhombus maximus asper squamifus*, called the turbot, or brent. 2. *Rhombus non aculeatus squamifus*, in Cornwall called the *Lug-alef*. 3. *Passer Bellini*, the plaice. 4. *Passer asper sive squamifus*, the dab. 5. *Passer fluviatilis sive amphibiis*, the flounder, fluke, or butt. 6. *Hippoglossus Rondeletii*, the holy but, called in the north, the *turbot*. 7. *Buglossus*, or *solea*, the sole.

IV. Of the *Eel* kind we have, 1. *Lampetra major*, the lamprey, or lamprey-eel. 2. *Lampetra parva*, and *fluviatilis*, the lampern. 3. *Anguilla*, the common eel. 4. *Conger*, the conger, or sea-eel. 5. *Ammodytes Gessneri*, the sand-eel, or lancee. 6. *Gunnellus cornubiensis*, the butter-fish. 7. *Muskela vulgaris* Ron-

deletii, the sea-toach, or whistle-fish. 8. *Muskela fluviatilis*, the eel-pout, or turbot. 9. *Lupus marinus*, the wolf-fish, or sea-wolf. 10. *Alauda non cristata*, the sea-lark, called in Cornwall *mulgranock*, and *bulcard*. 11. *Alauda cristata*, the crested sea-lark. 12. *Liparis Rondeletii*, Rondeletius's butter-fish. 13. *Gobio fluviatilis*, the bull-head, or miller's-thumb. 14. *Scorpaena Bellonii similis*, the dutch pots-hog; the Cornish boys call it *father-lasher*.

V. Of the kind of fishes wanting the belly pair of fins, we have 1. *Mola Sabiani*, the sun-fish. 2. *Acus Aristotelis species major*, the tobacco pipe fish. 3. *Acus Aristotelis congener*, the sea-adder. 4. *Xiphias seu gladius piscis*, the sword fish.

VI. Of the *non-spinous* kind of fishes, with three unsprickly soft fins on their backs, we have, 1. *Ascellus vulgaris major*, the cod-fish, or kaling. 2. *Huitingo-Pallacus*, the whitening pollack. 3. *Ascellus niger*, the coal-fish, or rawling pollack. 4. *Ascellus luscus*, the bib, or blinds. 5. *Asinus antiquorum*, the laddock. 6. *Ascellus mollis major*, the whitening.

VII. Of the *non-spinous* kind, with only two soft fins on their backs, are found with us, 1. *Merlucius*, the hake. 2. *Ascellus longus*, the ling. 3. *Thynnus*, or *thunus*, the tunny, or Spanish mackerel. 4. *Scomber*, the mackerel. 5. *Thymallus*, the gragling, or umber. 6. *Albula salmoni similis*, the guinnad. 7. *Albula borengi formis*, the schelly. 8. *Salmo*, the salmon. 9. *Salmulus*, the samlet, or bramin. 10. *Salmo griseus*, the gray. 11. *Trutta salmnauta*, the salmon trout. 12. *Trutta lacustris*, the scurl, or bull-trout. 13. *Trutta fluviatilis dum genarium*, the trout. 14. *Umbra minor Gessni*, the red charr, or Welch torgoch. 15. *Carpio lacus Beniaci*, the gilt, or gilt charr. 16. *Eperlanus seu viola*, the smelt. 17. *Gobius niger*, the rock-fish, or sea-gudgeon. 18. *Lumpus Anglorum*, the lump, or sea-owl. 16. *Cataphractus Schonfeldii*, in the west of England, a poggæ.

VIII. Of the *non-spinous* kind, with only one fin on the back, there are, 1. *Harengus*, the Herring. 2. *Harengus minor*, the pilchard, called also *calchis*. 3. *Encrasiobolus*, the anchovy. 4. *Aloja seu clupea*, the shad, or mother of herrings. 5. *Sardina*, the sprat or sparling, which is nothing else but the young herring. 6. *Acus vulgaris*, the gar-fish, or horn-fish. 7. *Sturio*, the sturgeon. 8. *Lucius*, the pike, or pickrel. 9. *Cyprinus*, the carp. 10. *Cyprinus latus*, the bream. 11. *Tinca*, the tench. 12. *Orfus Germanorum*, the rudd, orve, or nerling. 13. *Capito seu cephalus*, the chubb, or chevin. 14. *Barbus*, the barbel. 15. *Leuciscus*, the dace, or dore. 16. *Rutilus*, sive *rubellus*, the roach. 17. *Alburnus*, the bleak or bley. 18. *Gobius fluviatilis*, the gudgeon. 19. *Cobites fluviatilis barbata*, the loche. 20. *Varius*, sive *phoxinus lewis*, the pink, or minnow.

The last twelve of these are called *Malacostrami*, or *leather-mouthed fishes*; because they have no teeth in their jaws, but only deep down in their mouths.

IX. Of the *spinous* kind, with two fins on their backs, of which the foremost is aculeate, we have, 1. *Lupus*, the bass. 2. *Mugil*, the mullet. 3. *Gurnarnus griseus*, the grey gurnard. 4. *Hirundo Aldrovandi*, the tub-fish. 5. *Cuculus Aldrovandi*, the red gurnard, or rochet. 6. *Lyra prior Rondeletii*, the piper. 7. *Mullus major*, the sur-mullet. 8. *Draco sive araneus Plinii*, the spider. 9. *Trachurus*, the scad. 10. *Perca fluviatilis*, the perch. 11. *Faber piscis*, the dory, or doree.

X. Of the *aculeate* kind, with only one fin on the back, whose radii are some prickly, and some soft, there are, 1. *Aurata*, the gilt-head, or gilt-poll. 2. *Pagrus*, the sea-bream. 3. *Turdus*, vulgo the old-wife, or wrass. 4. *Perca fluviatilis minor*, sive *aurata*, the ruff. 5. *Piscis aculeatus vulgaris*, sive *pungitius Alberti*, the common prickle-back, or sharping, or bantickle. 6. *Piscis aculeatus minor*, the lesser prickle-back.

XI. Of the *cetaceous* kind, we reckon only, 1. *Balena Britannica antiquorum*, which seems now to be gone from our seas, and we scarce know what kind of fish it was. 2. *Balena vulgo Rondeletii*, the common whale, which is sometimes found stranded on our coasts, or rambles up our rivers. 3. *Delphinus antiquorum*, the dolphin, very rarely, but sometimes seen here. 4. *Phocæna*, the porpus, called by Schonfeld, the northern dolphin. See Supplement, under each of these several heads, CANIS, GALEUS, &c.

FISH, with regard to commerce, is distinguished into *dry*, *pickled*, *green*, and *red*.

Dry, or *salt FISH*, is that which is salted and dried, either by the heat of the sun, or by fire. Such principally are the cod, stock-fish, herring, and pilchard.

Green FISH is that lately salted, and which yet remains moist; as green cod, &c.

Pickled FISH is that boiled and steeped in a pickle made of salt, vinegar, &c. as salmon, cod, herring, mackerel, pilchard, anchovy, and oysters.

Red FISH is some fresh *Fish* broiled on the gridiron, then fried in oil of olives, and barreled up with a proper liquor, as new olive oil, vinegar, salt, pepper, cloves, and laurel leaves, or other herbs. The best *Fish* thus prepared are sturgeon and tunny.

FISH, considered as a food, makes a considerable article in the furniture of the table; and the breeding, feeding, catching, &c. thereof, make a peculiar art of no small moment in the economy of a gentleman's house and garden.

To this relate the ponds, fleys, &c. described in their proper places. See **FISH-pond**, **STEW**, &c. Some general rules and observations on the same subject may not here be unacceptable.

For the breeding of **FISH**, the quality of the pond, water, &c. proper for this end, is scarce determinable by any certain symptom, or rule: for some very promising ponds do not prove serviceable that way. One of the best indications of a breeding pond, is when there is good store of ruff and grazing about it, with gravelly shoals; such as horseponds usually have: and when a water takes thus to breeding, with a few millets and spawners, that is, males and females, two or three of each, a whole county may be stocked in a short time.

Eels and perch are of very good use to keep down the stock of *Fish*; for they prey much upon the spawn and fry of bred *Fish*, and will probably destroy the superfluity of them.

As for pike, perch, tench, roach, &c. they are observed to breed almost in any waters, and very numerously; only eels never breed in standing waters that are without springs; and in such are neither found, nor increase, but by putting in: Yet where springs are, they are never wanting though not put in. And, which is most strange of all, many say there is not in an eel the least token of propagation, either by milt, or spawn; so that how they are produced is a question very mysterious.

See **Supplement**, article **EEL**.

For the feeding of **FISH**, take the following remarks:

1. In a stew, thirty or forty carps may be kept from October to March, without feeding; and by fishing with trawls or fleys in March, or April, you may take from your great waters, to recruit the fleys: but you must not fail to feed all summer, from March to October again, as constantly as cooped chickens are fed; and it will turn to as good an account.

2. The constancy and regularity of serving the *Fish*, conduces very much to their well eating and thriving.

3. Any sort of grain boiled, is good to feed with, especially peas and malt, coarse ground: the grains after brewing, while fresh and sweet, are also very proper; but one bushel of malt, not brewed, will go as far as two of grains: chippings of bread, and orts of a table, steeped in tap-droppings of strong beer, or ale, are excellent food for carps. Of these the quantity of two quarts to thirty carps, every day, is sufficient: and to be fed morning and evening, is better than once a day only.

There is a sort of food for *Fish*, that may be called accidental, and is no less improving than the best that can be provided; and this is, when the pools happen to receive the wash of commons, where many sheep have pasture, the water is thus enriched by the soil, and will feed a much greater number of carps than otherwise it would do: and farther, the dung that falls from cattle standing in water in hot weather, is also a very great nourishment to *Fish*.

The best food to raise pikes to an extraordinary fatness is eels; and without them it is not to be done, but in a long time. Setting these aside, small perches are the best meat. Breams put into a pike pond, breed exceedingly, and are fit to maintain pikes; which will take care they do not increase overmuch: The numerous fry of roaches and rudds, which come from the greater pools into the pike-quarters, will likewise be good diet for them.

Pikes in all streams, and carps in hungry-springing waters, being fed at certain times, will come up, and take their meat almost from your hand.

The best feeding-place is toward the mouth of the pond, at the depth of about half a yard; for by that means the deep will be kept clean and neat; the meat thrown into the water, without other trouble, will be picked up by the *Fish*, and nothing will be lost: yet there are several devices for giving them food, especially peas; as a square board let down with meat upon it. When *Fish* are fed in the larger pools or ponds, where their numbers are great, malt boiled, or fresh grains, is the best food. Thus carps may be fed and raised like capons, and tench will feed as well; but perch are not for a stew in feeding-time.

As to the benefits that redound from the keeping of *Fish*, besides furnishing the table, and raising money, your land will be vastly improved, so as to be really worth, and yield more this way, than by any other employment whatsoever: For suppose a meadow of 2*l.* per acre; four acres in pond, will return every year a thousand fed carps, from the least size to fourteen or fifteen inches long; beside pikes, perch, tench, and other fry: the carps are saleable, and will bring six-pence, nine-pence, and perhaps twelve-pence a-piece, amounting in all to twenty-five pounds, which is six pounds five shillings per acre.

Royal **FISHES**, see the article **ROYAL FISHES**.

FISHES in astronomy, see the article **PRISCES**.

FISH-day, see the article **ABSTINENCE**.

FISHES, in heraldry, are of themselves of less esteem in a coat-armour, than beasts and fowls, as being posterior thereto in the

order of creation: but they sometimes become so dignified by the persons or families who bear them, as to be preferable to many birds and beasts.

Fishes are born divers ways; upright, embowed, extended, endoried, furnished of each other, fretted, triangled, &c. All *Fishes* born feeding, should be termed *devouring*. Those born directly upright, should be termed *hauriant*. And those born traverse the escutcheon, *naiant*.

FISHERY, a commodious place for *Fishing*; or a place wherein great quantities of *Fish* are caught.

The principal *Fisheries* of Europe, for salmon, herring, cod, and mackarel, are along the coasts of England, Scotland, and Ireland: for whales, about Greenland: for pearls, in the East and West-Indies, &c.

FISHERY, also denotes the commerce of *Fish*; more especially the catching them for sale. The *Fishery* makes a principal branch of the British commerce. A great quantity of vessels and fishermen are employed therein; and besides what is spent at home, above 200,000*l.* sterling is yearly returned, merely for herring and cod, exported to Spain, Italy, and several parts of the Mediterranean, and the islands of the Archipelago.

Yet are our countrymen reproached, and with a good deal of justice, for their remissness in this branch of trade. The advantageous situation of our coasts might be of immense benefit to us, did not we let our neighbours over-reach us therein. The Dutch, French, Hamburgers, &c. come yearly in large shoals, and not only take the fish from our own doors, but sell them to us for our money, when they have done.

Scotland suffers incredibly on this score: no country in Europe can pretend to rival it in the abundance of the finest fish, where-with its numerous harbours, loughs, rivers, &c. are stored. In the river Dee, it is said, an hundred and seventy head of salmon is not very extraordinary for a single draught of a net: and the pickled salmon sent hence, is allowed the best in Europe. The Scottish islands, especially those on the western side, do certainly lie most commodiously for carrying on the fishing trade to perfection.

King Charles the first began the experiment, in conjunction with a company of merchants; but the civil wars soon set it aside. King Charles the second made a like attempt; but having preferring occasion for money, he was persuaded to withdraw what he had employed in the *Fishery*; at which the merchants, joined with him, being displeas'd, did the like themselves.

Since the Union, several efforts have been made to retrieve it: and there has been long a corporation settled on that footing; and the Scotch *Fishery* is now likely to be put on a very advantageous footing.

COD FISHERY. — The *Cod* is a fish of passage, pretty large, with a great head; and teeth in the bottom of the throat; its flesh white; its skin brownish on the back, white under the belly, and covered with a few thin transparent scales.

It eats excellently, when fresh; and, if well prepared and salted, will keep a long time. This fish, thus prepared, is commonly eaten among us in lent, &c. under the denomination of *Salt-fish* or *Stock-fish*.

There are two kinds of salt cod; the one called *green*, or *white*; and the other *dried*, or *curd*: though it is all the same fish, only differently prepared. —

Green Cod. — The chief *Fisheries* for *green Cod* are in the bay of Canada, on the great and little Bank, near the coast of Newfoundland, the island of St. Peter, and the isle of Sable: and hither vessels are yearly sent from divers parts both of America and Europe.

The vessels used herein are from an hundred to an hundred and fifty tuns burthen; and these will bring thirty, or thirty-five thousand fish a-piece.

The most essential articles in this *Fishery* are the persons who know how to open the fish, to cut off the heads, and to salt them; upon the ability of which last the success of the voyage chiefly depends.

Several authors will have it, that the Biscayans, in pursuing their whales, made the first discovery of the great and little Banks of *Cods*, at Newfoundland, Canada, &c. a hundred years before Columbus's time; and that it was a Biscayan Newfoundland-lander, that gave the first intimation thereof to Columbus.

Others say, that the great Bank was discovered by a native of St. Malo's, named Cartier. But, be the inventor of what name or nation he will, the invention is certainly highly valuable: there is not a trading nation in Europe, but allows the commerce of *Cod-fish* one of the most secure and gainful that is known.

The best, largest, and fattest *Cod*, are those taken on the south side of the great Bank, which is a kind of submarine mountain, one hundred and fifty miles long, and fifty broad, and at the distance of twenty five from Newfoundland: those on the north side are generally much smaller.

The best season is from the beginning of February, to the end of April; at which time *Cod*, which during the winter had retired to the deepest parts of the sea, return to the Bank, and grow very fat.

Those caught from March, to June, keep well enough; but those in July, August, and September, soon spoil.

The fishing is sometimes done in a month, or six weeks; and sometimes it holds six months. As lent draws on, if the fishermen have but half their cargo, they strive who shall make homeward the fish; the market being then the best.

Some will thus make a second voyage, before others have got loading for the first. Each fisher only takes one cod at a time; and yet the more experienced will take from three hundred and fifty to four hundred per day: but this is the most; for it is very fatiguing work, both on account of the weightiness of the fish, and of the extreme cold which reigns on the bank.

The salary usually allowed the captain and sailors, is one third of the *Cod* they bring home found.

They salt the *Cod* on board. The head being cut off, the belly opened, and the guts taken out, the salter ranges them in the bottom of the vessel, head to tail; and having thus made a layer thereof, a fathom or two square, he covers it with salt: over this he lays another layer of fish, which he covers as before; and thus he disposes all the fish of that day, taking care never to mix the fish of different days together.

By that time the *Cod* has lain thus to drain three or four days, they are moved into another part of the vessel, and salted a-fresh. After this, they are no more to be touched, till the vessel have its burden.

Sometimes they put them up in barrels, for the convenience of carriage.

Dry Cod.—In the fishing of *dry Cod*, vessels of all sizes are used; though such are generally chose, as have large holds, by reason this sort of fish incumbers more than it burdens.

As *Cod* is only to be dried by the sun, the European vessels are obliged to put out in March, or April, to have the benefit of the summer for drying. Indeed, we send vessels for *Cod* in June, and July; but those only buy what had been fished and prepared by the inhabitants of the English colonies of Newfoundland, and the neighbouring parts; in exchange for which, we carry them meal, brandies, biscuits, pulse, molasses, linen, &c.

The principal *Fishery* for *dry Cod* is along the coast of Placentia, from Cape-Rose, to the Bay des Experts; in which compass there are divers commodious ports for the fish to be dried in.

The fish intended for this use, though of the same kind with the green cod, is yet much smaller; whence it is the fitter to keep, as the salt takes more hold.

The method of fishing is much the same in both; only this latter is the more expensive, as it takes up more time, and employs more hands; and yet scarce half so much salt is spent in this, as in the other.

When several fishing vessels meet, and intend to fish in the same port; he whose sloop first touches ground, becomes entitled to the quality and privileges of admiral; he has the choice of his station, and the refusal of all the wood on the coast at his arrival.

As fast as the captains arrive, they unrig all their vessels, leaving nothing but the shrouds, to sustain the masts; and in the mean time the mates provide a tent on shore, covered with branches of fir, and sails over them; with a scaffold, fifty, or sixty foot long; and one third as much broad. While the scaffold is making ready, the crew are a fishing; and as fast as they catch, they bring their fish, open them, and salt them on moveable benches: but the main salting is performed on the scaffold.

When the fish have taken salt, they wash them; and to drain them again, lay them in piles on the galleries of the scaffold; when drained, they range them on hurdles, a fish thick, head against tail, with the back uppermost; observing, while they lie thus, to turn, and shift them four times every twenty four hours.

When they begin to dry they lay them in heaps, of ten or twelve a-piece, to retain their warmth; and continue to enlarge the heap every day, till it becomes double its first bulk: at length they join two of these heaps into one, which they turn every day, as before. Lastly, they salt them over again; beginning with those that had been salted first; and thus lay them in huge piles, as big as hay-stacks.

In this manner they rest: till they are carried a shipboard, where they are laid on branches of trees, disposed for that purpose in the bottom of the vessel, with mats all around, to prevent their contracting any moisture.

There are four kinds of commodities drawn from *Cod*, viz. the tripes, and tongues, which are salted at the same time with the fish, and barrelled up: the rows, or eggs, which being salted and barrelled up, serve to cast into the sea, to draw fish together, and particularly pilchards: and lastly, the oil, which is used in dressing of leather, &c.

The Scots catch a small kind of *Cod* on the coasts of Buchan, which is highly prized, though very much like ling. They salt it, and dry it in the sun, upon rocks; and sometimes in the chimney: but the greatest part of it is spent at home.

Herring Fishery.—The *Herring* is a small salt-water fish, with a blueish back, and a white silvered belly, not unlike

a little shad fish; whence it is called in Latin *Alsa minor*. Rondeletius calls it *Harengus*.

It is a popular error to believe the *Herring* to be the *Halec* of the Romans. The *Halec* was no particular fish, but a kind of sauce, made of any sort of salt fish. The modern *Herring* seems to have been unknown to the antients: it is neither the *Halec*, nor *Halec*, nor *Moenis*, nor *Lencemenis*, nor the *Gerres* of Pliny. See Rondelet. *De Piscib. marin.* l. v. c. 13. and Vossius *De Idol.*

Herrings are chiefly found in the north sea. It is true, there are *Fisheries* elsewhere, but none so copious.

They usually make two fishing seasons for *Herrings*; the first in June, July, and August; the second in autumn: the latter of these is the more considerable, on account of the fogs, which are very favourable to this kind of fishing.

It is commonly said, that no body ever saw a *Herring* alive; and that they die the minute they are taken out of the water: but there are instances to the contrary.

The *Herring* is a fish of passage; so that 'tis allowed to catch them on holidays, and Sundays: in the *Decretal* there is an express chapter to this effect. They go chiefly in shoals, and are fond of following any fire, or light; and in their passage they resemble a kind of lightning themselves.

The Hollanders were the first who began the *Herring Fishery*, and observed the several seasons of their passage. Their first regular fishing is fixed to the year 1163.

The method of salting and barrelled them, was not discovered till the year 1416. tho' others date it from the year 1397. Willoughby, in his history of *Fishes*, observes, that Will. Buckelz, or Bachalen, a native of Bier Uliet, rendered his name immortal, by the discovery of the secret of curing and pickling *Herring*: He adds, that the emperor Charles V. coming into the Low Countries, made a journey to the isle of Bier Uliet, with the queen of Hungary, on purpose to view the tomb of this first barreller of *Herring*.

The Dutch begin their *Herring Fishing* on the 24th of June, and employ no less than two thousand vessels therein. These vessels are a kind of barks, called *Busses*, carrying from forty-five to sixty tun, and two or three small cannon.

None of them are allowed to stir out of port without a convoy; unless there be enough of them together, to make eighteen or twenty pieces of cannon: in which case they are allowed to go in company. Before they set out, they make a verbal convention; which has the same force, as if it were in writing.

These regulations of the admiralty of Holland are partly followed by the French, and other nations; and partly improved, and augmented with new ones: as, that no fisher shall cast his net within a hundred fathoms of another boat: that while the nets are cast, a light shall be kept on the hind part of the vessel: that when a boat is by any accident obliged to leave off fishing, the light shall be cast into the sea: that when the greater part of a fleet leaves off fishing, and casts anchor, the rest shall do the same, &c.

The manner of fishing has nothing particular in it. The nets wherein the fish is drawn, should, regularly, have their meshes an inch square, that none of the lesser fry may be taken.

The commerce of *Herring*, both white, i. e. pickled, and red, is very considerable; but there are so many different sorts prepared, in such different ways, and different places, that it is hard to say any thing precise thereupon.

The white herrings cured by the Dutch are in the greatest repute: they are distinguished into four kinds, according to their sizes. The goodness of this commodity consists in its being fat, fleshy, firm, white; salted the same day it is taken, and with good salt, and well barrelled.

The Irish *Herring* are the next in value after those of Holland; and principally those of Dublin, which are scarce inferior to the best *Herring* of Rotterdam or Enkuyzen. The Scotch *Herring* is not so well prepared, gutted, salted, nor barrelled as the Dutch; and yet its taste is excellent: nor is it doubted, but that if the Scots were as careful in these circumstances as their neighbours, their *Herring* would be the best in the world. The *Herring* fished in England is inconsiderable; the fish being too dry for the market.

Curing and preparing Herring.—1^o For *White* or *Pickled Herring*: As soon as the *Herring* are taken out of the sea, one of the crew, appointed for this office, cuts them open, and takes out the guts, and every thing but the milts and roes, which are always to be left in the body of the fish. Then, washing them in fresh water, they are left the space of twelve or fifteen hours in a tub full of strong brine made of fresh water, and sea salt.

When they are taken out, they drain them; and when well drained, put them up in barrels; taking care to dispose and range them evenly, in rows, or layers; pressing them well down; and strewing a layer of salt both at top, and bottom.

When the barrel is full, they stop it up very close; that no air may get in, nor any brine out; either of which is very prejudicial to the fish.

2^o For *Red-Herrings*: The fish being caught, they proceed to

to wash, gut, and lay them in brine, as for pickled-herring; only they let them lie double the time in brine, *viz.* twenty-four hours; inasmuch as they are to take all their salt here, whereas the other kind takes half its salt in the barrel.

When the *Herrings* are taken out of the brine, they spit them, *i. e.* firing them by the head on little wooden spits, and thus hang them in a kind of chimney, made for the purpose; and when the chimney is as full as it will hold, which less than ten or twelve thousand feldom effects, they make a little fire underneath of brush-wood, which yields a deal of smoke, but no flame.

Here the *Herring* remain, till sufficiently smoked, and dried; which ordinarily is in twenty-four hours. Then they are taken down, and barrelled up for keeping.

Their goodness consists in their being large, fresh, fat, oily, soft, and pliable; their outside of a yellow, golden colour; their having roes, or milt, within them, and being well salted and barrelled.

Mackarel FISHERY.—The *Mackarel* is a salt-water fish; without scales. Its body is round, and fleshy; terminating almost in a point, at each extreme.

Some persons well skilled in the naval architecture, hold its figure the most commodious for swimming of all others, and propose it as a model for the building of ships.

It is ordinarily about a foot long: when in the water, it appears yellow: and when out of it, of a silver white, excepting for streaks, or speckles of a deep blue, on the back, and sides.

The *Mackarel* is found in large shoals, in divers parts of the ocean; but especially on the French and English coasts.

The fishing is usually in the months of April, May, and June, and even July, according to the place. They enter the English channel in April, and proceed up to the straits of Dover, as the summer advances; so that by June they are on the coasts of Cornwall, Sussex, Normandy, Picardy, &c. where the *Fishery* is most considerable. They are an excellent food, fresh; and not to be despised, when well prepared, pickled, and put up in barrels.

Naturalists have observed, that the water wherein *Mackarel* has been boiled, often yields a light, after stirring it a little.—

The fish is taken two ways; either with a line, or nets: the latter is the more considerable; and is usually performed in the night-time. The rules observed in the fishing for *Mackarel* are much the same as those already mentioned in the fishery of herrings.

There are two ways of pickling them: The first is, by opening and gutting them, and filling the belly with salt, crammed in as hard as possible with a stick: Which done, they range them in frata or rows, at the bottom of the vessel, strewing salt between the layers.

In the second way, they put them immediately into tubs full of brine, made of fresh water, and salt: and leave them to steep, till they have imbibed salt enough to make them keep: After which they are taken out, and barrelled up; taking care to press them close down.

Pearl FISHERY.—See the article *PEARL Fishery*.

Pilchard FISHERY.—The *Pilchard* is a small salt-water fish, bigger than the anchovy; but less than the herring, which in other respects it resembles. Its head is yellow; its belly white; and its back a sea-green. It eats admirably, fresh, or lightly salted.

There are certain seasons for fishing the *Pilchard*; which, like the herring and anchovy, is a fish of passage. They are prepared and salted much as the anchovy is; with this difference, that the head is cut off the latter: But the *Pilchard* were distinguishable from the anchovy, even though its head were off likewise; the *Pilchard* having a very flat back, and the anchovy a round one.

The chief *Pilchard Fisheries* are along the coasts of Dalmatia, to the south of the island Isea; on the coasts of Bretagne, from Bell-island as far as Brest; and along the coasts of Cornwall and Devonshire.

That on the coasts of Dalmatia is so plentiful, that it not only furnishes all Greece; but a great part of Italy. That on the coasts of Bretagne, employs yearly above three hundred sloops, and most of the seamen of the country.

The fish caught on our own coasts, though bigger, are not so much valued, as those on the coasts of France; owing principally to their not being so thoroughly cured. The season is from June to September.

The *Pilchards* naturally follow the light; and will gather about a boat that bears a light in the night-time; which contributes much to the facility of the *Fishery*.

On the coasts of France they make use of the roes of cod-fish, as a bait; which, thrown into the sea, makes them rise from the bottom, and run into the nets, placed for that purpose.

On our coasts, there are persons posted a-shore, who spying by the colour of the water where the shoals are, make signs to the boats, to get among them, to cast their nets.

When taken, the fish are brought to a warehouse on shore, where they are laid up in broad piles, supported by backs and sides.

As they pile them, they salt them with bay-salt; in which lying

soaking twenty or thirty days, they run out a deal of blood, with dirty pickle, and bitter; which last draws a deal of the oil from the fish, to the great loss of the owners. When taken out of the pile, there remains a deal of salt, blood, scales, &c. at bottom, which, with fresh salt, serves for another pile.

They now proceed to wash them in sea-water to clear off the dirt, and blood; and when dry, they put them up in barrels, and press them hard down, to squeeze out the oil, which issues away at an hole in the bottom of the cask: And in this state they are fit for sale, or use.

Salmon FISHERY.—The *Salmon*, according to some, breeds in the sea; but the opinion of others seems better warranted, that it breeds in the clear sandy parts of rivers, not far from the mouths thereof. They commonly spawn in October, and the young becomes a *Samblet* the following year, and in a few months after a large *Salmon*. The milt and spawner having performed their office, betake themselves to the sea; and if their return be prevented by weas, or the like, they become sick, lean, and pine away, and die in two years time. If they spawn in the mean time, the produce is a diminutive *Salmon*, called *Skegger*, which will never arrive at the natural bulk; it being the sea that makes them grow big, and the rivers fat. The female is distinguished from the male, in that its nose is longer and more hooked, its scales not so bright, and its body speckled over with dark brown spots; its belly flatter, and its flesh not so red; more dry, and less delicious to the taste. In spawning time, when they repair from the sea up to the rivers, scarce any thing can stop their progress. Many have seen them leap up cataracts and precipices, many yards high.

The chief *Salmon Fisheries* in Europe, are along the coasts of England, Scotland, and Ireland. The fishing usually begins about the first of January, and ends by the last of September. It is performed with nets, in the places where the rivers empty themselves into the sea; and along the sea-coasts there about.

The fish are seen to crowd thither frequently in shoals from all parts, in search of the fresh water: They also fish for them higher up in the rivers; sometimes with nets; and sometimes with a kind of locks, or weas, made for the purpose, with iron grates therein, so disposed, as that the fish, in going up the river, open them with their head; but are no sooner entered, than the gate claps to. Thus the *Salmon* are inclosed as in a reservoir, where it is easy taking them. In some places they fish for *Salmon* in the night-time, by the light of torches, or kindled straw. The fishermen watch when the fish draws towards the light, whereof he is naturally a great lover, and strikes him with a spear, or lifer. In some parts of Scotland, it is said, they ride a-fishing up the rivers, and when they spy them in the shallow parts, shoot them with fire-arms.

When the fish are taken, they open them; take out the guts and gills, and salt them, in large tubs for the purpose: Out of which they are not taken before October, to be packed up in casks from three to four hundred and fifty pound weight.

Salmon is also fished for in rivers, after the manner of trout, with a line and hook. He bites best in the afternoon, about three, in May, June, July, and August; the water being clear, and a little breeze of wind stirring; especially if the wind and stream set contrary-ways. The *Salmon* is caught like a trout, with worm, fly, and minim; and especially the garden-worm, if well scoured, and kept twenty days in moss. The *Salmon* never stays long in a place, but is continually shifting to be as near the spring head as possible, and swimming generally in the deepest and broadest parts of the rivers, near the ground. Put two, or three garden-worms well scoured on your hook at once, as if you were baiting for trout; and be sure to give him time to gorge his bait, before you strike. Some use a wire-ring on the top of the rod, through which the line may be let run to any length at pleasure, by a reel near the hand.

Sturgeon FISHERY.—The *Sturgeon* is a large sea-fish, which at its season runs up the rivers; having a sharp-pointed snout, a flat belly, and bluish back. *Sturgeons* are reckoned among the number of royal fishes; and when left on shore, they belong to the King: but when taken out at sea, they are the property of the person who takes them.

There are *Sturgeons* of all sizes; and we even read of some twenty-foot long: but the middle size are reckoned the best. Tho' some prefer the smaller.

It is of the roe, or eggs of this fish that the *Cavear*, or *Kavia*, so much prized by the Italians, &c. is prepared.

Sturgeons, when fresh, eats deliciously. To make it keep, they salt or pickle it in large pieces, and put them up in cags, from twenty-five to fifty pounds.

The greatest *Sturgeon Fishery* in the world, is in the mouth of the *Volga*, in the *Caspian* sea; where the *Muscovites* find employment for a great number of men.

They are not caught in nets, but in a kind of inclosure, formed by huge stakes, disposed in triangles, representing the letter *Z* several times repeated. These sort of *Fisheries* are open on the side towards the sea, and close on the other; by which means the fish, ascending in its season up the river, embarrasses itself in these narrow, angular retreats, and not be-

ing able to turn itself, to go back again, by reason of its balk, is easily struck, and killed with a sort of harping iron. The chief object of this *Fishery* is the roe or spawn; which is a commodity as much used in Mufcovy, as butter in Holland; and there are some *Sturgeons* that furnish each four hundred pounds thereof. It is only the lesser and younger *Sturgeon* that they pickle for eating.

Whale FISHERY, or Greenland FISHERY.—This huge fish, we have elsewhere observed, is chiefly caught in the north sea. The largest fort are found about Spitzberg, some of them being three hundred foot in length. Those on the coasts of America are about ninety, or an hundred; and those on the coasts of Guyenne, and the Mediterranean, are the smallest of all.

The Dutch have, upwards of these hundred years, had the *Whale Fishery* almost to themselves; and it is now esteemed one of the principal branches of their flourishing trade. The chief merchants of the several provinces associate themselves into a body, for the carrying it on; and send every year a great fleet of vessels to the north seas for that purpose. They attempted to make their first establishments in Greenland; but not succeeding, they have since fixed their *Fishery* about the western coast of Spitzberg, from the latitude of 76 deg. 40 min. to 80 deg.

In the year 1725, the English South-Sea company began to share it with them; and by the extraordinary success they met withal in their first attempt, beyond any of their neighbours, have been induced to persist in it.

To give some idea of the manner and importance of this trade, we shall here subjoin the discipline of a long time observed in the *Whale Fishery*; the method of fishing; the cargo and equipage of a vessel; and the produce thereof.

The discipline is adjusted by a standing regulation, consisting of twelve articles; the principal whereof, are:

That in case a fishing vessel be shipwreck'd, and the captain and crew saved, the next vessel they meet shall take them in; and the second vessel take half of them from the first: but that no vessel shall be obliged to take any of the loading of a vessel shipwreck'd: that what effects of a shipwreck'd vessel, which are absolutely relinquish'd, another captain shall find, and take up, upon his arrival in Holland he shall account for one half of them to the proprietors of the shipwreck'd vessel, clear of all expences: that if the crew desert a shipwreck'd vessel, they shall have no claim to any of the effects saved; but the whole shall go to the proprietor; but if they be present, when the effects are saved, and assist therein, they shall have one fourth thereof: that if a person kill a fish on the ice, it shall be reputed his own, so long as he leaves any person with it; but the minute he leaves it, it becomes the due of the first captain that comes that way; but that if a fish be tied to an anchor, or a rope fastened to the shore, it shall remain to its first proprietor, though he leave it alone: that if any person be wounded, or limed in the service, the commissioners of the *Fishery* undertake to procure him a reasonable satisfaction; to which the whole fleet shall contribute.

Beside this general regulation, which all the captains, pilots, and masters of vessels are obliged to swear to be observed, before they put to sea; there is also a particular one for each ship's crew, which they are all sworn to execute, in presence of one of the commissioners, who goes aboard every ship, to receive the oath.

This regulation is a kind of charter-party, importing, that they will attend prayers morning and evening, on pain of an amercement, at the discretion of the captain: that they will not get drunk; nor draw their knives, on forfeiture of half their wages; nor fight, on forfeiture of the whole: that no body shall lay wagers, on the good or ill success of the fishing; nor buy, or sell, on these conditions, in case we take one or more *Fish*, on penalty of twenty-five florins: that they will be contented with the provisions allowed them: and that they will never light fire, candle, or match, by night or day, without the captain's leave, on the like penalty.

After the reading of this regulation, the crew are all called, to receive the customary gratuity before their setting out, with an assurance of another sum at their return, in proportion to the success of the fishing.

The captain, on this occasion, receives from an hundred, to an hundred and fifty florins; the pilot, from forty, to sixty; each harpiner, from forty, to fifty florins; the other officers, from twenty-six, to thirty-six florins; the elder sailors twenty; and the younger twelve.

The fleet, which consists mostly of fluyts, from two, to three hundred tons, and from thirty-five men to forty-one, usually sets sail about the beginning of April, and takes its course by the isles of Iceland, from 60 to 61 degrees of latitude; after which, leaving them to the west, it steers northward, through 73, 74, and 75 deg. of lat. where they begin to find the ice.

It is among these huge heaps of ice, wherewith the whole quarter is filled, that they first begin to spy the *Whales*; and there most of the vessels fix their abode for the fishing.—But,

as the fish are larger and fatter, the further north they go; some captains will venture as far as 80, or 82 deg. of north lat. Each vessel of three hundred tons has six shalloops; and each shalloop has six harpincers, with five seamen to row it. To every shalloop there are seven lines, of three inches circumference; five of them in the hind-part of the vessel, and two before. The hind lines together make six hundred fathoms, and with the addition of the other two, eight hundred and eighty. If the *whale* dive deeper, or run further underneath the ice than this stint, the line must be cut, lest the shalloop be drawn after it.

The instrument, wherewith the whale is struck, is a harping iron, or javelin, five or six foot long, pointed with steel, in a triangular shape, like the barb of an arrow.

The harpincer, upon sight of the fish, from one end of the shalloop, where he is placed, flings the harping iron with all his might against its back; and if he be so happy as to make it penetrate the skin and fat, into the flesh, he lets go a string fastened to the harping iron, at the end whereof is a dry gourd, which swimming on the water, discovers whereabouts the *whale* is; who, the minute he is struck, always plunges to the bottom.

If the *whale* return to breathe in the air, the harpincer takes occasion to give him a fresh wound; till, fainting by the loss of blood, the men have an opportunity of approaching him; and thrusting a long steel lance under his gills into his breast, and through the intestines, which soon dispatches him: and when the carcass begins to float, they cut off the fins and tail; and tying a rope to the place where the tail was, they swim to the vessel, where he is taken in.

When they have got their quota of *whales*, they begin to take the blubber, or fat, and the fins, as they are call'd, or *whale-bone*.

In order to this, the *whale* is hoisted over-board, and kept suspended above the water, by two ropes, the one tied around his neck, the other about his tail; and under the carcass are two shalloops, placed to receive what may chance to drop.

This done, three or four men go down upon the *whale*, with a kind of calkers, or irons on their feet, to prevent their slipping. They begin to open him on the side, and proceed downwards to the belly; cutting off all the lard or fat, in pieces of about three foot broad, and eight long: beside the fat on the sides, they likewise cut off that of the throat, and the under lip, leaving all the lean behind.—They next proceed to the *whale-bone*, which they cut off with a hatchet, made for the purpose, from the upper jaw of the fish, and make it up in packets. The fat and bone thus procured, what remains of the *whale*, they leave for the bears, who are very fond of it.

In proportion as the large pieces of fat are cut off, the rest of the crew are employ'd in slicing them smaller, and picking out all the lean. When this is prepared, they stow it under the deck, where it lies, till the fat of all the *whales* is on board: then, cutting it still smaller, they put it up in tubs, in the hold, or bottom of the vessel, cramming them very full and close.

Nothing now remains, but to sail homewards, where the fat is to be boiled, and melted down into train oil.

Produce of one year's Whale FISHERY.—To state the produce, we make choice of the *Fishery* of 1697, as being one of the greatest, and most fortunate, that ever was known: to which we shall add that of the year 1725.

In the year 1697. there were an hundred and ninety-seven vessels of divers nations; whereof an hundred twenty-nine were Dutch; forty-seven Hamburgers; two Swedish; four Danish, twelve of Bremen; two of Embden; and one of Lubeck.

In the year 1725. there were two hundred and twenty-six vessels; whereof one hundred and forty-four were Dutch; twelve English; forty-three Hamburgers; twenty-three of Bremen; two of Berghen; two of Flensburg. Their captures each year were as follow.

In 1697.		
129 Dutch vessels took	—	1255 whales.
47 Hamburgers	—	449
2 Swedes	—	113
4 Danes	—	52
12 Bremen	—	96
2 Embden	—	2
1 Lubeck	—	1
In all, 197 vessels took	—	1968
In 1725.		
144 Dutch vessels took	—	248½ whales
12 English	—	257
43 Hamburgers	—	46
23 Bremen	—	29
2 Berghen	—	0
2 Flensburg	—	0
In all, 226 vessels took	—	349

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The Dutch captures	in 1697.	produced	41344	punchcons of
The Hamburgers	—	—	16414	(blubber
The Swedes	—	—	540	—
The Dines	—	—	1710	—
The Bremeners	—	—	3790	—
The Embdeners	—	—	28	—

The English captures in 1725. produced 1000 punchcons of blubber, and 20 tons of whale-bone.

Now, estimating the punchcon of blubber at thirty florins Dutch, or 2*l.* 15*s.* English, the current price in the year 1697. the total produce of the year's *fish*ing amounts to 175521 *l.* 10*s.* sterling.—As to fins, or *Whale*-bones, setting them at two thousand weight per *Whale*; and an hundred weight at 4*l.* 4*s.* they will yield 171233 *l.* which, added to the former sum, amounts to 346754 *l.* 10*s.* whereof the share belonging to the Dutch was 228737 *l.*

On the same footing might the produce of the *Fishery* of the other year be easily stated. It will come far short of that of 1697; which indeed vastly transcends what has ever been known: each vessel, taking one with another, caught that year ten *Whales* $\frac{1}{2}$, and the other year only one *Whale* $\frac{1}{2}$; though the English, more happy than the rest, caught above two a-piece. But it may be added, that the *Whales* of that year being larger and fatter than those of 1697. produced one with another forty punchcons of blubber; and those others only thirty three punchcons.

FISH-GARTH, according to Skinner, signifies an engine to take *Fish*; but it should rather seem to denote the dam or wear in a river, where these engines are laid and used.

FISH-GLUE; see the article **ICHTHYOCOLLA**.

FISHING, the act, or art of catching *Fish*.

Fishing, is distinguished, with regard to its instrument, into that performed with the net, for fish that go in shoals; and that with the hook, for solitary fish: Which latter is properly called *Angling*.

Fishing again, is distinguished, with regard to its object, into that performed in salt-water, and that in fresh. The first practised for whales, herring, cod, salmon, pearls, mackerel, and other sea fish. The latter practised for pike, trout, carp, tench, perch, dace, eels, &c.

The instruments principally used in *Angling*, or *Fishing* with the hook, are the rod, line, hook, and fly.

The points on which the art of *Fishing* chiefly turns, are the proper season, place, bait, and manner of application. What relates to each hereof, we shall here entertain the reader withal, in the several kinds of *Fishing*, chiefly practised among us.

Carp FISHING—The *Carp* is generally held the queen of fresh-water fish. It is exceedingly subtle, and of all others, the eel only excepted, lives longest out of water. Mr. Ray assures us, that in Holland they have a speedy way of fattening them, by hanging them up in a net in a cellar, and feeding them with white bread and milk. They breed several times in the year; for which reason we seldom meet with male or female, without either milk or spawn. Their natural place is some still water; in running waters they rarely, if ever, breed. To make them fat and large, it is a good way, when the pond is low, in April, to rake all the sides thereof with an iron rake, and sow hay-seeds thereon. By autumn there will be a crop of grass; which coming to be overflowed, as the pond rises, will be a fine feeding place for them.

A world of patience is required to angle for *Carp*, on account of their incredible policy. They always chuse to lie in the deepest places: They seldom bite in cold weather; and in hot a man cannot be too early, or too late for them. When they do bite, there is no fear of the hold. The baits are, the red-worm, in March; the cadew, in June; and the grasshopper in July, August, and September. Proper pastes may also be prepared for them; as honey and sugar, wrought together with flour, and thrown in pieces into the water, some hours before you begin to angle. Honey and white crumbs of bread mixed together do also make a good paste.

Chub FISHING—The *Chubin*, or *Chub*, is a fresh-water fish, with a large head. It spawns in March, and is very strong, though inactive, yielding in a very little time, after it is struck; and the larger it is, the quieter. His bait is any kind of worm, or fly, particularly the large yellow moth; also grains, cheese, the pith in the bone of an ox's back, &c. He affects a large bait, and variety of them at the same hook. Early in the morning angle for him with snails; but in the heat of the day chuse some other bait; and in the afternoon, fish for him at ground, or fly.

Dace, or Dare FISHING—These fish bite at any fly; but especially the stone cadew fly, or May fly, in the latter end of April, and most part of May; and the ant fly in June, July, August, &c. They rarely refuse a fly a-top of the water, in a warm day; but when you fish under water for them, it is best to be within a hand's breadth of the ground. To catch *Dace* in winter, the best bait is a white worm, with a large

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red head, gathered after the plough in heaths or sandy grounds.—The nostrums for roaches are also commended for *Dace*.

Eel FISHING—The *Eel* is a fresh-water fish, much in shape of a serpent: Naturalists have long been divided, as to the manner how it is produced; whether as they express it, by generation, or by corruption, as some suppose worms are, or by certain glutinous dew drops, which falling in May and June on the banks of some ponds and rivers, are by the heat of the sun supposed to be turned into eels. This is certain, that there is not any obvious appearance of sex or difference therein. Abr. Mylius, in a treatise of the *origin of animals*, describes a method of producing them by art. He says, that if you cut up two turis, covered with May dew, and lay one on the other, the grassy side inwards, and thus expose them to the heat of the sun, on the banks of a water, in a few hours time there will spring from them an infinite quantity of *Eels*: But this is absurd and erroneous.—The kinds of *Eels* are various: Some reduce them to four; the *silver Eel*; a *greenish*, called the *grey Eel*; a *blackish Eel*, with a broad flat head; and an *Eel with reddish fins*. The first is allowed to generate: It is viviparous, and the young, when it comes from the female, is no bigger than a small needle.

The *silver Eel* may be caught with divers baits; particularly powdered beef, garden-worms, or lob, minnows, hen's guts, fish, garbage, &c. But as they hide themselves in winter in the mud, without stirring out for six months, and in the summer they take no delight to be abroad in the day, the most proper time to take them, is in the night, by fastening a line to the bank-side, with a hook in the water. Or a line may be thrown at large with a good store of hooks baited, and plumbed with a float, to discover where the line lies, in the morning. A small roach is here well for a bait, the hook being laid in his mouth.—Another useful way of catching *Eels*, called *snigging*, is performed in the day time, by taking a strong line, with a hook baited with a lob, or garden-worm, and resorting to such holes and places, as *Eels* use to abscond in, near mills, weirs, or flood-gates; where, the bait being gently put into the hole, by help of a cleft stick, the *Eel* will certainly bite.—*Bobbing* for *Eels* is another method: In order to this, four some large lob, and with a needle run a twisted silk through them, from end to end, taking so many as may be wrapped a dozen times round a board. Tie them fast with the two ends of the silk, that they may hang in so many links. This done, fasten all to a strong cord, and about an handful and half above the worms fix a plummet, three quarters of a pound weight; and make the cord fast to a strong pole: *Fishing* with these in muddy water, the *Eels* will bite hastily at the bait. When you think they have swallowed it, gently draw up the line, and bring them ashore as soon as may be.—Others use an *Eel spear*, with three or four forks, or jagged teeth, which they strike at random into the mud.

Flounder FISHING—The *Flounder* is a flat sea or river fish; caught in April, May, June, and July, in any time of the day; in a swift stream, and sometimes also in the still deep. The best bait is red worms, wasps, and gentles.

Gudgeon FISHING—The *Gudgeon* is a small fish, of a very delicious taste. It spawns three or four times in the summer season, and feeds in streams, and on gravel; sighting all kind of flies: But is easily taken with a small red worm, *fish*ing near the ground: and being a leather-mouthed fish, will not easily get off the hook, when struck. The *Gudgeon*, may either be fished for with a float, the hook being on the ground; or by hand, with a running line on the ground, without cork or float. He will bite well at wasps, gentles, and cadworms, and one may even fish him with two or three hooks at the same time; which makes good sport. When you angle for *Gudgeons*, stir up the sand or gravel with a long pole, which will make them gather to the place, and bite the faster.

Perch or Perch FISHING—The *Perch* or *Perch* is hook-back'd, not unlike a hog; armed with stiff prickles, and his sides with dry thick scales: He is voracious, and will venture on his own kind; even with greater courage than the pike. He seldom grows much about a foot long: He spawns in February, or March, and bites best when the spring is far spent. The proper baits are, the branding, minnow, and small frog; as also the lob-worm, bob, oak-worm, gentle, wasp, and cad-bait. The minnow yields the best sport, which is to be alive, and stuck on the hook through the upper lip, or back fin, and kept swimming about mid-water. If the frog be used, he is to be fastened to the hook by the skin of his leg. When the fish bites, as he is none of the leather-mouthed kind, he must have time to pouch his bait. The best place to fish for him, is in the turning of the water eddy, in a good gravel bottom.

Pike FISHING—The *Pike* is reputed the tyrant of the fresh waters: By the common consent of naturalists, he is the longest lived of all fishes. The larger he is found, the coarser is his flesh; and to vice versa. This fish never swims in shoals, but always single; being very rapacious, and preying even on his own kind. The *Pike* spawns in February, and March.

March. The best fort is in rivers: The worst in meres and ponds. His ordinary food is frogs, and what fish he can lay hold on.

There are two ways of fishing for the *Pike*; by the *ledger-bait*, and the *walking-bait*. 1° The *ledger-bait* is that, fixed in one certain place, and which the angler may leave behind him. Of this kind, the best is some living bait, as a dace, roach, gudgeon, or a living frog. To apply it, if a fish, stick the hook through his upper lip; then fastening it to a strong line, ten or twelve yards long, tie the other end of the line to some stake on the ground, or bough of a tree, near the *Pike's* usual haunt; letting the line pass over the fork of a stick, placed for the purpose, suspending the hook, and about a yard of line in the water; but so, as that when the *Pike* bites, the fork may give way, and let him have line enough to go to his hold and paunch. If the bait be a frog, the arming wire is to be put in at his mouth, and out at his vent, and one of the legs to be stretched, or tied over the upper joint of the wire.— 2° The *walking-bait*, is that which the fisher casts in, and conducts with a rod, &c. This is performed by a troll, with a winch to wind it up withal. At the top of the rod is to be placed a ring for the line to be run through. The line, for two yards and a quarter next the hook to be of silk double, and armed with wire, the length of seven inches: On the flank of the hook is to be fastened a smooth piece of lead, so as to sink the fish bait, which is to be a gudgeon with its head downwards. Thus disposed, the bait is to be cast up and down; and if you feel the fish at the hook, give him length enough to run away with the bait, and paunch it: Then strike him with a smart jerk.— To fish with a dead bait, use a yellow frog, dace, or roach, anointed in gum of ivy, dissolved in oil of spike; and cast it where the *Pike* frequents. After it has lain a little while at the bottom, draw it to the top, and so up the stream, and you will quickly perceive a *Pike* in earnest pursuit thereof. This fish bites best about three in the afternoon, in clear water, with a gentle gale, from the middle of summer, to the end of autumn; but in winter all day long; and in the spring he bites best early in the morning, and late at night.— Another method of fishing for *Pike*, see under HUXING.

Roach FISHING.—The *Roach*, or *Rochet*, is no delicate, but a very silly fish. Those in rivers are more valued, than those in ponds; though the latter are much the larger. They spawn about the middle of May.

To angle for this fish in April, cads or worms are proper baits; so are small white snails or flies in summer. The bait is always to be under water; for this fish will not bite a-top. Others use a May fly, in that season, with good success. In autumn a paste must be used, made of the crumb of white bread, moulded with a little water, laboured with the hands into a tough paste, and coloured, not very deep, with red-lead. In winter, gentles are the best bait.— Sprouted malt; the young brood of wasps, and bees, dipt in blood; and the thick blood of sheep, half dried, are nostrums in this sort of *Fishing*.

Tench FISHING.—The *Tench* is a fine fresh-water fish, having very small scales, but large, smooth fins, with a red circle about the eyes, and a little barb hanging at each corner of the mouth. It takes more delight among weeds in ponds, than in clear rivers; and covets to feed in foul water. His slime is said to have a healing quality for wounded fish; upon which he is commonly called the *Fishes Physician*. When the carp, pike, &c. are hurt, it is said they find relief by rubbing themselves against the *Tench*.

The season for catching this fish, is in June, July, and August, very early, and late, or even all night, in the still part of rivers. His bait is a large red worm, at which he bites very eagerly, especially if first dipt in tar. He also delights in all sorts of pastes, made up of strong scented oils, or with tar: or a paste of brown bread and honey. Nor does he refuse the cad-worm, lob-worm, flag-worm, green gentles, cod-bait, or soft boiled bread grain.

Trout FISHING. The *Trout* is a delicious fresh-water fish, speckled with red and yellow; coming in, and going out of season with the buck, and spawning in the cold months of October and November; whereas all the other species spawn in hot summer weather. There are divers kinds of this fish, all valuable; but the best are the red and yellow *Trouts*; and of these the female, distinguished by a less head and deeper body, is preferred. They are known to be in season by their large backs; which may serve also as a rule for other fish. All winter long they are sick, lean, and unwholesome, and frequently lousy. As the spring comes on, deserting the still, deep waters, they repair to the gravelly ground, against which they continue to rub till they have got rid of their lice, which are a kind of worms, with large heads. From that time they delight to be in the sharp streams, and such as are swift; where they lie in wait for minnows and May flies. At the latter end of May they are in their prime.

The usual baits whereby the *Trout* is caught, are the worm, minnow, and fly, either natural, or artificial. The proper worms are the brandling, lob-worm, earth-worm, dung-

worm, and maggot, or gentle, especially the two first: but whatever worms are used, they are the better for keeping, which is to be done in an earthen pot, with moss frequently changed. For the minnow, slip the hook through his mouth, and the point and beard out at the tail, so as it may lie almost straight on the hook. Then try against the stream, whether it will turn. In defect of a minnow, a small loach may serve the turn; or for want of either, an artificial one may be made of cloth, by the life, which is found every whit as good a bait as the natural one.

FISHING-FLY, a bait used in angling for divers kinds of fish. See FISH and FISHING.

The *Fly* is either natural or artificial.

Natural Flies are innumerable: The more usual on this occasion are the *Dun-Fly*, the *Stone* or *May-Fly*, the *Red-Fly*, the *Moor-Fly*, the *Tawny-Fly*, the *Vine-Fly*, the *Shell-Fly*, the *Cloudy* and *Blackish-Fly*, the *Flag-Fly*; also *Caterpillars*, *Canker-Flies*, *Bear-Flies*, &c. all which appear sooner or later, according to the forwardness or backwardness of the spring.— To know the particular *Fly* the fish most covets, when you come in the morning to the river-side, beat the bushes with your rod, and take up what variety you can of all sorts of *Flies*; try them all, and you will quickly know which are in greatest esteem: Not but that fish will sometimes change their *Fly*; but it is only when they have glutted themselves therewith.

There are two ways to *fish* with natural *Flies*, either on the surface of the water, or a little underneath it.

In angling for club, roach, or dace, move not your natural *Fly* swiftly, when you see the fish make at it; but rather let it glide freely towards him with the stream: But if it be in a still and slow water, draw the *Fly* slowly sideways by him, which will make him eagerly pursue.

The artificial *Fly* is most successfully used in blustering weather, when the waters are so troubled by the winds, that the natural *Fly* cannot be seen, nor rest upon them.

Of this artificial *Fly*, there are reckoned ten principal sorts.

1. The *Dun-Fly*, in March, made of dun wool, and the feathers of a partridge wing.
2. A *Dun-Fly*, made of black wool, and the feathers of a black drake; the body made of the first, and the wings of the latter.
3. The *Stone-Fly*, in April, the body made of black wool dyed yellow under the wings, and tail.
4. The *Ruddy-Fly*, in the beginning of May; the body made of red wool, and bound about with black silk, with the feathers of a black capon, which hang dangling on his sides, next his tail.
5. The *yellow*, or *greenish Fly*, in June; the body made of black wool, with a yellow slit on either side, and the wings taken off the wings of a buzzard, bound with black broken hemp.
6. The *moorish Fly*; the body made of duckish wool, and the wings with the blackish mail of a drake.
7. *Tawny Fly*, till the middle of June; the body made of tawny wool, the wings made contrary one against the other, of the whitish mail of a white drake.
8. The *Wasp-Fly*, in July; the body made of black wool, cast about with yellow silk, and the wings of drakes feathers.
9. The *Steel-Fly*, in the middle of July; the body made of greenish wool, cast about with the feathers of a peacock's tail, and the wings made of buzzards wings.
10. The *Drake-Fly*, in August; the body made of black wool, cast about with black silk, his wings of the mail of a black drake, with a black head.

The best rules for artificial *fly-fishing*, are,

1° To fish in a river somewhat disturbed with rain; or in a cloudy day, when the waters are moved by a gentle breeze: The south-wind is best; and if the wind blow high, yet not so, but that you may conveniently guard your tackle, the fish will rise in plain deeps; but if the wind be small, the best angling is in swift streams.

2° Keep as far from the water-side as may be; fish down the stream, with the sun at your back, and touch not the water with your line.

3° Ever angle in clear rivers with a small *Fly*, and slender wings; but in muddy places use larger.

4° When, after rain, the water becomes brownish, use an orange *Fly*; in a clear day, a light coloured *Fly*; a dark *Fly* for dark waters, &c.

5° Let the line be twice as long as the rod, unless the river be incumbered with trees.

6° For every sort of *Fly*, have several of the same, differing in colour, to suit with the different complexions of several waters and weathers.

7° Have a nimble eye, and active hand, to strike presently with the rising of the fish; or else he will be apt to spew out the hook.

8° Let the *Fly* fall first into the water, and not the line, which will scare the fish.

9° In slow rivers, or still places, cast the *Fly* cross over the river, and let it sink a little in the water, and draw it gently back with the current.

Salmon Flies should be made with their wings standing one behind the other, whether two, or four. That fish delights

in the gawdiest colours that can be; chiefly in the wings, which must be long, as well as the tail.

FISHING-FLOATS, are little appendages to the line, serving to keep the hook and bait suspended at the proper depth to discover when the fish has hold of them, &c.

Of these there are divers kinds; some made of Muscovy duck quills, which are the best for slow waters; but for strong streams found cork, without flaws or holes, bored through with an hot iron, into which is put a quill of a fit proportion, is preferable: Pare the cork to a pyramidal form, and grind it smooth.

FISHING-HOOK, a little engine of steel wire, of a proper form to catch and retain fish.

The *Fishing-hook*, in general, ought to be long in the shank, somewhat thick in the circumference, the point even, and straight; let the bending be in the shank.

For setting the *Hook* on, use strong, but small silk, laying the hair on the inside of your *Hook*; for if it be on the outside, the silk will fret and cut it asunder.

There are several sizes of these *Fishing-hooks*, some big, some little, and of these some have peculiar names; as,

1^o, *Single-Hooks*. 2^o, *Double-Hooks*, which have two bendings, one contrary to the other. 3^o, *Snappers*, or *Gorgers*, which are hooks to whip the artificial fly upon, or to bait with the natural fly. 4^o, *Springers*, or *Spring Hooks*, a kind of double *Hook*, with a spring which flies open, being struck into any fish, and so keeps its mouth open.

FISHING-ROD, a long, slender rod, or wand, to which the line is fastened, for angling.

Of these there are several sorts; as,

1^o, A *Treller*, or *Trelling Rod*, which has a ring at the end of the rod, for the line to go through, when it runs off a reel. 2^o, A *Whipper*, or *Whipping Rod*, a top-rod, that is weak in the middle, and top-heavy, but all slender and fine. 3^o, A *Depper*, which is a strong rod, and very light. 4^o, A *Snapper*, or *Snop Rod*, that is a strong pole, peculiarly used for the pike. 5^o, A *Bottom Rod*, being the same as the *Depper*, but somewhat more pliable. 6^o, A *Snagging*, or *Poking Stick*; a forked stick, having a short strong line, with a needle, baited with a lob-worm: this is only for eels in their holes.

FISHING-VESSELS, or those used in the several fisheries at sea, or on the coasts, are the *Buffe*, *Coble*, *Cock*, *Dogger*, *Driver*, *Eel Boat*, *Fly Boat*, *Fluit*, *Hooker*, *Peter Boat*, *Smack*, *Strana Boat*, *Trawler*, *Trinker*, &c. which see

FISH-PONDS, reservoirs of water, for the breeding, feeding and preserving of *Fish*.

For *Fish-ponds*, it is agreed, those grounds are best, which are full of springs, and apt to be moorish: the one breeds them well, and the other preserves them from being stolen. The situation of the pond is also to be considered, and the nature of the currents that fall into it; likewise, that it be refreshed with a little brook, or with the rain-water that falls from the adjacent hilly ground. Add, that those ponds which receive the stale and dung of horses, and other cattle, breed the largest and fattest *Fish*.

In making the pond, observe that the head be at the lowest part of the ground; and that the trench of the flood-gate, or sluice have a good swift fall, that it may not be too long in emptying on occasion.

If the pond carry six foot of water, it is enough; but it must be made eight foot deep, to receive the freshes and rains that may fall into it.

It would also be advantageous to have shoals on the sides, for the fish to sun themselves in, and lay their spawn on; beside, in other places, certain holes, hollow banks, shelves, roots of trees, islands, &c. to serve as their retiring places. Consider farther, whether your pond be a breeder; if so, never expect any large carps from thence; the greatness of the number of spawn overstocking the pond.

For large carps a store-pond is ever accounted the best; and to make a breeding-pond become a store-pond, see what quantity of carps it will contain: then put in all milers, or all spawners; whereby in a little time you may have carps that are both large, and exceeding fat. Thus, by putting in but one sex, there is an impossibility of the increase of them.

Reserve some great waters for the head-quarters of the fish, whence you may take, or wherein you may put any quantity thereof. And be sure have stews and other auxiliary waters, so as you may convey any part of the stock from one to the other; so, to lose no time in the growth of the fish, but employ the water, as you do your land, to the best advantage. View the grounds, and find out some fall between the hills, as near flat as may be, so as to leave a proper current for the water: if there be any difficulty in judging of such, take an opportunity, after some sudden rain, or the breaking up of a great snow in winter, and you will plainly see which way the ground falls; for the water will take the true fall, and run accordingly.

The condition of the place must determine the quantity of ground to be covered with water. For example, we may propose in all fifteen acres, in three ponds; or eight acres in two,

and not less: and these ponds should be placed one above another, so as the point of the lower may almost reach the head or bank of the upper; which contrivance is no less beautiful than advantageous.

The head, or bank, which by stopping the current is to raise the water, and so make a pond, must be built with the clay and earth taken out of the pan, or hollow, dug in the lowest ground above the bank: the shape of the pan is to be an half oval, whereof the flat is to come to the bank, and the longer diameter to run square from it.

FISSURE, **FISSURA**, in chirurgery, a longitudinal fracture of a bone: or, a solution of the continuity of a bone, whereby it is only cloven or crack'd.

Fissures are of two kinds: the one apparent, by the Greeks called *ῥήγμα*, or *ῥήξις*; and by the Latins, *Sciffura*: the other so small, as not to be visible, called *τηριχμοειδης*, or capillary; as resembling a thread.

The causes of *Fissures* are falls, leaps, and contusions of the parts against hard bodies.

Fissures, especially in the cranium, either happen on the part where the stroke was given; or on the opposite part: that on the opposite part is called *Counter-Fissure*, or *Counter-cleft*, by the Greeks *αντιρηγμα*; and the Latins, *Resonans*.

Old men are more subject to *Fissures* than young ones; by reason that their bones are drier.

Fissures are difficult to find; but they are the easiest cured of all fractures: though if they be not known, or be neglected, they bring on ulcers and caries; and in such case become very dangerous: so that there is frequently a necessity of having recourse to the severest operations.

The signs of a *Fissure* of the cranium, are bilious vomitings; vertigos; fluxes of blood at the mouth, or nose; dumbness, delirium, &c. If there be any *Fissure* in the skull, the patient will feel a pain in the place, upon holding a string between his teeth, while the chirurgeon pulls it strongly.

In such cases it is frequently necessary to perforate the cranium, to give a vent for the blood and fumes.

FISTULA, in the ancient music, an instrument of the wind kind, resembling our flute, or fageolet.

The principal wind instruments of the antients, were the *Tibia*, and *Fistula*: though how these were constituted, or wherein they differed, or how they were played on, does not at present appear. All we know, is, that the *Fistula* was at first made of reeds, and afterwards of other matters. Some had holes, some none; some again were single pipes; others a combination of several; witness the *fyryng* of Pan.

FISTULA, in medicine, a deep, winding, callous, cavernous ulcer, with a narrow entrance, but opening thence into a spacious bottom; and generally yielding a sharp, and virulent matter.

Fistula's differ from simple sinus's in this, that the former are callous, and the latter not.

They attack all parts of the body without exception; but particularly the anus, foramen lachrymale, thorax, &c. The general cause of *Fistula's*, is some abscess, or ulcer, which either being inveterate, or having been ill treated, comes to be callous; the orifice being at first lined or incrustated therewith, and at length the whole sinus.

The cure consists in consuming the callous, and healing and consolidating the ulcer with cleansing medicines, and farcotics.

The antients gave the name *Fistula* to this sort of ulcers, from the resemblance they bear, on account of their depth, to a flute or pipe, called by the Latins *Fistula*.

FISTULA in ano, is a *Fistula* formed in the anus, or fundament.

Of this some authors reckon four kinds, *viz.* the *Cecum internum*, which is open outwards, but not into the rectum: the *Cecum externum*, which has an aperture into the rectum but none outwards: the *Complateat*, which opens both ways: and the *Cuniculatus*, or that with several sinus's, which discharge themselves into one common cavity, which is the fund, and, as it were, reservoir of them all.

Others, as Wiseman, reduce *Fistula's in ano* to two classes. The *first* are those, arising from a phyma: these are very painful, and difficult to cure; as entering deep amongst the interstices of the muscles, and forming various cuniculi, or sinus's; which, the more remote they are from the anus, the worse they are, by reason they do not allow of being cut.

The *second* owe their origin to an internal hemorrhage, or extravasation between the coats of the rectum; and have a small perforation, near the circumference of the anus, whence they yield a thin sanies, or ichor, without pain; they in time bringing on itchings and excoriations; and the orifices at length become callous, and are sometimes closed, and sometimes open again.

Some *Fistulae*, if they do no harm by the copiousness of the flux, the stench, or the like accidents, are a benefit to nature, as carrying off cachectic humours; and ought not to be cured but kept open. The fresh, simple *Fistula* may be cured without danger.

The chief way is by cutting; where that may be done without

out damage to the muscle of the anus, which might occasion an involuntary discharge of the excrements.
The cutting is either performed with a thread, or with a cutting instrument.

FISTULA Lachrymalis, is a *Fistula* in the greater canthus of the eye; this is frequently confounded with *Eglops*. See *EGLOPS*.

It is a little deep callous ulcer, in the greater caruncle, or the place of the glandula lachrymalis. It usually begins with an abscess, called *Anchilops*, which in time produces an ulcer, called *Eglops*, which afterwards degenerates into a *Fistula*. When pressed with the finger, it yields a stinking matter, not unlike the yolk of an egg; and the corrosive humour finding, or making itself a passage, there ensues a perpetual oozing.

Sometimes the os ethmoides itself is corroded, and rendered carious by it; in which condition it is supposed to be only curable by an actual cautery: sometimes it becomes cancerous; and then, Riverius directs all medicines to be laid aside. The cure of the *Fistula lachrymalis* is wholly external and surgical; except that evacuations and mercurials may be given internally; as also decoctions of the woods. Some in this case perforate the os nasi, to give room for the matter to be evacuated that way.

A French surgeon, named Anel, found out a new way, *viz.* by putting a probe and syringe of an inconceivable fineness, through the puncta lachrymalia into the facculus lachrymalis.

FISTULA * also denotes the pipe put into the cup, out of which the communicants antiently sucked the wine.

* *Divisa celestis cruce, altaria, serinia, — scularis*; *Fistulas, & ornamenta varia*. Flor. Wigorn. Anno 1087.

FISTULAR, or **FISTULOUS**, is applied by the chirurgeons to wounds and ulcers, which degenerate into fistula's.

Care must be taken, not to leave the tent too long in the wound, lest it render it callous and *stibulus*. Dionis.

FISTULAR is also applied to the leaves of plants, which are round and hollow within; as the leaves of leeks, &c.

FISTULAR Flowers, among herbalists, are those made up of many small, long, hollow flowers, like pipes.

FIT, in medicine, an access, or paroxysm. See **PAROXYSM**.

FITS of easy reflexion, and easy transmisson. See **LIGHT**.

FITS of the Mother, see **HYSTERIC affection**.

FITCHEE, or **FICHEE**, in heraldry, is when the lower part of any cross is sharpened into a point, fit to fix into the ground. Thus, he bears, azure, a cross potent *fitchee*. See *Tab. Herald. fig. 24*.

The origin hereof, Mackenzy ascribes to the primitive Christians, who used to carry their crosses with them, wherever they went; and when they stopped at any place in a journey, fixed them in the ground.

FITZ, a French term, literally denoting *Sen*; sometimes given by way of addition to the natural sons of the kings of England: as James *Fitz-roy*, duke of Grafton, &c.

FIVE-leaved grass, cinque-foil, in heraldry, is used by such as would introduce a blazon by herbs and flowers, instead of metals and colours, to signify *vert* or *green*. See **VERT**.

FIXATION, the act of fixing, or of rendering a thing firm and fixed.

FIXATION is applied in the general to any process that fixes and binds together what of its own nature is volatile; and enables it to sustain the force of fire, for some considerable time.

Geber defines *Fixation* an operation whereby a volatile thing, *i. e.* a thing that cannot endure the fire, is rendered capable of enduring it. In the general, *Fixation* is the changing of a volatile body into a fixed one.

FIXATION, among alchemists, denotes a peculiar preparation of mercury, whereby it is to be put in a condition to bear the fire without evaporating; or the hammer without flying, or separating.

The alchemists hold, that if they had the true secret of *fixing* mercury, without the addition of any foreign less heavy and solid ingredient, they could make gold, or at least silver.

M. Homberg had a long process of many months, to prepare an oil from the fecal matter, or human excrements, which he imagined would have *fixed* mercury into silver; but it failed. See **FECAL Matter**.

FIXING Sulphur, see **SULPHUR**.

FIXITY, or **FIXEDNESS**, in philosophy, the quality of a body, which denominates and renders it fixed; or, a property which enables it to endure the fire and other violent agents.

According to Chauvin, *Fixity* consists in this, that the component principles of the body are so closely united, or cohere so strongly, and are mixed in such proportion, that they cannot easily be divided either by fire, or any other corrosive menstruum; or their integral parts separated, and carried off

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in vapour. For a body may be said to be *fixed* in two respects.

First, when on being exposed to the fire, or a corrosive menstruum, its particles are indeed separated, and the body rendered fluid, but without being resolved into its first elements: the second, when the body sustains the active force of the fire, or menstrooms, without its integral parts being carried off in fumes. Each kind of *Fixity* is the result of a strong or intimate cohesion between the particles of the mixed.

FIXITY, or **FIXEDNESS**, in chemistry, is in a peculiar manner used for the affection opposite to volatility, *i. e.* the property whereby bodies bear the action of the fire, without being dissipated in fumes. See **VOLATILITY**.

The principal causes of *Fixity*, or the qualifications that contribute most to the rendering a body fixed, according to Mr. Boyle, are, 1^o, That its corpuscles be singly of a certain proportionable bulk, too big and unwieldy to be carried up by heat, or buoyed up in the air. 2^o, That they have also a proper degree of weight, or solidity. 3^o, That their figure be such as unfits them for evaporation, or flying off; some being branched, others hooked, &c. so that being entangled with one another, they cannot easily be extricated, loosened, and separated. To these may be added a fourth circumstance, *viz.* the nearness of the particles, and their being contiguous in a great many points, or a deal of their surface, which produces a stronger force of attraction and cohesion.

FIXT, or **FIXED Bodies**, in the general, are those which neither the fire, nor any corrosive, has such effect on, as to reduce or resolve them into their component elements, *i. e.* absolutely to destroy them.

Chauvin holds it not sufficient to denominate a body *fixt*, that it can withstand the fire, or any one agent; but it should withstand all. He contends, that *Fixity* should not be refrained, as it usually is, to an exemption from evaporation; but from destruction, or resolution into primary elements: in this sense; gold, precious stones, and glass, and even sulphur and mercury itself, are properly *fixed* bodies; for mercury and sulphur retain their nature, notwithstanding all their evaporation.

FIXT, or **FIXED Bodies**, among chemists, are such as bear the violence of the fire, without evaporating.

The chemists divide all natural bodies into *fixed* and *volatile*, *i. e.* such as bear the utmost force of the fire, without dissipating, or spending themselves in fume, and such as do not.

Of *fixed* bodies, the principal are gold, silver, precious stones, particularly the diamond, salts, &c.

Of all metals, gold and silver alone are *fixed*, *i. e.* on remaining a long time exposed to the most intense flame, they alone lose nothing of their weight.

Whence this property should arise, is difficult to say. If the reader is not contented with the causes enumerated under **FIXITY**, he may add the following one from Boerhaave, *viz.* the homogeneity and equality of the parts.

The parts, *e. gr.* of gold being all homogeneous and equal, will equally sustain each other, and leave equal pores between them; through which pores, when fused, the fire finding an easy, equal passage, goes off, without carrying any thing of the metal with it: or rather, the particles of gold being of all others the most solid and heavy (as appears from the weight of that metal) and of all others the most strongly united, or bound together (as appears from the immense ductility of that metal) the force of the fire is not sufficient to overcome so powerful a resistance: the solidity of the particles, and their freedom from air prevents their being rarefied, or set further apart; which might lessen their specific gravity, and diminish their vis cohesionis; so that what has the chief effect in the raising of fumes and vapours, *viz.* the rarefaction, or expansion of the body, being here precluded, the metal maintains its natural weight and tendency to the centre.

Mr. Boyle, the prince of Mirandola, M. Homberg, and others have made numerous experiments on gold, silver, &c. to see how far their *Fixity* extended. In these, pure gold, kept in an intense heat for two months, lost nothing sensible of its weight. Silver, under the like circumstances, and in the like time, lost one twelfth part of its weight; but Mr. Boyle attributes this to the metal's not being fine and pure. See **SILVER**.

Indeed, by the great burning glasses of Mess. Tschirnhausen and Villette, the most *fixed* bodies, as gold itself, are rendered volatile, and lose of their weight; so that there is no body in all nature absolutely *fixed*.

FIXT Nitre, a preparation of salt-petre, made by fusing it in a crucible, and then inflaming it with throwing in a few coals; and this again and again, till no more flame, or detonation arise: then letting it cool, they pulverise and dissolve it in water; and afterwards evaporate it into a fine white salt; which serves to draw the tinctures out of vegetables. This salt, per deliquium, yields, what they call, the *Liquor of fixed Nitre*.

FIXT Salts, are those extracted or gained from bodies by calcination and lotion.

They are called *fixt*, in that the fire was not able to sublime or raise them; as those carried off in the course of calcination, by the vehemence of the fire, are called *volatile*.

The ashes of all plants yield *fixed Salts*. See **LIXIVIUM**. Chemists give the appellation *fixed* to certain of their preparations, as *fixt nitre*, &c.

FIXT Signs of the zodiac, according to some, are the *Signs* Taurus, Leo, Scorpio, and Aquarius.

They are so called, because the sun passes them respectively in the middle of each quarter, when that season is more settled and fixed, than under the *Sign*, which begins and ends it.

FIXT Stars are such, as constantly retain the same position, and distance with respect to each other.

By which they are contra-distinguished from erratic or wandering *Stars*, which are continually shifting their situation and distance.

The *fixed Stars* are, what we properly and absolutely call *Stars*: the rest have their peculiar denomination of *Planet*, and *Comet*. See **STAR**, **PLANET**, and **COMET**.

FLACCIDITY, in medicine, &c. a disorder of the fibres, or solid parts of the body, opposite to *rigidity*.

The too great *Flaccidity* of the parts is cured by cardiacs, exercise, friction, a dry warm air, proper food, &c.

FLAG, a general name, including colours, standards, antients, banners, ensigns, &c. which authors frequently confound with each other.

The fashion of bearing the *Flags* pointed, or triangular, which now obtains, Roderic Toletanus assures us, came from the Mahometan Arabs, or Saracens, upon their seizing of Spain; before which time all the ensigns of war were square, stretched or extended on cross pieces of wood, like church banners; on which account they were called in Latin, *Velilla*, q. d. *Velilla*, a *veli diminutione*, as is remarked by Isidore.

The pirates of Algiers, and those throughout the coasts of Barbary, are the only people that bear an hexagonal *Flag*. It is gules, charged with a morek head, coiled with its turban. &c. though this be expressly contrary to their law, which prohibits the making any image, or representation of a man; founded on an opinion, that they who make them, shall be obliged at the day of judgment to find souls for them; and, that in defect hereof they shall be damned. But this portrait which they carry is that of Hali, Mahomet's son-in-law, to whose party the Africans all retain; who ordered that his effigy should be expressed on their *Flags* and standards, believing himself so formidable to the Christians, that the bare sight of his image would carry undoubted victory over them. Leon clavus.

FLAG is more particularly used at sea, for the colours, antients, standards, &c. bore on the top of the masts of vessels, to notify the quality of the person who commands the ship, of what nation it is, and whether it be equipped for war, or trade.

The admiral, or commander in chief, carries his *Flag* on the main-top, or top of the main-mast.

The vice-admiral carries his on the fore-top; and the rear-admiral his on the mizzen top, or top of the mizzen-mast.

The commanders of squadrons bear their *Flag* on the mizzen-mast, when in the body of a fleet; and on the main-mast, when they command a party. It should be cleft two thirds of its height, and terminate in a point.

The *Flags* bore on the mizzen, are particularly called *Galants*. See **MAST**, &c.

The *Flag* of the French nation is blue, charged with a white cross, and the arms of France.

Beside the national *Flag*, merchant-ships frequently bear lesser *Flags*, on the mizzen-mast, with the arms of the city, where the master ordinarily resides; and on the fore-mast with the arms of the place, where the person who freights them lives.

To *hang out the white FLAG*, is to ask quarter: or, it shews, when a vessel is arrived on a coast, that it has no hostile intention, but comes to trade, or the like.---The *red Flag* is a signal of defiance and battle.

To *lower, or strike the FLAG*, is to pull it down, or take it in, out of respect or submission, when a weaker party meets a more powerful one.

By an ordinance of Philip II. king of Spain, 1565. the captains are peremptorily commanded to perish, rather than lower their royal *Flag*, when once hung out.

The way of leading vanquished ships in triumph, is to tie the *Flags* to the shrouds, or the gallery in the hind-part of the ship, and let them hang down towards the water: and to tow the vessels by the stern. It was thus the Romans used those of Carthage, as Livy relates.

FLAG-OFFICERS, those who command the several squadrons of a fleet: as, admirals, vice-admirals, and rear-admirals.

The *Flag-officers* in our sea-pay are the admiral, vice-admiral, and rear-admiral, of the white, red, and blue.

FLAG-SHIP, a ship commanded by a general, or *Flag-officer*, who has a right to carry a *Flag*; in contra-distinction to the secondary vessels, under the command thereof.

FLAG-STAVES, are staves set on the heads of the top-gallant masts, (serving to let fly, and unfurl the *Flag*).

FLAGS, in falconry, are the feathers in a hawk's wing, near the principal ones.

FLAGELLANTES, a sect of hereticks, who chastised and disciplined themselves with whips, in publick.

The sect of the *Flagellantes* had its rise at Perugia, in the year 1260. Its author was one Rainier, a hermit. It was in all probability no more than the effect of an indiscreet zeal. A great number of persons of all ages made processions, walking two by two, with their shoulders bare, which they whipped, till the blood ran down, in order to obtain mercy from God, and appease his indignation against the wickedness of the age. They were then called the *devout*; and having established a superior, he was called the *general* of the devotion.

Women did not appear in these publick assemblies; though they practised the same feveries: but it was in private, and in their own houses.

In the middle of the fourteenth century, the sect of the *Flagellantes* was restored, on occasion of a great mortality; and spread itself into all parts of Europe.

The bishops and magistrates at length found it necessary to put a stop to their excess. The writers and preachers disputed against it; but the *Flagellantes* remained unshaken against all they could say: so that of a number of perhaps innocent well-meaning zealots, pride, obstinacy, and schism converted them into a dangerous sect. They held, that the blood they thus spilt, was mixed with that of Jesus Christ; and that by a *Flagellation* of twenty-four days they gained the pardon of all their sins.

Clement VI. forbid all publick *Flagellations*. And Gerson wrote an express treatise against publick *Flagellations*.

FLAGELLATION, *whipping*, a voluntary discipline, or penance, frequently practised by the ancient penitents. See **DISCIPLINE**.

The parliament of Paris prohibited all publick *Flagellations*, by an arrest of 1601. See **FLAGELLANTES**.

FLAGELLATION, is a term more peculiarly appropriated to the sufferings of Jesus Christ, when whipped and scourged by the Jews.---From the Latin *flagellum*, a scourge, or whip.

We say, a painting of the *Flagellation*; or simply, a *Flagellation*, to denote a picture, or print, representing this torment inflicted on the Saviour of the world.

In this sense we say, the *Flagellation* of such a painter, &c.

FLAGEOLET, or **FLAJOLET**, a kind of little flute; or a musical instrument of the flute kind, used chiefly by shepherds and country people.

It is usually made of box, or some other hard wood; sometimes of ivory. It has six holes, or stops, beside that at bottom, the mouth-piece, and that behind the neck.

FLAIL, see the article **THRASHING**.

FLAMBEAU, or **FLAMBOY**, a luminary, made of several thick wicks, covered over with wax; serving to burn a nights in the streets; as also at funeral processions, illuminations, &c.

Flambeaux differ from links, torches, and tapers. See **TORCH**.

They are made square; sometimes of white wax, and sometimes of yellow. They usually consist of four wicks, or branches, near an inch thick, and about three foot long; made of a sort of coarse hempen yarn, half twisted.

They are made with the ladie, such as torches, or tapers are; viz. by first pouring the melted wax on the top of the several suspended wicks, and letting it run down to the bottom: this they repeat twice. After each wick has thus got its several cover of wax, they lay them to dry; then roll them on a table, and so join four of them together, by soldering them with a red-hot iron.

When joined, they pour on more wax, till the *Flambeu* is brought to the size required; which is usually from a pound and half, to three pounds.

The last thing is to finish their form, or out-side, which they do with a kind of polishing instrument of wood, by running it along all the angles, formed by the union of the branches.

The *Flambeaux* of the antients were different from ours. They were made of woods, dried in furnaces, or otherwise. They used divers kinds of wood for this purpose: the most usual was pine. Pliny says, that in his time they frequently also burnt oak, elm, and hazle. In the seventh book of the *Æneid*, mention is made of a *Flambeu* of pine: and Servius on that passage remarks, that they also made them of the cornel tree.

FLAME, the brightest and subtlest part of fire, ascending above the fewel in a pyramidal, or conical figure.

Flame seems to be the smoke, i. e. the fumes, or volatile parts of the fewel, greatly rarefied, and at last kindled, or heated red-hot. By this great rarefaction, the matter becomes so light, as to be raised with great velocity, in the air; and by the pressure of the incumbent atmospheric fluid, it is kept for some time together; the air forming a sort of arch, or sphere around it, that prevents its immediate diffusion and dissipation, and by its contiguity and fixation sustains and feeds the fire of the Flame: the aqueous and earthy parts of the fume being naturally incapable of being ignited, are only rarefied, and so impelled upwards in a dusky cloud without flaming.

Flame is defined by Sir I. Newton, in his little piece *De Acido*, to be *fumus candens*, red-hot smoke. The same author argues, Is not Flame a vapour, fume, or exhalation heated red-hot, that is, so hot as to fume? For bodies do not flame without emitting a copious fume; and this fume burns in the Flame. The ignis status is a vapour shining without heat; and is there not the same difference between this vapour, and Flame, as between rotten wood flaming without heat; and burning coals of fire? In distilling hot spirits, if the head of the still be taken off, the vapour which ascends, will take fire at the Flame of a candle, and turn into Flame. Some bodies, heated by motion; or fermentation, if the heat grow intense, fume copiously; and if the heat be great enough, the fumes will flame, and become Flame. Metals in fusion do not flame, for want of a copious fume. All *flaming* bodies, as oil, tallow, wax, wood, fossil coal, pitch, sulphur, &c. by burning, waste in smoke, which at first is lucid; but at a little distance from the body, ceases to be so, and only continues hot. When the Flame is put out, the smoke is thick, and frequently smells strongly; but in the Flame it loses its smell, and according to the nature of the fewel, the Flame is of divers colours. That of sulphur, e. g. is blue; that of copper opened with sublimate, green; that of tallow, yellow; of camphire, white, &c. We find that when gunpowder takes fire, it goes off in a flaming smoke. The manner we conceive to be this: the charcoal and sulphur easily take fire, and set fire to the nitre; by which the spirit of the nitre being rarefied into vapour, rushes out, like the vapour of water out of an alepille. Then the acid spirit of the sulphur entering violently into the fixed body of the nitre, sets loose the spirit of the nitre, and excites a greater fermentation, whereby the heat is increased, and the fixed body of the nitre rarefied into fume; and thus is a vehement explosion effected. The Flame of gunpowder arises from a violent action, whereby the mixt being quickly and vehemently heated, is rarefied and converted into fume and vapour: Which vapour by the violence of the action becoming so hot as to shine, appears in the form of Flame. Newt. *Optics*, p. 318.

It is a remarkable phenomenon of the Flame of a candle, torch, or the like, that in the dark it appears bigger at a distance than near at hand. The reason is, that at a distance, e. g. of six feet, the eye can readily distinguish between the Flame, and the contiguous air illuminated by it; and sees precisely where the Flame terminates: But at the distance, e. g. of thirty feet, though the angle subtended by the Flame, be much smaller than before; yet the eye not being able to distinguish the precise bound of the Flame, takes part of the sphere of air illuminated by it, for the Flame itself.

We have several instances of actual Flame being produced by the mixture of two cold liquors. Dr. Sars gives us a list of the oils which burst into Flame upon mixing them with compound spirit of nitre: such are those of carroways, cloves, cassiafras, guaiacum, box, camphire, pepper, hartshorn, blood, &c. *Phil. Transact.* N^o 213 See Supplement, article SPIRITUS NITRI.

Vital FLAME, FLAMMA or FLAMMULA vitalis, a fine, warm, igneous substance, supposed by many both of the ancients and moderns, to reside in the hearts of animals, as necessary to life, or rather, as that which constitutes life itself.

To the preservation of this Flame, they suppose air as necessary, as it is to the conservation of common Flame; and hence they ascribe the necessity of respiration to animal life.

Mr. Boyle, by experiments in an exhausted receiver, found that the vital Flame of animals, if life may be so called, survives or outlasts the Flame of spirit of wine, or of a wax or tallow candle, &c. Some animals would remain alive and well in vacuo, for three or four minutes, whereas no common Flame would last there one minute. The light of glow-worms he found would presently be destroyed by exhauing the air; and retrieved again upon its re-admission.

Dr. Quincy could find nothing more in the notion of vital Flame, than the natural warmth, which is the effect of a circulating blood; and which is always as its velocity.

FLAMEN, among the ancient Romans, was a priest, or minister of sacrifice.

There were as many kinds of *Flamens* at Rome, as there were Gods who had priests and sacrifices offered them.

Numa, at first, only instituted three: One for Jupiter, called *Flamen dialis*; another for Mars, called *Flamen martialis*, and a third for Romulus or Quirinus, called *Flamen quirinalis*. In after-times twelve more were added; which made the number of *Flamens* fifteen.

The three first were taken from among the patricians, and were held of a rank and distinction superior to the rest. They were called *greater Flamens*, *Flamines majores*; in contradistinction to the other twelve, who were chose from among the plebeians, and were therefore called *lesser Flamens*, *Flamines minores*. The *Flamen dialis*, or of Jupiter, was the first instituted, and held in the greatest repute. He bore a peculiar ornament on his head, called *Albigalerus*, which was made of the skin of a white victim, sacrificed to Jupiter.

The cap wore by the rest, was called *Flamma*, or *Apex*. It was made of a sheep's skin, with the wool on: To which was fastened a little branch of an olive tree. That of the *Flamen* of Jupiter ended in a point called *Tutulus*. It was tied under the chin with strings. But in the summer time it was only a woollen thread tied round the head; it being prohibited them ever to appear quite bare-headed. And hence, according to Festus, came their denomination of *Flamen*, viz. from *Filamen*, of *filum*, thread.

Though the *Flamens* bore one common appellation; yet did not they constitute any company or college. Each god had his several sacrifices, feasts, and ceremonies a-part: Nor had one *Flamen* any relation to another; only they were all subordinate to the pontifex maximus. Aulus Gellius assures us, that they were created by the people in the comitia curiata; but the pontifex maximus afterwards consecrated them. Their priesthood, called *Flaminatus*, was perpetual; though on some occasions they might be deposed.

The names of the several *Flamens* are as follow: The three great *Flamens*, as already observed, were the *Flamen aialis*; *Flamen martialis*, and *Flamen quirinalis*. The twelve lesser were, the *Flamen carmentalis*, or priest of the goddess Carmenta: *Flamen falacer*, or priest of the god Falacer; a name, whose origin, Varro observes, is not known: *Flamen foralis*, or of the goddess Flora: *Flamen furinalis*, whose etymology is not known: *Flamen levinialis*: *Flamen lucularis*: *Flamen palatualis*, whom some moderns will have to be the priest of the goddess that presided over the palatium; though Varro owns himself at a loss for its original: *Flamen pomonalis*, or of Pomona, goddess of fruits: *Flamen viribialis*, or of the god Virbius, whom some take for the same with Hippolytus: *Flamen vulcanalis*, or of Vulcan; and *Flamen volturialis*, or of the god Volturnus.

They had also their *Flaminæ* or *Flaminicæ*, who were wives of the *Flamens*, or the priestesses of the deities. In an ancient marble, quoted by Gruter, p. CCCCLIX. n. 9. the word *Flamina* is used for priestess: And in the same author, p. CCCVIII. n. 3. the priestess of the goddess Feronia is called *FLAM FERON*, that is, *Flamina*, or *Flaminica Feronia*.

The *Flamina* bore the same ornament on her head with the *Flamen*. She had also the same surname of office with her husband; as *Flamina dialis*, *martialis*, &c.

FLAMMULA, or FLAMULA, under the eastern empire, was a kind of flag, terminating in a point somewhat like a flame, serving as a mark, or badge, to distinguish the soldiers of the several companies, battalions, regiments, &c.

In Greek it was called *φλαμμουλον*: It was sometimes placed on the caik; sometimes on the cuirass, and sometimes at the end or tip of the pike, &c.

The emperor Maurice ordered, that the *Flammula* of each division should be of a particular colour, to distinguish them from the other battalions, or brigades: *φλαμμουλα εκαστης μοιρας ιδιουχουρου εναι*.

They used to lay aside the *Flammula* before an engagement, lest it should prove an incumbrance. The cavalry had also *Flammulae* on their horses, to distinguish the troops they belonged to.

FLANCH, FLANQUE, or FLASQUE, an ordinary in heraldry, formed by an arched line, which begins at the corners of the chief, and ends in the base of the escutcheon.—He beareth ermin two *Flanches* vert. See *Tab. Herald.* fig. 25. *Flanches* are always born by pairs.

Leigh makes *Flanque* and *Flask* two distinct bearings, whereof the former is more bent in than the latter; but Gibbon judiciously makes them but one, which he calls *Flanque*.

FLANEL, or FLANNEL, a kind of slight, loose, woollen stuff, not quilted, but very warm; composed of a wool, and warp, and wove on a loom, with two treddles, after the manner of bays, &c. See BAYS.

FLANK, or FLANC, in the manage, is applied to the sides of a horse's buttocks, &c.

In a strict sense, the *Flanks* of a horse are the extremes of the belly, where the ribs are wanting, and are below the loins.

The *Flanks* of a horse should be full; and at the top of each a feather. The distance between the last rib, and haunch bone, which is properly the *Flank*, should be short; which they

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they term *well coupled*: Such horses being most hardy, and fit to endure labour.

A horse is said to have no *Flank*, if the last of the short ribs be at a considerable distance from the haunch-bone; as also when his ribs are too much streightened in their compass.

FLANK, in war, is used by way of analogy, for the side of a battalion, army, &c. in contra-distinction to the *Front* and *Rear*.

To *attack the enemy in Flank*, is to discover, and fire upon them on one side.

The enemy *took us in Flank*: the *Flank* of the infantry must be covered with the wings of the cavalry.

FLANK, in fortification, is a line, drawn from the extremity of the face, towards the inside of the work.—Such is the line BA, *tab. fortification, fig. 1.*

Or, *Flank* is that part of the bastion, which reaches from the curtain to the face, and defends the opposite face, the *Flank*, and the curtain.

Oblique, or second FLANK, is that part of the curtain, EI, intercepted, between the greater line of defence, EC, and the lesser, IC: and from which they can see to scour the face of the opposite bastion.

Low, covered, or retired FLANK, is the platform of the casemate, which lies hid in the bastion; otherwise called the *orillon*. See ORILLON.

FLANK Fitchant is that from whence a cannon playing, fireth its bullets directly in the face of the opposite bastion.

FLANK Rozant is the point, from whence the line of defence begins, from the conjunction of which with the curtain, the shot only raseth the face of the next bastion; which happens when the face cannot be discovered but from the *Flank* alone.

Simple FLANKS, are lines, going from the angle of the shoulder, to the curtain; whose chief office is for defence of the moat, and place.

FLANKED, FLANQUE, is used by the French heralds, to express our party per saltier; that is, when the field is divided into four parts, after the manner of an X.

Though Colombiere uses the term in another sense, which appears more natural, *viz.* for the taking of flanches, or rounding sections out of the sides of the escutcheons; the first from the angles of it, the latter in straight lines, forming an angle at the feet, without making any saltier.

FLANKED Angle, in fortification, is the angle formed by the two faces of the bastion, and which of course forms the point of the bastion.

FLANKED Tenaille, called also *Tenaille*. See TENAILLE.

FLANKING, in the general, is the act of discovering, and firing upon, the side of a place, body, battalion, &c.

To *flank* a place, is to dispose a bastion, or other work in such manner, as that there shall be no part of the place, but what may be played on, both in front, and rear.

Thus we say to *flank* a wall with towers. This bastion is *flanked* by the opposite flank, and a half-moon. This horn-work is *flanked* by the curtain.

Any fortification that has no defence but just right forwards is faulty: and to render it complete, one part ought to be made to *flank* the other. Hence the curtain is always the strongest part of any place, because it is *flanked* at each end.

Battalions also are said to be *flanked* by the wings of the cavalry.—A house is sometimes said to be *flanked* with two pavillions, or two galleries; meaning it has a gallery, &c. on each side.

FLANKING line, of Defence, see RASANT, and LINE of Defence.

FLASK, FLASQUE, a bearing, more properly called *Flanch*, or *Flanque*. See FLANCH.

FLATS, in musick, a kind of additional or half notes, contrived, together with *Sharps*, to remedy the defects of musical instruments.

The natural scale of musick being limited to fixed sounds, and adjusted to an instrument, the instrument will be found defective in several points: As particularly, in that we can only proceed from any note, by one particular order of degrees; that for this reason we cannot find any interval required from any note, or letter upwards and downwards; and that a song may be so contrived, as that if it be begun by any particular note or letter, all the intervals or other notes, shall be justly found on the instrument, or in the fixed series; yet were the song begun with any other note, we could not proceed.

To remove, or supply this defect, musicians have recourse to a scale proceeding by twelve degrees, that is thirteen notes, including the extremes, to an octave; which makes the instruments so perfect, that there is but little to complain of. This, therefore, is the present system or scale for instruments, *viz.* the extremes of every tone of the natural scale is put a note, which divides it into two unequal parts, called *Semi-tones*; and the whole may be called the *semitonic Scale*, containing twelve Semi-tones betwixt thirteen notes, in the compass of the octave.

Now, to preserve the diatonic series distinct, these inserted notes either take the name of the natural note next below,

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with a character called a *Sharp*; or they take the name of the natural note next above, with a mark called a *Flat*. Thus D *Flat* signifies a Semi-tone below the D natural. And it is indifferent in the main, whether the inserted note be accounted as a *Flat*, or a *Sharp*.

This semitonic series or scale is very exactly represented by the keys of a spinner: The foremost range of keys being the natural notes; and keys behind, the artificial notes, or the *Flats* and *Sharps*.

FLATULENT, something that has a relation to *Flatul'*, or blasts of wind.

Peas, and most kinds of pulse, onions, &c. are *flatulent* foods.

FLATUS, or **FLATULENCY**, wind gathered in the bowels, or other cavity of the body, by means of indigestion, &c. It is dissipated by warm aromatics, which rarefy it enough to break away wherever a vent can be found.

FLATTER, or **FLATTENER**, } see COINING.

FLATTING, or **FLATTENING**, }

FLAX, or *Line, Linum*, a plant with a slender hollow stem, usually about three foot high; whose bark consists of fibres, or threads, much like those of hemp; which being dressed and worked in due manner, makes that noble commodity, linnen-cloth.

Flax thrives best in a soil that has long lain fallow. To bear *Flax*, it must be well plowed, laid flat and even, and the seed sown thick, in a warm season, about the middle of March, or beginning of April. The best seed is that brought from the East; which, though dear, repays the charges with abundance. One sowing of flax will produce two or three crops, before it need be renewed.

Flax pulled up in the bloom, proves whiter and stronger, than if left standing till the seed is ripe; but then the seed is lost.

For the preparations *Flax* must undergo, to fit it for spinning, as pulling, drying, and spinning, see HEMP.

The seed of *Flax*, called *Linsæed*, has several considerable properties. It enters the composition of divers medicines, and yields an oil by expression, which has most of the properties of nut-oil; and which is frequently used, in defect thereof, in painting, to burn in lamps, &c. That drawn cold, is also reputed good in divers distiches.

FLEA, in natural history.—The generation of this familiar vermin affords something very curious, first discovered by Sig. Diacinto Cestone.

Flas bring forth eggs, or nits, which they deposit on animals that afford them a proper food: These eggs being very round and smooth, usually slip straight down; unless detained by the piles, or other inequalities of the clothes, hairs, &c.

Of these eggs are hatched white worms, of a shining pearl colour, which feed on the scurfy substance of the cuticle, the downy matter gathered in the piles of clothes, or other the like substances.

In a fortnight they come to a tolerable size, and are very lively and active; and if at any time disturbed, they suddenly roll themselves into a kind of ball.

Soon after this they come to creep, after the manner of silk-worms, with a very swift motion. When arrived at their size, they hide themselves as much as possible, and spin a silken thread out of their mouth, wherewith they form themselves a small round bag or case, white within, as paper, but without always dirty, and souled with dust.

Here, after a fortnight's rest, the animalcule bursts out, transformed into a perfect *Flax*; leaving its exuvie in the bag. While it remains in the bag, it is milk white; till the second day before its eruption, when it becomes coloured, grows hard, and gets strength; so that upon its first delivery, it springs nimbly away. *Philosopb. Transact. N^o 249.*

FLEA-BITTEN Colour of a horse is white spotted all over with dark reddish spots.

FLEAM, a small instrument of pure steel, composed of two or three moveable lancets for bleeding a horse or the like.

FLEDWITE, or **FLIGHT-WITE**, in our antient laws, a discharge or freedom from amercements, when one, having been an outlawed fugitive, comes to the peace of our lord the king, on his own accord, or with licence. Rassa.

Others rather take it to denote a mulct, or fine, set upon a fugitive to be restored to the king's peace.

FLEECE, the covering of wool shorn off the bodies of sheep. The golden FLEECE is famous among the antient writers. It was this that the Argonauts, under the command of Jason, went in pursuit of to Colchis, a province of Asia, now called Mingrelia.

The mystery of the golden Fleece is variously explained,—either of the profit of the wool trade of Colchis; or of the gold that they commonly gathered there with fleeces, in the rivers. Arbutb. *Diff. p. 224.* See ARGONAUTS.

Order of the golden FLEECE. See GOLDEN FLEECE.

FLEET, a number of vessels, going in company, whether on a design of war, or commerce.

In times of peace, merchant ships go in *Fleets*, for their mutual aid and assistance: In times of war, besides this security, they likewise procure convoys of men of war; either to escort them to the places whither they are bound, or only a part

a part of the way, to a certain point or latitude, beyond which they are judged out of danger of privateers, &c.

The Spanish *Fleet* sent against England, by Philip II. consisted of a thousand vessels. In the East there have been *Fleets* seen of three thousand vessels.

Merchant *Fleets* generally take their denomination from the place they are bound to; as the Turkey *Fleet*, East-India *Fleet*, &c.

The Spaniards call simply the *Fleet*, or *Flota*, a certain number of vessels, belonging partly to the king, and partly to merchants, sent every year to Vera Cruz, a port of New Spain.

The *Flota* consists of the captain, admiral, and patach or pinnace, which go on the king's account; and about sixteen ships, from four hundred to a thousand tons, belonging to particular persons. They are all so heavily laden, both going and coming, that they have much ado to defend themselves when attacked. The *Fleet* puts out from Cadix about the month of August, and makes it eighteen or twenty months before its return.

The *Fleet* sent annually from the same port to Peru, they call the *Galleons*. See GALLEON.

When the two *Fleets* put out together, they go in company as far as the Antilles, where they separate; the *Galleons* for Carthagena, and Porto-Bello; and the *Flota* for Vera Cruz: At their return they join at the Havanna.

Of the two *Fleets* the *Galleons* are the most richly laden; not but the cargo of the *Flota* is also very considerable.

FLEET is also a famous prison in London, thus called from the river Fleet, on the border whereof it stands.

To this prison persons are usually committed for contempt of the king and his laws; or upon absolute command of the king, or some of his courts, particularly that of chancery; and lastly, for debt.

FLEGM, FLEGMATIC, FLEGMACOGUE, &c. See PHLEGM, PHLEGMATIC, &c.

FLEMISH, or the FLEMISH tongue, is that which we otherwise call *Low Dutch*, to distinguish it from the German, whereof it is a corruption, and a kind of dialect.

The *Flemish* is the language used throughout all the provinces of the Netherlands. It differs considerably from the Walloon, which is a corrupt French.

There are several *Flemish* translations of the Bible. In the year 1618. it was decreed by the synod of Dort, that a new *Flemish* version should be made of the whole Scriptures; by reason the old translation, which had been taken from that of Luther, was full of faults. Accordingly, several persons, learned in the Greek and Hebrew languages, undertook the work; which was published with notes in 1637. This Bible is highly valued by the Reformed in Holland, &c. though M. Simon censures it as being far from the perfection of a just translation.

FLEMISH Bricks, a neat, strong kind of bricks, of a yellowish colour, brought from Flanders, and much used for paving. See BRICK.

FLESH, *Caro*, in anatomy, a similar, fibrous part of an animal body, soft and bloody; being that whereof most of the other parts are composed, and whereby they are connected together.

Flesh is properly understood of such parts of the body where the blood-vessels are so small, as only to retain blood enough to preserve their colour red.

The antients accounted five different kinds of *Flesh*: the first muscular, fibrous, or *fibular*; as the substance of the heart, and other muscles. The second, *parenchymous*, as that of the lungs, liver, and spleen. The third *viscerous*, as the *Flesh* of the stomach and intestines. The fourth *glandulous*, as that of the breasts, pancreas, tonsils, &c. And the fifth *spurious*, as that of the gums, glans of the penis, the lips, &c.

The moderns only admit of one kind of *Flesh*, viz. the muscular, consisting of little tubes and vessels with blood therein; so that *fleshy* and muscular parts of the body with them are the same thing.

Sometimes, however, they apply the term to the glands; which they call, by way of distinction, *glandulous Flesh*.

As to the parenchyma's, they are now found to be quite other things than the antients imagined. The lungs are only an assemblage of membranous vesicles, inflated with air. The liver a collection of glands, wherein the bile is separated. The spleen, a heap of vessels, full of blood. And the kidneys, like the liver, a mass of glands, for separating of the urine.

FLESH is also used in theology, in speaking of the mysteries of the incarnation and eucharist.

The word was made *Flesh*, *verbum caro factum est*. See INCARNATION.

The Romanists hold, that the bread in the sacrament of the supper is turned into the real *Flesh* of Jesus Christ. See TRANSUBSTANTIATION.

The resurrection of the *Flesh* is an article of faith.

The Anthropophagi, or Cannibals, are said to feed upon human *Flesh*.

FUNGUS FLESH. See the article FUNGUS.

FLESH is sometimes also used by botanists, for the soft pulpy substance of any fruit, inclosed between the outer rind or skin, and the seeds, or stone: or for that part of a root, fruit, &c. fit to be eaten.

FLESH-COLOUR. See the article CARNATION.

FLEUR-DE-LISEE, FLEURETTEE, FLEURONNEE, and FLEURY, in heraldry. See FLORY.

FLEXIBLE, in physics, is applied to bodies that are capable of being bent, or changed from their natural form and direction.

Trees that grow near waters, as the willow, poplar, &c. are more flexible than others. The fibres being finer and more flexible in women than in men, they have generally a greater degree of delicacy of thought and imagination. A flexible voice succeeds best in music.

A body is not capable of being inflected or bent, unless the whole thereof be at rest. In bending a body, it constitutes, as it were, two levers; and the point it is to be bent in, is a fulcrum: hence, as a moving power, the further it is from the fulcrum, the greater is its force; the longer the flexible body is, the easier it is bent.

FLEXION, in anatomy, &c. is applied to the motion of an arm, or other member, whereby it is bent.

The arm has a motion of *Flexion*, and another of extension.

The motion of *Flexion* is, when the radius and humerus approach each other, and form an angle at the elbow.

FLEXION, or FLEXURE of Curves. See POINT of contrary *Flexion*.

FLEXOR, in anatomy, a name given to several muscles, in respect of their action, viz. the bending of the members, or joints, in opposition to the extensors, which open or stretch them.

FLEXOR *Capitis*, is a muscle of the head, called also *Rectus major anticus*. See RECTUS major, &c.

FLEXOR *Carpi radialis*, called also *Radialis internus*, rises from the inner protuberance of the humerus; and running along the radius, is inserted into the upper part of the bone of the metacarpus, which is joined with the fore-finger.

FLEXOR *Carpi ubaris*, called also *Cubitus internus*, arises tendinous from the inner protuberance of the humerus, and upper part of the ulna, upon which it runs along, till passing under the ligamentum annulare, it is inserted by a short strong tendon into the fourth bone of the first row of the carpus. See Tab. Anat. (Myol.) fig. 2. n. 24.

Both these muscles bend the wrist.

FLEXOR *Pollicis pedis brevis*, arises from the middle of the cuneiform bone. It is short, thick, and fleshy, seemingly two, and running over the termination of the peronæus, has a double insertion into the ossa sesamoidea.

FLEXOR *Pollicis pedis longus*; this is a muscle of the toe. It is derived from the back part of the fibula, with a double order of fibres, and runs tendinous under the inner ankle; and through the channel in the inner part of the bone of the heel, to its insertion at the extremity of the great toe, on the under side.

FLEXOR *primi internodii digitorum pedis*. See LUMBRICALES *pedis*.

FLEXOR *secundi internodii digitorum manus*. See PERFORATUS *manus*.

FLEXOR *tertii internodii digitorum manus*. See PERFORANS *manus*.

FLEXOR *tertii internodii digitorum pedis*. See PERFORANS *pedis*.

FLEXORES *primi internodii digitorum manus*, are muscles of the fingers, called also *lumbricales manus*. See LUMBRICALES.

FLEXORES *pollicis manus*, are two muscles serving to bend the thumb.

The first, called *Flexor tertii internodii*, &c. arises from the internal protuberance of the humerus, and part of the radius, by different orders of fibres, and passing under the ligamentum annulare, is inserted into the third bone of the thumb.—The second, called *Flexor secundi internodii*, &c. arises from the bones of the carpus, and annular ligament; and is inserted into the second bone of the thumb.

FLEXORES *secundi internodii digitorum pedis*. See PERFORATUS *pedis*.

FLIE, or FLY, that part of the mariner's compass, on which the thirty two winds are drawn, and over which the needle is fastened underneath.

FLIGHT, the act of a bird in flying; or the manner, duration, &c. thereof. See FLYING.

The feathers of birds are admirably contrived and fitted for the ease and conveniency of *Flight*.

Almost every kind of bird has its particular *Flight*: The eagle's

eagle's *Flight* is the highest: the *Flight* of the sparrow hawk and vultur are noble, and are fit for high enterprise and combat. The *Flight* of some birds is low, weak, tranſient, and, as they call it, *terra a terra*: the *Flight* of the partridge and pheasant is but of ſhort continuance: that of the dove is labour'd: that of the ſparrow, undulatory, &c.
The augurs provide to foretel future events from the *Flight* of birds.

FLIGHT.—In melting the lead-ore in the works at Mendip, there is a ſubſtance which flies away in the ſmoke, which they call the *Flight*.

They find it ſweetiſh upon their lips, if their faces happen to be in the way of the ſmoke, which they avoid all they can. This, falling on the graſs, kills cattle that feed thereon: and being gathered and carried home, kills rats and mice in their houſes: That which falls on the ſand, they gather and melt upon a flag-hearth, into ſhot and ſheet-lead.

Capons FLIGHT, in ſome cuſtoms, is a compaſs of ground, ſuch as a capon might fly over, due to the eldeſt born of ſeveral brothers, in making partition of the father's eſtate with them, when there is no principal manor in a lordſhip. It is uſually eſtimated by a bow-ſhot.

FLIGHT of a Stair-caſe. See the article STAIR-CASE.

FLIGHT, in heraldry. See the article VOL.

FLINT, *Silex*, a ſmall, hard, livid, or black pebble; chiefly uſed for yielding ſparks of fire by collision againſt ſteel.

The Indians, inſtead of *Flint* and ſteel, uſe two pieces of green wood, which they rub violently againſt each other. In the Eaſt, they uſe the wood candon; and in Peru, that called *reyaca*, for this purpoſe.

Flints are alſo one of the principal ingredients in the making of glaſs. See Supplement, article SILEX.

FLINT-Wall. See the article WALLS.

FLIP, a ſort of ſailors drink, made of malt liquor, brandy, and ſugar, mixed.

FLLOAT, or **FLEET.** See **FLOTA**, and **FLOTILLA.**

FLLOAT of a fiſhing line, a cork, or quill, ſwimming on the water, to diſcover what becomes of the hook, whether any thing bites, &c. See **FISHING-FLLOAT.**

FLLOAT alſo denotes a certain quantity of pieces of timber join'd together with rafters a-dwart, thrown into a river, to be convey'd down the ſtream; and even ſometimes to carry burdens down a river with the ſtream. The invention of *Flloats* is of great uſe; it is ſaid to have been firſt put in execution at Paris, in the year 1618.

FLOATING-Veſſels. See the articles **BOAT**, **VESSELS**, &c.

FLOATING, in huſbandry, is the drowning or watering of meadows.

FLOOD, a deluge, or inundation of waters. See **DELUGE.**
FLOOD is alſo uſed in ſpeaking of the tides. See **TIDE.**

When the water is at loweſt, it is called *Flood*; when riſing, *young*, or *old Flood*; when at high'eſt, and beginning to fall, *ebb water*.

FLOOR, or **FLUKE of an anchor.** See **ANCHOR.**

FLOOR, in building, the underſide of a room, or that part we walk on.

Floors are of divers ſorts; ſome of earth, ſome of brick, others of ſtone, others of boards, &c.

Carpenters, by the word *Floor*, underſtand alſo well the framed work of timber, as the boarding over it.

For brick and ſtone **FLOORS**, ſee the article **PAVEMENT.**

For boarded **FLOORS**, it is obſervable, that the carpenters never *floor* their rooms with boards, till the carcaſs is ſet up, and alſo incloſed with walls; left the weather ſhould injure the *Flooring*.

Yet they generally rough plane their boards for the *Flooring*, before they begin any thing eſſe about the building, that they may ſet them by to dry and ſeaſon; which is done in the moſt careful manner.

Earthen FLOORS are commonly made of loame, and ſometimes, eſpecially to make malt on, of lime, and brook-ſand, and gun-duſt, or anvil duſt from the forge.

Ox-blood and fine clay, tempered together, Sir Hugh Plat ſays, makes the fineſt *Floor* in the world.

FLOOR of a ſhip, ſtrictly taken, is only ſo much of her bottom, as the reſts on, when a-ground.

Such ſhips as have long, and withal broad *Floors*, lie on the ground with moſt ſecurity, and are not apt to ſeel, or tilt on one ſide; whereas others, which are narrow in the *Floor*, or, in the ſea-phraſe, *cranked by the ground*, cannot be grounded without danger of being overturned.

FLORALES Ludi, or **FLORAL Games**, in antiquity, were games held in honour of Flora, the goddeſs of flowers.

They were celebrated with horrible debaucheries. The moſt licentious diſcourſes were not enough; but the courtiers were called together by the ſound of a trumpet, and made their appearance naked, and entertained the people with abominable ſhews and poſtures: the comedians appeared after the ſame manner on the ſtage. Val. Maximus relates, that Cato being once preſent in the theatre on this occaſion, the people were aſhamed to aſk for the infamous pleaſure in his preſence; till

Cato, apprized of the reſervedneſs and reſpect he inſpired them withal, withdrew, that the people might not be balk'd of their accuſtomed diverſion.

There were divers other ſorts of ſhews exhibited on this occaſion; and if we may believe Suetonius in Galba, c. vi. and Vopiuſus in Carinus, theſe princes preſented elephants dancing on ropes, on theſe occaſions.

The *Ludi Florales*, according to Pliny, lib. xviii. c. 29. were inſtituted by order of an oracle of the Sybils, on the 28th of April; not in the year of Rome 1006. as we commonly read it in the ancient editions of that author; nor in 1014. as F. Hardouin has corrected it; but, as Voſſius reads it, in 513. They were chiefly held in the night-time, in the Patrician-ſtreet: ſome will have it, there was a circus for the purpoſe, on the hill called *Horuſbrum*.

The goddeſs Flora is by ſome held to be the ſame with the Chloris of the Greeks. Others maintain, that this Flora was a famous courtezan at Rome, who having enriched herſelf by prostitution, made the people of Rome her heir, on condition that they ſhould celebrate the anniversary of her birth-day, by the games and feaſts above-mentioned. Some time afterward, the ſenate judging ſuch a foundation unworthy the majeſty of the Roman people, to ennoble the ceremony converted Flora into a goddeſs, whom they ſuppoſed to preſide over flowers; and ſo made it a piece of religion to render her propitious, that it might be well with their gardens, vineyards, &c.

This is the common account: but Voſſius de *Idolol.* lib. i. c. 12. can by no means allow the goddeſs Flora to have been the courtezan above-mentioned: he will rather have her a Sabine deity, and thinks her worſhip might have commenced under Romulus. His reaſon is, that Varro, in his fourth book of the Latin tongue, ranks Flora among the deities, to whom Tatius, king of the Sabines, offered up vows, before he joined battle with the Romans. Add, that from another paſſage in Varro it appears, that there were prieſts of Flora, with ſacrifices, &c. as early as the times of Romulus and Numa.

FLORAL Games.—There are alſo a kind of *Floral Games* obſerved at this day in France; firſt inſtituted in 1324.

The deſign and eſtabliſhment is owing to ſeven perſons of condition, lovers of poetry, who about All-ſaints-day, in 1323, ſent a circular letter to all the provincial poets, called *Troubadours*, to meet at Thoulouſe on May-day following, there to rehearſe their poems; promiſing a prize of a violet of gold to the perſon whoſe piece ſhould be judged the beſt.

The capitouls found the deſign fo good, that it was afterwards reſolved, at a council of the city, to continue it at the city charge; which is ſtill done in a manner that does honour to the place.

In 1325, a chancellor and ſecretary of the new academy were choſe; and the ſeven inſtitutors took the quality of maintainers thereof. Two other prizes were afterwards added to the violet, *viz.* an eglantine for the ſecond prize, and a panſey for the third. It was alſo decreed, that the perſon who bore away the firſt prize, might demand to be made bachelor; and that whoever bore away all three, ſhould be created doctor in the *Gay Science*, that is, in poetry.

There is a regiſter of theſe games kept at Thoulouſe, which gives this account of their origin; though others give the thing another turn. It was an ancient cuſtom, they ſay, for the poets of Provence, to meet yearly at Thoulouſe, to confer together, rehearſe their verſes, and receive a prize allotted to the beſt performance. This held till about the year 1540. when a lady of quality left the beſt part of her fortune, to eternize the cuſtom, and bear the expence of prizes; the number of which the increaſed, ordering an eglantine, a panſey, a violet, and a pink: the three firſt a cubit high; and worth fifteen piſtoles a-piece. The ceremony begins on May-day, with a ſolemn maſs, muſic, &c. The corporation attend; and poems are rehearſed every day: the third day a magnificent treat is given by the magiſtracy, &c. and that day the prizes are adjudg'd. The three prizes are the rewards of three different kinds of compositions, *viz.* a poem, an eclogue, and an ode.

FLORALIA, in antiquity, a general name for the feaſts, games, and other ceremonies, held in honour of the goddeſs Flora.

The *Floralia* were alſo called *Antibiſeſtes*: they were held at the latter end of the month of April, as Ovid witneſſes,

Exit, & in Majas-feſtium Florale calendae.

In effect, the *Floralia* began on the 28th of April, and laſted fix days.

They who aſſiſted at the ceremony were crown'd with ivy, and committed a world of indecencies; which indeed was no extraordinary thing in the heathen feaſts.

Some apply the word *Floralia* indifferently to the feaſts, and games of this goddeſs; but others reſtrain it to the feaſts alone; calling the games, *Ludi Florales*. See **FLORALES Ludi**.

FLORID Style, is that enriched and heightened with figures, and flowers of rhetoric. See **STYLE**.

Longinus uſes the terms *ſolid* and *aſſeſted* ſtyle, indifferently, and lays them down as quite contrary to the true ſublime.

FLORILEGIUM, **FLORILEGE**, a name the Latins have given

given to what the Greeks call *ἀνθολογία*, *anthology*, viz. a collection of choice pieces, containing the finest and brightest things in their kind. See ANTHOLOGY.

FLORILEGE, is also particularly used for a kind of breviary, in the eastern church, compiled by Arcadius, for the convenience of the Greek priests and monks, who cannot carry with them, in their travels and pilgrimages, all the volumes wherein their office is dispersed.

The *Florilegium* contains the general rubrics, psalter, canticles, the horologium, and the office of the feria, &c.

FLORIN, is sometimes used for a coin, or real money; and sometimes for an imaginary money, or money of account.

FLORIN, as a *Coin*, is of divers values, according to the divers metals, and divers countries where it is struck. Pieces under this denomination were antiently very frequent in commerce, at present they are less common, though there were abundance of them struck in Holland, of English silver, during the war which was terminated by the treaty of Ryswick. In all appearance they took their name from the place where they were first struck, viz. the city of Florence. Their era is about the year 1251. Though others ascribe the name to a flower-de-lis, which was struck on one side.

The gold *Florins* are most of them of a very coarse alloy; some of them not exceeding thirteen or fourteen carats, and none seventeen and a half. They weigh about two penny weights, and thirteen grains.

Villani observes, that there were gold *Florins* in the year 1067; from which time the names *Frank* or *Florin* became applied to the gold coins, which till that time had been called *Solidi*, shillings. See FRANK, &c.

As to silver *Florins*, those of Holland are worth about 40 French sols, or 1 s. 10 d. sterling. Those of Genoa, &c.

were worth about 8½ d. sterling. Pieces of three *Florins* are called *Ducatoons*.

FLORIN, as a *money of account*, is used by the Italian, Dutch, and German merchants and bankers, in keeping their books, and making up their accounts. But this *Florin* is very diverse, and admits of different divisions. In Holland it is on the foot of the Dutch coin of that name, containing twenty-four Deniers Grosch, and is divided into Pacards and Penins.

At Francfort, Nuremberg, &c. it is equivalent to three shillings sterling, and is divided into Creutzers and Pfennings. At Liege it is equivalent to 2 s. 3 d. At Strasbourg to 1 s. 8 d. In Savoy to 11 d. At Genoa to 8½ d. And at Geneva to 6½ d.

FLORIN, or FLORENCE, was also a gold coin, struck in England in the 18th year of Edw. III. of the value of six shillings.

Camden says, it was so called, because made by Florentines. Fabian observes, the *Florins* were not of so fine gold as the nobles and half-nobles of that prince.

But what is most observable is, that Fabian calls the *Florin* a penny, value 6 s. 8 d. the half *Florin*, an half-penny, value 3 s. 4 d. the quarter *Florin*, a farthing, value 1 s. 8 d.

These words we often meet with in old histories and accounts, applied to several coins, as royals, angels, &c. where we are therefore only to understand by *penny* or *denarius* the whole, by *obolus* the half, and by *quadrans* the fourth part, or farthing.

By indenture of the mint, in 18 Edw. III. every pound weight of old standard gold, was to be coined into fifty *Florines*, or *Florins*, to be currant at six shillings a-piece; all which made in tale fifteen pounds; or into a proportionable number of half or quarter *Florins*.

FLORINIANI, or FLORIANI, a sect of heretics, of the second century, denominated from its author Florinus, or Florianus, a priest of the Roman church, deposed along with Blaustus, for his errors.

Florinus had been a disciple of St. Polycarp, along with Irenæus. He made God the author of evil, or rather asserted that the things forbidden by God are not evil, but of his own appointing.—In which he followed the errors of Valentius, and joined himself with the Carpocratians.

Irenæus relates, that they called their own sect *spirituales*, as having a perfect knowledge of God: and other Christians in respect of them were only *Pyschici*, i. e. animales, as having only a gross apprehension and faith, and not a perfect knowledge of divine things.

According to Philastrius, the *Florinians* likewise denied a future judgment and resurrection; and held that Jesus Christ was not born of a virgin; and taught that the resurrection was in effect a new generation. They are also charged with holding criminal assemblies in the night-time, and giving in to Judaism and Paganism. Some even deduce the origin of the Adamites from them.

They had also other names given them; Philastrius says, they were the same with the *Carpophorians*. He adds, that they were also called *soldiers*, *militæ*, quia de militaribus fuerunt. St. Irenæus calls them *Gnostics*; St. Epiphanius, *Phibionites*; and Theodoret, *Borborites*, on account of the impurities of their life: others call them *Zaccheans*; others *Cod-*

dians, &c. though for what particular reasons, it is not easy to say, nor perhaps would it be worth while to enquire.

FLORIST, a person curious, or skilled in flowers; their kinds; names characters, culture, &c.

FLORY, **FLOWRY**, **FLEURY**, **FLORETTEE**, **FLEUR-DE-LISSE**, &c. terms in heraldry, used when the out lines of any ordinary are drawn as if trimmed with, or in the form of flowers, as lillies, flower-de-luces, &c.

Thus, he bears a cross *Flory*, &c. See *Tab. Herald. fig. 26.*

FLOTA, or **FLOTTA**, *Fleet*; a name the Spaniards give particularly to the ships which they send annually from Cadix, to the port of Vera-cruz, to fetch thence the merchandizes gathered in Mexico for Spain.

Those sent to fetch the commodities prepared in Peru, are called *Galleons*.

The name **FLOTILLA** is given to a number of ships, which get before the rest in their return, and give information of the departure and cargo of the *Fleta* and galleons.

FLOTAGES, all such things as are floating on the top of the sea, or great rivers; a word chiefly used in the commiffions of water-bailiffs.

FLOTON, **FLOTZAM**, or **FLOATSAM**, a term signifying any goods lost by shipwreck, and swimming on the top of the water; which, with *jetson* and *Lagon*, and *Shares*, are given the lord high admiral, by his letters patent.

Jetson is what is cast out of the ship, being in danger of a wreck, and beaten to the shore by the water; or cast on shore by the seamen. *Lagon*, or *Lagan*, is that which lies in the bottom of the sea. *Shares* are goods due to several persons by proportion.

FLOUNDER, see FISHING.

FLOWER, **FLOS**, that part of a plant, which contains the organs of generation; or the parts necessary for the propagation of the kind.

The *Flower* is a natural production, which precedes the fruit, and yields the grain or seed.

The structure of *Flowers* is somewhat various; though the generality, according to Grew, have these three parts in common, viz. the empalement, the foliation, and the attire.

Mr. Ray reckons, that every perfect *Flower* has the petala, stamina, apices, and stylus, or pistil: And such as want any of these parts, he deems imperfect *Flowers*.

In most plants there is a perianthium, calyx, or *Flower cup*, of a stronger consistence than the *Flower* itself, and designed to strengthen and preserve it.

In some *Flowers* the two sexes are confounded, i. e. the male and female parts are found in the same *Flower*: in others, they are separated; and of these again, the female are followed by fruits, and the male *Flowers* not: Whence, *Flowers* become distinguished into *male*, *female*, and *hermaphrodite*.

The generality of *Flowers* are of the hermaphrodite kind: Such, e. gr. are the lilly, tulip, daffodil, rosemary, sage, thyme, geranium, althæa, &c.

The structure of parts is much the same in those where the sexes are divided: The difference between them consists in this, that the stamina and apices, i. e. the male parts, in these, are separated from the pistils; being sometimes on the same stalk, and sometimes on different ones.

Those wherein the stamina are, in regard they bear no fruit, are called *male*, or *barren Flowers*, and by the botanist, *stammineus Flowers*: Those which contain the pistil, being succeeded by fruit, are called *female*, or *fruitful Flowers*.

Among the plants which bear both male and female parts on the same plant, but at a distance from each other, are reckoned, the cucumber, melon, gourd, turkey-wheat, turnoff, walnut, oak, beech, fir, alder, cyprus, cedar, juniper, mulberry, plantain, &c.

Those, in which the male and female parts of the *Flowers* are bore on different plants, the willow, poplar, hemp, mercury, spinage, nettles, and hops.

As Mr. Ray divides *Flowers* into *perfect* and *imperfect*;

The *perfect FLOWERS* he accounts all such as have the petala, though they should want the stamina; but this is a very erroneous opinion. They he subdivides into *simple*, which are those not composed of other smaller ones, and which usually have but one single style; and *compounded*, which consist of many flocculi, all making but one *Flower*.

Simple FLOWERS, are either *monopetalous*, which have the body of the *Flower* all of one entire leaf, though sometimes cut, or divided a little way, into many seeming petala, or leaves; as the borrage, bugloss, &c.—or,

Polypetalous FLOWERS, those which have distinct petala, and those falling off singly, and not altogether, as the seeming petala of the monopetalous *Flowers* always do.

Both these are farther divided into *uniform* and *disform Flowers*.

The former have their right and left hand parts, and the forward and backward parts all alike; but the disform have no such regularity; such are in the *Flowers* of sage, dead-nettle, &c.

Monopetalous difform FLOWERS, are likewise farther divided into *Semi-fistular* FLOWERS, those whose upper part resembles a pipe, cut off obliquely; as in the aristolochia.

Labiata FLOWERS, those either with one lip only, as in the acanthium and scordium; or with two lips, as in the far greater part of the labiate *Flowers*.

In these the upper lip is sometimes turned upwards, and so turns the convex part downwards, as in the chamæcillus, &c. but most usually the upper lip is convex above, and turns the hollow part down to its fellow below, and so represents a kind of helmet, or monk's hood; whence these are frequently called *galeate, cucullate, and galericulate Flowers*.

Such are the *Flowers* of the lamium, and most of the verticillate plants.

Sometimes also the labium is entire, and sometimes jagged or divided.

Corniculate FLOWERS, these are such hollow *Flowers* as have on their hinder part a kind of spur or little horn; as in the linaria, delphinium, &c. and the corniculum, or calcar, is always impervious at the tip or point.

Compound FLOWERS, are, either *difscous, planifolius, or fistular*.

Difscous, or difscoidal FLOWERS, are those whose flosculi are set together so close, thick, and even, as to make the surface of the *Flower* plain and flat; which therefore, because of its round form, will be like a discus.

This disk is sometimes radiated, when there are a row of petals standing round in the disk, like the points of a star; as in the matricaria, chamæmelum, &c.

And sometimes naked, having no such radiating leaves round the limb of its disk; as in the tanacetum.

Planifolius FLOWERS, are those which are composed of plain *Flowers*, set together in circular rows, round the center, and whose face is usually indented, notched, uneven, and jagged; as the hierachia, fenchis, &c.

Fistular FLOWERS, are those which are compounded of many long, hollow, little *Flowers*, like pipes, all divided into large jaws at the ends.

Imperfect FLOWERS are such as want the petals, and are called likewise *staminous, apetalous, and capillaceous Flowers*.

Those which hang pendulous by fine threads, like the jully, are by Tournefort called *amentaceous*; we call them *cats-tails*. These are Mr. Ray's principal distinctions of *Flowers*; but other Botanists furnish other divisions and denominations of them.

Campaniform, or bell-like FLOWERS, are those in shape of a bell.

Cruciform FLOWERS, or those consisting of four petals, or leaves: The calyx also containing four leaves; and the pistil always producing a fruit. Such are those of the clove-tree, cabbage-tree, &c.

Infundibuliform FLOWERS, are such as resemble the figure of a funnel, *i. e.* are broad, and ample at top, and contracted into a neck at bottom: Such is that of the bear's ear, or auricula.

Cucurbitaceous FLOWERS, are such as resemble the *Flower* of the gourd; or have the same conformation therewith.

Stamineous FLOWERS, are such as have no petals, but consist wholly of stamina or threads, with apices a-top.

The leaves placed around these stamina, are not to be esteemed as petals, but a calyx; in regard they do not fall off, but afterwards become a capsula, or cover, including the seed; which is the office of the calyx alone.

In effect, it is essential to the leaves of *Flowers*, not to serve as a cover to the seeds that succeed them: And this is the only characteristic that distinguishes the leaves, or petals of *Flowers* from their calyx; for, that no particular colour of the leaves, does determine whether the parts in dispute be leaves of the *Flower*, or the calyx of the *Flowers*, appears hence, that there are some leaves of *Flowers*, which are green like the calyx; and some calyces coloured like petals.

Leguminous FLOWERS, are those of leguminous plants. These bear some resemblance to a flying butterfly; for which reason they are also called *papilionaceous Flowers*.

Papilionaceous FLOWERS, consist of four or five leaves, whereof the uppermost is called *vexillum, or standard*; and the lowest *carina*, as resembling the bottom or keel of a boat: Those between the two are called *lateral leaves, or alæ*.

From the bottom of the calyx arises a pistil, which is incompassed with a sheath, or cover, fringed with stamina. This pistil always becomes the fruit, and is usually called the *pod*, in latin, *siliqua*.

Umbelliform FLOWERS, are those with several leaves disposed in manner of a rose; and whose calyx essentially becomes a fruit of two seeds, joined, before they come to maturity; but afterwards easily separated again.

They have this denomination, by reason they are generally sustained by a number of pedicles, which proceeding from the same centre, are branched all around, like the sticks of an umbrella.

Of this kind are the *Flowers* of fennel, angelica, &c.

Verticillata FLOWERS, are those ranged, as it were, in stories, rings, or rays along the stems: Such are those of horehound, clary, &c. See Supplement, articles CAMPANIFORMIS, &c.

FLOWERS, in gardening, are distinguished into *early, or Spring*

Flowers, which flourish in the months of March, April, and May. Of this class are the anemonies, daffodils, hyacinths, tulips, junquils, cowslips, primroses, &c.

Summer FLOWERS, which open in June, July, and August, as pinks, gilly-flowers, lillies, daisies, campanulas, poppies, sun-flowers, &c.

Autumnal, or late FLOWERS, denote those of September and October; as the oculus Christi, indian pinks, and roses, pansy, flower-gentle, &c.

Of these *Flowers*, those which subsist all the year, we mean in the stem, or root at least, are called *perennials*.

And those which are to be planted, or sowed a-fresh every year, according to the season, are called *annuals*.

Flower, in architecture, according to Vitruvius, is a representation of some imaginary *Flower*, by way of crowning, or finishing, on the top of a dome, &c.

In lieu of this the moderns commonly use a vase, ball, or the like.

Flower-DE-LUCE, FLEUR DE LIS, in heraldry, is a bearing antiently of great dignity; being reputed the noblest of all *Flowers*, and as such having been in all ages the charge of the royal escutcheon of the kings of France; though tract of time has made the bearing thereof more vulgar.

In some coats it is bore single; in others triple; in others it is femée, seeded all over the escutcheon.

Flower of the capital, is an ornament of sculpture, in form of a rose, in the middle of the sweep of the Corinthian abacus. *Tab. Archit. fig. 26. lit. 4.*

In that of the Composite, it is not a rose, nor any real, but an imaginary kind of *Flower*.

FLOWERS, in chemistry, are the finest, and most subtle parts of dry bodies, raised by fire, into the vessel's head, and aludels; and adhering to them, in form of a fine powder, or dust. Such are the *Flowers* of sulphur, benjamin, &c.

Flowers of Sulphur, or Brimstone, are the vapours of melted brimstone conveyed from an iron pot (in which it is kept boiling) through a proper flew, into a close room or oven, where this vapour condenses into *Flowers*.

Flower of wheat, Rye, and other pulse. See FARINA.

FLOWERS*, in the animal oconomy, denote womens monthly purgations, or menses.

* Nicod derives the word in this sense from *suere*, q. d. *Flours*: Others will have the name occasioned hence, that women do not conceive, till they have had their *Flowers*; so that these are a sort of forerunners of their fruit.

FLOWERS, in rhetoric, are figures, or ornaments of discourse, by the Latins called *figurae*. See FIGURE.

FLOWERAGE, a collection of flowers of several kinds set together in husks, and hung up with strings.

FLOWERED, in the manufactures.—A stuff, or cloth, is said to be *flowered, flourished, sprigged, or figured*, when there are representations of *Flowers*, either natural, or imaginary, wrought thereon.

There are stuffs *flowered* of almost all kinds of matter: *flowers* of gold, silver, silk, wool, thread, cotton, &c. Stuffs and cloths are usually denominated from the ground, whereon the *flowers* are raised.

Thus, there are *flowered* velvets, taffaties, damasks, sattins, mohairs, dimities, &c.

Those *flowered* with gold and silver, are more usually called *brocades*. See BROCADE.

The flowers are usually wrought at the same time with the cloth, or ground. The threads of the warp are raised, and lowered by means of packthreads passed through them in mounting the loom; and the manufacturer shooting his warp, or matter of the flowers, whether gold, silver, silk, or the like, between the threads thus raised, forms the flowers.

It is very curious to see them mount a loom; or, as they call it, *read a design*, to be represented on a stuff: But it is next to impossible to describe it; yet we have endeavoured to give some idea thereof under the article DESIGN.

FLUIDITY, in physics, that state or affection of bodies, which denominates or renders them *fluid*.

Fluidity stands in direct opposition to *firmness, or solidity*.

Fluidity is distinguished from *liquidity or humidity* in that the idea of the first is absolute, and the property contained in the thing itself; whereas that of the latter is relative, and implies wetting, or adhering; *i. e.* somewhat that gives us the sensation of wetness, or moisture, and which would have no existence, but for our senses.

Thus, melted metals, air, æther, and even smoke, and flame itself, are *fluid* bodies, but not liquid ones; their parts being actually dry, and not leaving any sense of moisture.

The nature, and causes of *Fluidity* have been variously assigned. The Gassendists, and antient Corpuscularians, require only three conditions as necessary thereto, *viz.* a smallness and smoothness of the particles of the body; vacancies interspersed between them; and a spherical figure. Thus the Epicurean poet, Lucretius:

*Ille autem dehant ex levisibus atque rotundis
Essè magis, fluido quæ corpore liquida constat.*

The

The Cartesians, and after them Dr. Hook, Mr. Boyle, &c. beside the circumstances above-mentioned, require a various, perpetual, intestine motion of the particles of the bodies, as that which principally contributes to *Fluidity*.

Fluidity then, according to these philosophers, consists in this, that the parts of the body being very fine, and final, are so disposed by motion, or figure, as that they can easily slide over one another's surfaces all manner of ways; and that they be in a constant, various, separate agitation to and fro; and that they only touch one another in some few parts of their surfaces. Mr. Boyle, in his *history of Fluidity*, mentions these three as the conditions principally required to *Fluidity*, viz.

1° The minuteness of parts: thus, in effect, we find that fire by dividing metals into fine, small parts, renders them fluid; and that acid menstrua dissolve and render them fluid after the like manner; and that fire turns the hard body of common salt almost wholly into a liquor, by distillation: Not but that the figure of the particles may have a considerable share in *Fluidity*.

Thus mercury, whose parts are doubtless much grosser than those of oil and water, is yet more fluid than either of them: And thus oil by the action of fire, may be converted into a consistent substance, like butter.

2° Stare of vacuities interspersed between the corpuscles, to give room for the several particles to move among themselves.

3° A motion and agitation of the corpuscles; either from some principle of mobility within themselves, or from some extraneous agent, penetrating and entering the pores, moving variously among them, and communicating to them a part of its motion.

That this last is the qualification chiefly required in *Fluidity*, he argues from divers observations and experiments.

Thus, a little dry powder of alabaster, or plaster of Paris finely sifted, being put in a vessel over the fire; it soon begins to boil like water; exhibiting all the motions and phenomena of a boiling liquor. It will tumble variously in great waves like that; will bear stirring with a stick or ladle like that, without resisting; nay, if strongly stirred near the side of the vessel, its waves will apparently dash against them: Yet is it all the while a dry, parched powder.

The like is observed in sand: A dish of which being set on a drumhead, briskly beaten by the sticks, or on the upper stone of a mill, it in all respects emulates the properties of a fluid body. A heavy body, *e. gr.* will immediately sink in it to the bottom, and a light one emerge to the top. Each grain of sand has a constant vibratory and dancing motion: and if a hole be made in the side of the dish, the sand will spin out like water.

That the parts of fluids are in continual motion, the Cartesians bring divers considerations to prove. As 1° The transmutation of solids into fluids, *e. gr.* ice into water, and vice versa; the chief difference between the body in those two states consisting in this, that the parts being fixed and at rest in the one, resist the touch; whereas in the other, being already in motion, they give way upon the slightest impulse.

2° The effects of fluids, which commonly proceed from motion: Such are the insinuation of fluids among the pores of bodies; the softening and dissolving of hard bodies; the actions of corrosive menstrua, &c. Add, that no solid can be brought to a state of *Fluidity*, without the intervention of some moving, or moveable body, as fire, air, or water. Air, the same gentlemen hold the first spring of these causes of *Fluidity*; it being this that gives motion to fire and water, though itself receives its motion and action from the æther, or subtle medium.

Boerhaave pleads strenuously for fire's being the first mover, and the cause of all *Fluidity* in other bodies, as air, water, &c. Without this, he shews that the atmosphere itself would fix into one solid mass.

Sir I. Newton sets aside this theory of the cause of *Fluidity*, and substitutes a new one, the great principle of attraction.

—The corpuscular system, with all the improvements of Des Cartes, and Mr. Boyle, did not sufficiently account for the primary condition, requisite to constitute a body fluid, viz. the various intestine motion and agitation of its particles. But this motion is naturally enough accounted for, by supposing it a primary law of nature, that, as all the particles of matter attract each other when within a certain distance; so at all greater distances, they fly from, and avoid one another. For then, though their common gravity, together with the pressure of other bodies upon them, may keep them together in a mass; yet their continual endeavour to avoid one another singly, and the adventitious impulses of heat, light, or other external causes, may make the particles of fluids continually move round about one another, and so produce this quality.

There is a difficulty indeed, in accounting, why the particles of fluids always keep at such a distance from one another, as not to come within the sphere of one another's attraction. The fabric and constitution of that fluid body, water, is amazing; that a body so very rare, and which has a vast over-proportion of pores, or interspersed vacuity, to solid matter, should yet be perfectly incompressible by the greatest

force: And yet this fluid is easily reducible into that firm, transparent, friable body, which we call ice; by being only exposed to a certain degree of cold.

One would think, that though the particles of water cannot come near enough to attract each other; yet the intervening frigorific matter doth, by being mingled per minima, strongly attract them, and is itself likewise strongly attracted by them, and so wedges or fixes all the mass into a firm, solid body; which solid body looses its solidity again, when by heat the vinculum is solved, and the frigorific particles are disjoined from those of the water, and are forced to fly out of it. And just thus may the fumes of lead perhaps fix quicksilver.

When a firm solid body, such as a metal, is by heat reduced into a fluid, the particles of fire disjoin and separate its constituent parts, which their mutual attraction caused before to cohere; and keep them at such a distance from one another, as that they are out of the sphere of each other's attraction, as long as that violent motion lasts; and when by their lightness and activity they are flown off, unless they be renewed by a continual supply, the component particles of the metal finally come near enough again to feel one another's attractions.

As, therefore, the cause of cohesion of the parts of solid bodies appears to be their mutual attraction; so the chief cause of *Fluidity* seems to be a contrary motion, impressed on the particles of fluids; by which they avoid, and fly one another, as soon as they come at, and as long as they keep at such a distance from each other.

It is observed also in all fluids, that the direction of their pressure against the vessels which contain them, is in lines perpendicular to the sides of such vessels; which property being the necessary result of the particles of any fluid's being spherical, it shews that the parts of all fluids are so, or of a figure very nearly approaching thereto.

FLUIDS, are bodies, whose particles are but weakly connected; their mutual cohesion being in great measure prevented by some external cause.

In this sense a *Fluid* stands opposed to a *solid*.

—Sir I. Newton defines a *fluid* body, to be that whose parts yield to the smallest force impressed, and by yielding are easily moved among each other.

The cause, therefore, of *Fluidity*, should seem to consist in this, that the parts do not cohere so strongly, as they do in solid or firm bodies; and that their motion is not hindered by any inequality in the surface of the parts; as is the case in powders.

For, that the particles whereof *Fluids* consist, are of the same nature, and have the same properties with the particles of solids, is evident, from the conversion of liquids and solids into each other, *e. gr.* of water into ice, of metals into fluors, &c. Nor can it be reasonably doubted, that the component parts of all bodies are the same, viz. hard, solid, impenetrable, moveable corpuscles.

The Cartesians define a *Fluid* to be a body whose parts are in continual intestine motion; and Dr. Hook, Mr. Boyle, and Boerhaave, though far from Cartesianism, subscribe to the definition: alledging arguments to prove that the parts of *Fluids* are in continual motion; and even that it is this motion, which constitutes *Fluidity*.

The later Newtonians dare not go so far: To say that the parts of a *Fluid* are in continual motion, is more than either our senses, experience, or reason will warrant; and to define a thing from a property that is disputable, is certainly bad philosophy.

Add, that the great argument from geometry, produced in favour of this continual motion, viz. That the resistance of a body moving in a *Fluid*, is less, if the parts of the *Fluid* be agitated by an intestine motion, than if they were at rest, is demonstrated to be false.

We observe therefore, with Dr. Clarke, That if the parts of a body either do not touch each other, or easily slide over one another; and are of such a magnitude, as that they may be easily agitated by heat, and the heat be sufficiently great to agitate them, though it may perhaps be less than suffices to prevent water from freezing; or, even, though the parts be not actually moved; yet, if they be small, smooth, slippery, and of such a figure and magnitude as disposes them to move and give way; that body is *fluid*.

And yet the particles of such *fluid* bodies do, in some measure, cohere; as is evident hence, that mercury, when well purged of air, will be sustained in the barometer, to the height of 60 or 70 inches; that water will ascend in capillary tubes even in vacuo; and that the drops of liquors in vacuo run into a spherical form: as adhering by some mutual cohesion like that between polished marble planes. Add, that these *fluid* bodies, if they consist of particles that are easily entangled within each other, as oil; or if they be capable of being stiffened by cold, and joined by the interposition of little cones, or wedges, as water; they are easily rendered hard: But if their particles be such as can neither be entangled, as air; nor stiffened by cold, as quicksilver; then they never grow hard and fixed.

F L U

FLUIDS are called either *natural*, as water, and mercury; or *animal*, as blood, milk, bile, lymph, urine, &c. or *facitious* as wines, spirits, oils, &c. See each under its proper article.

The doctrine and laws of *Fluids* are of the greatest extent in philosophy.—The pressure, and gravitation of bodies in *Fluids*, and the action of the *Fluids* immersed in them, make the subject of hydrostatics.

Hydrostatical Laws of FLUIDS.—I. The upper parts of all *Fluids*, as water, &c. do press upon the lower: Or, as some philosophers state it, all *Fluids* do gravitate in proprio loco.

The contrary of this was a principle in the school philosophy; but the certainty of such pressure is now demonstrated by a thousand experiments: It will be sufficient to instance one or two.

Immerse a tube, open at both ends, and half filled with oil of turpentine, in a vessel of water, the upper end of the tube being stopped with the finger: if now the upper surface of the oil lie as low as that of the water; the oil, upon removing the finger, will not run out at the lower end of the tube; nay, and if the tube be thrust a little lower, the water will rise up in it, and bear the oil above it: But if the upper surface of the oil be considerably higher than that of the water, the oil will drop out of the tube. Whence it follows, that the column of oil in one case presses or gravitates less on the plane imagined to pass under its lower surface, than a column of water; and in the other case, more.

—Or thus; an empty vial, close shut, being immersed in water, and suspended by a horse hair to the beam of a balance, with a weight at the other end exactly counterpoising it: upon unstopping the vial, and letting it fill with water, it will preponderate, and bear down the end of the balance, without having any communication with the external air.

Which two experiments abundantly prove the proposition, that the upper parts of *Fluids* do really press, or gravitate on the lower.

From this gravity it follows, that the surfaces of stagnant *Fluids* are plain, and parallel to the horizon; or rather, that they are segments of a sphere concentrical with the earth.

For, as the particles are supposed to yield to any force impressed, they will be moved by the action of gravity, till such time as none of them can descend any lower. And this situation once attained, the *Fluid* must remain at rest, unless put in motion by some foreign cause; inasmuch as none of the particles can now move without ascending, contrary to their natural tendency.

II. If a body be immersed in a *Fluid*, either wholly, or in part; its lower surface will be pressed upward by the water underneath it.

The truth of this proposition is evident from the experiment above-mentioned; where the oil of turpentine was suspended, nay, and made to mount up in the tube, by the pressure of the water upwards on its lower parts.

The law, or quantity of this pressure is this, that a body immersed in a *Fluid*, loses just so much of the weight it would have in air; as so much of the *Fluid* as is equal to it in bulk, if weighed in the air, would amount to.

This pressure of *Fluids* on the lower parts of an immersed body, is farther confirmed, by attending to the reason why bodies specifically lighter than *Fluids* ascend therein. The effect is owing to this, that there is a greater pressure or weight on every other part of the plane or surface of the *Fluid* imagined to pass under the lower surface of the body, than there is on that whereon the emerging body rests. Consequently, to produce an equilibrium in the *Fluids*, the parts immediately under the rising body being pressed by the rest every way, do continually force it upwards.

In effect, the emerging body is continually pressed on by two columns of water, one beating against its upper, and the other against its lower parts: The length of both which columns being to be accounted from the top of the water, that which presses on the lower part, will be the longer, by the thickness of the ascending body, and consequently will over-balance it by the weight of as much water as will fill the space that body takes up.

Hence, 1^o we are furnished with one reason, why very minute corpuscles, either heavier, or lighter than the liquor they are mingled with, will be sustained therein a good while, without either emerging to the top, or precipitating to the bottom; the difference between the two columns of the *Fluid* being here inconsiderable.

Hence, 2^o if a body A be specifically lighter than B, an equal portion of the *Fluid* in which it is immersed; it will rise with a force proportionable to the excess of gravity of B above A: And if A be specifically heavier than B, it gravitates and descends with the excess only of its weight above that of B.

III. The pressure of the upper parts of a *Fluid* on the lower, exerts itself every way, and every way equally; laterally, horizontally, and obliquely, as well as perpendicularly.

F L U

For, as the parts of a *Fluid* yield to any impression, and are easily moved: it is impossible any drop should remain in its place: If while it is pressed by the super-incumbent *Fluid*, it be not equally pressed on every side.

The same is confirmed from experiments: for several tubes of divers forms, straight, curved, angular, &c. being immersed in the same *Fluid*, though the apertures, through which the *Fluid* enters, be differently posited to the surface or plane, some being perpendicular, others parallel, and others variously declined; yet will the *Fluid* rise to an equal height in them all.

Hence, 1. all the particles of *Fluids* being thus equally pressed on all sides, it is argued, that they must be at rest, and not in continual motion, as has been usually supposed.

Hence, 2. also a body being immersed in a *Fluid*, sustains a lateral pressure from the *Fluid*; which is also increased as the body is placed deeper beneath the surface of the *Fluid*.

IV. In tubes that have a communication with each other, whatever their magnitude be, whether equal, or unequal; and whatever their form, whether straight, angular, or crooked: still, *Fluids* rise in them to the same height.

V. If a *Fluid* rise to the same altitude in two tubes that communicate with each other; the *Fluid* in one tube is a balance, or equal in weight to that in the other.

If the tubes be of equal diameters, the columns of the *Fluid* having the same base and altitude, are equal, and consequently their gravities equal; so that they press and gravitate against each other with equal force.

This is demonstrated from mechanics. *E. gr.* Let the base of G I, *Tab. Hydrostatics*, fig. 6. be supposed quadruple the base of H K; and let the *Fluid* descend in the greater tube the space of an inch, as from L to O; it will then rise in the other the space of four inches, as from M to N. Wherefore the velocity wherewith the *Fluid* moves in the tube H K, is to that wherewith it moves in G I, as the base of the tube G I to the base of the other, H K. But the altitude of the *Fluid* being supposed the same in both tubes, the quantity of the *Fluid* in the tube G I, will be to that in the other tube H K, as the base of the tube G I to the base of the other H K.

Consequently, the momentum of the *Fluid* in the tube G I, is to that in the tube H K; as the product of the base of the tube G I into the base of the other H K, to the factum of the tube H K into the base of the other G I. Wherefore, the products being equal, the momenta must be equal.

The same is easily demonstrated where one of the tubes is inclined, and the other perpendicular, &c.

Hence in tubes that communicate, the *Fluid* will preponderate in that where its altitude is the greatest.

VI. In communicating tubes, *Fluids* of different specific gravities will equiponderate, if their altitudes be in the ratio of their specific gravities.

Hence we have a way of finding the specific gravities of *Fluids* viz. by pouring one *Fluid* into one of the communicating tubes, as A B (fig 7.) and another, into the other tube C D; and measuring the altitudes E B and F D, at which they stand when balanced.

For the specific gravity of the *Fluid* in A B, is to that in D C, as D H, to B G.—If the *Fluids* employed in this experiment be apt to mix, it may be proper to fill the horizontal tube B D with mercury, to prevent the mixture.

Hence, since the densities of *Fluids* are as their specific gravities; the densities will likewise be as the altitudes of the *Fluids* D H and B G: so that we have hence likewise a method of determining the densities of *Fluids*. See DENSITY.

VII. The bottoms, and sides of vessels, are pressed in the same manner, and by the same laws as the liquids contained in them.

And hence, as action and re-action are equal; the *Fluids* themselves sustain an equal pressure from the bottoms and sides.—And as the pressure of *Fluids* is equal every way, the bottom and sides are pressed as much as the neighbouring parts of the *Fluids*: and consequently this action increases in proportion to the height of the *Fluids*, and is equal every way at the same depth; as depending altogether on the height, and not at all on the quantity of the *Fluid*.

VIII. In perpendicular vessels of equal bases, the pressure of *Fluids* on the bottoms, is in the ratio of their altitudes.

This is evident, in that the vessels being perpendicular, the bottoms are horizontal: consequently the tendency of *Fluids* by the action of gravity will be in lines perpendicular to the bottom, so that they will press with all their weight; the bottoms therefore are pressed in the ratio of the gravities. But the gravities are as the bulks; and the bulks here are as the altitudes: therefore the pressures on the bottoms are as the altitudes.

IX. In perpendicular vessels of unequal bases, the pressure on the bottoms is in a ratio compounded of the bases, and altitudes.

From the preceding demonstration it appears, that the bottoms are pressed in the ratio of the gravities: and the gravities

vities of *Fluids* are as their bulks; and their bulks in a ratio compounded of the bases and altitudes. Consequently, &c.

X. If an inclined vessel ABCD, fig. 8. have the same base and altitude with a perpendicular one, BEFG; the bottoms of each will be equally pressed.

For in the inclined vessel ABCD, the bottom CD, is pressed in the direction BD. But the force of gravity in the direction BD, is to the absolute gravity, as BE to BD.

Consequently, the bottom CD is pressed in the same manner, as if it had been pressed perpendicularly by the *Fluid* under the altitude BE. Therefore, the bottoms of the perpendicular and inclined vessels are equally pressed.

XI. *Fluids* press upon subject bodies, according to their perpendicular altitude, and not according to their latitude, or breadth.

Or, as others state it, thus: If a vessel be taper, or unequally big at top and bottom; yet the bottom will be pressed after the same manner as if the vessel were cylindrical, and the top and bottom equal.

Or thus: The pressure sustained by the bottom of a vessel, whatever the figure of the vessel be, is ever equal to the weight of a column of the *Fluid*, whose base is the bottom itself, and height, the vertical distance of the upper surface of the water from the bottom.

Or, yet more explicitly, thus: If there be two tubes or vessels, having the same heights, and bases, both filled with water; but one of them made to taper upwards, that it shall contain but twenty ounces of water; whereas the other widening upwards, holds two hundred ounces: yet the bottoms of the two tubes shall sustain an equal pressure of water, viz. each of them that of the weight of two hundred ounces.

This is a noble paradox in hydrostatics, first discovered by M. Pascal, and which it is well worth the clearing and insinuating on. It is found unexceptionably true from abundant experiments; and it may even be demonstrated and accounted for on principles of mechanics.

Suppose, e. g. the bottom of a vessel, CD (fig. 9.) less than its top, AB; since the *Fluid* presses the bottom CD, which we suppose horizontal, in a perpendicular direction, EC, none but that part within the cylinder ECDF can press upon it; the natural tendency and pressure of the rest being taken off by the sides.

Again, supposing the bottom CD (fig. 10.) much bigger than the top FG; or even, for the easier demonstration, suppose a tube FE fixed in a cylinder ABCD; and suppose the bottom CD raised to L, that the *Fluid* may be moved through the interval DL; then will it have risen through the altitude GH, which is to DL, as the base CD to that GF. The velocity therefore of the *Fluid* FE, is to its velocity in the vessel AD, as the base CD to the base FG.

Hence, we have the momentum wherewith the *Fluid* in the tubes tends downwards, by multiplying the base of the cylinder CD into its altitude CK.

Consequently, the bottom CD is pressed with the same force; as it would be pressed by the cylinder HCDD.

To confirm and illustrate this doctrine of the pressure of *Fluids* in the ratio of the base and altitude, provide a metallic vessel, ACDB (fig. 10.) so contrived, as that the bottom CD may be moveable, and to that end fitted in the cavity of the vessel with a rim of wet leather, to slide without letting any water pass. Then, through a hole in the top, AB, apply successively several tubes of equal altitudes, but of different diameters. Lastly, fastening a string to the beam of a balance, and fixing the other end by a little ring K to the moveable bottom; put weights in the other scale, all they be sufficient to raise the bottom CD; then will you not only find, that the same weight is required, what diameter or magnitude soever the tube be of; but even, that the weight which will raise the bottom, when pressed by the smallest tube, will raise it when pressed by the whole cylinder HCDD.

XII. The most solid and ponderous body, though when near the surface of the water it would sink with great velocity, yet if placed at a greater depth than twenty times its own thickness, will not sink, unless assisted by the weight of the incumbent water.

Thus, immerge the lower end of a slender glass tube in a vessel of mercury: then stopping the upper end with your finger, you will by that means keep about half an inch of that ponderous *Fluid* suspended in the tube. Lastly, keeping the finger thus, immerge the tube in a long glass of water, till the little column of mercury be more than thirteen or fourteen times its length under water; then, removing the finger, you will find that the mercury will be kept suspended in the tube by the pressure of the water upwards: but if you raise the tube a very little above the former station, the mercury will immediately run out; whereas, if before you had removed the finger from the top, you had sunk the pipe so low, as that the mercury were twelve or fourteen inches, &c. below the surface of the water; the

mercury would be violently forced up, and make several ascents and descents in the tube, till it had gained its proper station, according to the laws of specific gravity.

Hence then we have a solution of the phenomenon of two polished marbles, or other planes, adhering so strongly together: in that the atmosphere presses or gravitates with its whole weight on the under surface, and sides of the lower marble; but cannot do so at all on its upper surface, which is closely contiguous to the upper, and suspended marble.

For the laws of the pressure and gravitation in *FLUIDS* specifically heavier, or lighter than the bodies immersed, see *GRAVITY Specific*.

For the laws of the resistance of *FLUIDS*, or the retardation of solid bodies, moving in *Fluids*, see *RESISTANCE*.

For the ascent of *FLUIDS* in capillary tubes; or between glass planes, see *ASCENT*.

The motions of *Fluids*, and particularly water, do also make the subject of hydraulics.

Hydraulic Laws of FLUIDS.— I. The velocity of a *Fluid*, as water, moved by the pressure of a super-incumbent *Fluid*; as air, is equal at equal depths, and unequal at unequal ones.

For the pressure being equal at equal depths, the velocity arising thence must be so too; and vice versa: yet does not the velocity follow the same proportion as the depth; notwithstanding that the pressure, whence the velocity arises, does increase in the proportion of the depth. But here the quantity of the matter is concerned: and the quantity of motion, which is compounded of the ratio of the velocity and quantity of matter, is increased in equal-times as the squares of the velocities.

II. The velocity of a *Fluid* arising from the pressure of a super-incumbent *Fluid*, at any depth, is the same as that which a body would acquire in falling from a height equal to the depth. As is demonstrated both from mechanics and experiments. See *DESCENT*.

III. If two tubes of equal diameters, full of any *Fluid*, be placed any how, either erect, or inclined; provided they be of the same altitude, they will discharge equal quantities of the *Fluid* in equal times.

That tubes, every way equal, should, under the same circumstances, empty themselves equally, is evident; and that the bottom of a perpendicular tube is pressed with the same force, as that of an inclined one, when their altitudes are equal, has already been shewn. Whence it easily follows, that they must yield equal quantities of water, &c.

IV. If two tubes of equal altitudes, but of unequal apertures, be kept constantly full of water; the quantities of water they yield in the same time, will be as the diameters: and this, whether they be erect, or any way inclined.

Hence, if the apertures be circular, the quantities of water emptied in the same time, ought to be in a duplicate ratio of the diameters.

But this law, Mariotte observes, is not perfectly agreeable to experiment. If one diameter be double the other, the water flowing out of the less, is found more than a fourth of what flows out of the greater. But this may have been owing to some accidental irregularities in making the experiments.

Volius however ascribes it principally to this, that the column of water directly over the aperture is shorter than that next the sides or parietes of the vessel: for the water, in its efflux, forms a kind of cavity over the aperture; that part immediately over it being evacuated first, and the other water not running fast enough from the sides to supply it. Now, this cavity, or diminution of altitude, being greater in the greater tube, than in the less; hence the pressure or endeavour to pass out, becomes proportionally less in the greater tube, than in the less.

V. If the apertures E and F of two tubes AB and CD (fig. 12. and 13.) be equal; the quantities of water, discharged in the same time, will be as the velocities.

VI. If two tubes have equal apertures E and F, and unequal altitudes AB and CD; the quantity of water discharged from the greater AB, will be to that discharged from CD, in the same time, in a sub-duplicate ratio of the altitudes AB and CD.

Hence, 1^o the altitudes of waters, A B, and C D, discharged through equal apertures E and F, will be in a duplicate ratio of the waters discharged in the same time.—And as the quantities of water are as the velocities; the velocities are likewise in a sub-duplicate ratio of their altitudes.

Hence, 2^o the ratio of the waters discharged by two tubes A B, and C D, together with the altitude of one of them, being given; we have a method of finding the altitude of the other, viz. by finding a fourth proportional to the three given quantities; which proportional, multiplied by itself, gives the altitude of CD, required.

Hence, also, 3^o the ratio of the altitudes of two tubes of equal apertures being given, as also the quantity of water discharged by one of them; we have a method of determining the quantity the other shall discharge in the same time. Thus, to the given altitudes, and the square of the quantity of water discharged at one aperture, find a fourth proportional.

tional. The square root of this will be the quantity of water required.

Suppose, *e. gr.* the heights of the tubes as 9 to 25; and the quantity of water discharged at one of them, three inches: that discharged by the other will be $\sqrt{9 \cdot 25 \cdot 9} = \sqrt{25} = 5$.

VII. If the altitudes of two tubes AB and CD be unequal, and the apertures E and F be likewise unequal; the quantities of water discharged in the same time, will be in a ratio compounded of the simple ratio of the apertures; and the subduplicate one of the altitudes.

And hence, if the quantities of water discharged in the same time by two tubes, whose apertures and altitudes are unequal, be equal; the apertures are reciprocally as the roots of the altitudes, and the altitudes in a reciprocal ratio of the squares of the apertures.

VIII. If the altitudes of two tubes be equal, the water will flow out with equal velocity, however unequal the apertures be.

IX. If the altitudes of two tubes, AB and CD, as also their apertures E and F be unequal; the velocities of the waters discharged are in a subduplicate ratio of their altitudes.

And hence, 1^o, as the velocities of waters flowing out at equal apertures, when the altitudes are unequal, are also in a subduplicate ratio of the altitudes, and, as this ratio is equal, if the altitudes be equal; it appears in the general, that the velocities of waters flowing out of tubes, are in a subduplicate ratio of the altitudes.

Hence also, 2^o, the squares of the velocities are as the altitudes.

Mariotte found from repeated experiments, that if a vessel ABCD have a tube EG fitted to it, there will more water be evacuated through the tube, than there could have been in the same time, through the aperture of the vessel E, without the tube: and that the motion of the Fluid is accelerated so much the more, as the tube EG, is the longer.

E. gr. The altitude of a vessel AC, being one foot, that of the tube EG three feet, and the diameter of the aperture three lines; no less than 6½ septiers of water were discharged in the space of one minute; whereas upon taking off the tube, only four septiers were discharged. Again, when the length of the tube EG was six feet, and the diameter of the aperture G, an inch; the whole quantity of water run out in thirty-seven seconds: but cutting off half the tube, the vessel was not evacuated in less than forty-five seconds; and taking it quite away in less than ninety-five seconds.

X. The altitudes and apertures of two cylinders full of water, being the same; one of them will discharge double the quantity of water discharged in the same time by the other; if the first be kept continually full, while the other runs itself empty. For the velocity of the full vessel will be equable; and that of the other will be continually retarded. Now it is demonstrated, that if two bodies be impelled by the same force; and the one proceeds equably, and the second is equably retarded; by that time they have lost all their motion, the one has moved double the space of the other.

XI. If two tubes have the same altitudes, and equal apertures; the times wherein they will empty themselves, will be in the ratio of their bases.

XII. Cylindric, and prismatic vessels, as ABCD (fig. 14.) empty themselves by this law, that the quantities of water discharged in equal times, decrease according to the uneven numbers, 1, 3, 5, 7, 9, &c. taken backwards.

For the velocity of the descending level FG, is continually decreasing in the subduplicate ratio of the decreasing altitudes: but the velocity of a heavy body descending, increases in the subduplicate ratio of the increasing altitudes. The motion therefore of the level FG, in its descent from G to B, is the same as if it were to descend in the inverse ratio from B to G. But if it descend from B to G, the spaces, in equal times, would increase according to the progression of the uneven numbers. Consequently, the altitudes of the level FG, in equal times, would decrease according to the same progression inversely taken.

Hence, therefore, the level of water FG, descends by the same law, as, by an equal force impressed, it would ascend through an altitude equal to FG.

From this principle might many other particular laws of the motion of Fluids be demonstrated, which for brevity sake we here omit.

To divide a cylindrical vessel into parts, which shall be evacuated in certain parts, or divisions of time, see CLEPSYDRA.

XIII. If water descending through a tube HE (fig. 15.) spout up at the aperture G, whose direction is vertical; it will rise to the same altitude GI, at which the level of the water LM, in the vessel ABCD, does stand.

For since the water is driven through the aperture G, by the force of gravity of the column EK, its velocity will be the same as that with which a body by the same force impressed, would rise to the altitude FI. Wherefore, since the direction of the

aperture is vertical, the direction of the water spouting through it, will be so too; consequently, the water must rise to the height of the level of the water LM in the vessel.

Indeed, by the experiment it appears, that the water does not rise quite so high as I: beside, that the aperture G should be smaller, as the height of the level of the water is less; and even smaller, when mercury is to be spouted, than when water. But this is no objection to the truth of the theorem; it only shews, that there are certain external impediments, which diminish the ascent.

Such are the resistance of the air, the friction of the tube, and the gravity of the descending Fluid.

XIV. Water descending through an inclined tube, or a tube bent in any manner, will spout up through a perpendicular aperture to the height at which the level of the water in the vessel stands.

XV. The lengths or distances DE and DF, or IH, and IG (fig. 16.) to which water will spout either through an inclined, or a horizontal aperture D, are in a subduplicate ratio of the altitudes in the vessel or tube AB and AD.

For, since water spouted out through the aperture D, endeavours to proceed in the horizontal line DF; and at the same time, by the power of gravity, tends downwards in lines perpendicular to the same; nor can the one power hinder the other, inasmuch as the directions are not contrary: it follows, that the water by the direction BA will arrive at the line IG, in the same time wherein it would have arrived at it, had there been no horizontal impulse at all. Now the right-lines IH and IG are the spaces which the same water would have described in the mean time by the horizontal impetus; but the spaces IH and IG, inasmuch as the motion is uniform, are as the velocities. Consequently, the velocities are in a subduplicate ratio of the altitudes AB and AD. And therefore the lengths or distances to which the water will spout in apertures either horizontal, or inclined, are in a subduplicate ratio of the altitudes. Hence, as every body, projected either horizontally or obliquely, in an unresisting medium, describes a parabola; water projected either through a vertical or inclined spout, will describe a parabola.

Hence we have a way of making a delightful kind of water arbours, or arches, *viz.* by placing several inclined tubes in the same right-line.

On these principles are formed various hydraulic engines for the raising, &c. of Fluids, as pumps, siphons, fountains, or jets d'eau, &c. which see described under their proper articles, PUMP, SIPHON, FOUNTAIN, SPIRAL SCREW, &c.

For the laws of the motion of FLUIDS, by their own gravity, along open channels, &c. see RIVER, and WAVE.

For the laws of pressure and motion of air, considered as a FLUID, see AIR and WIND.

FLUMMER Y, a wholesome sort of vegetable jelly, made of oatmeal.

The manner of preparing it in the western parts of England, is to take half a peck of wheat bran, which must be soaked in cold water three or four days; then strain out the milky water of it, and boil it to a jelly: afterwards season it with sugar, add some rose and orange-flower water, and let it stand till cold, and thickened again; and then eat it with white or rhenish wine, or with cream.

FLUOR, in physics, &c. denotes a fluid; or, more properly, the state of a body, which was before hard and solid, but is now reduced by fusion or fire into a state of fluidity.

Gold and silver will remain a long time in Fluor, kept to them by the intensest heat, without losing any thing of their weight. See GOLD, FIXITY, &c.

FLUOR is also used by the modern mineral writers for such soft, transparent, sparry kinds of mineral concretions, as are frequently found amongst ores, and stones, in mines and quarries.

These are of a stony nature, and resemble gems, but are less hard; and are called *Metallic Fluors* and *Spars*. See Supplement, article SPAR.

FLUOR *Albus*, or *Uterinus*, a kind of flux, incident to women, popularly called the *Whites*.

It consists in an irregular, disorderly discharge of some corrupt humour from the uterus, sometimes white, and pale, like whey; sometimes yellow, green, or blackish. At first it is usually mild, and harmless, but in time it grows hot, sharp, and corrosive, and excoriates all the parts it touches.

It is attended with a pain in the spina dorsa, a swelling of the feet and eyes, weariness, lumbago, a loss of appetite, change of complexion, &c.

It is frequently produced from a too heavy and lasting grief. It must be carefully distinguished from an ulcer in the uterus, and a gonorrhoea, which last it greatly resembles.

It happens to all ages; from girls of three years old; and at all times; before, after, or even along with the menses; and even to women with child.

Etmuller takes it for a gonorrhœa muliebris, analogous to a non-violent gonorrhœa in men, flowing out of the glandule of the prostate.

What the coxyza is in the nostrils; too much weeping in the eyes; and coughing and hawking in the fauces; that, according to Etmuller, is this *Fluar* in the uterus.

According to Pitcairn, all the difference between the venereal gonorrhœa, and a *Fluar albus*, is that the humour evacuated in the latter is viscid, and in the former quite thin and ferous. The same author adds; that the *Fluar albus* can only be cured by medicines proper for the venereal disease. See Supplement, article FLUAR ALBUS.

FLUTE*, an instrument of musick, the simplest of all those of the wind-kind; played, by blowing in it with the mouth; and the tones or notes formed and changed by stopping or opening holes disposed for that purpose all along it.

* The *Latins* call it *sputula*, and sometimes *tibia*, pipe; from the former of which, some derive the word *Flute*: Though Borel will have it derived from *futa*, a lamprey, thus called *a stutendo in sputis*; in regard the *Flute* is long, like the lamprey, and has holes all along it, like that fish.

The ancient *Pistula* or *Futus* were made of reeds; afterwards they were of wood; and at length of metal. But how they were blown, whether as our *Flutes*, or hautboys, does not appear.

It is plain, some had holes, which at first were but few; but afterwards were increased to a greater number: and some had none. Some were single pipes, and some a combination of several, particularly Pan's syringes, which consisted of seven reeds, joined together sideways.

These seven reeds had no holes, each giving but one note, in all seven distinct notes; but at what intervals, is not known: Perhaps they were the notes of the natural, or diatonic scale.

The *German Flute* is different from the common one: It is not put into the mouth, by the end, as the ordinary one is; the end is stopped up with a plug, or tampon, but the lower lip is applied to a hole a little way distant from it.

It is made equally big every where, and perforated with six holes, beside that of the mouth.

FUTA*, or **FLUYT**, is also a kind of long vessel, with flat ribs, or floor timbers; round behind, and swelled in the middle, serving chiefly for the carrying of provisions in fleets or squadrons of ships; though it is also used in merchandize.

* The word *Flut*, taken for a sort of boat; or vessel, is derived, according to Borel, from the ancient *fotta*, a little boat. In the verbal process of the miracles of St. Catherine of Sweden, in the xiiith century, we read, *Unus equum suum una cum mercibus magni ponderis intravit super instrumentum de lignis fabricatum, vulgaverit dictum Fluta*. Upon which the *Hollandists* observe, that in some copies it is read *fotta*, an instrument called by the *Latins* *ratis*; and that the word *futta* or *fottas*, arose from *fotten*, or *solaten*, to float.

FLUTE-Crafting, see the article ENGRAFTING.

FLUTES, or **FLUTINGS**, in architecture, are perpendicular channels, or cavities, cut along the shaft of a column or pilaster.—See *Tab. Archit.* fig. 32. lit. *d,d*, fig. 28. lit. *u,u*.

They are supposed to have been first introduced in imitation of the plaits of womens robes; and are therefore called by the *Latins*, *Strigæ*, and *rugæ*.

The French call them *Cannelures*, as being excavations, and we, *Flutes*, or *Flutings*, as bearing some resemblance to the musical instrument so called.

They are chiefly affected in the Ionic order, in which they had their first rise; though they are also used in all the richer orders, as the Corinthian and Composite; but rarely in the Doric; and scarce ever in the Tuscan.

Their number is usually 24, though in the Doric it is only 20.

Each *Flute* is hollowed in exactly a quadrant of a circle.

Between the *Flutes* are little spaces that separate them, called by Vitruvius, *strigæ*, and by us, *flits*; though in the Doric, the *Flutes* are frequently made to join each other, without any intermediate space at all; the flit being sharpened off to a thin edge, which forms a part of each *Flute*.

In some buildings we see columns with *Flutes* that go winding round the shaft, spirally; but this is rather looked on as an abuse.

Vignola determines the depth of the *Flutes*, by taking the angle of an equilateral triangle for the centre. Vitruvius describes it from the middle of the square, whose side is the breadth of the *Flute*: Which latter method makes them deep. The *Flutes*, or *strigæ*, are frequently filled up with a prominent, or swelling ornament, sometimes plain, in form of a staff or reed; and sometimes a little carved, or enriched, in imitation of a rope, or otherwise, and therefore called *radedures* or *cablings*; and the columns thus enriched, are called *cablings*.

This is most frequent in the Corinthian order. The cablings, or fillings up, commence from about one third of the height of the column, reckoning from the base: and are continued

to the capital: That is, they begin and end with the diminution of the column.

FLUTES, or *Flutings*, are also used in botany, to denote the stems and fruits of certain plants, which have furrows analogous to those of these columns.

FLUX, **FLUXUS**, in medicine, an extraordinary issue, or evacuation of some humour.

Fluxes are various, and variously denominated, according to their seats, or the humours thus voided; as a *Flux* of the belly; uterine *Flux*, hepatic *Flux*, salival *Flux*, &c.

The *Flux* of the belly is of four kinds, which have each their respective denominations, viz. the *lientery*, or *Fluxus lientericus*; the *celiac*, or *Fluxus chylofus*; the *diarrhœa*; and the *dysentery*, or *bloody Flux*. See each explained under its proper article, LIENTERY, &c.

A wound, or scarification cross the crown of the head is used in Scotland to cure *Fluxes* and dysenteries. *Phil. Transact.* N^o 312.

FLUX of the mouth, or salival *Flux*, see SALIVATION.

The *Hepatic Flux* of the antients, is by several moderns held a mere name, being in reality a hæmorrhoidal *Flux*, out of the hæmorrhoidal veins.

Women are subject to three kinds of *Fluxes* extraordinary: The first, called the *menfes* or *menstrual Flux*, as happening every month; sometimes *courses*, as keeping pace with the moon; and sometimes *flowers*. See MENSES.

The second is after delivery, called *Lochia*. See LOCHIA.

The third is irregular, and præternatural; and for want of a better name, called *Fluar albus*, or the *whites*. See FLUAR ALBUS.

FLUX, in hydrography, a regular, periodical motion of the sea, happening twice in twenty-four hours; wherein the water is raised, and driven violently against the shores.

The *Flux* or *Flew*, is one of the motions of the tide; the other, whereby the water sinks and retires, is called the *reflux*, or *ebb*. See TIDES.

There is always a kind of rest, or cessation of about half an hour, between the *Flux* and reflux; during which time the water is at its greatest height, called *high-water*.

The *Flux* is made by the motion of the water of the sea, from the equator towards the poles; which, in its progress, striking against the coasts in its way, and meeting with opposition from them, swells, and where it can find passage, as in flats, rivers, &c. rises up, and runs into the land.

This motion follows in some measure the course of the moon; as it loses, or comes later every day by about three quarters of an hour; or more precisely, by 48 minutes: and by so much is the motion of the moon slower than that of the sun. It is always highest and greatest in full moons; particularly those of the equinoxes. In some parts, as at Mount St. Michael, it rises eighty or ninety feet; though in the open sea it never rises above a foot, or two; and in some places, as about the *Morea*, there is no *Flux* at all.

It runs up some rivers above a hundred and twenty miles. Up the river Thames it only goes eighty, viz. near to Kingston in Surry.

Above London-bridge the water flows four hours, and ebbs eight; and below the bridge, flows five hours, and ebbs seven.

FLUX-Powders are those prepared to facilitate the fusion of the harder metals; as also to melt ores, in order to discover what proportion of metal they contain.

Powder of antimony is a very good *Flux* powder. By this alone may you readily melt iron or steel in a crucible, with an ordinary charcoal fire. See Supplement, article FLUXES.

FLUXION, in medicine, a sudden collection of morbid matter in any part of the body.

Fluxions arise either from the weakness, flaccidity, and inactivity of the part affected, which does not disperse; protrude, or expel the humours naturally received into it: Or from the derivation of some extraordinary quantity of peccant matter from some other part.

This latter is properly called *defluxion*, and by the antients, *attribution*. See DEFLEXION.

A *Fluxion*, or *defluxion* on the trachea and lungs, is called a *catarrh*. See CATARRH.

FLUXION, in the Newtonian analysis, denotes the velocity with which a flowing quantity is increased by its generative motion.—By which it stands contradistinguished from *flux* or the *flowing* quantity, which is gradually, and indefinitely increasing; after the manner of a space which a body in motion describes.

Method of FLUXIONS, is the arithmetic and analysis of *Fluxions*, and fluents, or flowing quantities.

Foreigners usually define the method of *Fluxions* the arithmetic, or analysis, of infinitely, or rather indefinitely, small variable quantities; or the method of finding an infinitesimal, or infinitely small quantity, which being taken an infinite number of times, becomes equal to a given quantity.

Sir I. Newton, and after him the English authors, call these infinitely small quantities, *moments*; as considering them as the momentary increments or decrements of variable quantities, *e. gr.* of a line considered as generated by the flux of a point; or of a surface generated by the flux of a line.

Accordingly, the variable quantities are called *fluent* or flowing quantities; and the method of finding either the *Fluxion*, or the *fluent*, the method of *Fluxions*.

M. Leibnitz, considers the same infinitely small quantities as the differences, or differentials of two quantities; and calls the method of finding those differences, the *differential calculus*.

Each of these ways of considering and denominating, has its advantages; which the retainers to this or that method frequently assert.

Flowing quantities, *i. e.* such as in the genesis of figures by local motion, are continually increasing and diminishing, are certainly very properly denominated *fluents*: And as all figures may be conceived as so generated; the infinitely small increments, or decrements of such quantities are very naturally denominated *Fluxions*.

Beside this difference in the name, there is another in the notation.

Sir I. Newton expresses the *Fluxion* of a quantity, as x , by a dot placed over it, as \dot{x} ; and M. Leibnitz expresses his differential of the same x by prefixing a d , as $d x$; each of which methods of notation has likewise its advantage.

Setting aside these circumstances, the two methods are the same. The method of *Fluxions* is one of the greatest, most subtil and sublime discoveries of this, or perhaps of any age: It opens a new world to us, and extends our knowledge, as it were, to infinity. It carries us beyond the bounds that seemed to have been prescribed to the human mind; at least infinitely beyond those to which the ancient geometry was confined.

The history of this important discovery, as fresh as it is, is a little dark, and imbroiled. Two of the greatest men of this age do both of them claim the invention, Sir I. Newton, and M. Leibnitz; and nothing can be more glorious for the method itself, than the zeal wherewith the partisans of either side have asserted their title.

To give the reader a just view of this noble dispute, and of the pretensions of each party, we shall lay before him the origins of the discovery, and mark where each claim commenced, and how it was supported.

The first time the method made its appearance in publick, was in 1684; when M. Leibnitz gave the rules thereof in the *Leipfic Acts* of that year; but the demonstrations he kept to himself. The two brothers, the Bernoullis, were presently struck with it; and found out the demonstrations, though very difficult; and practised the calculus with surprising success.

This is all we hear of it, till the year 1687; when Sir I. Newton's admirable *Principia* came forth, which is almost wholly founded on the same calculus.

The common opinion at that time, was, that Sir Isaac, and M. Leibnitz had each invented it about the same time: And what confirmed it, was, that neither of them made any mention of the other; and that, though they agreed in the substance of the thing, yet they differed in their ways of conceiving; called it by different names; and used different characters.

In effect, M. Leibnitz's character was supported by foreigners to be somewhat more commodious than that of Sir Isaac Newton; accordingly the method soon spreading itself throughout Europe, M. Leibnitz's character went with it; by which means the geometricians were insensibly accustomed to look on him as the sole, or principal inventor.

The two great authors themselves, without any seeming concern, or dispute as to the property of the invention, enjoy'd the glorious prospect of the progresses continually making under their auspices, till the year 1699; when the peace began to be disturbed.

M. Fatio, in a treatise of the *line of swiftest descent*, having declared that he was obliged to own Sir I. Newton, as the first inventor of the differential calculus, and the first by many years; and that he left the world to judge, whether M. Leibnitz, the second inventor, had taken any thing from him: This precise distinction between first and second inventor; with the suspicion it insinuated, raised a controversy between M. Leibnitz, supported by the editors of the *Leipfic Acts*, and the English geometricians, who declared for Sir Isaac Newton.

Sir Isaac himself never appeared on the scene; his glory was become that of the nation, and his adherents, warm in the cause of their country, needed not him to animate them.

Writings succeeded each other but slowly, on either side; probably on account of the distance of places; but the controversy grew still hotter and hotter: till at length it came to such pass that in the year 1711, M. Leibnitz complained to the Royal Society, that Dr. Keil had accused him of pub-

lishing the method of *Fluxions* invented by Sir I. Newton, under other names, and characters.

He insisted, that no body knew better than Sir Isaac himself, that he had stolen nothing from him; and required that Dr. Keil should publicly disavow the ill construction which might be put on his words.

The society, here appealed to as judge, appointed a committee to examine all the old letters, papers, &c. that had passed among the several mathematicians, relating to the point; and after a strict examen of all the evidences that could be procured, gave in their report, "That it did not appear that M. Leibnitz knew any thing of the differential calculus before a letter wrote him by Sir I. Newton, and sent to him at Paris, in the year 1672; wherein the method of *Fluxions* was sufficiently explained, to let a man of his sagacity into the whole matter; and that Sir I. Newton had even invented his method before the year 1669, and of consequence fifteen years before M. Leibnitz had given any thing on the subject in the *Leipfic Acts*." And thence they concluded that Dr. Keil had not at all injured M. Leibnitz in what he had said.

The society printed this censure of theirs, together with all the pieces and materials relating thereto, under the title of *Commercium epistolaeum de analysi promota*, London, 1712. This book was carefully distributed through Europe, to vindicate the title of the English nation to the discovery, for Sir Isaac, as already hinted, never appeared in it: whether it were, that he trusted his honour with his comparions, who were zealous enough in the cause; or whether it were, that he was even superior to the glory thereof.

M. Leibnitz, and his friends however could not shew the same indifference: He was accused of a theft; and the whole *commercium epistolaeum* either expressed it in terms, or insinuates it.

—Soon after the publication thereof, a loose sheet was printed, at Paris, in behalf of M. Leibnitz, then at Vienna. It is wrote with a world of zeal and spirit, and maintains boldly that the method of *Fluxions* had not preceded that of *differentials*; and even insinuates, that it might have arisen from it. The detail of the proofs on each side would be too long, and could not be understood without a large comment, which must enter into the deepest geometry.

M. Leibnitz had begun to work upon a *commercium epistolaeum*, in opposition to that of the Royal Society; but he died before it was completed.

It must be owned that there are strong presumptions in favour of M. Leibnitz; presumptions, we mean, that he was no plagiarist: For that Sir Isaac Newton was the first inventor, is past all dispute; his glory is secure; and the reasonable part, even among the foreigners, allow it; and the question is only, whether M. Leibnitz took it from him, or fell upon the same thing with him: For in his *theory of abstract notions*, which he dedicated to the royal academy, in 1671. before he had seen any thing of Sir I. Newton's, he already supposed infinitely small quantities, some greater than others; which is one of the great principles of the system.

The doctrine consists of two parts, *viz.* the *direct method of Fluxions*, called also *calculus differentialis*; and the *inverse method of Fluxions*, or *calculus integralis*.

The latter is directly opposite to the former; and is a sequel of it. Both of them are adopted into the new geometry, and make reigning methods therein.

The first descends from finite, to infinite; the latter ascends from infinitely small, to finite; the one de-compounds a magnitude, the other re-establishes it.

The foundation of the direct method of *Fluxions* amounts to this problem: The length of the space described being continually, (that is, at all times) given, to find the velocity at any time proposed.

The foundation of the inverse method of *Fluxions* amounts to this problem: The velocity of the motion being continually given, to find the space described by it at any time proposed.

Direct method of FLUXIONS.—All finite magnitudes are here conceived to be resolved into infinitely small ones; which are the elements, moments, or differences thereof.

The art of finding these infinitely small quantities, and of working on them, and discovering other infinite quantities by their means, makes the direct method of *Fluxions*.

What renders the knowledge of infinitely small quantities of such infinite use and extent, is that they have relations to each other, which the finite magnitudes, whereof they are the infinitesimals, have not.

Thus, *e. gr.* in a curve of any kind whatever, the infinitely small differences of the ordinate and abscissa, have the ratio to each other, not of the ordinate, and abscissa, but of the ordinate and subtangent; and of consequence, the abscissa and ordinate alone being known, give the subtangent unknown; or, which amounts to the same, the tangent itself. See the *inverse method of FLUXIONS*.

The method of notation in *Fluxions*, introduced by the inventor Sir I. Newton, is thus:

The variable, or flowing quantity, to be uniformly augmented, as suppose the abscissa of a curve, he denotes by

by the letters $v x y z$; and their Fluxions by the same letters with dots placed over them, thus $\dot{v} \dot{x} \dot{y} \dot{z}$. Again, as the Fluxions themselves are also variable quantities, and are continually increasing or decreasing; he considers the velocities with which they increase, or decrease, as the Fluxions of the former Fluxions, or second Fluxions; which are denoted with two dots over them, thus $\ddot{v} \ddot{x} \ddot{y} \ddot{z}$.

Alter the same manner one may consider the augmentations, and diminutions of these, as their Fluxions also, and thus proceed to the third, fourth, fifth, &c. Fluxions, which will be noted thus, $\dot{v} \dot{x} \dot{z} : \ddot{v} \ddot{x} \ddot{z} : \ddot{\dot{v}} \ddot{\dot{x}} \ddot{\dot{z}} \text{ \&c.}$

Lastly, if the flowing quantity be a surd, as $\sqrt{a-bx}$; he notes its Fluxion $\sqrt{a-bx} : \frac{-b}{2\sqrt{a-bx}}$; If a fraction $\frac{x}{d-y}$ he notes it, $\frac{-x}{d-y} \cdot \frac{d-y}{d-y} = \frac{-x(d-y)}{(d-y)^2}$. V. Wallis's Algebra, p. 392.

The chief scope and business of Fluxions is, from the flowing quantity given, to find the Fluxion: for this we shall lay down one general rule, as stated by Dr. Wallis: and afterwards apply and exemplify it in the several cases.

“Multiply each term of the equation separately by the several indices of the powers of all the flowing quantities contained in that term; and in each multiplication, change one root or letter of the power into its proper Fluxion: The aggregate of all the products connected together by their proper signs, will be the Fluxion of the equation desired.”

The application of this rule will be contain'd in the following cases. In the general; To express the Fluxions of simple variable quantities as already mentioned, you need only put the letter, or letters, which express them, with a dot over them: thus, the Fluxion of x is \dot{x} , and the Fluxion of y is \dot{y} , and the Fluxion of $x+y+v+z$, is $\dot{x} + \dot{y} + \dot{v} + \dot{z}$, &c.

Note, For the Fluxion of permanent quantities, when any such are in the equation, you must imagine 0, or a cypher; for such quantities can have no Fluxion, properly speaking, because they are without motion, or invariable.

To find the Fluxions of the products of two or more variable or flowing quantities,—multiply the Fluxion of each simple quantity by the factors of the products, or the product of all the rest; and connect the last products by their proper signs; then the sum, or aggregate, is the Fluxion sought.

Thus, the Fluxion of xy , is $\dot{x}y + x\dot{y}$; and the Fluxion of xyz , is $\dot{x}yz + x\dot{y}z + xy\dot{z}$; and the Fluxion of $xvyz$, is $\dot{x}vyz + xv\dot{y}z + xv\dot{y}\dot{z} + x\dot{v}yz$; and the Fluxion of $a+bx$ by $b-y$ (the common product being $ab+bx-ya-xy$) will be $b\dot{x}-y\dot{a}-x\dot{y}-y\dot{x}$.

To find the Fluxion of a fraction,—multiply the Fluxion of the numerator by the denominator, and after it place (with the sign —) the Fluxion of the denominator; this will be the numerator, and the square of the denominator will be the denominator of the fraction expressing the Fluxion of the given fraction.

Thus the Fluxion of $\frac{x}{y}$ is $\frac{\dot{x}y - x\dot{y}}{y^2}$.

For suppose $\frac{x}{y} = z$, then will $x = yz$; which equal quantities must have equal Fluxions; therefore $\dot{x} = \dot{y}z + y\dot{z}$, and $\dot{x} - z\dot{y} = y\dot{z}$; and dividing all by y $\frac{\dot{x} - z\dot{y}}{y} = \dot{z}$ (because $\frac{\dot{x}}{y} = z$) $\frac{\dot{x} - z\dot{y}}{y} = \dot{z}$. Wherefore this last is the Fluxion of the fraction $\frac{x}{y} = z$; because z being $\frac{x}{y}$, \dot{z} will be equal to the Fluxion of $\frac{x}{y}$.

And the Fluxion of $\frac{a}{x}$ will be $\frac{-\dot{x}a}{x^2}$; for the permanent quantity a having no Fluxion, there can be no product of the Fluxion of the numerator into the denominator, as there would have been, had a been x, z , or any other variable quantity.

To find the Fluxion of a power.—Multiply the power (first brought one degree lower) by the index of that first power; and the product by the Fluxion of the root.

Thus, the Fluxion of x^2 will be $2x\dot{x}$; for $x^2 = x \times x$; but the Fluxion of $x \times x = \dot{x}x + x\dot{x} = 2x\dot{x}$, &c. and the Fluxion of x^3 will be $3x^2\dot{x}$. That of x^4 will be $4x^3\dot{x}$, &c.

Or if m express the index of any power, as suppose x^m ; its

Fluxion will be $m x^{m-1} \dot{x}$, or $m x x^{m-2} \dot{x}$. For x^m brought one degree lower (m being a general index) must be x^{m-1} ; then that x by m , the index, makes $m x^{m-1}$; and this last

by the Fluxion of the root, produces $m x^{m-1} \dot{x}$. If the power be produced from a binomial, &c. as suppose

$xx + 2xy + yy$, its Fluxion will be $2x\dot{x} + 2\dot{x}x + 2x\dot{y} + 2y\dot{y}$.

If the exponent be negative, as suppose x^{-m} or $x^{-\frac{1}{n}}$, its Fluxion will be $-m x^{-m-1} \dot{x}$.

Or, if you would do it by way of fraction, $\frac{-m x^{-m-1} \dot{x}}{x^m + 1}$

(for the square of x^m is as well x^{2m} as $x^m x^m$) or, according to

Sir Isaac Newton's method, which is yet shorter, $\frac{-x \dot{x}}{x^m + 1}$.

If the power be imperfect, i. e. if its exponent be a fraction,

as suppose $\sqrt[n]{x^m}$; or in the other notation $x^{\frac{m}{n}}$, suppose

$x^{\frac{m}{n}} = z$: Then if you raise up each member to the power of n , it will stand thus, $x^m = z^n$; the Fluxion of which will

be, by this general rule, $m x^{m-1} \dot{x} = n z^{n-1} \dot{z}$. Where-

fore \dot{z} will be $\frac{m x x^{m-1} \dot{x}}{n z^{n-1}}$ (by dividing both parts by

$n z^{n-1}$) and $\frac{m x x^{m-1} \dot{x}}{n z^{n-1}} = \frac{m}{n} x^{\frac{m-1}{n}} \dot{x}$; or $\frac{m}{n} x^{\frac{m}{n}-1} \dot{x}$.

putting instead of $n z^{n-1}$, its value $n x^{\frac{m}{n}-1}$. Hence, to find the Fluxion of any kind of power, proceed thus:—Multiply the power given by its index or exponent, and then multiply that product by the Fluxion of the root of the power given; and after that, subtract 1, or unity, from the index of the power.

To find the Fluxions of surd quantities.—Suppose it required to find the Fluxion of $\sqrt{2rx-xx}$, or $2rx-xx \frac{1}{2}$. Suppose $2rx-xx \frac{1}{2} = z$; then is $2rx-xx = z^2$; and consequently $r\dot{x} - x\dot{x} = 2z\dot{z}$; and, by division,

$\frac{r\dot{x} - x\dot{x}}{z} = \dot{z}$ (by substitution) $\frac{r\dot{x} - x\dot{x}}{\sqrt{2rx-xx}} =$ to the Fluxion of $\sqrt{2rx-xx}$.

If it be required to find the Fluxion of $\sqrt{ay-xx^2}$; for $\sqrt{ay-xx^2}$ put z ; then $ay-xx^2 = z^2$, and $ay-2x\dot{x} = 2z\dot{z}$. And multiplying by 3; $3ay-6x\dot{x} = 6z\dot{z}$; and consequently, $3ay-6x\dot{x} = 6z\dot{z}$ equal (substituting $\sqrt{ay-xx^2} = z$) $3a^2y^2 - 6a^2x^2 = 6a^2z^2$

$x^2y\dot{y} + 3ax^2\dot{y} - 6a^2x\dot{x} + 12ayx\dot{x} - 6x^2\dot{x} =$ to the Fluxion of $\sqrt{ay-xx^2}$.

To find the Fluxion of quantities compounded of rational and surd quantities.—let it be required to find the Fluxion of $b^2x^2 + cax + ea^2x \sqrt{xx+a} = z$. Put $b^2x^2 + cax + ea^2x = p$, and $\sqrt{xx+a} = q$. Then the given quantity is $pq = z$ and the Fluxion thereof is

$p\dot{q} + q\dot{p} = \dot{z}$. But q is $\sqrt{xx+a}$, and \dot{p} is $2bx\dot{x} + ca\dot{x}$; therefore in the equation $p\dot{q} + q\dot{p} = \dot{z}$, if in the place of p, q, \dot{p}, \dot{q} , we restore the quantities they represent, we shall have

$\frac{b^2x^2 + cax + ea^2x}{\sqrt{xx+a}} \dot{x} + \sqrt{xx+a} (2bx\dot{x} + ca\dot{x}) = \dot{z}$. Which being reduced to one denomination, gives $3b^2x^3 + 2acx^2 + ea^2x + 2ba^2x + xa^3\dot{x} = \dot{z}$ to the Fluxion of $\sqrt{xx+a}$ the given quantity.

Inverse method of Fluxions, or calculus integrælis, consists in finding finite magnitudes, from the infinitely small parts thereof.

It proceeds, as already observed, from infinitely small quantities to finite; and recomponds and sums up what the other has resolved: whence it is also called by some: the *summatory calculus*. But what that has decomponded, this does not always re-establish; so that the inverse method is limited, and imperfect; at least hitherto. If it were once complete, geometry would be arrived at its last perfection.

To give an idea of its nature and office, take the instance already proposed in the direct method: in that the infinitely small quantities of the ordinates and absciss, being known, give the subtangent required. In this, on the contrary, the subtangent of an unknown curve being had, gives the infinitely small quantities of the absciss and ordinate which produced it, and of consequence the absciss and ordinate themselves; which are finite magnitudes, in whose relation the whole offence of the curve is founded.

But the distinguishing use of this method is in measuring. The base of a parallelogram multiplied by the infinitely small element of its altitude, gives an infinitely small parallelogram; which is the element of the finite parallelogram, and is repeated an infinity of times therein, *i. e.* as many times as there are points in the height of the parallelogram.

To have the finite parallelogram, therefore, by means of its element, the element must be multiplied by the altitude; which is the inverse method of *Fluxions*, re-ascending from the infinitely small quantity to the finite.

Such a circuit of infinitesimals, it is true, would be impertinent in so simple a case; but when we have to do with surfaces terminated by curves, the method then becomes necessary, or at least superior to any other.

Suppose, *e. gr.* in a parabola, the space included between two infinitely near ordinates, an infinitely small portion of the axis, and an infinitely little arch of the curve: it is certain, this infinitely small surface is no parallelogram; since the two parallel ordinates which terminate it on one side, are not equal; and the arch of the curve, opposite to the little portion of the axis, is frequently neither equal nor parallel thereto. And yet this surface, which is no parallelogram, may be considered, in the strictest geometry, as if it really were one, by reason it is infinitely small, and the error, of consequence, infinitely little, *i. e.* none.

So that to measure it, there needs nothing but to multiply an ordinate of the parabola by the infinitely small portion of the axis corresponding thereto. Thus we have the element of the whole parabola; which element being raised by the inverse method to a finite magnitude, is the whole surface of the parabola.

This advantage so peculiar to the geometry of infinites, of being able without any error to treat little arches of curves, as if they were right lines; curvilinear spaces, as if rectilinear ones, &c. enables it not only to go with more ease and readiness than the ancient geometry, to the same truths; but to reach a great number of truths which were inaccessible to the other.

Its operations, in effect, are more easy, and its discoveries more extensive; and simplicity and universality are its distinguishing characters.

To find the flowing quantity belonging to any FLUXION given. — To have the doctrine of the inverse method correspond and keep pace with that of the direct, we will apply it in the same cases.

In the general: to express the variable quantity of a Fluxion, there needs nothing but to write the letters without the dots.

Thus the flowing quantities of $x \dot{y} z$, are $x y z$.

To find the flowing quantities belonging to the FLUXION of the product of two quantities;

Divide each member of the Fluxion by the fluxionary quantity or letter; or change the fluxionary letter into the proper flowing quantity of which it is the Fluxion: the quotients connected by their proper signs will be the flowing quantities sought.

Only, if the letters be all exactly the same, the flowing quantity will be a simple one, whose parts are not to be connected together by the signs + and —.

To find the flowing quantity belonging to the Fluxion of any power, either perfect or imperfect. — Take the fluxionary letter or letters out of the equation: then augment the index of the Fluxion by 1, or unity: lastly, divide the Fluxion by the index of its power so increased by unity.

Thus suppose $3x \dot{x} x$ proposed; by taking away x it will be $3x \dot{x}$: and by increasing its index by unity, it will be $3x \dot{x}$: then dividing it by 3, its now (augmented) index, the quotient will be $x \dot{x}$, the flowing quantity required.

Again, suppose $x \dot{x} x$ a Fluxion proposed: by taking away

the fluxionary x , it will be $x \dot{x}$

index by unity (*i. e.* by taking away — 1) it will be $x \dot{x}$

And lastly, by dividing the remaining part of the Fluxion by n —, prefixed to, or multiplied into x , the quotient will be $x \dot{x}$; which is the flowing quantity sought.

The uses of the direct method of Fluxions, see specified under the articles MAXIMIS and MINIMIS, and TANGENTS.

Those of the inverse method, see under QUADRATURE of curves; RECTIFICATION of curves; and CUBATURE of solids.

To FLY *grofs*, in falconry, is said of a hawk, when she flies at the great birds, as cranes, geese, herons, &c.

FLY on lead, is when the hawk missing her quarry, betakes herself to the next check, as crows, &c. See HAWK.

FLYBOAT, a large vessel, with a broad bow, used by merchants in the coating trade. — Some of them will carry 800 tons of goods.

FLYERS, in architecture, such stairs as go straight, and do not wind round, nor have the steps made tapering; but the fore and back part of each stair and the ends respectively parallel to one another.

So that if one flight do not carry you to your designed height, there is a broad half space; and then you fly again, with steps every where of the same breadth and length as before.

FLYING, the progressive motion of a bird, or other winged animal in the liquid air.

Flying is either natural, or artificial. Natural FLYING is that performed by an apparatus or structure of parts concerted for that end by nature herself. Such is that of most birds, and insects; and of some fishes.

In Virginia, and New-England, they have monstrously large flying beetles. *Philosop. Transact.* N^o 127. And in Languedoc, grasshoppers, about an inch long, wherewith the ground, in several parts, in the year 1685, was covered one third of a foot deep. — *Ibid.* N^o 182.

The parts of birds, &c. chiefly concerned in Flying, are the wings and tail: by the first, the bird sustains and wafts himself along; and by the second, he is assisted in ascending and descending; to keep his body poised and upright, and to obviate the vacillations thereof.

It is by the largeness and strength of the pectoral muscles, that birds are so well disposed for quick, strong, and continued Flying. — These muscles, which in men are scarce a seventieth part of the muscles of the body, in birds, exceed and outweigh all the other muscles taken together: upon which Mr. Willoughby makes this reflection, that if it be possible for man to fly, his wings must be so contrived and adapted, that he may make use of his legs, and not his arms, in managing them.

The Flying of birds is thus effected:

The bird first bends his legs, and springs with a violent leap from the ground: then opens or expands the jointures of his wings, so as to make a right-line, perpendicular to the sides of his body. Thus, as the wings with the feathers therein, constitute one continued lamina; being now raised a little above the horizon, and vibrating the wings with great force and velocity, perpendicularly against the subject air; the air, though a fluid, resists those succussions, both from its natural inactivity, and from its elasticity, which makes it restore itself after it has been compressed, and re-act as much as it is acted on: by such means is the whole body of the bird protruded. The sagacity of nature is very remarkable in the opening and recovering of the wing for fresh strokes. — To do it directly, and perpendicularly, it must needs have a great resistance to overcome: to avoid which, the bony part, or bend of the wing, into which the feathers are inserted, moves sideways with its sharp end foremost; the feathers following it like a flag.

The resistance the air makes to the withdrawing of the wings, and consequently the progress of the bird will be so much the greater, as the waft, or stroke of the fan of the wing is the longer: but, as the force of the wing is continually diminished by this resistance; when the two forces come to be in equilibrio, the bird will remain suspended in the same place: for the bird only ascends so long as the arch of air, the wing describes, makes a resistance equal to the excess of the specific gravity of the bird above the air. If the air, therefore, be so rare as to give way with the same velocity as it is struck withal, there will be no resistance, and consequently the bird can never mount on such unstable steps.

Mr. Ray, Willoughby, &c. have supposed the tail to do the office of a rudder, in steering and turning the body this way or that; but Borelli has shewn it unfit for any such office. —

The Flying of a bird, in effect, is quite a different motion from the sailing of a ship: birds do not vibrate their wings towards the tail, as oars are struck towards the stern; but waft them downward: nor does the tail of the bird cut the air at right angles as the rudder does the water; but is disposed horizontally, and preserves the same situation what way soever the bird turns.

In effect, as a vessel in the water is turned about on its centre of gravity to the right, by a brisk application of the oars to

the left; so a bird, in beating the air with its right wing alone, towards its tail, its fore part will be turned to the left: as when in swimming, by only striking out with the right arm and leg, we are driven to the left.

Thus, we see pigeons changing their course to the leftward, labour it with their right wing, keeping the other almost at rest.

Add, that birds with long necks have another way of altering their course: for by only inclining the head and neck towards this or that side, the centre of gravity of the whole being changed, the bird will proceed according to this new direction.

Birds never fly upwards in a perpendicular line, but always in a parabola, the line described by projectiles.—In a direct ascent, the natural and artificial tendency would oppose and destroy each other; so that the progress would be very slow. In a direct descent, they would aid one another, so that the fall would be too precipitate.

Indeed the hawk we frequently find take that advantage in seizing of the partridge: but ordinarily, birds keep their wings expanded, and at rest, to retard their descent; and at the same time stretch out their feet, and legs.

Artificial FLYING, is that attempted by men, by the assistance of mechanics

The *Art of Flying*, is one of the great desiderata of mechanics; it has been attempted in divers ages: the discovery of it might prove of great service, and also of great disservice to mankind. No body seems to have bid so fair for that invention, as our famous iryar Bacon, who lived upwards of five hundred years ago. He not only affirms the art feasible; but assures us he himself knew how to make an engine, in which a man fitting might be able to carry himself through the air, like a bird: and affirms, that there was another person who had actually tried it with success.

The secret consisted in a couple of large thin hollow copper globes, exhausted of air; which being much lighter than air, would sustain a chair, whereon a person might sit.

Fa Francisco Lana, in his *Prodromus*, proposes the same thing, as his own thought. He computes, that a round vessel of plate brass, thirteen foot in diameter, weighing three ounces the square foot, will only weigh 18.8 ounces; whereas a quantity of air of the same bulk, will weigh 215 $\frac{1}{2}$ ounces: so that the globe will not only be sustained in the air, but will carry with it a weight of 373 $\frac{1}{2}$ ounces; and by increasing the bulk of the globe, without increasing the thickness of the metal, he adds, a vessel might be made to carry a much greater weight.

But the fallacy is obvious: a globe of the dimensions he describes, Dr. Hook shews, would not sustain the pressure of the air, but would be crushed inwards. Besides, in whatever ratio the bulk of the globe were increased, in the same must the thickness of the metal be also, and consequently the weight increased: so that there would be no advantage in such augmentation.

The same author describes an engine for *Flying*, invented by the Sieur Besnier, a smith of Sable, in the county of Maine. V. d. *Philosoph. Collect.* N^o 1.

FLYING BRIDGES, in fortification, are those made of two small bridges, laid one upon the other, so that the uppermost, by means of ropes and pulleys, is forced forwards, till the end of it is joined to the place designed.

FLYING CAMP, a small body of an army, consisting of four, five, or six thousand men, and sometimes a greater number, as well foot as horse, which continually keep the field, making divers motions, to prevent the incursions of the enemy, or to frustrate their enterprises; to hinder convoys, to harass the adjacent country, and to be thrown into a besieged place, as occasion shall serve.

FLYING PINION, is a part of a clock, having a fly or fan, whereby to gather air, and so bridle the rapidity of the clock's motion, when the weight descends in the striking part. See **CLOCK**.

FOCAGE, or **FUAGE**, fire-money, hearth-money, or chimney-money. See **FUAGE**.

FOCILE, **FOCIL**, in anatomy, a name the Arabs gave to the two bones of the arm, reaching from the elbow to the wrist.

The biggest, which is what we call the *Cubitus*, and *Ulna*, they call the *greater Focil*, *Focile majus*.

The less, which we call *Radius*, they call *Focile minus*.

The like is observed with regard to the bones of the leg. The biggest of which, by the Latins called *Tibia*, the Arab writers, &c. call the *great Focil*: and the less, or *Fibula*, the *lesser Focil*.

FOCUS, in geometry and the conic sections, is applied to certain points in the parabola, ellipsis, and hyperbola; wherein the rays reflected from all parts of these curves do concur or meet. See **CURVE**.

The **FOCUS** of an *Ellipsis* are two points, as *F*, *Tab. Con. fig. 21.* in the axis *AB*, on which, as centers, the figure is described: VOL. I.

or, two points in the longer axis, whence two right-lines being drawn to any point in the circumference, shall be together equal to the axis itself. These are also called *ambitici*.

To find the *Foci* of an ellipsis: from *B* to *L*, let off half the parameter; and in the centre *C* erect a perpendicular *CK*, meeting a semicircle described on *AL*. Then making *CF* = *CK*, the point *F* will be the *Focus*.

If then the axis *AB* be cut in the *Focus F*; the rectangle of the segments of the axis *A F*, *F B*, will be subquadruple of the rectangle of the parameter into the axis; whence the square of the distance of the *Focus* from the centre is equal to the rectangle of half the axis into the difference of the semi-parameter from half the axis. See **ELLIPSIS**.

FOCUS of the *hyperbola*, see the article **HYPERBOLA**.

The **FOCUS** of a *parabola* is a point in its axis, as *F*, (*Tab. Conics, fig. 18.*) wherein the semi-ordinate *FN*, is equal to the semiparameter; or, a point in the axis distant from the vertex, by a fourth part of the parameter, or latus rectum.

It is demonstrated in conics, 1^o That in a parabola, the distance of the *Focus* from the vertex, *A F*, is to the parameter in a subquadruple ratio.

2^o That the square of the semi-ordinate is quadruple of the rectangle of the distance of the *Focus* from the vertex, and the abscisse.

3^o That the right-line *FM* drawn from the *Focus F* to the extremities of the semi-ordinate of the parabola, is equal to the aggregate of the abscisse *AP*, and the distance of the *Focus* from the vertex *AF*.

FOCUS, in optics, is a point wherein several rays concur, and are collected; either after having undergone refraction, or reflection.

It is thus called, by reason the rays being here brought together, and united; their force and effect is increased; so that they become able to burn: accordingly, it is in this point, that bodies are placed to sustain the force of burning-glasses, or mirrors.

It must be observed, that the *Focus* is not, strictly speaking, a point; the rays are not all accurately collected into the same place: Huygens demonstrates, that the *Focus* of a lens convex on both sides, is $\frac{1}{2}$ of the thickness of the lens.

FOCUS, in dioptrics, is the point wherein refracted rays, rendered convergent by refraction, do concur, or meet, and cross the axis.

The same point is also called the *Point of Concurrence*, or *Concurrence*.

Virtual Focus, in dioptrics, is the point from which refracted rays, when by refraction they are rendered divergent, do begin to diverge or recede from each other.

The same point is also called *Punctum dispersus*, or *Point of Divergency*.

The effect of convex glasses, or lenses; is to render the rays, transmitted through them, convergent, and to bring them together into a *Focus*, which will be nearer or further off, as the lens is a portion of a greater or less sphere.

The effect of concave lenses is to render the rays transmitted through them, divergent, or to disperse them from a virtual *Focus*.

For the place, position, distance, &c. of the *Foci* of rays refracted through plain, concave, and convex mediums of divers densities, as air, water, glass, &c. see **REFRACTION**; **LENSES**, &c.

The laws of the *Foci* of glasses, and the methods of finding the same, being those of most use, and importance; we shall here subjoin them a part, as delivered and demonstrated by Mr. Molyneux, in his *Dioptrica Nova*.

1^o Then, the *Focus* of a convex glass, *i. e.* the point wherein parallel rays transmitted through a convex glass whose surface is the segment of a sphere, do unite, is distant from the pole or vertex of the glass, almost a diameter and half of the convexity.

2^o In a plano-convex glass, the *Focus* of parallel rays, or the place where they unite with the axis, is distant from the pole of the glass a diameter of the convexity; provided the segment do not exceed thirty degrees.

The rule or canon in plano-convex glasses, is as 107 : 193 :: so is the radius of the convexity: to the refracted ray taken in its concurrence with the axis; which in glasses of larger spheres, is almost equal to the distance of the *Focus* taken in the axis.

3^o In double convex glasses of the same sphere, the *Focus* is distant from the pole of the glass about the radius of the convexity, if the segment be but thirty degrees.

But if the convexities be unequal, or if the two sides be segments of different spheres, then the rule is, As the sum of the radii of both convexities: to the radius of either convexity alone :: so is the double radius of the other convexity: to the distance of the *Focus*.

Here observe, that the rays which fall nearer the axis of any glass, are not united with it so soon as those farther off: nor will the focal distance be so great in a plano-convex glass,

when the convex side is towards the object, as when the contrary way.

Hence it is truly concluded, that in viewing any object by a plano-convex glass, the convex side should always be turned outward; as also in burning by such a glass.

For the *Virtual Focus* objective, — 1^o, That in concave glasses, when a ray falls from air parallel to the axis, the virtual *Focus*, by its first refraction, becomes at the distance of a diameter and an half of the concavity.

2^o, In plano-concave glasses, when the rays fall parallel to the axis, the virtual *Focus* is distant from the glass the diameter of the concavity.

3^o, in plano-concave glasses; as 107 : 193 :: fo is the radius of the concavity : to the distance of the virtual *Focus*.

4^o, In double concaves of the same sphere, the virtual *Focus* of parallel rays is at the distance of the radius of the concavity.

But whether the concavities be equal or unequal, the virtual *Focus*, or point of divergency of the parallel rays, is determined by this rule;

As the sum of the radii of both concavities : is to the radius of either concavity : so is the double radius of the other concavity : to the distance of the virtual *Focus*.

5^o, In concave glasses, if the point to which the incident ray converges, be distant from the glass farther than the virtual *Focus* of parallel rays, the rule for finding the virtual *Focus* of this ray is this;

As the difference between the distance of this point from the glass, and the distance of the virtual *Focus* from the glass : is to the distance of the virtual *Focus* : so is the distance of this point of convergence from the glass : to the distance of the virtual *Focus* of this converging ray.

6^o, In concave glasses, if the point to which the incident ray converges, be nearer to the glass, than the virtual *Focus* of parallel rays, the rule to find where it crosses the axis, is this;

As the excess of the virtual *Focus*, more than this point of convergency : is to the virtual *Focus* : so is the distance of this point of convergency from the glass : is to the distance of the point where this ray crosses the axis.

Rules for finding the Foci of glasses. — To find the *Focus* of a convex spherical glass, being of a small sphere, apply it to the end of a scale of inches, and decimal parts, and expose it before the sun; upon the scale you will have the bright intersection of the rays measured out : or, expose it in the hole of a dark chamber; and where a white paper receives the distinct representation of distinct objects, there is the *Focus* of the glass.

For a glass of a pretty long *Focus*, observe some distant object through it, and recede from the glass till the eye perceives all in confusion, or the object begins to appear inverted; here the eye is in the *Focus*.

For a plano-convex glass; make it reflect the sun against a wall; you will on the wall perceive two sorts of light; one more bright within another more obscure : withdraw the glass from the wall, till the bright image is at its smallest; the glass is then distant from the wall about the fourth part of its *focal* length.

For a double convex: expose each side to the sun in like manner; and observe both the distances of the glass from the wall. The first distance is about half the radius of the convexity turned from the sun; and the second, about half the radius of the other convexity.

Thus we have the radii of the two convexities; whence the *Focus* is found by this rule;

As the sum of the radii of both convexities : is to the radius of either convexity : so is the double radius of the other convexity : to the distance of the *Focus*.

Focus, in catoptrics, is a point wherein the rays reflected from the surface of a mirror, or speculum, and by reflection rendered convergent, do concur, or meet.

The effect of concave mirrors is to collect the rays falling on the concave surface into a *Focus*.

The effect of convex mirrors is to disperse the rays falling on them, or render them more divergent.

For the laws of the *Foci* of rays refracted from mirrors, or specula, see REFLECTION.

The *Foci* of concave glasses are had by reflection: for as a concave mirror burns at the distance of about half the radius of the concavity; so a concave glass, being supposed a reflecting speculum, unites the rays of the sun at the distance of about half the radius of the concavity.

To find the Foci of all glasses geometrically. — Dr. Halley furnishes us a general method for finding the *Foci* of spherical glasses of all kinds, both concave and convex; exposed to any kind of rays, either parallel, converging, or diverging; under the following problem.

To find the *Focus* of any parcel of rays diverging from, or converging to a given point in the axis of a spherical lens, and inclined thereto under the same angle, the ratio of the sines of refraction being given :

Suppose GL (*Tab. Optics*, fig. 38. N^o 2.) a lens; P a point in its surface; V its pole; C the centre of the sphere whereof

it is a segment; O the object, or point in the axis, to or from which the rays do proceed; and OP a given ray: and suppose the ratio of refraction to be as r to s . Then making CR to CO, as s to r for the immersion of a ray; or as r to s for the emerion (*i. e.* as the sines of the angles in the medium which the ray enters, to the corresponding sines in the medium out of which it comes) and laying CR, from C towards O, the point R will be the same for all the rays of the point O. Lastly, drawing the radius PC, if need be, continued; with the centre R, and distance OP strike a piece of an arch, intersecting PC in Q. The line QR being drawn, shall be parallel to the refracted ray; and PF being made parallel thereto, shall intersect the axis in the point F; the *Focus* sought.

Or, make it, as CQ : CP :: CR : CF; then will CF be the distance of the *Focus* from the centre of the sphere.

This author gives a demonstration of the method; and adds various figures, exhibiting the various cases of rays either diverging, or converging, as they enter, or emerge out of the surface either of a convex or concave lens.

From this principle all the rules for the *Foci* of rays parallel to the axis, as likewise for the principal *Focus*, where the rays nearest the axis do unite, are deduced. As,

Hence, 1^o, If OP be equal to CR; the points Q and C are coincident, and the rays OP, after refraction, run on parallel to the axis. 2^o, If the point Q fall on the same side of the axis, as is the point P; then the beams after refraction do tend on, either diverging, or converging, as before: but if Q fall on the other side the axis, the diverging rays are made to converge by a convex, or the converging to diverge by a concave glass.

3^o, If OP do exceed CR, the *Focus* is in all cases on the same side of the glass, as is the centre of the sphere C. But contrariwise, if OP be less than CR, the *Focus* falls on the other side of the glass beyond the vertex V. 4^o, An object may be so placed, that the rays next the axis of a convex glass shall have an imaginary *Focus* transmitting diverging rays, when the more remote parts thereof shall make them converge to a real *Focus*.

5^o, If OV, the distance of the object from the pole or vertex of the glass, be taken instead of OP, then will CQ be the difference of OV and CR; and as that difference is to CR, so is the radius CV, to CF, the distance of the principal *Focus* from the centre of the sphere, whereof the glass is a segment. Or else, as CQ : OP or RQ :: PC : to VF, the *focal* distance from the pole of the glass.

Whence follows a general rule for the *Foci* of all glasses; only according to *Corol.* 3. if OV do exceed CR, the *Focus* is on the same side of the glass, as the centre of the sphere: but if CR be greater, then the *Focus* is on the opposite side of the glass: whence it will be determined, whether the *Focus* be real, or imaginary.

What has been said of one surface of the lens, is easily applicable to the other, taking F the *Focus*, for an object.

FODDER, any kind of meat for horses, or other cattle: in some places hay and straw mingled together, is more peculiarly denominated *Fodder*.

In the civil law it is used for a prerogative that the prince has, to be provided of corn, and other meat, for his horses, by the subjects, in his warlike expeditions.

FODINA, a name some authors give to the labyrinth in the bone of the ear. See LABYRINTH.

FECES, } See FÆCES.
FÆCAL, }
FÆCULÆ, }
FÆCUNDITY, } FÆCULÆ.
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Others will only have the female ovum to be a proper nidus for the animalcule, which, they contend, is in the male seed. The animalcule getting into an ovum fit to receive it; and this falling through one of the tubes fallopianæ into the womb, the humors which distil through the vessels of the womb penetrating the coats of the egg, swell and dilate it, as the juice of the earth does seeds thrown into the ground. Or else the branches of the veins and arteries, whereby the egg was tied in the ovary, being broken, knit with the vessels of the womb.

The first thing that appears of a *Fœtus*, is the placenta, like a little cloud, on one side of the external coat of the egg: about the same time the spine is grown big enough to be visible; and a little after the cerebrum and cerebellum appear like two small bladders: next, the eyes stand prominent in the head: then the *punctum salivæ*, or pulsation of the heart is plainly seen. The extremities discover themselves last of all.

The *Fœtus*, when formed, is almost of an oval figure, while it lies in the womb: for its head hangs down, with its chin upon the breast: its back is round; with its arms it embraces its knees, which are drawn up to its belly; and its heels are close to its buttocks: its head upwards, and its face towards its mother's belly. About the ninth month, its head, which was hitherto specifically lighter than any other part, becomes specifically heavier; its bulk bearing a much smaller proportion to its substance than it did.

The consequence of this change is, that it tumbles in the liquor which contains it: its head falls down; its feet get up; and its face turns towards its mother's back. But being now in an irksome posture, though at the same time a favourable one for its exit; the motion it makes for its relief, gives frequent pains to the mother; which causes a contraction of the womb, for the expulsion of the *Fœtus*.

What some anatomists pretend to give farther as to the posture of the *Fœtus* in the womb, in the several stages of gestation, is very precarious.

In the first month it is of no moment how it lies in the womb: in the latter months, after the *Fœtus* is grown not only quick, but robust, it frequently changes its posture of itself; as not only the mothers themselves feel, but any other person, by laying the hand on their bellies, frequently may. However, its ordinary posture is supposed to be fitting: as the time of birth draws near, it turns itself, and presents the head to the os uteri; though sometimes it offers the feet first, and sometimes lies a-crois, and offers either a hand, a knee, or the like; these are irregular situations, and without a deal of address in the midwife in turning the *Fœtus*, both the mother and the infant are in danger.

The *Fœtus* is inclosed in two membranes, or coats; the inner, which immediately invests the *Fœtus*, and the liquor wherein it lies, is called the *Amnios*: the outward membrane is called the *Chorion*.

In some animals there is a third membrane, called the *Allantois*, whose place is between the other two; and which serves for the discharge of the urine of the *Fœtus*, brought higher by the urachus.

Dr. Needham seems to have discovered something analogous hereto in the human *Fœtus*, and calls it the *Membrana Urinaria*: But others chuse only to make it a duplicature of the chorion; though the necessity of such third membrane be the same in men, as in cows, sheep, &c. See **ALLANTOIS**.

There are some differences in the structure, mechanism, and proportion of the parts of a *Fœtus*, from those of an adult: and even some additional and extraordinary parts; by which the nutrition of this zoophyte, or plant animal, as it is called, and the circulation of the blood therein, are effected.

The principal variations are about the liver, heart, and lungs. Of these the most considerable are the umbilical vessels, which are two arteries, a vein, and the urachus, arising from the placenta, and conveyed through the navel to the liver of the *Fœtus*, near the navel; all which, after the birth, drying up, become impervious and useless.

In the liver itself there is an extraordinary communication between the porta and cava, called *Canalis Venosus*, which, after the birth, gradually dries up. In the heart, at the mouth of the vena cava, is the foramen ovale, whereby that vein has a communication with the pulmonary vein: there is also a communication between the aorta, and pulmonary artery, by means of the canalis arteriosus, which passes between the two, at about two inches distance from the base of the heart. It is by means of these two canals or passages, that the blood circulates in the *Fœtus* while inclosed in the womb; they serving to convey and pass the blood from the heart into the arteries; and from the veins into the heart again, without its passing through the lungs, which are now useless.

The lungs of a *Fœtus* are of a darker colour, and closer consistence, than after they have been breathed into; as appears

from their swimming in water, after birth, which they will not do before; which difference affords an useful experiment, in case of the suspected murder of children. For if they were still-born, the lungs sink in water; if born alive, they swim.

The two canals above-mentioned serve only to prevent the obstruction the blood would otherwise have within the lungs, before they have been opened. After respiration has opened the lungs, the blood taking its course through them those passages close up.

—The head of the *Fœtus* is much bigger in proportion to the body, than afterwards; the bones and brain are softer, the sutures open, and they leave a great space on the top of the head, covered only with a membrane; and the glands, particularly the thymus and renales, are bigger and softer. For other differences in the proportion, see **EMBRYO**.

Bartholine, in his treatise *de insulitis partu viis*, relates a great many stupendous cases of *Fœtus*'s dead and putrified in the womb; the parts of which have made their way through apertures; one whereof at the navel was some years in coming away: And in the *Philosoph. Transactions* we meet with the like instances; particularly, of one voided piece-meal by the anus, several years after conception.

Authors give accounts of *Fœtus*'s found in the fallopian tubes; and others in the cavity of the belly. M. de S. Maurice, in the *Memoirs of the royal academy of sciences*, relates the history of a *Fœtus* formed in the ovary of the mother; and which at three months from impregnation, bursting the testicle, forced its way through, into the epigastric region.

During the rupture, the mother felt all the preludes of an imminent travel; and having called her chirurgeon, died in his arms, crying, I am delivering, I am delivering!

The story of Margaret countess of Holland, who is said to have been delivered of 364 *Fœtus*'s, all alive, and afterwards baptized, passes for a fable; and yet there is a picture of this notable delivery still preserved in the church of Lofdune, as a monument of the truth thereof. Albertus Magnus gives a like instance of a woman, who brought forth 150 *Fœtus*'s, or embryo's all formed, and as big as the little finger.

FOG, or *Mist*, a meteor, consisting of gross vapours, floating near the surface of the earth.

If the vapours, plentifully raised from the earth, and waters, either by the solar or subterraneous heat, meet, at their first entrance into the atmosphere, with cold enough to condense them considerably; their specific gravity being hereby increased, their ascent will be stopped, and they will either return back in form of a dew, or of drizzling rain; or they will remain suspended for some time, in form of a *Fog*.

Fogs are only low clouds, or clouds in the lowest region of the air, and clouds are no other than *Fogs* raised on high. Objects viewed through *Fogs*, appear larger, and more remote than through the common air.

The fishing for herring is chiefly practised in *foggy* weather. **FOGAGE**, in the forest law, is rank grass, not eaten in the summer.

FOIBLE, a French term, frequently used also in our language. It literally signifies weak; and in that sense is applied to the body of animals, and the parts thereof: As, *foible reins*, *foible sight*, &c. being derived from the Italian *fiavole*, of the latin *fibilis*, to be lamented, pitied.

But it is chiefly used with us substantively, to denote a defect, or flaw in a person, or thing. Thus we say, every person has his *Foible*; and the great secret consists in hiding it artfully: Princes are gained by flattery, that is their *Foible*: The *Foible* of young people is pleasure; the *Foible* of old men is avarice; the *Foible* of the great and learned is vanity; the *Foible* of women and girls, coquetry, or an affection of having gallants: You should know the sort, and the *Foible* of a man, before you employ him: but we should not let people perceive that we know their *Foible*.

FOIL*, or **FOYLE**, among looking-glass grinders, a sheet of tin, with quicksilver, or the like, laid on the backside of a looking-glass, to make it reflect. See **FOLIATING**.

* The word is formed of the Latin *folium*, leaf.

FOLLING, among hunters, the footing, and treading of deer, which remains on the grass, but scarce visible.

FOLDS, in the manufactures. See the articles **CLOTH**, &c.

FOLDS of the drapery, in painting. See **DRAPERY**.

FOLIA, in botany, is used for the leaves of plants and also of flowers; but particularly the former; the leaves of flowers being more properly called *petala*.

FOLIACEUM expansum, in anatomy, is that extreme of the fallopian tube, next the ovary; and which is expanded like the mouth of a trumpet, and invironed with a sort of fringe. See **FALLOPIAN tube**.

FOLIAGE, a cluster or assemblage of flowers, leaves, branches, &c.

FOLIAGE is particularly used for representations of such flowers, leaves, branches, rinds, &c. whether natural, or artificial;

ficial; used as enrichments on capitals, freezes, pediments, &c. See *Tab. Archit.* fig. 30. lit. a a; see also CAPITAL, FREEZE, &c.

FOLIATING of *looking-glasses*, is the spreading a composition of something which will firmly adhere to the back of the glass, and there reflect the image.

This composition is called the *Foil*, and is usually made with quicksilver, mixed with tin and some other ingredients.

For the method of *Foliating* looking-glasses, see **LOOKING-GLASS**.

In *Philos. Trans.* N^o 245. we have a method of *foliating* globe looking-glasses, communicated by Sir R. Southwell. The mixture is of quicksilver, and Bismuth, of each three ounces; and tin, and lead, of each half an ounce: To the two last, throw on the marcasite; and afterwards the quicksilver; stir them well together over the fire; but they must be taken off, and be towards cooling, before the quicksilver be put to them. When you use it, the glass should be well heated, and very dry; but it will do also when it is cold, though best when the glass is heated.

FOLIATION, in botany, &c. is used by Dr. Grew, to express the assemblage of the folia, or petala of a flower. See **PETALA**.

The *Foliation* is the most conspicuous part of flowers; being that collection of fugacious, coloured leaves, which constitute the compass, or body of the flower.

It is of great use in the generation and preservation of the young fruit, or seed: it filtrates a fine juice, to nourish it in the uterus, or piftil.

In some species, as apricocks, cherries, &c. it likewise serves to guard the young tender fruit from the violence of wind, weather, &c. for these being of a very tender, and pulposus body, and coming forth in the colder times of the spring, would be often injured by the extremities of weather, if they were not thus protected, and lodged up within their flowers.

Before the flower opens, the *Foliation* is curiously and artfully folded up in the calyx or perianthium.

Dr. Grew enumerates several varieties of these foldings, *viz.* the *close Couch*, as in roses; the *concave Couch*, as in the blattaria flower also; the *single Plait*, as in peas blossoms; the *Couch and Plait*, as in marigolds; and the *Rowl*, as in the ladies bower.

FOLIO, or rather **FOLIUM**, in books of accounts, &c. signifies *Page*.

Thus *Folio 7*, wrote abridgedly *F^o 7*. denotes the seventh page, &c.

Folio Recto, or *F^o R^o* expresses the first side or page of a leaf.

Folio Verso, or *F^o V^o* the second, or back-side of the leaf.

The word is Italian, and literally signifies *leaf*.

FOLIO, among bookfellers. A *Book in Folio*, or simply, a **FOLIO**, is that where the sheet is only folded in two, each leaf making half a sheet.

Beneath the *Folio* are the *Quarto*, *Octavo*, *Duodecimo*, *Sextens*, *Twenty-four*, &c. See **BOOK**.

FOLIUM Caryophyllum, or clove leaf. See **CLOVES**.

FOLIUM Indicum, or *Indum*, called also *Thamalapatra*, and *Malabatrum*; a leaf brought from the Indies, growing chiefly about Cambaye, produced by a tree not unlike the lemon-tree; used in the composition of Venice treacle. See *Supplement*, article **MALABATHRUM**.

FOLK-LAND, in our ancient Saxon customs, denoted *Copyhold Lands*. See **COPYHOLD**.

In opposition to these, charter lands were called *Bocklands*. See **BOCK-LAND**.

Fundus sine scriptis possessus (says Somner) *censum pensitans annuum, & officiorum servituti obnoxius: Terra popularis*.

FOLKMOTE, **FOLCMOTE**, or **FOLKESMOTE**, among our Saxon ancestors, signified any popular, or public meeting of all the folk, or people of a place, district, or the like; *e. gr.* of all the tenants at a court-leet, or court-baron; or of all the freemen of a county; or all the barons, &c. of a kingdom.

The word, says Stow, is still in use among the Londoners, and signifies, *Celbrem ex omni civitate conventum*, an assembly of all the citizens. Manwood says, it is the court holden in London, wherein all the folk and people of the city did complain of the mayor and aldermen for any misgovernment.

Somner, in his Saxon dictionary, makes *Folemete* to denote a general assembly of the people, for doing fealty to the king, and considering and ordering matters of the commonwealth*. Whence some date the origin of parliaments.

* *Omnes proceres regni, & milites & liberi homines universi totius regni Britanniae facere debent in pleno Folcmote fidelitatem domino regi, coram episcopis regni.* In leg. Edw. Confess. cap. 33. *Et amplius non fit in hustinga, miskninga, i. e. speaking amifs; neque in Folkemote, neque in aliis placitis infra civitatem.* Charta H. I. pro London. *Du Cange*.

When such assembly is made in a city, it may be called a *Burghmote*; when in the county, a *Shiregemote*.

* *Cum aliquid vero inopinatum & malum contra regnum vel contra coronam regis emerisset, statim debent pulsatis campanis, quod*

Anglice vocatur Mobeel, convocantes omnes & universos; quod Anglice vocatur Folkemote, &c. Leg. Alfred.

FOLLICULUS, among gardeners, the seed-vessel, case, coat, husk, or cover, wherewith several kinds of seeds and fruits are inclosed.

FOLLICULUS Follis; see **VESICULA Fellis**.

FOLLY, according to Mr. Locke, consists in the drawing of false conclusions from just principles; by which it is distinguished from madness, which draws just conclusions from false principles.

FOMAHANT, or **FOMALHAUT**, in astronomy, a star of the first magnitude, in the water of the constellation Aquarius.—Its longitude, according to Hevelius, for the year 1700, is 29^o, 37', 48", and latitude southward, 20^o, 59', 46". How it stands in Mr. Flamsteed's catalogue, see in the article **AQUARIUS**.

FOMENTATION, a liquid medicine, applied on any diseased part, to resolve, discuss, soften, assuage, fortify, or constringe the same.

Fomentations are either simple, or compound.

Compound FOMENTATIONS are decoctions of roots, leaves, flowers, and seeds, made in common water, or other proper liquor; to which are sometimes added salts, axungie, oils, &c.

To use, or apply them, they dip a hot linen cloth, or flannel, in the liquor, and spread it on the part affected.

There are also *Fomentations* made another way, *viz.* by boiling certain drugs in linen bags, and then applying them, bags and all, on the part.

There are also a sort of *Fomentations*, being bags filled with medicines, but not boiled, only sometimes sprinkled with a little wine or brandy.

Simple FOMENTATIONS are those made with lukewarm water, milk, oil, oxycrate, or other like liquor.

Fomentations are also called *Local Baths*, or partial bathings; because, being applied on a diseased part, they have much the same effect as a bath, or half bath, has on the whole body.

FONT, or **Baptismal Font**, a stone, or marble vessel, at the lower end of a parish-church, serving to hold the water, to be used in administering the sacrament of baptism.

A baptismal *Font* was antiently the character of a parish-church.

Its place, at present, is at the bottom of the church, or in a little chapel within the church. Antiently, it was placed in a little church, distinct from the great one, though near to it, called the *Baptistry*.

It is said to have been a common thing, during the first ages of the church, for the baptismal *Fons* to be filled miraculously, at the time of Easter, which was their great baptizing season. Baronius gives divers instances of these miraculous *Fons* in the years 417, 554, and 558.

Possivinus B. of Lilybrum, who wrote in 443, observes, that in the year 417, under the pontificate of Zozimus, there was an error committed in the time of celebrating Easter; it being held on the 25th of March, in lieu of the 22^d of April, which was the time it was held on at Constantinople. He adds, that God was pleased to shew the error in a very convincing manner, by the *Fons* of a certain village, which always used to be miraculously filled against Easter; and which, this year, were not full till the 22^d of April. See Tillmont *Hist. Eccles.* t. x. p. 678, and 679. Gregory de Tours, p. 320; 516, 746, 950, 1063.

FONTICULUS*, or **FONTANELLA**, in chirurgery, a general name for issues, fetons, and the like other small artificial discharges. See **ISSUE**.

* The word is a diminutive of *font*, fountain, or spring.

FONTINALIA, or **FONTANALIA**, in antiquity, a religious feast, held among the Romans, in honour of the deities who presided over fountains, or springs.—Varro observes, that it was the custom to visit the wells on those days, and to cast crowns into fountains.—Scaliger in his conjectures on Varro, takes this not to be a feast of fountains in general, as Festus insinuates; but of the Fountain which had a temple at Rome, near the Porta Capena, called also *Porta Fontinalis*: he adds, that it is of this fountain Cicero speaks in his 2^d book *De legib.*—The *Fontinalia* were held on the thirteenth of October.

FOOD, or **ALIMENT**, is whatever matter is taken in at the mouth, digested in the stomach, and other viscera, and converted into the matter of the body, to repair, or supply what is spent, or wanting.

The operations which the *Food* undergoes, before it become a part of our body, are 1^o Mastication; 2^o Deglutition; 3^o Concoction; 4^o Chiffication; 5^o Sanguification; 6^o Assimilation.

Food is of two kinds, *viz.* *Esulentis*, or *Meat*; and *Potulentis*, or *Drink*.

The first *Foods* of our great forefathers, were water, and the spontaneous productions of the earth; with which also many whole nations sustain themselves to this day.

Tulpius somewhere notes, that men antiently fed after the same rate as other animals; and lived on hay and corn. That by degrees they came to the humours or juices of certain beasts, as milk; and at length they commenced carnivorous, and devoured the parts of the animals themselves.

The variety of *Foods*, it seems, does not make any difference in the substance, or actions of the bodies sustained thereby; the viscera having a power of altering and assimilating them, however heterogeneous, into one similar substance, like themselves.

The difference in *Foods* consists principally in this, that some are more easily digested and assimilated, than others; and that some afford more nutritious juice, than others: and to this end it is, that the divers kinds of dressing have been invented, *viz.* to dispose the matter for a more easy and plentiful assimilation.

The best, most simple, and light of digestion, are the *Foods* prepared of frumentaceous, and leguminous seeds; as wheat, rye, barley, oats, and mays, dried, ground, fermented, baked, &c. Peas, beans, vetches, &c. Also green plants, and pot-herbs, as lettuce, beet, parley, &c. Fruits, as apples, pears, hories, plumbs, cherries, &c. And the lean parts of animals, birds, fishes, insects, &c. prepared by boiling, baking, stewing, &c.

And yet for different intentions, different kinds of *Foods* are required: thus hard, dry, thick, heavy, feculent *Foods* are best for those whose viscera are strong, digestion quick, &c. and soft, light, humid, simple *Foods* to such, are pernicious. Again, to the weak, valctudinary, fludious, and sedentary, those *Foods* are best, which are either by art, or nature, the nearest to chyle; as milk, broths, &c.

Where the temperature inclines to acidity, there alcalious *Foods* are the most suitable; and acids, where the constitution inclines to be alcaline.

Some will have it that iron, metals, minerals, &c. may by a proper preparation become *Food*; on which account decoctions of gold, chalybeats, &c. are eried up: but it is certain, that no such matters can ever be assimilated, and become part of our body. They may act, indeed, on the blood, and the blood-vessels, by their weight, impetus, &c. and, on that account, may be of use in medicine; but not as *Food*.

A due regulation of the quantity and quality of our *Food*, and a nice adjustment thereof to the concoctive powers, would be of the utmost consequence to health and long life.

What we expend in motion, excretion, effluvia, &c. is but a determinate quantity; and the supply should only keep pace with the expence. A just proportion of the two would probably preserve us from acute distempers; as it certainly would from chronic ones; most, or all of which proceed from repletion, as appears from their being cured by evacuation. The qualities of *Foods*, as to calidness, or difficulty of digestion, Dr. Cheyne thinks, may be determined in all cases from these three principles.

1^o, That those substances which consist of the grossest parts, are hardest of digestion; by reason their constituent parts touch in the most points; or have the greatest quantity of contact, upon which their cohesion depends.

2^o, That those substances, whose parts are brought together with greater force, cohere proportionably closer, and are the more difficultly separated.

3^o, That salts are very hard to be digested; because united by plane surfaces, under which they are always comprehended; hence, in the last stages of the circulation, where it is slower, they readily shoot into larger clusters, and so are hard to be driven out of the habit.

From these principles that author infers, that such vegetables and animals, as come soonest to their growth, are easier of digestion, than those long in attaining to maturity: the smallest of their kind, sooner than the larger: those of a dry, fleshy, and fibrous substance, sooner than the oily, fat, and glutinous: those of a white colour, sooner than those of a redder; those of a soft, mild, and sweet, sooner than those of a rich, strong, poignant, aromatic taste: land animals, than sea animals: animals that live on light vegetable *Food*, than those on hard and heavy *Food*: plain dressed *Food*, than what is pickled, salted, baked, smoked, or otherwise high seasoned: and boiled meat sooner than roast, &c.

The same author adds, that abstinence and exercise must concur with the due *Food* for the preservation of health; and that where exercise is wanting, as in studious persons, the defect must be supplied by abstinence.

FOOL, according to Mr. Locke, is one who makes false conclusions from right principles; by which he is distinguished from a madman.

Dr. Willis relates, that upon dissecting a *Fool*, the principal differences found between him and a man of sense, were, that the brain was smaller; and that the cervical plexus, formed of the intercostal nerve, whereby the correspondence between the brain and heart is effected, was less, and sent forth fewer branches to the heart, &c. *Nervor. Descript. & Uf.* c. 26.

FOOT, a part of the body of most animals, whereon they stand, walk, &c.

Animals are distinguished, with respect to the number of *Feet*, into bipedes, *q. d.* two-footed; such are men and birds: quadrupedes *q. d.* four-footed; such are most land animals: and multipedes, *q. d.* many-footed; as insects.

The reptile kind, as serpents, &c. have no *Feet*.

Travellers would persuade us, that the bird of paradise has no *Feet*; that when it sleeps, it hangs by its wings; and, when it feeds, by its bill: but the truth of the matter is, they who catch them, cut the *Feet* off, either that the bird may be thought the more extraordinary; or for fear they should spoil the feathers, which are very beautiful.

Lobsters have twelve *Feet*; spiders, mites, and polypus's, eight; flies, grasshoppers, and butterflies, have six *Feet*.

Galen has several good observations on the wise adjustment of the number of *Feet* in men, and other animals, in his book *De Usu Part.* l. iii.

The fore-*feet* of the mole are admirably formed to dig, and scratch up the earth, and make way for its head, &c. In water fowls, the legs and *Feet* are excellently adapted to their respective occasions and manners of living. In such as are to wade in the rivers, the legs are long, and bare of feathers a good way above the knee; their toes also are broad: and in such as hear the name of *mudfuckers*, two of the toes are somewhat alated, that they may not easily sink in walking upon boggy places.

Others, which are to swim, are whole *footed*, *i. e.* have their toes webbed together, as the goose, duck, &c. And it is pretty enough to observe, how artfully these will gather up their toes and *Feet*, when they withdraw their legs, or go to take their stroke in swimming, and again expand, or open the whole *Foot*, when they press upon, or drive themselves forward in the water.

FOOT, in anatomy, the *great Foot*, denotes the whole extent from the jointure of the hip to the tip of the toes; as the great hand does the whole from the shoulder to the fingers ends.

The *pes magnus*, or *great Foot*, is divided into the thigh, the leg, and the *Foot* properly so called.

Its bones are the femur, or thigh bone; the tibia and fibula for the leg; and those of the tarsus, metatarsus, and toes.

Its arteries are branches of the crural artery; and its veins terminate in the crural vein. Of these there are five principal ones, *viz.* the Saphena, great and little Iliaciadic, the Muscularis, Poplitea, and Suralis. See each under its proper article, *SAPHENA*, &c.

FOOT, properly so called, or the *lesser Foot*, denotes only the extremity of the leg; consisting of three parts, *viz.* the Tarsus, the space from the ankle to the body of the *Foot*, answering to the wrist in the hand: Metatarsus, the body of the *Foot* to the toes; and Digitus, or toes. Each of these parts consists of a great number of bones; as the Calx, Talus, Cuneiformia, and Cuboides. The bottom of all is called the Sole, or Plantaris pedis. See *TALUS*, &c.

FOOT, in the Greek and Latin poetry, denotes a metre or measure, composed of a certain number of long and short syllables.

The Spondee, Iambic, Trochee, and Pyrrhic, are dissyllabic *Feet*, *i. e.* they consist of two syllables each. The Dactyl, Anapest, Molossus, Tribrach, Bacchius, Antibacchius, Amphibrachius, and Creticus, are trissyllabic, or consist of three syllables each. The Proceleusmaticus, Choriambus, and Epitrite, are quadrisyllabic, or composed of four syllables. See each under its proper head, *SPONDEE*, *IAMBIC*, &c.

There are also other *Feet*, invented by idle grammarians, of five, six, or more syllables, but they are not worth the reciting. Hexameter verses consist of six *Feet*; pentameters, only of five.

Even and odd Foot, par and impar. In poetry, and particularly in iambic verses, *Feet* are denominated *odd* and *even*, in respect of their situation in the verse. Thus, the first, third, and fifth *Foot* of the verse are uneven; in regard those numbers are not capable of being divided into two equal parts.

In the antient tragedy, the iambic verses, which prevailed therein, only allowed uneven *Feet* to the spondees; so that the second, the fourth, and sixth *Feet* were to be iambus's, in regard they were even. This regular mixture of spondees in the uneven *Feet*, rendered the verse the more solemn and noble.

The comic poets, the better to disguise their verse, and make it more like prose, took the contrary course; putting spondees, where the tragic poets would only have allowed iambus's.

FOOT is also a long measure, consisting of twelve inches. The *Foot* long is divided into twelve inches; and the inch into barley corns. See *INCH*, &c.

Geometricians divide the *Foot* into ten digits; and the digit into ten lines, &c.

The French divide their *Foot*, like us, into twelve inches; and the inch into twelve lines.

The *Foot* square is the same measure both in length, and breadth, containing 144 square, or superficial inches.
 The cubic, or solid *Foot* is the same measure in all the three dimensions, containing 1728 cubic inches.
 The *Foot* is of different lengths, in different countries. The Paris *Foot* exceeds the English by seven lines and a half: the ancient Roman *Foot* of the capitol consisted of four palms; equal to eleven inches, and seven tenths English: the Rhinland, or Leyden *Foot*, by which the northern nations go, is to the Roman *Foot*, as 950 to 1000. The proportions of the principal *Feet* of several nations, compared with the English and French, are here subjoined.

The English *Foot* being divided into one thousand parts, or into twelve inches, the other *Feet* will be as follow;

		Th.	Pts.	P.	Inch.	Li.
London	— — —	Foot	1000	0	12	0
Paris	— — —	Foot	1068	1	00	8
Amsterdam	— — —	Foot	942	0	11	3
Antwerp	— — —	Foot	946	0	11	2
Dort	— — —	Foot	1184	0	02	2
Rhinland, or Leyden	— —	Foot	1033	1	00	4
Lorraine	— — —	Foot	958	0	11	4
Mechlin	— — —	Foot	919	0	11	0
Middleburg	— — —	Foot	991	0	11	9
Strafburg	— — —	Foot	920	0	11	0
Bremen	— — —	Foot	964	0	11	6
Cologne	— — —	Foot	954	0	11	4
Frankfort on the Mayn	—	Foot	948	0	11	4
Spanish	— — —	Foot	1001	0	11	0
Toledo	— — —	Foot	899	0	10	7
Roman	— — —	Foot	967	0	11	6
Bononia	— — —	Foot	1204	1	02	4
Mantua	— — —	Foot	1569	1	06	8
Venice	— — —	Foot	1162	1	01	9
Dantzick	— — —	Foot	944	0	11	3
Copenhagen	— — —	Foot	965	0	11	6
Prague	— — —	Foot	1026	1	00	3
Riga	— — —	Foot	1831	1	09	9
Turin	— — —	Foot	1062	1	00	7
The Greek	— — —	Foot	1007	1	00	1
Paris Foot, by Dr. Bernard	— — —	Foot	1066	1	00	1
Old Roman	— — —	Foot	970	0	00	0

The Paris *Foot* being supposed to contain 1440 parts; the rest will be as follow:

Paris	- - - - -	Foot	1440
Rhinland	- - - - -	Foot	1391
Roman	- - - - -	Foot	1320
London	- - - - -	Foot	1350
Swedish	- - - - -	Foot	1320
Danish	- - - - -	Foot	1403
Venetian	- - - - -	Foot	1540 $\frac{5}{8}$
Constantinopolitan	- - -	Foot	3120
Bononian	- - - - -	Foot	1682 $\frac{1}{2}$
Strafburg	- - - - -	Foot	1282 $\frac{3}{4}$
Norimberg	- - - - -	Foot	1346 $\frac{1}{2}$
Dantzick	- - - - -	Foot	1721 $\frac{1}{2}$
Hall	- - - - -	Foot	1320

FOOT-BANK, or FOOT-STEP, *Banquette*, in fortification, is a small step of earth, on which the soldiers stand to fire over the parapet.

FOOT of the Forest^s, *Pes forestæ*, in our ancient customs, contained 18 inches, or $1\frac{1}{2}$ of the common *Foot*.

* *Notandum est, quod pes forestæ usitatus tempore Ric. Oxell, in oratione vassorum, factus est, signatus & sculptus in pariete cancellæ ecclesiæ de Edwynshone, & in ecclesiâ Beatæ Mariæ de Nottingbam: Et dicitur pes continet in longitudine octidicem pollices, &c.* Ex Regiâ. Abb. de Novo Loco in Com. Nott.

FOOTGELD was an ancient americiament, for not cutting out the balls of the feet of great dogs in the forest; to prevent their running after the king's deer.

FOOT GUARDS, see the article GUARDS.

FOOT HUSKS, among gardeners, are the short heads out of which flowers grow.

FOOT LEVEL, an instrument, which serves to do the office both of a level, a square, and a *Foot* rule.

The *Foot level*, represented *Tab. Surveying*, fig 22. consists of two branches, about an inch broad; opening and shutting like a two-foot rule.

These branches are hollowed half way up the side of each, to receive a kind of tongue, or thin piece of brass, which is fastened to one of them, by means whereof the branches may be shut close together. The use of this tongue is such, that when the end of it is placed in the branch it is not fastened to, where there is a pin that holds it, the two branches will stand at right angles: to the head of the instrument is likewise added a square piece of brass; by means whereof it does the office of a square.

At the bottom of the angle of the said piece of brass is a little hole, wherein is fastened a line with a plummet; which falling on a perpendicular line drawn on the tongue, shews whether any thing the instrument is applied to, be level or not.

Lieutenant Colonel of FOOT. See LIEUTENANT.

FOOT Pace, half pace, or landing place, see STAIR-CASE.

FOOT Rule, see the article RULE.

FORAGE—*Trufs* of FORAGE, see the article TRUSUS.

FORAMEN, in anatomy, a name given to certain holes or perforations in divers parts of the body; as the

FORAMEN Lacrum, see DURA Mater.

FORAMEN of the membrana tympani, is a perforation in the membrane of the tympanum, or drum in the ear; which admits of the passage of wind, smocke, &c. from the meatus a palato to the drum.

This passage is very small, and runs obliquely from the tympanum through the upper part of its membrane, near the process of the malleus. The existence of this perforation is more evident, when ulcers affect the palate, by the egress of wind upon the patient's stopping his nose and mouth, and forcing the wind by the ears, than by any anatomical inspection.

FORAMEN Ovale, or FORAMEN Botalli, an oval aperture, or passage through the heart of a foetus, which closes up after birth. See *Tab. Anat. Splanchn.* fig. 12. lit. g.

It arises above the coronary vein, near the right auricle; and passes directly into the left auricle of the heart.

The *Foramen ovale* is one of the temporary parts of the foetus, wherein it differs from an adult. It serves for the circulating of the blood in the foetus, till such time as the infant breathes, and the lungs are opened.

Its use was first exactly described by Leon. Botallus of Asti in Piedmont, in the year 1562; who tracing the course and passage of the blood, asserted the *Foramen ovale* to be that opening whereby the blood in foetus's was conveyed from the right ventricle to the left.

The modern anatomists stand to the discovery; and the *Foramen ovale* is now generally allowed a part necessary in the system of the circulation of the blood in the foetus.

At the aperture of the *Foramen*, there is a kind of floating membrane, which looks like a valve; but it has nothing of the office thereof: it does not hinder the blood from passing from either auricle to the other. All it serves for, according to Mr. Winslow, is, to close the *Foramen* after the birth.

It has generally been thought, that the *Foramen ovale* may sometimes remain open, even in adults: and in effect, divers authors furnish us with instances thereof.

Dr. Connor assures us, he found it but half closed in a girl of four or five years old; and in another girl, which he opened at Oxford, there was room left to thrust a tent through. *Dissert. Med. Phys. de Stup. Of. Coal.*

The accurate Mr. Cowper adds, that he has often found the *Foramen ovale* open in adults. *Anat. Append.* fig. 3. And the Paris anatomists observe, that in a sea-calf the *Foramen ovale* is always open; by which means it is enabled to stay so long under water.

Somewhat of this, too, is supposed to have been the case in the extraordinary recoveries of divers persons drowned, hanged, &c. See DROWNING.

But Mr. Cheselden ventures to set aside all these authorities; and contends, that the *Foramen ovale* is neither open in any adult land animals, nor in amphibious creatures.

When he first applied himself to dissection, he tells us, he had no distrust of the frequent accounts in authors of the *Foramen* being open; but he afterwards found that he himself often mistook the ostium of the coronary veins for the *Foramen*; and the like he imagines other authors to have done; who assert, that it is always open in amphibious animals; for that upon a diligent enquiry into these animals, he could never find it open in any of them.

Neither does he think that sufficient to enable those creatures to live under water, as the foetus does in utero; unless the ductus arteriosus were open also. *Chesl. Ap. Der. Phys. Theol.* 1. iv. c. 7.

FORCE, *vis*, or power, in mechanics, philosophy, &c. See VIS, and POWER.

Accelerating FORCE,		See	ACCELERATION.
Attractive FORCE,			ATTRACTION.
Central FORCE,			CENTRAL.
Centrifugal FORCE,			CENTRIFUGAL.
Centripetal FORCE,			CENTRIPETAL.
FORCE of Cohesion,			COHESION.
Contractile FORCE,			CONTRACTILE.
Elastic FORCE,			ELASTIC, and ELASTICITY.
Electrical FORCE,			ELECTRICITY.
FORCE of Gravity,			GRAVITY.
FORCE of the Heart,			HEART.
FORCE of Inactivity,			VIS Inertivæ.
Repelling FORCE,			REPULSION.
Resisting FORCE,			RESISTANCE.
Retaining FORCE,			RETARDATION.
FORCE of Wind,			WIND, &c.

FORCE, in common law, signifies an offence, by which violence is used either to persons, or things.

Force is either *simple*, or *compound*.
Mixed, or *compound Force* is violence committed with some fact, which of itself alone were criminal: as if any man by *Force* enter into another man's possession, and there kill a man, or ravish a woman, &c.

Simple Force is that which has no other crime adjoined to it: as if one, by *Force*, enter into another man's possession, without doing any other unlawful act.

Force is also divided into *true Force*, and *Force after a fort*. There are other branches; as *forcible entries*, *forcible detaining*, or holding; *unlawful assembly*, routs, riots, rebellions, &c. See **FORCIBLE Entry**, &c.

Fresh Force. See the article **FRESH**.

FORCE, in grammar, and some other arts, is applied to a thing which stands in lieu of, or has the same effect as another.

In our language, the *f* between two vowels has the *Force* or power of a *z*, and is sometimes put for a *z*: as in horison, baptising, &c.

In Hebrew, the Dageth; and in Arabic, the Tefsid, have the *Force* of a letter suppressed. An unite before a cypher, has the *Force* of ten.

FORCEPS*, a chururgeon's instrument, wherewith dead, and corrupt parts are seized, cut, or pulled off, &c. As also foreign bodies extracted out of wounds, &c.

* The word literally denotes a pair of tongs.

They are of divers forms, long, crooked, with teeth; with beaks, half-mooned, &c.

FORCIBLE Entry, a violent, actual entry into houses, or lands, &c. weapon'd; whether violence or hurt be offered any person therein, or not.

FORCIBLE holding, or *detaining*, a with-holding by violence, and with a strong hand, of the possession of land, &c. whereby he who has a lawful right of entry is barred or hindered.

FORDICIDA*, in antiquity, a religious feast among the Romans, held on the fifteenth of *April*: thus called from the Latin *forda*, a cow big with calf, and *cardo*, I slay, or sacrifice; by reason such cows were herein sacrificed to the goddesses *Tellus*, or the earth.

* *Forda*, a cow with calf, is formed, according to Ovid, from *fero*, I bear; or rather, as Scaliger and Salmalius imagine, from the Greek, φορμα, φορμα, the same.

Varro writes, that there were several of these cows sacrificed in the Curia. And Livy, and Halicarnassius relate, that there was one in each Curia; so that there were thirty in all; which is confirmed by Ovid. *Faster*. l. iv. ver. 631.

The *Fordicidia* were first instituted by Numa, on occasion of a general barrenness among the cattle: Ovid gives a particular description of the ceremony, in the passage above quoted: He adds, that part of these cows were sacrificed in the temple of Jupiter, that is, in the capitol.

FORE-CASTLE of a ship, is that part where the fore-mast stands. See *Tab. Ship*. fig. 2. lit. B. C. n. 23.

It is divided from the rest of the floor by a bulk-head; that part of the *Fore-Castle* which is aloft, and not in the hold, is called the *Prova*.

FORECLOSED, in our ancient law books, signifies barred, shut out, or excluded for ever: as, when the equity of redemption on mortgages is barred.

FOREFOOT, in the sea language, is when one vessel sails, or lies across another's way.

As if two ships being under sail, and in ken of one another; one of them lies in a course with her stern so much a-weather of the other, that if both hold on, the windward ship will run a-head of the other. Such ship is said to lie with the other's *forefoot*.

Though as soon as she has passed, they say, she is gone out a-head.

FOREIGN*, something extraneous, or that comes from abroad.

* The word is formed of the latin *foras*, doors; or *foris*, out of doors; or *forum*, market, &c.

Foreign minister, *foreign prince*, *foreign goods*, &c. are those belonging to other nations. See **MINISTER**, &c. *Foreign* to the purpose, signifies a thing remote or impertinent. Matter is *foreign* to the idea of space, i. e. it is not inherent therein, but adventitious thereto.

Foreign plants are particularly called *exotics*.—*Foreign Fossils*, see **Fossil**.—*Foreign Motion*, see **MOTION**.—*Foreign Canons*, see **CANON**.

In some universities they give the appellation *foreign doctors*, *doctores forensis*, to such as do not reside in the place, or the university; but take degrees to go and live elsewhere, and in other countries.

In the life of St. Paul, bishop of Verdun, written by an anonymous author, and published from a MS. above four hundred years old, by Bollandus, we meet with *forensis presbyter*, for a priest who lives in another part. The same Bollandus

notes, that St. Ambrose uses the word *forensis* for exterior. **FOREIGN**, or **FORAINE Traite**, is a duty belonging to the king of France, of one twentieth of the value of all goods, imported or exported out of the kingdom.

FOREIGN, is used in law in several senses, and joined with divers substantives.—Thus,

FOREIGN Answer, is such an answer, as is not triable in the county where it is made.

FOREIGN Attachment, is an attachment of foreigners goods found within a liberty or city, in the hands of a third person, for the satisfaction of some citizen, to whom the foreigner oweth money.

FOREIGN Matter, in law, is matter triable in another county; or matter done in another county.

FOREIGN Opposer, or *Apposer*, is an officer in the exchequer, to whom all sheriffs or bailiffs do repair to be apposed by him of their green wax, after they are apposed of their fums out of the Pipe-office; and who from thence draws down a charge upon one of them to the clerk of the pipe.

His business is, to examine the sheriff's estreats with the record, to ask the sheriff, what he says to every particular sum therein.

FOREIGN Plea, is a refusal of the judge as incompetent, because the matter in hand was not within his precinct.

FOREIGN Service, is such service whereby a mean lord holdeth of another, without the compass of his own fee: or, that which a tenant performeth, either to his own lord, or to the lord paramount out of his own fee.

FOREJUDGED the Court, is when an officer of any court is banished or expelled the same for some offence, or for not appearing to an action by bill filed against him; in which latter case, he is not to be admitted to officiate, till he appear to the bill. Anno 2 Hen. IV. c. 8.

He shall lose his office, and be *forejudged* the court, &c. *Fore-judicare, interdum est male judicare*. Spel.

FOREJUDGER, in law, signifies a judgment, whereby a man is deprived, or put by the thing in question.

FORE-KNIGHT, in the sea language, a piece of wood, carved in figure of a man's head, and fast bolted to the beams upon the second deck.

FORELAND, or **FORENESS**, in navigation, a point of land jutting out into the sea.

FORELAND, in fortification, is a small space of ground between the wall of a place, and the moat; called also *berme* and *liziere*.

FORELOCKS, in a ship, are little flat wedges, like pieces of iron, used at the ends of bolts, to keep them from flying out of the holes.

FORELOIN, among hunters, is when a hound going before the rest of the cry, meets chace, and goes away with it.

FORELORN Hopes, in an army, *Infans perdas*. See **ENFANS Perdas**.

FORE-MAST of a ship, is a round large piece of timber, seated in her fore-part, on which is born the fore-sail, and fore-top-sail yard. (See *Tab. Ship*. fig. 1. n. 81.)

Its length is usually $\frac{3}{4}$ of the main-mast.

FORENSIC Service, see the article **SERVICE**.

FORENSIS Toga, see the article **TOGA**.

FORE-SAIL, the sail of the fore-mast. See **SAIL**.

FORESCHOK E, *Derechitum*, antiently signified as much as *forfaken* in modern language.

It is especially used in one of our statutes, for land or tenements seized by the lord, for want of services due from the tenant; and so quietly held and possessed beyond the year and day.

As if we should say, that the tenant, who seeing his lands or tenements taken into the lord's hand, and possessed so long, takes not the course appointed by law to recover them; does in due presumption of law disavow or forsake all the right he has to them.—In which case, such lands shall be called *Fore-schok e*, says the stat. 10 Ed. II. c. 1.

FORESKIN, see the article **PREPUCE**.

FOREST*, *Silva*, in geography, a great wood; or, a large extent of ground, covered with trees.

* The word is formed of the Latin *foresta*, which first occurs in the *Capitulors* of Charlemain, and which itself is derived from the German *forst*, signifying the same thing. Spelman derives it from the Latin *foris riuat*, by reason *Forests* are out of towns. Others derive *Foresta* a *foris*, q. d. *Foresta quod situta statio ferarum*, as being a safe station or abode for wild beasts.

The Caledonian and Hercynian *Forests* are famous in history. The first was a celebrated retreat of the antient Picts, and Scots: the latter antiently possessed the greatest part of Europe; particularly Germany, Poland, Hungary, &c. In Caesar's time it extended from the borders of Alfatia and Switzerland to Transylvania; and was computed sixty days journey long, and nine broad: some parts, or cantons thereof are still remaining.—The *Forest* of Dean in Gloucestershire is famous for the iron works therein.

The antients adored *Forests*, and imagined a great part of their gods to reside therein: temples were frequently built in the thickest *Forests*; the gloom and silence wherof naturally inspired sentiments of devotion, and turned mens thoughts within themselves.

For the like reason, the antient Druids made *Forests* the place of their residence, and performed their sacrifices, instructed their youth, and gave laws therein. See DRUIDS.

FOREST Trees, see the articles TREE, and TIMBER.

Pruning FOREST Trees, see the article PRUNING.

Transplanting of FOREST Trees, see TRANSPLANTING.

FOREST, in a law sense, is defined a certain territory of woody grounds and fruitful pastures, privileged for wild beasts, and fowls of *Forest*, chase and warren, to rest and abide in, under the safe protection of the king, for his princely delight; bounded with unremoveable marks, and meers, either known by matter of record, or prescription; replenished with wild beasts of ventry, or chase, and with great covers of vert for succour of the said beasts; for preservation and continuance wherof, with the vert and venison, there are certain peculiar laws, privileges, and officers.

The properties and characters of a *Forest*, are, — First, That it cannot be in the hands of any, but the king; because none else hath power to constitute such commissions as are necessary to the being of a *Forest*, beside the king; as, particularly, that of a justice in eyre of the *Forest*.

And yet the abbot of Whity had a *Forest* by grant of king Henry II. and king John; with all officers incident thereto.

The second character, is the courts belonging thereto, which are, the *Justice-seat*, held every three years; the *Swanimote*, held thrice every year; and the *Attachment*, once every forty days.

The third characteristic is the officers belonging thereto, for preservation of the vert and venison; as the justices of the forest, the warden or keeper, ranger, verderers, foresters, agitors, regarders, bailiffs, beadles, &c. See each under its proper article, JUSTICE of the *Forest*, KEEPER, &c.

But the most essential mark of a *Forest*, is the Swanimote, which is no less incident thereto, than the court of Pye-powder to a fair. If this fail, it ceases to be a *Forest*, and commences a chase. See SWANIMOTE.

The way of making a *Forest*, is thus: certain commissioners, appointed under the great seal, view the ground intended, and fence it round: this being reported in chancery, the king causes it to be proclaimed throughout the county where the land lies, that it is a *Forest*; and is thenceforth to be governed by the laws of the *Forest*: and prohibits all persons from hunting therein, without his leave.

New Forest in Hampshire, history tells us, was made by the destruction of twenty-two parish churches, and all the villages, manors, chapels, &c. for the space of thirty miles together. Beside *New Forest*, there are now subsisting sixty-eight *Forests* in England; thirteen chaces; and more than seven hundred eighty-one parks.

Our antient Norman kings were the first who inclosed *Forests*, and settled the jurisdiction thereof: their taste ran mightily that way. In the course of a few reigns from the conquest, no less than sixty-eight *Forests* were inclosed; the strictest laws were made to secure them; and the severest penalties inflicted on all trespassers thereon.

William the conqueror decreed, the eyes of any person to be pulled out, who took either a buck, or boar: William Rufus made the stealing of a doe a hanging matter: the taking of a hare was fined at 20 s. and a coney at 10 s.

Eadmer adds, that fifty persons of fortune being apprehended by that last prince, for killing his bucks, were forced to purge themselves by the fire of ordeal, &c.

Henry I. made no distinction between him who killed a man, and him who killed a buck; and punished those who destroyed the game, though not in the *Forest*, either by forfeiture of their goods, or loss of limbs; though Henry II. remitted it for a temporary imprisonment.

Richard I. revived the old discipline of gelding and pulling out the eyes of those convicted of hunting in the *Forest*: but he afterwards relaxed a little, and was contented to make such convicts abjure the realm, or be committed, or pay a fine.

Assize of the FOREST, see the article ASSIZE.

Charter of the FOREST, see CHARTA de *Foresta*.

Drift of the FOREST, see the article DRIFT.

Foot of the FOREST, see the article FOOT.

Keeper of the FOREST, see the article KEEPER.

Perambulation of the FOREST, see PERAMBULATION.

Repossession of the FOREST, see REPOSITION.

Waste of the FOREST, see the article WASTE.

FORESTÆ Pes, see the article PES.

FOREST is also used adjectively. — The *Forest* cities of the empire are four cities situate in the antient Black *Forest*, or Silva Nigra, a part of the antient Hercynian *Forest*; viz. Rhinfield, Waldhust, Seckingen, and Lauffembourg. But, now that the bounds of the Black *Forest* are contracted, these cities are out of the limits thereof.

FOREST Law. — The *Forest* laws are peculiar laws, different from the common law of England.

Before the making of *Charia de Foresta*, offences committed therein, were punished at the pleasure of the king, in the severest manner; and even in the charter there were some grievous articles, which the clemency of later princes have since by statute thought fit to alter *per Assisas Foresta*.

Yet to this day, in trespasses relating to the *Forest*, *voluntas reputabitur pro facto*; so that if a man be taken hunting a deer, he may be arrested, as if he had taken a deer. The forester may take, and arrest a man, if he be taken either at dog-draw, stable-stand, back-bear, or bloody-hand; notwithstanding that three of these be only presumptions. See DOG-DRAW, STABLE-STAND, &c.

FORE-STAFF, an instrument used at sea, for taking the altitudes of heavenly bodies.

The *Fore-staff*, called also *Cross-staff*, takes its denomination hence, that the observer, in using it, turns his face towards the object; in contradistinction to the Back-staff, where he turns his back to the object.

The *Fore*, or *Cross-staff*, represented in *Tab. Navigation*, fig. 14, consists of a fraight, square, graduated staff, A B, and four crosses, or vanes, F F, E E, D D, C C, which slide thereon.

The first and shortest of these vanes, F F, is called the *ten Cross*, or *Vane*, and belongs to that side of the instrument, whereon the divisions begin at 3 degrees, and end at 10.

The next longer vane, E E, is called the *thirty Cross*, belonging to that side of the staff, wherein the divisions begin at 10 degrees, and end at 30, called the *thirty Scale*. The next vane, D D, is called the *sixty Cross*, and belongs to the side where the divisions begin at 20 degrees, and end at 60. The last, and longest, C C, called the *ninety Cross*, belongs to the side whereon the divisions begin at 30 degrees, and end at 90.

Use of the FORE-STAFF. — The great use of this instrument, is to take the height of the sun, and stars, or the distance of two stars: and the ten, thirty, sixty, or ninety crosses are to be used according as the altitude is greater, or lesser; that is, if the altitude be less than ten degrees, the ten cross is to be used; if above ten, but lesser than thirty, the thirty cross is to be used, &c.

Note, for altitudes greater than sixty degrees, this instrument is not so convenient as a quadrant, or semi-circle.

To observe an altitude by the FORE-STAFF. — Apply the flat end of the staff to your eye, and look at the upper-end *d* of the cross of the centre of the sun or star, and at the lower end *a* for the horizon. If you see the sky instead of the horizon, slide the cross a little nearer the eye; and if you see the sea, instead of the horizon, slide the cross further from the eye: and thus continue moving, till you see exactly the sun or star's centre by the top of the cross *b*, and the horizon by the bottom thereof, *a*.

Then the degrees and minutes cut by the inner edge *e* of the cross upon the side of the staff, peculiar to the cross you use, is the altitude of the sun or star.

If it be the meridian altitude you want, continue your observation as long as you find the altitude increase; still moving the cross nearer to the eye.

By subtracting the meridian altitude thus found, from ninety degrees, you will have the zenith distance.

To work accurately, an allowance must be made for the height of the eye above the surface of the sea, viz. for one English foot, 1 minute; for five foot, 2½; for ten foot, 3½; for twenty foot, 5; for forty foot, 7, &c.

These minutes subtracted from the altitude observed, and added by the zenith distance observed, give the true altitude, and zenith distance.

To observe the distance of two stars, or the moon's distance from a star, by the FORE-STAFF. — Apply the instrument to the eye; and looking to both ends *a* and *b* of the cross, move it nearer, or farther from the eye, till you see the two stars; the one on the one end, and the other on the other end of the cross.

Then the degrees and minutes cut by the cross on the side proper to the vane in use, give the stars distance.

FORESTAGE, FORESTAGIUM, in our antient customs; an obsolete duty, or service, paid by the foresters to the king.

In Britany, Lobineau observes, the office of foresters was held by gentlemen of the first rank, who for their *Forestage* were obliged to furnish the lord, when he kept open house, with cups and spoons.

FORESTAGE also seems to have been used for a duty, payable to the king's foresters. *Et sint quieti de shelmio, et passagio, et de Forestagio, &c. Chari. Edv. I.*

It may likewise be taken for a right to use the forest; or a taking of reasonable estovers. See ESTOVER.

FORESTAL*, or FORSTAL, in Domesday wrote FORSTEL, is an intercepting in the highway; or stopping, or even insulting a passenger therein.

* The word is formed of the Saxon, *fore*, before; and *stal*, station. — In the laws of Hen. I. the sense of the word is thus explained: *Forestal est, si quis ex transverso incurrat, vel in viam expectet, et assaliet inimicum suum.*

FORESTALLER, a person who *forefals* the market, or buys up goods upon the road.

FORESTALLING*, the buying, or bargaining for corn, cattle, or other merchandize, by the way, before it reaches the market, or fair, to be sold; or by the way, as it comes beyond the seas, or otherwise, toward any city, port, haven, or creek of this realm, with design to take advantage thereof, and sell it again at a more advanced, and dear rate.

* *Pleta* says, it signifies *obstructionem viæ, vel impedimentum transitus & fugæ auerivum.*

FORESTALLING is particularly used in Crompton, for stopping a deer broken out of the forest, and preventing its returning home again; or, a lying between him and the forest, in the way he is to return.

FORESTER, a sworn officer of the forest, appointed by the king's letters patent, to walk the forest, and watch the vert, and venison; as also to attach and prevent all trespasses against both, within his bailiwick, or walk, to the forest courts; to be punished according to their offences.

Though the letters patent of a *Forester* be ordinarily only granted, *quam diu bene se gesserit*; yet they are granted to some and their heirs; who are hereby called *Foresters in Fee*.

Sir William Temple relates, that the Franks having subdued all Gaul, their princes reduced Flanders into a kind of government; and gave the quality of *Foresters*, with part of the province, to the bravest of their captains.

This quality of lord *Forester* held till the time of Charlemaign, or, according to others, of Charles the Bald, in whose time Flanders being erected into a county, the title of *Foresters* was changed into that of count.

FORE-TOP-MAST is half the length of the fore-mast, (See *Tab. Ship. fig. 1. 11. 102.*) and the fore-top-gallant-mast half the length of the fore-top-mast.

FORFEITURE*, originally signifies a transgression, or offence against some penal law.

* The word is formed of the base Latin *forisfactura*; whence *forisfactura*, and *forisfactura*, and the French *forfait*. *Forisfactura* comes of *forisfacere*, which, according to Isidore, signifies to hurt, or offend, *facere contra rationem*; and which is not improbably derived of *foris*, out, and *facere* to do, q. d. an action out of rule, or contrary to the rules. Borel will have *forfait* derived from the using of force or violence: Lobinmau in his glossary will have *forisfacta* properly signify a mulet, or amend, not a *forfeit*; which latter he derives from the base Briton *forfed*, a penalty.

But with us, it is now more frequently used for the effect of such transgression, or the losing some right, privilege, estate, honour, office, or effects, in consequence thereof; than for the transgression itself. As, *forfeiture of escheats, forfeiture of goods, &c.* A fee becomes vacant by the forfeiture or rebellion of the vassal.

Goods *forfeited*, and goods confiscated, differ: those which have a known owner, who has committed some offence, whereby he loses his goods, are said to be *forfeited*. Those which an offender disavows, as not his own; and which are not claimed by any other, are said to be confiscated. Stat. 25 Edv. III. Add that *forfeiture* or *forfeit*, is more general; and confiscation more particular, being principally used for such as *forfeit* only to the king's exchequer.

Full **FORFEITURE**, *plena forisfactura*, called also *plena vita*, is a *forfeiture* of life and member, and all else that a man has.

FORFEITURE of marriage, *Forisfactura maritagi*, a writ, which formerly lay against him, who, holding by knight's service, and being under age, and unmarried, refused her whom the lord offered him, without his disparagement, and married another.

FORFEX, in furgery, a pair of scissars wherewith things may be cut.

The word is sometimes also used for pincers, nippers, or plyers: and is often confounded with *forceps*. Blanchard, and after him Quincy, describes a *Forfix* as an instrument to draw teeth withal.

FORGE, properly signifies a little furnace, wherein smiths, and other artificers in iron and steel, &c. heat their metals red hot, in order to soften and render them more malleable and manageable on the anvil, &c.

We say a farrier's *Forge*, silversmith's *Forge*, cutler's *Forge*, locksmith's *Forge*, &c.—The *Forge* used by the several operators in iron, is very simple; we shall instance in that of the blacksmith, to which all the rest are reducible.

The hearth, or fire-place, is a mass of brick, about two foot six inches high: the back of the *Forge* is built upright to the ceiling, and is inclosed over the fire-place with a hovel, which leads into a chimney, to carry away the smoke. In the back of the *Forge*, against the fire-place, is a thick iron plate, with a taper pipe fixed therein, about five inches long, called the *tewel*, into which the nose or pipe of the bellows is received: the use of this plate and *tewel* is, to preserve the pipe of the bellows, and the back of the hearth from being burnt. Right before the back, at about two foot distance, is

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the trough, filled with water, to wet the coals with, and thereby increase their force; as also to quench the iron in. Behind the back of the *Forge* is placed the bellows, one of whose boards is fixed so, that it moves not, either upward, or downward; and to the other is fitted a rope, chain, or even a rod; which rising perpendicularly, is fixed to a cross piece, called the *rocker*, which moving on a kind of fulcrum near the middle, serves as a handle.

By drawing down this handle, the moveable board of the bellows rises; and by a considerable weight a-top of its upper side, it sinks down again; and by this alternate agitation performs the necessary motions of a pair of bellows. See **BELLOWS**. Braziers and coppersmiths *Forge* differs but little from that already described; only that it is much less, and that nothing is burnt in it but charcoal; the metals used by these operators not working well with pit-coal.

FORGE is also used for a large furnace, wherein iron ore taken out of the mine, is melted down.

But this is not so properly called a *Forge* as a furnace.

FORGE is more properly used for another kind of furnace, wherein the iron ore, melted down and separated in a former furnace, and there cast into sows and pigs, is heated, and fused over again, and beaten afterwards with large hammers; and thus rendered more soft, pure, ductile, and fit for use.

Of these *Forges* there are two kinds; which the iron successively passes through, before it comes to the smith.

The first is called the *Finary*, where the pigs are worked into gross iron, and prepared for the second, which is called the *Chafery*, where it is further wrought into bars, fit for use.

FORGE Mills, see the article **MILL**.

FORGER of false deeds, signifies either him that fraudulently makes and publishes false writings, to the prejudice of any man's right; or else the writ that lies against him who commits this offence.

Fitz. Nat. Br. fol. 69. b. says, That a writ of deceit lies against him, who commits this offence, and the penalty of it is declared in the stat. 5 Eliz. cap. 14.

FORGING, in the mechanic arts, the act of beating, or hammering iron on an anvil, after having first made it red not in the *Forge*; in order to extend it into various forms, and fashion it into works.

Iron is hammered, and *forged* two ways: either by the force of the hand; in which there are usually several persons employed, one of them turning the iron, and hammering likewise; and the rest only hammering.

Or, it is done by the force of a water-mill; which raises, and works several huge hammers, beyond the force of man, under the strokes whereof the workmen present large lumps, or pieces of iron, which are sustained at one end by the anvils, and at the other by iron chains fastened to the ceiling of the forge.

This last way of *forging* is only used in the largest works, as anchors for ships, &c. which usually weigh several thousand pounds.—For the lighter works, a single man suffices to hold, heat and turn with one hand, while he strikes with the other.—Each purpose the work is designed for, requires its proper heat.—If it be too cold, it will not feel the weight of the hammer, as the smiths call it, (*i. e.* it will not stretch or give way;) and if it be too hot, it will red-fer, *i. e.* it will break or crackle under the hammer.

The several heats the smiths give their iron, are 1° A blood-red heat. 2° A white-flame heat. 3° A sparking, or welding heat.

FORKED Heads, among hunters, those horns of deer which bear two croches on the top; or which have their croches doubled.

FORLET Land, such land in the bishoprick of Hereford, as was granted or leased, *dim episcopus in episcopatu suserit*; that the successor might have it for his present income.

But now that custom is disused, and the same lands are granted, as others, by lease; yet they still retain the name. *Butterfield's Survey*, fol. 56.

FORM, FORMA, in physics, denotes the manner of being peculiar to each body; or that which constitutes it such a particular body, and distinguishes it from every other.

The philosophers generally allow two principles of bodies: *Matter*, as the common basis, or substratum of all; and *Form*, as that which specifies and distinguishes each; and which added to a quantity of common matter, determines or denominates it this, or that; wood, or fire, or ashes, &c.

Aristotle calls *Form λογος της υλης*, the reason, or manner of the essence, or being of a thing; but as *υλη* denotes substance, as well as essence, a mighty controversy has arose in the schools, in which sense the word is here to be used; and whether *Forms* are to be accounted substantial, or only essential; *i. e.* whether the *Forms* of bodies be real substances, and have an existence distinct from that of matter, or not. It is certain, the most ancient philosophers never dreamt of making *Form* a substance. Parmenides, and after him *Tellesius* expressly assert, all natural things to consist of one and

the same kind of substance, and only to differ in accidents. And though Empedocles allowed of a substantial *Form* in mixt bodies, yet he denied it in the elements, and only held an essential one.

Galen allowed of nothing in matter more than the temperature of the primary elements; in which he was seconded by Alex. Aphrodisæus, Philoponus, and others.

Substantial *Forms* seem to have been first broached by the followers of Aristotle, who thought matter, under different modes or modifications, not sufficient to constitute different bodies; but that something substantial was necessary to set them at a greater distance: and thus introduced substantial *Forms*; on the footing of souls, which specify and distinguish animals.

The considerations which the Peripatetics principally insist on, in confirmation of this doctrine are: 1^o That without substantial *Forms*, all natural things would be of the same species, nature, and essence; which is supposed an absurdity.

2^o That every thing has its peculiar power, motion, and operation; as the magnet, *e. gr.* has that of attracting iron; but that this power does not flow from the matter of the body, which is only passive; nor from the accidents: and therefore that it must arise from a substantial *Form*.

3^o That without substantial *Forms* there would be no generation; for a production of accidents is only an alteration.

4^o That without such *Form*, the nature of a man and of a lion would not differ.

What contributed much to their error, was the circumstances of life and death: for, observing, that as soon as the soul was departed out of a man, all motion, respiration, nutrition, &c. immediately ceased; they concluded that all those functions depended on the soul; and consequently that the soul was the *Form* of the animal body, or that which constituted it such: that the soul was a substance, independent of matter, no body doubted; and hence the *Forms* of other bodies were concluded equally substantial.

But to this it is answered, that though the soul be that by which a man is man; and consequently is the *Form* of the human body, as human: yet it does not follow, that it is properly the *Form* of this body of ours, as it is a body; nor of the several parts thereof, considered as distinct from each other.

For those several parts have their proper *Forms* so closely connected with their matter, that it remains inseparable therefrom, long after the soul has quitted the body: thus, flesh has the *Form* of flesh; bone of bone, &c. long after the soul is removed, as well as before.

The truth is, the body does not become incapable of performing its accustomed functions, by reason the soul has deserted it; but the soul takes its leave, by reason the body is not in a condition to perform its functions.

The ancient and modern corpufcular philosophers therefore, with the Cartesians, exclude the notion of substantial *Forms*; and shew by many arguments, that the *Form* is only the modus or manner of the body it is inherent in.

And as there are only three primary modes of matter, *viz.* figure, rest, and motion; with two others arising therefrom, *viz.* magnitude, and situation: the *Forms* of all bodies they hold to consist therein; and suppose the variations these modes are capable of, sufficient to present all the variety observable in bodies. See **MODE**.

Many varieties we actually see result from changes in these modes; which may very well pass for differences of *Form*: thus an awl only differs from a needle in magnitude; a globe from a cube in figure: and transparent glass being pulverized, will reflect the light, and appear white; and yet all the alteration consists in the order and arrangement of the parts: when wheat is ground into flour, all the change consists in a separation of the contiguous parts; and when the flour is baked into bread, what is it but the same particles associated again, in another manner? By agitating water, a froth is formed; if the agitation be increased, the particles will exhale, and form clouds; which being congregated again, return in dew, snow, hail, or rain: and the same water, by the accession of cold, might have been formed into ice. So many different bodies, endued with different qualities, and which the Peripatetics themselves allow specifically different, arise from one and the same body by mere motion, and rest!

The philosophy of substantial *Forms*, its rise, use, and extent, are set in an excellent light by Fa. Malebranche.

The way of thinking, that first introduced it, is this: every thing I perceive in tasting, seeing, and handling this honey, and salt, is in the honey, and salt: but it is certain, that the things I perceive in the honey, *e. gr.* the colour, taste, &c. differ essentially from those I perceive in the salt; consequently, there is an essential difference between the two.

Hence it follows, that they are grossly deceived, who take all the differences between those bodies to consist in the different configurations of the component parts; since the different figure is not at all essential to the different bodies: for change the figure of the parts of the honey how you will; and even give them those of the parts of salt; yet it is honey still.

There must therefore be some substance added to the com-

mon matter of all bodies, to make them essentially different. And thus are substantial *Forms* hooked in; those fertile substances, which perform every thing that we see in all nature.

Since then in every natural body there are two substances; the one common to honey, salt, and all other bodies; and the other, that which makes the honey, honey; the salt, salt; and all other bodies what they are: it follows, that the first, *viz.* Matter, having no contrary, but being indifferent to all *Forms*, must remain without force, and action; as having no occasion to defend itself.

But for the others, *viz.* the substantial forms, there is a necessity of their being accompanied and invested with faculties and qualities for their defence, and subsistence. These must be always on their guard, for fear of being surprized: they are in possession of a thing, which they are to hold against numerous pretenders; and therefore they must be continually at work, to fortify themselves, and extend their dominion over the neighbouring matters, and push their conquests as far as they can: were they to remain unactive, and unprepared, other *Forms* would lay hold of them, and banish and destroy them for ever. To guard against this, they keep constant watch; and entertain mortal enmities and antipathies against those other *Forms*, which only wait to destroy them.

If now it happen, that one *Form* seize the matter; or receptacle of another; that the *Form* of a carcass, for instance, seize the body of a dog: it is not enough, that this new *Form* annihilate the former; but its hatred must be further gratified with the destruction of all the qualities, that took its enemy's parts.

The hair of the carcass, then, must be turned white, by a creation of a new colour: its blood must become red, but of such a red, as is not to be suspected in the interest of the enemy; and the whole body to be invested with qualities, truly to their new master, whom they are to defend with all the power the qualities of a carcass can have; till such time as being overpowered, this *Form* gives way too, in its turn, to the *Form* of maggots, worms, &c.

But, as nothing can be in perpetual war; but every thing has its place of rest; it follows, that even the fire must likewise have its centre, whither its natural levity always prompts it, that it may remain at rest, cease to burn, and even quit its heat, which it only maintains here below for its defence.

These may serve as a taste of the consequences, drawn from that important principle, substantial *Forms*; which is infinitely fertile, and furnishes every philosopher with all sorts of solutions, according to his ability, address, inclination, &c.

Forms are usually distinguished into essential and accidental.

Essential FORMS. Though the five modes above-mentioned, generally taken, be adventitious; yet, to this, or that body, *e. gr.* to fire, or water, they are essential: thus, it is accidental to iron, to have this, or that magnitude, figure, or situation; since it might exist in different ones; yet, to a knife, or hammer, the figure, magnitude, and position of parts, which constitute it a hammer, or knife, are essential; and they cannot exist, or be conceived without them.

Hence it is inferred, that though there be no substantial, there are essential *Forms*, whereby the several species of bodies become each what they are, and are distinguished from all others.

Accidental FORMS, are those really inherent in bodies; but in such manner, as that the body may exist in all its perfection, without them.—Such is whiteness in a wall; heat in water; a figure of a man in wax, &c.

Metaphysical FORM is nothing else but specific difference; as metaphysical matter is nothing else but the genus.—Thus, rational, is the metaphysical *Form* of man.

Forms, again, are distinguished into simple, and compound.

Simple FORMS are those of simple bodies, *i. e.* of such as have but few properties.

Compound FORMS are those of more compound bodies; or of such as have more properties.

Thus, *e. gr.* if the *Form* of a hard body be compared with the *Form* of wood; the former may be accounted simple, and the latter complex; inasmuch as a hard body, considered only as hard, has fewer properties than wood.—Absolutely speaking, however, simple *Forms* are those of the elements; and compound, those of mixt bodies.

Lastly, some distinguish *Forms* into natural, and artificial.

Natural FORMS, are those inherent in bodies without any thing contributed thereto on the part of man. Such is the *Form* of marble.

Artificial FORMS, are those arising from human industry: such is that of a statue.—But this distinction is useless; and does not imply any intrinsic difference in the *Forms* themselves.

FORM of Corporeity, according to Avicenna, and the Scotists, is that which constitutes body in the general esse of body.

That there is such a thing, they prove thus: the human body is a natural body, which cannot be placed in the esse of body, but by the *Form* of corporeity: For it is either so placed by this, or by the rational soul; not by the soul, since that is spiritual; therefore by the *Form* of corporeity. And the same may be understood of other bodies: but the later philosophers set this aside as a chimæra.

Syllogistic FORM, is a just disposition, both of the terms, in respect of predicate, and subject; and of the propositions, in respect of quantity, and quality.

By just disposition we mean such an one, wherein the conclusion follows duly and legitimately from the two premises; there being no *Form* where there is no conclusion. See SYLLOGISM. The disposition of the several terms, being, as it were, so many steps or degrees of a *syllogistic Form*; is called the *figure of the syllogism*.

The disposition of the premises alone, being as it were another degree, is called the *mode of the syllogism*.

FORM, in theology, denotes one of the essential parts of the sacraments; being that which gives them their sacramental nature and efficacy.

The *Form* consists in certain words, which the priest pronounces in administering them. --- In some of the Romish sacraments the *Form* is deprecatory; in ours it is absolute, or indicative.

The fathers and ancient divines held, that the sacraments consisted of things, and words, *rebus et verbis*. William of Auxerre was the first, who, about the beginning of the 13th century, introduced the terms, *mater* and *form*, in lieu thereof.

FORM is also used, in a moral sense, for a manner of being, or doing a thing according to rules.

This republic has frequently changed its *Form* of government; that is, its constitution. Pardons generally express a remission, or abolition of a crime, in what *Form* or manner soever it were committed. He was admitted doctor in *Form*; put your argument in *Form*.

FORM, in law, is applied to certain established rules to be observed in processes or judiciary proceedings.

In which sense the word stands opposed to the ground or matter in dispute.

It is a maxim in law, that the *Form* leads, or sways the matter: the very contrary maxim should be true.

Contra FORMAM *sequestrant*, } See the article CONTRA.
Contra FORMAM *collationis*, }

Modo & FORMA, see the article FORMA.

FORM *, in joinery, &c. is applied to the long seats or benches in the choirs of churches, for the priests, canons, prebends, religious, &c. to sit on.

* Du Cange takes the name to be derived from hence, that the backs of these seats were anciently enriched with figures of painting and sculpture, called in Latin, *formae & typi*. --- In the life of St. William of Rochford we meet with *Forma*, as signifying a seat for an ecclesiastic, or religious, in a choir; and in that of St. Lupicin, we have *formula* in the same sense. In the rule of the nunnery of St. Cæcilia, the nun who presides over the choir is called *primiceria, vel formaria*.

FORM also denotes the external appearance or surface of a body; or the disposition of its parts, as to length, breadth, and thickness.

In which sense it coincides with figure.
FORM is also used in the mechanic arts, for a kind of mould, whereon a thing is fashioned, or wrought.

Such are the *hatters Form*, the paper-makers *Form*, &c.
Hatters FORM, is a large block, or piece of wood of a cylindrical figure; the top thereof being rounded, and the bottom quite flat.

Its use is, to mould or fashion the crown of the hat, after the matter thereof has been beaten and felled.

To *form* a hat, it is necessary the wool, hair, &c. be very hot, just reeking out of the copper.

Paper-makers FORM is the frame or mould wherein the sheets are fashioned. See PAPER.

Printers FORM is an assemblage of letters, words, and lines, ranged in order, and disposed into pages, by the compositor; from which, by means of ink, and a press, the printed sheets are drawn.

Every *Form* is inclosed in an iron chafe, wherein it is firmly locked by a number of pieces of wood; some long and narrow, and others in *form* of wedges.

There are two *Forms* required for every sheet; one for each side; and each *Form* consists of more or fewer pages, according to the volume of the book.

FORM, in hunting, denotes the feat of a hare; or the place and time when and where the quarts.

FORMA Pauperis, or in **FORMA Pauperis**, is when any person has cause of suit, but is so poor that he cannot dispense the usual charges of suing at law, or in equity.

In this case, upon his making oath that he is not worth 5*l.* his debts being paid, and bringing a certificate from some lawyer, that he has just cause of suit, the judge admits him to sue in *Forma pauperis*, that is, without paying fees to the counsellor, attorney, or clerk. This custom has its beginning from stat. 11 H. VII. c. 12.

FORMAL, something that regards the *Form*; or that gives the manner, or *Form*.

The *formal cause*, joining itself to the material, produces the body, or compound.

The schoolmen also apply the word to any thing which has

a kind of *Form*, either essential, or accidental; at least, in our conception.

Thus, we frequently hear the philosophers talk of the *formal object* of knowledge; and of the *formal reason* of any thing; *formal unity*, &c.

FORMAL Cause is defined by certain philosophers, to be something implanted in one parcel of matter, whereby it is distinguished from all other matter.

For matter is supposed common to all bodies; consequently, that they are distinguishable from one another does not arise from their matter, but from the *Form* which is peculiar to each: hence what is produced by such cause, is said to be *formal*.

Hence it follows, that the causality of matter, and *form*, is not the same; or that the component power, and the actual composition are different. Contrary to the opinion of the generality of schoolmen, who maintaining *Form* to be a substance co-existent with matter, make it a real component part; as much as matter itself.

FORMAL Circle, see the article CIRCLE.

FORMAL Notion, see the article NOTION.

FORMAL is also used in a moral sense, importing positive, express, and precise.

Thus we say, a *formal agreement*, a *formal text*, *formal answer*, &c. --- *Formal evidence*. See EVIDENCE.

FORMALITER, **FORMALLY**, is variously used in the schools.

Sometimes it is understood of the subject, when a predicate is therein on account of some form: thus, white *formally* taken, diffuses light; *q. d.* the form inherent in this subject, *viz.* whiteness, is the cause why the subject diffuses the light.

FORMALLY has also place in suppositions; a word being *formally* supposed, when it is taken for the thing it was intended to signify: as, *man is an animal*.

FORMALLY is also used in the same sense with *adequately*, and totally: thus, a syllogism *formally*, *i. e.* adequately taken, requires three propositions.

Sometimes it is also used for *quidditatively*: thus, man *formally* taken, is a reasonable animal.

FORMALLY is also used for *really*; in opposition to objectively: thus, a thing is said to be *formally* such, when it is such in the proper notion of the thing spoke of.

FORMALLY, again, is used in speaking of the manner wherein a thing is contained in another; in opposition to *virtually*, and *eminently*. See VIRTUALLY, and EMINENTLY.

FORMALITY, the quality of a *Form*, or *Forma*: or that which constitutes and denominates them such.

FORMALITY, as defined in the schools, is any manner, wherein a thing is conceived: or, a manner in any object, importing a relation to the understanding, whereby it may be distinguished from another object.

Thus, animality and rationality are *Formalities*. --- The Scotists make great use of *Formalities*; in opposition to the virtualities of the Thomists.

The Scotists hold, that the metaphysical degrees in man are so many *Formalities*, really distinct from each other, as *man*, *living*, *animal*, &c. And the same they hold of the attributes of God: the Thomists, on the contrary, contend, that they are really and intrinsically the same.

FORMALITIES, in matters of law, are frequently used for the formula's themselves; or the rules prescribed for judiciary proceedings. --- In contracts of strict law, all the *Formalities* must be strictly observed: an omission of the least *Formality* may ruin the whole convention.

The term is also used for a certain order, or decorum, to be observed.

The composition of *Formalities*, decencies, and circumspensions, may form a political pedant; but not an ambassador, who must be a gallant man. Viquefort.

FORMATION, in philosophy, &c. the act of forming, fashioning, or producing a thing.

The *Formation* of the chick in the egg is admirably explained by Malpighi, in an express treatise, *De Formatione pulli in ovo*.

The *Formation* of the fetus, the embryo, in the womb, is a process of which we have but very dark conceptions.

The *Formation* of metals is effected in the earth, of fumes, or vapours raised by the subterraneous fire, and fixed or condensed as they arrive toward the surface of the earth.

FORMATION of stones, see the article STONES.

FORMATION of the tails of comets, see COMETS.

FORMATRIX, or **FORMATRICE**. The ancient philosophers admitted a *Virtus*, or *Facultas Formativæ*, whereby all bodies had their forms given them.

FORMATUM Punctum, see the article PUNCTUM.

FORME, or **FORMY**, in heraldry. A *Crest FORME*, or *Formy*, is a cross narrow in the centre, and broad at the extremities;

tremes; so called by Leigh and Morgan; though most other authors call it *Pater*.

FORMED, or **FIGURED Stones**, among naturalists, are such bodies, as being either pure stone, flint, or spar, are found in the earth, so *formed*, as that they bear a near resemblance to the external figure of muscles, cockles, oysters, or other shells, or to plants, or animals.

Authors have been greatly divided as to their origin: the several opinions see under the articles **FOSSIL**, **SHELL**, &c.

FORMED Bachelor, see the article **BACHELOR**.

FORMED, in heraldry, &c. the same with *seated*.

FORMEDON, in law, a writ which lies for him who has right to lands, or tenements, by virtue of any entail, arising from the statute of Westm. 2. c. 1.

There are three kinds, *viz.* *Forma Donationis*, or *Formedon in the Descender*; *Formedon in the Reverter*; and *Formedon in the Remainder*.

FORMEDON in the Descender, lies for the recovery of lands, &c. given to one and the heirs of his body; or to a man and his wife, and the heirs of their two bodies; or to a man, and his wife, being cousin to the donor, in frank marriage, and afterwards alienated by the donee.

After his decease, his heir shall have this writ against the tenant or alienee.

Fitz. Nat. Br. fol. 211, &c. makes three sorts of *Formedon* in the descender: the first is that now expressed: the second, for the heir of a coparcener that aliens, and dies; the third he calls, *Infimus tenent*; which lies for a coparcener, or heir in gavel-kind, before partition, against him to whom the other coparcener or heir has alienated, and is dead.

FORMEDON in the Remainder, lies where a man gives land in tail, the remainder to another in tail; and afterwards the former tenant in tail dies without issue, and a stranger abates: then he in remainder shall have this writ.

FORMEDON in the Reverter, lies for the donor, or his heirs (whose land is entailed to certain persons, and their issue, with condition, for want of such issue to revert to the donor, and his heirs) against him to whom the donee alienates after the issue extinct, to which it was entailed.

FORMICA*, in medicine, a species of tumid, callous wart, of a blackish colour, and broad base; which appears like the stings of ants.

* And hence the name *Formica*, which literally denotes an ant: for the like reason it is denominated by the Greeks, *μυρμικα*.

FORMING, is used for the act of giving being, or birth to any thing: thus, God is said to have *formed* man after his own image. Every thing generated is *formed* of something corrupted.

The word is also simply used for giving the figure to any thing. The potter *forms* his vessels as he pleats. Geometry teaches how to *form* all kinds of figures.

It is used also, for the producing of a thing: thus, thunder is *formed* of exhalations: the lineaments of the face began to be *formed*.

FORMING of a Siege, is the making lines of circumvallation, to fortify the camp, and disposing things for the attack of a place in *form*.

They also say, to *form* a squadron, or battalion; meaning, to range the soldiers in form of a squadron, &c.

The term is also used in speaking of a body of forces; which being out of any order of squadrons, battalions, &c. do halt, range themselves in order, and put themselves in a condition for the attack. — As soon as the enemy observed this motion, they began to *form* themselves.

Angle FORMING the Plank, see the article **ANGLE**.

FORMING, is also used in grammar, in speaking of certain tenses of verbs, which are made from others, by a change of certain letters.

The present tense is *formed* from the infinitive. Compound and derivative words also; and even all that have any etymology, are said to be *formed*.

FORMULA, a rule, or model; or certain terms prescribed, and decreed by authority, for the form and manner of an act, instrument, proceeding, or the like.

The Roman law was full of *Formula*: divorces, adoptions, stipulations, &c. were performed by certain *Formula*'s, or in certain terms. — Cneius Flavius published a collection of the *Formula*'s of his time; which were well received. — The least slip or failure in any of the terms of these *Formula*'s, rendered the whole transaction null. — The *Formula*'s of Marculphus, with M. Bignon's comment, are in great esteem.

FORMULA, in church history, and theology, denotes a formulary, or profession of faith.

The council of Seleucia was dissolved by Leonas, the emperor's commissary, as not able to bring them to sign the *Formula*.

FORMULA, in medicine, denotes a little form, or prescription; such as physicians direct in extemporaneous practice: in distinction from the greater forms, which are the official medicines. See **PRESCRIPTION**.

FORMULARY, a writing, containing the form, or formula

of an oath, declaration, attestation, or abjuration, &c. to be made on certain occasions.

There are also *Formularies* of devotion, of prayers, &c. liturgies are *Formularies* of the public service in most churches.

FORNACALIA, or **FORNICALIA**, a feast held among the antient Romans, in honour of the goddess Fornax or Fornix.

It was solemnized with sacrifices, performed before the mouth of an oven, wherein they dried their corn, baked their bread, &c.

The *Fornacalia* were moveable: the grand curio proclaimed the time of celebration every year on the twelfth of the calends of March.

They were first instituted by Numa; and the Quirinalia were instituted for the sake of such as had not kept the *Fornacalia*. See **QUIRINALIA**.

FORNICATION, *IVbordom*; the act, or crime of incontinency between single persons; for if either of the parties be married, it becomes adultery.

St. Thomas labours much to prove simple *Fornication*, contrary to the law of nature.

By the antient law of England, the first offence herein was punished with three months imprisonment: the second was made felony, by an act in the time of the late usurpation. At present, doing public penance is the chief punishment.

FORNICATION is sometimes used as a general term, including all kinds of offences against chastity.

Its species are, 1^o *Simple Fornication*, which is that committed with a prostitute. 2^o *Stuprum*, that committed with persons of reputation and sobriety. 3^o That committed with relations, called *Incest*. 4^o That committed with married persons, *Adultery*. 5^o That committed with persons consecrated to God, *Sacrilege*. 6^o That committed between persons of the same sex, *Sodomy*. 7^o That committed by persons on themselves, *Manusupration*. And 8^o That committed with beasts, *Bestiality*.

FORNIX, in anatomy, the extremity of the corpus callosum, next the cerebellum; which is separated or divaricated into two legs, forming a kind of arch, or *Fornix*. See **CORPUS CALLOSUM**.

FORPRISE, in law, an exception, or reservation. — In which sense the word is used in the statute of Exon, 14 Edv. I. We still use it in conveyances and leases, wherein excepted and *forprised* are synonymous terms.

FORPRISE * is also used for an exaction. — In which sense it amounts to the same with *forecapium*.

* *Totum pratum, &c. sine quacunque Forprisa in excambium pro pace dedit.*

FORAGE*, provision for cattle, of hay, oats, and straw; particularly in war.

* Skinner derives the word from *foras agere*, by reason they go abroad to seek *Forrage*: Others from *Fair*, which antiently signified any kind of corn, or grains: Menage, from *Foderagium*, or *Foderum*, or *Fodrum*, which the Romans used in the same sense: Cujas and Du Cange, derive it from the German *Futter*, horse-meat: Vossius, from the German *foden*, or *voeden*, to feed: Nicod, from *Farrage*; which literally signifies what we call *Farrage*; and figuratively, a mixture of divers kinds of things. Hicks derives it from the Saxou *Fodre*, or the English *Fodder*, or the base Latin, *Fodrum*. See **FODDER**.

In marching, encamping, &c. care must be taken, that the cavalry may find *Forrage*. To go to *forrage*: They were sent *a-forraging*.

A ration of *Forrage* is the portion of hay, straw, and oats, allowed each horseman, for the subsistence of his horse one day; which is twelve pounds of hay, as much straw, and three pecks of oats.

FORSTAL, } See } **FORESTAL**.
FORSTALLING, } See } **FORESTALLING**.

FORT, a little castle, or fortress; or a place of small extent, fortified by art, or nature, or both.

A *Fort* is a work encompassed round with a moat, rampart, and parapet; to secure some high ground, or passage of a river; to make good an advantageous post; to fortify the lines and quarters of a siege, &c.

Field Fort, see the article **FORTIN**.

Paine Fort, & *dure*. See the article **PAINÉ**.

Royal Fort, is a *Fort* whose line of defence is at least twenty-six fathoms long.

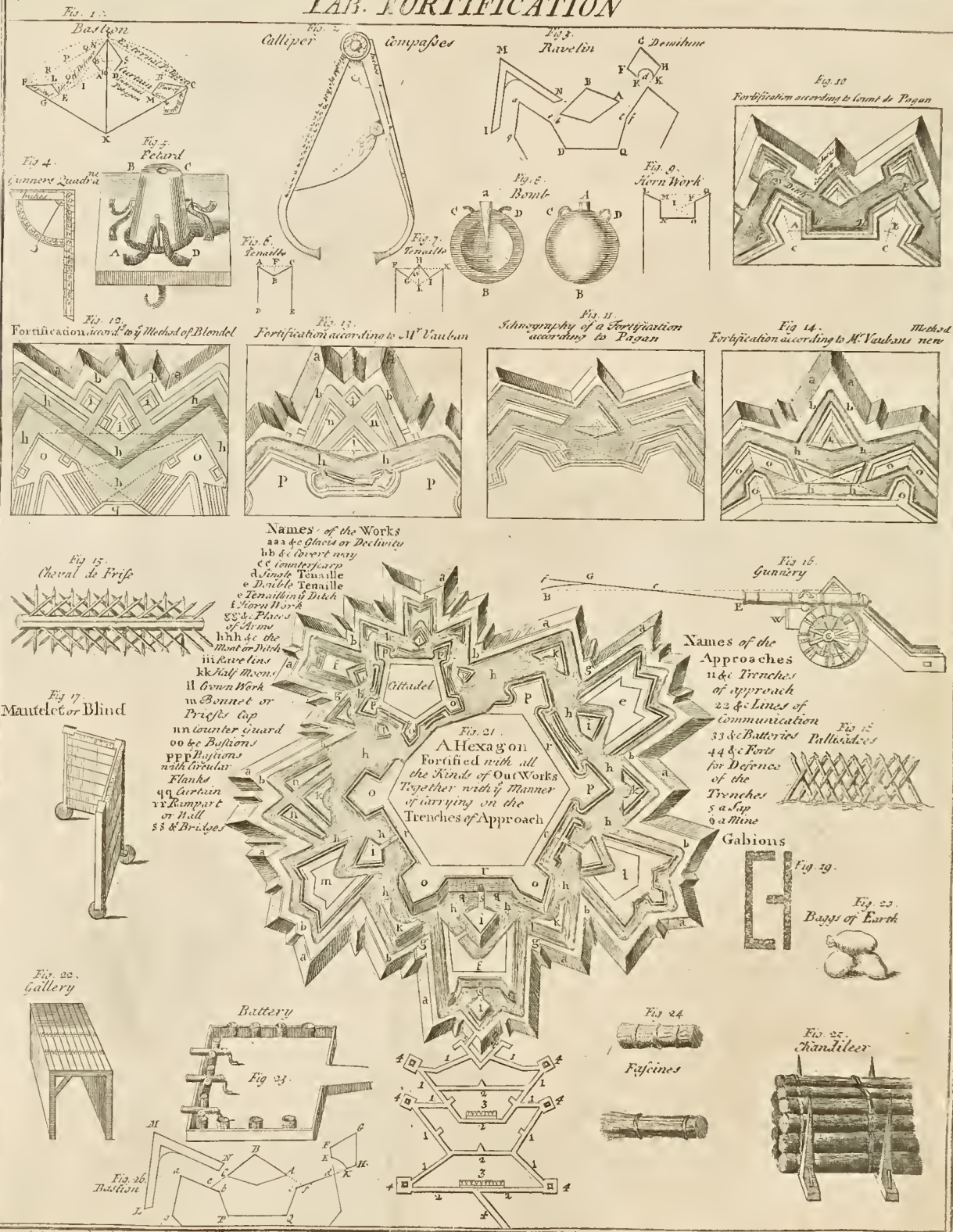
Star Fort, is a sence, or redoubt, constituted by re-entering and salient angles; having commonly from five to eight points; and the sides flanking each other.

FORTERESSE, or **FORTRESSE**, a general name for all fortified places; whether so made by nature, or art.

Such are fortified towns, castles, citadels, forts, towers, redoubts, sconces, &c.

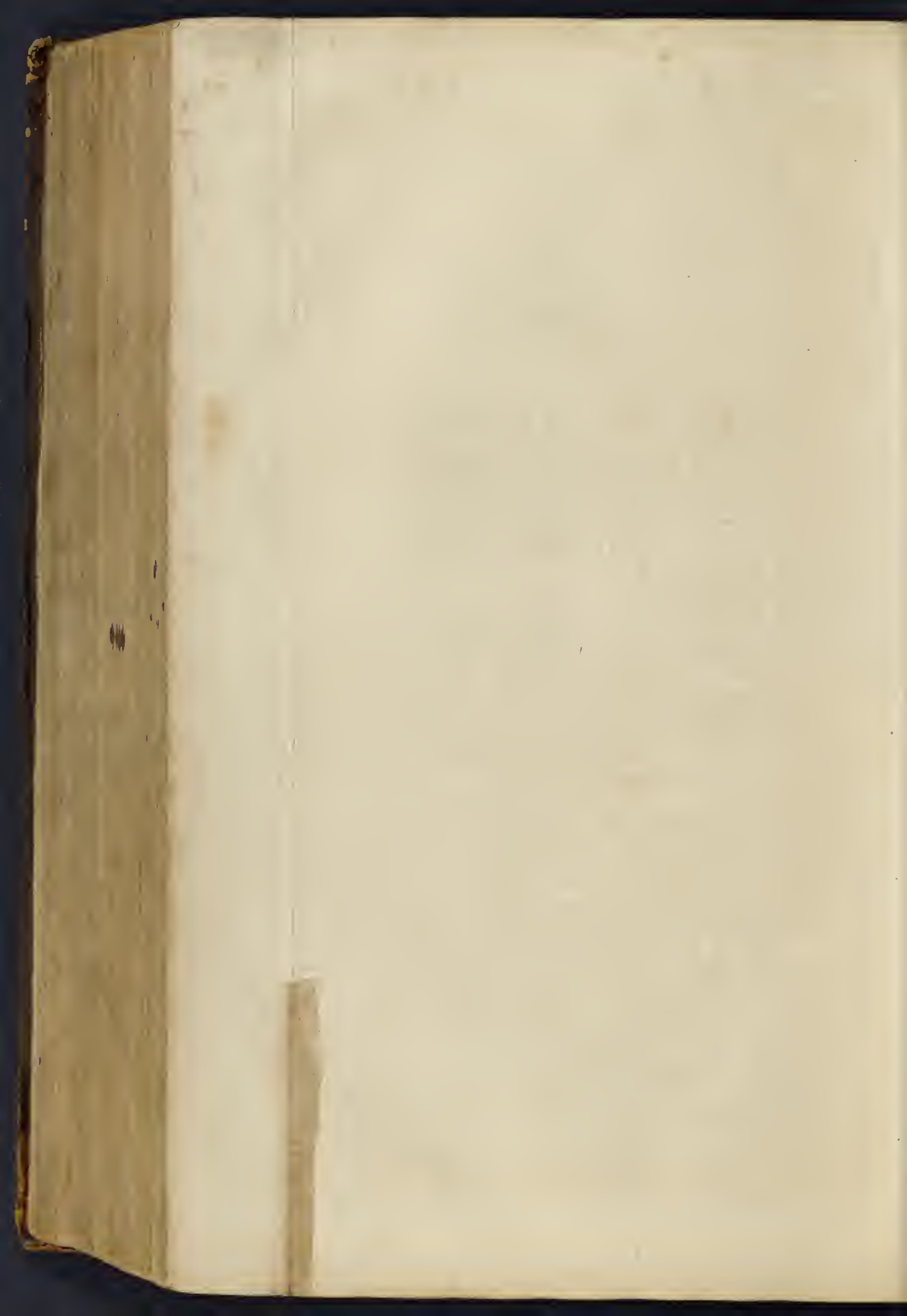
FORTIFICATION, called also *military architecture*, is the art of fortifying, or strengthening a place; by making works around the same, to render it capable of being defended by a small force, against the attacks of a more numerous enemy.

TAB. FORTIFICATION



Names of the Works
 aa &c Glacis or Declivity
 bb &c covert way
 cc Counterscarp
 dd Single Tenaille
 ee Double Tenaille
 ff Tenailles Ditch
 gg & Placis of Arms
 hhh &c the Mont or Ditch
 ii &c the
 kk Half Moon
 ll Crown Work
 mm Bonnet or Priest's Cap
 nn Counter Guard
 oo &c Bastions
 ppp Bastions with circular Flanks
 qq Curtain
 rr Rampart or Wall
 ss & Bridges

Names of the Approaches
 1 &c Trenches of approach
 22 &c Lines of Communication
 33 &c Batteries Palliades
 44 &c Ports for Defence of the Trenches
 5 a Sap
 6 a Mine



Some authors go back to the beginning of the world, for the author and origin of military architecture. According to them, God himself was the first engineer; and paradise, or the garden of Eden, was the first fortress. Cain improved on the hint, in building the first city, Gen. iv. 17. After him came Nimrod, Gen. x. 10. Then Semiramis, as Polyænus relates, *Stratagem*. l. viii. c. 27. The Canaanites, Numb. xiii. 19. Deut. i. 28. David, 2 Sam. v. 9. Solomon, 2 Chron. iii. 5. Rehoboam his son, 2 Chron. viii. 5. and the other kings of Judah and Israel; and at length the Greeks and Romans. Vitruvius, l. x. cap. ult. and l. i. c. 5.

Such is the series of those who fortified places; to which might be added Pharaoh, the persecutor of the Israelites, who built the cities of Pithom and Raames, Exod. i. 11. But how ancient soever the surrounding of cities with walls, towers, &c. may be, the name *Fortification*, and the art now understood thereby, are of no very old standing.

These have had their rise since the invention of cannons; the terrible effects whereof rendered it necessary to change the structure of the ancient walls, and to add to many things thereto, that those changes were thought enough to constitute a new art, which was called *Fortification*, by reason of the strength it afforded those in cities, to defend them against an enemy.

The first authors who have wrote of *Fortification*, considered as a particular formed art, are Ramelli, and Cataneo, Italians. After them Errard, engineer to Henry the great of France; Stevinus, engineer to the prince of Orange; Marolois, the chevalier de Ville, Lorini, Coehorn, the count de Pagan, and the marshal de Vauban: which last two noble authors have contributed greatly to the perfection of the art.

From the idea and office of *Fortification*, some general fundamental rules or axioms may be drawn: as,

1^o, That the manner of fortifying should be accommodated to that of attacking; so that no one manner can be assured all ways to hold, unless it be assured the manner of besieging be incapable of being altered; and that to judge of the perfection of a *Fortification*, the method of besieging at the time when it was built must be considered.

2^o, All the parts of a *Fortification* should be able to resist the most forcible machines used in besieging.

3^o, A *Fortification* should be so contrived, as that it may be defended with as few men as possible, which consideration, when well attended to, saves a vast deal of expense.

4^o, That the defendants may be in the better condition, they must not be exposed to the enemy's guns and mortars; but the aggressors must be exposed to theirs.

Hence, 5^o, All the parts of a *Fortification* should be so disposed, as that they may defend each other; in order to this, every part there is to be flanked, *i. e.* capable of being seen and defended from some other; so that there be no place where an enemy can lodge himself, either unseen, or under shelter.

6^o, All the campaign around must lie open to the defendants; so that no hills or eminence must be allowed, behind which the enemy might shelter himself from the guns of the *Fortification*; or from which he might annoy them with his own.

The fortrefs, then, is to command all the place round about; consequently the out-works must all be lower than the body of the place.

7^o, No line of defence is to be above point blank musket shot, which is about one hundred and twenty fathom.

8^o, The acuter the angle at the centre, the stronger is the place; as consisting of the more sides, and consequently more defensible.

Such are the general laws and views of *Fortification*: the particular ones, respecting each several work or member thereof, will be delivered under their proper articles. See BASTION and FORTIFIED place.

FORTIFICATION is also used for the place fortified; or the several works raised to defend and flank it, and keep off the enemy.

All *Fortifications* consist of lines and angles, which have various names, according to their various offices.

The principal angles are those of the centre, the flanking angle, flanked angle, angle of the epaule, &c.

The principal lines are those of *circumvallation*, of *contravallation*, of the capital, &c. See each in its place.

Fortifications are divided into *regular*, and *irregular*; and again into *dwable* and *temporary*.

Regular FORTIFICATION, is that wherein the bastions are all equal; or that which is built in a regular polygon, the sides and angles whereof are generally about a musket shot from each other.

In a regular *Fortification*, the parts being all equal, have the advantage of being equally defensible; so that there are no weak places.

Irregular FORTIFICATION, is that wherein the bastions are unequal, and unlike; or the sides and angles not all equal, and equidistant.

In an irregular *Fortification*, the defence and strength being unequal; there is a necessity for reducing the irregular figure, as near as may be, to a regular one.

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And, as the irregularity of a figure depends on the quantity of angles and sides; the irregularity of a *Fortification* arises either from the angles being too small, or the sides being too long, or too short.

Consequently, an irregular figure being proposed to be fortified; all the angles, with the quantity of the sides, must be found, to be able to judge how it is to be fortified.

Durable FORTIFICATION, is that built with design to remain a standing shelter for ages. Such are the usual *Fortifications* of cities, frontier places, &c.

Temporary FORTIFICATION, is that erected on some emergent occasion, and only for a little time.

Such are field works, cast up for the seizing and maintaining a post, or passage; those about camps, &c. as *circumvallations*, *contravallations*, *redoubts*, *trenches*, *batteries*, &c.

The methods of fortifying, that have been invented, are various; and new methods continue still to be proposed. The principal, and those which chiefly obtain through Europe, are those of Coehorn, Pagan, Vauban, and Scheiter, from which all the rest are easily conceived.

FORTIFICATION, according to the Dutch method, is that, which making the flank perpendicular to the curtain, makes the flank the subsuple of the face, and subsuple of the curtain; and the angle of the bastion, equal, either to two thirds of the angle of the polygon; or to half thereof, with the addition of fifteen or twenty degrees, to make it equal to a right angle.

Freitach determines the quantity of the flank in a square to be six; in a pentagon, seven; in a hexagon, eight; in a heptagon, nine; in an enneagon, ten; in a decagon, eleven; and in all other figures, twelve Rhinland perches: consequently, the face twenty-four, and the curtain thirty-six perches.

To draw the profile of a *Fortification* after the Dutch manner, draw the inner polygon G H, *Tab. Fortification*, fig. 6. into five equal parts: the demi-gorge A H is to contain one of them; and the capital H C, two. Then divide the curtain E A into four parts; and make the flank A B one.

This is Freitach's method: but the French make both the demi-gorge, and flank, a sixth part of the polygon; and in squares, and pentagons, setting aside the second flanks, they describe a semicircle upon B S, that the angle of the bastion C may be a right angle.

The Italians giving the same dimensions to the gorge and flank, make the secondary flank half the curtain, in polygons exceeding a hexagon, and a third of the curtain in the rest.

Lastly, the Spaniards giving the same dimensions to the flanks, omit the secondary flanks.

But flanks perpendicular to the curtain with secondary flanks, are in disrepute, on account of the obliquity of the defence; so that the Dutch method of fortifying, with the other ancient ones, founded on the same principles, are now out of doors.

FORTIFICATION, according to the count de Pagan's method; supposes in the larger *Fortifications*, the external polygon A B, fig. 7. to be one hundred, and the face A G, thirty perches; in the smaller, the first eighty, and the second twenty-five; and in the middle size, the first ninety, and the second twenty-seven and a half: the perpendicular C D, fifteen, and the flanks G F and H E perpendicular to the lines of defence A F and B E, covered with an orillon, and threefold, to which add a ravelin and counter-guard, to serve for out-works.

This method was received with great applause, and must be allowed greatly preferable to the Dutch method.

But it has its defects; for besides that the fortifying of places by it, is very expensive; its triple flanks are too close, so as to lie exposed to the violence of the bombs; the orillon is so large as to prejudice the length of the flanks; and the outer rampart of the bastion is too big.

FORTIFICATION according to Mons. Blondel's method, has a great affinity with that of the count de Pagan, only that the quantity of the lines and angles are differently determined. See *Tab. Fortification*, fig. 12.

Thus, a right angle being subtracted from the angle of the polygon, and to a third part of the remainder, fifteen added; the sum gives the diminished angle. In the greater *Fortifications*, the outer polygon is one hundred, in the smaller eighty-five. The external polygon being divided into ten parts, seven of them give the lines of defence; and the faces are half those of the tenaille.

This method is very well calculated for the purposes of architecture; only, being somewhat expensive, it is but little used.

FORTIFICATION, according to Mons. Vauban's method, supposes the outer polygon in the larger *Fortifications* to be one hundred; in smaller, eighty; and in the middle size, ninety: the faces are made $\frac{2}{3}$ of the same; the perpendicular, in a square $\frac{1}{3}$, in a pentagon $\frac{2}{3}$, in the other polygons $\frac{1}{2}$ of the same. The complement of the face to the line of defence, he makes equal to the distance of the epaule; he uses re-entering and crooked flanks; and places a low tenaille before the curtain; and the Dutch ravelin with lunettes. See *Tab. Fortification*, fig. 13.

This method of fortifying pleases most people; both as it increases the strength, without much expence; and as it is perfectly well accommodated to the principles of military architecture, above laid down.

Yet it seems defective in this, that the faces are too much exposed to the view of the enemy; and that the lunettes are a little too long to be defended.

Monf. Vauban's newer method of FORTIFYING, is that which builds large bastions before small ones, and covers the curtain with a double ravelin; drawing a low tenaille before the same curtain. See *Tab. Fortification*, fig. 14.

Detached bastions are perfectly suitable to what we have delivered in the former method; excepting that the flanks are rectilinear, and destitute of an orillon.

FORTIFICATION according to the method of Scheiter, supposes the external polygon, in the larger Fortifications to be one hundred perches; in the lesser eighty; in the middle size ninety: the flanks perpendicular to the lines of defence; and the lines of defence in the greater Fortifications seventy perches, in the lesser sixty, and the middle size sixty-five.

It detaches bastions from the curtain, and forms a kind of inner recess behind the curtain; it assumes the angle of the bastion, in a square, to be sixty-four degrees; to this adding eight, the product is the angle in a pentagon; to which adding six degrees, the sum is the angle of the bastion in a hexagon; and adding five to this, the sum is the same angle in a heptagon.

FORTIFIED Place, a Fortrefs, or Fortification, i. e. a place well flanked, and sheltered with works. — See *Tab. Fortification*, fig. 20.

Places fortified after the modern way, consist chiefly of bastions, and curtains, and sometimes of demi-bastions; according to the situation of the ground; of cavaliers, ramparts, fausse-brayes, ditches, countercarps, covert ways, half moons, ravelins, hornworks, crownworks, outworks, esplanades, redens, and tenailles. See each under its proper article, *BASTION, &c.*

There are other moveable and additional parts; as bermes, parapets, banquettes, embrasures, cordons, boyaux, moulins, chevaux de frise, chaussetrapes, galleries, mantelets, batteries, saps, mines, blinds, gabions, and palisades. See each in its place, *BEPME, PARAPET, &c.*

Several of these works, again, consist of divers parts, which have different denominations; thus a bastion consists of faces, flanks, casemates, orillons, gorge, &c. which see.

FORTIN, or FORTLET, a diminutive of the word *Fort*, importing a little *Fort*, or sconce, called also *Field Fort*, built in haste, for the defence of a pass, or post; but particularly to defend a camp, in the time of a siege; where the principal quarters are usually joined, or made to communicate with each other by lines defended by *Fortins* and redoubts.

Fortins being very small, their flanked angles are generally one hundred and twenty fathom distant from each other; but their figure and extent is various, according to the place and occasion; some having whole bastions, and others only half bastions.

Star FORTIN, is that whose sides flank each other, &c. See *Star FORT*.

FORTIORI. A multo FORTIORI, see *MULTO*.

FORTIS Aqua, see the article *AQUA*.

FORTUNA Equestris, see the article *EQUESTRIS*.

FORTUNA, in our ancient law books, is the same with what we call *Treasure-Trove*.

Thesaurum ductent Fortunâ invenire inquirendum est per 12 juratores pro rege, &c. quod fideliter præsentabunt, &c. omnes Fortunas, objuraciones, appello, &c.

Some pretend it also signifies *Fortuito occisus*; but this seems to be very fanciful.

FORTUNATE Islands, in the ancient geography, an appellation which has given the critics and antiquaries a world of perplexity; being the name of a place famous for golden apples which grew therein: or, as Varro says, for sheep, with golden fleeces.

The antients describe them as situate without the straits of Gibraltar, in the Atlantic ocean. — The common opinion of the moderns takes them for the Canary Islands; this is grounded principally on the situation and temperature of those islands, which renders the use of clothes there unnecessary; and from the abundance of oranges, lemons, grapes, and other delicious fruit growing therein.

Ol. Rudbeck has found a very different place for them. That learned author, who makes his native country, Sweden, the scene of all that is great and extraordinary in ancient tradition and fable; will have the *Fortunate islands* to be Sweden; and the delicious fruits, talked of by the antients, his imagination suggests, were nothing but the virtue, and good manners, which antiently flourished in that cold hyperborean nation.

FORTUNE, see the articles *PROVIDENCE, FATE, &c.*

FORTUNE, τυχη, is a name unknown in the earlier ages; and does not occur either in Homer or Hesiod; as not being invented in their time.

In after days, it was introduced as a machine; and made to serve divers purposes in natural philosophy, and theology.

Men observing a world of evils and disorders to fall out; and not daring directly to complain of providence; and being willing withal to excuse themselves from being the occasions of their own misfortunes, had recourse to the notion of *Fortune*, against whom they might vent their resentments with impunity.

Plutarch, in an express treatise of the *Fortune* of the Romans, accounts for the practise of the ancient poets, who seem to make Jupiter the author of all the evils of life. Mankind, he observes, before the name of *Fortune* had got into the world, perceiving a certain arbitrary cause, disposing of things in an irresistible manner, called it *god*; but the same cause being often observed to act at random, and without any rule or order at all, the supreme being came to be divested of the attribute; and *Fortune*, or destiny, acknowledged in his stead.

It is not easy to unravel, what the antients meant by the name *Fortune*. — The Romans understood by it, I know not what principle of fortuity, whereby things came to pass, without being necessitated thereto: but what, and whence that principle is, they do not seem to have ever precisely thought; whence their philosophers are often intimating, that men only framed the phantom *Fortune*, to hide their ignorance; and that they call *Fortune* whatever befalls a man without his knowing why. Hence Juvenal affirms, it was men who made a deity of *Fortune*:

*Nulum numen abest, si sit prudentia; sed
Nos facimus, Fortuna, deam, cælogue locamus.*

According to the opinion of the heathens, therefore, *Fortune*, at bottom, was only the arrival of things in a sudden and unexpected manner, without any apparent cause, or reason. so that the philosophical sense of the word coincides with what is vulgarly called *chance*.

But in religion it had a further force; altars and temples in great numbers were consecrated to this *Fortune*, as a deity. — This intimates that the heathens had personified, and even deified their chance; and conceived her as a sort of goddess, who disposed of the fate of men at her pleasure. Hence that invocation of Horace, *O diva, gratum que regis Antium*; in the 35th ode of the first book, where he recommends Augustus, then preparing for a visit to Britain, to her protection. From these different sentiments it may be inferred, that the antients at one time took *Fortune* for a peremptory cause, bent upon doing good to some, and persecuting others: and sometimes for a blind, inconstant cause, without any view or determination at all.

If then the word *Fortune* had no certain idea in the mouth of those who erected altars to her: much less can it be ascertained what it denotes in the mind of those who now use the word in their writings.

They who would substitute the name *providence* in lieu of that of *Fortune*, cannot give any tolerable sense to half the phrases wherein the word occurs.

To these, *e. gr.* we must always distrust *Fortune*, but especially when the seems to flatter us most: the contempt of riches, in the philosophers, is a secret desire of revenging their merit against the injustice of *Fortune*, by a contempt of those very benefits she deprives them of: *Fortune* is so blind, that amidst a crowd, wherein there is but one wife man, we must not imagine she will trace him out, to accumulate him with her favours.

On these, and the like occasions, the word *providence* cannot be substituted in lieu of *Fortune*: the idea answering to the expression, is pagan, as well as the expression itself. Add, that it is a fault, even in point of accuracy, to use a term that signifies nothing; as much as it is in point of religion, to ascribe *Fortune* with providence, in the direction of the universe.

Horace paints the goddess, preceded by Necessity, holding nails and wedges in her hands, with a cramp-iron, and melted lead to fasten it; rarely accompanied with Fidelity, unless when she abandons a family; for in that case Fidelity never fails to depart with her, as well as friends.

The painters represent her in a woman's habit with a bandage before her eyes, to shew that she acts without discernment: and standing on a wheel, to express her instability. The Romans, says Lactantius, represented her with a cornucopia, and the helm of a ship, to shew that she distributes riches, and directs the affairs of the world. In effect, it is with such characters, that we see her represented on so many medals, with the inscriptions, *FORTUNA AVG. FORTVNA REDVX. FORTVNAE AVG. or REDVCIS, &c.* Sometimes she is seen pointing at a globe before her feet, with a sceptre in one hand, and holding the cornucopia in the other.

The Romans had a virile, as well as a muliebric *Fortune*, for the objects of their adoration: the *Fortuna virilis* was honoured by the men, and the *Fortuna muliebris*, by the women.

On the reverse of a medal of Commodus, we have a representation of *Fortune*, under the quality, or surname of *Manena*, *i. e.* stable, permanent; holding a horse by the reins. On the Greek medals we meet with *ΑΓΑΘΗ or ΚΑΛΗ ΤΥΧΗ*, good *Fortune*. Constantine gave the epithet *antibousia*, *i. e.* flourishing, to the *Fortune* of his new city Constantinople.

Part of FORTUNE, see the article *PART*.

FORTY Days, see QUADRAGESIMA and LENT.

Prayers of FORTY Hours, see PRAYERS.

FORUM, in antiquity, is used in divers acceptations: sometimes for a place of traffic; answering to our market-place; in which sense it has usually some adjective added to it, as *forum boarium*, the beast market; *forum piscarium*, the fish market; *olitorium forum*, the herb market, &c.

FORUM, again, is used for any place, where the governor of a province convenes his people, to give judgment, according to course of law.

Whence a man is said *Forum agere*, when he keeps the assizes; *Forum indicere*, when he appoints the place where they are to be kept, &c.

FORUM was also a publick standing place in the city of Rome, where causes were judicially tried, and orations delivered to the people.

Of these *Forums* there were several; at first only three, *viz.* *Romanum*, *Julianum*, and *Augustum*: but that number was afterwards increased to six, by the addition of the *Transitorium*, called also *Palladium*; the *Trojanum*, and *Salustii Forum*.

The first, and most eminent of these, was the *Forum Romanum*, called also *Forum Vetus*; and absolutely, *Forum*, or the *Forum*.

In this was an apartment, called the *Rostra*, where the lawyers pleaded; the officers harangued; funeral orations were delivered, &c. See *ROSTRA*.

In the same *Forum* was the *Comitium*, or hall of justice, with the sanctuary of Saturn, the temple of Castor, &c.

FORUM is also used among casuists, &c. for *Jurisdiction*. Thus, they say *in Foro legis*, or the *outer Forum*, i. e. in the eye of the law, or the common course of justice: *in Foro Conscientie*, or the *inner Forum*, i. e. in the eye of God, or a man's own conscience.

There are a great many things not condemned in *Foro Legis*, which yet are criminal in *Foro Conscientie*.

FOSS*, or FOSSE in fortification, &c. a ditch, or moat. See *DITCH*.

* The word is French, formed of the Latin participle *fissum*, of the verb *fodis*, I dig.

Advance FOSSE, see the ARTICLE ADVANCE.

Van FOSSE, see the article VAN.

Foss, FOSSA, in anatomy, a kind of cavity in a bone, with a large aperture, but no exit, or perforation.

When the aperture is very narrow, it is called a *Sinus*.

In the cranium there are six internal, and fourteen external *Fosses*. The cavity of the orbit, which contains the eye, is a *Foss*.

Foss is particularly used for the cavity, or denture in the back part of the neck.

FOSSA *Magna*, or *Navicularis*, is an oblong cavity, forming the inside of the pudendum muliebre, and which presents itself upon opening the labia; and in the middle whereof are the carunculae myrtiformes. — See *Tab. Anat.* (Splanchn.) *fig.* 9, lit. 1.

FOSSE, in our ancient customs, was a ditch, full of water, where women committing felony, were drowned; as men were hanged, *Nam & ipsi in omnibus tenementis suis omnem ab antiqua legem habuere justitiam, videlicet ferrum, fossam, furcas, & similia.* In another sense it is taken for a grave, as appears by these old verses;

*Hic jacent in fossa Bedæ venerabilis ossa,
Hic est fossatus, qui bis erat hic cathedratus.*

Foss-Way, was antiently one of the four great Roman high-ways of England; so called, according to Camden, because it was ditched on both sides, which was the Roman method of making highways.

FOSSARI, in antiquity, a kind of officers in the eastern church, whose business was to inter the dead.

Cicconius relates, that Constantine created nine hundred and fifty *Fossarii*, whom he took out of the divers colleges or companies of tradesmen: he adds, that they were exempted from taxes, services, onerary offices, &c.

Fa. Goar, in his notes on the Greek *Euchologion*, insinuates, that the *Fossarii* were established in the times of the apostles; and that the young men, who carried off the body of Ananias, and those persons full of the fear of God, who interred St. Stephen, were of the number.

St. Jerom assures us, that the rank of *Fossarius* held the first place among the clerks: but he is to be understood of those clerks only, who had the direction and intendance of the interment of the devout.

FOSSELS, in natural history, is used, in a general sense, for any thing dug up, or found under ground. — Such are all minerals, metals, rock salts, &c.

The chemists divide all bodies into three classes, or kingdoms; *viz.* *Fossil*, or *Mineral*; *Vegetable*; and *Animal*.

Fossils may be distinguished into, 1^o Such as are *Natives* of the earth; and, 2^o Such as are *adventitious*, and repositied therein by any extraordinary means; as earthquakes, deluges, &c.

Native Fossils, or *Fossils properly so called*, are sensible bodies generated, and growing in the earth; whose constituent parts are so simple, and homogeneous, that there is no apparent distinction of vessels, and juices; nor any difference between the part, and the whole.

Native Fossils are either *simple*, or *compound*.

Simple Fossils are those, whose parts, however divided, are all of the same nature, *i. e.* of the same gravity, magnitude, figure, hardness, and mobility.

Such is quicksilver, which, however divided, is always found the same.

Compound Fossils are those which may be divided into different, or dissimilar parts.

As antimony, which may be resolved by fire into sulphur, and a metalline part.

The *simple Fossils* are all metals, salts, stones, both vulgar and precious, and earths.

The *compound Fossils* are all sulphurs, all femimetals, or what we properly call minerals; and all bodies combined out of any two, or more of the preceding, either simple, or compound *Fossils*.

Adventitious, or *Foreign Fossils*, include the subterraneous exuviae of sea and land animals, and even vegetables; as shells, bones, teeth, leaves, stalks, &c. which are found buried in great abundance, in divers parts of the earth.

These extraneous *Fossils* have employed the curiosity of several of our latest naturalists, who have each their several system to account for the surprizing appearances of petrified fish, in places far remote from the sea, and on the tops of mountains; shells in the middle of quarries of stones; and of elephants teeth, and bones of divers animals, peculiar to the southern climates; and plants only growing in the east, found fossil in our northern and western parts.

Some will have these shells, &c. to be real stones, and stone plants, formed after the usual manner of other figured stones: of which opinion is our learned Dr. Lister.

That author, though he allows of petrified shells on the sea shores, will by no means agree, that there are any such petrifications in the midland countries. The shell-like stones, found in our quarries, he contends, are *Lapides sui generis*; and never were any part of an animal.

His reasons are, that their matter, and texture, is perfectly the same with that of the rock, or quarry, where they are taken; as iron-stone shells are all iron-stone; spar, or crystalline, all spar, &c. Add, that the quarries of different stone yield different sorts of these shells; and that there are no animals in nature, which yield any thing exactly like many of them.

But to this erroneous doctrine it is to be answered, 1^o That these shells found under ground, are often perfectly conformable to those in the sea in figure, substance, magnitude, &c. 2^o The substance of these *Fossils* often also differs essentially from the common substance of stones. It is true, we frequently find them covered, or impregnated with a mineral, or stoney matter, which has gradually insinuated itself into the pores; but it is in many cases easy to distinguish that matter from the substance of the shell.

The more judicious opinion is, that these *fossil* shells, with all other foreign bodies, found within the earth, as bones, trees, plants, &c. were buried therein at the time of the universal deluge; and that having been penetrated either by the bituminous matter, abounding chiefly in watery places, or by the salts of the earth; they have been preserved entire, and sometimes petrified.

Others think, that those shells, found at the tops of the highest mountains, could never have been carried thither by the waters, even of the deluge; inasmuch as most of these aquatic animals, by reason of the weight of their shells, always remain at the bottom of the water, and never move but close along the ground.

They imagine, that a year's continuance of the waters of the deluge, intermixed with the salt waters of the sea, upon the surface of the earth, might well give occasion to the production of shells of divers kinds in different climates; and that the universal saltness of the water was the real cause of their resemblance with the sea shells. As the lakes formed daily by the retention of rain, or spring, water, produce different kinds.

Others think, that the waters of the sea, and the rivers, with those which fell from heaven, turned the whole surface of the earth upside down; after the same manner as the waters of the Loire, and other rivers, which roll in a sandy bottom, overturn all their sands, and even the earth itself, in their swellings and inundations: and that in this general subversion, the shells came to be interred here, fishes there, trees there, &c. See the *Journ. des Savans*, 1715. p. 19. and *Mém. de Trev.* 1713.

But no body has set this system in a better light, than Dr. Woodward, in his *Nat. history of the Earth*. That author maintains, the whole mass of earth, with every thing belonging thereto, to have been so broke, and dissolved, at the time of the deluge, that a new earth was then formed in the bosom of the water, consisting of different strata, or beds of

terrestrial matter, ranged over each other usually, according to the order of their specific gravities. By this means, plants, animals, and especially fishes, and shells, not yet dissolved among the rest, remained mixed and blended among the mineral and fossil matters; which preserved them, or at least assumed and retained their figures and impressions, either indentedly, or in relieve.

Camerarius attacks this opinion of Dr. Woodward, and goes yet higher, and advances many new notions. He supposes, 1^o That the greatest part of the shells now dug from under ground, had been placed there before the deluge, that is, at the time of the creation, when God separated the earth from the waters. 2^o That, without having recourse to the dissolution of the earth by the waters, one might suppose most of them to have slipped in at the chinks and crevices naturally happening after the waters were retired, and the earth sufficiently drained. 3^o That particular inundations might have swept most of these shells into the places where we now find them. 4^o That the sea may have wrought, or cast up most of these shells through subterraneous spiracles and canals. 5^o That God has created divers stony and metalline bodies, perfectly like the vegetables and animals, which we see on earth, and in the sea.

To all these suppositions, Dr. Woodward answers, 1^o That it is no ways probable, God should create such a number of shell-fish of the same species at once; and that purely with a design to destroy them all again so soon after: that among the fossil shells of the same species it is easy to distinguish those of different ages: that some appear precisely such as we now find them in the spring, the season when the deluge began: that it is not only shells, we find under ground, but also bones of quadrupeds, plants, and trees of extraordinary sizes, and which are not of the number of aquatics: and lastly, that the waters were separated from the earth on the third day; and that none of these things were created, till afterwards. 2^o That, on the second supposition, these shells would be disposed perpendicularly, and not horizontally, as they are always found: that we should sometimes find them in the clefts of the earth, where in fact there are none but which are broke. 3^o That we have no acquaintance with any of these pretended inundations: that they could never have brought shells, stags horns, and elephants teeth from America, and the East Indies, to England, and other parts of Europe; nor the fruits, pines, and beeches, frequently found far greater than any of our growth. Add, that these particular inundations must have risen to the tops of the highest mountains, and of consequence they must have been general. 4^o On the fourth supposition it must be held, that God did not only create all these several bodies in the entrails of the earth; but their several parts, and the separate pieces and fragments of those parts; a piece of a shell, for instance; one side of a shell, which consists of two; a shell void of the fish it should contain; beads of corn, without the grain; pieces of cedar bark, without the wood; pieces of bullocks hides without flesh and bones; human skins without bodies; a bone without the rest of the skeleton; a tooth without the jaw, &c. Add, that the fossil shells have not only external, but essential resemblances to sea shells; both, *e. gr.* yielding, by analysis, a quantity of sea salt: That among the fossil teeth of fishes, we meet with some apparently worn: and lastly, that the shell fish called *Purple*, has a long sharp tongue, by means whereof it pierces other shells, and picks the fish out of them; and that in digging under ground we actually meet with divers of these shells thus pierced. Can such minute thorough-paced resemblances be the accidental effect of a *lusus nature*?

This is the substance of what has hitherto been advanced on the point; wherein it is evident that Dr. Woodward has greatly the better of the argument.

Fossil SALT, see the article SALT.

Fossil WOOD, see the article WOOD.

FOSTERLEAN *, antiently signified nuptial gifts: much the same with what we now call *jointure*.

* The word is originally Saxon, and signifies *eborum exhibitio*, that is, a stipend which the wife has for her maintenance. *Poeta sciendum est cui Folkerlean pertinet, vadit hoc Brigandia, & plerumq; amicit sui.*

FOTUS, in medicine, the same as fontanation. See FONTANATION.

FOVEA cordis, the pit of the heart, or rather of the stomach; called also *Scrabiculus Cordis*.

FOUGADE *, or FOUASSE, in the art of war: a little mine, in manner of a well, seldom exceeding ten foot in width, and twelve in depth; dug under some work, or post that is like to be lost; and charged with barrels, or sacks of gunpowder, covered with earth.—It is set on fire like other mines, with a fauciffie.

* The word is French: M. Huet derives it from *foata, of focus, fire*.

FOUL, in the sea language, is used when a ship has been long untrimmed, so that grass, weeds, periwinkles, barnacles, or the like, stick or grow to her sides under water. In this state, she is said to be *foul*.

Again, a rope is said to be *foul*, when it is either tangled in itself,

or hindered by another, so that it cannot run, or he haled.

A ship is said to make *foul water*, when being under sail, she comes into such shoal, or low water, that though her keel do not touch the ground, yet she comes so near it, that the motion of the water under her raises the mud from the bottom, and so *fouls* the water.

FOUNDATION, that part of a building which is under ground: or, that mass of stone, &c. which supports a building; or upon which the walls of the superstructure are raised: or, it is the coffer, or bed, dug below the level of the ground, to raise a building upon.

The *Foundation* either takes up the whole area and extent of the building, as when there are to be vaults, cellars, or the like: or it is drawn in cuts, or trenches, as when only walls are to be raised.

The *Foundation* is properly so much of the masonry, as reaches as high as the surface of the ground; and this is always to be proportioned to the load, or weight of the building which it is to bear.

Sometimes it is massive, and continued under the whole building; as in the antique arches, and aqueducts, and some amphitheatres: more usually it is only in spaces, or intervals; either to avoid expence, or because the vacancies are at too great a distance, in which latter case they make use of insulated pillars, bound together by arches.

That we may find our habitation firmly, says Sir H. Wotton; we must first examine the bed of earth, upon which we are to build; and then the under-ceilings, or substruction, as the antients called it. For the former, we have the general precept in Vitruvius, *Substructionis Fundationes fodiantur, si quantum inveniri ad solidum & in solidis*: by which he recommends not only a diligent, but even jealous examination of what the soil will bear; advising us not to rest upon any appearing solidity, unless the whole mould through which we cut, have likewise been solid.

But how deep we should go in this search, he has no where determined, as perhaps depending more on discretion, than regularity, according to the weight of the work: yet Palladio has ventured to reduce it to a rule; allowing for the cavation, *i. e.* the hollowing or under-digging, a sixth part of the height of the whole fabrick, unless there be cellars under ground, in which case he would have it somewhat lower. Sir H. Wotton's *Elem. of Architecture*.

The *Foundations* of buildings are either *natural* or *artificial*.—*Natural*, as when we build on a rock, or a very solid earth; in which case we need not seek for any further strengthening.

—*Artificial*, where the ground is sandy, or marshy, or has lately been dug. In the former case, the architect must adjust the depth of the *Foundation* by the height, weight, &c. of the building: a sixth part of the whole height is looked on as a medium; and as to thickness, double that of the width of the wall, is a good rule.

Where the natural *Foundation* may not be trusted, they either fortify the ground by pallifying it, *i. e.* driving it full of piles, (see PALLIFICATION:); Or else they lay large wooden planks at the bottom of the trenches dug for the *Foundation*.

In some places they found the peers of bridges, and other buildings near the water, on sacks of wool, laid like mattresses; which being well pressed, and greasy, will never give way, nor rot in water.

FOUNDATION, is also used figuratively for the establishment of a city, empire, or the like.

The Romans reckoned their years from the *Foundation* of Rome, *ab urbe condita*; which we sometimes express by *ab U. C.* Chronologers make 779 years from the Israelites passing out of Egypt, to the *Foundation* of Rome.

FOUNDATION also denotes a donation, or legacy, either in money, or lands, for the maintenance and support of some community, hospital, school, lecture, or other work of piety.

Among the order of Augustines, there is a *Foundation* for the marrying of poor maids; and another for the furnishing of trusses to poor people who have ruptures, or hernias.

FOUNDER, he who lays a foundation, or who founds and endows a church, school, religious house, or other work of charity and piety.

The *Founders* of churches may preserve to themselves the right of patronage, or presentation to the living.

FOUNDER *, is also an artist that melts, or casts metals into various forms, for divers uses; as guns, bells, statues, bombs, types or printing characters; and other small works, as candlesticks, buckles, &c.

* The word in this sense is formed of the French *fondre*, to melt, or fuse.—In the Roman law they are called *Statuarii*.

From the different productions, or works of the *Founders*, they are differently denominated, as *Founders of small Works*; *Bell Founders*; *Gun Founder*; *Letter Founders*; *Figure Casters*, &c. What belongs to each, see under *FOUNDRY*.

FOUNDER'S FURNACE, see the article FURNACE.

Moulds of FOUNDERS, see the article MOULDS.

FOUNDER'S PRESS, see the article PRESS.

FOUNDER, in the sea language. A ship is said to founder at sea, when by an extraordinary leak, or a great sea breaking

in upon her, she is so filled with water, that she cannot be freed of it; nor is able to swim under it, but sinks with the weight thereof.

FOUNDERING, in the manage, a disorder in horses, whereof there are two kinds, *viz.* in the feet, and in the chest.

FOUNDERING in the feet, arises from hard riding, poor labour, great heats, sudden colds, &c. which inflame the blood, and, as the farriers express it, melt the grease, and make it descend downward to the feet, and there settle; which causes such a numbness, and pricking in the hoof, that the horse has no sense or feeling in it, being hardly able to stand; or when he does, shaking and trembling, as if he had an ague.

A horse may likewise be *foundered* by wearing freight shoes, and by travelling upon hard ground.

It may be known when he is *foundered* on his forefeet, and not his hindfeet, by his treading firmly only on his hindfeet, and sparing the other; or his going crouching and crippling on his buttocks.

Sometimes, though rarely, he is *foundered* on his hindfeet, and not his fore; which is known by his seeming weak behind, and resting as much as possible on the forefeet.

The general methods of curing this distemper, are first by paring all the horse's soles so thin that the quick may be seen; then bleeding him well at the toes; stopping the vein with tallow and rosin; and then having tacked hollow shoes on his feet, stopping them with bran, tar, and tallow, as boiling hot as may be; which is to be renewed once in two days, for a week together; after which he is to have good exercise.

Or, after he is pared thin, and let blood at the toes, his feet are to be stopped with cows dung; kitchen see, tar, and foot boiled together, and poured boiling hot into them.

FOUNDERING, in the chest or body, usually befalls a horse by eating too much provender suddenly, when too hot; as also by drinking too much upon travelling, when he is hot, and riding him after it.

The effect of which, is, that his body is oppressed with ill humours, which take away his strength, and put him in such condition that he can neither go, nor bow his joints; and being once laid, he cannot rise again, &c. his legs swell; and soon after begin to peel: he has a dry cough, which makes his eyes water; and his nose runs with white phlegmatic matter.

FOUNDERY, or FOUNDRY, the art of melting and casting all sorts of metals; particularly brass, iron, bell-metal, &c.

The word is also used for a place, or work-house, furnished with furnaces, or forges for this purpose.

FOUNDERY of small works, or the manner of casting in sand.—

The sand used by the *Founders*, in casting of brass, &c. is yellowish, and pretty soft; but after it has been used, it becomes quite black, by reason of the charcoal dust used in the moulds. Every time they would use this sand, they work and tew it several times over in a board about a foot square, placed over a kind of trunk, or box, into which it may fall from off the board. This tewing is performed with a roller, or cylinder, about two foot long, and two inches in diameter; and a kind of knife, made of the blade of a sword: with these two instruments they alternately roll and cut the sand, and at length turn it down into the box underneath.

Then, taking a wooden board, or table, of a length and breadth proportional to the quantity of things to be cast; round this they put a frame, or ledge, and thus make a sort of mould. This mould they fill with the sand before prepared, and moderately moistened. Which done, they take wooden, or metal-line models, or patterns of the things intended to be cast; apply them on the mould, and press them down into the sand, so as to leave their form indented. Along the middle of the mould is laid half a little cylinder of brass, which is to be the master jet, or canal for running the metal; being so disposed as to touch the ledge at one side, and only to reach to the last pattern on the other. From this are placed several lesser jets, or branches, reaching to each pattern, whereby the metal is conveyed through the whole frame.

This first frame being thus finished, they turn it upside down, to take out the patterns, from the sand: in order to which they first loosen them a little all round, with a small cutting instrument.

After the same manner they proceed to work the counter part, or other half of the mould, with the same patterns, in a frame exactly like the former; excepting that it has pins, which entering holes corresponding thereto in the other, make, when the two are joined together, the two cavities of the pattern fall exactly on each other.

The frame being thus moulded, is carried to the founder, or melter, who after enlarging the principal jet, or canal of the counter part, with a kind of knife, and adding the cross jets, or canals to the several patterns in both, and sprinkling them over with mill dust, sets them to dry in an oven.

When both parts of the mould are sufficiently dried, they join them together, by means of the pins; and to prevent their starting or slipping aside by the force of the metal, which is to come in flaming hot through a hole contrived at the master jet, they lock them in a kind of press, either

with screws; or, if the mould be too big for this, with wedges.

The moulds thus put in press, are ranged near the furnace, to be in readiness, to receive the metal as it comes out of the crucible.

While the moulds are thus preparing, the metal is put in fusion in an earthen crucible, about ten inches high, and four in diameter.

The furnace wherein the fusion is made, is much like the smith's forge; having, like that, a chimney, to carry off the smoke; a pair of bellows, to blow up the fire; and a hearth, where the fire is made, and the crucible placed. It is the use of this hearth, that chiefly distinguishes the furnace from the forge.

In the middle thereof is a square cavity, ten or twelve inches wide, which goes to the very bottom. It is divided into two, by an iron grate: the upper partition serves to hold the crucible and the fuel; and the lower to receive the ashes.

When the fuel, which is to be of dry wood, is pretty well lighted, they put the crucible full of metal in the middle, and cover it with an earthen lid: and to increase the force of the fire, besides blowing it up with the bellows, they lay a tile over part of the aperture or cavity of the furnace.

The metal first put in being brought to a fusion, they fill the crucible with pieces of brass, beaten in a mortar. To put them in, they make use of a kind of iron tangle, with a long shaft at the end thereof, formed into a kind of hollow cylinder, out of which the piece is dropped.

Nothing now remains, but for the founder to take the crucible out of the fire, and carry it in a pair of iron tongs (whose feet are bent, the better to embrace the top of the crucible) to the mould: into which he pours the melted metal, through the hole answering to the master-jet of each mould.

Thus he goes successively from one to another, till his crucible is emptied, or there is not matter enough left for another mould.

Then, casting cold water on the moulds, they take the frames out of the presses, and the castworks out of the sand, which afterwards they work again for another casting. Lastly, they cut off the jets, or casts, and sell, or deliver the work to those who bespoke it, without any further repairing.

FOUNDERY of statues, great guns, and bells.—The art of casting statues in brass, is very ancient; inasmuch that its origin was too remote and obscure, even for the research of Pliny, an author admirably skilled at discovering the inventors of other arts.

All we can learn for certain, is, that it was practised in all its perfection first among the Greeks, and afterwards among the Romans: and that the number of their statues consecrated to the gods and hero's, surpassed all belief. See **STATUE**.

The single cities of Athens, Delphos, Rhodes, &c. had each three thousand statues; and Marcus Scaurus, alone, though only ædile, adorned the Circus with no less than three thousand statues of brass, for the time of the Cirenian games.

This taste for statues was finally carried to such a pitch, that it became a proverb, that in Rome the people of brass were not less numerous than the Roman people.

Among us, the casting of statues was but little known, or practised before the seventeenth century.

As to the casting of guns, it is quite modern; and it were perhaps to be wished, we were as ignorant of it as the ancients.

—All authors agree, that the first cannon were cast in the fourteenth century; though some fix the event to the year 1338, and others to 1380.

The casting of bells is of a middle standing, between the other two.—The use of bells is certainly very ancient in the western church; and the same were likewise once used in the church of the east. But at present P. Vanleb assures us, in his second account of Egypt, he had found but one bell in all the eastern church, and that in a monastery in the upper Egypt.

The matter of these large works is rarely any simple metal, but commonly a mixture of several, as brass, bell-metal, &c.

We shall here give the process in the *Foundery* of each.

Method of casting Statues, or Figures.—There are three things chiefly required in casting of statues, busts, basso-relievo's, vases, and other works of sculpture; *viz.* the mould, the wax, and shell or coat.

The inner mould, or core (thus called from *cœur*, as being in the heart, or middle of the statue) is a rude, lumpsift figure, a little resembling the statue intended. It is raised on an iron grate, strong enough to sustain it, and is strengthened within-side by several bars or ribs of iron.

It may be made indifferently of two sorts of matter, at the discretion of the workmen, *viz.* Potters clay mixed up with horse-dung and hair; or of plaster of Paris, mixed with fine brick-dust.

The use of the core in statues is to lessen the weight, and save metal. In bells it takes up all the inside, and preserves the space vacant where the clapper is hung. In great guns it forms the whole chace, from the mouth to the breech: and in mortars, the chace, and chamber.

The wax is a representation of the intended statue in wax. If

it be a piece of sculpture, the wax must be all of the sculptor's own hand, who usually fashions it on the core itself. Though it may be wrought a-part in cavities moulded, or formed on a model, and afterwards disposed and arranged on the ribs of iron over the grate, as before; filling the vacant space in the middle with liquid plaster, and brick dust; by which means the inner mould, or core is formed in proportion as the sculptor carries on the wax.

When the wax (which is to be of the intended thickness of the metal) is finished, they fit little waxen tubes perpendicularly to it, from top to bottom; to serve both as jets for the conveyance of the metal to all parts of the work, and as vent holes, to give passage to the air, which would otherwise occasion great disorder, when the hot metal came to encompass it. By the weight of the wax used herein, is that of the metal adjusted; ten pounds of this last being the proportion to one pound of the former.

The work brought thus far, wants nothing but to be covered with its shell; which is a kind of coat, or crust laid over the wax; and which being of a soft matter, and even at first liquid, easily takes and preserves the impression of every part thereof, which it afterwards communicates to the metal, upon its taking the place of the wax between the shell and the core.

The matter of this outer mould, or shell, is varied according as different layers, or strata are applied. The first is a composition of clay and old crucibles well ground and sifted, and mixed up with water, to the consistence of a colour fit for painting. Accordingly, they apply it with a pencil, laying it seven or eight times over; letting it dry betwixt whiles. For the second impression they add horse's dung, and natural earth to the former composition. The third impression is only horse's dung and earth. Lastly, the shell is finished by lying on several more impressions of this last matter made very thick with the hand.

The shell thus finished is secured and strengthened by several bands or girts of iron wound around it at half a foot's distance from one another, and fastened at bottom to the grate under the statue, and at the top to a circle of iron, where they all terminate.

Here it must be observed, that if the statue be so big, that it would not be easy to move the moulds when thus provided, it must be wrought on the spot where it is to be cast.

This is performed two ways: in the first, a square hole is dug under ground, much bigger than the mould to be made therein; and its insides lined with walls of freestone or brick. At the bottom is made a hole of the same materials with a kind of furnace, having its aperture outwards. In this is a fire to be lighted, to dry the mould, and afterwards to melt the wax. Over this furnace is placed the grate; and on this the mould, &c. framed as above explained. Lastly, at one of the edges of the square pit is made another large furnace to melt the metal, as hereafter mentioned.

In the other way, it is sufficient to work the mould above ground; but with the same precaution of a furnace, and grate underneath. When finished, four walls are to be run up around it; and by the side thereof a massive made for a melting furnace.—For the rest, the method is the same in both.

The mould being finished and inclosed between four walls, whether under ground, or above it; a moderate fire is lighted in the furnace under it; and the hole covered with planks, that the wax may melt gently down, and run out at pipes contrived for the purpose at the foot of the mould, which are afterwards very exactly closed with earth, as soon as all the wax is carried off.

This done, the hole is filled up with bricks thrown in at random, and the fire in the furnace is augmented, till such time as both the bricks and the mould become red-hot; which ordinarily happens in twenty-four hours. Then, the fire being extinguished, and every thing cold again, they take out the bricks, and fill up their place with earth, moistened, and a little beaten, to the top of the mould, in order to make it the more firm and steady.

Things being in this condition, there remains nothing but to melt the metal, and run it into the mould. This is the office of the furnace above; which is made in manner of an oven, with three apertures; one to put in the wood, another for a vent, and a third to run the metal out at. From this last aperture, which is kept very close all the time the metal is in fusion, a little tube or canal is laid, whereby the molten metal is conveyed into a large earthen basin over the mould, into the bottom of which all the big branches of the jets, or casts, which are to carry the metal into all the parts of the mould, are inserted.

It must be added, that these jets are all terminated, or stopped with a kind of plugs, which are kept close, that upon opening the furnace, the bras, which gushes out like a torrent of fire, may not enter any of them, till the basin be full enough of matter to run into them all at once: upon which occasion they pull out the plugs, which are long iron rods, with a head at one end capable of filling the whole diameter of each tube. The hole of the furnace is opened

with a long piece of iron, fitted at the end of each pole; and the mould is then filled in an instant.

The work is now finished; at least so much as belongs to the casting; the rest being the sculptor's or carver's business; who, taking the figure out of the mould and earth, it is encompassed withal, saws off the jets wherewith it appears covered over, and repairs it with instruments proper to his art, as chissels, gravers, puncheons, &c.

The manner of casting bells. What has been hitherto shewn of the casting of statues, holds, in proportion, of the casting of bells: all that there is particular in these latter, is as follows.

First, then, the metal is different; there being no tin in the metal of statues, but no less than a fifth part of tin in that of bells. Secondly, the dimensions of the core, and the wax of bells, especially if it be a ring of several bells that is to be cast, are not left to chance, or the caprice of the workman; but must be measured on a kind of scale, or diapacon, which gives the height, aperture, and thickness necessary for the several tones required.

It need not be added, that it is on the wax, that the several mouldings, and other ornaments and inscriptions to be represented in relief on the outside of the bell, are formed.

The clapper, or tongue, is not properly a part of the bell, but is furnished from other hands. In Europe, it is usually of iron, with a large lump at the extreme, and is suspended in the middle of the bell. In China it is only a huge wooden mallet, struck by force of arm against the bell: whence they can have but little of that consonancy so much admired in some of our rings of bells. The Chinese have an extraordinary way of increasing the found of their bells, viz. by leaving a hole under the cannon, which our bell-founders would reckon a defect.

The proportions of our bells differ very much from those of the Chinese. In ours, the modern proportions are, to make the diameter fifteen times the thickness of the brim, and the height twelve times.

Manner of casting great guns, or pieces of artillery. The casting of cannons, mortars, and other pieces of artillery, is performed like that of statues and bells; especially as to what regards the mould, wax, shell, turnaces, &c.

As to the metal, it is somewhat different from both; as having a mixture of tin, which is not in that of statues; and only having half the quantity of tin that is in bells, i. e. at the rate of ten pound of tin, to an hundred of copper. A cannon is always shaped a little conical, being thickest of metal at the breech, where the greatest effort of the gunpowder is made, and diminishing thence to the muzzle: so that if the mouth be two inches thick of metal, the breech is six.

Its length is measured in calibers, i. e. in diameters of the muzzle. Six inches at the muzzle require twenty calibers, or ten feet in length: there is always about a sixth of an inch allowed play for the ball.

Letter Foundery, or the manner of casting printing letters. The invention of printing letters we shall speak of under the articles PRINTING, and LETTER.

Their difference, kind, &c. has already been explained under the articles CHARACTER, &c.

The two things principally to be regarded in the casting of letters, are the *matter*, and the *matrices*.

The *matter* is a compound metal; partly bras or copper, and partly lead, mixed in a certain proportion, which every letter-founder regulates at his own discretion, and to which he frequently adds a certain quantity of some other metal or mineral, as his experience directs him, to render his composition the harder.

The most usual proportion of the two metals, is a hundred pound of lead to twenty or twenty-five pound of bras. Some (though not the best founders) use iron, instead of bras; in the proportion of a hundred pound of lead, to thirty or thirty-five of iron.

These metals are melted separately in large crucibles; the bras, or iron with antimony, and the lead by itself. When in fusion they are mixed together: this fusion and mixture are the most laborious parts of the letter-founder's art.

The *matrices* of the letters are pieces of copper, whereon the impression of the intended character has been cut, or struck in creux, by means of puncheons, &c. graven in relief.

Each letter has its proper matrix; and there are particular ones for points, virgula's, figures, rules, head-pieces, and other ornaments of printing: excepting the quadrats, which being only of lead, and not intended to leave any impression, are cast without matrices, and only in moulds: and each matrix has its puncheon made of steel, or iron, well tempered.

The matrices being struck, and touched up, or repaired, where needful, are put each at the end of an iron mould, inclosed between two thin pieces of board, two or three inches square; the two upper angles being cut off, so as to compose an irregular hexagon.

The principal parts of these moulds, which, as already mentioned, are hid between the slips of wood; are, 1^o, Two steel plates, with each its screw, to keep them fast, at a distance from the boards. 2^o, Two called *long pieces*. 3^o, A piece called the *blank*, which is what properly forms the body of the character, at the extremity whereof the matrice is put. 4^o, A jet, or cast; which is a sort of little funnel to receive and convey the melted matter to the matrice. 5^o, A register, serving to rejoin the two parts of the mould, after they have been opened to take out the letter when cast.

On the outside of the moulds are three other pieces, *viz.* the bow, at bottom; and two hooks a-top. The bow is a thick steel wire, two or three lines in diameter, and eight or ten inches long, bent in manner of a bow, or arch; whereof the lower piece of wood is as it were the chord, or string. One end is fastened to the board, and the other, which is left at liberty, serves, by its spring, or elasticity, to press and retain the matrice of the character against the extremity of the blank, where the melted matter running in, makes the impression.

The hooks a-top of the mould are also of wire, about the same size with the bow, and about an inch and a half long; being fastened, one of them to one board, and the other to the other. Their use is, to open the mould, and to take out the character, when cast, so as the workman may not be incommoded with the heat.

Every thing belonging to the mould being thus disposed, they begin to prepare the matter. — The furnace, whereon the bafon is placed for the metal to be melted in, is made of the same matter as crucibles. It is usually eighteen or twenty inches high, and ten or twelve in diameter. An iron grate horizontally placed, divides it into two: the lower part serves to hold the ashes, and is furnished with the hole to let in the air. The wood is put in the upper part, through an aperture made over the grate. An earthen pipe serves to carry off the smoke out at a window, near which the furnace is ordinarily placed. And lastly, a stone, or wooden stool, serves to support the furnace, and raise it to a proper height for the workman to work standing.

Over the furnace is placed the melting bafon, or copper. It is about nine inches in diameter, and takes up the whole aperture a-top; being even luted to it all round, with potters earth. Its matter is a kind of pot metal; and that it may be fit for melting both hard and soft metals, it is divided into two equal parts by a perpendicular partition.

In this bafon they melt only the matter already prepared; that is, the mixture or composition made in the crucibles above-mentioned. A little iron ladle serves to scum of the scoriae or impurities from the surface of the melted metal: and these scoriae are not all lost, but serve to melt over again.

Two workmen are usually employed at each furnace. Each of them has his part of the bafon to empty; and they have a table or bench in common, where they lay the characters as fast as they are cast.

To run the metal into the mould, the founder holds it in his left hand; and in his right has a little iron ladle with a wooden handle, containing just enough for one letter.

Having now filled this ladle with liquid metal, he pours it into the jet, or funnel, whose aperture is in the middle of the two hooks of the mould; and thrusting his hand briskly forward wherewith he holds the mould, he makes the metal run into the matrix of the character; which without such motion might grow cold before it arrived there.

He then unbends the bow, opens the mould, and with one of the hooks takes out the character; and, without loss of time, shuts it again, replaces the matrice, and casts a new letter. It is incredible with what expedition and address all this is done. The letter being cast, they view it, before they break off the jet, to see whether it be perfect; otherwise to throw it among the refuse of the font.

If it be found complete, the jet or tail is broke off; the superfluous metal, occasioned by the mould's not being exactly closed, is taken off with a knife; and the long tailed letters, as *f* and *g* hollowed at bottom, to give room for the massive of the other letters to be placed underneath.

With the same knife they scrape the letter, to smooth its two broadest sides, or faces, and fit them to be rubbed on the stone. They take care only to rub these sides; for fear of damaging a notch on one of the other sides, which is to distinguish the sides to the compositor, when he sets his forms.

The stone they grind them on, is a sort of hard, coarse-grained free stone, placed horizontally; before which the workman sits. To save his fingers from the friction, he has a kind of finger-stalls, made of some old piece of leather; with which he covers the two fingers next the thumb: with these he works each side of the letter backwards and forwards: to shift sides, he makes use of the thumb, but without discontinuing the motion; so that the by-stander would easily be deceived, and be ready to swear they had all the while rubbed on the same side.

The letters thus ground, are placed on the compository to be scraped and brought to the proper thickness on the two other sides, *viz.* that of the notch, and its opposite. This they sometimes call *composition*.

The compository is a wooden ruler, with a little ledge at bottom, against which the letters are ranged. On the same instrument the quadrats, rules, borders, &c. are also adjusted.

When the letters are composed, they remain to be justified, both as to thickness and height. In order to this, they use a little copper plate, which is their level.

The justification, as to thickness, is made on a piece of marble; and that for the height on an iron compository. The justification of the height is guided by the *m* of some body of characters already justified.

Letters are said to be of their just height, when the part of the plate, or level, bears equally on the standard *m* placed on its foot, in the little compository, and the face of two letters newly cast placed aside of it, to be justified: as to the thickness, the justification is performed by laying the standard letter flat on the little marble, and two new letters aside of it; and thus levelling the three with the plate.

All that then remains, is to dress the letters, *i. e.* to cut the foot, or rather hollow it, and make that sort of groove which every letter has at bottom, precisely opposite to the eye or upper part, or face of the letter.

In order to this, they turn a long line of them upside down in the justificator; which is an instrument of polished iron or steel, consisting of two long pieces joined together by ferrets. Between these two, they enclose as many letters as they will hold, all placed against each other in the same situation, as when composed for books; excepting that the face in the former case is downwards, and the foot a top. When the justificator is full of letters, they set it on the table of the cutter, between two cheeks of wood; which pressing it very tight, enable the workman to run his plane along the side of the line thus inverted.

This plane consists of three parts; two steel, and the third wood. Of the steel ones, that at bottom consists of two moveable steel plates, which may be drawn closer, or set further off, at pleasure, by means of two screws. Within the interval between the two, they pass the feet of the row of letters; and thus is the plane kept from deviating.

The second part of the plane, answering to the bit of steel in the common planes, consists of two branches, and two screws, which serve to raise or let down the steel, as the groove is to be cut deeper or shallower. The position of this piece of steel, which is four or five inches long, is almost perpendicular.

The last part of the plane, which is wood, serves to join the other two. Its form is that of an arch: one end of it is fastened to the posterior extreme of the plates, and the other to the branches which carry the bit of steel: so that the three parts together make a kind of triangle, voided in the middle.

The cutter is a steel instrument, with a wooden handle, made in manner of a chisel; serving to pare off the rough wire edge of the letters when they are dressed.

When the letters have passed all these operations, they are fit for the printer's use.

The perfection of letters thus cast, &c. consists in their being all universally square and straight, on every side; and all, generally of the same height, and evenly lined, without sloping one way or other; neither too big in the foot, nor the head; well grooved so as the two extremes of the foot contain half the body of the letter; and well ground, barbed, and scraped; with a sensible notch, &c.

FOUNT, or FONT, among printers, &c. a set or quantity of characters, or letters of each kind; cast by a letter-founder, and sorted.

We say, a founder has cast a *Fount* of pica, of english, of pearl, &c. meaning, he has cast a set of characters of these kinds.

A complete *Fount* does not only include the running letter; but also majuscules, or large, and small capitals, single letters, double letters, points, comma's, lines, borders, head-pieces, tail-pieces, and numeral characters.

The letter-founders have a kind of list or tariff, whereby they regulate their *Founts*. The occasion thereof is, that some letters being in much more use, and oftener repeated than others, their cells, or cases, should be better filled and stored than those of the letters which do not return so frequently.

Thus the *e* and *i*, for instance, are always in greater quantity than the *k* or *z*.

This difference will be best perceived from a proportional comparison of those letters with themselves, or some others.

Suppose a *Fount* of a hundred thousand characters, which is a common *Fount*; here the *e* should have five thousand; the *c* three thousand; the *r* eleven thousand; the *i* six thousand; the *m* three thousand; the *k* only thirty; and the *x* and *z* not many more.

But this is only to be understood of the letters of the lower-case; those of the upper having other proportions, which it would be here too long to insist on. See **LETTER and CHARACTER**.

FOUNTAIN, FONS, in philosophy, a spring, or source of water, rising out of the ground.

For the phenomena, theory, origin, &c. of springs or *Fountains*, see **SPRING**.

Among the antients, the *Fountains*, or sources of rivers, were held sacred, and even worshipped as a kind of divinities.

Seneca

Seneca observes as much, in his forty-first epistle: and Cicero, l. iii. *de Nat. Deor.* c. 20, mentions, that the Roman priests and augurs used in their prayers and invocations to call on the names of the Tyber, and other rivers, brooks, and springs about Rome. And the seventh inscription in p. 94. of Gruter has, *FONTI DIVINO ET GENIO NUMINIS FONTIS*.

It was a point of religion, not to disturb or muddy these waters in washing or bathing.—Tacitus gives an instance hereof in Nero, *Annal.* l. xiv. c. 22. And Struvius, *Antiq. Rom. Syntag.* c. i. p. 167.

FOUNTAIN, or artificial **FOUNTAIN**, in hydraulicks, a machine, or contrivance, whereby water is violently spouted, or darted up; called also a *Jet d'Eau*. See *JET d'Eau*, **FLUID**, &c.

There are divers kinds of artificial *Fountains*; some founded on the spring, or elasticity of the air; and others on the pressure or weight of the water, &c.

The structure of each hereof, being pretty, and curious, and affording a good illustration of the doctrine of hydraulicks and pneumatics, shall be here explained.

Construction of an artificial FOUNTAIN, playing by the spring or elasticity of the air.—A vessel, proper for a reservoir, as A B, *Tab. Hydraulicks*, fig. 17. is provided of metal, glass, or the like; ending in a small neck *c*, a-top. Through this neck a tube is put, *c a*, traversing the middle of the vessel, till its lower orifice, *d*, nearly, but not absolutely, reach the bottom of the vessel; the vessel being first half filled with water. The neck is so contrived, as that a syringe, or condensing pipe may be screwed upon the tube; by means whereof, a large quantity of air may be intruded through the tube into the water; out of which it will disengage itself, and emerge into the vacant part of the vessel, and lie over the surface of the water, C D.

Now, the water here contained, being thus pressed by the air, which is, *c. gr.* twice as dense as the external air; and the elastic force of air being equal to its gravitating force, the effect will be the same as if the weight of the column of air, over the surface of the water, were double that of the column pressing in the tube; so that the water must, of necessity, spout up, through the tube, with a force equal to the excess of pressure of the included, above that of the external air.

Construction of an artificial FOUNTAIN, playing by the pressure of the water.—Having the convenience of a fund, or reservoir of water, in a place considerably higher than that where the *Fountain* is to be (whether that fund have been placed there by nature; or whether it have been raised for the purpose, by a proper engine, as a pump, siphon, spiral screw, or the like) from the reservoir lay vertical tubes for the water to descend through; and to these vertical tubes, fit other horizontal ones, under ground, to carry the water to the place where the *Fountain* is to play. Lastly, from these horizontal tubes erect other vertical ones, by way of adjustages, jets, or spouts; their altitude being much less than that of the tubes whereby the water was carried to the horizontal ones.

Then will the water, by the pressure of the superincumbent column, be spouted up at these jets; and that to the height or level of the water in the reservoir; and this, howsoever any of the tubes be bent or incurvated.—The demonstration hereof, see under **FLUIDS**.

Thus may water be spouted to any given height at pleasure: and the tubes may be so proportioned as to yield any given quantity of water, in a given time; or several tubes of the same *Fountain* may be made to yield water in any given ratio: or, lastly, different tubes may project the water to different altitudes. Rules for all which, the reader will find among the laws of **FLUIDS**.

These aerial, or aquatic *Fountains*, may be applied in various manners; so as to exhibit various appearances: and from these alone, arise the greatest part of our artificial water-works. An instance or two, will not be disagreeable.

A FOUNTAIN spouting the water in various directions.—Suppose the vertical tube, or spout in which the water rises, to be A B (*Tab. Hydraulicks*, fig. 18.) into this, fit several other tubes; some horizontal, others oblique; some inclining, others reclining, as O P, M N, F L, &c.

Then, as all water retains the direction of the aperture through which it is spouted: that, issuing through A, will rise perpendicularly; and that through L, H, N, P, E, will describe arches of different magnitudes, and tending different ways.

Or thus: Suppose the vertical tube A B, fig. 19. through which the water rises, to be stopped a-top, as in A; and instead of pipes, or jets, let it be only perforated with little holes all round, or only round half its surface. Then will the water spin forth in all directions, through the little apertures, and to a distance proportional to the height of the fall of the water.

And hence, if the tube A B be supposed the height of a man, and be furnished with an epistomium, or cock at C;

upon opening the cock, the spectators, dreaming of no such matter, will be covered with a shower.

It must be here observed, that the diameters of the apertures, by which the water is emitted, must be considerably less than those of the tubes in which the water is brought; lest the resistance of the air, and other impediments, specified under **FLUID**, break the force of the water.

A FOUNTAIN playing by the draught of the breath.—Suppose A B, fig. 20. a glass or metallic sphere; wherein is fitted a tube, C D, having a little orifice in C, and reaching almost to D, the bottom of the sphere. If now the air be sucked out of the tube C D, and the orifice C be immediately immersed under cold water; the water will ascend through the tube into the sphere.

Thus proceeding, by repeated exsuctions, till the vessel be above half full of water; and then applying the mouth to C, and blowing air into the tube; upon removing the mouth, the water will spout forth.

Or, if the sphere be put in hot water; the air being thereby rarified, will make the water spout as before.

This kind of *Fountain* is called *Pila Heronis*, or Hero's ball, from the name of its inventor.

A FOUNTAIN, the stream whereof raises, and plays a brass ball.—Provide a hollow brass ball A, fig. 21. made of a thin plate, that its weight may not be too great for the force of the water. Let the tube B C, through which the water rises, be exactly perpendicular to the horizon.

Then, the ball being laid in the bottom of the cup, or basin B; will be taken up in the stream, and sustained at a considerable height, as A; alternately vibrating, or playing up and down.

Hence, as the figure of the ball contributes nothing to its reciprocal rise, and fall: any other body, not too heavy, may be substituted in lieu thereof; *c. gr.* a bird with its wings stretched forth.

But, note, that as it is necessary the ball, when on the descent, should keep the same precise perpendicular, wherein it rose (since otherwise it would miss the stream, and fall down right) such a *Fountain* can only be played in a place free from wind.

A FOUNTAIN, which spouts water in form of a shower.—To the tube wherein the water is to rise, fit a spherical, or lenticular head, A B, fig. 22. made of a plate of metal, and perforated a-top, with a great number of little holes.

The water rising with vehemence towards A B, will be there divided into innumerable little threads, and afterwards broke, and dispersed into the finest drops.

A FOUNTAIN which spreads the water in form of a table-cloth.—To the tube A B, fig. 23. solder two spherical segments C and D, almost touching each other; with a screw E, to contract, or amplify the interstice or chink at pleasure.

Others chuse to make a smooth, even cleft, in a spherical, or lenticular head fitted upon the tube.

The water spouting through this chink, or cleft, will expand itself in manner of a cloth.

FOUNTAINS wherein the water spouts out of the figures of men and other animals.—Since water may be derived or conveyed by tubes in any situation, and always retains the direction of the aperture; all here required, is to inclose tubes within the figures of men, or other animals, having their orifices in those parts whence the water is intended to spout forth.

From the principles hitherto laid down, it will be very easy to deduce whatever relates to the furniture of *Fountains*, and the various forms water may be put into by their means; all depending on the magnitude, figure, and direction of the adjustages, or apertures.

A FOUNTAIN which when it has done spouting, may be turned like an hour-glass.—Provide two vessels L M, and N O, fig. 24. to be so much the bigger as the *Fountain* is to play the longer; and placed at so much the greater distance from each other, P N, as the water is desired to spout the higher. Let B A C be a crooked tube, furnished in C with a cock; and F E D another bent tube, furnished with a cock in D. In I and K are to be other lesser tubes, open at both ends, and reaching near to the bottoms of the vessels N O, and L M: to which the tubes Q R, and S T are likewise to reach.

If, now, the vessel L M be filled with water; it will descend through the tube B A, and upon opening the cock C, will spout up near to the height of K: and, after its fall again, will sink through the little tube I, into the vessel N O, and expel the air through the tube Q O. At length, when all the water is emptied out of the vessel L M; by turning the machine upside down, the vessel N O will be the reservoir, and make the water spout up through the cock D.

Hence if the vessels L M, and N O contain just as much water as will be spouted up in an hour's time; we shall have a spouting cleftysdra, or water clock, which may be graduated or divided into quarters, minutes, &c. as shewn under the article **CLEPSYDRA**.

A FOUNTAIN that begins to play upon the lighting of candles, and ceases as they go out.—Provide two cylindrical vessels, A B,

A B, and C D, *fig. 25.* connect them by tubes, open at both ends, K L, B F, &c. so that the air may descend out of the higher into the lower. To the tubes folder candlesticks, H, &c. and to the hollow cover of the lower vessel, C F, fit a little tube, or jet F E, furnished with a cock G, and reaching almost to the bottom of the vessels. In G let there be an aperture, furnished with a screw, whereby water may be poured into C D.

Then, upon lighting the candles H, &c. the air in the contiguous tubes becoming rarified thereby; the water will begin to spout through E F.

By the same contrivance may a statue be made to shed tears upon the presence of the sun, or on the lighting of a candle, &c. All here required being only to lay tubes from the cavity where in the air is rarified, to some other cavities plac'd near the eyes, and full of water.

FOUNTAIN, with regard to architecture, is an assemblage of masonry, sculpture, &c. either for the decoration, or convenience of a city, garden, or the like.

Fountains acquire various denominations, according to their form, and situation; as,

Arched FOUNTAIN, that whose basin and jet are placed perpendicularly under the arch. — Such are the *Fountains* of the Colonnade, and the triumphal water-arch at Versailles.

Basin FOUNTAIN, is that with only a simple basin, of any figure whatever; in the middle whereof is a jet, or spout, or perhaps a statue; or even a group of figures. — As the *Fountain* in the court of Buckingham house.

Covered FOUNTAIN, a kind of pavilion, built of stone; either insulate, and square; or round; or multilateral; or backed: and that, either with a projection, or indented; inclosing a reservoir, and spouting or darting forth the water thereof through one or more cocks; in the middle of a street, square, garden, court, or the like. Such is that in Lincoln's-Inn new square, London.

Cup FOUNTAIN, is that which, beside a basin, has likewise a cup of one single piece of stone, or marble, supported on a shaft or pedestal, and receiving a jet, or spout rising out of the middle thereof.

As the *Fountain* in the court of the Vatican; the cup whereof is of granite, and antique; being brought from the baths of Titus at Rome.

Marine FOUNTAIN, that composed of aquatic figures, as sea divinities, naiads, tritons, rivers, dolphins, and other fishes, and shells. Such is the *Fountain* of the palace Paestrina at Rome; where a shell supported by four dolphins, serves as a cup, and supports a triton, that spouts water out of his concha marina.

Naval FOUNTAIN, is that made in form of a vessel. Such is that of the place d'Espagne at Paris, representing a bark: That at Monte-Cavallo, representing a galley; or that before the vineyard Mattei at Rome, resembling a boat.

Open FOUNTAIN, is any spouting *Fountain* with a basin, cup, and other ornaments; all open: as is frequent in our gardens, and in the vineyards at Rome.

Pyramidal FOUNTAIN, that formed of several basins, or cups, ranged in stories over each other, and diminishing all the way; being supported by a hollow stem, or shaft. — As the *Fountain* of Monte-Dragone at Frefcati.

Or else supported by figures, fishes, or consoles; the water whereof in its fall makes nets in divers stories, and represents a kind of water-pyramid. — As that at the head of the cascades at Versailles.

Rustic FOUNTAIN, is that formed, or enriched with rock-work, shell-work, petrifications, &c.

Satyrical FOUNTAIN, is a kind of rustic *Fountain*, in manner of a grotto; adorned with termini, mascarons, fauns, sylvens, bacchantes, and other satyrical figures, serving for ornaments as well as jets d'eau.

Spouting FOUNTAIN, or *jet d'eau*, is any *Fountain* whose water is darted forth impetuously through one, or more jets, or adjuvages, and returns in form of rains, nets, folds, or the like.

Spring FOUNTAIN, a kind of plain spout, or stream of water, issuing out of a stone, or hole in a wall, without any decoration. — Such is the *Fountain* of Trevi at Rome.

Statuary FOUNTAIN, that which being open and insulate, or even backed, is adorned with one or more statues, by way of finishing, or crowning. — As the *Fountain* of Latona at Versailles; and that of the shepherd at Caprarola.

There are also statues, which spout forth water at some of their parts: or at sea shells, vases, urns, and other attributes of the sea.

Synbolical FOUNTAIN, that where the principal ornaments are the attributes, arms, or cognizances of the person who erected it. — Such are the *Fountains* of St. Peter in Montorio, resembling a castle flanked with towers, and donjons, representing the arms of Castile; and some other *Fountains* at Rome; among which are the *flower-de-lis*, and the dove, the bearings of the family of pope Innocent X.

FOUNTAIN-PEN, is a sort of pen, contrived to contain a great quantity of ink, and let it flow by gentle degrees; so as to supply the writer a long time, without a necessity of taking fresh ink.

The *Fountain-pen*, represented *Tab. Miscellany, fig. 5.* consists of divers pieces, F, G, H, of brass, silver, &c. whereof the middle piece F carries the pen, which is screwed into the inside of a little pipe; which again is soldered to another pipe of the same bigness, as the lid G; in which lid is soldered a male screw, for screwing on the cover; as also for stopping a little hole at the place, and hindering the ink from passing through it. At the other end of the piece F is a little pipe, on the outside whereof of the top cover H may be screwed. In the cover there goes a port-crajon, to be screwed into the last mentioned pipe, in order to stop the end of the pipe, into which the ink is to be poured by a funnel.

To use the pen, the cover G must be taken off, and the pen a little shaken, to make the ink run more freely.

FOUR, *Cal de four*, see the article CUR.

FOURCHEE, or **FOURCHEY**, in heraldry. — A cross *Fourchee* is that forked at the extremities turning

upwards, and divided into three points; whereas the true cross *Fourchee*, i. e. forked, has its forks composed of straight lines, and blunt ends. — *Tab. Herald fig. 27.*

FOURCHEK, an ancient law term, signifying a putting off, prolonging, or delaying an action.

As by stammering we draw out our speech, not delivering that we have to say, in ordinary time; so by *fourching* we prolong a suit, that might be ended in a shorter space.

In Stat. *Westm. 1. cap. 42.* we have these words: "coparceners and joint tenants shall no more *fourch*, but only shall have one effoin," &c. and anno 6 Edw. 1. cap. 10. it is used in the same sense; "the defendants shall be put to answer without *fourching*," &c. In the Latin it is called *fourcare*; and is used where a man and his wife do effoin severally.

Caveat vir et mulier implacitati, quod semper in officio alterius alter compareat, quamdiu furcare possint; et cum ultra non possint, concurrant eorum officio in suis locis: alter autem eorum tentum unum officio de malo levi habere potest. Hengham mag. cap. 9.

FOURCHETTE. *Fer de FOURCHETTE*, see the article FER.

FOURTH, in musick, one of the harmonic intervals, or concords.

The *Fourth*, is the fourth in order of the concords. It consists in the mixture of two sounds, which are in the ratio of 4 to 3; i. e. of sounds produced by chords, whose lengths are to each other as 4:3.

It is called *Fourth*, because containing four terms, or sounds between its extremes; and three degrees: or, as being the fourth in the order of the natural scale from the fundamental.

The ancients call the *Fourth*, *Diatesaron*, and speak of it as the first and principal of all concords; and yet the moderns find it one of the most imperfect. It is so very barren, and jejune, that it affords nothing good, either by multiplication; or division.

The redundant **FOURTH** is a discord composed of the ratio's of 27 to 20; and of 4 to 5.

Arches of the FOURTH Point, see the article ARCH.

FOURTH RATE; see the article RATE.

FOUTGELD, or **FOOTGELD**, see **FOOTGELD**.

FOWL, in its general sense is of equal import with bird.

See **BIRD**.

FOWL, is in a more peculiar manner understood of poultry, or the larger sort of birds both domestic and wild, either bred up, or hunted, for the table.

Such are turkeys, geese, cocks, hens, and ducks, both wild and tame; pheasants, partridges, pigeons, snipes, &c.

Tame FOWL, are a necessary part of the stock of a country farm; and yield considerable service and profit by their eggs, brood, feathers, dung, &c.

They may be kept at a very easy expence near any highway side; as being able to stift for themselves during the greatest part of the year, by their feeding on insects, worms, snails, and almost any thing eatable.

The oldest hens are always the best for sitting; and the youngest for laying; but no sort will be good for either, if kept too fat.

The best age to set a hen for chickens, is from two years old to five; and the most proper month to set them in, is February; though it may be done to good purpose any time between that and Michaelmas. One cock will serve ten hens: a hen sits but twenty days, whereas geese, ducks, and turkeys, sit thirty.

Buckwheat, or French wheat, or hempseed, it is said, make them lay faster than any other food; and the same buckwheat, either whole, or ground, and made into a paste, fats them apace; though the common food for that purpose is barley-meal, or wheat-flower, soaked in milk, or water, made into a paste, and crammed down their throats twice a day, till they will hold no more. A goose will scarce sit on any but her own eggs: a hen will sit indifferently on all.

The lightest coloured geese are the best; and those that begin to lay the soonest; as they have a chance of hatching twice in one year. They begin to lay in the spring; and lay twelve or sixteen eggs. Green geese are begun to be fattened at a month old; and will be fat in a month more. Old geese are chiefly

chiefly fattened at six months old, in, or after the harvest. A wild goose, if red footed, and hairy, is old; but if white footed, and not hairy, she is young.

When the eggs are set under a hen, or other *Fowl*, it is advisable to mark the upper sides thereof; and when she goes to feed, to note whether she minds to turn them upside down, or not; that if she neglect that office, it may be done for her.

FOWLING, the act, or art of catching birds with nets; birdlime, decoys, and other devices; as also of breeding up the same.

FOWLING is also used for the pursuing, and taking of birds with hawks, falcons, and other birds of prey; more properly called *Falconry* and *Hawking*.

FOWLING-PIECE, a portable fire-arm for the shooting of birds.

Of *Fowling-pieces*, those are reputed the best, which have the longest barrel, &c. from 5¹/₂ to 6; with an indifferent bore, under the harquebus; though in different applications they should be of different sorts, and sizes. But in all, it is essential the barrel be well polished, and smooth within; and the bore all of one gauge, from one end to another; which may be proved by thrusting in a piece of wood, cut exactly to the bore of the muzzle, down to the touch-hole.

FOX Hunting, see the article *FOX HUNTING*.

FRACTION, in arithmetic, a part, or division of an unite, or integer; or, a number which stands to an unite in the relation of a part to its whole.

The word literally imports a broken number.

Fractions are usually divided into *decimal*, *sexagesimal*, and *vulgar*.

For *decimal*, and *sexagesimal Fractions*, see *DECIMAL*, and *SEXAGESIMAL Fractions*.

Vulgar Fractions, called also simply, *Fractions*, are always expressed by two numbers, the one wrote over the other, with a line between them.

The lower, called the *denominator of the Fraction*, denotes the unite, or whole, that is divided into parts; and the upper, called the *numerator of the Fraction*, expresses the parts given in the present case.

Thus, two third parts of a line, or other thing, are wrote $\frac{2}{3}$; where the denominator 3 shews, that the whole line is supposed to be divided into three equal parts; and the numerator 2 indicates or assigns two of such parts.

Again, twenty-nine sixtieths is wrote $\frac{29}{60}$; where the numerator 29 expresses 29 parts of an integer divided into 60; and the denominator 60 gives the denomination to these parts, which are called *sixtieths*.

The real design of adding the denominator, is to shew what aliquot part the broken number has in common with unity.

In all *Fractions*, as the numerator is to the denominator; so is the *Fraction* itself, to the whole whereof it is a *Fraction*.

Thus, supposing $\frac{3}{4}$ of a pound equal to 15 s. it is evident, that 3 : 4 :: 15 : 20. Whence it follows, 1^o That there may be infinite *Fractions* of the same value, one with another; inasmuch as there may be infinite numbers found, which shall have the ratio of 3 : 4.

Fractions are either *proper*, or *improper*.

Proper FRACTION is that where the numerator is less than the denominator; and consequently the *Fraction* less than the whole, or integer; as $\frac{3}{4}$.

Improper FRACTION is, where the numerator is either equal to, or bigger than the denominator; and, of course the *Fraction* equal to, or greater than the whole, or integer, as $\frac{4}{3}$; or $\frac{5}{2}$; or $\frac{7}{2}$.

Fractions, again, are either *simple* or *compound*.

Simple FRACTIONS are such, as consist of only one numerator, and one denominator; as $\frac{3}{4}$, or $\frac{1}{2}$, &c.

Compound FRACTIONS, called also *Fractions of Fractions*, are such as consist of several numerators, and denominators; as $\frac{3}{4}$ of $\frac{1}{2}$ of $\frac{1}{3}$, &c.

Of *Fractions*, those are equal to each other, whose numerators have the same ratio to their denominators.—Those are greater, whose numerators have a greater ratio; and those less, which have less: thus, $\frac{3}{4} = \frac{6}{8} = \frac{9}{12} = \frac{12}{16}$. But $\frac{3}{4}$ is greater than $\frac{2}{3}$; and $\frac{3}{4}$ less than $\frac{1}{2}$.

Hence it both the numerator, and denominator of a *Fraction*, as $\frac{3}{4}$, be multiplied, or divided by the same number, 2; the facta in the former case, $\frac{6}{8}$, and the quotients in the latter, $\frac{3}{2}$, will constitute *Fractions*, equal to the first *Fraction* given.

The arithmetic of *Fractions* consists in the *reduction*, *addition*, *subtraction*, and *multiplication* thereof.

Reduction of FRACTIONS.—1^o To reduce a given whole number into a *Fraction* of any given denominator.—Multiply the given integer, by the given denominator: the factum will be the numerator. Thus we shall find 3 = $\frac{3 \times 4}{4}$; and 5 = $\frac{5 \times 3}{3}$; and 7 = $\frac{7 \times 2}{2}$, &c.

If no denominator be given, the number is reduced to a *Fraction*, by writing 1 underneath it, as a denominator. Thus $\frac{3}{1}$, $\frac{5}{1}$, $\frac{7}{1}$.

2^o To reduce a given *Fraction* to its lowest terms, i. e. to find a *Fraction*, equivalent to a given *Fraction*, ($\frac{12}{24}$), but expressed in less numbers—divide both the numerator 12, and denominator 24 by some one number, that will divide them both without any remainder, as here by 4. The quotients 3 and 6 make a new *Fraction* $\frac{3}{6}$, equal to $\frac{12}{24}$.

And if the division be performed with the greatest number that will divide them both; the *Fraction* is reduced to its lowest terms.

To find the greatest common divisor of two quantities.—Divide the greater by the less: then divide the divisor of the division by the remainder thereof: again, divide the divisor of the second division by the remainder of the second; and so on, till there remain nothing. The last divisor is the greatest common measure of the given numbers.

If it happen that unity is the only common measure of the numerator and denominator; then is the *Fraction* incapable of being reduced any lower.

3^o To reduce two, or more *Fractions* to the same denomination; i. e. to find *Fractions* equal to the given ones, and with the same denominator.—If only two *Fractions* be given, multiply the numerator, and denominator of each, by the denominator of the other: the products given are the new *Fractions* required. Thus $\frac{3}{4}$ and $\frac{2}{3}$ make $\frac{9}{12}$ and $\frac{8}{12}$. If more than two be given, multiply both the numerator and denominator of each into the product of the denominators of the rest. Thus $\frac{3}{4}$, $\frac{2}{3}$, $\frac{1}{2}$ = $\frac{3 \times 2 \times 1}{4 \times 3 \times 2}$.

4^o To find the value of a *Fraction* in the known parts of its integer. Suppose, e. gr. it were required to know what is $\frac{3}{4}$ of a pound; multiply the numerator 9 by 20, the number of known parts in a pound, and divide the product by the denominator 16, the quotient gives 11 s. Then multiply the remainder 4 by 12, the number of known parts in the next inferior denomination; and dividing the product by 16, as before, the quotient is 3 d. So that $\frac{3}{4}$ of a pound = 11 s. 3 d.

5^o To reduce a mixed number, as 4 $\frac{1}{2}$ into an improper *Fraction* of the same value.—Multiply the integer, 4, by 12, the denominator of the *Fraction*; and to the product 48 add the numerator; the sum 59 set over the former denominator, $\frac{59}{12}$, constitutes the *Fraction* required.

6^o To reduce an improper *Fraction* into its equivalent mixed number. Suppose the given *Fraction* $\frac{59}{12}$; divide the numerator by the denominator; the quotient 4 $\frac{11}{12}$ is the number sought.

7^o To reduce a compound *Fraction* into a simple one. Multiply all the numerators into each other for a new numerator; and all the denominators for a new denominator. Thus $\frac{1}{2}$ of $\frac{2}{3}$ of $\frac{3}{4}$ reduced, will be $\frac{1}{4}$.

Addition of vulgar FRACTIONS. 1^o If the given *Fractions* have different denominators, reduce them to the same. Then, add the numerators together, and under the sum write the common denominator. Thus, e. gr. $\frac{1}{2} + \frac{1}{3} = \frac{3}{6} + \frac{2}{6} = \frac{5}{6}$. And $\frac{1}{4} + \frac{1}{2} + \frac{1}{3} = \frac{3}{12} + \frac{6}{12} + \frac{4}{12} = \frac{13}{12} = 1 \frac{1}{12}$.

2^o If compound *Fractions* are given to be added; they must first be reduced to simple ones: and if the *Fractions* be of different denominations, as $\frac{1}{2}$ of a pound, and $\frac{1}{3}$ of a shilling, they must first be reduced to *Fractions* of the same denomination of pounds.

3^o To add mixed numbers: the integers are first to be added; then the fractional parts: and if their sum be a proper *Fraction*, only annex it to the sum of the integers. If it be an improper *Fraction*, reduce it to a mixed number, adding the integral part thereof to the sum of the integers, and the fractional part after it. Thus, $5 \frac{1}{2} + 4 = 9 \frac{1}{2}$.

Subtraction of FRACTIONS. 1^o If they have the same common denominator, subtract the lesser numerator from the greater, and set the remainder over the common denominator. Thus from $\frac{7}{8}$ take $\frac{3}{8}$, and there remains $\frac{4}{8}$.

2^o If they have not a common denominator, they must be reduced to *Fractions* of the same value, having a common denominator, and then, as in the first rule. Thus, $\frac{1}{2} - \frac{1}{3} = \frac{3}{6} - \frac{2}{6} = \frac{1}{6}$.

3^o To subtract a whole number from a mixed number; or one mixed number from another. Reduce the whole, or mixed numbers to improper *Fractions*, and then proceed as in the first and second rule.

Multiplication of FRACTIONS. 1^o If the *Fractions* proposed be both simple, multiply the numerators one by another for a new numerator, and the denominators for a new denominator. Thus $\frac{1}{2}$ into $\frac{2}{3}$ produces $\frac{2}{6}$.

2^o If one of them be a mixed, or whole number, it must be reduced to an improper *Fraction*; and then proceed as in the first rule. Thus $\frac{1}{2}$ into $5 \frac{1}{3}$, gives $\frac{1}{2} \times \frac{16}{3} = \frac{8}{3}$.

In multiplication of *Fractions*, observe that the product is less in value, than either the multiplicand, or multiplier; because in all multiplications, as unity is to the multiplicator, so is the multiplicand, to the product: or, as unity is to either factor, so is the other factor, to the product. But unity is bigger than either factor, if the *Fractions* be proper; and therefore either of them must be greater than the product.

Thus in the whole numbers, if 5 be multiplied by 8, it will be as 1 : 5 :: 8 : 40; or 1 : 8 :: 5 : 40. Wherefore in

Fractions also, as 1 : 3 :: 2 : 6; or as 1 : 2 :: 3 : 6. But 1 is greater than either 2/3 or 3/2: wherefore either of them must be bigger than 1/2.

Division of FRACTIONS. -- 1^o, If the Fractions proposed be both simple, multiply the denominator of the divisor, by the numerator of the dividend; the product is the numerator of the quotient. Then multiply the numerator of the divisor, by the denominator of the dividend, the product is the denominator of the quotient. -- Thus 1/2 : 3/4 :: 2/3

2^o, If either dividend, divisor, or both, be whole or mixed numbers, reduce them to improper Fractions: and if they be compound Fractions, reduce them to simple ones: and proceed as in the first rule.

In divisions of Fractions, observe that the quotient is always greater than the dividend; because in all division, as the divisor is to the unity, so is the dividend to the quotient; as if 3 divide 12, it will be, as 3 : 1 :: 12 : 4. Now 3 is greater than 1; wherefore 12 must be greater than 4: but in Fractions, as 3/2 : 1 :: 3/2 : 3/4; where, 3/2 is less than 1; wherefore 3/4 must also be less than 1/2.

Fractions in Species, or algebraic quantities. -- 1^o, To reduce Fractions in Species to their least terms. -- The numerators and denominators are to be divided by the greatest common divisor, as in numbers.

Thus the Fraction a a c / b c is reduced to a more simple one

a a / b by dividing both a a c, and b c by c: and 203 / 667 is reduced to a more simple one 7 / 23 by dividing both 203 and 667 by 29; and 203 a a c / 667 b c is reduced to 7 a a / 23 b by dividing by 667 b c

29 c. And so 6 a a - 9 a c c becomes 2 a a - 3 c c by dividing by 3 a. And 6 a a + 3 a c becomes 2 a + c by dividing by a - b.

2^o, To reduce Fractions in Species to a common denominator. -- The terms of each are to be multiplied by the denominator of the other.

Thus, having a / b and c / d, multiply the terms of one by d, and also the terms of the other by b, and they will become a d / b d and b c / b d, whereof the common denominator is b d. And thus a and c, or a / 1 and c / 1 become a d / c and a b / c

But where the denominators have a common divisor, it is sufficient to multiply them alternately by the quotients.

Thus the Fraction a^3 / b c and a^3 / b d are reduced to these a^3 d / b c d and a^3 c / b c d by multiplying alternately by the quotients c and d, arising by the division of the denominators by the common divisor b.

Addition and subtraction of Fraction in Species. -- The process is in all respects the same in Species as in numbers. E. gr.

Suppose it be required to add the Fractions a / b and c / d. These, when reduced to the same denomination, will be a d / b d and b c / b d

consequently their sum is a d + b c / b d

So, if the Fraction a / b were to be subtracted from c / d: having reduced them, they will be a d / b d and b c / b d, as before.

Their difference, therefore, is b c - a d / b d

Multiplication and division of Fractions in Species. -- Here too,

the process is perfectly the same as in vulgar arithmetic. Thus, e. gr. suppose the factors, or Fractions, to be multiplied;

a / b and c / d: the product will be, a c / b d

Or suppose the Fractions required to be divided, a c / b d and a / b; the quotient will be a c b / b d a = a b c / b d d

Hence, as a = a / 1: the product of a into c / d, that is, of an

integral quantity into a Fraction, c / d = a c / d

appears, that the numerator of the Fraction is to be multiplied by the integer.

Hence also the quotient of c / d by a, that is of the broken

quantity, divided by the whole one, c / d a = c / a d

Beside the common notion of a Fraction, there is another necessary to be understood. Thus, Suppose 3/4 of 20s. or a pound sterling, were the Fraction: this Fraction instead of three quarters of one pound, may be considered as a fourth part of three pounds; that is, by taking as many of the integers, as the numerator expresses (viz. 3.) and dividing them by 4, the denominator; for then the quotient of the same value will arise for 4) 60s. 15s. This shews the reason of that manner of expression used by geometers and algebraists, who read a / b, thus, a divided by b.

Logarithm of a FRACTION, see LOGARITHM. Summing of infinite FRACTIONS, see CALCULUS, and FLUXIONS.

FRACTURE, In medicine and chirurgery, a breach, or rupture of a bone: or a solution of continuity in a bone, when it is crushed, or broken, by some external cause.

In Fractures, the bone is either broken breadth-wise, that is, transversely; or length-wise, which last is more properly called a Fissure.

Transverse Fractures are more easy to discover, but more difficult to cure than longitudinal ones. A Fracture in the middle of a bone is less dangerous than one towards the articulation. When the Fracture is attended with a wound, contusion, &c. or when the bone is shattered into several pieces, it is highly dangerous. A Fracture of the femur in adults is rarely, if ever so well cured, but there still remains a lameness. Fractures of the lesser bones are usually cured in seven or fourteen days; those of the greater, in twenty or forty days.

In the cure of Fractures, the chirurgeon has two things to attend to: first, to restore the fractured bone into its natural situation; and then to keep it tight with ferula, or splinters, and bandages: in which case, nature takes on herself the office of healing and conglutinating it, by forming a callus thereon.

If there be an inflammation, it must be cured before any thing be attempted about the Fracture. If the bone happen to be broke again, it never breaks in the callus, but at a distance from it. After setting, or replacing the fractured bone, bleeding is required, to prevent any lodgment of blood on the part aggrieved, by the violence upon the fibres.

A Fracture of the cranium is usually certain death, without trepanning.

Capillary FRACTURE, see the article CAPILLATION.

FRENUM, or FRENUM, Bridle, in anatomy, a name given to divers ligaments; from their office in retaining, and curbing the motions of the parts they are fitted to.

FRENUM Linguae, or Bridle of the Tongue, is a membranous ligament, which ties the tongue to the os hyoides, larynx, fauces, and lower part of the mouth.

In some subjects the Frenum runs the whole length of the tongue, to the very tip; in which cases, if it were not cut, it would take away all possibility of speech.

FRENUM of the Penis, is a slender ligament, whereby the prepuce is tied to the lower part of the glans.

Nature varies in the make of this part; it being so short in some, that unless divided, it would not admit of perfect erection. There is also a kind of little Frenum, fastened to the lower part of the clitoris. See CLITORIS.

FRAIGHT *, or FREIGHT, in navigation and commerce, the hire of a ship, or of a part of it; for the conveyance and carriage of goods, from one part, or place, to another; or the sum agreed on between the owner and the merchant, for the hire, and use of a vessel.

* The word is formed of the French Fret, signifying the same thing; or from Fret, of Fretum, an arm of the sea; though others chuse to derive it from the German Fracht, or the Flemish Fracht signifying carriage.

The *Freight* of a vessel is usually agreed on either at the rate of so much for the voyage, or by the month, or per tun.

Freighting, or letting out of vessels on *Freight*, or hire, is one of the principal articles in the trade of the Hollanders: they are the carriers of all the nations of Europe, and their purveyors; notwithstanding that their country produces nothing at all, and that they are forced to have every thing necessary for the building of a vessel from other countries.

The principal laws and rules relating to *freighting* are: that if a whole vessel be hired, and the merchant, or person who hires it, do not give it its full load, or burthen; the master of the vessel cannot without his consent take in any other goods, without accounting to him for *Freight*.

That, though the merchant do not load the full quantity of goods agreed on in the charter-party; yet he shall pay the whole *Freight*; and if he load more, he shall pay for the excess.

That the master may set a-shore such goods as he finds in his vessel, which were not notified to him; or take them at a higher rate than was agreed on for the rest.

That, if a ship be stopped or detained in its course, either through the master's, or the merchant's default; the delinquent shall be accountable to the other.

That, if the master be obliged to refit his vessel during the voyage, the merchant shall wait; or else pay the whole *Freight*: if the vessel could not be refitted, the master is obliged to hire another immediately; otherwise only to be paid his *Freight* in proportion to the part of the voyage performed; though, in case the merchant prove that the vessel at the time it set sail, was not capable of the voyage, the master must lose his *Freight*, and account for damages to the merchant.

That *Freight* shall be paid for merchandizes which the master was obliged to sell for victuals, or refitting, or other necessary occasions; paying for the goods at the rate the rest were sold at, where they were landed.

That in case of a prohibition of commerce with the country whither the vessel is bound, so that it is obliged to be brought back again; the master shall only be paid *Freight* for going.

And if a ship be stopped or detained in its voyage, by an embargo by order of the prince, there shall neither be any *Freight* paid for the time of the detention, in case it be hired per month: nor shall the *Freight* be increased, if hired for the voyage; but the pay, and the victuals of the sailors, during the detention, shall be deemed average.

That the master shall take no *Freight* for any goods lost by shipwreck, plundered by pirates, or taken by the enemy, unless the ship and goods be redeemed; in which case he shall be paid his *Freight* to the place where he was taken; upon contributing to the redemption.

That the master shall be paid his *Freight* for the goods saved from shipwreck; and in case he cannot get a vessel to carry them unto the place where they were bound, that he shall be paid in proportion to the part of the voyage already gone.

That the master may not detain any merchandize in his vessel, in default of payment of *Freight*; though he may order them to be seized any time, or any where afterwards. That if merchandizes in casks, as wines, oils, &c. have so run out in carriage, that the vessels are left empty; or almost empty; the merchant may relinquish them, and the master be obliged to take them for their *Freight*; though this does not hold of any other goods damaged, or diminished of themselves, or through accidents.

FRAIGHT is also used for the burthen, or lading of a ship; or the cargo of goods, &c. which she has on board.

FRAIGHT is also a duty of fifty sols per tun, paid to the crown of France by the captains and masters of all foreign vessels at their entrance into and going out of the ports and havens of that kingdom. And note, that all vessels not built in France, however they may belong to the subjects of France, are reputed foreigners, and subject to this impost; unless it be made appear, that two thirds of the ship's crew are French.

By the 11th article of the treaty of commerce concluded at Utrecht between England and France, this duty of 50 sols per tun was to have been remitted the English; and at the same time the duty of 5 s. sterling to have been suppressed in favour of the French: but the execution of that article, as well as the tariff settled between the two nations, has been suspended.

The Dutch however and the Hans towns are exempted from the duty of *Freight*.

FRAIL, a basket of ruffles, or the like matter, wherein to pack up figs, raisins, &c.

FRAIL also denotes a certain quantity of raisins, about seventy-five pounds.

FRAISE, in fortification, a kind of defence, consisting of pointed stakes, driven parallel to the horizon, into the retranchments of a camp, a half-moon, or the like, to send off and prevent any approach, or scalade.

Fraises differ from palisades chiefly in this, that the latter stand perpendicular to the horizon: and the former jet out parallel to the horizon, at least nearly so; being usually made a little sloping, or with the points hanging down.

Fraises are chiefly used in retranchments, and other works thrown up of earth: sometimes they are found under the parapet of a rampart; serving instead of the cordon of stone used in stone works.

He fortified all the weak places of his camp with *Fraises* and palisades.—All the outworks of the place were *fraised* and palisaded.

FRAISING of a *battalion*, is the lining it all around with pikes; in case of being charged by a body of horse.

FRAME, in joinery, &c. a kind of case, wherein a thing is set, or inclosed, or even supported; as a window *Frame*, a *Frame* of a picture, of a table, &c.

FRAME, is also a machine, used in divers arts. The printer's *Frame* is more usually called a *chase*.

The founder's *Frame* is a kind of ledge, inclosing a board; which being filled with wetted sand, serves as a mould to cast their work in. See **FOUNDERY**.

FRAME is more particularly used for a sort of loom, whereon artizans stretch their linens, silks, stuffs, &c. to be embroidered, quilted, or the like.

FRAME; among painters, &c. is a kind of chassy, or square; composed of four long pieces, or slips of wood, joined together; the intermediate space whereof is divided by little strings or threads into a great number of little squares, like the meshes of a net; and for that reason sometimes called *reticula*.

Its use is in reducing of figures from great to small; or augmenting their size from small to great.

FRAME Lavo, see the article **LAW**.

FRAMING of a *house*, all the timber-work therein; viz. the carcase, flooring, partitioning, roofing, cicling, beams, shivering, &c.

FRAMPOLE Fence, a privilege enjoyed by the tenants of the manor of Writted in Essex; whereby they are entitled to the wood growing on the fence; and as many trees or poles as they can reach from the top of the ditch with the helve of an ax; toward the repair of their fences.

The late chief justice Brampton, whilst steward of this court, acknowledged he could not find out the reason, why these fences were called *Frampole*.—It may come from the Saxon *frimful*, profitable; or may be a corruption of *France-pole*, because the poles are free for the tenant to take.

FRANC, see the article **FRANK**.

FRANCHISE, a privilege, or exemption from ordinary jurisdiction.

FRANCHISE is also used for an asylum, or sanctuary, where people are secure of their persons, &c.

Churches and monasteries in Spain are *Franchises* for criminals; so were they antiently in England; till they were abused to such a degree, that there was a necessity for abolishing the custom.

One of the most remarkable capitulars made by Charlemain in his palace of Heristal, in 779, was that relating to the *Franchises* of churches.—The right of *Franchise* was held so sacred, that even the less religious kings observed it to a degree of scrupulousness; but to such excess in time was it carried, that Charlemain resolved to bring it down. Accordingly he forbid any provision being carried to criminals retired into churches for refuge.

FRANCHISE is also used for an immunity from the ordinary tributes, and taxes.

This is either real, or personal; that is, either belonging immediately to the person; or accruing on account of this or that place, or office of immunity. See **IMMUNITY**.

FRANCHISE of *quarters*, is a certain space, or district at Rome, wherein are the houses of the ambassadors of the princes of Europe; and where such as retire, cannot be arrested, or seized by the sbirri, or sergeants, not prosecuted at law.

The people of Rome look on this as an old usurpation, and a scandalous privilege, which ambassadors, out of a jealousy of their power, carried to a great length in the 15th century, by enlarging insensibly the dependances of their palaces or houses, within which the right of *Franchise* was antiently confined. Several of the popes, Julius III. Pius XIV. Gregory XIII. and Sixtus V. published bulls and ordinances against this abuse; which had rescued so considerable a part of the city from their authority, and rendered it a retreat for the most abandoned persons.

At length Innocent XI. expressly refused to receive any more ambassadors but such as would make a formal renunciation of the *Franchise* of *quarters*.

FRANCHISE *royal*, is a place where the king's writ runs not; as at Chester, and Durham: and antiently at Tyndal and Ex-amshire in Northumberland.

FRANCHISING, see **ENFRANCHISEMENT**, and **MANUMISSION**.

FRANCIGENA, or **FRENCHMAN**, in our antient customs, was a general appellation of all foreigners, i. e. all persons who could not prove themselves Englishmen.

FRANGIPANE, an exquisite kind of perfume, frequently given to the leather whereof gloves, purses, bags, &c. are made.

It takes its name from a Roman nobleman, of the ancient family of Frangipani; who was the inventor thereof.

There is also a kind of perfumed liquor of the same denomination, said to have been invented by a grandson of Mutio Frangipani; and also a perfumed kind of *ros silis*, called by the same name.

FRANK, or **FRANC**, a term literally signifying free, open, exempt from public impositions and charges: as *Frank confession*, *Frank fair*, *Frank letter*, &c.

The term *Frank* is much used in our ancient customs and tenures; where it receives various particular modifications and meanings, according to the words it is combined with, as

FRANK Alien, or *Allodium*, is a land, tenement, or demesne, that is not hold of any superior lord.

FRANK Alms, or *Free Alms*, is a tenure of lands or tenements bestowed on God; that is, given to such people as devote themselves to the service of God, in pure and perpetual alms.

Whence, the feoffers, or givers cannot demand any terrestrial service, so long as the lands remain in the hands of the feoffees.

Briton mentions another kind of this land given in alms, but not free alms; the tenants being tied in certain services to the feoffer.

FRANK Bank, see the article **FREE Bench**.

FRANK Chace, denotes liberty of free chace, in a circuit adjoining to a forest, on account of which, men, though they have land of their own within that compass, are forbidden to cut down wood, without the view of the forester; though it be their own demesne. See **CHACE**.

FRANK Fee, *Feudum francum*, as defined by Brooke, is that which is in the hands of the king, or lord of a manor; being ancient demesne of the crown.

FRANK Fee, *Feudum liberum*, according to some, denotes that for which no service is performed to any lord.

According to Fachin, l. vii. c. 39. lands held in *Frank Fee* were exempted from all services, except homage.

In contradistinction to that in the tenants hands, which is only ancient demesne.

In the reg. of writs, *Frank Fee* is said to be that which a man holds at common law to him and his heirs; and not by such service as is required in ancient demesne, according to the custom of the manor.

It is added, that the land in the hands of king Edward the Confessor, at the making of domesday book, is ancient demesne; and all the rest, *Frank Fee*. On which footing, all the lands in the realm are either ancient demesne, or *Frank Fee*.

Others define *Frank Fee* to be a tenure in fee simple, of lands pleadable at common law; and not in ancient demesne.

FRANK Farm, *frma libera*, is lands or tenements, wherein the nature of the fee is changed, by seoffment, from knight's service, to a certain yearly service; and whence neither homage, wardship, marriage, nor relief may be demanded: nor any other service, not contained in the seoffment. See **FREE Farm**.

FRANK Fold, is where the lord hath the benefit of folding his tenant's sheep, within his manor; for the manuring of his land.

FRANK Language, or *Lingua FRANCA*, is a kind of jargon, spoke on the Mediterranean, and particularly throughout the coasts and ports of the Levant; composed of Italian, Spanish, French, vulgar Greek, and other languages.

The *Lingua Franca* is the trading language; and is thus called from the *Franks*, a common appellation given in the Levant to all the European merchants and traders, who come thither to traffick.

In this language, if it may be so called, nothing but the infinitive mood of each verb is used; this serving for all the tenses and moods of the conjugation: and yet this lame, mutilated diction, this barbarous medley, is learnt and understood by the merchants and mariners of all nations who repair thither.

FRANK Law, *Lex libera*, is the benefit of the free, and common law of the land.

He that for any offence, as conspiracy, &c. loseth his *Frank Law*, incurs these inconveniencies. 1^o That he may not be impanelled on any jury or affize; or otherwise used as an evidence, or witness to the truth. 2^o That if he have any thing to do in the king's court, he must not approach it in person, but appoint his attorney. 3^o That his lands, goods, and chattels, be seized into the king's hands; and his lands be treated, his trees rooted up, and his body committed to custody.

FRANK Marriage, *Liberum Matrimonium*, is a tenure in tail special, whereby lands or tenements are held to a person and his wife, and the heirs of their bodies, on condition of doing fealty to the donor from the fourth degree.

This tenure arises from those words in the gift: *Sciatis, &c. me T. B. de O. dedisse ac concessisse, & presenti charta mea confirmasse A. B. filio meo, & Marice uxori ejus, filie C. D.*

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in liberum matrimonium unum messuagium, &c.

Fleta gives this reason, why the heirs do no service, till the fourth degree: *ne donatus vel eorum heredes per homagi receptionem a reversione repellantur*: and why in the fourth descent they shall do service to the donor, *quia in quarto gradu vehementer presumitur quod terra est pro defectu heredum donatoriorum reversione*.

Frank Marriage, is more clearly expressed by Braeton, to be that where the donor intends that the land thus bestowed, shall remain quiet, and free from all secular service that might be affected to the fee; so that he who gave it, shall claim no manner of service from it, until the third heir, and the fourth descent, or degree; reckoning the donee in the first degree, his heir in the second, the heir of him in the third, and his, again, in the fourth; but afterwards the same land to become subject to all the former services; as being then supposed to revert to the lord for want of heirs.

The lands otherwise given in marriage, *viz. servitio obligata*, were with a reservation of the services due to the lord, which the donee and his heirs were bound to perform for ever: only, homage was not to commence till the fourth degree; when both service and homage were to be enjoined for ever.

FRANK Pledge, signifies a pledge, or surety for the behaviour of a free man; called also *Friburgh*.

The ancient custom of England, for preservation of the public peace, was, that every free-born man, at fourteen years of age (religious persons, clerks, knights, and their eldest sons excepted) should find surety for his truth towards the king and his subjects, or else to be kept up in prison.

Accordingly, a number of neighbours became interchangeably bound for each other, to see each man of their pledge forthcoming at all times; or to answer for the offence committed by any one gone away: so that whenever one offended, it was presently enquired in what *Pledge* he was; and then those of the *Pledge* either brought him forth within one and thirty days to his answer; or they satisfied for his offence.

This custom was called *Frank Pledge*; and the circuit it extended to, *Decenna*, by reason it usually consisted of ten households; and every person thus bound for himself and neighbours, was called a *Decennior*.

In observance of this custom, the sheriffs at every county court did from time to time take the oaths of young persons, as they arrived at the age of fourteen; and see they were settled in one *Decenna*, or *Dozain*, or another. Whereupon this branch of the sheriff's office and authority was called *Visus Franci Plagi*, i. e. *View of Frank Pledge*.*

* *Omnis homo, sive liber, sive servus, aut est, vel debet esse in Franco Plegio, aut de aliquo, manuposte, nisi sit aliquis itinerans de loco in locum, qui non plus se teneat ad unum quam ad alium, vel qui habet quod sufficiat pro Franco Plegio, sicut dignitatem, vel ordinem, vel liberum tenementum, vel in civitate rem immobilem, &c.* Braeton, l. iii. Trañ. de Corona, c. 20.

FRANK Service, see the article **SERVICE**.

FRANK Tenement, see **TENEMENT**, and **FREEHOLD**.

FRANK, or **FRANC**, also denotes an ancient coin, struck, and current in France; thus called from its impression, which represented a Frenchman, sometimes on horseback, and sometimes on foot.

The *Frank* was either of gold, or silver: the first was worth somewhat more than the *ecu d'or*, or gold crown. See **CROWN**. The second was a third of the first: but these coins have been long disused.

The term *Frank*, however, is still retained, as the name of a money of account. In this sense it is equivalent to a *livre*, or 20 *sols*, or a third of a French crown.

Thus they say indifferently, a hundred *Franks*, or a hundred *livres*.

FRANKINCENSE*, or simply **INCENSE**, an odorous aromatic gum, or resin, antiently burnt in temples, as a perfume, and now used in pharmacy, as an agglutinant and strengthener.

* The word is formed from the Latin *incensum*, burnt; as alluding to its antient use in temples.

Frankincense distils from incisions made in a tree, called *Arbor Thurifera*, during the heats of summer. — But for all the great use of this gum, both in the antient religion, and the modern medicine; the tree that produces it, or even the place where the tree grows, is but little known.

The most common opinion has always been, that it was brought from Arabia Felix, and was found near the city of Saba; whence its epithet *Sabæum*: and yet the name *Olibanum*, which it sometimes also bears, seems to intimate, that there are of these thuriferous, or incense-bearing trees in the Holy Land near mount Lebanon. And travellers are positive, that there are others in the East Indies.

Nor are we less at a loss as to the form or kind of the tree from which it flows. Pliny contents himself to say that it at first resembles the pear tree; then the mastic tree; then the laurel; but that in reality it is a kind of turpentine tree.

Frankincense is usually divided into *male* and *female*.

The best *Male Incense*, *Thus Masculum*, called also *Olibanum*, is in fair, white bits, or tears, a little yellowish, of a bitter disagreeable taste; and when chewed, it promotes the flux of saliva. It is called *Male*, in respect of its tears, which are larger than those of the comnton; or female.

That brought from the Indies, is not near so good as that from Arabia, or mount Lebanon; it is sometimes called *Incense of Mocha*; though it be not brought from that city. It is often in a mass, but sometimes in loose drops or tears; somewhat reddish, and bitter to the taste. Some sell this for the true bellinum.

Male incense, or *Olibanum*, is an ingredient in divers galenic and chemical preparations: it warms, dries, and binds; and is used not only in divers diseases of the head and breast; but in vomitings, diarrheas, and dysenteries. Externally it is applied to strengthen the brain, and heal wounds. Some use it to alluage the tooth-ach; but it is apt to spoil the good teeth.

For *Female Incense*, or *Frankincense*, authors describe it to be softer, and more resinous, but of lesser virtue than the former. *Bark of Incense*, *Cortex Ybaris*, is the bark of the tree whence the *Incense* flows, which has the same qualities with the *Incense* itself.

There is another bark brought from the Indies, called also *Bark of Incense*, and sometimes *Jews Incense*, in regard the Jews make frequent use thereof in their perfumes; this is the *Cortex Eleutherie*.

Manna of Incense, is the flower or farina of *Incense*, occasioned by the friction of the grains against each other in the sacks wherein they carry it.

There is also a foot of *Incense*, which is a preparation of it; burnt like resin to make lamp-black.

Frankincense was formerly burnt in the temples of all religions, to do honour to the divinities that were there adored. Many of the primitive christians were put to death, because they would not offer *Incense* to idols.

In the Romish church they still retain the use of *Incense* in many of their ceremonies, particularly at solemn funerals, bestowing it on such persons as they would honour, as on prelates, &c. and sometimes also on the people. See *Supplements*, article *THUS*.

F R A N K S, **F R A N C S**, **F R A N K I S**, or **F R A N Q U I S**, a name which the Turks, Arabs, Greeks, &c. give to all the people of the western parts of Europe.

The appellation is commonly supposed to have had its rise in Asia, at the time of the Croisades; when the French made the most considerable figure among the Croisades: from which time the Turks, Saracens, Greeks, Abyssinians, &c. used it as a common term for all the Christians of Europe; and called Europe itself, *Frankistan*.

The Arabs and Mahometans, says Monf. d'Herbelot, apply the term *Franks* not only to the French (to whom the name originally belonged) but also to the Latins and Europeans in general.

Franks, or *Frauc*, primarily denotes a *Frenchman*; and, by extension, an European, or rather a Latin, by reason, says the same author, the French distinguished themselves above the other nations, engaged in the holy war.

But Fa. Goar, in his notes on Codinus, cap. v. n. 43. furnishes another origin of the appellation *Franks*, of greater antiquity than the former. — He observes, that the Greeks at first confined the name to the *Franks*, i. e. the German nations, who had settled themselves in France or Gaul: but afterwards they gave the same name to the Apulians and Calabrians, after they had been conquered by the Normans; and at length the name was further extended to all the Latins.

In this sense is the word used by divers Greek writers; as Comnenus, &c. who, to distinguish the French, call them the *western Franks*.

Du Cange adds, that about the time of Charlemaign, they distinguished eastern France; western France; Latin, or Roman France; and German France, which was the ancient France, afterwards called *Franconia*.

F R A T E R N I T Y, *Brotherhood*; the relation, or union of brothers, friends, partners, associates, &c.

F R A T E R N I T Y, in a civil sense, is used for a gild, association, or society of persons, united into a body, for some common interest, or advantage.

For the origin, use, &c. of *Fraternities*, see **G I L D**.

F R A T E R N I T Y, in a religious sense, is a society of persons, meeting together to perform some exercises of devotion, or divine worship.

In the Romish church, such *Fraternities* are very numerous and considerable; being most of them established by royal patents: as the *Fraternity of the Scapulary*; of St. Francis's cord. The bishop may hinder the establishment of any such *Fraternity* in his diocese.

At Rome there is a *Fraternity* called the *Archi-Fraternity*, or *Grand Fraternity*, under the title of *Our Lady of the Suffrages*, established in favour of the souls in purgatory; approved and confirmed by a bull of pope Clement VIII. in 1584. There are nine different sorts of *Fraternities*, or confraternities

in France, viz. 1° Of Devotion. 2° Of Charity, or Mercy. 3° Of Penitents, under divers names. 4° Of Pilgrimages. 5° Of Merchants, to procure the divine favour on their endeavours. 6° Of Officers of Justice. 7° Of the Sufferings of Christ. 8° Of Arts and Trades of divers kinds. And 9° Of Factions.

Fraternities, in Latin called *Sodalitates*, derive their origin from the heathens; as is shewn by Polydore Virgil, in his book *de Inventariis rerum*. But the good use made of them by the Christians, has effectually purged them of any impurities, derived from so ill a source.

Numa Pompilius is said to have established *Fraternities* of all arts and trades in ancient Rome; and to have prescribed the sacrifices each profession was to perform to the patrons or tutelary gods he had assigned them.

F R A T E R N I T Y of the holy Trinity, see **T R I N I T Y**.

F R A T E R N I T Y is also a title, or quality, which kings and emperors gave to each other; so also do bishops and monks. We meet with it frequently in authors under the eastern empire; both Greek and Latin; the Greek term is *αδελφότης*, *Fraternitas*.

F R A T E R N I T Y of Arms, was an alliance, or association in arms, antiently concluded between two knights, who thereby agreed to go together, share their fortune, and mutually assist each other against all the world.

Bertrand du Guesclin, and Oliver Clifton swore a *Fraternity* of arms in the year 1579, laying their hands on the gospels. *Hist. de Bret. T. i. p. 395.*

F R A T I C E L L I*, a sect of heretics, who rose in the marquise of Ancona, about the year 1294.

* The word is an Italian diminutive, signifying *fratriculi*, or little brothers; and was here used by reason they were most of them apostate monks, whom the Italians call *Frattelli*, or *Fraticelli*.

The founders were P. Maurato, and P. de Fossombroni; who having obtained of pope Celestin V. a permission to live in solitude, after the manner of hermits, and to observe the rule of St. Francis in all its rigor; several idle vagabond monks joined them; who living after their own fancies, and making all perfection to consist in poverty, were soon condemned by pope Boniface VIII. and the inquisitors ordered to proceed against them as heretics. Upon this, retiring into Sicily; Peter John Oliva de Serignan had no sooner published his comment on the Apocalypse, than they adopted his errors.

They held the Romish church to be Babylon; and proposed to establish another far more perfect one; they maintained that the rule of St. Francis was the evangelical rule observed by Jesus Christ and his Apostles.

Some say they even elected a pope of their new church: at least they appointed a general, with superiors: and built monasteries, &c. Beside the opinions of Oliva, they held that the sacraments of the church were invalid; by reason those who administered them, had no longer any power or jurisdiction.

They were condemned a-fresh by pope John XXII; but several of them returning into Germany, were sheltered by the duke of Bavaria.

The *Fraticelli* had divers other denominations: they were called *Fraticelli*, according to some, by reason they lived in community, in imitation of the primitive Christians; *Dulcini*, from one of their doctors; and *Bisaches*, for what reason we do not know.

F R A T R I A G E, **F R A T R I A G I U M**, or **F R E R A G E**, the partition among brothers, or cohorts, coming to the same inheritance or succession.

F R A T R I A G E is more particularly used for that part of the inheritance, which comes to the youngest brothers.

Whatever the cadets, or younger brothers, possess of the father's estate, they possess *ratione Fratriagii*, and they are to do homage to the elder brother for it; in regard he is to do homage for the whole to the superior lord.

F R A T R I F S *Arvales*, see the article **A R V A L E S**.

F R A T R E S *Conjurati*, in our ancient law books, &c. denote sworn brothers, or companions.

Sometimes they are also so called who were sworn to defend the king against his enemies, *Leg. W. I. cap. 59. Praecipimus ut omnes liberi homines sint Fratres conjurati ad monarchiam nostram & regnum nostrum contra inimicos pro posse suo defendendum.*

F R A T R I C I D E, the crime of murdering one's brother. See **P A R R I C I D E**.

Cain committed the first *Fratricide*: and the empire of Rome began with a *Fratricide*.

F R A U D, **F R A U S**, a secret, under-hand deceit, or injury, done to any one.

To export, or import goods by *Fraud*, or fraudulently, is to do it by indirect ways; in order to avoid the paying of duty, &c. if they be permitted goods; or if they be contraband goods, to avoid the penalties adjudged by the laws.

F R A Y, literally signifies to fret; as cloth or stuff does by rubbing, or over-much wearing.

Among hunters a deer is said to *fray his head*, when he rubs it against a tree, to cause the skins of his new horns to come off.

FRECKLES, small, dusky spots, sprinkled on the skin of the face, or hands; particularly in persons of the fairest skins, and during the hot seasons, after being exposed to the sun, and air. They are supposed to be formed of fuliginous vapours, stopped and coagulated in the skin. Vide Turner's discourse of the skin, p. 256.

They are called in Latin, *Lentiginos*, from their resemblance in size and colour to a lentil: by the French they are called *Rouffeurs*, and *bande Judas*; by the Italians *Rossore*, and *Lentigine*.

Freckles seem to be only the earthy, oily, and saline part of the sweat, retained in the plexus, or masses of the skin. While the aqueous liquor, which was their vehicle, is evaporated by the heat of the body, these grosser parts are gradually accumulated, till the masses are full.

Some parts of this sweat are continually oozing through the cuticle; and being of a viscid nature, they retain the dirt, dust, &c. that falls about the face. This viscid matter on the surface of the *Freckles*, will stick there, notwithstanding any repeated wipings, which rather condense and press it into the cavities thereof, than clear it off.

They are found more about the nose, than any where else; by reason the skin is more stretched there, and consequently the pores more patent, to receive the dust, &c.

It follows, that there can scarce be any such thing as an adequate remedy, or preventive of *Freckles*. Temporary ones there may be, which shall draw out and dissipate what matter is already gathered: but the spaces will fill up again in time.

Bullock's gall, mixed with alum; and after the alum has precipitated, exposed three or four months to the sun in a close phial, Monf. Homberg shews, is one of the best remedies known for *Freckles*. It acts as a lixivium; and enters the pores, and dilutes and dissolves the coagulum of the *Freckles*. *Mém. de l'Acad. Royal. des Scien. An. 1709, p. 472, &c.*

FREE, a term variously used; but generally in opposition to constrained, confined, or necessitated. See **FRANK**.

Thus, a man is said to be *free*, who is out of prison: and a bird is *free*, when let out of the cage; *free* from pain, i. e. void of pain: we say, a *free* air: a *free* passage, &c.

FREE, in speaking of things endowed with understanding, has a more peculiar relation to the will, and implies its being at full liberty.

The Stoics maintain, that their sage or wise men alone are *free*.

FREE is also used in opposition to slave.

The moment a slave sets foot on English ground, he becomes *free*. The finest legacy the antient Romans could leave their slaves, was their *freedom*.

FREE Agents, see the article **AGENTS**.

FREE Bench, or *Franc Bone*, signifies that estate in copyhold lands, which the wife hath after the decease of her husband, for her dower, according to the custom of the manor.

Fitzherbert calls *Free Bench* a custom, whereby, in certain cities, the wife shall have her husband's whole lands, &c. for her dower.

Thus, at Orleton, in the county of Hereford, the relict of a copyhold tenant is admitted to her *Free Bench*, i. e. to all her husband's copyhold land, during her life, at the next court after her husband's death.

In the Manors of East, and West Emborne, in Berks, if a customary tenant die, the widow shall have her *Free Bench* in all his copyhold lands, only *dum sola & casta fuerit*; if the commit incontinency, she forfeits her estate: but if she will come into court, riding backwards on a black ram, with his tail in her hand, rehearsing a certain form of words, the steward is bound by the custom to restore her to her *Free Bench*.

The like customs hold also in the manor of Chadleworth, in Berks, that of Tor, in Devonshire; and in some others parts of the West.

FREE Bord*, *Franc Bord*. --- In some places three feet, in others more, and in others less, is claimed by way of *Free Bord*, beyond or without the fence.

* *Et totum boscum, quod vocatur Brendewode, cum Franc Bordo curram pedum, & dimid. per circuitum illius bosci.* Mon. Ang. 2^a Part, fol. 241.

FREE Chapel, is a chapel founded by the king, and by him exempted from the jurisdiction of the ordinary. See **CHAPEL**.

A subject may also be licensed by the king to build such a chapel; and by his charter may exempt it from the visitation of the bishop, &c.

FREE, or *imperial cities* in Germany, are those not subject to any particular prince; but governed, like republics, by their own magistrates.

There were *free cities*, *libere civitates*, even under the antient Roman empire: such were those to whom the emperor, by the advice, or consent, of the senate, gave the privilege of appointing their own magistrates, and governing themselves by their own laws. See **CITY**.

FREE Fair, see the article **FAIR**.

FREE Fee, see the article **FEE**.

FREE Mason, see the article **MASON**.

FREE Part, see the article **PORT**.

FREE State, is a republic, governed by magistrates, elected by the *free suffrages* of the inhabitants.

FREE Stone, a whitish stone, dug up in many parts of England, that works like alabaster; but is more hard and durable; being of excellent use in building, &c.

It is a kind of the greet stone, but finer fanded, and a smoother stone; and is called *Free Stone* from its being of such a constitution as to be cut freely in any direction.

FREE Stool, see the article **FRIDSTOLL**.

FREE Thinker, see the article **DEIST**.

FREE Warren, the power of granting, or denying license to any one to hunt in such and such ground.

FREE Will, see the article **WILL**.

FREEBOOTER, or **FLIBUSTER**, a name given to the pirates, who scour the American seas; particularly such as make war against the Spaniards.

The French call them *Flibusters*, deducing the word from the English flibote, or flybote; by reason the first adventurers of this kind were the people of S. Domingo, who made their excursions with flybotes, which they had taken from the English. See **BUCCANEER**.

FREEDOM, the quality, or state of being *free*. See **FREE**.

FREEDOM of a City, Town, &c. denotes a right, or capacity of exercising a certain trade, or employment, in that city, or town corporate; and of being elected to the dignities and offices thereof. It is procured regularly, by serving an apprenticeship; but sometimes purchased with money; and sometimes conferred as a favour or compliment.

FREEDOM of the will, a state, or faculty of the mind, wherein all the motions of our will are in our own power; and we are enabled to determine on this, or that; to do good, or evil, without any force; or constraint from any external cause whatever. See **LIBERTY**.

FREEDOM of Conscience, see **LIBERTY** and **TOLERATION**.

The schoolmen distinguish two kinds of this *Freedom*. --- *viz.* **FREEDOM of Contradiction**, whereby we are at our choice to will, or nill; to love, or not love, &c.

Thus, if I give my friend a power to take my horse; that friend has *Freedom* of contradiction, with respect to the horse; since it is in his own power, either to use him, or let him alone.

FREEDOM of Contrariety, or of *Contrarietas*, is that whereby we are at our choice to do good, or evil; to be virtuous or vicious.

Thus, if I offer my friend a horse, or a lion; and give him his option of the two, he is said to have a *liberty of contrariety*, over the horse and lion.

But the logicians charge this as a faulty, or unartful division; in regard one member of the division is contained in the other, as a species in the genus: for whatever is free, in respect of contradiction, is also free in respect of contrariety; though not vice versa: for if it be free for my friend to take the horse, or the lion; it is also free for him, to let them both alone: but he may be free to take one of them, without a *Freedom* of chusing which to take.

Yet is the distinction of some use; as it intimates that the will is not always possessed of both kinds of *Freedom*; and that the matter, or subject of the two is different.

The will, though free, has not a liberty of contrariety: thus, any evident truth being proposed to the mind, e. gr. that the whole is greater than a part, we have a power of not assenting thereto, by diverting our attention to something else: but we have not a power of dissenting from that proposition, and judging that the whole is not greater than the part.

Hence, moralists commonly hold, that with respect to the supreme good, mankind has a liberty of contradiction; inasmuch as he may abstain from the love, or pursuit thereof: but he has not a liberty of contrariety, whereby to hate goodness.

Add, that though the human mind may have a *Freedom* of contradiction, with respect to all objects, even the supreme good itself; yet the *Freedom* of contrariety is restrained to certain particulars, which either are, or appear to be good: the will having such a natural propensity to good, that it cannot desire evil, but under the notion and appearance of good.

FREEDOM of thinking, see the article **DEISM**.

FREEHOLD, **FRANK TENEMENT**, *Libertum Tenementum*, is land, or tenement, which a man holds in fee simple, fee tail, or for term of life.

Freehold is of two kinds, *in deed*, and *in law*.

The first is the real possession of land, or tenement in fee, fee tail, or for life: the other is the right a man has to such land or tenement before his entry or seizure.

FREEHOLD is likewise extended to such offices as a man holds in fee, or for life. See **FEE**.

FREEHOLD is also sometimes taken in opposition to *Villinage*. See **VILLENAGE**.

Lambard observes, that land, in the Saxons time, was distinguished into bockland, *i. e.* holden by book, or writing; and folk-land; held without writing.

The former, he says, was held on far better condition, and by the better sort of tenants; as noblemen and gentlemen; being such as we now call *Freehold*: the latter was mostly in possession of peasants; being the same with what we now call *the will of the lord*.

In the antient laws of Scotland, *Freeholders* are called *militēs*, knights.—In *reg. judicial*, it is expressed, that he who holds land upon an execution of a statute merchant, until he hath satisfied the debt, *tenet ut liberum tenementum sibi et assignatis suis*; and the fame of a tenant per elegit: the meaning of which seems to be, not that such tenants are *Freeholders*; but as *Freeholders* for the time till they have received profits to the value of their debt.

FREEZE, or **FRIZE**, in architecture, that part of the entablature of columns, between the architrave and cornice.—See *Tab. Archit.* fig. 24, 26, 28, 30, 32, 49. lit. e. and 26. lit. u. The *Freeze* is properly a large, flat face, or member separating the architrave from the cornice.

The antients called it *Zophorus*, *ZooPhoros*, by reason it was usually enriched with figures of animals; and our denomination *Freeze* has a like origin, being formed of the latin *phrygio*, an embroiderer, because it is commonly adorned with sculptures in basso relievo, imitating embroidery.

The *Freeze* is supposed to be intended to represent the heads of the transverse beams that sustain the roof or covering.

In the tuscan order it is quite plain: in the doric, enriched with triglyphs: in the ionic, it is sometimes made arched, or swelling, in which case it is called by Vitruvius, *pulsinatus*, q. d. bolstered: in the corinthian, and composite, it is frequently joined to the architrave, by a little sweep; and sometimes to the cornice. And in these richer orders it is usually adorned with sculpture, figures, compartiments, histories, foliages, festoons, &c.

As to the height of the *Freeze*, it is in general much the same with that at the architrave.—The tuscan *Freeze*, Vitruvius makes 30 minutes; Vignola 35; Palladio, who makes it swelling, gives it but 26; and Scamozzi 42. The doric, in Vitruvius and Vignola, is 30 or 40 minutes; in Palladio, &c.

45. The ionic, Vitruvius makes flat, adorned with acanthus leaves, lions, &c. and makes it 30 minutes high: Vignola, who also makes it flat, gives it 45 minutes; and Palladio, who makes it convex, or swelling, 27 minutes; and Scamozzi 28. The corinthian, Vitruvius enriches with acanthus leaves, human figures, &c. and makes its height 37 minutes, Vignola 45; Palladio 28; and Scamozzi 31½. Lastly, the composite, which in Vitruvius is set with cartouches, and carved between them, is 52½ minutes; Vignola, who makes it like Vitruvius, only gives it 45 minutes; Palladio, who makes it swelling, only 30; and Scamozzi, 32.

From the variety of enrichments practised on the *Freezes*, they become variously denominated, as

Convex, or *pulsinated FREEZES*, are those whose profile is a curve; the best proportion whereof, is, when drawn on the base of an equilateral triangle.

In some the swelling is only at the top, as in a console: in others at bottom, as in a baluster.

Flourished FREEZES are those enriched with rinds or imaginary foliages; as the corinthian *Freeze* of the frontispiece of Nero: or with natural leaves, either in clusters, or garlands: or continued, as in the ionic of the gallery of Apollo in the Louvre.

Historical FREEZES are those adorned with bas-relievo's, representing histories, sacrifices, &c. as that of the arch of Titus at Rome.

Marine FREEZES, are those representing sea-horses, tritons, and other attributes of the sea; or shells, batis, grotto's, &c.

Rustic FREEZES, are those whose courses are rusticated, or imbossed; as the tuscan *Freeze* of Palladio.

Symbolical FREEZES, are those adorned with the attributes of religion; as the corinthian of the temple behind the capitol at Rome, whereon are represented the instruments and apparatus of sacrifice.

FREEZE of the capitol, see **HYPOTRACHELIUM**.

FREEZE, in commerce, a kind of cloth, or stuff; see **FRIZE**.

FREEZING, *Congelation*, in physiology, the fixing of a fluid, or depriving it of its natural mobility, by the action of cold: or it is the act of converting a fluid substance into a firm, coherent, rigid one, called *Ice*.

The Cartesians define *Freezing* by the quietude, or resting of a fluid body, hardened by cold; which follows naturally enough from their notion of fluidity, where the parts are supposed to be in a continual motion.

In effect, one may pretty safely say, with some of those philosophers, that water only *freezes*, because its parts lose their natural motion, and adhere close to each other.

The principal phenomena of **FREEZING** are, 1^o That water, and all fluids, oil alone excepted, dilate in *freezing*, *i. e.* take up more space, and are specifically lighter than before.

2^o That the bulk, or dimensions of water is increased by *freezing*,

is matter of abundant experiment; and here it may be proper to observe the process of nature in this alteration.

A glass vessel, then, B D (*Tab. Pneumat.* fig. 20.) full of water to D, being immersed in a vessel of water, mixed with salt, RSTV, the water presently rises from E to F; which seems owing to the sudden contraction of the vessel hastily plunged into cold a medium. Soon after, from the point F it continually descends, condensing; till it arrives at the point G; where, for some time, it seems to remain at rest. But it soon recovers itself, and begins to expand; rising from G to H; and from thence, soon after, by one violent leap, mounts to I. And here the water in B is immediately seen all thick, and cloudy; and in the very instant of this leap, is converted into ice. Add, that while the ice is growing harder, and some of the water near the neck of the vessel B is *freezing*, the flux of water is continued above I, towards D, and at length runs out of the vessel.

2^o That they lose not only of their specific, but also of their absolute gravity, by *freezing*; so that when thawed again, they are found considerably lighter than they were before.

3^o That *frozen* water is not quite so transparent, as when liquid; and that bodies do not perspire so freely through it.

4^o That water, when *frozen*, evaporates almost as much as when fluid.

5^o That water does not *freeze* in vacuo; but necessarily requires the presence and contiguity of the air.

6^o That water which has been boiled, does not *freeze* quite so readily as that which has not.

7^o That the water being covered over with a surface of oil of olives, does not *freeze* so readily as without it; and that nut oil absolutely preserves it under a strong frost, when olive oil would not.

8^o That spirit of wine, nut oil, and oil of turpentine, do not *freeze* at all.

9^o That the surface of the water, in *freezing*, appears all wrinkled; the rugae, or wrinkles, being sometimes in parallel lines, and sometimes like rays, proceeding from a centre to the circumference.

The Theories of **FREEZING**, or the method of accounting for these phenomena, are very numerous.—The great principles different authors have gone upon, are either, that some foreign matter is introduced within the pores of the fluid, by whose means it is fixed, its bulk encreased, &c.

Or, that some matter naturally contained in the fluid, is now expelled; by the absence whereof the body becomes fixed, &c.

Or, that there is some alteration produced in the texture or form, either of the particles of the fluid itself, or of something contained within it.

To some one of these principles all the systems of *freezing* are reducible.

The Cartesians, who ascribe all to the quietude of the parts of the fluid, before in motion, account for *Freezing* from the recess of the ætherial matter out of the pores of the water. The activity of that æther, or subtle matter, they hold to be that which gave the particles of the fluid their motion: consequently, upon the absence of this matter, the fluidity must cease.

Though others of the same sect ascribe *Freezing* to a diminution of the usual force and efficacy of the ætherial matter, occasioned by an alteration in the temperature of the air, whereby it is incapacitated for agitating the parts of the fluid as usual.

The Gassendists, and other corpuscularians, with more probability ascribe the *Freezing* of water to the ingress of multitudes of cold or frigorific particles, which entering the liquor in swarms, and dispersing themselves every way through it, do crowd into the minutest pores of the water, and hinder the wonted agitation of its parts; wedging it up, as it were, into the hard and consistent body of ice. And hence its increase of dimensions, coldness, &c.

This intromission of a foreign frigorific matter, they suppose essential to congelation; as that which characterises and distinguishes it from conglutination; the latter being effected indifferently by a hot, or cold mixture; but the former only by a cold one.

Of what kind these frigorific particles are, or how they produce their effect, is matter of debate; and has given occasion to various systems.

Hobbes will have them to be common air, which intruding into the water in congelation, entangles itself with the particles of the fluid, prevents their motion, and produces those numerous bubbles observed in ice; thus expanding its bulk, and rendering it specifically lighter: but this opinion is overturned by Mr. Boyle, who shews that water will freeze in vessels hermetically sealed, and into which the air can have no ingress; and yet the bubbles will be as numerous herein, as in that froze in the open air. Add, that oil is condensed, in *freezing*: consequently, the air cannot there be the cause.

Others, and those the greatest number, will have the *freezing* matter to be a salt; arguing, that an excess of cold will render water torpid: but can never congeal it, without salt. They are saline particles, say they, and those dissolved and mixed in a due proportion, that are the chief cause of *Freezing*: congelation bearing a near relation to crystallization.

This salt, they suppose of the nitrous kind; and to be furnished by the air, which is generally allowed to abound in nitre. See AIR, and NITRE.

How the particles of nitre may prevent the fluidity of water, is pretty easily accounted for: these particles are supposed to be so many rigid, pointed spicula, which are easily driven into the stamina, or globules of the water; and thus becoming variously mingled and entangled therewith, by degrees insensible and destroy the motion thereof.

The reason this effect only arises in severe winter weather, is, that it is then only that the retarding action of the nitrous spicula is more than equal to the power or principle whereby the fluid is otherwise kept in motion, or disposed for motion.

This opinion is supported by the known experiment of artificial Freezing.—A quantity of common salt or saltpetre being mixed with snow, or ice pulverised; and the mixture dissolved by the fire: upon immersing a tube full of water in the solution; the water, or at least that part of it next the mixture, presently freezes, even in warm air. Whence it is imagined, that the spicula of the salt, by the gravity of the mixture, and of the incumbent air, are driven through the pores of the glass, and mixed with the water: for that it is the salt has the effect, is supposed evident; inasmuch as we know assuredly that the particles of water cannot find their way through the pores of glass. In these artificial Freezings, whatever part the mixture is applied in, there is presently produced a skin, or lamina of ice; whether at top, or bottom, or on the sides: by reason there is always a flock of saline corpuscles, sufficient to overpower the corpuscles of fire: but natural congelations are confined to the top of the water, where the salt most abounds.

Against this system the author of the *Nouvelle conjecture pour expliquer la nature de la glace*, objects, that it does not appear, that nitre always enters the composition of ice; but that if it did, it would come short of accounting for some of the principal effects. For how, for instance, should the particles of nitre, by entering the pores of water, and fixing the parts, oblige the water to dilate, and render it specifically lighter? Naturally they should augment its weight. This difficulty, with some others, shew the necessity of a new theory. That author, therefore, advances the following one, which seems to solve the phenomena in a more easy and simple manner; as not depending on the precarious admission or extrusion of any heterogeneous matter.

Water, then, freezes in the winter only, because its parts being then more closely joined together, mutually embarrass one another, and lose all the motion they had: and the cause of this closer union of the water, is the air; or more expressly, an alteration in the spring and force of the air.

That there are an infinite number of particles of gross air, interpersed among the globules of water, is abundantly evident from experiment: and that each particle of air has the virtue of a spring, is confessed: now this author argues, that the small springs of gross air mixed with the water, have more force in cold winter weather, and unbend themselves more, than at other times. Hence, those springs thus unbending themselves on one side, and the external air continuing to press the surface of the water on the other; the particles of water thus constringed and locked up together, must lose their motion and fluidity, and form a hard consistent body: till a relaxation of the spring of the air, from an increase of heat, reduce the particles to their old dimensions, and leave room for the globules to flow again.

But this system has its foible: even the principle on which it stands, may be demonstrated to be false. The spring, or elasticity of the air is not increased by cold; but diminished. Air expands itself by heat, and condenses by cold: and it is demonstrated in pneumatics, that the elastic force of expanded air, is to that of the same air condensed; as its bulk when rarified, to its bulk condensed.

It is scarce worth mentioning, that some authors have advanced, to account for the increase of bulk and diminution of specific gravity of frozen water, that the aqueous particles, in their natural state, were nearly cubes, and so filled that space without the interposition of many pores: but that by congelation they are changed from cubes to spheres; whence a necessity of a deal of empty space between them. Cubic particles are certainly much less proper to constitute a fluid, than spherical ones: and spherical particles less disposed to form a fixt, than cubic ones.—Thus much the nature of fluidity and firmness easily suggests. After all, for a consistent theory of Freezing, we must recur either to the frigorific matter of the corpuscularians; considered under the light and advantages of the Newtonian philosophy: or to the aethereal matter of the Cartesian, under the improvements of Monf. Gauthier, in the *Mémoires de l'Académie Royale des Sciences*, an. 1709.

Each of which we shall here subjoin; and leave the reader to make his choice.—For the first: a number of cold, saline corpuscles being introduced into the interstices, between the globules of water; may be so near each other, as to be within the spheres of one another's attractions; the consequence of which must be, that they will cohere into one solid, or firm body: till heat afterwards, separating them, and putting them in-

to various motions, breaks this union, and separates the particles so far from one another, that they get out of the distance of the attracting force, and into the verge of the repelling force; and then the water re-assumes its fluid form:

For, that cold and Freezing do arise from some substance of a saline nature, floating in the air, seems probable hence, that all salts, and more eminently some particular ones, when mixed with snow, or ice, do prodigiously increase the force and effects of cold: add, that all saline bodies do produce a stiffness and rigidity in the parts of those bodies into which they enter.

Microscopical observations upon salts manifest, that the figures of some salts, before they shoot into masses, are thin, double, wedge-like particles, which have abundance of surface with respect to their solidity (the reason why they swim in water, when once raised in it, though specifically heavier.) These small points of the salt getting into the pores of the water, whereby also they are in some measure suspended in the winter time (when the heat of the sun is not strong enough to dissolve the salts into a fluid, to break their points, or to keep them in perpetual motion) being less disturbed, and more at liberty to approach one another; and by shooting into crystals of the form above-mentioned, do, by their extremities, insinuate themselves into the minutest pores of water, and by that means freeze it into a solid form.

Further, there are many little volumes, or particles of air, included at several distances both in the pores of the watry particles, and in the interstices left by the spherical figures. By the insinuation of the saline crystals, the volumes of air are driven out of the watry particles; and many of them uniting, form larger volumes, which thereby have a greater force to expand themselves, than when dispersed; and so both enlarge the dimensions, and lessen the specific gravity of the water, thus congealed into ice.

Hence also we may conceive, how water, impregnated with salts, sulphurs, or earths, which are not easily dissolveable, may form itself into metals, minerals, bitumens, and other fossils; the parts of these mixtures becoming a cement to the particles of water, or getting into their pores, change them into these different substances.

For the second: as an ethereal matter or medium is generally allowed the cause of the motion of fluids; and as the air itself has all its motion from the same principle; it follows, that all fluids must remain in a state of rest, or fixity, when this matter loses of its necessary force. Of consequence, the air being less warmed in the winter time, from the obliquity of the rays of the sun; is denser, and more fixed in winter, than any other season of the year.

But further, from divers experiments we have learned, that the air contains a salt, supposed to be of the nature of nitre. This granted, and the density of the air allowed, it follows, that the molecules of this nitre must likewise be brought nearer together, and thickened by the condensation of the air: as, on the contrary, a rarefaction of the air, and an augmentation of its fluidity, must divide and separate them.

If now the same thing happen to all liquors that have imbibed or dissolved any salt; if the warmth of the liquid keep the salt exactly divided; and if the coolness of a cellar, or of ice give occasion to the molecules of the dissolved salt to approach, run into each other, and shoot into crystals: why should the air, which is allowed a fluid, be exempt from the general law of fluids?

It is true, the nitre or the air being grosser in cold weather, than hot, must have less velocity: but still, the product of its augmented mass, into the velocity remaining, will give it a greater momentum, or quantity of motion. Nor is any thing further required to make this salt act with greater force against the parts of fluids: and, probably, this is the cause of the great evaporation in frosty weather.

This aërial nitre must promote the concretion of liquors: for it is not the air, nor yet the nitre it contains, that gives the motion to fluids: it is the ethereal medium. From a diminution of the force of that, therefore, arises a diminution of the motion of the rest. Now the ethereal matter being weak enough of itself in the winter time, must lose still more of its force by its action against air condensed and loaded with large molecules of salt. It must, therefore, lose of its force in cold weather, and become less disposed to maintain the motion of fluids. In a word, the air, during frost, may be esteemed like the ice impregnated with salt, wherewith we ice our liquors in summer time. These liquors, in all probability, freeze, from a diminution of the motion of the ethereal medium, by its acting against the ice and salt together: and the air, for all its scorching heat, is not able to prevent its concretion.

FREEZING Mixture, a preparation for the artificial congelation of water, and other liquors.

All kinds of salts, whether alcalizate, or acid; and even all spirits, as those of wines, &c. as also sugar, and saccharum Saturni, mixed with snow, are capable of freezing most fluids; and the same effect is produced in a very great degree by a mixture of oil of vitriol, or spirit of nitre with snow: Thus Mr Boyle.

Monf. Homberg obferves the fame of equal quantities of corrofive fublimatè, and fal armoniac, with four times the quantity of diftilled vinegar.

F R E E Z I N G *RAIN*, or *Raining Ice*, a very uncommon kind of flower, which fell in the weft of England, in December, anno 1672; whereof we have divers accounts in the *Philofophical Tranfactions*.

This rain, as foon as it touched any thing above ground, as a bough, or the like, immediately fettled into ice; and by multiplying and enlarging the icicles, it broke all down with its weight. The rain that fell on the fnow, immediately *froze* into ice, without finking in the fnow at all.

It made an incredible deftruction of trees, beyond any thing in all hiftory: "had it concluded with fome guff of wind," fays a gentleman on the fpot, "it might have been of terrible confequence."

"The fprig of an afh-tree, of juft three quarters of a pound, being weighed, the ice thereon weighed fixteen pound.—"

"Some were frighted with the noife in the air; till they difcerned it was the clatter of icy boughs dafhed againft each other." Dr. Beale obferves, that there was no confiderable froft obferved on the ground during the whole; whence he concludes, that a froft may be very fierce and dangerous on the tops of fome hills, while in other places it keeps at two, three, or four foot diftance above the ground, rivers, lakes, &c. And may wander about very furious in fome places, and remifs in others, not far off. This froft was followed by glowing heats, and a wonderful forwardnefs of flowers and fruits.

F R E E Z I N G, in commerce and manufactures; fee **F R I S I N G**.
F R E E Z E L A N D, **F R I Z E L A N D**, or **F R I Z E L A N D**, *Horfes*, in war, the fame with *Cheval de Frijfe*. See **C H E V A L de Frijfe**.
F R E G I T *Claufum*, fee the article **C L A U S U M**.
F R E I G H T, fee the article **F R A I G H T**.
F R E N C H, **F R A N C O I S**, abfolutely ufed, fignifies the language of the people of France.

The *French*, as it now ftands, is no original, or mother-language; but a medley of feveral: there is fcarce any language, but it has borrowed words, or perhaps phrafes, from.

The languages that prevail moft, and that are, as it were, the bafis thereof, are 1^o The Celtic; whether that were a particular language itfelf, or whether it were only a dialect of the Gothic, as fpoke in the weft, and north. 2^o The Latin, which the Romans carried with them into the Gauls, when they made the conqueft thereof. And 3^o, the Teutonic, or that dialect of the Teutonic fpoke by the Franks, when they paffed the Rhine, and eftablifhed themfelves in the Gauls.

Of thefe three languages, in the fpace of about thirteen hundred years, was the prefent *French* formed; fuch as it is now found.

Its progrès was very flow; and both the Italian and Spanifh were regular languages long before the *French*.

Pafquier obferves, it was under Philip de Valois, that the *French* tongue firft began to be polished: and that in the register of the chamber of accounts of that time, there is a purity feen almoft equal to that of the prefent age.

However, the *French* was ftill a very imperfect language, till the reign of Francis I. The cuftom of fpeaking Latin at the bar, and of writing the public acts and inftruments of the courts of juftice in that language, had made them overlook the *French* their own language. Add, that the preceding ages had been remarkable for their ignorance, which was owing in good meafure to the long and calamitous wars, which France had been engaged in: whence, the *French* nobleffe deemed it a kind of merit, not to know any thing; and the generals regarded little, whether or no they wrote and talked politely, provided they could but fight well.

But Francis I. who was the reftorer of learning, and the father of the learned; changed the face of things; and after his time Henry Stevens printed his book *De la Precellence du Langage François*.

The change was become very conspicuous at the end of the 16th century; and under Henry IV. Amyot, Coeffeteau, and Malherbe contributed towards bringing it to its perfection: which the cardinal de Richelieu completed, by the eftablifhment of the *French* Academy; an afsembly, wherein the moft diftinguifhed perfons of the church, the fword, and the gown have been members.

Nor did the long reign of Louis XIV. contribute a little to the improvement of the language. The perfonal qualities of that prince, and his tafte for the polite arts, and that of the princes of the blood, rendered his court the politeft in Europe. Wit and magnificence feemed to vie; and his generals might have difputed with the Greeks, Romans, &c. the glory of writing well, if they could not that of fighting.

From court, the elegance, and purity of the language foon fpread itfelf into the provinces; and now there is fcarce any body there but writes and fpeaks good *French*.

One of the characters of the *French* language is to be natural and eafy. The words are ranged in it much in the fame order as the ideas in our minds; in which it differs exceedingly from the Greek and Latin, where the inverfion of the natural order of words is reputed a beauty.—Indeed the Hebrew fuffices

even the *French* in this point; but then it comes fhort of it in copioufnefs and variety.

It muft be added, however, that as to the analogy of grammar, and the fimplicity wherewith the moods of verbs are formed; the *English* has the advantage, not only over the *French*, but over all the known languages in the world: but then the turns, the expreffions, and the idioms of the *English* are fometimes fo quaint, and extraordinary, that it lofes a good deal of the advantage which its grammatical fimplicity gives it over the reft.

The *French* has but few compound words; wherein it differs widely from the Greek, High Dutch, and *English*. This the *French* authors own a great difadvantage in their language; the Greek and Dutch deriving a great part of their force and energy from the compofition of words; and frequently expreffing that in one founding word, which the *French* cannot exprefs but by a periphrasis. The diminutives in the *French* are as few as the compounds; the greateft part of thofe remaining in ufe having loft their diminutive fignification. But what diftinguifhes the *French* moft, is its juftnefs, purity, accuracy, and flexibility.

French is the moft univerfal and extenfive language in Europe. The policy of ftates and courts has rendered it neceffary for the minifters of princes, and their officers, &c. And the tafte of arts and fciences has had the fame effect with regard to the learned.

In Germany, and elfewhere, the princefles and perfons of diftinction value themfelves on underftanding *French*: and in feveral courts of Europe, *French* is almoft as much known as the language of the country: though the court of Vienna is an exception from this rule. *French* is there very little ufed: The emperor Leopold could not bear to hear it fpoke in his court: the Latin and Italian are there cultivated inftead of it. This extenfive ufe of the *French* language is no modern advantage: William the conqueror gave laws to England in the *French* language; and the ancient cuftoms of moft of the provinces of the Netherlands are wrote in the fame.

Laftly, the *French* is the fame language every where; not only in all the provinces of France, but in all the places where it is fpoke, out of France.

The feveral nations who fpeak Slavonic, do not fo much fpeak the fame language, as different dialects of the fame language. In feveral parts of Europe there are as many different languages, as there are ftates; and in Italy there are reckoned no fewer than ten or twelve dialects, fome of which differ as much from the common Italian as from the *French*, or Spanifh. In Holland, the feamen of Rotterdam, and the banks of the Meufe, do not underftand thofe of Amfterdam, and the cofts of the Zuyder Zee. They who underftand Caftilian, will not underftand the language of Catalonia and Cerdana. The High Dutch is not the fame in Sweden, as in Jutland: in the Low Countries, as at Lubek. Bohemia, Hungary, Croatia, &c. are countries belonging to the emperor; yet they have a language different from that fpoke at Vienna. The king of Sweden, when he fpeaks the language of his country, will not be underftood by his fubjects in Pomerania, Lapland, &c. And the like may be obferved of the king of Denmark, with regard to his fubjects of Norway, and Iceland: whereas, at Quebec, the Louifania, Martinico, St. Domingo, Pondicheri, &c. they fpeak the fame language as at Paris, and throughout the reft of France.

For a critical acquaintance with what regards the *French* tongue, fee the *Remarques* of M. Vaugelas; and the *Observations* M. Corneille has made on thofe remarks: the *Remarques* of Fa. Bouhours; and the *Doubts of a Bas-Breton* Gentleman, by the fame father: the *Conversations of Arifte and Eugene*: the *Observations* of M. Menage, and his *Etymologies*; with thofe of M. Huet: Fa. Buffier's *French grammar*; and that of the Abbe Regnier. Add, the two difcourfes of the Abbe de Dangeau; one on the vowels, and the other on the confonants, and many later works.

F R E N C H *Bread*, a fort of bread valued for its lightnefs and delicacy.

It is prepared by taking half a bufhel of fine flower to ten eggs, and a pound and half of frefh butter; and into that putting as much yeff with a manchet.—Then, tempering the whole maf with new milk pretty hot, let it remain half an hour to rife. Which done, make it into loaves or rolls, and wafh it over with an egg, beaten with milk. The oven is not to be too hot. See **B A K I N G**.

F R E N C H *Charakter*, CHARACTER.
F R E N C H *Coins*, COINS.
F R E N C H *Companies*, COMPANY.
F R E N C H *Crown*, CROWN.
F R E N C H *Man*, FRANCIGENA and ENGLICERY.
F R E N C H *Meafures*, MEASURES.
F R E N C H *Money*, MONEY.
F R E N C H *Order*, ORDER.
F R E N C H *Saddle*, SADDLE.
F R E N C H *Pox*, POX.
F R E N C H *Silks*, SILKS.
F R E N C H *Weights*, WEIGHTS.
F R E N C H *Wines*, duty on, DUTY.
F R E N C H, FRANK.

FRENUM, or FRÆNUM, see FRÆNUM.

FRENZY, and FRENETIC, see PHRENZY, and PHRENETIC.

FRESCO, a kind of painting performed on fresh plaster, or on a wall laid with mortar not yet dry; and with water colours.

This sort of painting has a great advantage; by its incorporating with the mortar, and drying along with it, it is rendered extremely durable: and never falls or falls, but along with it. The Italians, from whom we borrow the term, call it *Fresco*: Vitruvius, lib. vii. c. 4. calls it *Udo Tectorio*.

Painting in *Fresco* is very ancient; having been practised in the earliest ages of Greece and Rome.—It is chiefly performed on walls and vaults newly plastered with lime and sand: but the plaster is only to be laid, in proportion as the painting goes on; no more being to be done at once, than the painter can dispatch in a day, while it dries.

Before he begins to paint, a cartoon or design is usually made on paper, to be calked, and transferred to the wall, about half an hour after the plaster is applied.

The antients painted on stucco; and we may remark in Vitruvius, what infinite care they took in making the incrustation or plastering of their buildings to render them beautiful and lasting: though the modern painters find a plaster made of lime and sand preferable thereto; both as it does not dry so hastily; and as being a little brownish, it is fitter to lay colours on, than a ground so white as stucco.

In this kind of painting, all the compound and artificial colours, and almost all the minerals are set aside; and scarce any thing is used but earths; which are capable of preserving their colour, defending it from the burning of the lime, and resisting its sal, which Vitruvius calls its bitterness.

For the work to come out in all its beauty; the colours must be laid on quick, while the plaster is yet moist: nor should they ever be reouched, dry, with colours mixed up with the white of an egg, or size, or gum, as some workmen do; by reason such colours grow blackish: nor do any preserve themselves, but only such as were laid on hastily at first.

The colours used, are white made of lime slacked long before, and white marble dust; oker, both red, and yellow; verditer; lapis lazuli; smalt; black chalk, &c. All which are are only ground, and worked up with water; and most of them grow brighter and brighter, as the *Fresco* dries.

FRESH FINE, is that which was levied within a year past. Weistm 2. c. 45. See FINE.

FRESH FORCE, *Frisca Fortia*, in law, denotes a force done within forty days.

If a man be disseised of lands or tenements, within any city or borough; or deposed from them after the death of his ancestors, to whom he is heir; or after the death of his tenant for life, or in tail; he may, within forty days after his title accrued, have his remedy by an assize, or bill of *Fresh Force*.

FRESH SHOT, in the sea phrase, signifies the falling down of any great river, into the sea; by means whereof the sea hath *fresh* water a good way from the mouth of the river.—As this is more or less, they call it a *great*, or *small fresh* shot.

FRESH SPELL, in the sea language, a fresh gang, to relieve the rowers in the longboat.

FRESH SUIT, *reus insecutio*, is such a present and active prosecution of an offender, where a robbery is committed, as never ceases, from the time of the offence committed, or discovered, till he be apprehended.

The benefit of such pursuit of a felon, is, that the party pursuing shall have his goods restored to him; whereas otherwise they are the king's.

Fresh Suit is either within the view, or without. Manwood says, that upon *fresh Suit* within the view, trespassers in the forest may be attached by the officers pursuing them, though without the limits of the forest.—*Fresh Suit* may continue for seven years.

FRESH WATER, is that not tinged or impregnated with salt, or saline particles, enough to be discoverable by the sense.

Such generally is that of springs, rains, wells, lakes, &c.

Dr. Lister is of opinion, that the natural and original state of water is to be salt: the *Freshness* he supposes to be accidental, and to be owing to the vapours of plants, and the breath of animals therein; and to the exhalations raised by the sun.

Others will have all water originally *fresh*; and take its saltness to be accidental: to account for which a great number of hypotheses have been framed.

The saltness of water is a foreign, and in most cases a hurtful quality. It renders it not only nauseous to the taste, but greatly prejudicial to the body: and it is generally agreed, that those waters, *cateris paribus*, are best, not only for drinking, but also for economical uses, as washing, boiling, and brewing, which are the freed from saltness.

Hence, various methods have been contrived for examining the *Freshness* of waters; and of dulcifying or making salt water *fresh*.

Mr. Boyle gives us a method of examining the *Freshness* of

water, by means of a precipitate, which casts down any saline particles before floating therein.

Into one thousand grains of distilled water he puts one grain of salt; and into the solution lets fall a few drops of a strong well filtrated solution of well refined silver, dissolved in clear aqua fortis; upon which there immediately appears a whitish cloud, which, though but slowly, descends to the bottom; and there settles in a white precipitate, in which is the saline matter of the fluid.

This method, if it were required, would examine water to a greater nicety, than that here specified. It has discovered salt in water, where there was but one grain of salt in two thousand, nay in three thousand times the weight of water.

The experiment was tried before the Royal Society, in 1692, by Sir Hans Sloan; where it was likewise found that a drop or two, even of spirit of salt, mixed with common water, would be discovered by the same method.

Dr. Hook, in the same year, read a lecture before the Royal Society, on a method of his own, for discovering the smallest quantity of salt contained in water, on a principle of hydrostatics.

The operation was performed by means of a large pipe of glass, of the shape of a bolt head; the ball thereof was three inches in diameter, and the neck $\frac{1}{4}$ of an inch. This being so poised, with red lead put in it, as to make it very little heavier than *fresh* water; and then suspended by the small stem, which was graduated, to the end of a nice beam of a balance; and the degree or division of the neck, contiguous to the surface of the water, noted: upon infusing a quantity of salt, only equal to the two thousandth part of the weight of the water, the neck of the pipe sunk near half an inch lower in the water.

The dulcifying, or making of salt water *fresh*, is a secret, that has been long sought with great attention.—Dr. Lister takes the most easy, safe, and natural way of procuring *fresh* water from the sea, to be by putting sea plants, as *alga marina*, or common sea weed into a quantity of the water, in a glass body, with a head, beak, and receiver: from which a *fresh*, sweet, and potable liquor will continually distil.

Mont. Heston has also at length declared his secret of making sea water *fresh*.—It consists, first, in a precipitation, made with oil of tartar, which he can prepare at a small expence. Next he distils the sea water, with a furnace contrived to take up little room, and which, with a very little fire, will distil twenty-four French quarts of water in a day. For the cooling thereof, instead of making the worm pass through a vessel full of water, he makes it pass through a hole made on purpose out of the ship and enter it again at another; so that the sea water does the office of a refrigeratory. To the two preceding operations he joins filtration, which is performed by a peculiar kind of earth, mixed and stirred with the distilled water; and at length suffered to settle. This filtration, he says, finally leaves it perfectly salubrious. *Phil. Trans.* N^o 67.

FRET, or FRETTE, in architecture, a kind of knot, or ornament, consisting of two lists, or fillets variously interlaced, or woven; and running at parallel distances, equal to their breadth. See *Tab. Archit.* fig. 55.

A necessary condition of these *Frets* is, that every return, and intersection be at right angles. This is so indispensable, that they have no beauty without it; but become perfectly gothic.

Sometimes the *Fret* consists but of a single fillet; which, if well managed, may be made to fill its space exceedingly well.

The antients made great use of these *Frets*: the places they were chiefly applied on, were even, flat members, or parts of building; as the faces of the corona, and eaves of cornices; under the roofs, soffits, &c. on the plinths of bases, &c.

The appellation was occasioned hence, that the French word *Frette* literally signified the timber work of a roof, which consists chiefly, of beams, raters, &c. laid a-cross each other, and as it were, *fretted*.

FRET*, or FRETTE, in heraldry, is a bearing consisting of six bars, crossed, and interlaced, *fret-wife*: as, in *Tab. Herald.* fig. 39.

* Guillin derives the word from the French *rets*, net: but the reader will easily furnish himself a wish better etymology from the word *Fret*, in architecture.

He bears diamond a *Fret* topaz: the coat armor formerly of the lord Maltravers, and now quartered by the duke of Norfolk. When it consists of more than six pieces, the number must be specified.

Some call this the *true Lovers Knot*, others, *Harrington's Knot*, because it is their arms, and *Nodo firmo* the motto. Gibbon is for calling it *Heraldorum nodus amatorius*.

FRETTY, or FRETTE, in heraldry, is where there are divers bars laid a-cross each other.

Fretty is of six, eight, or more pieces. Azure, *Fretty* of eight pieces, or: the coat of the lord Willoughby.

Columbiere observes, that *Fretty* absolutely used, without any addition, is supposed to be of six pieces; that is, so many bars

bars or pieces crossing each other: which, therefore, need not be expressed; but if there be more, as much must be mentioned. And yet Guillim has azure, *Fretty* of fix, argent: the coat of the ancient lords Elthingham of Suffex.

FRET-WORK, an enrichment of *Frets*; or a place adorned with something in manner thereof. See **FRET**.

Fret-work is sometimes used among us, to fill up, and enrich flat, empty spaces; but it is principally practised in roofs, which are *fretted* over with plaster work.

The Italians also apply it to the mantlings of chimneys with great figures: a cheap piece of magnificence, and as durable almost within doors, as harder matters in the weather.

FRIABLE, is applied to bodies, to denote them tender and brittle; easily crumbled, or reduced to powder between the fingers: their force of cohesion being such as easily exposes them to such solution. Such are pumice, and all calcined stones, burnt alum, &c.

Friability is supposed to arise hence, that the body consists wholly of dry parts, irregularly combined, and which are readily separated, as having nothing unctuous, or glutinous to bind them together.

FRIAR, or **FRIER**, by the Latins called *Frater*, the Italians *Fra*, and the French *Frere*, that is, *Brother*, is a term common to the monks of all orders; founded on this, that there is a kind of fraternity, or brotherhood presumed between the several religious persons of the same convent, or monastery.

The kinds of *Friars* are very numerous, Augustin *Friars*; Dominican, or Black, or Preaching *Friars*; Franciscan, or Grey, or Minor, or Begging *Friars*; and Carmelites, or White *Friars*.

FRIAR, in a more peculiar sense, is restrained to such monks, as are not priests; for those in orders are usually dignified with the appellation of *Father*. See **FATHER**.

FRIARS, or **FRIERS** *Observant*, *Freres Observantes*, were a branch of the Franciscans, thus called, because not combined together in any cloister, convent or corporation, as the conventuals are; but only agreed among themselves to observe the rules of their order, and that more strictly than the conventuals did; from whom they separated themselves out of a singularity of zeal; living in certain places of their own chuting.

FRIARY of the *holy Trinity*, see the article **TRINITY**.

FRIBURGH *, **FRIDBURGH**, or **FRITHEBORG**, among our Anglo-Saxon ancestors, denoted the same as Frankpledge did after the time of the conquest.

* *Præterea est quædam summa & maxima securitas, per quam omni statu firmissimo sustinentur, viz. ut unusquisque subleat si sub injuriosis securitate, quam Angli vocant Froborghes: soli tamen Eboracenses dicant eandem Tiemannatate, quod sonant latine decem hominum numerum. LL. Edv. II. ap. Lamb.*

Every man in this kingdom was antiently associated in some decennary, or company of ten families, who were pledged or bound for each other, to keep the peace, and observe the law. See **TITHING**.—If any offence was done by one, the other nine were to answer it: that is, if the criminal fled from justice, they had thirty days allowed to apprehend him: if he was not taken in that time, he who was the *Friburgh*, i. e. the principal pledge of the ten, should take two of his own number, and the chief pledges of three neighbourin *Friburghs*, with two others out of each of the said *Friburghs*; who were to purge themselves and their *Friburgh* of the forfeiture and flight of the criminal. If they could not do this, the principal pledge, with the other eight, were to make satisfaction.

Great men were not combined in any ordinary decenn, or dozen; as being deemed a sufficient assurance for themselves and their mental servants.

FRICASSE *, a dish, or mess, hastily dressed in a frying-pan, and seasoned with butter, oil, or the like.

* The word is French, formed of the Latin *Fricatura*, frying. Others will have *Fricasse* formed in imitation of the noise made by butter, or other fat, when melted in the pan.

We say, a *Fricasse* of pullets, of rabbits, of tench, of tripe, of frogs, of eggs, of peas, &c.

FRICITION, the act of rubbing, or grating the surface of one body against that of another, called also *Atrition*. The phenomena arising upon the *Fricition* of divers bodies under different circumstances, are very numerous, and considerable.

Mr. Hawksbee gives us a number of experiments of this kind: particularly of the attrition, or *Fricition* of glass, under various circumstances; the result of which was, that it yielded light, and became electrical.

All bodies by *Fricition* are brought to conceive heat; many of them to emit light; particularly a cat's back, sugar, beaten sulphur, mercury, sea water, gold, copper, &c. But above all, diamonds, which when briskly rubbed against glass, gold, or the like, yield a light, equal to that of a live coal, when blown by the bellows.

FRICITION, in mechanics, denotes the resistance a moving body meets withal from the surface whereon it moves.

Fricition, arises from the roughness or asperity of the surface of the body moved on, and that of the body moving. For such surfaces conflicting alternately of eminences, and cavities; either the eminences of the one must be raised over those of the other; or they must be both broke and wore off: but neither can happen without motion; nor can motion be produced without a force impressed. Hence, the force applied to move the body, is either wholly, or partly spent on this effect; and consequently there arises a resistance, or *Fricition*: which will be greater, *cæteris paribus*, as the eminences are the greater, and the substance the harder. And as the body, by continual *Fricition*, grows more and more polite, the *Fricition* diminishes.

Hence it follows that the surfaces of the parts of machines that touch each other, should be as smooth and polished as possible. But, as no body can be so much polished, as quite to take away all inequality; witness those numerous ridges discovered by the microscope on the smoothest surfaces: hence arises the necessity of anointing the parts that touch, with oil, or some other fatty matter.

Laws of FRICTION. 1° As the weight of a body moving on another, is increased, so is the *Fricition*.

This we see experimentally in a balance; which when only charged with a small weight, easily turns; but with a greater, a greater force is required.

Hence, if the line of direction of a moving body be oblique to the surface moved on; the *Fricition* is the greater: this having the same effect as an increase of weight.

And hence, again, as a perpendicular stroke, or impression is to an oblique one; as the whole sine, to the sine of the angle of incidence; and the sine of a greater angle is greater, and that of a lesser less, the *Fricition* is the greater, as the line of direction approaches nearer to a perpendicular.

This is easily observable, and especially in the teeth of wheels, which are frequently broke on this very account. The *Fricition*, therefore, is taken away, if the line of direction of the moving body be parallel to the surface.

2° The *Fricition* is less in a body that rolls, than it would be were the same body to slide, as is easily demonstrated.

For suppose a dented ruler, AB, *Tab. Mechanics*, fig. 38. and suppose a wheel DE to move along it, with its teeth perpendicular to the circumference; if now the body were to slide, the tooth F, when it touched the ruler, would describe a right line on the surface thereof: and, as the tooth of the ruler, H, resists the same; it could not proceed without removing, or breaking either the tooth H, or that F. And the same will hold in the sliding of any rough surface upon another; where all the *Fricition* will take place, that can any way arise from the roughness of the surface. But if the wheel ED roll along the ruler, then the tooth H will no longer resist its motion, only as it is to be hoisted out of the cavity F over the eminence of the tooth H: and the same holds in the rubbing of any rough body over the surface of another.

Hence, in machines, lest the *Fricition* should employ a great part of the power; care is to be taken, that no part of the machine slide along another, if it can be avoided; but rather that they roll, or turn upon each other. With this view it may be proper to lay the axes of cylinders, not, as is usually done, in a groove, or concave matrix; but between little wheels, ABCD, *fig. 39*. moveable on their respective axes. This was long ago recommended by P. Castus; and experience confirms, that we have a deal of power by it. Hence also it is that a pulley moveable on its axis resists less than if it were fixed. And the same may be observed of the wheels of coaches, and other carriages.

From these principles, with a little further help from the higher geometry, Olaus Roemer determined the figure of the teeth of wheels, that should make the least resistance possible; and which should be epicycloidal. And the same was afterwards demonstrated by De la Hire; though, which is much to be lamented, the thing is not yet taken into practice.

Hence, in sawing-mills, the sides of the wooden rectangle the saws are fitted into, should be furnished with rotular, or little wheels; which would greatly lessen the *Fricition*; and the like in other cases.

Calculation of the quantity of FRICTION. The *Fricition* is a point of the utmost importance in machines; and by all means to be considered, in calculating the force thereof: yet it is generally overlooked in such calculations: but this is principally, by reason its precise value is not known.

It is not yet reduced to certain, and infallible rules: the common method is, barely to compute the advantage, which a moving power has from the machine; either on account of its distance from a fixed point; or of the direction in which it acts. And in all the demonstrations it is supposed that the surfaces of bodies are perfectly smooth and polished. Indeed the engineers expect, that in the practice they should lose part of the advantage of their force, by the *Fricition*: but how much, it is supposed, nothing but the practice can determine. M. Amontons, indeed, has made an attempt to settle,

by experiment, a foundation for a precise calculation of the quantity of *Friction*; and M. Parent has confirmed it from reasoning, and geometry: but their theory, however warranted, is not generally and fully received.

M. Amontons's principle is, that the *Friction* of two bodies depends on the weight, or force wherewith they bear on each other; and only encreases as the bodies are more strongly pressed, or applied against each other; or are charged with a greater weight: and that it is a vulgar error, that the quantity of *Friction* has any dependance on the bigness of the surfaces rubbed against each other: or that the *Friction* increases as the surfaces do.

Upon the first proposal of this paradox, M. de la Hire had recourse to experiments, which succeeded much in favour of the new system. He laid several pieces of rough wood, on a rough table: their sizes were unequal; but he laid weights on them, so as to render them all equally heavy. And he found, that the same precise force, or weight, applied to them by a little pulley, was required to put each in motion, notwithstanding all the inequality of the surfaces. The experiment succeeded in the same manner in pieces of marble, laid on a marble table.

Upon this M. de la Hire betook himself to the rationale of the thing; and has given us a physical solution of the effect: and M. Amontons has settled a calculus of the value of *Friction*, and the loss sustained thereby in machines, on the footing of the new principle.

In wood, iron, lead, and brass, which are the principal materials used in machines, he finds the resistance caused by *Friction*, to be nearly the same, when those materials are anointed with oil, or other fatty matter: and this resistance, independent of the quantity of surface, he makes to be nearly equal to a third part of the force wherewith the bodies are pressed against each other.

Beside the pressure, the magnitude whereof determines that of the *Friction*; there is another circumstance to be considered, viz. the velocity. The *Friction* is the greater, and the more difficult to surmount, as the parts are rubbed against each other with the greater swiftness: so that this velocity must be compared with that of the power necessary to move the machine, and overcome the *Friction*. If the velocity of the power be double that of the parts rubbed; it acquires, by that means, an advantage that makes it double; or, which amounts to the same, it diminishes the contrary force of *Friction* by one half; and reduces it to a sixth part of the weight or pressure. But this velocity M. Amontons only considers as a circumstance that augments or diminishes the effect of the pressure, i. e. the difficulty of the motion: so that the *Friction* still follows the proportion of the weight. Only, we are hereby directed to dispose the parts of machines that rub against each other, in such manner as that they may have the least velocity possible: and thus the diameter of the axis of a wheel should be as small as possible with regard to that of the wheel; in that the lesser the axis, the slower will be the motion of the surfaces rubbing against each other: since the velocity of a circular motion always goes diminishing from the circumference to the centre. And for the same reason the teeth of dented wheels should be as small and thin as possible: for a tooth catching on a notch, &c. rubs one of its sides against a surface equal to its own; and is to disengage itself in a certain time by passing over a space equal to the surface; consequently, the lesser the surface, the less space it has to move; the smallness of the surface diminishing the resistance of the *Friction*; not as it is a less surface that rubs, but as there is a less space to move.

But notwithstanding all the confirmations and illustrations of this theory of *Friction*; the public, or even the academy itself where it was proposed, could not be brought fully to acquiesce in it. It is granted, that the pressure has a great effect; and is, in many cases, the only thing to be considered in *Frictions*: but it will be hard to persuade us absolutely to exclude the consideration of the surface. In effect, the contrary seems capable of a metaphysical demonstration.

If two bodies, with plain surfaces, supposed infinitely hard, and polished, be moved along each other; the *Friction* will be none; or infinitely small: but if, in lieu of such supposition, which has no place in nature, we suppose two bodies with rough, uneven surfaces; the difficulty of moving one of them on the other, must either arise from this, that the first is to be raised, in order to disengage the parts catch'd or locked in the second; or that the parts must be broken and worn off; or both. In the first case, the difficulty of raising one of the bodies, makes that of the motion; and of consequence the *Friction* arises wholly from the weight, or pressure; and the surface has nothing to do in it.

In the second case, the magnitude of the surface would be all; were it possible this second case could be absolutely abstracted from the first; i. e. could the parts of one body be rubbed and worn against those of the other, without raising one of them; it being visible that a greater number of parts to be broken would make a greater resistance, than a less. But as in practice we never rub, or grind, without raising the body; the resistance arising from the greatness of the surface in the second case,

is always combined with that from the pressure: whereas in the former case, that arising from the pressure may be alone, and uncompounded.

Add, that what is wore off a body, is ordinarily very little; with regard to the great number of times the body must have been raised during the *Friction*, and all the little heights added together, which the body must have been raised to.

Hence, as the resistance from pressure may be single; and as the same always accompanies that arising from the magnitude of the surfaces; and is usually much the more considerable of the two, when it does accompany it: for these reasons, in most of the experiments that are made, it is the only one perceived, and the only one that needs to be considered.

But then, as it is possible, in certain cases, for the pressure to be very slender; and the number of parts to be rubbed very great: it must be owned, there are cases wherein the *Friction* follows very sensibly the proportion of the surfaces.

For the *Friction* of the parts of fluids; see RESISTANCE, and RETARDATION of Fluids.

Friction, in medicine, and chirurgery, denotes the act of rubbing a diseased part with oils, unguents, or other matters, in order to ease, relieve, and cure it.

Frictions are much used of late in venereal cases. They prefer the applying of mercury externally, by way of *Friction*, to that of giving it internally, to raise a salivation.

There are also *Frictions* with the flesh-brush, a linen cloth, or the hand only: for the effect of which last, see STROAKING.

Frictions of any kind, are a sort of exercise, which contributes greatly to health; as they excite and stir up the natural warmth, divert defluxions, promote perspiration, open the pores of the skin, and carry off stagnant humours.

The flesh-brush, Dr. Cheyne observes, is an exercise extremely useful for promoting a full and free perspiration and circulation. Every body knows the effect of currying horses; that it makes them sleek, gay, lively, and active; so as even to be judged equivalent to half the feeding.

This it can no otherwise effect, but by assisting nature to throw off the recrement of the juices, which stop the free circulation; and by constant *Friction*, irritation, and stimulation, to call the blood and spirits to the parts most distant from the seat of heat, and motion, and so plump up the superficial muscles. And the same effects it would have in other creatures, and man himself, if managed in the same manner, and with the same care and regularity.

Persons, therefore, of weak nerves, and sedentary lives would do well to supply the want of other exercise, with spending half an hour, morning and night, in currying and rubbing their whole body, especially their limbs, with a flesh-brush.

Friction, or rather *Frixion*, in chemistry, is the same with what in cookery we call *Frying*, viz. the coction of certain matters in a pan, with the addition of some unctuous thing, as oil, fat, &c.

The *Frixion* of medicines is performed over a slow, moderate fire; and that of foods over a quick one.

FRIDSTOLL*, or FRITHSTOW, in our antient writers, signifies a seat, chair, or place of peace, where criminals might find safety, and protection.

* In the charter of immunities confirmed to the church of St. Peter in York, ann. 5 H. VII. it is explained by *Cathedra quietudinis & pacis*.—*Quod si aliquis vesano spiritu agiturus diabolo ausu quinquam capere presumpserit in cathedra lapidea iuxta altare, quod Anglici vocant Fridstol, i. e. cathedra quietudinis vel pacis; hujus tam flagitiosi sacrilegii emendatio sub nullo iudicio erit, sub nullo pecunie numero claudatur, sed apud Anglos Botetes, hoc est, sine emenda, vocabatur.* Monast. t. 3, p. 135.

Of these there were many in England; but the most famous was at Beverly, which had this inscription, *Hec sedes lapidea Fredstoll dicitur, i. e. Pacis Cathedra, ad quem reus fugiendo pervenient, omnimodam habet securitatem.* Camden.

FRIENDLESS Man, was the old Saxon name for him whom we call an *Outlaw*.

The reason is, because he was, upon his exclusion from the King's peace and protection, denied all help of friends after certain days: *Nam suis fecit amicos.*

FRIERS Alien, see the article ALIEN.

FRIEZE, FRIZE, or FREEZE, in architecture, a member, or division of the entablature of columns, by the antients called *Zephoros*. See FREEZE.

FRIGATOON, a Venetian vessel, commonly used in the Adriatic, built with a square stern, and without any fore-mast, having only a main-mast, mizen-mast, and bow-sprit.

FRIGID, FRIGIDUS, cold, is variously used.—A *frigid* style, is a low, jejune manner of diction, wanting force, warmth of imagination, figures of speech, &c.

FRIGID Zone, or Frozen Zone, in geography. See ZONE.

FRIGIDITY, is also used in the same sense with impotency, see IMPOTENCE.

FRIGORIFIC, in physics, something that occasions cold.

Some philosophers, particularly Gassendus, and other corpuscularians, denying cold to be a mere privation or absence of heat, contend that there are actual *frigorific* corpuscles, or particles

particles as well as fiery ones: whence proceed cold and heat. But later philosophers allow of no other *frigorific* particles, beside those nitrous salts, which float in the air in cold weather, and occasion freezing.

FRIPPERY, a French term, sometimes used in our language; properly importing the trade, or traffic of old, second-hand clothes, and goods.

The word is also used for the place where such sort of commerce is carried on, and even for the commodities themselves. The company of *Frippiers*, or *Frippiers*, at Paris, are a regular corporation, of an ancient standing, and make a considerable figure among the communities of that city.

FRISELAND *Horse*, *Cheval de FRISE*, see **CHEVAL**.

FRI T, or **FRI T T**, in the glass manufacture, is the matter or ingredients whereof glass is to be made; when they have been calcined, or baked in a furnace.

A salt drawn from the ashes of the plant kali, or from fern, or other plants mixed with sand, or flints, and baked together, make an opaque mass, called by glass-men *Frit*; probably from the Italian *frittare*, to fry; or by reason the *Frit*, when melted, runs into lumps like fritters, called by the Italians, *Fritelli*.

Frit, by the ancients, was called *Hammonitrum*, or *Ammonitrum*, of *αμμων*, sand, and *νιτρον*, nitre: under which name it is described by Pliny thus: Fine sand from the Volturnian sea, mixed with three times the quantity of nitre, and melted, makes a mass called *Ammonitrum*; which being re-baked, makes pure glass. *Hist. Nat.* l. xxxvi. c. 26.

Frit, Neri observes, is only the calx of the materials which make glass; which, though they might be melted, and glass be made without thus calcining them, yet would it take up much more time. This calcining, or making of *Frit*, serves to mix and incorporate the materials together, and to evaporate all the superfluous humidity. The *Frit* once made, is readily fused and turned into glass.

There are three kinds of *Frits*: the *first*, crystal *Frit*, or that for crystal metal, made with salt of pulverine and sand.

The *second*, and ordinary *Frit*, is made of the bare ashes of pulverine, or barilla, without extracting the salt from them. This makes the ordinary white, or crystal metal.

The *third*, is *Frit* for green glasses, made of common ashes, without any preparation. This last *Frit* will require ten or twelve hours baking.

The materials in each, are to be finely powdered, washed, and sieved; then equally mixed; and frequently stirred together in the melting pot. For the rest, see **GLASS**, and **CRYSTAL**.

FRITHBURGH, see the article **FRIBURGH**.

FRITHGILD, was anciently the same with what we now call a *Guild*, or a *Fraternity*, or *Company*. See **GILD**.

FRIXION, see the article **FRICITION**.

FRIZE, or **FRIEZE**, in architecture, a part of the entablature of columns, more usually wrote, and pronounced *Freeze*. See **FREEZE**.

FRIZE, or **FREEZE**, in commerce, a kind of woollen cloth, or stuff for winter wear, being *frized* or nap on one side; whence, in all probability, it derives its name.

Of *Frizes*, some are crossed, others not crossed. The former are chiefly of English manufacture: the latter of Irish.

FRIZING of cloth, a term in the woollen manufacture, applied to the forming of the nap of a cloth, or stuff into a number of little hard burrs, or prominences, covering almost the whole ground thereof.

Some cloths are only *frized* on the back-side; as black cloths: others on the right side, as coloured and mixed cloths, rascens, bays, frizes, &c.

Frizing may be performed two ways: one with the hand, *i. e.* by means of two workmen, who conduct a kind of plank, that serves as a *frizing* instrument.

The other way is by a mill, worked either by water, or a horse; or sometimes by men. This latter is esteemed the better way of *frizing*; by reason the motion being uniform, and regular, the little knobs of the *frizing* are formed more equally, and regularly.

The structure of this useful machine is as follows.

The three principal parts are, the *Frizer*, or crisper; the *frizing* table; and the *drawer*, or beam.—The two first are two equal planks or boards, each about ten feet long, and fifteen inches broad; differing only in this, that the *frizing* table is lined, or covered with a kind of coarse woollen stuff, of a rough, sturdy nap, and that the *Frizer* is incruitated with a kind of cement, composed of glue, gum arabic, and yellow sand, with a little aqua vitæ, or urine. The beam, or *drawer*, thus called by reason it draws the stuff from between the *frizer* and *frizing* table, is a wooden roller, beset all over with little, fine, short points or ends of wire, like those of cards, used in carding of wool.

The disposition and use of the machine is thus: the table stands immovable, and bears, or sustains, the cloth to be *frized*, which is laid with that side uppermost, on which the nap is to be raised. Over the table is placed the *frizer*, at such distance from it as to give room for the stuff to be passed between them: so that the *frizer*, having a very slow semicircular motion, meeting the long hairs or nap of the

cloth, twists and rolls them into little knobs, or burrs; while, at the same time, the *drawer*, which is continually turning, draws away the stuff from under the *frizer*, and winds it over its own points.

All that the workman has to do while the machine is going, is to stretch the stuff on the table, as fast as the *drawer* takes it off; and from time to time, to take off the stuff from the points of the *drawer*.

It has already been observed, that the *frizing* table is lined with stuff of a short, stiff, sturdy nap; the use whereof is to detain the cloth between the table, and *frizer*, long enough for the grain to be formed; that the *drawer* may not take it away too readily; which must otherwise be the case, inasmuch as it is not held by any thing at the other end.

It were needless to say any thing particular of the manner of *frizing* stuffs with the hand; it being the aim of the workmen to imitate as near as they can, with their wooden instrument, the slow, equable, and circular motion of this machine. It needs only be added, that their *frizer* is but about two feet long, and one broad; and that to form the nap more easily, they moisten the surface of the stuff lightly with water, mingled with whites of eggs, or honey.

FRONT*, the forehead; or that part of the face above the eyebrows.

* The word is formed of the Latin *Front*, and that from the Greek *φρον*, to think, perceive; of *φρον*, *mens*, the mind, thought. Marinius, to make out this etymology, observes, that from the forehead of a person we perceive what he is, what he is capable of, and what he thinks of. Du Laurens chuses to derive it from *ferre*, by reason it bears the marks of what we have in our head.

FRONT is also used where several persons, or things, are ranged side by side, and shew their *Front*, or fore-part.

Those troops ranged in form of battle make a large *Front*: the three legions were here disposed in two lines, as *Caesar* used to do, when with a few forces he had occasion to extend his *Front*. The *Front* of the army consisted of so many battalions, and so many squadrons.

The military evolutions teach how to make a *Front* of any side, *i. e.* how to present the face, and arms to the enemy, what side soever he attack on. They attacked the enemy in *Front*, and in flank.

FRONT, in architecture, denotes the principal face, or side of a building: or that presented to the chief aspect, or view.

The palace consists of a large pile in *Front*, flanked with two wings.

FRONT, in perspective, a projection, or representation of the face or fore-part of an object, or of that part directly opposite to the eye; called also, and more usually, *Orthography*. See **ORTHOGRAPHY**.

Line of the FRONT, see the article **LINE**.

FRONT Scale, see the article **SCALE**.

FRONTAL, in architecture, a little fronton, or pediment, sometimes placed over a small door, or window.

FRONTAL, **FRONTLET**, or *Brow-band*, is also used in speaking of the Jewish ceremonies.

This *Frontal* consists of four several pieces of vellum, on each whereof is wrote some text of Scripture. They are all laid on a piece of a black calfs leather, with thongs to tie it by. The Jews apply the leather with the vellum on their foreheads, in the yinnogque, and tie it round the head with the thongs.

FRONTALE *Os*, in anatomy, see *Os FRONTALIS*.

FRONTALE, or **FRONTAL**, in medicine, an external form of remedy applied on the forehead, and temples, with a bandage; for the cure of the head-ach, megrim, vapours, defluxions on the eyes, &c.

Frontals are composed of roses, elder flowers, betony, marjoram; lavender, camphire, &c. wrapped in a linen cloth, and applied over the forehead and temples.

There are also *Frontals* in manner of liniments, made of unguinum populeum, and extract of opium; or of palters, powders, seeds, &c.

In *Frontals* applied to ease the violence of the head-ach in the height of fevers, they frequently mix the kernels of cherries.

FRONTALES, in anatomy, two muscles, one on each side the forehead; commonly supposed to spring from the skull, but now known to arise from the occipital muscles; or rather, it appears that the *Frontales* and occipitales are only one continued digastric muscle, on each side, moving the scalp and skin of the forehead and eyebrows.—See *Tab. Anat. (Myol.) fig. 1. p. 1.*

The *Frontales* begin to be thus denominated after they have begun to pass the coronal suture, with fibres passing obliquely to the eyebrows, where they terminate, and in the lower part of the skin of the forehead.

They have each two appendages; the superior, or external, is commonly fixed to the bone of the nose; the lower is fixed to the os frontis, and is by Volcherus Cöiner made a distinct muscle, and called *Corrugator*, from its use in drawing the eyebrows to each other, and wrinkling the forehead.

FRONTATED, a term used by botanists, to express that the petalum or leaf of a flower grows broader and broader; and at last, perhaps, terminates in a right line.—In opposition to *cuspidated*, which expresses that the leaves terminate in a point.

FRONTIER *, the border, confine, or extreme of a kingdom, or province; which the enemies find in front, when they would enter the same. Thus we say, a *Frontier* town, *Frontier* province, &c. *Frontiers* were antiently called *Marches*.

* The word is derived from the French *Frontiere*, and that of the Latin *Frontaria*, as being a kind of front opposed to the enemy. Skinner derives *Frontier* from *Front*; inasmuch as the *Frontier* is the exterior, and most advanced part of a state, as the front is that of the face of a man.

FRONTIS *Oz*, in anatomy, the bone of the forehead. See *Tab. Anat. (Ofseal)* fig. 1. lit. a.

The *Oz Frontis* is a bone of the cranium, in form almost round: it joins the bones of the finciput and temples by the coronal suture, and the bones of the upper jaw by the transverse suture, and the osphenoides, by the sphenoidal suture.

It forms the upper part of the orbits, and has four apophyses, which are at the four angles of the two orbits.

It has two holes above the orbits, through which pass the vein, artery, and some twigs of the first branch of the fifth pair of nerves. It has also one in each orbit, a little above the os planum, through which a twig of the ophthalmic branch of the fifth pair of nerves passes to the nose.

It has two sinuses above the eyebrows, between its two tables; they are lined with a thin membrane, in which there are several blood vessels and glands, which separate a mucous serosity, which falls into nostrils.

The inflex of this bone has several inequalities, made by the vessels of the dura mater. It has two large dimples made by the anterior lobes of the brain. Above the crista galli, it has a small blind hole, into which the end of the sinus longitudinalis is inferted.

FRONTISPIECE *, in architecture, the portail, or principal face of a fine building.

* The word is formed of the Latin *Frontispicium*, q. d. *Frontis hominis inspectio*.

The *Frontispiece* of the Louvre is the finest piece of architecture in France.

Hence also, by a figure, we say the *Frontispiece* of a book, meaning an ornament with an engraven title on the first page.

FRONTLET, see the article **FRONTAL**.

FRONTON, in architecture, an ornament, among us more usually called *Pediment*. See **PEDIMENT**.

FROST, an excessive cold state of the weather, whereby the motion and fluidity of liquors is suspended: or, it is that state of the air, &c. whereby fluids are converted into ice.

Metals contract, or are shortened in *Frost*. Mons. Auzout, found by experience, that an iron tube twelve foot long lost two lines of its length, upon being exposed to the air, in a frosty night. But this we suppose wholly the effect of the cold.

Frost does not contract fluids, as was formerly imagined: on the contrary, it swells or dilates them by nearly a tenth of their bulk.

Scheffer assures us, that in Sweden the *Frost* pierces into the earth two cubits, or Swedish ells; and turns what moisture is found therein, into a whitish substance, like ice. He adds, the standing waters freeze to a greater depth; even to three ells, or more: but those that have a current, less; and rapid waters, and bubbling springs, never freeze even there.

Mr. Boyle gives us several experiments of vessels made of metals, exceeding thick and strong; which being filled with water, close stopp'd, and exposed to the cold, in which the water, in freezing, coming to be expanded, and not finding either room, or vent, burst the vessels.

A strong barrel of a gun, with water in it, close stopp'd and frozen, was rent the whole length: and a small brass vessel, five inches deep, and two in diameter, filled with water, &c. lift up its lid, which was press'd with a weight of fifty-six pounds.

Olearius assures us, that in the city of Moscow he observed the earth to be cleft by the *Frost* many yards in length, and a foot broad. Sheffer mentions sudden cracks or rifts in the ice of the lakes of Sweden, nine or ten foot deep, and many leagues long; and adds, that the rupture is made with a noise not less terrible than if many guns were discharged together. By such means the fishes are furnished with air; so that they are rarely found dead.

In the great *Frost* of 1683, oaks, ashes, walnut-trees, &c. Mr. Bobart tells us, were miserably split, and cleft, so that one might see through them; and this frequently with terrible noises, like the explosion of fire arms. The clefts were not only in the bodies, but continued to the larger boughs, roots, &c. See an inquiry into the circumstances and causes hereof, in the *Philos. Transact.* N^o 165.

The natural histories of *Frosts* furnish very extraordinary effects thereof. The trees are frequently scorched and burnt up as with the most excessive heat; of which there are divers instances in so warm a climate as that of Provence. See *Mezzaray, Hist. de France*, An. 1570.

The year 1708, was remarkable throughout the greatest part of Europe for a severe *Frost*. Mr. Derham says, it was the greatest in degree, if not the most universal, in the memory of man. It extended throughout England, France, Germany, Denmark, Italy, &c. but it was scarce felt in Scotland or Ireland. All the orange trees, and olives in Italy, Provence, &c. and all the walnut trees throughout France, with an infinity of other trees, perished by this *Frost*. They had a kind of gangrene grew on them; which Mons. Gauteron takes to have been the effect of a corrosive salt, corrupting and destroying their texture. He adds, there is so much resemblance between the gangrene betwixt plants through *Frost*, and that which the parts of animals are liable to, that they must have some analogous cause. Corrosive humours burn the parts of animals; and the aerial nitre condensed, has the same effect on the parts of plants: *Penetrabile Frigus adurit. Memoires de l'Academie Royale des Sciences*, An. 1709.

In Germany the fresh water fish were every where killed; and a vast destruction befel the smaller birds. The spittle was no sooner out of a man's mouth than it was froze. The Lusatian letters add, that many cows were froze to death in their stalls; and many travellers on the road were some quite froze to death, others lost their hands, feet, noses, and ears.

G. Remus, the author of an academical exercise on this subject, published at Hall in Saxony, entitled, *Consideratio physico-mathematica hyemis proxime præterlapsæ*, gives instances from the news-papers, of two gentlemen and a smith in England; and above sixty men, and many cattle near Paris; and the like at Venice; and eighty French soldiers near Namur; all killed on the road with cold. On the coasts of Italy many of the mariners aboard the English men of war died of the cold; and several lost part of their fingers and toes.

In England, the greatest sufferers in the animal kingdom, Mr. Derham observes, were birds and insects; particularly larks and robin-red-breasts: much the greatest part of which perished. But the vegetables were far the greater sufferers. Few of the tender sorts escaped: Bay, Hollies, Rosemary, Cypress, Alaterni, Phillyrea's, Arbuti, Laurustines, and even Furze, with most of the fragrant Herbs, as Lavenders, Abrotonums, Rue, Thyme, &c. Mr. Bobart informs us, were generally destroyed. The same writer adds, that the sap of the finer wall-fruit was so congealed, and disorder'd, that it stagnated in the limbs and branches, and produced disorders like to chilbains in human bodies, which in many parts of trees would turn to mortifications: and that the very buds of the finer trees, both the leaf buds, and blossom buds, were quite killed and dried into a farinaceous matter.

In Switzerland, Scheuchzer relates, that not only the Walnut trees and Vines, but even the Beech, Larix, &c. were destroyed. And yet in some parts of those cantons, he adds, there never was a milder winter season known.

Mr. Derham relates it as a common observation, that vegetables suffered more in this winter from the sun, than the *Frost*; in that the sun-shine melting the snow, and opening the ground, left them more exposed to the rigours of the ensuing night. And at a meeting of the Royal Society, it was observed, that the calamities which befall trees, arose not purely from their being frozen; but principally from the winds shaking and rocking them, when they were so; which rent and parted their fibres. *Philosop. Transact.* N^o 324.

Haar Frost, or **White Frost**, *Prauna*, is the dew frozen or congealed early in cold mornings; chiefly in autumn.

Haar Frost. Mr. Regis observes, consists of an assemblage of little parcels of ice crystals; which are of various figures, according to the different disposition of the vapours, when met and condensed by the cold.

Dew, is in all appearance the matter of *Haar Frost*: though many of the Cartesians will have it formed of a cloud, and either congealed in the cloud; and so let fall; or ready to be congealed as soon as it arrives at the earth.

FROTH, a white, light substance, formed on the surface of fluids, by vehement agitation.

Froth consists wholly of little spherules, or globules; and accordingly, may be defined an assemblage of aqueo-aereal bubbles.

FROZEN, or **FRIGID Zone**, see the article **ZONE**.

FROZEN Ocean, see the article **OCEAN**.

FROZEN Waters, see the article **WATERS**.

FRUGIVOROUS Birds, are such as feed on fruits, either wholly or in part.

The *Frugivorous*, according to Mr. Willoughby, are a species of terrestrial birds, some of which have crooked bills and claws; yet are of gentler nature, and not rapacious. Such are the

parrot kind, which though sometimes carnivorous, yet feed likewise on fruit.

FRUIT, in its general sense, includes whatever the earth produces, for the nourishment and support of men, and other animals; as herbs, grain, pulse, hay, corn, flax, and every thing expressed by the Latins under the name *Fruges*.

The devotion and solemnity of rogation week, were instituted to procure a blessing on the *Fruits* of the earth.

In the civil law, they distinguish three kinds of *Fruits*.

Natural FRUITS, which the earth produces spontaneously and without any culture; as those of trees.

FRUITS of industry, which, though natural, require some culture to perfect them. — And

Civil FRUITS, which are only *Fruits* in the eye of law; as rent, salaries, wages, &c.

In the canon law, *Fruits* include every thing whereof the revenue of a benefice consists; as glebe-land, tithes, rents, offerings, mills, &c.

FRUIT, in natural history, denotes the last production of a tree, or plant; for the propagation, or multiplication of its kind: In which sense *Fruit* includes all kinds of seeds, with their furniture, &c.

FRUIT, in botany, is properly that part of a plant wherein the seed is contained; called by the Latins *Fructus*, and by the Greeks *καρπος*.

FRUITS are sometimes dry, and sometimes soft, and fleshy.

FRUIT also implies an assemblage of seeds, in a head; as in a ranunculus, &c. and in the general, all kinds of seeds or grains, whether naked, or inclosed in a cover, capsule, or pod; and whether bony, fleshy, skinny, membranous, or the like. The *Fruit* is the product, or result of the flower; or that for whose production, nutrition, &c. the flower is intended. The structure and parts of different *Fruits* are somewhat different; but in all the species, the essential parts of the *Fruit* appear to be only continuations, or expansions of those observed in the other parts of the tree.

Dr Beal suggests some very good reasons for a direct communication between the remotest parts of the tree and the *Fruit*; so that the same fibres or stamina, which constitute the root, trunk, and boughs are extended into the very fruit.

Thus, cutting open an apple transversely, it will be found to consist of four parts, *viz.* 1^o A skin, or cortex, which is only a production of the skin, or outer bark of the tree. 2^o A parenchyma, or pulp; which is an expansion, and intumescence of the inner bark of the tree. 3^o Fibres or ramifications of the woody part of the tree, dispersed throughout the parenchyma.

Of these last, authors generally reckon fifteen principal branches; ten whereof penetrate the parenchyma, and incline to the basis of the flower; the other five ascend more perpendicularly from the pedicle, or stalk, and meet with the former at the base of the flower: to these branches are fastened the capsule, or coats of the kernels.

These branches being at first extended through the parenchyma to the flower, furnish the necessary matter for the vegetation thereof; but, the *Fruit* increasing, it intercepts the aliment, and thus the flower is starved, and falls off.

4^o The core, which is the produce of the pith or medulla of the plant, indurated and strengthened by twigs of the wood and fibres, imbedded therewith. It serves to furnish a cell, or lodge for the kernels; filtrates the juice of the parenchyma, and conveys it thus prepared to the kernel.

In a pear we distinguish five parts, *viz.* the skin, parenchyma, ramification, stone, and acetarium.

The three first parts are common to the apple. The stone, observed chiefly in choak pears, is a congeries of hard corpuscles, dispersed throughout the whole parenchyma, but in the greatest plenty, and closest together, about the centre or acetarium. It is formed of the harder or calculeous parts of the nutritious juice of the parenchyma, extravasated in masses.

The acetarium, is a substance of a tart, acid taste, of a globular figure, inclosed in an assemblage of several of the stony parts above-mentioned.

In the plumb, cherry, &c. there are four parts, *viz.* a coat, parenchyma, ramification, and stone, or nucleus. The stone consists of two very different parts; the inner, called the kernel, is soft, tender, and light; being derived from the pith or medulla of the tree by feminal branches, which penetrate the base of the stone: the external or harder part, called the shell, is a concretion of the stony, or calculeous parts of the nutritious juice; like the stone in pears, and like that, it contains a soft, parenchymous matter within it.

The nut, analogous to which is the acorn, consists of a shell, cortex, and medulla. The shell consists of a coat and parenchyma, derived from the bark and wood of the tree. The cortex consists of an inner, and outer part: the first is a duplication of the inner tunic of the shell; the second is a mossy substance, derived from the same source as the parenchyma of the shell. But whether the medulla or pulp of the kernel arise from the pith of the tree, or the cortical part of the fruit, is not yet agreed.

Lastly, berries, as grapes, &c. besides the three general parts *viz.* coat, parenchyma, and ramification, contain grains of a stony nature, which do the office of seeds.

As to the use of *Fruits*, beside the pleasure and advantage they afford men, &c. they are of service in guarding, preserving, and feeding the seed inclosed; in filtrating the coarser, more earthy and stony parts of the nutritious juice of the plant, and retaining them to themselves; and sending none to the seed but the purest, most elaborated and spirituous parts for the support and growth of the tender delicate embryo, or plantule contained therein.

So that the *Fruit* does the same office to the seed that the leaves of the flower do to the *Fruit*.

FRUIT, in gardening, denotes the production of a *Fruit-tree*; as the Apple, Pear, Plumb, Peach, Apicot, Cherry, Grape, Currant, Orange, Fig, Almond, &c.

Fruits are distinguished by gardeners into *Stone Fruit*, and *Kernel Fruit*; *Summer Fruit*, and *Winter Fruit*; *Wall Fruit*, and *Dwarf Fruit*, &c.

Monf. Quintinie observes, that cold, heavy, moist lands produce the fairest and largest *Fruit*; but the hotter, drier, and lighter, the more delicious and rich tasted.

Fruits, with regard to commerce, are distinguished into *recent* or *fresh*; and *dry*.

Recent FRUITS are those sold just as they are gathered from the tree, without any further preparation. — As are most of the productions of our gardens and orchards, sold by the fruiters.

Dry FRUITS are those dried in the sun or by fire, with other ingredients, sometimes added to them, to make them keep; imported chiefly from beyond sea, and sold by the grocers.

Such are raisins, currants, figs, capers, olives, cloves, nutmegs, pepper, and other spices: which see under their respective articles.

Under the denomination of *dry Fruits* are also frequently included apples, pears, almonds, filberds, &c.

Polyphyrenous FRUITS, see the article **POLYPHYRENOUS**.

FRUITS current for coins, see the article **COIN**.

First FRUITS, see the article **FIRST FRUIT**.

FRUIT-TREES are distinguished like the *Fruits* they bear, into *Wall Fruit-trees*, *standard Fruit-trees*, &c.

With regard to *Fruit-Trees*, Monf. Quintinie observes, 1^o That the cutting and trimming of young trees hinders them from quick bearing; though it contributes both to the beauty of the tree, and to the richness and flavour of the *Fruit*.

2^o That *kernel-fruit-trees* come later to bear than *stone-fruit-trees*; the time required by the first before they arrive at a fit age for bearing, being, one with another, about four or five years: but that when they do begin, they bear in greater plenty than *stone Fruit*.

3^o That *stone-fruits*, figs and grapes, commonly bear considerably in three or four years; and bear full crops the fifth and sixth years: and hold it for many years, if well ordered.

4^o That *Fruits* in the same neighbourhood will ripen a fortnight sooner in some grounds, than in others of a different temperature.

5^o That in the same country, hot or cold summers set considerably forwards, or put backwards the same *Fruit*.

6^o That the *Fruit* of wall trees generally ripen before those on standards; and those on standards before those on dwarfs.

7^o That the *Fruits* of wall trees planted in the south and east quarters commonly ripen about the same time; only those in the south rather earlier than those in the east: those in the west are later by eight or ten days, and those in the north by fifteen or twenty.

For the planting, pruning, engraving, &c. of *Fruit-trees*, see **PLANTING**, **TRANSPLANTING**, **PRUNING**, and **ENGRAFTING**. See also **ORCHARD**, **GARDEN**, and **NURSERY**.

Monf. de Reffons, in the *Memoires de l'Academie Royale des Sciences*, An. 1716. gives us a method of grafting *stone Fruit-Trees*, without losing of time; so that a tree which bore forty *Fruit* the preceding year, shall bear the choicest *Fruit* the year following.

It frequently happens, that persons are deceived in their *Fruit* trees; especially those bought of the nursery men: and it is a melancholy thing, after having waited three years for *Fruit*, to find it naught at last; and to be obliged to graft the tree again, and wait four years more, for the second hopes. In effect, in the common methods of grafting, they know nothing better than to cut off the head of a tree, and make it put forth new wood, to graft in: this necessarily makes a long delay; which Monf. Reffons shews how to abridge.

Upon considering the union of the sap in grafts, that author was led to think, that all the office the bark has in grafting, is to receive the scutecheon; so that if the bark be not quite hard, dry, and inflexible, and incapable of yielding without cracking

cracking, or bursting; it should seem indifferent, whether one grafted on new wood, or old: the sap passing equally into both. Which reasoning had the good fortune to be verified by a number of experiments made with that view.

We are at liberty, then, to graft almost at any age, and in any wood. Accordingly, a peach tree of a worse kind or quality, may be grafted from another of the best, in autumn, in the height of its *Fruit* and *sap*, without cutting off any branches; the graft soon cements to the tree by the union of the saps, without shooting at all: so that cutting off the branches above the grafts the spring following; the same graft inserted the preceding autumn will shoot vigorously; and being on a wood of the same kind, the *Fruit* thenceforth produced will be much the larger and finer. But this is not the great point: for the tree thus engrafted will not bear till the third year; and we want *Fruit* the first.

In order to this, it is to be observed, that there are three kinds of branches: wood-branches, growing immediately from the stem or stock of the tree: *Fruit* branches: and branches half of the wood, half of the *Fruit* kind, being such as arising from the largest wood branches, preserve the character thereof, but which, in two years time, will produce *Fruit* branches. Now, it is these intermediate kind of branches, that we are to chuse for scutcheons or grafts. They are easily known by being bigger than the *Fruit* branches, and less than the wood branches: they have each of them, two, three, four, or even five leaves to each eye; and the eyes are farther distant from each other than those of the *Fruit* branches, but closer than those of the wood branches. It must be added, that the eyes on such branch are three; one intended for a wood branch, being situated between the two leaves, and advancing further than the other two, which are intended for *Fruit*, and are placed without-side the leaves.

It is these last that are the precise subjects to be chosen for the grafting withal. Twelve of these scutcheons, more, or less, according to the strength of the tree to be grafted on, being duly applied; we may depend on a crop of good *Fruit*, the very next year, on the same tree which the last year produced the worst.

FRUITERY, a place for the laying up and keeping of *Fruit*. See **FRUIT**, and **GRANARY**.

The *Fruiter* should be inaccessible to any thing of moisture, or even frost.

FRUITFULNESS, the quality of bearing plenty of fruit; called also *Fertility*, and *Fecundity*. See **FECUNDITY**.

FRUMENTACEOUS Plants*, are those which produce geniculated or knotted stalks with reed-like leaves; and whose seed growing in spikes or jubæ is useful to make pulstage, or bread.

* The word is formed from *Frumentum*, a general name comprehending all sorts of corn, or grain, for bread. Hence the Italians, who follow the Latins, use *Grano* and *Frumento*, for the same.

Wheat, barley, rye, millet, &c. are *frumentaceous* plants.

Some authors use *frumentaceous* in a narrower sense; restraining it to plants which bear a conformity to wheat; either in respect of their fruits, leaves, ears, or the like.

But this seems founded on a mistaken notion of *Frumentum*, as if it denoted only wheat; which is rather the sense of the word, *triticeum*.

FRUMENTARIJ, in antiquity, a kind of soldiers, or archers, under the western empire.

St. Cyprian relates, in one of his letters, that some of these *Frumentarii* were sent to take him.

The first time we read of *Frumentarii*, as officers, is in the time of the emperor Adrian. Spartian, in his life of that prince, assures us, that he made use of them to inform himself of what passed.

Before, the name *Frumentarius* was only given to the corn merchants, or measurers of corn.

These *Frumentarii* did not make any particular corps, distinct from the other forces; but there were a certain number of them in each legion; as, among us, there are a certain number of grenadiers in each battalion. Accordingly, in ancient inscriptions, we meet with *Frumentarii* of this or that legion.

It is supposed they were originally a number of young persons, disposed by Augustus throughout the provinces, particularly on all the grand roads, to advertise the emperor with all expedition, of every thing that happened.

In order to this, they had a kind of intendance of all the carriages; and on this account came to be employed for the conveyance of corn, *Frumentum*, to the armies: whence their appellation.

Afterwards, they were incorporated into the troops themselves; where they still retained their antient name.

Their principal office was the giving of intelligence; in which they agreed with those called *Curiati*, with whom they were frequently joined.

FRUMENTY, popularly **FURMETY**, a kind of pottage, the basis whereof is wheat, boiled up with milk, fugar, and sometimes spice.

Pliny tells us, that in his time they mixed chalk among it. Galen describes it as a very nutritious food made of corn, or pulse, boiled with water, wine, and oil.

The Latins called it *Alica*, which Festus derives *ab alendo*; as being very nourishing. But then it must be observed, they made it of any kind of corn.

Ours being restrained to wheat, we have given its denomination accordingly, from *Frumentum*. — An emulsion, wherein wheat was an ingredient, would be a kind of *Frumenty*.

FRUSTUM, in mathematics, a piece cut off, or separated from a body.

FRUSTUM of a pyramid, or cone, is a part, or piece thereof, cut off, usually, by a plane parallel to the base.

All round, and square timber that goes tapering, may be conceived as the *Frustum* of a cone, or pyramid; to find the quantity whereof, take the following theorem; which in the main is Mr. Oughtred's. Given, B (*Tab. Survey*, fig. 5. N^o 2.) the side of the greater base, b the lesser base's side, A the height of the *Frustum*: though, below, we suppose B and b to represent the areas of the two bases. Whole height $a \div A = H$.

First, to find a, say, as $B - b : b :: A : \frac{bA}{B-b}$, or $\frac{bA}{x}$.

Now $BH = 3$ times the whole pyramid, because any prism is three times a pyramid of the same base, and height with it, by 7 and 10 Euclid, and $b a = 3$ times the upper pyramid.

$$B A - b a$$

Wherefore $\frac{3}{B A - b a}$ equal to the *Frustum* of the pyramid required; which theorem in words is this.

Multiply the lower base by the whole height; and from the product subtract the upper base multiplied by the height of the top-piece wanting; and then one third of the remainder shall give the *Frustum*.

And the same way you may proceed for the *Frustum* of a cone; only it will be more difficult to find the circular bases.

FRUTEX, *Shrub*; a vegetable of a genus between a tree and an herb; being low, but of a woody substance, and yielding woody branches.

FRUTICOSE Stalks, of plants, are those of a hard, woody substance.

FRYTH, or **FRITH**, is explained by Sir Edward Coke, as a plain between two woods; or a lawn.

Camden uses it for an arm of the sea; or a strait between two lands; from *Fratum*. — Maketh his issue into the estuary, or *Fritb* of Thames.

Smith, in his *England's Improvement*, makes *Fritb* signify all hedge-wood, except thorns.

How to reconcile these different sentiments, we know not: but we are sure the Saxon word *Fritb*, signifies *Peace*; and that *Fryth*, in our records, is often used for a wood: *Leitor tu tibi Oedipus isto*.

FUAGE, or **FOCAGE**, a tax, or imposition, laid on hearths, or chimneys, *i. e.* on fire-places, or families; called also *Hearth-money*, and *Chimney-money*.

Edward the black prince, having Acquitain granted him, laid an imposition of *Fuage*, or *Focage*, upon the subjects of that dukedom, *viz.* one shilling for every fire-place. After his example, Charles V. of France laid a tax of a franc for each fire-place, for one year only. His successor, Charles VI. augmented it under the same name. Charles VII. rendered it perpetual, and called it *taille*.

By an ordonnance of Humbert II. dauphin of Viennois, the imposition of *Fouage*, or *Fevage*, was then laid per feu, *i. e.* per fire, or family, *feu per lares sacum habentes*. In Latin it was called *Focagium*, *q. d. pro singulis focis*. — Sometimes it was also called *Fournage*, on account of the oven, or furnace: in Greek $\kappa\alpha\pi\mu\omega\nu$, or $\kappa\alpha\pi\mu\theta\epsilon$, *sumus*, smoke. — In Will. Tyr. *De bello sacro*, it is called *Focagium*: for it was also imposed by the kings of Jerusalem. The counts, and other lords, likewise imposed it on the feudataries, or vassals. Zonaras assures us, that the general Nicephorus first established it among the Greeks.

FUCUS is used for a paint, or composition applied on the face, to beautify it, and heighten the complexion.

Old women make use of *Fucus*, and pomatums, to appear young. The *Fucus* made with cerus, is corrosive and pernicious to the skin.

The chemists abuse the ladies in selling them oil of bricks, as an excellent *Fucus*. Pliny says, that the *Fucus* of the Roman dames was a kind of white earth, or chalk, brought from Chio and Samos, dissolved in water.

The *Fucus Solimanni* is a composition of prepared sublimate, in great repute among the Spaniards of Peru.

FUEL, or **FEWEL**, the pabulum of fire; see **FEWEL**, and **FIRE**.

FUGA Vacui, in the antient school philosophy, a supposed aversion in nature to a vacuum.

The *Fuga vacui* was a very fertile, and extensive principle; and solved abundance of difficulties with a great deal of ease. Suppose, *e. gr.* a syringe; immerse one extreme of it in water; and draw up the embolus, or sucker; then hear how the antients will reason upon it. They first hid it down for granted, that there can be no vacuum; then arguing, that there must be a vacuum, unless the water should follow the embolus; they conclude, that the higher the embolus is drawn, the higher shall the water ascend; and this *Fuga vacui* is to keep out a vacuum.

In after-times, the matter was stated in other terms, and the water was said to rise, *metu vacui*, for fear of the vacuum, which must otherwise ensue. And at length, as if this were not enough, instead of *fuga* and *metu*, they substituted the word *horror*; and affirmed, that the water rose out of nature's *abhorrence* of a vacuum. This was just as good sense, as if a person being asked, how coals were brought to London? should answer, that it was done *fuga*, or *metu*, or *horrore frigidis*; for fear of cold! Which is giving the final cause, when the efficient one was required.

Most of the phenomena, which the antients ascribed to the *Fuga vacui*, the moderns have demonstrated to arise from the gravity and pressure of the air. This is the case in the ascent of water in syringes, pumps, &c.

FUGALIA, in antiquity, a feast celebrated among the Romans; supposed by some to be the same with the *Regifugium*, held on the 24th of February, in memory of the expulsion of the kings, and the abolishing of the monarchical government. Struvius, *Antiq. Roman. Syntag.* c. 9. distinguishes the *Fugalia* from the *Regifuge*: and even doubts, whether the *regifugium* were thus called on account of the expulsion of the kings; or by reason the rex sacrorum, after the sacrifice was ended, fled hastily out of the forum, and comitia.

Be this as it will, the only antient author of note, that makes express mention of the *Fugalia*, is St. Augustin, *de civitat. Dei*, lib. ii. c. 6. And his commentator Vives shews a great inclination to correct the reading of the word, were it not, that St. Augustin adds, that the feast was a true *Fugalia*; all decency and modesty being banished therefrom.

That learned person conjectures, that the *Fugalia* were the same thing with the *Poplifugia*, or the feast of *Fugia*, the goddess of joy, occasioned by the rout of an enemy; which was the reason why the people abandoned themselves to riot and debauchery: and that the feast was first instituted on occasion of the victory gained over the Ficulneates, Fidenates, and neighbouring nations, upon their attempt to take possession of Rome, the day after the people had withdrawn from it. As related by Varro, *l. v. de Ling. Lat.*

But according to Varro, the *Poplifugia*, which fell in the month of June, were held in the memory of the flight, or retreat of the people, in a sedition raised among them: it is true, he adds, that the day followed soon after the retreat of the Gauls, and the time when the neighbouring nations conspired against them: but this does not appear to have any relation to the *Poplifugia*, being only meant to mark the *æra*, or time when the sedition and flight of the Roman people happened.

After all, though the *Poplifugia* might have been originally established in commemoration of the flight of the people, and not that of the enemies; this does not hinder, but the *Fugalia* of St. Augustin may probably be the *Poplifugia* of Varro; according to the conjecture of Vives.

FUGITIVE, a person obliged to fly his country, or remove from a place where he had some abode or establishment; on account of his crimes, debts, or on other occasions.

A person who has broke open, or escaped out of prison, is obliged to be a *Fugitive*. Cain became a *Fugitive*, after the murder of his brother.

Among the learned, *fugitive* pieces denote those little compositions which are printed on loose sheets, or half sheets; thus called, because easily lost, and soon forgot.

In the Roman law, a *fugitive* slave was such a one as was apt to run away from his master. And in selling a slave, the master was obliged to declare, whether or no he were *fugitive*.

The term is also applied to deserters in an army; or those who fly from the combat.

FUGITIVES Goods, *Bona Fugitivorum*, the proper goods of him that flies upon felony; which after the flight lawfully found on record, do belong to the king, or lord of the manor.

FUGUE, in music, is when the different parts of a musical composition follow each other; each repeating what the first had performed.

There are three kinds of *Fugues*: the *single Fugue*, *double Fugue*, and *Counterfugue*.

Single, or simple FUGUE, is some point consisting of 4, 5, 6 or any other number of notes, begun by one single part, and then seconded by a third, fourth, fifth, and sixth part, if the composition consists of so many, repeating the same, or such like notes; so that the several parts follow, or come in, one after another in the same manner, the leading parts still flying before those which follow.

Double FUGUE, is when two or more different points move together in a *Fugue*, and are alternately interchanged by several parts.

For the *Counter FUGUE*, see *COUNTER Fugue*.

The Italians say, a *Fugue*, or flight of *Rooms*, or *Chambers*, meaning a series, or range of rooms, the doors whereof answer in a right line behind each other; so as they may be all seen at once, from one extreme to the other.

FULCRUM, *Prop.* in mechanics; see *LEVER*.

FULIGINOUS*, an epithet applied to a thick smoke, or vapour, replete with soot, or other crass matter. See *SMOKE*.

* The word is formed from the Latin *fuligo*, soot; and is rarely used but when joined with vapour.

In the first fusion of lead, there exhales a great deal of *fuliginous* vapour; which retained and collected, makes what we call *Litharge*.

Lampblack is what is gathered from the fuliginous vapours of pines, and other resinous woods, when burnt.

Some physicians talk of *fuliginous* vapours emitted from the spleen to the brain; which they will have to be the cause of the hypochondriac and hysterical disorders; thence called the *Vapours* and by some the *Splen*.

FULL, is variously used, in opposition to empty, narrow, confined, &c.

The Cartesians hold, that the universe is *full*, *i. e.* that every part or point has matter in it.

When the body is full of humours, it should be purged. See *PLENTITUDE*, and *PLETHORA*.

An ambassador has *full* power given him to act, transact, &c. —The army was in *full* march, *i. e.* the whole army was in march, with all the forces it consisted of.

A man is said to bear the arms of a family, *full*, *i. e.* without any difference or diminution.

FULL Forfeiture, see the article *FORFEITURE*.

FULL Arms, see the article *ARMS*.

FULL Moon, *plurimonia*, that phase of the moon, when her whole disk, or face is illuminated; which is in the time of her opposition to the sun.

Eclipses of the moon always happen at the time of *full Moon*.

FULLER*, a workman employed in the manufactories, to full, mill, or scour cloths, rateens, serges, and other woollen stuffs, by means of a mill, to render them thicker, and more compact and durable.

* The word is formed of the Latin *fullo*, which signifies the same thing.

The *Fullers* among the Romans, washed, scoured, and fitted up cloaths; and their office was judged of that importance, that there were formal laws prescribed them for the manner of performing it. Such was the *Lex Metalla de Fullenibus*. See also Pliny, *l. vii. c. 56*. Ulpian, *leg. 12. ff. de Furtis*, *l. xiii. § 6. Locati*, *l. xii. § 6. ff. &c.*

FULLERS Earth, a fatty fossil earth, soft and brittle; of great use in the woollen manufacture.

It serves to scour cloths, stuffs, &c. and imbibes all the grease and oil necessarily used in the preparing, dressing, &c. of the *Wool*.

Fullers Earth is dug in great plenty out of certain pits near Brick-hill, in Staffordshire; also near Ryegate, in Surry; near Maidstone, in Kent; near Nutley and Pctworth, in Suffex; and near Wooburn, in Bedfordshire.

It is absolutely necessary to the well dressing of cloth; and hence foreigners, though they can procure wool to be clandestinely exported out of the kingdom, can never reach to the perfection of the English cloths, &c. without *Fullers earth*.

For this reason it is made a contraband commodity; and the export made equally criminal with that of exporting wool.

Abroad they make great use of urine, in lieu of *Fullers earth*. This earth abounds much in the vegetative salt, which promotes the growth of plants; and is therefore reckoned by Sir H. Plat, and others, a great improver of land. When mixed with vinegar, it disperses pimples and pustles; checks inflammations, and cures burns. See *Supplement*, article *CYMOLIA*.

FULLERS Weed, *Thistle*, or *Teazle*. See *TEAZLE*.

FULLERY, a workhouse, or place where cloths, &c. are *fulled*, or scoured.

The term is principally understood of the fulling-mill.

Thus, when they say, carry that cloth, serge, or the like, to the *Fullery*, they mean it is to be sent to the mill, to be scoured and fulled.

FULLING, the art, or act of cleansing, scouring, and pressing cloths, stuffs, and stockings, to render them stronger, closer, and firmer: called also *Milling*.

Pliny, *lib. vii. cap. 56*. assures us, that one Nicias, the son of Hermias, was the first inventor of the art of *Fulling*: and it appears by an inscription, quoted by Sir G. Wheeler, in his travels through Greece, that this same Nicias was a governor in Greece in the time of the Romans.

The *Fulling* of cloths and other stuffs, is performed by a kind of water mill; thence called a *Fulling*, or *Scouring Mill*. These mills, excepting in what relates to the mill-stones and hopper, are much the same with corn-mills. And there are even some, which serve indifferently for both purposes; corn being ground, and cloths full'd by the motion of the same wheel.

Hence, in some places, particularly France, the fullers are called *Millers*; as grinding corn, and milling stuffs at the same time.

The principal parts of the *Fulling-mill*, are, the wheel, with its trundle; which gives motion to the tree, or spindle, whose teeth communicate it to the pebbles, or stampers, which are hereby raised, and fallen alternately according as its teeth catch on, or quit a kind of latch in the middle of each pebble. The pebbles and troughs are of wood; each trough having at least two, sometimes three pebbles, at the discretion of the master, and according to the force of the stream of water.

In these troughs are laid the cloths, stuffs, &c. intended to be full'd: then, letting the current of water fall on the wheel, the pebbles are successively let fall thereon, and by their weight and velocity they stamp, and press the stuffs very strongly, which by this means become thickened, and condensed.

In the course of the operation, they sometimes make use of urine, sometimes of fullers earth, and sometimes of soap.

To prepare the stuffs to receive the first impressions of the pebble, they are usually laid in urine; then in fullers earth, and water; and lastly in soap, dissolved in hot water.

Soap alone would do very well; but this is expensive; though fullers earth, in the way of our dressing, is superior thereto; but then it must be first well cleared of all stones and grittiness, which are apt to make holes in the stuff.

As to urine, it is certainly prejudicial, and ought to be entirely discarded; not so much on account of its ill smell, as of its sharpness, and saltness; which is apt to render the stuffs dry, and harsh.

The true method of *Fulling* with soap, is delivered by Mons. Colmet, in an authentic memoir on that subject, supported by experiments made by order of the marquis de Louvois, then super-intendant of the arts and manufactures of France. The substance of which we shall here subjoin.

Method of FULLING cloth, and woollen stuffs, with soap.—

A coloured cloth, of about forty-five ells, is to be laid in the usual manner, in the trough of a *Fulling-mill*; without first soaking it in water, as is commonly practised in many places.

To full this trough of cloth, fifteen pounds of soap are required; one half of which is to be dissolved in two pails of river or spring water, made as hot as the hand can well bear it. This solution is to be poured by little and little upon the cloth, in proportion as it is laid in the trough: and thus it is to be full'd for at least two hours; after which it is to be taken out, and stretched.

This done, the cloth is immediately returned into the same trough; without any new soap; and there full'd two hours more. Then taking it out, they wring it well, to express all the grease and silt.

After the second *Fulling*, the remainder of the soap is melted, as the former, and cast at four different times, on the cloth; remembering to take out the cloth every two hours, to stretch it, and undo the plaits and wrinkles which it has acquired in the trough. When they perceive it sufficiently full'd, and brought to the quality and thickness required, they scour it out for the last time in hot water, keeping it in the trough till it be quite clean.

As to white cloths; in regard these full more easily, and in less time, than coloured ones, a third part of the soap may be spared.

FULLING of Stockings, Caps, &c. may be performed somewhat differently; viz. either with the feet, or the hands; on a kind of rack, or wooden machine, either armed with teeth of the same matter, or else with hoes or bullocks teeth.

The ingredients made use of herein, are urine, green soap, white soap, and fullers earth. But the urine also is reckoned prejudicial here.

Note, woven stockings, &c. should be full'd with soap alone: for those that are knit, fullers earth may be used with the soap.

Indeed, it is frequent to full these kinds of works with the mill, after the usual manner of cloths, &c. But that is too coarse and violent a manner, and is apt to damage the work, unless it be very strong.

FULLONUM Carduus, see the article *CARDIUS*.

FULMINANT, FULMINANS, or FULMINATING, an epithet applied to something that thunders, or makes a noise like that of thunder.

We say, *Jupiter Fulminans, Aurum Fulminans, Pulvis Fulminans, &c.*

Aurum FULMINANS, see the article *AURUM*.

Pulvis FULMINANS, is a composition of three parts of nitre; two parts of salt of tartar, and one of sulphur.

Both the *Aurum* and *Pulvis Fulminans* produce their effect principally downwards: in which they differ from gunpowder, which acts *in orbem*; but principally upwards. If they be laid in brass ladles, and so set on fire; after fulmination, the ladles will be often found perforated.

FULMINATING Legion, see the article *THUNDERING Legion*.

FULMINATION, in the Romish canon law, a sentence of a bishop, official, or other ecclesiastic appointed by the pope; whereby it is decreed, that some bull sent from the pope, shall be executed.

Fulmination is the same thing with the verification, or recognition of a letter, or instrument of a prince in a lay court.

FULMINATION is also used for the denunciation, or execution of a sentence of anathema, made in public, with due solemnity.

In *fulminating anathema's*, the bishop who pronounces sentence, is to be clothed in his episcopalia. See *ANATHEMA*.

FULMINATION, or *FULGURATION*, in chemistry, a vehement noise, or shock made by divers preparations; as *Aurum fulminans*, &c. when set on fire.

FUMIGATION, in medicine, and chemistry, is understood of things taken in the way of fume, or smoke; or that are turned into smoke, or steam.

A northern physician has an express treatise to justify the use of *fumigations* in many cases.

It is dangerous taking mercury by *Fumigation*. This *Fumigation* is a kind of potential calcination; the vapour of mercury laid on the fire, corroding and reducing into a calx the little laminæ of metals suspended over it.

FUMIGATION is also used for the act of making a suspended body receive the fumes, or steams of one or more other bodies; in order to calcine it, to correct it, or impart to it some new quality.

Corus is made by the *Fumigation*, or vapour of vinegar, gnawing and corroding plates of lead.

FUNAMBULUS, among the Romans, was what we call a *Rope-dancer*, and the Greeks, *Schambobates*. See *ROPE-DANCER*. The term is also used for such as letting themselves down by a rope, or cord; make their escape out of a city, or place besieged: as is observed by Du Cange.

Julius Capitolinus, and Horace, make mention of *Funambuli*: Acron on Horace, assures us, that it was the orator Messala, who first introduced the word *Funambulus*, in lieu of *Schambobates*, used by the Greeks. For the Greeks seem to have had of these rope-dancers from the first institution of their scenic games, which are said to have been invented about the time of Learius, father of Erigone; or of Dionysius, surnamed *Liber Pater*, whom Theophrastus first introduced into Athens.

At Rome, the *Funambuli* first appeared under the consulate of Sulpicius Peticus, and Licinius Stolo, who were the first introducers of the scenic representations. It is added, that they were first exhibited in the island of the Tyber: and that the censors Messala and Cassius afterwards promoted them to the theatre.

In the *floralia*, or *ludi florales*, held under Galba, there were *funambulatory* elephants, as we are informed by Suetonius. Nero also shewed the like, in honour of his mother Agrippina. Vopiscus relates the same of the time of Carinus and Numerianus.

There was a *Funambulus*, it seems, who performed at the time when the Hecyra of Terence was acted; and the poet complains, that the spectacle prevented the people from attending to his comedy. *Ita populus studio stupidus in funambulo animimum occupavit.*

FUNCTION, the act of doing something for which the agent was appointed, or which he was obliged to.

Thus we say, the stomach performs its *Function*; i. e. digests well; the fumes of wine disturb the brain in the performance of its *Functions*.

Physicians divide the *Functions* of the human body into *vital, natural, and animal*.

Vital FUNCTIONS are those necessary to life; and without which it cannot subsist: as, the actions of the heart, brain, lungs, &c.

Natural FUNCTIONS, are those which change the food, &c. so as to assimilate it to our own nature: such are the actions of the viscera, and the vessels which receive, retain, secrete, &c. the humors.

Animal FUNCTIONS, are those without which we cannot perceive, will, remember, &c. Such are feeling, seeing, imagining, judging, passions, voluntary motion, &c.

FUNCTION, is also used figuratively in speaking of the offices, duties, or occupations a person is engaged in.

He acquitted himself of all the *Functio*ns of the magistracy with applause. The actions of an ambassador must be distinguished from his *Functio*ns; the one regards his character, the other his person.

FUND, FUNDUS, a Latin term, used for the bottom of certain things; and particularly of certain parts of the body.

FUND of the eye, FUNDUS Oculi, is that part possessed by the choroides and retina.

The images of objects are represented in an inverted situation, in the *Fund* of the eye. See **VISION**.

FUNDUS Uteri, or bottom of the womb, is the body or principal part thereof: so called in contradistinction to the cervix, or neck; the osculum, or mouth; and the vagina, or sheath. — See *Tab. Anat. (Splan.)* fig. 9. lit. a. fig. 11. lit. d.

FUNDUS Vesicæ, or bottom of the bladder, is the cavity thereof, wherein the urine is contained. In men it is placed over the rectum; and in women over the matrix.

FUND of the gall bladder, the stomach, &c. See **GALL Bladder, STOMACH, &c.**

FUNDUS Plantæ, is that part of a plant, where the stalk just meets, and joins the root.

FUNDUS Cæli, is the point opposite to the point of culmination; or the point of the ecliptic, wherein it is intersected by the meridian, beneath the horizon.

FUND, in commerce, is used for the capital, or stock of a merchant, company, or corporation; or the sum of money they put into trade.

In this sense we say absolutely, the *Funds*, the *Public Funds*, meaning the stock of the great companies, or corporations, as the Bank, South-Sea, East India, &c.

FUNDAMENT, the anus, or aperture, through which an animal voids his excrements.

FUNDAMENTAL, something that serves as a base, rest, support, or foundation for any thing.

The Apostles creed contains the *fundamental* points of religion. The Satic law is the *fundamental* law of the polity of France.

FUNDAMENTAL, in music, denotes the principal note of a song, or composition, to which all the rest are in some measure adapted, and by which they are swayed; called also the *key* of the song. See **KEY**.

FUNERAL, the ceremonies performed at an interment; or the last offices paid the deceased.

* The word is formed of the Latin *Funus*; and that of *Funalia*, by reason of the torches (which were *lucæ, cera circumdati*) used in the *Funerals* of the Romans: though others derive *Funus* from the Greek, *φύος* death, or slaughter.

The *Funeral* rites among the ancient Romans were very numerous. — The deceased was kept seven days; and every day washed with hot water, and sometimes with oil, that, in case he were only in a slumber, he might thus be waked; and every now and then his friends meeting, made a horrible outcry or shout, with the same view; which last action they called *Conclamatio*.

The third conclamation was on the seventh day; when, if no signs of life appeared, the defunct was dressed and embalmed by the pollinctores; placed in a bed near the door, with his face and heels toward the street; and the outside of the gate, if the deceased were of condition, was garnished with cyprus boughs.

In the course of these seven days, an altar was raised near his head-side, called *Atera*; on which his friends every day offered incense; and the Libitinarii provided things for the *Funeral*.

On the seventh day a cryer was sent about the city to invite the people to the solemnization of the *Funeral* in these words, *Exequias L. Tit. L. filii, quibus est commodum ire, jam tempus est. Ollus ex ædibus offertur*.

The people being assembled, the last conclamation ended, and the bed was covered with purple; a trumpeter marched forth, followed by old women, called *Præfææ*, singing songs in praise of the deceased: and lastly, the bed followed, bore by the next relations. And if the person were of quality and office, the waxen images of all his predecessors were carried before him on poles.

The bed was followed by his children, kindred, &c. *attrati*, or in mourning: from which act of following the corps, these *Funeral* rites were called *Exequiæ*.

The body thus brought to the rostra, the next of kin *laudabat defunctum pro vestris*, made a *Funeral* oration in his praise and that of his ancestors.

This done, the body was carried to the *Pyra*, or *Funeral* pile, and there burnt: his friends first cutting off a finger, to be buried with a second solemnity.

The body consumed, the ashes were gathered; and the priest sprinkling the company thrice with clean water, the eldest of the *Præfææ* crying aloud, *lietæ*, dismissed the people, who took their leave of the deceased in this form, *Vale, Vale, Vale: nos te ordine quo natus a permisit, sequemur*.

The ashes, inclosed in an urn, were laid in the sepulchre, or tomb.

The first Romans did not burn their dead, but interred them, as we do. Pliny, lib. vii. c. 54. assures us, that the custom of burning was not introduced till after they had learnt, that their enemies dug up, and exposed the bodies of their soldiers buried in remote countries. And yet Plutarch, in his life of Numa, observes, that Numa was buried; as having expressly forbid them by his testament to burn him: this shews that the Romans had practised burning before him.

This custom of burning the dead, so religiously observed by the Greeks and Romans, was held in abhorrence by several other nations.

Herodotus relates, that the Persians detested it; as holding fire to be a god. The Egyptians declined to burn their dead; as taking fire for an inanimate beast; and judging it impious to commit the bodies of the deceased to be devoured by beasts. The custom of burning among the Romans ceased under the empire of the Antonines.

FUNERAL Columæ, a column crowned with an urn, wherein the ashes of some deceased person are supposed to be inclosed; the staff, or shaft, being beset with tears, or flames; the symbols of grief, and of immortality.

FUNERAL Games, Ludi Junebres, were a part of the ceremony of the ancient *Funerals*.

They consisted chiefly in processions, and sometimes in mortal combats of gladiators around the *funeral* pile.

The custom was very ancient; though it had not always been the same. At first, they cut the throats of a number of captives before the pyra, as victims to appease the manes of the deceased. This Achilles does in Homer, *Iliad*, φ, at the *Funeral* of Patroclus: and Æneas, in Virgil, l. ix. at that of Pallas, son of Evander. Cæsar, in his *Commentaries*, l. vii. relates, that the Gauls also did the like.

But at length it appeared barbarous, thus to butcher men; and therefore to save the horror of the spectacle, yet without the dead's losing any thing thereby; they made the poor captives fight and kill one another, only saving some few of such as came off victors.

This custom was borrowed of the Greeks by the Romans, among whom the cruel diversion was called *Munus*.

The first who introduced it at Rome, was Junius Brutus, at the obsequies of his father; or, according to others, Ap. Claudius, and M. Fulvius, during their consulate.

The like horrible combats were also occasionally exhibited by the magistrates; and sometimes they were added to the theatrical pieces.

The emperor Claudius decreed, that whereas these accursed games were till then frequent and arbitrary; it should be the practice for the future, only to perform them regularly every year, at the expence of the state; and that the *Ædiles* should have the care and direction thereof. But he conceived a horror for them himself; and soon after abolished them: though it was still allowed particular persons to have them, provided they were worth forty thousand sesterces per annum. — They were not finally abolished before Theodoric king of the Goths, at the end of the fifth century.

FUNERAL Honours, see the article **HONOURS**.

FUNERAL Oration, or Sermon, a discourse pronounced in praise of a person deceased, at the ceremony of his *Funeral*.

The custom of making *funeral* orations is very ancient. The Romans had it of a long standing; and it was always one of the nearest relations that made the harangue. Augustus did the office to his grandmother Julia, when only twelve years of age. Suet. Aug. c. 8. And we have divers parallel instances.

The custom seems to have begun with the republic; at least, the first *funeral* oration we read of, was that of Brutus, who expelled the kings, and was the first consul; who having been killed in a battle against the Hetrurians, was *laudatus pro vestris*, praised in the forum by Valerius Publicola his colleague.

Indeed, some authors will have the practice more ancient. They maintain it to have been in use among the Greeks; and that Solon, who, according to Aulus Gellius, gave laws to the Athenians, in the time when the elder Tarquin reigned at Rome, was the first author thereof: something like which, it seems, the orator Anaximenes has left in writing. See Polydore Vergil *de Invent. Rer.* l. iii. c. 10.

FUNGUS, in natural history; see **MUSHROOM**.

FUNGUS, in medicine, a fleshy tumor, or excrescence, very spongy, soft, and pale; arising on the membranes, tendons, and other nervous parts, in consequence of ulcers, wounds, contusions, and strains.

Fungus's are frequently formed on the meninges, or membranes of the brain, in wounds of the head when not well covered, or detended from the external air: they are also frequent about the joints; which last grow very insensibly. But where the skin is open, finding more room, they grow to a prodigious degree in a very little time, assuming the form of a mushroom, or *Fungus*.

There are also *Fungus*'s of the anus, and uterus. They are all

is supposed to proceed from a retention and depravation of the nutritious juice.

The *Fungus* is a general kind of excrescence, whereof there are divers particular species; as the *Ficus*, the *Sarcoma*, *Comy lema*, &c.

FUNGOUS Fleish, is a spongy excrescence, or (as we popularly call it) *prout fleish*, frequently growing on the lips of wounds, ulcers, &c.

The Sarcocoe is the effect of a sort of *fungous* flesh.

In ulcers, Wiseman observes, there frequently arises a spongy, or *fungous* flesh, either from the too great afflux of humours, or through the surgeon's unskilfulness.

It must be suppressed, or taken off by drying medicines, or even by causticks: as lapis turis, burnt alum, precipitate of mercury, Roman vitriol, &c.

FUNICULUS Umbilicalis, see the article **UMBILICALIS**.

FUNNEL of a Chimney, the shaft; or smallest part of the chimney, from the waist upwards.

Palladio orders, that the *Funnel* be raised three, four, or five foot at least above the roof, that it may carry the smoke clear from the house into the air.

Care too is to be taken, as to the width; for that if it be too wide, the wind will drive back the smoke into the room; and if too narrow, the smoke will not be able to make its way. Chamber-chimneys therefore are not to be made narrower than ten or eleven inches; nor broader than fifteen.

FUNNEL, see the article **TUNNEL**.

FURBISHER, a person who *furbishes*, or polishes arms, and gives them a brightness, and lustre.

In the general sense of the word, it includes what we now call *armours* and *sword cutlers*: in a more restrained sense, it is appropriated to those who clean, and scour up old swords, guns, and halberds, and put them in order.

Among the officers of the Tower, there is a *Furbisher* of small arms, and another of swords: and the like there is in most other armories of England; as at St. James's, Windior, Chelster, Plymouth, Hull, and Berwick.

FURBISHING*, the act of cleaning, scouring, and polishing arms; as guns, pistols, swords, &c.

* The word is formed of the French *Furbisire*, which Hicks derives from *Furber*, which in the language of the ancient Franks signified to clean and polish. Though M Huet chuses rather to derive the French *Furbir* and *Furbisire*, from the English *Furbish*, and *Furbishing*. Skinner observes, that some authors derive the English *Furbish*, from the Latin *Furvus*, and *fervus*; but for his part he rather derives it from the German *Farb*, colour, and *farben*, to dye or give a colour.

Furbishing is principally performed with emery.

FURCA, FORK, in antiquity, a kind of punishment, or rather instrument of punishment, among the Romans.

The form of the Roman *Furca* is very obscurely described by the antients, and much controverted by the moderns.

All we know for certain, is, that it was of wood, and resembled a fork; whence it is called in writers $\xi\upsilon\lambda\omicron\upsilon\ \delta\iota\pi\lambda\omicron\upsilon\ \delta\iota\kappa\tau\omicron\upsilon\ \delta\iota\delta\upsilon\mu\epsilon\upsilon\omicron\upsilon$, which is, *lignum duplex, bicornutum, geminum*, a double-forked or horned timber. Plutarch, treating of the *Furca*, says, it is originally the piece of timber wherewith the beam of the waggon is upheld: he adds, that it is the same with what the Greeks call *Apstates*, and *Sterigna*: and the *steriga* is described by Hesychius as the forked piece of timber put under the yoke of the waggon.

From these accounts, Godwyn takes the *Furca* to have been the beam of a waggon, to which the yokes were fastened.

The punishment of the *Furca* was of three kinds: the first, only ignominious, was when a master forced his servant for small offences to carry a *Furca*, or fork, on his shoulders, about the city; confessing his fault, and warning others to beware of the like: whence such servant came to be denominated *Furcifer*.

The second kind was *penal*; when the party having the *Furca* on his neck, was lead about the circus, or other place, and whipped all the way.

The third was *capital*; the malefactor having his head fastened to the *Furca*, and so being whipped to death.

In after-times of the empire, when this sort of punishment became interdicted, the form of the *Furca* was changed, and made like our gibbets or gallows. See the articles **CROSS**, **GIBBET**, &c.

FURCA, and Fossa, in our antient customs, i. e. gallows and pit; denoted a right or jurisdiction of punishing felons; viz. men with hanging, women with drowning.

FURCHES, in heraldry, a cross in the form represented in *Tob. Herald. fig. 41*. See **CROSS**.

FURCULA, in anatomy, the same with *Clavicula*; which see.

FURFUR, literally signifies bran; and is therefore used for the scales, scurf, or dandriff, which grow upon the skin, having some likeness thereto. See **CURICLE**. Hence,

FURFURATION, the falling off of furfures in combing &c.

Vol. I.

FURIES, *Eumenides*, *Diræ*, in the heathen theology, and poetry, were internal deities, supposed to enter, and possess men; to torment, and punish them.

The *Furies* were reputed the ministers of Pluto; and the avengers of crimes. Strabo paints them clothed in long robes falling to their heels, but girt about the breast. They were three in number: Tiphone, Megera, and Alecto.

Patin, Spanheim, &c. will have it to be them, which we see on a medal of the emperor Philip struck at Antioch, on whose reverse are represented three women dressed as abovementioned, and armed with a key, and with burning torches, poniards, and serpents.

Struvius, *Antiq. Rom. Synt. c. i. p. 182.* adds, that the three *Furies* may probably be no other than the triple Hecate, whom the antients believed to pursue and torment the wicked in hell, on earth, and in heaven.

Some of the poets add a fourth *Fury*, called *Lyssa*; a Greek word, signifying madness, or rage.

They represent the *Furies* with eyes inflamed, their heads twisted round with snakes, and furnished with whips and burning torches in their hands to punish the guilty.

The daffodil was sacred to the *Furies*; and such as offered sacrifices to them, were crowned therewith. This we learn from Eustathius, on the first book of the *Iliad*, p. 87.

These *Furies* were also called *Pænae*, *Παλαιαι*, by reason of the punishments they inflicted on criminals; as their denomination *Furies* arose from the rage and madness, which they threw into the conscience. *Voss de Idolol. l. viii. c. 18.*

The Greeks called them *Eumenides*; the origin of which name is much controverted among the learned: the etymology that seems best authorized, derives it from *εὐμενεις*, gentle, mild; which was applied to them on occasion of Orestes's being absolved of the murder committed by him on the person of his mother. Minerva, it seems, appeared and pacified the *Furies*; so that they ceased to pursue him: upon which the Athenians ever after denominated them *Eumenides*.

But it must be observ'd that in truth the Athenians called them by the same name, long before Orestes's time; as appears from the Oedipus of Sophocles. There was a temple in Athens, near the Areopagus, consecrated to the *Eumenides*, whom the Athenians called *Venerable Goddesses*. Aristides and the Scholiast of Thucydides speak of this temple as erected in memory of the judgment of Orestes.

FURLING Lines, are small lines made fast to the top-sails, top-gallant sails, and the mizen-yard arms; serving to *furl* up those sails.—The mizen has but one *furling* line, but all the rest have two, one at each end.

FURLONG, an English long measure, containing the eighth part of a mile.

The English *Furlong* is equal to forty poles, or perches; and the perch to 16 feet.—I though in an old law book, printed in Henry the VIII's time, we read, that six hundred foot, of five score to the hundred, make a *Furlong*.

Hercules is said to have run a stadium, or *Furlong*, at one breath.

FURLONG is also used for the eighth part of an acre, or half a rood.

FURLONG*, is sometimes also used for a piece of land, of more, or less acres.

* *Omnibus Christi Fidei. Johannes Blunt de Eye, Arm.—Dedit Thomas Croft & Francisco Lovel, Arm. unum Furlongum terre arabilis continen. per estimationem quatuor acres, &c. Dat. 20. Jan. 3. Eliz.*

FURLOUGH, a licence granted by an officer to a soldier, to be absent for a while.

FURNACE, an utensil, or vessel, proper to contain fire; or to raise and maintain a vehement fire in; whether of coal, or wood.

There are divers kinds of *Furnaces*, of various forms, and for various uses.

The domestick *Furnace*, used in making confections, &c. is usually of iron, or earth.

Those used by the goldsmiths, refiners, &c. are much larger, and of a different structure.

Those wherein lime, bricks, &c. are burnt, are called *Kilns*.

FURNACE is particularly used for a kind of oven, wherein the ores of metals, after beating, washing, &c. are melted down, by a great coal or wood fire.

The structure and application of these *Furnaces* is somewhat different for the different metals. See **Supplement, article FURNACE**.

FURNACE is more strictly applied to those used in the melting of iron; which authors frequently confound with iron forges; though there is a considerable difference between them.

This *Furnace* is a brick structure, much in the shape of an egg set an-end, wherein the iron ore, after it has been burnt in a kiln, is put, intermixed with cinders and charcoal; and the whole melted, till it trickle down into a receiver underneath; where, the scum and dross being taken away, the metal is thrown into furrows made in a bed of sand, and thus is cast into sows or pigs of iron.

The forge is a place, where the pigs are heated, and fused a second, and even a third time, to prepare and fit them further for use. See FORCE.

Bellows-FURNACE, is one of the two kinds of Furnaces used in coinage, for the fusion of Metals. It consists of a flat hearth at bottom, into which the air may be admitted by a hole contrived therein.

On a level with the hearth is a second aperture, which gives passage to the pipe of the bellows, from which the Furnace is denominated. About a foot over this is a moveable grate, which may be taken off, and put on at pleasure. Lastly, over this is the place where the crucible is set: which is square, and made of the same earth with the crucible; of breadth sufficient to bear a range of coals around the crucible. To melt a metal in this Furnace, they lay a little plate of forged iron over the grate; and on this they set the crucible, which is likewise covered with an iron, or earthen lid. Then they fill the Furnace with charcoal; and when it is well lighted, and the crucible sufficiently hot, they stop the vent-hole. Lastly, throwing on fresh coals, they stop the Furnace with an iron lid: thus continuing to work the bellows, and supply fresh fuel, till the metal be in fusion.

Founders FURNACE, is of divers kinds, according to the different kinds of work to be cast.

That used by the founders of small work, is much like the smiths forge, with this only difference, that the fire is made on a hearth, built in a cavity in the middle of the Furnace, to which the pipe of the bellows reaches.

This cavity goes to the bottom of the massive: a cross the middle of it is placed a grate, which holds the fire and the crucible: and below is the place for the ashes, &c.

The statuary, or figure-makers, use two kinds of Furnaces; which fee described under the article **FOUNDRY of Statues**;

Glass-hoys FURNACE, is the place wherein the ingredients or materials of glass are fused, and vitrified.

There are three kinds of Furnaces used in the glass-works. — The first, called the *Calcar*, serves to prepare or calcine the Frit in. It is made in fashion of an oven, ten foot long, seven broad, and two deep. The fuel, which is sea-coal, is put in a trench, on one side of the Furnace; and the flame reverberates from the roof back upon the frit. The coals burn in an iron grate, and the ashes fall hence into a hole underneath.

The second, is the *working Furnace*, serving to melt the metal in, or make the glass. Its figure is round, three yards in diameter, and two high, being arched over. Round the inside there are eight or more pots placed, and piling pots on these. The number of pots is always double that of the boccas or mouths, or that of the workmen, that each may have one pot refined, to work out of, and another for metal, to refine in, while he works out of the former.

The Furnace has two partitions; the lower, separating the pots from the fire-place, has a circular hole in the centre, covered with a grate, through which the flame passes from the fire-place into the Furnace; from the arched sides and roof whereof it is reverberated into the melting-pots.

The second partition divides this from the leer, or annealing Furnace. Through the boccas, or working holes, the metal is taken out of the pots, and the pots put in the Furnace. These boccas are stopped with moveable covers, made of lute and brick, to screen the workmens eyes from the fire. On each side the bocca is a boccarella, out of which, coloured glass, or the finer metal, is taken from the piling-pot. To the Furnace likewise belong ovens or holes near the leer, for the calcining of tartar, iron, &c.

The *Leer*, which serves to anneal, and cool the vessels, and which Agricola makes a particular Furnace, consists of a tower, besides the leer. The tower lies directly over the melting Furnace, with a partition betwixt them a foot thick; having an aperture, called *Occhia*, or *Lunella*, through which the flame or heat ascends out of the Furnace into the tower: on the floor or bottom of this tower, the vessels, fashioned by the masters, are set to anneal. This has also two boccas, or mouths, by which the glasses are put in with a fork, and set on the floor.

The leer is an avenue, five or six yards long, continued to the tower; through this the glasses, when annealed, are drawn in iron pans, called *Fraches*; by which they come to cool by degrees; being quite cold, by that time they reach the mouth of the leer, which enters the farosel, or room where the glasses are to be set.

The third, is the *green glass Furnace*, which is a kind of compound of all the former. It is made square (the two former being circular) having an arch at each angle thereof, for annealing and cooling the glasses. The metal is wrought on two opposite sides; and on the other two, they have their calcars, into which are made linnen holes for the fire to come from the Furnace, to bake the frit; as also to discharge the smoke. Fires are made in the arches, to anneal the vessels; so that the whole process is done in one Furnace.

The stones wherewith the insides of these Furnaces are built, are not brick (which would soon melt down into glass, as also all the softer stones) but hard, and sandy kinds, by Imperatus called *Pyramachia*.

Glass-Painters FURNACE, is made of brick, nearly square, and about two foot and a half each way. It is cut horizontally in the middle by a grate, which sustains the pan or shovel the glass is baked in. This Furnace has two apertures; one below the grate, to put the fuel in at; the other above it, through which the workman spies how the coction of the colours goes on.

Hatters FURNACES are of three kinds: a little one under the mould whereon they form their hats: a larger, in the scouring room, under a little copper full of water and lees: and a very large one under the great copper, when they dye their hats in.

Letter-Founders FURNACE is very small, not exceeding a foot and half in height, and a foot in diameter; being placed on a wooden stand, or bench, to raise it to a proper height, for the artist, who works standing. It is made of the same earth with crucibles.

Plumbers FURNACE is of three kinds: in the first, they melt the lead, whereof sheets are to be cast.

This is only a sort of large copper, or receptacle like a copper, made of free-stone, and coated well round with potters clay, having a little iron pan at bottom.

In the second, they melt the lead to be cast in moulds for pipes, &c. which are not to be folded.

The third, is the tinning Furnace, which is a square frame of wood, or sometimes a mass of stone work, with a brick hearth, whereon is made a charcoal fire, which serves them for the applying of thin tin leaves on their works.

Wind-FURNACE is the second Furnace used in the fusion of metals for coinage. At bottom it has a hearth made hollow, in manner of a cupel, with a vent-hole in the fore part thereof. Over the vent-hole is a grate sealed in the massive of the Furnace. Over the grate is the place for the crucible, which is usually of forged iron.

The fire being lighted, the crucible is set in, with a cover over it, and a capital or cover of earth or iron is laid likewise over the Furnace; and at the top of this capital is a hole, five or six inches in diameter.

It is called *Wind-furnace*, by reason the air entering through the vent-hole at bottom, which is always open, serves the same purpose as the bellows in other Furnaces.

Gold is usually melted in the bellows-furnace, as requiring an intenser heat before it fuses. — Silver and copper are commonly melted by the *Wind-furnace*.

FURNACE, in chemistry, is a receptacle either of brick, iron, or stone, wherein the fire necessary for the several operations, is contained, determined, and directed.

The Furnace consists of several parts; as, a place for the vessel or body to be wrought on; a hearth, or hole for the ashes; a chimney; a grate; a door; a dome; and a fan, or else registers, whereby to let in air, to increase or abate the fire.

The perfection of a Furnace consists in its maintaining a constant, equable fire; and this easily tempered; and at an easy expence.

To have the expence easy, the whole action of the fire or fuel must be employed on the subject that is to undergo the operation.

It must be equable, since different degrees of fire have different effects; so that if any given degree would answer any given intention, an alteration of that degree will prevent the intention from taking place. And on these circumstances does all the variety of Furnaces depend.

Furnaces are either fixed and immovable, called *Athanos*; or portable, called *Catholice*, i. e. universal, as being proper for all operations, where the body to be operated on is not too large.

The first species of Athanos, or fixed Furnace, is fitted to give a heat equal to that of a healthy man.

The second is the Furnace of the balneum Mariæ, fit for the distillation of the more subtle spirits.

The third is the digesting Furnace. See DIGESTION.

The fourth is the anemius, or *Wind-furnace*, called also *melting Furnace*, and *metallic Furnace*; used in the fusion of metals, minerals, and vitrifications.

It is called *Wind-furnace*, by reason the air drives forcibly in, to blow up the coals; its form is much like that of the reverberatory Furnace, only it is less.

For the reverberatory Furnace, see REVERBERATORY.

Almond FURNACE, see the article ALMOND.

Mortar for FURNACES, see the article MORTAR.

FURNACE of a Mine, in the art of war; see CHAMBERS and MINE.

FURNITURE, in dialling, certain additional points and lines drawn on a dial, by way of ornament.

Such are the signs of the zodiac, length of days, parallels of declination, azimuths, meridians of the principal cities, Babylonian and Italian hours, points of the compass, &c.

For drawing *Furniture* on dials, the analemma, or trigon of signs, is an instrument of principal use. See ANALEMMA.

FUROR Uterinus, a species of madness, peculiar to women, exciting them to a vehement desire of venery, and rendering them insatiate therewith.

It is owing, according to Sennertus, to a too great abundance of the humors of the part, and a præternatural heat and pungency thereof.

FURR*, the skins of divers kinds of wild beasts, dressed with the hair on; to be used as a lining, or doubling of garments, robes, &c. either for warmth, ornament, or distinction of rank and dignity.

* The word is formed of the French *Fourrure*, a lining; which Du Cange derives from *Furrura*, used, in the barbarous Latin, for the same thing. We also meet with *Ferratura*, *federata*, *judæum*, and *federata*, in the same sense.

The robes of kings, dukes, and peers, are lined with divers kinds of *Furrs*, and in particular ermine, to render them more magnificent.

The same may be observed of several chief magistrates, judges, and doctors of different faculties in the universities.

The kinds of *Furrs*, or skins chiefly dressed in alum, and with the hair on, are those of the ermine, sable, squirrel, coney, castor, otter, dog, fox, wolf, tiger, bear, &c.

Timber of FURRS, see the article **TIMBER**.

FURR, in heraldry, a representation of the skins of certain wild beasts, seen, both in the doublings of the mantles of coat-armour, and in the armour itself.

The heralds use two metals, five colours, and two *Furrs*, or hairy skins, viz. ermine and vair.

The origin of these *Furrs*, Mackenzy ascribes to the shield's being antiently covered with skins, which skins or coverings were afterwards represented in the shields: a more probable derivation, in our opinion, than to say they were placed on shields, because they had been wore in mantles and garments.

Furrs either consist of one colour, which is white; or more than one; and these either two, or more than two.

Furrs of two colours are either ermine, being white with black spots; ermines, black with white spots; erminois, whose ground is yellow; or pean, which is black powdered with yellow.

Furrs of more than two colours are called *vair*. See **VAIR**, and **VAIRY**.

FURRIER, a person who trades, or works in *Furrs*, or lines robes, &c. therewith.

FURRINGS, or **FURRS** in architecture, the making good of the rafter-feet in the cornice.

When rafters are cut with a knee, these *Furrings* are pieces which go straight along with the rafter, from the top of the knee to the cornice.

When rafters are rotten, or sunk hollow in the middle, there are pieces cut thickest in the middle, and tapering towards each end, which are nailed upon them to make them straight—Such pieces are called *Furrs*; and the putting them on, is called *Furring* the rafters.

FUSAROLE*, in architecture, a moulding, or ornament, placed immediately under the echinus, in the Doric, Ionic, and Composite capitals.

* The Italians call it *Fusciole*; and the French, from whom we borrow it, *Fusarole*.

The *Fusarole* is a round member, carved, in manner of a collar or chaplet, with oval beads. The *Fusarole* should always answer exactly under the eye of the volute in the Ionic capital.

FUSEE*, or **FUSY**, in watch-work, is that conical part, drawn by the spring, and about which the chain, or string is wound.

* The word is French, where it literally signifies a *Spindle*.

The spring of a watch is the first mover. It is rolled up in a cylindrical box, against which it acts, and which it turns round in unbending itself. The string, or little chain, which at one end is wound about the *Fusee*, and at the other fastened to the spring-box, disengages itself from the *Fusee*, in proportion as the box is turned. And hence the motion of all the other parts of the spring watch.

Now the effort, or action of the spring is continually diminishing from first to last; and of consequence, unless that inequality was resisted, it would draw the string with more force, and wind a greater quantity of it upon the box at one time than another; so that the movement would never keep equal time.

To correct this irregularity of the spring, nothing could be more happily contrived than to have the spring applied to the arms of levers which are continually longer as the force of the spring is weaker. This foreign assistance, always increasing as it is most needed, maintains the action, and effect of the spring in an equality.

It is for this reason, that the *Fusee* is made of a conical figure.

Its axis, which is immovable, is the series of the centres of all the unequal circumferences which compose the surface of the *Fusee*. According as the part of a string which is unwinding, is applied to a larger circumference, it is at a greater distance from the fixed point in the axis corresponding thereto; and of consequence the power which draws by this string, viz. the spring, acts with the more advantage. The spring begins to draw from the vertex of the cone, the most disadvantageous part, by reason its own force is then the greatest.

If the action of the spring diminished equally, as the parallel bases of a triangle do; the cone, which is generated of a triangle, would be the precise figure required for the *Fusee*. But it is certain the weakening of the spring is not in that proportion; and of consequence the *Fusee* should not be conical.

In effect, experience shews, that it should not be strictly so; but that it be a little hollow toward the middle, i. e. the arm of the lever must be there a little shortened; by reason the action of the spring is not sufficiently diminished of itself.

It is a matter of inquiry among geometricians what the precise figure of the *Fusee* should be: that is, what the curve is, by whose revolution round its axis, the solid, whose figure the *Fusee* is to have, shall be produced.

M. Varignon has determined this curve. The axis of the *Fusee* is also the axis of the curve, which is convex on the side toward the axis, and of consequence concave all the way on the other, or outer side; and the ordinates are the different distances at which the string is to be, with regard to all the successive fixed points of the axis.

The force of the spring multiplied by the arm of the lever it is applied to, each moment, being always to make an equal product; it follows, that when the solid of the curve shall be formed, an ordinate multiplied by the surface of the solid comprised between that ordinate, and the greatest of all the ordinates, viz. that of the base, will always yield a product equal to that of any other ordinates multiplied in the same manner. For the ordinates are only arms of the lever; and the parts of the surface comprehended between them and the base are equal to the lengths of the string which cover them, i. e. to the correspondent forces of the spring: which is what constitutes the equation and the essence of the curve.

FUSEE*, **FUZE**, or **FUSE**, in war, an appendage of a bomb, or granado-shell, by which the powder or composition in the shell is set on fire, to do the designed execution.

* The word is French, and literally denotes a *Spindle*.

The *Fusee* is a wooden pipe or tap, filled with wild-fire, or the like composition; and is designed to burn so long, and no longer, as is the time of the motion of the bomb from the mouth of the mortar, to the place, where it is to fall: which time is about twenty-seven seconds: so that the *Fusee* must be contrived, either from the nature of the composition, or the length of the pipe which contains it, to burn just that time.

The usual composition of *Fuses* is two ounces of nitre, to one of sulphur, and three of gunpowder dust.

FUSIBILITY, that quality in metals, and minerals, which disposes them for fusion.

Gold is more *fusible* than iron, or copper; but less so than silver, tin, and lead.

Borax is frequently mixed with metals, to render them more *fusible*.

FUSILE Column, see the article **COLUMN**.

FUSIL, in heraldry, by the French called *Fusee*, q. d. spindle, is a bearing of a rhomboidal figure, more slender than the lozenge; its upper and lower angles being more acute than the two middle ones.—V. *Tab. Herald. fig. 42.*

FUSILIERS*, or **FUZILEERS**, in the military art, foot-soldiers armed with firelocks, which are generally hung. There is a regiment of *Fuzileers* for the guard of the artillery.

* The word is formed from the French *Fusil*, à *Fusee*, firelock.

FUSILY, or **FUSILE**, in heraldry, is when a field or ordinary is entirely covered over, or divided into *Fusils*.

FUSION*, the solution, or melting of metals, minerals, &c. by means of fire: or, the act of changing them from their solid state to a fluid.

* The word is derived from the Latin *Fusio*, of *fundo*, I pour out.

—Whence also, *Effusion*, *Infusion*, *Suffusion*, and *Transfusion*.

Which see.

To give the ore its metallic form, they *fuse* it; when it is in *Fusion*, the metalline substance, being the heaviest, sinks to the bottom of the furnace; the other terrestrial matters rising in form of scoria to the surface.

It is commonly imagined, that the *Fusion* and metalline form of ores is wholly the effect of fire; and we have theories of fusibility built on this principle: but it is a mistaken one. Fire, no doubt, is the principal agent; but fire alone is not sufficient. A mineral, or piece of metal not purified, being put alone in a crucible, melts with a world of difficulty, and never becomes a perfect metal: copper ore, for instance, being thus applied, its impure part forms a scoria, and vitrifies; the metalline part residing at bottom, under the appearance of a black regulus. To promote the *Fusion* and separation, they mix coals, or stones, or cinders, or old scoria along with the ore; the inflammable

F U S

flammable principle in which, by help of fire, fuses them perfectly, sets the heterogeneous part at liberty, and raises it to the top.

The general reason of *Fusion* is pretty easily assigned. The firmness, or solidity of a body arises from the force wherewith its particles cohere. And the cohesion of all bodies is as the quantity of contact in the component particles.

Now, the corpuscles of fire entering with rapidity into the pores of the metal, agitate, and, by degrees, loosen, divide, and diminish their contact; till at length there is not enough to hinder their rolling over each other, and giving way upon the least impulse.

The dilatation observable in all *Fusion*, is a proof that the particles of the bodies are separated and set at a distance from each other, and consequently their contacts and cohesions diminished. In effect, rarefaction and dilatation are the necessary consequences of fire and heat.

From the difference of cohesion proceeds that variety we observe in the *Fusion* of bodies: for such as have least contact of parts, soonest give way to the fire; and some will melt away by the warmth of a vapour only; when others, which have a stronger contact, are not to be separated without much difficulty. Upon this account, vegetables very easily disunite; minerals sower; and metals slowest of all: and of the last, those where-in the contact of parts is least, as in lead and tin, most readily melt; but those which are more compact, as gold, and silver, are not to be managed, but by a violent heat.

If now the force of cohesion were proportional to the quantity of matter, or to the weight of bodies, we might from statics account for all the variety that occurs in *Fusion*: for by knowing the specific gravity of a body, we should then know, what force is required to melt it: but because the same quantity of matter may be so variously disposed, that in one body there shall be a much greater contact, than in another, though the gravity be equal, or even greater in the latter; therefore the force of cohesion cannot be estimated by gravity: for lead, though more ponderous than all other metals, except gold; yet in the fire is more easily melted, than almost any other: so that it necessarily follows, that in this metal there must be a less cohesion, or contact of parts, how much soever it may exceed others in the quantity of its matter.

Bodies after *Fusion* return again into a solid mass, upon removing them from the fire; because their particles hereupon approach nearer to one another by their attractive force, and are so compelled to unite.

Such as consist of homogeneous and unalterable parts, as wax, gums, and the purer metals, recover their ancient form: for when the same texture of parts remains in the whole body, it must of course reassume the same appearance, when the separating power ceaseth to act; but other bodies, whose parts, with respect to density and surface, are extremely different from one another, while some are carried off by the force of heat, and others are changed as to figure and position, must be forced to appear in another form: for they cannot recover their original phases, unless every particle could reinfuse itself in that very situation it had before, which may be hindered infinite ways; as may be experienced easily in heterogeneous bodies.

The difference therefore, observed even in homogeneous bodies after liquefaction, is no ways to be accounted for but from the changeableness of surface in their parts: for those bodies whose parts constantly retain the same surfaces, never lose

F U Z

their form; but others, by having the surfaces of their parts altered, have a different texture, and put on another appearance. **FUST***, in architecture, the shaft of a column; or that part comprehended between the base, and the capital; called also *the naked*.

* The word is French, and literally signifies a *Coff*.

The *Fust* is that cylindrical part, which makes, as it were, the body, or trunk of the column, exclusive of the head and foot. **FUSTIAN***, in commerce, a kind of cotton stuff, which seems, as it were, quilted, or whaled on one side.

* *Menge* derives the word from *Fustanum*, which in the corrupt Latin writers is used in the same sense, and is supposed to be formed from *Fustis*, on account of the tree whereon the cotton grows. Bochart derives it from *Fustat*, which in Arabic signifies the ancient city of Memphis, where cotton is produced in great abundance.

Right *Fustians* should be made altogether of cotton thread, both wool, and warp.

There are *Fustians* of divers kinds, wide, narrow, coarse, fine; with flag, or nap, and without it. There are also a great many made whereof the warp is flax or even hemp.

FUSTIAN, in criticism, a word used to express bombast.

FUSTICK, or **FUSTOCK**, a yellow wood, used by the dyers.

The colour it yields is a fine golden yellow; but there should be some other ingredients mixed with it, to make it lasting. The tree that yields it, grows in all the Caribbee islands, particularly in Barbadoes, and Tobago, where it rises to a great height.

The dyers use it chiefly for black. See **BLACK**. But some of the ablest, and honestest among them, who would dye none but the best, and most lasting colours, are of opinion it should be absolutely excluded out of all dyeing.

Beside this, there is another kind of *Fustick* or *Fustel*, growing in Italy, Provence, &c. this is used to dye a coffee colour.

FUT-FA, in music. See **F**. and **CLIFF**.

FUTURE, something to come hereafter.

We say, a *future* state, a *future* contingency; there is none but God to whom *future* things are present.

FUTURE, or **FUTURE Tense**, in grammar, denotes an inflexion of verbs, whereby they denote, that a thing will be, in some time yet to come. As, the last day will come: I shall see an end.

The *future* time admits of two cases: either we may intend to express a thing that shall come to pass in a short time; or a that shall happen in any indefinite time.

Thus the Greeks have their *paolo post futurum*, μετ' ολιγον μελλον, which marks a thing just going to be done; as ωπισσομαι; beside the common, indefinite *future*, ποιησω, I will do it; αγαθα, I will love.

In Latin, Italian, French, and even in English, the *future* of the indicative expresses only the design, or intention of doing a thing, or simply that the thing will be; as, I will praise, I will be approved: and the *future* of the subjunctive shews that the thing will be done under certain circumstances: when I shall have seen Versailles, I will tell you. Sometimes the *future* is expressed in English by the present; if I meet your friend, I will send him to you; si offendero, si incidere, &c.

FUZE or **FUZEE**, see the article **FUSEE**.

FUZILEERS, see the article **FUSILEERS**.

G, The seventh letter of our alphabet, and the fifth consonant: though in the alphabets of all the oriental languages, the Hebrew, Phœnician, Chaldee, Syriac, Samaritan, Arabic, and even Greek, *G* is the third letter.

The Hebrews call it *Ghimel*, or *Gimel*, *q. d.* camel; by reason it resembles in its form the neck of that animal: and the same appellation it bears in the Samaritan, Phœnician, and Chaldee: in the Syriac it is called *Gamel*, in Arabic *Giim*, and in Greek, *Gamma*.

The letter *G* is of the mute kind and cannot be any way founded without the help of a vowel. It is formed by the reflexion of the air against the palate, made by the tongue as the air passes out of the throat: which Martianus Capella expresses thus, *G spiritus cum palato*; so that the *G* is a palatal letter.

The Latins took the liberty to drop the letter *G* at the beginnings of words, before an *n*; as in *gnatus*, *gnoscus*, *gnobilis*, *gnaratus*, &c. which they ordinarily wrote *natus*, *noscus*, *nobilis*, &c. They also frequently changed it into *C*, as *Gamelus*, into *Camelus*; *Grogulus*, *Graculus*; *Quingentum*, *quingentum*, &c. Sometimes it was put instead of *N*, before a *C*, and for another *C*; as *Agchises*, *Aggora*, *Aggulla*, &c. for *Anchises*, *Anchora*, *Agulla*, &c. And instead of *P*; as *Magalia*, for *Magalia*, &c. *G* is also used instead of *Q*, and *Q* instead of *G*, as in *Anguina*, *Angina*, *Anguina*, &c. Instead of *R*, as in *Aquagium*, for *Aquarium*; *Agger*, for *Arger*, &c. And instead of *S*, as in *Sparge*, *sparis*, *sparjum*; or, rather, it is retrenched from those last words, to avoid the cacophony of *sparge*, or *sparsi*. *G* is also put for *C*; as in *Cneus*, for *Gneus*; *Carus*, for *Garus*; *Gaeta*, for *Caieta*: And for *V*; as in *figere*, for *fvore*. See *N*, *P*, &c.

The northern people frequently change the *G* into *V*, or *W*; as in *Gallus*, *Wallus*: *Gallia*, *Wallia*, *Vallia*, &c. For in this instance it must not be said that the French have changed the *W* into *G*; by reason they wrote *Gallus* long before *Wallus*, or *Wallia* were known; as appears from all the ancient Roman and Greek writers.

And yet it is equally true, that the French change the *W* of the northern nations, and the *V* consonant into *G*; as *Willelmus*, *William*, into *Guillaume*; *Wulphilas*, into *Gulphilas*; *Vascon*, into *Gascon*, &c.

Diomed. l. ii. c. *de Litera*, calls *G*, a new letter; his reason is, that the Romans had not introduced it before the first Punic war; as appears from the rostral column, erected by C. Dullius, on which we every where find a *G* in lieu of *G*. It was Sp. Carvilius, who first distinguished between those two letters; and invented the figure of the *G*: as we are assured by Terentius Scaurus. The *C* served very well for *G*; it being the third letter of the Latin alphabet, as the *g* or *γ* was of the Greek.

The *G* is found instead of *C* on several medals: *Vaillant Nem. Imperat.* t. i. p. 39. M. Beger produces a medal of the *Familia Ogulina*, where *GAR* is read instead of *CAR*, which is on those of M. Patin. But the *C* is more frequently seen on medals, in lieu of *G*; as *AUGUSTALIS CALLAECIA CARTACINENSES*, &c. for *AUGUSTALIS*, &c. Not that the pronunciation of those words was altered; but only that the *G* was unartfully or negligently cut by the workmen. As is the case in divers inscriptions of the eastern empire; where *AUC*, *AUCC*, *AUCCC*, are frequently found for *AUG*, &c.

The form of our *G* is taken from that of the Latins, who borrowed it from the Greeks; the Latin *G* being certainly a corruption of the Greek gamma, *Γ*, as might easily be shewn, had our Printers all the characters and forms of this letter, which we meet withal in the Greek and Latin MSS. through which the letter passed from *Γ* to *G*.

As to the gamma of the Greeks, it is manifestly the γ ghimel of the Hebrews or Samaritans. All the difference between the gamma and ghimel consists in this, that the one is turned to the right, and the other to the left, according to the different manners of writing and reading, which obtained among those different nations: so that all the pains Salmafus has taken on Solinus, to prove that the *G* was derived from the Greek kappa, is lost.

G has also been used as a numeral letter, signifying 400, according to the verse,

G Quadrigentis demonstrativa tenbit.

When a dash was added a-top, *Ḡ*, it signified forty thousand. *G* is also used in music, to signify one of the clefs; viz. that of the highest part, called the *Treble*, or *Alt*. See *CLEF*, and *TREBLE*.

GABBARA, a name which the Egyptians gave the dead bodies, which they kept by them, instead of burying them. That people, out of a custom which they had received from their ancestors, and which arose in some measure from the dif-

position of their country, which is exposed to the inundations of the Nile; used to wrap up the bodies of persons of eminence, particularly those of saints, and martyrs, in a great number of linen cloths, with balms, and spices; and instead of interring them, they preserved them in their houses: thinking that thereby they did them much more honour.

And these, St. Augustin tells us, were what they called *Gabbaras*. Sermon cxx. *de diversis*, c. 12.

Pliny makes mention of the same thing, lib. vii. c. 16. where he relates, that in the time of Claudius, a *Gabbara* was brought from Arabia, almost ten foot long*.

* Fa. Hardouin imagines, that Pliny here took the word for a proper name; and accordingly searches in Tacitus, for one Abbarus, a king of Arabia: but Hardouin himself is not of that opinion; taking the word to be rather the γ ghimel of the Hebrews; or γ Gabbbar, of the Arabians: to signify a Giant.—But the Jesuit Roswey gives a better account in his learned notes on the life of St. Anthony, c. 7. and in his *Onomasticon*, under the word *Gabbara*; where he shews that we meet with both *Gabbara*, *Gabbare*, *Gabarus*, and *Gabbarus*; and that they all signify a body embalmed; which he proves from the testimonies of Cicero, *Tuscul. Quest.* of Pompon. Mela, lib. i. c. 9; of Sextus Empiricus, lib. iii. *Pyrrhon Hypothef.* c. 24; of Lucian, *de Luctu*; of Corippus, lib. iii. *de funere Justiniani*; of St. Angustin, *Callian*, *Damaicensus*, &c. — The word in reality is Arabic, Syriac, and Hebrew, formed of γ *Gaber*, a man.

GABEL, in building, see the article **GAVEL**.

GABEL, or **GABELLE***, in the French customs, a duty or imposition on salt.

* Etymologists are divided as to the origin of the word. Some derive it from the Hebrew *Gab*, a present; others from γ to deliver; others from γ *Kabbalah*, receipt; others from *Gbaul*, or *Gabe*, unjust law; and others from the corrupt Latin *Gabelle*, or *Gabulum*, tribute.

The *Gabel* is let out to farm; and makes the second article in the king's revenue.

There are three farms of *Gabels*; the first comprehends the greatest part of the kingdom: the second is that of the Lyonsnois and Languedoc; and the third that of Dauphine and Provence. There are several provinces exempt from the *Gabel*; having purchased that privilege of Henry II.

This duty is said to have had its rise in France, in 1286. under Philip the fair. Philip the long took a double per livre on salt, by an edict in 1331; which he promised to remit when he was delivered from his enemies; and which he did accordingly in 1345. King John resumed it in 1355; and it was granted the dauphin in 1358, to ransom king John: Charles V. made it perpetual. Charles VII. raised it to six deniers; Louis XI. to twelve; and Francis I. to twenty-four livres per muid. And it has been considerably augmented since that time. Philip de Valois first established granaries and officers of the *Gabelle*, and prohibited any other persons from selling salt: from which time the whole commerce of salt, for the inland consumption, has lain wholly in the king's hands, who sells and distributes every grain thereof by his farmers, and officers created for the purpose.

The produce of this impost is so considerable, that it is computed to make one fourth of the whole revenue of the kingdom; and yields the crown as much as all the mines of Peru, Chili, Potosi, and the rest of America does the king of Spain.

GABEL, or **GABLE**, is also used in some of our ancient writers, for any sort of tax, or imposition: as *Gabel* of wines, of silks, &c.

GABINIA *Toga*, see the article **TOGA**.

GABIONS, in fortification, &c. large baskets, made of osier twigs, woven of a cylindrical form, six foot high, and four wide; which being filled with earth, serve as a defence, or shelter from the enemy's fire.—See *Tab. Fortif. fig. 19*. They are commonly used in batteries, to screen the engineers, &c. In order to which one is placed on either side each gun, only leaving room for the muzzle to appear through. See **BATTERY**.

There are also a smaller sort of *Gabions*, used on parapets, in trenches, &c. to cover the musqueteers; being placed so close as that a musket can but just peep through.

They also serve as a parapet on lines, lodgments, &c. where the ground proves too hard to dig into.

To render the *Gabions* uselefs, they endeavour to set them on fire, by throwing pitched faggots among them.

GABLE, or **GABLE-End** of a house, is the upright triangular end; from the cornice, or eaves, to the top of its roof.

Land-GABLE, see the article LAND-Gable.

GABRES, or GAVRES, a religious sect in Persia; called also *Gebres*, *Geores*, &c.

The Turks call the Christians, *Gabres*; *q. d.* infidels, or people of a false religion; or rather, as Leucclavius observes, Heathens, or Gentiles: the word *Gabre* among the Turks having the same signification, as Pagan, or Infidel, among the Christians; and denoting any thing not Mahomedan.

In Persia, the word has a more peculiar signification; wherein it is applied to a sect dispersed through the country, and said to be the remains of the ancient Persians, worshippers of fire: though, upon the whole, they rather appear to have been Persians converted to christianity; who being afterwards left to themselves, mingled their ancient superstitions with the truths and practices of Christianity; and so formed themselves a religion a-part.

The *Gabres* pretend they derive their religion from one Azer, a Frank by nation, and by profession a sculptor: this man coming to Babylon, where they then dwelt, they say, married a maid of the country, named Dogdon; who, after a visit which she received from an angel, was filled with a divine light; and soon afterwards found herself with child. The astrologers, at the same time, perceiving that the child would be a great prophet, and the founder of a new religion; Neubrout, the prince then reigning, was advertised hereof; who gave immediate orders for all the women with child to be put to death, throughout the empire.

The order was executed accordingly; but the mother of the future prophet, showing no token of pregnancy, escaped; and was at length happily delivered of a son, called *Ebrahim Zer-Areucht*.

After his birth, new dangers arose: and the king, being informed thereof, had him brought before him; and drawing his sabre, would have slain him with his own hand; but, they say, his arm grew motionless upon the spot: upon this, a huge fire was lighted, and the child cast into the same; but he rested therein, as on a bed of roses. He was afterwards delivered from other kinds of death, by a sort of flies, which infested the kingdom; one whereof, entering the king's ear, rendered him frantic, and at length killed him.

Cha-Glochtes, his successor, made the like attempts on the child; but was so struck with the miracles which he saw him work, that he began to adore him, as all the rest of the people already did.

At length, after a great number of miracles, the prophet disappeared.—Some held he was translated into heaven, body and soul; others, that he found an iron coffin near Bagdad, where shutting himself up, he was carried away by the angels.

After he was in possession of paradise, God sent them, they say, through his means, seven books; which contained all the matters of religion; and afterwards, seven more, of the explanation of dreams; and lastly, seven of medicine. Alexander the great burnt the first seven, by reason no body understood the language, and kept the other fourteen for his own use.

After his death, some of the priests and doctors among the *Gabres* retrieved as much as their memory would allow them, of the lost books; and composed a large volume, still extant among the modern *Gabres*; though they understand nothing, either of the words, or the character.

Throughout the whole of this romantick story, we may discern the marks, and traces of christianity; though grievously defaced: the annunciation; the magi; the massacre of the infants; our Saviour's miracles; his persecutions, ascension, &c.

GAGE, in our ancient customs, signifies a pledge, or pawn, given by way of security.

The word is only properly used in speaking of moveables: for immoveables, the term *Hypotheca* is used.

If the *Gage* perish, the person who received it is not to answer for it, but only for extreme negligence, &c.

GAGE is also used for a challenge, to combat. See CARTEL.

In which sense, it was a pledge, which the accuser, or challenger cast on the ground, and the other took up, as accepting the challenge: this was usually a glove, gantlet, chaperoon, or the like.

The *Grand customary* mentions *Gages Pleiges de Duel*. These were gentlemen; of the relations or friends of the combatants: if he who had given the *Gages Pleiges*, was overcome, he was to pay a mulct agreed on.

GAGE is only now retained as a substantive: as a verb, the *G* is changed into *W*, and of *Gage* is formed *Wage*; as, to *wage* law, to *wage* deliverance, *q. d.* to give security a thing shall be delivered.

If a person who has distrained be sued for not having delivered what he had took by distress, he should *wage* or *gage*, or *gager* deliverance; that is, put in surety that he will deliver them.

Mort-GAGE, is that which is left in the bands of the proprietor, so that he reaps the fruits thereof.

In opposition to *Vif-gage*, where the fruits or revenues are repaid by the creditor, and reckoned on the foot of the debt, which diminishes in proportion thereto. The second, acquits, or discharges itself; the first does not.

Pomey also uses *Mort-gage* for the possession of any effects, on condition of surrendering them up at the good pleasure of the person who gave them. See MORTGAGE.

GAGE, in the sea language. When one ship is to windward of another, it is said to have the *weather-gage* of her.

The seamen also call trying how much water a ship draws, *gaging*, or rather *gauging* of her; and it is done thus:

They drive a nail into a pike, near the end, and then put down this pike by the rudder, till the nail catch bold under it; for then as many feet as the pike is under water, is the ship's *Gage*, or depth of water she draws.

GAGE, in joinery, is an instrument made to strike a line truly parallel to the freight side of any board or piece of stuff.

Its chief use is for *gaging* of tenons true, to fit into mortises; and for *gaging* stuff of an equal thickness.

It is made of an oval piece of wood, fitted upon a square stick, to slide up and down stily thereon, and with a tooth at the end of a staff, to score, to strike a line upon the stuff at any distance, according to the distance of the oval from it.

Water-GAGE, see the article WATER-GAGE.

GAGER *à la Ley*; see WAGE, and WAGER of Law.

GAGER, } in geometry, } see GAUGER.

GAGING } } see GAUGING.

GAIANITES, GAIANITE, a sect of ancient heretics, sprung from the Eutycheans.

This sect was of an older standing than Gaian, a bishop of Alexandria, in the sixth century, from whom however they took their name. They adhered to the opinions of Julian Hilarianasseus, the chief of the Incommunicables and Phantastici; and came at length to be denominated *Gaianites*, upon *Gaian's* putting himself at their head. They denied that Jesus Christ, after the hypostatical union, was subject to any of the infirmities of human nature.

GAIN *, the profit, or lucre a person reaps from his trade, employment, or industry.

* Some derive the word from the German *Gewin*; whereof the Italians have made *Guadagno*; the French, and English, *Gain*.

There are legal and reputable *Gains*, as well as fordid and infamous ones. What is *gained* by gaming, is all liable to be restored again. If the loser will take the benefit of the law.

GAIN, in architecture, is the workmen term for the bevelling shoulder of a joist, or other timber.

It is used also for the lapping of the end of the joist, &c. upon a trimmer, or girder; and then the thickness of the shoulder is cut into the trimmer also bevelling upwards, that it may just receive the *Gain*; and so the joist and trimmer lie even and level with their surface.—This way of working is used in floors and hearths.

GAINAGE, GAINAGIUM, in our ancient writers, signifies the draught-oxen, horses, wain, plough, and furniture for carrying on the work of tillage by the baser sort of folkemen and villains.

Gainage is the same with what is otherwise called *Wainage*. Bracton, lib. i. cap. 9. speaking of lords and servants, says, *Ut si eis distraxit, quod solum non possit esse Wainagium suum*. And again, lib. iii. tract. 2. cap. 1. *Villanus non amercietur, nisi salvo Wainagio suo*. For antiently, as it appears both by *Mag. Chart.* and other books, the villain, when amerced, had his *Gainage*, or *Wainage* free; to the end his plough might not stand still: and the law, for the same reason, does still allow a like privilege to the husbandman, that is, his draught-horses are not, in many cases, distrainable.

GAINAGE is also used for the land itself, or the profit raised by cultivating it.

GALACTITIS, Γαλακτιτις, in natural history, a stone, thus called by reason when broke or ground with water, it yields a white liquor, like milk, which the Greeks call γαλα.

The stone is of an ash colour, and pretty soft, and sweet to the taste. It is said to be still found in Tullyany, Saxony, and other parts.

Authors recommend it as good in defluxions of the eyes, and for ulcers: it is supposed to make the milk more copious in nurses; and when hung on the necks of children, they say, it promotes dentition. See Supplement, article GALACTITES.

GALACTOPHAGI *, and GALACTOPOTÆ, in antiquity, persons who lived wholly on milk, without corn, or the use of any other food.

* The words are compounded of γαλα, γαλακτις, milk; φάγειν, to eat: and ποτός, of ποίω, I drink.

Certain nations in Scythia Asiatia, as the Getæ, Nomades, &c. are famous in ancient history, in quality of *Galactophagi*, milk-eaters. Homer makes their elege, *Iliad*, lib. iii.

Ptolemy, in his geography, places the *Galactophagi* between the Rhiphaean mountains, on one side, and the Hircanian sea on the other.

GALACTOPHOROUS *Dullis*, are such vessels as serve to convey milk.

GALACTOPOTÆ, see the article GALACTOPHAGI.

GALACTOSIS, the production of milk; or the action whereby the food, or chyle, is converted into milk.

GALANGAL,

GALANGAL, GALANGA, a medicinal root, brought from the East-Indies; the produce of a plant of the same name.

There are two kinds of *Galangals*; the *small*, and the *great*: the *small* is a rough, knotty root, of a ruddy colour both within, and without, and of a very pungent aromatic taste, and smell. It is brought from China, and is used with good success in all disorders of the stomach, bowels, and womb, arising from the weakness of the nerves.

The *greater Galangal*, growing chiefly in Java and Malabar, inclines more to the ash colour. Its qualities are of the same kind with those of the other; only less efficacious, but it used to be more common. The vinegar-makers use both.

GALANT, see the article **GALLANT**.

GALAXY*, in astronomy, that long, white, luminous track, which seems to encompass the heavens like a swath, scarf, or girdle; and which is easily perceivable in a clear night, especially when the moon does not appear.

* The Greeks call it Γαλαξίας, *Galaxy*, of Γάλα, *γαλακτικός*, Milk; on account of its colour, and appearance: the Latins, for the same reason, call it *via lactea*; and we, the *milky way*.

It passes between Sagittary and Gemini, and divides the sphere into two parts: it is unequally broad; and in some parts is single, in others double.

The ancient poets, and even philosophers, speak of the *Galaxy*, as the road, or way, by which the heroes went to heaven. Aristotle makes it a kind of meteor, formed of a crowd of vapours, drawn into that part by certain large stars disposed in the region of the heavens answering hereto.

Others, finding that the *Galaxy* was seen all over the globe; that it always corresponded to the same fixed stars; and that it transcended the height of the highest planets; set aside Aristotle's opinion, and placed the *Galaxy* in the firmament, or region of the fixed stars, and concluded it to be nothing but an assemblage of an infinite number of minute stars.

Since the invention of the telescope this opinion has been abundantly confirmed. By directing a good telescope to any part of the milky way; where, before, we only saw a confused whiteness, we now descry an innumerable multitude of little stars. These stars are so remote, that a naked eye confounds them: the like we observe in those other spots, called *Nebulose Stars*, which when examined with the telescope, are distinctly perceived to be clusters of little stars, too faint to affect the eye singly. See **STAR**.

GALBANETUM, a composition, or preparation of galbanum formerly prescribed; but now much out of use.

GALBANUM*, in pharmacy, a gum issuing from an incision in the root of a ferulaceous plant, called in Latin, *Ferula Galbanifera*; growing in Arabia, Syria, &c.

* The word is derived, according to Martinius, from the Hebrew *Chelbanah*, fat.

There are two kinds of *Galbanum*; the one in grains, or tears; the other in a coarse mass: the first is to be chose of a golden yellow without tinge, but much paler within; of a bitter taste, and strong, disagreeable smell. For the second, take that which is fullest of tears, very dry, clear, and not stinking. This last is easily sophisticated with broken beans, rosin, and gum ammoniac.

Galbanum is of an emollient, and resolutive nature; good in all hysteric cases, and in asthma's and inveterate coughs: it provokes the menses, and brings on delivery: but it is chiefly used externally, in plasters for the belly, which it also loosens, what way soever applied.

GALE, a sea phrase, for the blowing of the wind.

When the sea is not blown so hard, but that a ship can carry her top-sails a-trip, that is, hoisted up to the highest, they say it is a *Lean Gale*.

When it blows very strong, they say it is a *Stiff Gale*, or at least a *Fresh Gale*; but when it blows so hard, and violently, that a ship cannot bear any fail, they say, it blows a *Storm*.

When two ships are near one another at sea, and there being but little wind blowing, one feels more of it than the other; they say, the ship *gales* away from the other.

GALEARI, in antiquity, *helmet-bearers*; a name the Romans gave to the black guards, or servants of the soldiers.— See Vegetius iii. 6. and Salmastius on the third chapter of the life of Adrian by Spartian.

GALEASSE, a large, low built, heavy vessel, using both sails and oars; being the biggest of all the vessels that go with the latter.

It may carry twenty guns; with a stern, capable of lodging a great number of musqueteers: it has three masts; the main, mizzen, and bowsprit, which are never to be taken down, or lowered, as they may be in galleys. It has thirty-two benches of rowers, and to each bench five or six slaves. Will. of Tyre makes mention of *Galeasses*, with one hundred benches of oars.

It has three tire of guns, in the head, one over the other; they are of two guns each, bearing balls of thirty-six, twenty-four,

and ten pounds. It has but two tire in the stern; each containing three guns, carrying balls of eighteen pounds.

The Venetians are the only people who now use *Galeasses*: antiently, the French likewise made use of them.

GALEATE Flowers, see the article **FLOWERS**.

GALENIC, or **GALENICAL Medicine**, is that manner of considering and treating diseases, founded on the principles of Galen; or introduced by Galen.

Claud. Galen, was of Pergamus in Asia, the son of Nicon, a famous geometrician, architect; and was a pupil of Satyron and Pelops, two able physicians. He first distinguished himself at Athens; then at Alexandria; and lastly at Rome; where he wrote a great deal; and where he also died, in the year of Christ 140.

He is said to have composed two hundred treatises, whereof there are one hundred and seventy still extant. There have been twenty-three several editions of this author: the first is that of Venice, in folio, in the year 1525; but the best is that of Paris, in thirteen volumes in folio, Greek and Latin, published in 1639.

This author, collecting and digesting what the physicians before him had done; and explaining every thing according to the strictest doctrines of the Peripatetics, set physic on a new footing; he introduced the doctrine of the four elements; the cardinal qualities, and their degrees; and the four humours, or temperaments.

GALENIC is now more frequently used; as contradistinguished from *chemical*.

In this sense, *Galenical Medicine*; and *Galenical Pharmacy*, are those which go upon the easier preparations of herbs, roots, &c. by infusion, decoction, &c. and attain their ends, and make their remedies effectual, by the combining and multiplying of ingredients: in opposition to the chemical medicine, or pharmacy, which torture the materia medica by fire, and draw their more intimate and remote virtues by elaborate preparations; as calcination, digestion, fermentation, &c.

Medicine was wholly *Galenical*, till the time of Paracelsus: Geber indeed, and after him Raymund Lully, Arnoldus de Villa Nova, and Basil Valentine, made some attempts to apply chemistry to medicine; especially the last of them: but no great advance was made. Paracelsus, and after him Ven Helmont, altered the whole body of medicine; exploded *Galenism*; and the Peripatetic doctrine, and rendered medicine almost wholly chemical.

The late improvements in philosophy have reformed, and retrieved the *Galenical* medicine, which however has now little of *Galen's* in it. It is become all mechanical, and corporeal: instead of qualities and degrees, every thing is now reduced to mechanical affections; to the figures, bulks, gravities, &c. of the component particles, and to the great principle of attraction.

GALENICAL Physicians, see the article **PHYSICIAN**.

GALENISTS, a denomination given to such physicians, as practise, prescribe, or write on the *Galenical* principles.

The *Galenists* stand opposed to the *chemists*: the materia medica of the first, is chiefly of the vegetable kind; the virtues of which they procure by the more simple and easy means; and seldom go beyond decoction. The latter take in minerals, salts, stones, and even metals, and semi-metals: These, they hold, afford more efficacious remedies; and their virtues, are procured by long, artful, labour'd processes, with the help of fire, are had more pure, and in a lesser compass.

At present, the *Galenists* and chemists are pretty well accommodated; and most of our physicians use the preparations and remedies of both.

GALENISTS, or **GALENITES**, are also a Branch of Menonites, or Anabaptists, who take in several of the opinions of the Socinians, or rather Arians, touching the divinity of our Saviour.

They are thus called from their leader, Abr. Galenus, a learned, and eloquent physician of Amsterdam, who is accused of being a thorough Socinian. *Journ. t. i. p. 413, &c.*

GALERICULATE Flowers, see **FLOWERS**.

GALILEANS, GALILEI, a sect among the antient Jews, denominated from Judas of *Galilee*, their chief; who, esteeming it unworthy, that the Jews should pay tribute to strangers; raised up his countrymen against the edict of the emperor Augustus, which had ordered a census or enumeration to be made of all his subjects.

Their pretence was, that God alone should be owned as master, and called by the name of the *Lord*. In other respects they had much the same doctrine as the Pharisees; but as they judged it unlawful to pray for insidel princes, they separated themselves from the rest of the Jews, and performed their sacrifices apart.

As our Saviour, and his apostles were of *Galilee*, they were suspected to be of the sect of *Galileans*; and it was on this principle, as St. Jerom observes, that the Pharisees laid a snare for him, asking, Whether it was lawful to give tribute

to Cæsar; that in case he denied it, they might have an occasion of accusing him. Vid. Joseph. *Ant. Jud.* lib. xviii.

GALILEO's *Telescope*, see the article *TELESCOPE*.

GALL, a yellow, bitter juice, or humor, called also *Bile*, secreted from the blood, in the glands of the liver, and deposited in a peculiar reservoir, called the *Gall-bladder*.

The bile contained in the *Gall-bladder*, properly called *Gall*, is somewhat different from the bile deposited in the porus biliaris; being of a brighter yellow, a greater consistence, and more bitter and acrimonious. For the rest; the manner of secretion, with the qualities, use, &c. of the two juices, are the same; which see under the article *BILE*.

The *Gall* of divers animals, is found of divers uses: that of a hog is said to make the hair grow, and deterges and heals ulcers of the ears: that of a lamb is recommended for the epilepsy: that of the pike, for intermitting fevers: that of the carp, clears and strengthens the sight: that of a kid, mixed with the white of an egg, bread, and oil of bays, and applied in form of poultice on the navel, is an approved remedy for a quotidian ague: that of a cock, and a bullock, are reputed good in diseases of the eyes, and to take away freckles and other disfigurements of the skin; that of a roe-buck, or hare, deterges and carries off clouds, specks, and cataracts of the eyes: that of the boar, externally applied, is resolute, and good in scrophulous tumors: those of the sheep and partridge, serve to deterge and cleanse ulcers of the eyes. Fa. Roger adds, that the Mahometans of Palestine use no other remedy against poisons, but seven, or eight drops of the *Gall* of a bear.

GALL-BLADDER, *vesicula*, or *folliculus felleus*, is a membranous receptacle, in figure somewhat like a pear; situate at the lower margin of the liver, on the concave side; being about the bigness of a pullet's egg.—See *Tab. Anat. (Splanchn.)* fig. 1. lit. c. fig. 5. lit. c. (Angeiol.) fig. 1. n. 34.

The *Gall-bladder* adheres to the liver, both by its vessels, which it receives from it; and likewise by its membranes, whereof the external is common with that of the liver. The lower part, which hangs out of the liver, rests on the pylorus of the stomach, which it dyes yellow with the *Gall* transuding through its membranes.

Its membranes are reckoned five: an outer, or common one, from the peritonæum; an inner one, from the capsula of the porta, and porus biliaris; and three proper ones: the first, *vascularis*, consisting of white fibres, interwove with vessels; the second, *muscular*, consisting of a double row of fleshy fibres, the one longitudinal, the other angular; the third, or inner coat, *glandulous*, consisting of a great number of glands, like the crusta villosa of the stomach, which separate a mucus that lines the inside of the *Gall-bladder*, and defends it from the acrimony of the bile.

This bladder is usually divided into two parts, the *fundus*, or bottom; and the *collum*, or neck: at the orifice of which latter is placed a ring, or circle of muscular fibres, which serve as a sphincter to constrict the orifice of the *Gall-bladder*, and hinder the too liberal discharge of the bile.

There are some animals without *Gall bladders*, as deer, horses, asses, mules, camels; and among fishes, the sea-calf, and dolphin. The *Gall* of these animals is inclosed in ducts, which terminate in the intestines.

Wind GALL, see the article *WIND-GALL*.

GALLÆ, see the article *GALLÆ*.

GALLANT, or GALANT, a French term, signifying civil, polite, well-bred; or a person of wit, and address; who does every thing with a good grace: in fine, a civil person, somewhat brighter, gay, and more agreeable than ordinary.

It is difficult to define all the qualities annexed to the idea of a gallant man: it frequently implies an air of the world; a disposition to please, and particularly the ladies; and a great devotion to the sex. The French authors are very nice on the point: they distinguish *galant homme*, and *homme galant*.

Mercur GALANT, is the title of a book, which appeared monthly at Paris for several years.

It contain'd abundance of pretty, curious things; though several of the wits have made it their business to decry it. M. de Vize was the first projector, and author, or rather collector of it; and after his death, it was continued by other persons successively.

GALLED-Saddle, see the article *SADDLE-galled*.

GALLEON, see the article *GALLION*.

GALLERY*, in architecture, a covered place in a house, much longer than broad, and which is usually placed in the wings of the buildings; and serves to walk in.

* Savot, in his architecture, derives the word *Gallery* from *Gaul*, as supposing the ancient *Gauls* to have been the first who used them: Nicod fetches it from the French *aller*, to go, *q. d. Allerie*. Others bring it from *Galeus*, galley, by reason it bears some resemblance thereto in respect of length. In the corrupt Latin we meet with *Galilea*, for the *Gallery* of a monastery.

The *Galleries* of the Louvre are magnificent: a *Gallery* of painting; a compleat apartment is to consist of a hall, antichamber, chamber, cabinet, and *Gallery*.

GALLERY, also denotes a little life, or walk, serving as a common passage to several rooms placed in a line, or row.

The *Gallery* of a church is a kind of continued tribune, with a balustrade; built along the sides or lower end of a church, to make it hold the more people: and, in the Greek churches, to separate the women from the men.

GALLERY, in fortification, a covered walk, or passage made across the ditch of a town besieged, with timbers fastened on the ground, and planked over.—See *Tab. Fortif.* fig. 22.

The sides of the *Gallery* are to be musket proof, and to consist of a double row of planks, lined with plates of iron; and the top is sometimes covered with earth, or turf, to hinder the effect of the stones, artificial fires, &c. of the enemy.

Galleries are chiefly used to secure and facilitate the miners approach to the face of the bastion, over the moat, which is already supped filled up with faggots and bawns, and to consist of the opposite flank dismounted. Sometimes this is called a *Traverse*.

GALLERY of a Mine, denotes the *branch*; or that narrow passage under ground, leading to a mine carrying on under any work designed to be blown up.

The besiegers, and besieged do each of them carry *Galleries*, or branches under ground, in search of each other's mines, and these sometimes meet and destroy each other.

GALLERY in a Ship, is a kind of balcony, made upon the stem without board, into which there is a passage out of the great cabin.—See *Tab. Ship.* fig. 1. lit. M. fig. 2. n. 98. and 101.

These *Galleries* are for show, and the captain's pleasure, rather than any other benefit; for in ships of war, all open *Galleries* of this kind are to be avoided; in regard of the facility of an enemy's entrance, and boarding of the ship that way.

GALLEY*, a low built vessel, going both with oars and sails; chiefly used by the states bordering on the Mediterranean.

* The *Galley* is called by the Greek authors under the eastern empire, *Γαλαία*, and *Γαλινα*; and by the Latin authors of the same time, *Galea*; whence the modern denomination. Some say, it was called *Galea*, on account of the figure of a calk, or helmet, which it bore on its head, or prow, as Ovid attests, *De Tristib.* The French call it *Galerie*, by reason, they say, that the top of the masts is usually cut in manner of a hat, which the Italians call *Galea*. Others derive both *Galea* and *Galeus* from a fish, by the Greeks called *Γαλινα*, or *Γαλινα*; and by us, the *Sword-fish*, whose shape this vessel resembles. Lastly, others derive *Galley*, *Galea*, *Galerie*, *Galeaffe*, &c. from the Syriac and Chaldee *Gaul*, and *Gallin*, a man exposed on the water, or in a vessel of wood.

Galleys have usually from twenty-five to thirty benches of oars; on each side; and four or five *Galley-flaves*, to each bench.

The *Galley* carries a large gun, called the *Cowser*; two bastard pieces; and two small pieces, with two masts and two latin or square sails. It is usually from twenty to twenty-two fathoms long; three broad; and one deep; and has two masts, viz. a main-mast, and a fore-mast, which may be struck or lowered at pleasure.

All the *Galleys*, both ancient and modern, are of a finer, and slenderer make than ships. Formerly they made divers kinds; at present the *Galleys* are all alike: all the difference between them is as to size, and nothing as to figure. They usually keep towards the coasts; though sometimes they cross the sea.

The king of France keeps up forty *Galleys* for the use of the Mediterranean, the arsenal thereof being at Marseilles: the general of the *Galleys* bears a double anchor, placed in pale, behind the escutcheon of his arms, as a mark of his office.

Galleys, in Latin, are called *Biremes*, *Triremes*, and *Quadriremes*, not on account of their having two, three, or four ranges of oars before one another, as many learned men have imagined, and particularly Scaliger and Snellius, though this last has wrote excellently on the subject of navigation; for this were impracticable: nor yet on account of their having but two, three, or four oars; for then they would want strength: but by reason there were two, three, or four rowers fastened to each oar, as in the *Galleys* used among us; as is very well shewn by the Jesuit Dechaies, in his *art of sailing*.

The error was occasioned by some ancient *Galleys*, represented on medals, or basso-relievo's, wherein are several ranges of rowers placed over each other: but all the mathematicians, pilots, and ship-builders look on this as a mere vision; inasmuch as Pliny makes mention of *Galleys* of fifteen, twenty, thirty, forty, fifty rows of rowers; so that if they were ranged over each other, though we were only to allow four feet for each deck, there would be a distance of one hundred and sixty feet between the lowest rowers, and the highest: and yet we are assured, that the highest vessel ever built, was only seventy-two feet high.

Scaliger affirms, that the first *Triremis*, or *Galley* of three stories, was built at Corinth; and is of opinion, that what

Pliny calls *Long Ships*, were what we call *Galeasses*; the first whereof was that of the Argonauts. Vegetius mentions a *Galley* of five decks; and Memnon, another with eight, and only one man to each oar. See Supplement, article TRIREMIS.

Captain-GALLEY is the principal *Galley* of a fleet, commanded by the captain-general of the *Galleys*: in France, the *Royal Galley* is the first.

Patron-GALLEY denotes the second *Galley*, both of France, Tuscany, and Malta.

The second general of the *Galleys* is always on board the royal *Galley*; and the lieutenant on board the patron.

The terms peculiar to *Galleys* are very numerous, and make a new system of sea-language, different from that used in ships. Monf. de Baras, an ancient officer on board the king of France's *Galleys*, engaged himself in writing a new dictionary of the dialect of the *Galleys*.

Condemnation to the GALLEYS, is a penalty imposed on criminals and delinquents, particularly in France; whereby they are adjudged to serve the king, or state, as slaves on board the *Galleys*, either for ever, or for a limited time.

Condemnation to the *Galleys* for ever, imports confiscation of lands, goods, &c. For in France, that which confiscates the person, confiscates the goods.

A man condemned to the *Galleys* for perpetuity, is dead in a civil sense. He cannot dispose of any of his effects; cannot inherit; and if he be married, his marriage is null; nor can his widow have any of her dower out of his goods. The ecclesiastical courts cannot sentence to the *Galleys*: it is out of their jurisdiction.

By an ordinance of Charles IX. in 1564, the judges are enjoined not to condemn a criminal to the *Galleys* for less than ten years: and Hen. III. by another of 1579, enjoins the captains, not to detain their *Galley* slaves, after their time is expired. But neither of these laws are now observed.

GALLEY, in printing, a wooden frame, or instrument, into which the compositor empties the letters out of his composing-stick, as often as it is filled.

The *Galley*, when filled, contains the matter of one page; and when they have composed as many pages as are required for a whole sheet, half sheet, or the like, they impose them, *i. e.* they take the several pages out of the *Galleys*; put them into a chase; lock them up with the furniture; and so make forms, ready for the press.

GALLI, or **GALLÆ**, in antiquity, a name given in Phrygia to the eunuch priests of the goddess Cybele.

The principal of them was called *Archi-Gallus*. The *Galli* were also called *Daſtyli*, *Idæi*, *Corybantes*, &c. Authors are not agreed as to the reason of this denomination. St. Jerom, on the fourth chapter of Hosea, says, it was, because they took Gauls for the priests of this goddess, and, by way of punishment and derision for burning of Rome, castrated them. Forcatulus maintains the same opinion, l. v. de *Gallor. Imp. & Philof.* But Valla, *Eleg. v. c. 6.* and Vossius, de *Idolol. l. i. c. 20.* reject it, with reason; as the Phrygians were no ways interred in the burning and sacking of Rome.

Others derive the name from the river Gallus; by reason these priests drank of its waters, which inspired them with I know not what religious fury and enthusiasm, and deprived them of their senses to such degree, that they mutilated themselves. Others hold, that the first priest of Cybele having been named *Gallus*, the name became appropriated to all his successors. Vossius, who proposes these two opinions, seems to incline most to the latter; though Ovid, in the fourth of his *Fasti*, and Herodian, l. i. favour the former.

These priests threw themselves into a kind of phrenzy, when they performed the ceremonies of the goddess; apparently, in imitation of the young Atys, her favourite; whom they likewise imitated, by mutilating themselves.

For authors relate, that Cybele being desperately in love with that young Phrygian, she gave him the superintendance of her sacrifices, on condition he would keep his virginity; but that soon after, forgetting his promise, he had an affair with the nymph Sangaritis: that Cybele, provoked hereat, struck him mad: that in a vehement access of his phrenzy he was going to kill himself; and that the goddess relenting, restored him to his understanding: that out of his own remorse, he castrated himself; and that after his example all the priests of Cybele from that time did the like.

Their phrenzy at the time of the sacrifices, consisted in throwing round the head with great rapidity, and making violent contortions of the whole body: they had also drums and flutes, wherewith they played, and danced to them; as already observed under the articles **CORYBANTES**, and **CURETES**.

Caput GALLI, } See the articles { **CAPUT**,
Crista GALLI, } **CRISTA**.

GALLIAMBIC, in the ancient poetry. — **GALLIAMBIC poem** is a composition in *Galliambic* verses.

GALLIAMBIC verse, a sort of Iambic, consisting of six feet: 1, An Anapaest, or a Spondee; 2, An Iambus, or an Anapaest,

or Tribrach; 3, An Iambus; 4, A Daſtyl; 5, A Daſtyl; and 6, An Anapaest.

Though one might measure the *Galliambic* verse in another manner; and make a different arrangement and combination of syllables; which would give different feet. — It is certain the ancients regarded little more in the *Galliambic* verse, beside the number of measures, or intervals, without troubling themselves about the number of syllables, or the kinds of feet, whereof it was composed.

GALLIAMBUS*, in poetry, a pleasant kind of verse, used to be sung by the *Galli*, priests of Cybele, in honour of that goddess.

* The word is a compound of *Gallus*, a priest of Cybele, and *Iambus*, a foot in the Greek and Latin verse.

Galliambus also denotes a piece, or composition in *Galliambic* verses.

GALLIARD*, or **GAGLIARDA**, in music and dancing, a sort of dance, antiently in great request; consisting of very different motions, and actions, sometimes proceeding *tara à terra*, or smoothly along; sometimes capering; sometimes along the room, and sometimes a-cross.

* The word is French, *Gaillard*, or rather Italian, and literally signifies gay, merry, sprightly. This dance was also called *Romanesque*, because brought from Rome.

Thoinot Arbeau, in his *Orchesography*, describes it as consisting of five steps, and five positions of the feet, which the dancers performed before each other, and whereof he gives us the score, or tablature, which is of six minims, and two triple times.

GALLICAN Church denotes the church of France; or the assembly or convocation of the prelates of France.

M. du Puy has an express treatise of the liberties of the *Gallican* church.

GALLICAN Breviary, denotes the breviary used by the church of Agrigentum, in Sicily; which the modern writers call *Breviarium Gallicanum*.

The reason, no doubt, is its having been introduced by St. Gerlan, who was made bishop of Agrigentum, after earl Roger had been driven out of Sicily by the Saracens; and by the other French bishops, which the Norman princes brought thither.

GALLICAN liturgy, is the manner of performing divine service, antiently observed in the Gauls.

Fa Mabillon shews wherein it differed from the Roman liturgy.

1. *Liturg. Gall. c. 5, &c.*

GALLICAN Mass, see the article **MESSE**.

GALLICISM, a phrase, or construction, peculiar to the French language; or which has something contrary to the ordinary rules of grammar of other languages.

Thus, *Cet homme est sur sa bouche*, is a *Gallicism*, having no regular construction: and the same may be said of *Paire de la terre le fesse*; which no grammar could ever find out.

GALLIMATHIAS*, a dark, perplexed discourse, where words and things are huddled together so as to make an inconceivable jargon.

* The word is French; formed, as some will have it, from *poly-mathia*, which signifies diversity of sciences; by reason such as have their memory burdened with several kinds of sciences, are usually confused, and express themselves ill. M. Huet rather takes the word *Gallimathias* to have had the same origin with *aliborum*; and to have first arose at the time when all the pleadings at the bar were in Latin. There was a cause, it seems, upon the carpet, about a cock, belonging to the plaintiff Matthias. The counsel in the heat of his harangue, by often repeating the words *Gallus* and *Matthias*, happened to blunder; and instead of saying *Gallus Matthias*, said *Galli Matthias*; which at length became a general name for all confused, imbroiled language and discourse.

GALLIMAWFRY*, a ragout, hache, or hotch-pot, made of the remains of several kinds of meats.

* The word is French, *Gallimafree*, which signifies the same.

Hence the word is also used in a figurative sense for a piece, or composition, of several different parts, ill digested, and embarrassed.

GALLINAGINIS Caput, see **CAPUT**.

GALLING, see **BARK-galling**, **SADDLE**, &c.

GALLION, or **GALION**, formerly denoted a large vessel, or ship of war, of three or four decks.

GALLION is now only used in speaking of the Spanish fleet; the *Gallions* being a part of the ships employed in the commerce of the West Indies.

The Spaniards send every year two fleets; the one for Mexico, which they call the *Flota*; and the other for Peru, which they call the *Gallions*. The first, we have already given an account of, under the article **FLOTA**.

The *Gallions* are eight in number, the principal whereof are the Capitana, the Amirante, il Governo, the Patache, and Margarita, of fifty pieces of brass cannon; beside which there is a Patache of advice. These are all ships of war, and go on

the king's account; but they are so loaden and embarrassed with merchandizes, that in case of an attack, they find it difficult to defend themselves.

Beside the king's *Gallions*, there are usually twelve, or sixteen merchant ships, called *Register Ships*, belonging to private persons, who obtain leave for the same, or rather buy it; there being no West India Company in Spain. See REGISTER.

The *Gallions* are loaded at Cadix, from whence they may put out at any time: they are about two years in the whole voyage. Their departure is usually some months before that of the Flota; which cannot put out before August, by reason of the wind. When they put out together, they separate about the Antilles islands; the *Gallions* for Carthagena and Porto Bello; and the Flota for Vera Crux. At their return, they rejoin at the Havanna in the isle of Cuba.

The loading of the *Gallions* is always the richest: is an estimate of the yearly returns or cargo's, both of the Flota and *Gallions*, is as follows:

Of gold, the *Gallions* bring yearly about two or three millions of crowns; and the Flota about one. Of silver, the *Gallions* bring eighteen or twenty thousand crowns; and the Flota ten or twelve. Of precious stones, the *Gallions* bring as follow; two hundred thousand crowns worth of pearls; two or three hundred thousand crowns of emeralds; and twenty or thirty thousand crowns worth of bezards, amethysts, and other stones of less value: the Flota brings none at all. Of wools, the *Gallions* bring forty or fifty thousand crowns: the Flota, none. Of quinquina, the *Gallions* bring the value of twenty thousand crowns: the Flota, none. Of skins and leathers, the *Gallions* bring seventy thousand crowns worth: the Flota, as much. Of campeche wood, the *Gallions* bring sixty thousand crowns worth: the Flota, none. Of skins and leathers from Buenos Ayres, the register ships may bring to about two hundred thousand crowns: of cochineal, about a million of crowns: and of indigo, about six hundred thousand crowns.

GALLIOT, a small galley; or a sort of brigantine, built very lightly, and designed only for chase.

She hath but one mast, and can both sail and row. She usually carries two or three pedrero's, and hath sixteen or twenty oars.

Some also call the bomb-ketches, *Galliot*.

GALLOGLASSES, a kind of militia, or soldiery, in Ireland.

Camden, in his annals of Ireland, p. 792, relates that the Irish militia consists of cavalry, or horsemen, called *Gallloglassis*, or *Gallloglassis*, who use a very sharp sort of hatchet: and infantry, called *Kernes*.

GALLON, an English measure, for things both liquid and dry, containing two pottles, or four quarts.

The *Gallon* always contains eight pints, or four quarts; but those pints and quarts, and consequently the *Gallon* itself, are different, according to the quality of the things measured: the wine *Gallon*, for instance, contains 231 cubic inches, and holds eight pound, averdupois, of pure water: the beer, and ale *Gallon*, contain 282 solid inches: and the *Gallon* for grains, meals, &c. 272 inches, and holds nine pound, thirteen ounces, of pure water.

GALLOON, in commerce, a thick, narrow kind of ferret, ribband, or lace, used to edge or border clothes.

The term is ordinarily understood of that made of wool; sometimes, that of a thread, or even gold, or silver.

GALLOP *, in the manage, is the swiftest natural pace of a horse, performed by reaches, or leaps; the two fore-feet being raised almost at the same time; and when these are in the air, and just ready to touch the ground again, the two hind-feet are also lifted almost at once.

* The word is borrowed from the barbarous Latin *calupare*, or *calpere*, to run. Some derive it from *caballitare*: others from the Greek *καλαζεις*, or *καλαται*, to spur a horse.

In *Galloping*, the horse may lead with which fore-leg he pleases; the most usual way is that with the right: but which soever it be, the hind-leg of the same side must follow it next; otherwise the legs are said to be *disunited*, and the *Gallop* to be *false*. To remedy which disorder, the rider must stay the horse a little on the hand, and help him with the spur on the contrary side to that on which he is disunited.

In a circle the horse is confined always to lead with his fore-leg, within the turn; otherwise he is said to *gallop false*. But here, too, the hind-leg of the same side must follow.

We say, a *Hand-Gallop*, a *Canterbury-Gallop*, a *School-Gallop*, &c. A smooth *Gallop*, close to the ground, the French call, the *English Gallop*, *Galop à l'Angloise*.

GALLOWS, an instrument of punishment whereon persons convicted capitally of felony, &c. are executed by hanging. Among our ancestors it was called *Furca*, fork; a name by which it is still denominated abroad, particularly in France and Italy. In this latter country, the reason of the name still subsists; the *Gallows* being a real fork drove into the ground, a cross the legs whereof is laid a beam, to which the rope is tied.

GALLS, or **GALL-NUTS**, in natural history, &c. a kind of morbid tumors, or excrescences found on divers trees and plants, as the oak, willow, &c. in form of balls, cones, or little apples, sometimes solid, sometimes perforated. The manner of the production of *Galls* is well described by Malpighi, in an express treatise, *de Gallis*. The process, as observed in the cone *Galls*, or apples on the genus of oaks, is also given us by Mr. Derham.

These cones, says that author, are in outward appearance perfectly like the gems, or buds themselves, only vastly bigger; and, in effect, they are no other than the gems swelled out in bulk, which naturally ought to be pushed out at length. The cause of which obstruction of vegetation is this: into the very heart of the young, tender bud, which begins to be turged in June, and shoots out in a month more, an insect of the ichneumon fly kind, thrusts one, or more eggs; and, in all probability, some venomous ichor therewith. This egg soon becomes a maggot; which eats itself a little cell in the very heart or pith of the gem, which should be the rudiment of the branch, leaves, and fruit.

The branch thus destroyed, or, at least, its vegetation obstructed; the sap that was to nourish it, is diverted into the remaining parts of the bud, which are only the scaly teguments; and which by this means grow large and flourishing, and become a covering to the insect case, as before they were to the tender branch. The case lying within this cone, is, at first, but small; but by degrees, as the included maggot increases, so does the case; till it comes to the size of a large white pea, shaped like an acorn.

It may be added, that even nettles, ground-ivy, &c. have a kind of balls or cases produced on their leaves, by the injection of the eggs of a fly of the same kind. These cases always grow in, or adjoining to some rib of the leaf; and their production Malpighi and Mr. Derham describe thus:

The parent-insect, with its stiff setaceous tail, bores into the rib of the leaf, when tender, and makes way for its eggs into the very pith, or heart thereof; emitting along with them a proper juice to pervert the regular vegetations.

From this wound rises a small excrescence, which, when the maggot is hatched, increases and swells on each side the leaf, between the two membranes; extending itself into the parenchymous parts thereof, till it be grown as big as two grains of wheat. In this case lies a small, white, rough maggot; which turns to an aurelia, and afterwards to an ichneumon fly. See Supplement, article GALLS.

GALLS, or **Aleppo GALLS**, are a particular kind of vegetable tumors, or excrescences, wherein insects are hatched; and which are much used in dying, making ink, &c.

These *Galls* are produced on the hardest species of oak, called *Quercus Gallum ferens*. Those on other oaks are less fit for the purpose. They are hard as shells; and yet are no other than the cases of the insects, which are bred in them after the manner above described; and which, when come to maturity, gnaw their way out; which is the cause of those little holes observable in them. Of these insects bred in them, we have a particular account in *Philos. Transact.* N^o 245.

There are three sorts of these *Galls*: the first, blackish; the second, bordering on green; the third, whitish. The dyers use them all, according to their respective qualities; the green and black serve to dye in black; and the white for liness. 'Tis the black and green that are used in making of ink.

The English and Dutch import yearly from Aleppo, ten thousand quintals of *Galls*. The Turks have likewise a kind of ruddy *Gall*, of the size of a small nut, which they mix with cochineal and tartar, to dye scarlet with.

GAMBEZON, **GAMBEYSON**, **GAMBESON**, in the antient military language, was a kind of coat, or doublet, wore under the cuirass, to make it sit easy, and prevent its hurting the body.

It was made of wool, or cotton, quilted between two stuffs; and was likewise called *Counter-point*.

Others define the *Gambeson* a kind of soft, quilted waistcoat, wore under the coat of mail, and hanging down over the thighs.

Pellora tui coris, tui gambesonibus ornata.

GAME, *ludus*, a regular diversion; or a sport prescribed, and limited by rules.

Games may be distinguished into those of exercise, and address, and those of chance, or hazard.

To the first, belong tennis, billiards, chess, bowls, cudgels, wresting, quarts, shooting with bows, &c.

To these also belong the antient *justs* and *tournaments*.

Under the second come cards, and dice, &c.

Under cards, again, come several subordinate *Games*; the principal whereof are, *ombre*, *piquet*, *buffet*, *whist*, &c. See OMBRE, and PIQUET.

GAMES, *ludi*, in the plural, were shews, or public representations used among the antients, on religious, funerary, and other solemn occasions.

Such among the Greeks, were the *olympic*, *pythian*, *isthmian*, and *ijalytic Games*.

Among the Romans, there were three sorts of *Games*; *sacred*, *honorary*, and *ludicrous*: and Aufonius observes a difference, somewhat of the same kind, among those of the Greeks; two of their celebrated *Games* being dedicated to Gods, and two to Heroes.

Sacred GAMES were those instituted immediately in honour of some deity; of which kind were the *ludi cereales*, *florales*, *martiales*, *apollinares*, *megalenses*, *romani consulares*, or *circenses*, *capitolini*, *seculares*, *plebeii*, *compitalitii*, *augustales*, *palatini*, and *votivi*. See each described in its place.

To this class may also be referred those celebrated in memory of some illustrious person, or action; as the *ludi neroniani*, and *antici*, &c.

Authors mention a decree of the Roman senate by which it was enacted, that the public *Games* should be consecrated, and united with the worship of the gods as a part thereof; and accordingly, feasts, sacrifices, and *Games* appear to have made up the greatest part, or rather the whole, of the external worship, or service, offered to the deities of the Romans.

Honorary GAMES, *Ludi Honorarii*, were those exhibited by private persons, out of their own purse; in order to gratify the people, or ingratiate themselves with them, to make way for their own promotion.—Such were the combats of gladiators, fœnic *Games*, tragedies, comedies, and other theatrical and amphitheatrical sports.

Ludicrous GAMES were of the same kind with the *games* of exercise, and hazard among us.—Such were the *ludus trojanus*, or *pyrrhus*; the *tesseles*, and *tali*, or dice; and the *lanculi*, or chess; the *discus*, or quoit; the *pila*, ball; *trochus*, top; *mætes*, or *par impar*, odd and even with nuts; *hæpustum*, foot-ball; *capita vel navem*, crofs and pile, &c.

Others distinguish the ancient *Games* into three classes, *viz.* *races*, *combats*, and *spectacles*. The first were called *equestrian*, or *curule Games*, *ludi equestres*, or *curules*; being races of horses, and chariots, performed in the circus, in honour of the Sun and Neptune.

The second were called *agonales*, or *gymnici*; being combats of men, or beasts, in the amphitheatre, dedicated to Mars and Minerva.

The last, called *scenici*, *poetici*, and *musici*, were tragedies, comedies, balls, &c. represented on the theatres, sacred to Venus, Bacchus, Apollo and Minerva.

Homer gives us a fine description of the *Games* which Achilles instituted at the funeral of his friend Patroclus, in his *Iliad*; and others of the different *Games* held among the Phœnici, Ithacans, and at the court of Alcineus, in his *Odyssey*. And Virgil's description of the *Games* celebrated by Æneas, at the funeral of old Anchises, is nothing inferior to any of them.

GAME is also used for all kinds of wild beasts and birds, fit for eating, and which are fought after on that account.

Game includes wild beasts of venery and chase; and also beasts and iowls of warren.

Some authors divide *Game* into *large*; which include red, and fallow deer: and *small*, to which belong hares, rabbits, pheasants, and partridges.

A forest is a place set apart for preserving, feeding, breeding, &c. of all sorts of *Game*; and consists of divers things, *viz.* holt, covert, laws, courts, judges, officers, *Game*, and bounds. A chase differs from a forest, in this, among other things, that it has no such variety of *Game*.

Ways of catching *Game*, are by Hunting, Hawking, Fowling, &c.

There are abundance of *laws made for the security and preservation of the Game*.—The *Forest Law* of king Canutus, and the *Charta de Foresta* of king Henry III. we have elsewhere mentioned.

By a statute in 33 Hen. VIII. it is enacted, That no person shoot with, or keep in his house any cross-bow, or stone-bow, hand-gun, or hagbut, under the length of one yard; unless he have lands of the yearly value of 100 *l.* on pain of a forfeiture of 10 *l.* for every offence: Nor shall any person travel with a cross-bow bent, or gun charged; or shoot within a quarter of a mile of a city or town, except at a dead mark, or in defence of his house, under the like forfeiture, to be divided between the king and the prosecutor.—None, under the degree of a baron, shall shoot with any hand-gun, within a city, or town; or shoot at any fowl whatever with hail-shot; on the same forfeiture. *Id. Stat.*

Any person shooting in the night-time, or disguised, shall be deemed a felon, if he deny; if he confess, he is fineable at the next general sessions. 1 Hen. VII.

None shall kill or take pheasants or partridges, with any net, or engine, in the night-time; on forfeiture of 20 *s.* for every pheasant; and 10 *s.* for every partridge. 33 Eliz.

None shall hawk or hunt with spaniels in standing corn, or before it be thocked, unless on his own ground; on the penalty

of 40 *s.* half to the king, and the other half to the proprietor of the ground.

He that is convicted of killing or taking a pheasant, partridge, duck, heron, hare, or other *Game*; or of taking and destroying the eggs of swans, pheasants, or partridges, shall pay 20 *s.* for every such fowl, hare, &c. to the use of the poor, 1 Jac. I.

Every person convicted to have kept a greyhound dog, or net, to kill, or take deer, hare, pheasant, or partridge, unless he have inheritance of 10 *l.* per annum, a lease for life of 31 *l.* per annum; or be worth 200 *l.* in goods; or be the son of a knight, or heir-apparent of an esquire, shall pay 40 *s.* for the use aforesaid.—Nor shall any sell, or buy to sell again, any deer, hare, pheasant, or partridge, on pain of 40 *s.* *Id. Stat.*

The lord of a manor, or one having inheritance of 40 *l.* per annum, freehold of 10 *l.* or goods worth 400 *l.* or their servants licensed by them, may take pheasants, or partridges within their own lands or precincts, in the day-time between Michaelmas and Christmas. 7 Jac. I.

No lay-man, who hath not lands of 40 *s.* per annum; nor clerk, who hath not 10 *l.* revenue, shall keep any greyhound, hound, ferret, net, or engine, to destroy deer, hares, conies, or other gentleman's *Game*; on pain of a year's imprisonment. 13 Jac. I.

They that kill and take away red, or fallow deer, without consent of the owner, shall forfeit 20 *l.* to be taken by distress; one half to the owner, and the other to the informer; or for want of such distress, shall suffer a year's imprisonment. 13 Car. II.

Lords of manors, or other royalties, not under the degree of esquire, may commission one or more *Game-keepers*, who may seize all guns, dogs, bows, &c. of persons not having estates of 100 *l.* per annum freehold, or 150 *l.* per annum leasehold, or are not sons and heirs of esquires; and destroy, or convert such guns, &c. to the use of the lord. 22 Car. II.

If any enter a coney-warren though not inclosed, and chase or kill conies, he shall forfeit treble damages, and be imprisoned three months: and they that kill conies in the night-time upon the borders of warrens, or grounds used for keeping conies, shall be amerced at the discretion of the justice of peace, in any sum not exceeding 10 *s.* *Id. Stat.*

He who unlawfully hunts, takes in toiles, kills, or takes away any deer, in any forest, chase, park, parlic, or other inclosed ground; or shall be aiding and assisting therein, shall forfeit 30 *l.* for every deer killed, taken, or even wounded; and 20 *l.* though none shall be wounded or taken: to be levied by distress. 3 Will. and Mar.—And if the keeper of a forest, &c. be an offender herein, or be aiding thereto, he shall forfeit 50 *l.* 5 Georg. I. to be levied as above.

In case any hare, partridge, pheasant, fish, fowl, or other *Game* shall be found in any offender's house, he shall forfeit a sum not less than 5 *s.* nor more than 20, to be levied by distress; or in want thereof, he shall be committed to the house of correction for a space of time not greater than a month; nor less than ten days. And if any person, not qualified by law, shall keep or use any bows, grey-hounds, setting-dogs, ferrets, tumblers, snares, &c. he shall be subject to the same penalties.

If any higler, chapman, carrier, inn-keeper, or victualler, shall have in his keeping any hare, pheasant, partridge, fowl *Game*, or growse, not put in his hands by a person qualified by law, he shall forfeit 5 *l.* for every such hare, &c. half to the informer, and half to the poor, to be levied by distress; or for want thereof, he shall be sent to the house of correction for three months. 5 Anne.

Persons not qualified, keeping greyhounds, lurchers, setting-dogs, or engines to destroy *Game*; and *game-keepers*, who under colour of office, kill and sell *Game*, without their masters knowledge, are liable to the like penalty. *Id. Stat.*

No lord of a manor to appoint more than one *game-keeper*, and his name to be entered with the clerk of the peace, who is to give a certificate thereof; otherwise he is liable to the penalties against higlers. 5 Anne.

If any hare, pheasant, &c. be found in the possession of a person not qualified; unless he be entitled to it by some person that is qualified; the same shall be adjudged an exposing it to sale. Persons destroying a hare in the night, shall incur the forfeiture of 5 *l.* 5 Ann.

No lord of a manor shall appoint a *game-keeper*, with power to kill or destroy *game*, unless he be truly a servant of such lord; or be immediately employed to kill *game* for the sole use of such lord: nor shall any lord authorize a person not qualified to keep or use gun, greyhounds, &c. and such persons as shall be found offending in either of these points, shall for every offence forfeit 5 *l.* 3 Geo. I.

Lastly, if any person enter a park, paddock, or other inclosed ground, where deer are usually kept, and wilfully wound or kill any red, or fallow deer, he shall be transported to the plantations for seven years. 5 Georg. I.

GAMELIA*, Γαμηλια, a nuptial feast, or rather sacrifice, held in the ancient Greek families on the day before a marriage.

* It was thus called from γαμος, marriage; whence also γαμουλός, an epithet, or surname, given to Jupiter and Juno, considered as presiding over marriages.

GAMELION, or GAMELIUM, a poem, or composition in verse, on the subject of a marriage; more usually called an Epithalamium.

GAMETRIA, see the article GEMATRIA.

GAMING, the art, or act of performing, or practising a game; particularly a game of hazard.

All public Gaming is severely prohibited; and what money is thus lost, is recoverable again by law.

In China, Gaming is equally prohibited the common people, and the mandarins; and yet this does not hinder their playing, and frequently losing all they have; their lands, houses, children, and even wife, which are all, sometimes, laid on a single card. F. le Comte.

The business of chance, or hazard, is of mathematical consideration; inasmuch as it admits of more, and less. It is, or is supposed to be, an equality of chance, upon which the gamblers set out: this equality is to be broke in upon in the course of the game by the greater good fortune, or address of one of the parties; upon which he comes to have a better chance; so that his share in the deposit, or stakes, is now proportionally more, or better than at first: this more and less is continually varying, and runs through all the ratio's between equality, and infinite difference; or from an infinitely little difference till it arrives at an infinitely great one, upon which the game is ended. The whole game, therefore, with respect to the event or issue thereof, is only a change of the quantity of each person's share, or chance; or of the proportion their two shares bear to each other; which mathematicks alone can measure.

Hence several authors have computed the variety of chance in several cafes and circumstances that occur in Gaming; particularly M. de Moivre, in a treatise, de mensura sortis: which, as it may either be of service to the practical gamester, or the better, in teaching them on what side the advantage lies; and whether they lay on the square: or to the speculative one, in letting him into the way of thinking and determining in such cafes, we shall here give the reader an abstract of.

Laws of chance applied to GAMING.—Suppose p the number of cafes wherein an event may happen, and q the number of cafes wherein it may not happen; both sides, the contingent and non-contingent, have their degree of probability: and if all the cafes wherein the event may and may not happen, be equally easy; the probability of the happening, to that of not happening, will be as p to q.

If two gamblers, A and B, engage on this footing, that if the cafes, p, happen, A shall win; but if q happen, B shall win; and the stake be a: the chance, or expectancy of A

will be $\frac{pa}{p+q}$; and that of B $\frac{qa}{p+q}$; consequently if A or B sell their expectancies; they should have for them $\frac{pa}{p+q}$ and $\frac{qa}{p+q}$ respectively.

If there be two independent events; and p be the number of cafes wherein the first may happen, and q the number of those wherein it may not happen, and r the number of cafes wherein the second event may happen, and s the number of those wherein it may not happen; multiply p+q by r+s; the product, viz. pr+qr+ps+qs will be the number of cafes wherein the contingency or non-contingency of the events may be varied.

Hence, if A lay with B, that both events shall happen, the ratio of the chances will be as pr to qr+ps+qs. Or if he lay that the first shall happen, but not the second; the ratio of the chances will be as ps to pr+qr+qs. And if there were three, or more events; the ratio of the chances would be found by multiplication alone.

If all the events have a given number of cafes wherein they may happen, and also a given number of cafes wherein they may not; and a be the number of cafes wherein any one may happen, and b the number of cafes wherein it may not; and n be the number of all the events: raise a+b to the power of n.

If now A and B agree, that if one or more of the events happen, A shall win; if none, B: the ratio of the chances will be as a+b^n - bn to b^n; for the only term where a is not found, is b^n.

If A and B play with a single die, on this condition, that if A throw two or more aces at eight throws, he shall win; otherwise B shall win: what is the ratio of their chances?—Since there is but one cafe wherein an ace may turn up; and five where it may not; let a=1, and b=5. And again, since there are eight throws of the die, let n=8; and you will have a+b^n - bn = n a b^n - 1, to b^n - n a b^n - 1. That is, the chance of A, will be to that of B, as 663991, to 1015625; or nearly as 2 to 3.

A and B are engaged at single quois, and after playing some time, A wants 4 of being up, and B, 6; but B is so much the better gamester, that his chance again? A upon a single throw, would be as 3 to 2: what is the ratio of their chance?—Since A wants 4, and B, 6, the game will be ended in 9 throws at the most; therefore raise a+b to the ninth power, and it will be a^9 + 9 a^8 b + 36 a^7 b^2 + 84 a^6 b^3 + 126 a^5 b^4 + 126 a^4 b^5 + 84 a^3 b^6 + 36 a^2 b^7 + 9 a b^8 + b^9: and take all the terms wherein a has 4 or more dimensions, for A; and all those wherein it has 6 or more, for B: and the ratio of the chances will be as a^5 + a^4 b + 36 a^3 b^2 + 84 a^2 b^3 + 126 a b^4 + 126 a^2 b^5, to 84 a^3 b^6 + 36 a^2 b^7 + 9 a b^8 + b^9. Call a, 3; and b, 2; and you will have the ratio of the chances in numbers 1759077 to 194048.

A and B are to play with single quois; and A is the best gamester; so that he can give B, 2 in 3: what is the ratio of their chance, then, in a single throw?—Suppose the chances as x to 1; and raise x+1 to its cube; it will be x^3 + 3x^2 + 3x + 1. Now since A could give B 2 out of 3; A might undertake to win three throws running; and consequently the chances in this case will be as x^3 to 3x^2 + 3x + 1. Consequently, x^3 = 3x^2 + 3x + 1. Or, 2x^3 = x^3 + 3x^2 + 3x + 1.

And therefore $x \sqrt[3]{2} = x + 1$; and consequently $x = \frac{1}{\sqrt[3]{2}-1}$.

The chances therefore are $\sqrt[3]{2}-1$ and 1 respectively.

To find at how many trials it is probable any event will happen; so that A and B may lay a wager upon even terms.—Let the number of cafes, wherein the thing may happen at the first trial, be a, those wherein it may not, b; and x the number of trials, wherein it is an even chance, whether the thing happen or not. By what is above shewn a + b^x = bx = bx:

Log. 2. Or, a + b^x = 2 b^x. Therefore, x = $\frac{\text{Log. } a + b - \text{Log. } b}{\text{Log. } 2}$. Again, reforme the equation a + b^x = 2 b^x, and let a : b :: 1 : q, and the equation will change into this, 1 + $\frac{1}{q^x}$ = 2, Raise

1 + $\frac{1}{q^x}$ to the power of x, by Sir I. Newton's theorem, and it will be 1 + $\frac{x}{q} + \frac{x(x-1)}{2q^2} + \frac{x(x-1)(x-2)}{6q^3} + \dots$, &c. = 2.

In this equation, when q=1, then x=1: if q be infinite, x will also be infinite. Supposing x to be infinite, the equation above will be 1 + $\frac{x}{q} + \frac{x^2}{2q^2} + \frac{x^3}{6q^3} + \dots$, &c. = 2.

Again, let $\frac{x}{q} = z$, and we shall have 1 + z + $\frac{1}{2}z^2 + \frac{1}{6}z^3 + \dots$, &c. = 2.

But 1 + z + $\frac{1}{2}z^2 + \frac{1}{6}z^3 + \dots$, &c. is a number whose hyperbolic logarithm is z; consequently z=log. 2. But the hyperbolic logarithm of 2 is .7 very nearly; and therefore z=.7 nearly.

Hence where q is 1, there x=1 q; and where q is infinite, x=.7 q nearly. Thus are the limits of the ratio of x to q fixed; for that ratio begins with equality, and when raised to infinity, ends at length in the ratio of 7 to 10 nearly.

To find in how many throws A may undertake to throw two aces with two dice?—Since A has but one cafe wherein he may throw two aces with two dice; and 35 wherein he may not, q=35: therefore multiply 35 by 7; the product 245. 5. shews that the number of throws required is between 24. and 25.

To find the number of cafes, wherein any given number of points may be thrown with a given number of dice?—Let p+1 be the given number of points; n the number of dice; and f the number of sides or faces of each die: let p-f=q, q-f=r, r-f=s, s-f=t, &c. The number of cafes required will be,

$\frac{p}{1} \times \frac{p-1}{2} \times \frac{p-2}{3} \times \dots \times \frac{p-n+1}{n}$, &c. $\times \frac{q}{1} \times \frac{q-1}{2} \times \frac{q-2}{3} \times \dots \times \frac{q-n+1}{n}$, &c. $\times \frac{r}{1} \times \frac{r-1}{2} \times \frac{r-2}{3} \times \dots \times \frac{r-n+1}{n}$, &c. $\times \frac{s}{1} \times \frac{s-1}{2} \times \frac{s-2}{3} \times \dots \times \frac{s-n+1}{n}$, &c. $\times \frac{t}{1} \times \frac{t-1}{2} \times \frac{t-2}{3} \times \dots \times \frac{t-n+1}{n}$, &c.

Which series is to be continued, till some of the factors either become equal to nothing, or negative. And note,

so many factors of the several products $\frac{q}{1} \times \frac{p-1}{2} \times \frac{p-2}{3} \times \dots \times \frac{p-n+1}{n}$, &c. $\times \frac{r}{1} \times \frac{r-1}{2} \times \frac{r-2}{3} \times \dots \times \frac{r-n+1}{n}$, &c. are to be taken as there are units in n-1.

Suppose the number of cafes required, wherein 16 points may be thrown with four dice?

+ 15 x 15 x 15 x 15 = 455
- 2 x 15 x 15 x 15 = -336
+ 1 x 15 x 15 x 15 = + 6

Now, 455 - 336 + 6 = 125; so that 125 is the number required.

To find at how many casts A may undertake to throw 15 points with six dice?—Since A has 1666 cafes, wherein he may turn up 15 points, and 44990 against him; divide 44990 by 1666; and the quotient 27 will be = q. Therefore, multiply 27 by 7; the product 189 shews the number of throws required to be nearly 19.

To find the number of trials wherein it is probable any event may happen twice; so that A and B may lay a wager thereon with an equal chance?—Suppose the number of cafes wherein the event may happen the first trial, to be a; and those wherein it may not, b; and call the number of trials required, x: it appears from what is above shewn, that a + b = x

= 2bx + 2ax - 1. Or, making a : b :: 1 : q, 1 + 2x/q = 2 + 2x/q. 1° Let q = 1, and then x = 3. 2° Let q be infinite, and x will also be infinite: suppose x infinite, and x = z, and then 1 + 2z + 2z^2 + 2z^3, &c. = 2 + 2z; and therefore z = log. 2 + log. 1 + z: if then log. 2 be called y; the equation will be transformed into the following fluxional one z/z = y. And investigating the value of z by the powers of y, we shall find z = 1.678, nearly; and therefore x will always be between the limits 3q and 1.678q; but x will soon converge to 1.678q; and therefore if q have not a very small ratio to 1, we may take x = 1.678q. Or if there be any suspicion of x being too small, substitute its value in the equation 1 + 2x/q = 2 + 2x/q, and note the error, if it be worth regarding: thus will x be a little increased: substitute the thus increased value for x in the foregoing equation, and note the new error: thus, from the two errors, may the value of x be corrected with sufficient accuracy. Here we shall add a table of limits, that will carry the intent of this problem much further.

If the wager be upon happening once, the number of trials will be between 1 q and 0.693 q. If upon twice, between 3 q and 1.678 q. If upon thrice, between 5 q and 2.675 q. If upon four times, between 7 q and 3.671 q. If upon five times, between 9 q and 4.673 q. If upon six times, between 11 q and 5.668 q.

To find at how many throws A may undertake to throw three aces, twice, with three dice?—Since A has but one cafe, wherein he may throw three aces; and 215, wherein he may not; q = 215. Therefore multiply 215 by 1.678. The product 360.7 will shew the number of throws required to be between 360 and 361.

A and B deposit each 12 pieces of money, and play with three dice, on this footing, that every time 11 points are thrown, A shall give B one piece; and every time 14 points are thrown, B shall give A a piece; and that he shall win the whole, that first gets all the money in his hands: we demand the ratio of the chance of A to that of B.—Let p be the number of pieces each severally takes; and a and b the number of cafes wherein A and B may respectively gain each a piece; the ratio of their chances will be as ap to bp: In this case, p = 12, a = 27, b = 15; or if when 27: 15 :: 9: 5, you make a = 9, b = 5; and therefore the ratio of the expectancies will be as 9^12 to 5^12, or as 244140625 to 282429536481.

N. B. Great care must be taken to avoid the confounding of different problems together, from some appearance of affinity between them. The following one seems very like the former.

C having 24 pieces or counters, throws three dice; and every time 27 points turn up, gives one counter to A; and every time 14 turn up, gives one to B, and A and B engage on this footing, that he who first gets 12 counters, shall win the stake: we require the ratio of their expectancies.—This problem differs from the preceding one, in that the game must necessarily end in 23 throws; whereas, in the former, it might hold out to eternity, by reason of the reciprocations of loss and gain, which destroy one another.—Raise a + b to the 23^d power, and the 12 former terms will be to the 12 latter as the expectancy of A to that of B.

Three gamblers, A, B, and C, have each twelve balls, 4 of them white, and 8 black; and being hoodwinked, play on this condition, that the first who chuses a white ball shall win the stake;

and that A shall have the first choice, then B, then C; and so round again: what, then, is the ratio of the chances of A, B, C?—Let n be the number of balls, a the number of white ones, b of black ones, and n the stake. Here

1° A has the cafes a, wherein he may chuse a white ball; and the cafes b for a black one: consequently, his expectancy, from the first choice, is a/n, or a/(a+b). Wherefore, futfracting a from 1; the value of the remaining expectancies will be 1 - a/(a+b) = b/n.

2° B, has the cafes a for a white, and the cafes b-1 for a black one; but the first election is in A; and it is uncertain, whether or no he may have won the stake; and therefore the stake, in respect of B, is not 1, but only b/n; so that his expectancy from the second choice is (a/n) x (b/n) = ab/(n x n-1).

3° C, has the cafes a for a white; and the cafes b-2 for a black one; and therefore his expectancy from the third choice is (a/n) x (b/n) x (b-1)/(n x n-1).

4° After the like manner, A has the cafes a for a white, and b-3 for a black; so that at the fourth choice, the expectancy will be (a/n) x (b/n) x (b-1)/(n x n-1) x (b-2)/(n x n-2).

Write down, therefore, the series a/n + (a/n) x (b/n) x (b-1)/(n x n-1) + (a/n) x (b/n) x (b-1)/(n x n-1) x (b-2)/(n x n-2) + ...

Q + R + S, where Q, R, S, &c. denote the preceding terms, with their characters; and take as many terms of this series, as there are units in b+1 (for there cannot be more choices than there are units in b+1) and the sum of all the third terms, skipping the two intermediate, beginning from a/n, will be the whole expectancy of A; the sum likewise of all the third terms, commencing from a/n x (b/n) x (b-1)/(n x n-1), will be the whole expectancy of B; and the sum of the thirds, commencing from a/n x (b/n) x (b-1)/(n x n-1) x (b-2)/(n x n-2), the whole expectancy of C.

Lastly, making a=4, b=8, n=12; and the general series will change into the following one 1/12 + 1/12 x 8/11 + 1/12 x 8/11 x 7/10 + 1/12 x 8/11 x 7/10 x 6/9 + 1/12 x 8/11 x 7/10 x 6/9 x 5/8 + 1/12 x 8/11 x 7/10 x 6/9 x 5/8 x 4/7 + 1/12 x 8/11 x 7/10 x 6/9 x 5/8 x 4/7 x 3/6 + 1/12 x 8/11 x 7/10 x 6/9 x 5/8 x 4/7 x 3/6 x 2/5 + 1/12 x 8/11 x 7/10 x 6/9 x 5/8 x 4/7 x 3/6 x 2/5 x 1/4 + 1/12 x 8/11 x 7/10 x 6/9 x 5/8 x 4/7 x 3/6 x 2/5 x 1/4 x 1/3 + 1/12 x 8/11 x 7/10 x 6/9 x 5/8 x 4/7 x 3/6 x 2/5 x 1/4 x 1/3 x 1/2 + 1/12 x 8/11 x 7/10 x 6/9 x 5/8 x 4/7 x 3/6 x 2/5 x 1/4 x 1/3 x 1/2 x 1/1.

And therefore A will have 165 + 56 + 10 = 231; B will have 120 + 35 + 14 = 159; and C will have 84 + 20 + 1 = 105. So that their several expectancies will be as 231, 159, 105; or as 77, 53, 35.

A and B having 12 counters, four of them white, and eight black; A wagers with B, that taking out seven counters, blindfold, three of them shall be white: what is the ratio of their expectancies?—1° Seek how many cafes there is for seven counters, to be taken out of 12; they will be found from the doctrine of combinations, to be 792.

2° Set aside three white ones, and find all the cafes wherein 4 of the 8 black ones may be combined therewith; they will be found to be 70.

And since there are 4 cafes, in which 3 white may be taken out of four; multiply 70 by 4: Thus, the cafes, wherein 3 whites may come out with 4 blacks, are found to be 280.

3° By the common laws of gaming, he is reputed conqueror, who produces an effect oftener than he undertook to do, unless the contrary be expressly agreed on; and therefore, if A take out 4 whites with 3 blacks, he wins. Set aside 4 whites, and then find all the cafes wherein 3 of the 8 blacks may be combined with 4 whites: these cafes will appear to be 56.

4° x 3/4 x 2/3 = 56. 4 F f

40 A, therefore, has $280 + 56 = 336$ cases, wherein he may win; which subtracted from the whole number of cases 792, leaves 456, the number of cases wherein he may lose. The ratio of the chance of A, therefore, to that of B, is as 336 to 456; or as 14 to 19.

To avoid too much prolixity in this article, we must desist from further investigations, which in the following problems grow very long, and more perplexed. In the rest, therefore, we shall content ourselves to give the answer, or result, without the process of arriving at it; which may be of use, as it furnishes for many data, from whence, as standards, we may be enabled occasionally to judge of the probability of events of the like kinds: tho' without letting the mind into the precise manner, and reason thereof.

A and B play with two dice on this condition, that A shall win, if he throw six; and B, if he throw seven: A to have the first throw, in lieu of which B to have two throws; and both to continue with two throws each turn, till one of them wins: What is the ratio of the chance of A to that of B?—*Ans.* as 10355 to 12276.

If any number of gamesters, A, B, C, D, E, &c. equal in point of dexterity, deposit each one piece of money, and engage on these conditions, that two of them, A, and B, beginning the game, whichever ever of them shall be overcome shall give place to the third, C, who is to play with the conqueror; and the conqueror here, to be taken up by the fourth man, D, and thus on; till some one, having conquered them all round, draws the stake: what is the ratio of their expectancies?—This problem, M. Bernoulli solves analytically. Here, calling the number of gamesters $n+1$, he finds that the probabilities of any two immediately following each other in the course of playing, are in the ratio $1+2^n$ to 2^n ; and therefore the expectancies of the several gamesters A, B, C, D, E, &c. are in a geometrical progression $1+2^n$: 2^n : 2^{2n} : a : c : c : d : d : e , &c.

Hence it is easy to determine the state of the probabilities of any two gamesters, either before the game, or in the course thereof. If, e. gr. there be three gamesters, A, B, C, then $n=2$ and $1+2^n$: 2^n : 5 : 4 : a : c : that is, their several probabilities of winning, before A has overcome B, or B, C; are as the numbers 5, 5, 4; and therefore their expectancies are $\frac{5}{12}$, $\frac{5}{12}$, $\frac{4}{12}$; for all of them taken together, must make 1, or absolute certainty. After A has overcome B, the probabilities from A, B, and C will be $\frac{1}{2}$, $\frac{1}{2}$, $\frac{1}{2}$, as in the answer above. If there be four gamesters, A, B, C, D, their probabilities from the beginning will be as 81, 81, 72, 64. After A has beat B, the several probabilities of B, D, C, A, will be as 25, 32, 36, 56, respectively. After A has beat B and C, the probabilities of C, B, D, A, will be as 16, 18, 28, 87.

Three gamesters, A, B and C, whose dexterities are equal, deposit each one piece, and engage upon these terms: That two of them shall begin to play, and that the vanquished party shall give place to the third, who is to take up the conqueror: and the same condition to go round; each person when vanquished, forfeiting a certain sum to the main stake, which shall be all swept by the person who first beats the other two successively. How much, now, is the chance of A and B better or worse than that of C?—1^o If the forfeiture be to the sum each person first deposited, as 7 to 6, the gamesters are upon an equal footing. 2^o If the forfeiture be in a less ratio to the deposit, A and B are on a better footing than C: if in a greater ratio, the advantage is on the side of C. 3^o After A has overcome B once, the probabilities are as $\frac{7}{12}$, $\frac{6}{12}$, $\frac{6}{12}$; or as 49, 21, 1; viz. that of A the greatest, and of B the least.

M. Bernoulli gives an analytical solution of the same problem, only made more general; as not being confined to three gamesters, but extending to any number at pleasure.

A and B, two gamesters of equal dexterity, play with a given number of balls; and after some time A wants 1 of being up, and B, 3: what is the ratio of their chances?—A's expectancy is worth $\frac{7}{8}$ of the stake, and B's only $\frac{1}{4}$; so that their chances are as 7 to 1.

Two gamesters, A and B, of equal dexterity, are engaged in play, on this condition, that as often as A exceeds B, he shall give him one piece of money; and that B shall do the like, as oft as A exceeds him; and that they shall not leave off, till one has won all the other's money: each now having four pieces; two by-flanders, R and S, lay a wager on the number of turns, in which the game shall be finished; viz. R, that it shall be over in 10 turns: what is the value of the expectancy of S?— $\frac{6}{11}$ of the wager; or it is to that of R as 560 to 464.

If each player had 5 pieces, and the wager were, that the game shall end in ten turns, and the dexterity of A were double that of B; the expectancy of S would be $\frac{11}{17}$.

If each gamester have 4 pieces; and the ratio of the dexterities be required to make it an even wager that the game shall end in 4 turns; it will be found that the one must be to the other as 5.274 to 1.

If each gamester have 4 pieces, and the ratio of their dexterities be required to make it an even lay that the game shall be ended in 6 turns; the answer will be found to be, as 2.576 to 1.

Two gamesters, A and B, of equal dexterity, having agreed not

to leave off playing till ten games are over; a spectator, R, lays a wager with another, S, that by that time, or before, A shall have beat B by three games: what is the value of the expectancy of R?— $\frac{1}{12}$ of the wager; or it is to that of S, as 352 to 672.

GAMMUT, GAMUT, or GAM-ut, in music, a scale, whereon we may learn to found the musical notes, ut, re, mi, fa, sol, la, in their several orders, and dispositions.

The invention of this scale is owing to Guido Aretin, a monk of Arezzo, in Tuscany; though it is not so properly an invention, as an improvement on the diagramma or scale of the antients.

The gammut is also called the *harmonical hand*; by reason Guido first made use of the figure of the hand, to arrange his notes on.

Finding the Greek diagramma of too small extent, Guido added five more chords, or notes to it: one, below the proflambanomenos, or gravest note of the antients; and four, above the nete, or acutest.

The first, he called *hypo-proflambanomenos*; and denoted it by the letter G, or rather the Greek Γ, gamma: which note being at the head of the scale, occasioned the whole scale to be called by the barbarous name *gamm*, or *gammut*.

Some say, Guido's intention in calling his first note Γ, gamma, was to shew, that the Greeks were the inventors of music: others that he meant hereby to record himself; this being the first letter of his own name.

Guido's scale is divided into three series, or columns; the first called *molle*, or flat; the second *natural*; and the third *durum*, or sharp, as represented in the scheme, *Tab. Miscel. fig. 17*. But since his time, some alterations have been made therein.

The use of this scale, is to make the passages, and transpositions from B molle, to B durum, by means of the tones and semi-tones. The series of B natural standing betwixt the other two, communicates with both; so that to name the chords of the scale by these syllables, if we would have the semitones in their natural places, viz. b c and e f, then we apply ut to g; and after la we go into the series of b natural at fa; and after la of this, we return to the former at mi, and fo on: or we may begin at ut in c, and pass into the first series at mi, and then back to the other at fa: by which means the one transition is a semitone, viz. la, fa: and the other a tone, la, mi. To follow the order of b molle, we may begin with ut in c, or f, and make transitions after the same manner.

Hence came the barbarous names of *gammut*, *are*, *bmi*, &c. But what a perplexed work is this, with so many different syllables applied to every chord; and all to mark the places of the semitones, which the simple letters a, b, c, &c. do as well, and with more ease?

Several alterations have since been made in the *gammut*. M. le Maire, particularly, has added a seventh note, viz. fi; and the English usually throw out both ut and fi, and make the other five serve for all: as will be shewn under the article SOL-FADING.

GAMMUT, or GAMM, is also the first, or gravest note in the modern scale of music, the reason whereof is shewn under the preceding article.

GANG, in the sea language, signifies a crew.

To man a boat, is called to put a gang of men (which is a company) into her: they are commonly called the *cockswain's gang*, who has the charge of her.

GANG-WAY, is applied to all the several entrances, ways, or passages, from one part of the ship to the other.

Whatever is put in one of these passages, is said to be laid, or put in the *gang-way*. See *Tab. Ship. fig. 2. n. 22, 84, 94*.

Water-GANG, see the article WATER-GANG.

GANGLIO*, GANGLION, in medicine, a small, hard knotty tumor, formed on the nervous and tendinous parts, without any discolouring of the skin, or any sense of pain.

* The word is Greek, γανγλιον, which signifies the fame. The tumor, when on the nerves, tendons, articulations, or any of the membranous parts, retains its name, *ganglio*; every where else, it is called *nodus*.

The cause of the *ganglio* is a too great distention of the pores of the part; or the too great compression; or a laceration thereof: of any of these occasion the nutritious juice to be there stopped and retained; and even to exude, condense, and harden into a tumor. The same effect is sometimes also produced by a bruise, hard labour, or the like. Most authors hold the cause of the *ganglio* to be a heavy, viscid pituita.

The *ganglio* is sometimes removed, and resolved by mere dry friction, long continued; and sometimes by friction with lilia: some chuse to apply a plate of lead, anointed with mercury: others use gum ammoniac; or the plaster of vigo, with mercury. If these do not succeed, recourse is had to section.

GANGRENE*, **GANGRÆNA**, in medicine, is a mortification in its first, or beginning state; while yet the part retains some sense of pain, and a share of the natural heat.—By which this disease is distinguished from a *sphacelus*, or thorough mortification; where there is no sense or warmth left.

* The word is Greek, *γκάγγραινα*, derived by some authors from the Paphlagonian *gangra*, a goat; it being the character of a goat to brooze the grass all around, without shifting its place. It is juster, perhaps, to derive it from the Greek verb *γᾶω*, *γᾶνω*, *manduco*, *absumo*, I eat, I consume.

The *gangrene* is a disease in the flesh of the part, which it corrupts, consumes, and turns black; spreading and seizing itself of the adjoining parts: and it is rarely cured without amputation.

It arises from a stoppage, or interception of the circulatory motion of the blood; which by this means fails to furnish the part with the nutritious and spirituous juices, necessary to preserve its warmth, and life.

This interception of circulation, which is the proximate cause of the *gangrene*, is itself occasioned divers ways: as by large tumors, erysipela's, great inflammations, violent cold, tight bandages or compressions, sudden fluxions of some malignant humor, bites of venomous beasts, fractures, wounds, and ulcers ill managed, &c.

It is distinguished by the colour of the flesh, which first turns pale, then dusky, or sublivid; and by its growing loose, and flabby from vehemently tense which it was before. In the progress of the disease, the part distils a fetid, discoloured water; and emits a cadaverous smell.

Upon the first seizure, the skin turns pale, afterwards it becomes livid; vesications arise, and the colour at length changes to black; the flesh becomes fetid, fanious, and moist; then withers, and soon becomes insensible: the heat and pulsation of the part being likewise diminished. Shaw.

If in a large wound, the tumor of the lips do not suppurate, nor any flux of matter, or inflammation arise; if the lips do not swell, or after swelling grow lank and flaccid again on a sudden: it is reckoned a sure sign of an approaching *gangrene*.

When a *gangrene* proceeds from extreme cold, the part affected is first benumbed, or seized with a pricking pain, this is followed by a redness, which gradually changes to black.

When a tight bandage is the cause, a faccidity of the part is joined to the insensibility thereof; when the scurvy, it often begins in the great toe, and appears in form of a blackish spot, which turns to a dry crust, succeeded by a stupor of the part, &c.—When the bite of any venomous creature is the cause, a continual fever attends, &c. and pain is felt in the part; which usually brings on a syncope, or delirium: and pustles arise about the bite.

By the microscope a *gangrene* has been discovered to contain an infinite number of little worms, ingenerated in the morbid flesh; and which continually producing new broods, swarm and overrun the adjacent parts.

To stop the progress of the *gangrene*, physicians prescribe, internally, sudorifics, and alexipharmics; externally, decoctions of quick-lime, either simple, or with the addition of sulphur, mercurius dulcis, and spirit of wine camphorated.

In a severe stage of the distemper, they fearily deep, to the very quick; and afterwards apply hot liquors, cataplasms, &c. Some recommend horse-dung boiled in wine, or urine. The unguent ægyptiacum also comes into use in this case.

Bellefleur prescribes the following, as the most efficacious remedy, known for *gangrenes*; viz. quicksilver dissolved in double the quantity of spirit of nitre, or aqua fortis; a linen cloth being dipt therein, and applied to the *gangrenous* part. This alone, he assures us, is sufficient. If the *gangrene* be occasioned by an intense frost; snow water, or a linen cloth dipt in cold water, and applied to the part affected, Boerhaave directs as the best cure.

If the *gangrene* proceed to an utter sphacelation, and be seated in any of the limbs, or extreme parts, recourse must be had to the operation of amputation.

GANTLET*, or **GAUNTLET**, a large, strong glove, made to cover the arm, or hand of a cavalier, when armed at all points.

* The word is derived of the French *gantlet*; and that from *gant*, or *gant*, glove.

The *Gauntlet* was of iron; and the fingers, plated.—The catk, and *Gauntlets* were always bore in the ancient marches in ceremony.—*Gauntlets* were not introduced, till about the thirteenth century.

The *gantlet* was frequently thrown, like the glove, by way of challenge.

GANTLET, in chirurgery, is a kind of bandage for the hand; being a swathe, four or five yards long; wherewith they wrap up the hand, and all the fingers, one after another.

GANYMEDE, *Γαγυμῆδης*, a term lately come in use to express a catamite, or bardacio. See **SODOMY**.

The expression takes its rise from a young beautiful Trojan shepherd, thus called; whom Jupiter ravished, or carried off by his eagle, or rather by himself under the figure of an eagle, as he was hunting on mount Ida; and made him his cup-bearer, in the place of Hebe; who, having made a false step, and spilt her liquor, was turned out of that office.

Some say, that the Jupiter, who ravished *Ganymedes*, was *Tantalus*, king of Phrygia; the eagle expressed the swiftness, wherewith he was carried off. See *Vossius de Idæol.* l. i. c. 14. &c. and Barthius, on the *Thebaid*, l. i. ver. 548.

GAOL*, a prison, or place of legal confinement.

* The word is formed of the French *geole*; and that of the barbarous Latin *geola*, *gaola*, *goyola*, a cage; whence the Picards still call a bird-cage, *geyolle*.—The gaoler, geolier, was called *gaularius*, and *cajularius*. Scaliger derives the word *galer* from *janicularius*. And some Latin authors call him *commentaricnsis*, by reason he keeps a register, or list of all those under his custody.

GOAL-Delivery, see the article **JUSTICE**.

GARBE, in heraldry, a representation of a sheaf of corn, or other grain; sometimes born in coat armour, to signify summer, or the month of August; as the bunch of grapes does autumn.

He bears azure a *garbe* or; the arms of the Grosvenors of Eaton in Cheshire.

GARBLER of Spices, an officer of great antiquity, in the city of London, who is empowered to enter any shop, warehouse, &c. to view, and search drugs, &c. and to *garble* and cleanse them.

GARBLES, the dust, soil, or filth, severed from good spice, drugs, &c.

GARBLING*, of spice, drugs, &c. is the cleansing it from the dross and dust mixed therewith; and severing the good from the bad.

* The word comes from the Italian *garbellare*, to shake.

GARBLING of bow staves, is the sorting, or culling out the good from the bad.

GARCON*, or **GARSOON**, a French term, literally signifying a boy, or male child, any time before his marriage.

* Pontanus remarks, that the word was antiently wrote *warcon*. Etymologists cannot agree as to its origin.—To say nothing of all the rest, Martinius alone proposes seven derivations; without pitching upon any, viz. the Latin *garrus*, to prattle; the Chaldee *גַרְר*, student, learner; the French *garder*, to guard; the German *warren*, to tarry, or wait; the Greek *ναρξ*, young-man; the Arabic *جَارِي*, young-man; and the Hebrew *גַרְר*, the young of any brute.

GARCON, is also applied to divers inferior officers, among us called *grooms*, *garçons*.—Thus, all the servants in the French king's chamber, wardrobe, &c. who do the lesser offices thereof under the proper officers, are called *garçons de la chambre*, *de la garde-robe*, &c.

GARD, see the article **GUARD**.

Ravissement de GARD, see the article **RAVISHMENT**.

GARDE—Corps de GARDE, see the article **CORPS**.

GARDANT, in heraldry, see the article **GUARDANT**.

GARDEN, an inclosure, or plot of ground, curiously cultivated, and furnished with variety of plants, flowers, fruits, &c.

Gardens are distinguished into *flower-gardens*, *fruit-gardens*, and *kitchen-gardens*: the first are for pleasure, and ornament; and therefore are placed in the most conspicuous parts: the two latter are for service; and therefore made in by-places.

In a *garden*, the principal things to be considered, are the *form*, *soil*, *situation*, and *aspect* or *exposure*.

For the *form*: a square, or rather oblong, is most eligible; leading from the middle of the house, with a gravel walk in the midst; narrow grass-borders on each side; and on either side of these, rows of variety of winter greens. If the ground be irregular, it may be made uniform, so as to afford a prospect nothing inferior to the most regular; straight lines will reduce any figure to order. A triangle has its beauty, as well as a square; and the most irregular spots may be brought by borders, and walks, to those two figures.

Indeed, an irregularity is easily hid in a large *garden*, by long walks, and tall hedges, interrupting a distant view: and the little corners, and triangular spaces, may be agreeably filled up with borders of flowers, dwarf trees, flowering shrubs, or evergreens. Nor is it prudent, to be solicitous to throw the whole *garden* into a single view; as irregularities, and unevennesses, afford many uncommon, and pretty devices, &c.

For the second point, or the *soil*: a deep, rich, black mould is best for useful plants; sandy land is warm and forward, and good for flowers; chalky land is cold and backward. But both are easily corrected by composts, or materials of opposite kinds.

For the *situation*: if the *garden* be too high, it will be exposed to the winds, which are highly prejudicial to trees; if too low, the dampness will be injurious, beside the breeding of vermin; a flat, therefore, or the side of a hill, are the happiest situations; especially the latter, as it is usually well

watered, and sheltered from the extremities of weather, beside that the water descending from on high, will supply it with fountains, cascades, and other ornaments of a garden. For the *aspect*, or *exposure*, we have already considered what relates thereto, under the article *exposure*.

Of all things, the ground, or soil of the garden is the most important: unless this be rich, and fertile, all the other advantages will be vain. To judge of the quality of the soil, some direct us to look, whether there be any heath, thistles, or other such weeds growing spontaneously therein, this being a certain sign of a poor ground: the growth of the trees, too, thereabout, is to be considered: if they grow crooked, ill-shaped, and grubby, of a faded green, and full of moss; the place is to be immediately rejected. If the contrary be found; you must proceed to examine the depth of the soil, by digging holes into the ground. The soil should be three foot deep; but less than two, is not sufficient.

The chief furniture of pleasure gardens are, parterres, vistas, glades, groves, compartments, quincunces, verdant halls, arbour work, mazes, labyrinths, fountains, cabinets, cascades, canals, terraces, &c. See each under its proper article.

In the planting a fruit or kitchen garden, if the soil be a hungry gravel, or sand, Mr. Switzer directs the holes where the trees are to be planted, to be dug two feet deep, and three or four over, and filled with rotten horses or cows dung, mixed with rich mould: if it be marl or stiff clay, a compost of rubbish, lime, pieces of brick, ashes, sand, &c. will be best to mix with the dung and mould; though he is of opinion, that untried earth, dung from a waste or common where cattle have been fed, would prove the best soil of any for young trees.

The trees being now taken out of the nursery, the biggest roots are to be shortened to about six inches; all the small fibres taken off; and the head to be pruned, so as not to leave above two branches; and those not above six inches long.

The wall trees, to be placed as far from the wall, as may be; that there may be the more room for the roots to spread. Then, filling up the hole with mould, there remains nothing but to secure the roots from the winter's frost, by covering the spot with straw, fern, dung, &c. And in summer, from the sun; by sand and pebble tones.

For trees planted in borders, the common practice is to make a trench by the wall-side, two foot broad, and as many deep. This trench they fill with old dung, mixed with earth, lightly laid, near as high as the borders are intended to be; and then trodden down to half the height in the places where the trees are intended to be. It is prudent, to plant the trees shallow, and to raise the earth about them; especially in a wet, clayey soil.

It is an observation of some importance, that wall trees, and fruit thrive best, when the walks that run parallel to them, are gravel; more of the rays of the sun being thereby reflected to them, than if they were grass. Add, that no sort of tall trees are to be suffered to grow in any of the opposite borders, or intermediate spaces, so, that their shade might reach to the south-east, or south-west walls. The places near the walls are most advantageously filled with dwarfs.

GARDENING, *Horticulture*, the art of cultivating a garden.

Gardening has in all ages been esteemed an employment worthy the greatest heroes, and philosophers: the emperor Dioclesian, at Salona; and Epicurus, and Metrodorus, at Athens, have ennobled the art beyond all encomium.

Goetzius, superintendent of Lubbeck, printed a dissertation in 1706, entitled *Κυρτοφιλια, seu de eruditiss hortorum cultoribus*, of the learned men who have loved, and cultivated gardens; among which number he ranks Adam, Gregory Nazianzen, St. Augustin, Pliny, and Cicero: nor should he have forgot the elder Cato, Democritus, and Plato, and his academy.

The Sieur le Nostre first carried *gardening* to any thing of perfection: M. la Quintinie has gone yet further; nor have our own countrymen of late been wanting to its improvement; as London, Wife, Bradley, Laurence, Fairchild, Miller, &c.

M. Fatio has lately applied mathematical reasoning to *gardening*, and shewn how to make the best use of the sun's rays in gardens.

The principal operations in *gardening*, are planting, transplanting, engraving, inoculating, pruning, sowing, &c. All which see under their proper articles.

Other particulars, relating to the art of *gardening*, see under PINCHING, VARIEGATING, NURSERY, SEED, GREENHOUSE, HOT-BED, &c. See also FRUIT-TREE, DWARF, &c. See also SALLET, &c.

GARDENING, in falconry—To *garden a hawk*, is to put her on a turf of grass to cheer her.

Some also use the same phrase for the giving her an airing, at letting her fly at large.

GARDEROBE, see the article **WARD-ROBE**.

GADVISURE, in heraldry; see **VIZOR**.

GARDEYN, see the article **GUARDIAN**.

GARDIAN, see the article **GUARDIAN**.

GARDS, see the article **GUARDS**.

GARGARISM *, **GARLE**, in medicine, a liquid form of remedy, for disorders of the mouth, gums, throat, &c.

* The word is Greek, *Γαργαρισμα*, formed of *Γαργαρις*, *collure*, to wash.—Or of the Hebrew *Garghera*, the throat.

Gargarisms are composed of honey, salt, syrups, spirits, vinegar, waters, and decoctions; and produce their effect by cleaning, lubricating, &c. the parts.

We say, an astringent *gargarism*, detergent *gargarism*, refrigerent *gargarism*, emollient *gargarism*, apoplectic *gargarism*, &c.

GARLAND *, an ornament for the head, made in manner of a crown, or chaplet.

* The word is formed of the French *guirlande*, and that of the barbarous Latin *garlanda*, or Italian *ghirlanda*: Menage traces its origin from *gyrus*, through *gyrulus*, to *gyrularis*, *gyrlandum*, *ghirlandum*, and at length *ghirlanda* and *guirlande*; to that *guirlande* and *garland* are descended in the sixth or seventh degree from *gyrus*. Hicks rejects this derivation, and brings the word from *garde banda*, which in the northern languages signify, a *nosegay* artfully wrought with the hand.

Garlands are a sort of chaplets, made of flowers, feathers, or even of precious stones; but especially of flowers: To which the word in our language is more immediately appropriated. Janus passes in antiquity, for the inventor of *garlands*. *Athen. Dipsos*. l. xv.

Garlands also denote ornaments of flowers, fruits, and leaves intermixed, antiently much used at the gates of temples, where feasts, or solemn rejoicings were held; or at any other places, where marks of public joy and glee were desired; as at triumphal arches, tournaments, &c. *Garlands* or *Festoons*, were also put on the heads of victims in the antient heathen sacrifices. St. Paulinus, in his poem on St. Felix, does not forget the *garlands* and crowns of flowers, placed at the door of the church, and on the tomb of that saint.

The Italians have a sort of artificers, called *festaroli*, whose office is, to make *garlands* or *festoons*, and other decorations for feasts.

GARLAND, in a ship, denotes a collar of ropes, wound about the head of the main-mast, to keep the shrouds from galling.

GARNET, see the article **GRANATE**.

GARNISH, in some antient writings and statutes—To *garnish* the heir, signifies to warn the heir.

GARNISHEE, in law, the party, in whose hands money is attached within the liberties of the city of London; so called in the sheriff's court, because he has had *garnishment*, or warning, not to pay the money, but to appear and answer to the plaintiff-creditor's suit. See **ATTACHMENT**.

GARNISHING *, is popularly used for the furniture, assembly, or fortment necessary for the using, or adorning any thing.

* The word is French, formed of the verb *garnir*, to furnish, or fit out.

The *Garnishing* of a dish, consists of certain things which accompany it; either as a part, and ingredient thereof; in which sense pickles, mushrooms, oysters, &c. are *garnishing*: or as a circumstance or ornament; as when leaves, flowers, roots, &c. are laid about a service, to amuse the eye.

The same word is used for the finer herbs, fruits, &c. laid about a fallot: *garnishings* are of lemon, pistachio's, pomegranate, yolks of hard eggs, artichock bottoms, capers, truffles, sweetbread, &c.

GARNISHMENT, in law, denotes a *warning* given any one to appear; for the better *summoning* the cause, and court. Thus if one be sued for the detinue or certain charters, and says, they were delivered to him, not only by the plaintiff, but by J. S. also; and therefore prays, that J. S. may be warned to plead with the plaintiff, whether the conditions are performed, or no—in this petition he is said to *pray garnishment*; which may be interpreted, a warning to J. S. to provide himself of a defence; or else a summoning the court with all parties to the action, whereby it may thoroughly determine the cause.

GARRISON *. a body of forces, disposed in a fortress, to defend it against the enemy; or to keep the inhabitants in subjection; or even to be substituted during the winter season.

* Du Cange derives the word from the corrupt Latin *garnisio*, which the later writers use to signify all manner of munition, arms, victuals, &c. necessary for the defence of a place, and the sustaining of a siege.

Garrison, and *winter quarters*, are sometimes used indifferently for the same thing; and sometimes they denote different things.

In the latter case, a *garrison* is a place wherein forces are maintained, to secure it; and where they keep regular guard: as, a frontier town, a citadel, castle, tower, &c. — The *garrison* should always be stronger than the towns-men.

Winter-quarters, signify a place where a number of forces are laid up in the winter-season, without keeping the regular guard. The soldiers therefore like better to be in winter-quarters, than in *garrison*.

GARTER, *Πηξιακός*, a ligature to keep up the stockings; it is also particularly used for the badge, or cognizance of a noble order of knights, hence denominated the

Order of the GARTER, a military order, instituted by king Edward III. in 1350; under the title of the *Sovereign*, and *knights-companions of the most noble order of the Garter*.

This order consists of twenty-six knights, or companions; generally, all peers, or princes; whereof the king of England is the sovereign, or chief.

They wear a *garter*, set with pearls and precious stones, on the left leg, with this motto, *honi soit qui mal y pense*, q. d. shame to him, that thinks evil thereof.

They are a college, or corporation; having a great, and little seal: their officers are, a prelate, chancellor, register, king at arms, and usher.

Beside which, they have a dean, and twelve canons, with petty canons, vergers, and twenty-six pensioners, or poor knights.

The order is under the patronage, or protection of St. George of Cappadocia, the tutelary saint of this kingdom.

Their college is held in the castle of Windsor, within the chapel of St. George, and the chapter-house, erected by the founder for that purpose. Their robes, &c. are the *garter*, decked with gold and gems, and a buckle of gold, to be worn daily; and, at feasts and solemnities, a fur-coat, mantle, high velvet cap, collar of SS's, composed of roses enamelled, &c.

When they wear not their robes, they are to have a silver star on the left side; and they commonly bear the picture of St. George, enamelled on gold, and beset with diamonds, at the end of a blue ribbon, crossing the body from the left shoulder. They are not to appear abroad without the *garter*, on penalty of 6 s. 8 d. paid to the register.

The order of the *garter* appears the most ancient and noble lay order in the world. It is prior to the French order of St. Michael, by 50 years; to that of the golden fleece, by 80 years; to that of St. Andrew, by 190 years; and to that of the Elephant, 209 years.

Since its institution, there have been eight emperors; and twenty-seven or twenty-eight foreign kings; beside numerous sovereign princes enrolled as companions thereof.

Its origin is somewhat differently related: the common account is, that it was erected in honour of a *garter* of the countess of Salisbury, which she dropped in dancing, and which king Edward picked up: but our best antiquaries set this aside as fabulous.

Camden, Fern, &c. take it to have been instituted on occasion of the victory obtained over the French, at the battle of Cressy: that prince, say some historians, ordered his *garter* to be displayed, as a signal of battle; in commemoration whereof he made a *garter* the principal ornament of the order, erected in memory of this signal victory; and a symbol of the indissoluble union of the knights.

Fa. Papebroche, in his *Analesta* on St. George, in the third tome of the *Acta Sanctorum* published by the Bollandists, has a dissertation on the *order of the garter*. This order, he observes, is not less known under the name of *St. George*, than under that of *garter*; and that, though it was only instituted by king Edward III. yet it had been projected before him, by king Richard I. in his expedition to the Holy-Land; if we may credit an author, who wrote under Henry VIII. Papebroche adds, however, that he does not see what that author grounds his opinion on; and that though the generality of writers fix the epocha of this institution to the year 1350, he rather chuses, with Froissard, to refer it to the year 1344; which agrees better with the history of that prince; where we read, that he called an extraordinary assembly of knights that year.

In 1551. Edward VI. made some alterations in the ritual of this order; that prince composed it in Latin, the original whereof is still extant in his own hand writing. He there ordained, that the order should no longer be called the *order of St. George*; but that of the *garter*; and instead of the *George*, hung at the collar, he substituted a cavalier, bearing a book on the point of his sword, with the word *protectio* graven on the sword; and *verbum Dei* on the book; with a buckle in the left hand, and the word *fills* thereon. Larrey.

For a further account of the order of the *garter*, see Camden, Ashmole, Dawson, Leland, Polydore Virgil, Heylin, Legar, Glover, and Faun.

Erhard, Cellius, and the prince of Orange, adds Papebroche, have given descriptions of the ceremonies used at the installment of knights. A Cistercian monk, named Mendocius Belvalctus, has a treatise, intitled *La Garretiere, or Speculum Anglicanum*, since printed under the title of the *Casubijm* of Vol. I.

the *order of the garter*: wherein he explains all the allegorical, or pretended, of those ceremonies, with the moral significations thereof.

GARTER, *principal king at arms*; see **KING at arms**.

Garter, and *principal king at arms*, are two distinct offices, united in one person: *garter's* employment is to attend the service of the order of the *garter*; for which he is allowed a mantle and badge, a house in Windsor castle, and pensions both from the sovereign and knights, and lastly, fees. He also carries the rod and sceptre at every feast of St. George, when the sovereign is present: and notifies the election of such as are new chosen: attends the solemnity of their installations, and takes care of placing their arms over their seats: and carries the *garter* to foreign kings and princes; for which service, it has been usual to join him in commission with some peer, or other person of distinction.

Garter's oath relates only to services to be performed within the order; and is taken in chapter before the sovereign and knights. His oath, as king at arms, is taken before the earl marshal.

GARTER is also a term in heraldry, signifying the moiety, or half, of a bend.

GARTH, see the article **FISHGARTH**.

GAS, in chemistry, a term used by Van Helmont, to express a spirit not coagulable; such as that arising from wine when fermenting; or from aqua regia when preying on gold.

In reality, he applies the word so obscurely, and precariously, that 'tis hard reducing it to any one sense.

Thus, he calls the vital principle in man, *gas vitale*; and the same denomination *gas* he gives to the sulphurous steams which occasion damps: add, that he calls the air, *gas vitiosum*; and water, the *gas of salt*.

Some would fix his meaning to the spirit, or subtle and most volatile part of a body: and thus, *gas cervicifera*, is the spirituous steam, which flies off from ale, while in working; but this does not take in his whole idea of *gas*.

ASCOIGN, or **GASKOING**, the hinder thigh of a horse; commencing from the stifle, and reaching to the ply, or bending of the ham.

GASCONADE, a boast or vaunt of something very improbable.—He pretended he had fought singly against three men; a downright *gasconade*!

The term has its rise from the Gascoons, or people of Gascony, in France, who, it seems, have been distinguished for bragging, and rhodomontado.

GASKOIN, see the article **GASCOIN**.

GASTALDUS*, or **CASTALDUS**, an officer, antiently entertained in the courts of divers princes.

* The word is also wrote *gastaldus*, *gastaldo*, *gastaldarus*, *gastaldus*, &c. Macri derives it from the Arabic *chafendari*, purveyor of a house; others, from the German *gast*, and *balten*, to retain travellers.

The *gastaldus* was what in Italy and Spain is now called *major-domo*, viz. the master, or steward of a household. The *gastaldus* was a comes, or count, which shews his office to have been very considerable.

In the laws of Italy we sometimes also meet with *gastaldus*, in the sense of a courier; and sometimes as an ecclesiastical officer; so that it is somewhere expressed to be simony, to buy the function of *gastaldus*.

GASTREPIPOICA, in anatomy, a vein, which opens into the trunk of the vena porta; formed of several branches, derived from the stomach, and epiploon*.

* Whence its name from *γαστρης*, stomach, and *επιπλοον*, epiploon.

GASTRIC, **GASTRICUS**, in anatomy, is applied to divers veins, on account of their proceeding from the stomach, or ventricle, which the Greeks call *γαστρικη*.

The *gastricus major*, or greater *gastric* vein, is inserted into the splenic vein; and the *minor*, or lesser *gastric*, into the trunk of the vena porta.

GASTRILLOQUUS*, or **GASTRILLOQUOS**, a person who speaks inwardly, or within his stomach; and whose voice seems to come from a-far off; more usually called *ventriloquus*. See **VENTRILLOQUUS**.

* The word is formed of the Greek, *γαστρικη*, belly, stomach, and the Latin *loqui*, to speak.

GASTROCNEMIUS, in anatomy, a name common to two muscles, constituting the *fura*, or calf of the leg; the one called *externus*, the other *internus*. See *Tab. Anat. (Myol.)* fig. 6, 11, 41, 41.

GASTROCNEMIUS externus, called also *suralis externus*, and *gemellus*, has two distinct, fleshy originations, from the superior, and hindermost part of each tubercle of the lower appendage of the thigh-bone; which in their descent are each dilated into two small fleshy bellies, the innermost of which is thickest and largest; having each a different series of fleshy fibres, which at length uniting, make a broad, strong tendon; which narrowing itself, joins the great tendon of the soleus, four fingers breadth above its insertion into the os calcis. See *Tab. Anat. (Myol.)* fig. 1. n. 66. fig. 2. n. 48.

When this muscle acts, the foot is said to be extended or pulled backwards; which motion is very necessary in walking, running,

ning, leaping, or standing on tip-toe, &c. whence it is, that those who walk much, or carry heavy burdens, and who wear low-heeled shoes, have these muscles larger than others.

GASTROCHEMIUS, or *suralis internus*, called also *solatus*, from its figure resembling a sole fish, is placed under the external. Its outer fleshy part is covered with a transparent tendinous expansion, which makes it appear of a livid colour.—See *Tab. Anat. (Myol.)* fig. 1. n. 63. fig. 2. n. 47.

It begins partly tendinous, chiefly from the hindermost part of the upper appendix of the fibula, and back-part of the tibia, that is, below the insertion of the subpopliteus; and increases to a large fleshy belly, composed of various orders of fleshy fibres, some of them underneath aptly expressing the figure of the top of a feather, whose Stamina, being here tendinous, join with the great tendon, which is about a finger's breadth long; and inserted into the superior and hindermost part of the os calcis.

The foot, together with the toes, being, as it were, a lever to the whole body, ought therefore to be attended with muscles of great strength to extend it; which is the reason that these muscles so much exceed their antagonists.

GASTROLATER, a glutton, or belly-god: *cujus deus ventris est*.

GASTROMANCY*, or **GASTROMANTIA**, a kind of divination, practised among the ancients, by means of words coming, or seeming to come out of the belly.

* The word is Greek, γαστρομαντία, composed of γαστήρ, belly, and μαντία, divination.

There is another kind of divination, called by the same name *gastromancy*, which is performed by means of glasses, or other round, transparent vessels; within which certain figures appear, by magic art. It is thus called, by reason the figures appear as in the belly of the vessels.

GASTROTOMY, the operation of cutting open the belly; otherwise called the *Cæsarian Section*. See **CÆSARIAN SECTION**.

GATE, a large door, leading, or giving entrance, into a city, town, castle, palace, or other considerable building.

Thebes, in Egypt, was antiently known by the appellation, *with an hundred gates*. Fez, in Africa, has thirty-one gates. In antient Rome there was a triumphal gate, *porta triumphalis*. In modern Rome there is the *jubilee gate*, which is only opened in the year of a grand jubilee. See **JUBILEE**.

The gates of London are many of them converted into gaols, or prisons; as *Ludgate*, *Newgate*, &c.—The lesser, or *by-gates*, are called *posterns*.

Gates through which coaches, &c. are to pass, should not be less than seven foot broad; nor more than twelve; the height to be $1\frac{1}{2}$ the breadth.

Opening of GATES, in astrology, see **OPENING**.

GAVEL, or **GABEL**, in law, signifies tribute, toll, custom, yearly rent, payment, or revenue; of which there were antiently several kinds, *gavel-corn*, *gavel-malt*, *out-gavel*, *gavel-fodder*, &c.

GAVEL, is sometimes also used for what we more usually call the *gable*. See **GABLE**.

GAVELET, **GAVELETUM**, in law, a special, and antient kind of cessavit, used in Kent, where the custom of *gavel-kind* continues; whereby the tenant shall forfeit his lands and tenements to the lord, if he withdraw from him his due rents, and services*.

* The process of the *gavelet* is thus: the lord is first to seek by the steward of his court, from three weeks to three weeks, to find some distress upon the tenement; till the fourth court; and if at that time he find none, at this fourth court, it is awarded, that he take the tenement in his hand in name of a distress, and keep it a year and a day without manuring; within which time, if the tenant pay his arrears, and make reasonable amends for the with-holding, he shall have and enjoy his tenement as before; if he come not before the year and day be past, the lord is to go to the next county court, with witnesses of what had passed at his own court, and pronounce there his process, to have further witnesses; and then by the award of his own court, he shall enter and manure the tenement as his own: so that if the tenant desire afterwards to have and hold it as before, he must agree with the lord, according to this old saying: "Has he not since any thing given, or any thing paid, then let him pay five pound for his were, ere he become headler again."—Other copies have the latter part with some variation: "Let him nine times pay, and nine times repay."

GAVELKIND, a tenure, or custom, whereby the lands of the father are equally divided, at his death, among all his sons; or the land of the brother among all the brethren, if he have no issue of his own.

*Tantumvis patriis succedit in agros
Miserula stirps unius, ne foret ulla potens.*

This custom, which antiently obtained throughout England, is still of force in the greatest part of Kent, Urchenfield in Herefordshire, and elsewhere; though with some difference: But by the Stat. 34 and 55 Hen. VIII. all *Gavelkind* lands in Wales are made defendable to the heir, according to the course of common law.

In an antient book of records in Christ-church, Canterbury, of the time of Henry VIII. our Saxon ancestors are said to have held all their lands either by writing or without: the first were called *bookland*; whose owners were men, whom we now call *freeholders*: the second was called *folkland*; the owners whereof were of servile condition, and possessed *ad voluntatem domini*. Now, the inheritance, or freehold, did not, in those days, descend to the eldest son, but to all alike; which in Saxon was called *landesfestan*, and in Kent, *to sifst land*; whence came the custom *gavelkind*. And the reason why it was retained in Kent more than other places, was that "The people of Kent, upon the Norman invasion, could not be reduced to surrender to the conqueror, but on these conditions, that they should retain their antient country-customs without any infringement or diminution; and especially that called *gavelkind*."

"The lands held under this denomination, descend equally; and are divided, share and share alike, among all the male children; and in defect of these, among the females." He adds, "That they are of age, or qualified to take the lands upon them, at fifteen; and may then give, vend, or alienate the same to any person, without the consent of any lord: and children here inherit their father's land though convicted of felony, murder, &c. The tenants in *gavelkind* are to do fealty; and to be in the tuition of the next a-kin, who is not next heir after them, till fifteen years of age; to pay acknowledgment to the lord for the lands." &c.

GAVELMAN*, a tenant who is liable to tribute.

* *Villani de Torrington, qui vocantur Gavelmanni.* Somner, *Gavelkind*.

GAUGE-Line, a line on the common gauging-rod, whose description and use see under the article **GAUGING**.

GAUGE-Point, of a solid measure, is the diameter of a circle, whose area is equal to the solid content of the same measure. Thus, the solidity of a wine gallon being 231 cubic inches; if you conceive a circle to contain so many inches, the diameter of it will be 17.15; and that will be the *gauge-point* of wine measure.

And an ale gallon containing 283 cubic inches; by the same rule, the *gauge-point* for ale-measure will be found to be 19.15; and after the same manner may the *gauge-point* of any other measure be determined.

Hence we deduce, that when the diameter of a cylinder in inches is equal to the *gauge-point* in any measure, (given likewise in inches) every inch in length thereof will contain an integer of the same measure. In a cylinder whose diameter is 17.15 inches, every inch in height contains one intire gallon in wine-measure; and in another, whose diameter is 19.15, every inch in length contains one ale gallon.

GAUGER, an officer, appointed by the king, to gauge, i. e. to examine, or measure all casks, tuns, pipes, barrels, hogheads of beer, wine, oil, &c. and to give them a mark of allowance (which is a circle burnt with an iron) before they be sold in any place within the extent of this office.

GAUGING, the art, or act of measuring the capacities, or contents of all kinds of vessels; and determining the quantity of fluids, or other matters contained therein.

Gauging is the art of reducing the unknown capacity of vessels of divers forms, cubical, parallelepipedal, cylindrical, spheroidal, conical, &c. to some known cubic measure; and of computing, for instance, how many gallons, quarts, pints, or the like, of any liquor, a. g. ale, beer, wine, brandy, &c. are contained therein.

Gauging is a branch of stereometry.

The principal vessels that come under its operation, are pipes, barrels, rundlets, and other casks; also backs, coolers, fats, &c. The solid content of cubical, parallelepipedal and prismatical vessels, is easily found in cubic inches, or the like, by multiplying the area of the base by the perpendicular altitude.

And for cylindrical vessels, the same is found by multiplying the area of the circular base, by the perpendicular altitude, as before.

Casks of the usual form of hogheads, kilderkins, &c. may be considered as segments of a spheroid cut off by two planes, perpendicular to the axis; which brings them to Oughtred's theorem, for measuring ale and wine casks; which is thus: Add twice the area of the circle at the bung, to the area of the circle of the head. Multiply the sum by one third of the length of the cask: the product is the content of the vessel in cubic inches.

But, for accuracy, Dr. Wallis, Mr. Caswell, &c. think, that most of our casks had better be considered as frustums of parabolic spindles; which are less than the frustums of spheroids of the same base, and height; and give the capacity of vessels nearer the truth, than either Oughtred's method,

which

which supposes them spheroids; or than that of multiplying the circles at the bung and head, into half the length of the cask, which supposes them parabolic conoids; or than that of Clavius, &c. who takes them for two truncated cones; which is furthest off of all.

The common rule for all wine or ale casks, is to take the diameters at the bung, and at the head; by which you may find the areas of the circle there: then taking two thirds of the area of the circle at the bung, and one third of the area of the circle at the head; and adding them together into one sum; this sum multiplied by the internal length of the cask, gives the content in solid inches: which are converted into gallons, by dividing by 282 for ale, and by 231 for wine gallons.

But *gauging*, as now practised, is chiefly done by means of instruments, called *gauging-rods*, or *rules*, which do the business at once, and answer the question without so much calculation; which is no inconsiderable addition, both to the ease and dispatch of the work. This instrumental way of *gauging*, therefore, we shall here chiefly insist upon.

Construction of a GAUGING-rod, whereby the content of any cylindrical, or other common vessel is easily had.—Take the diameter AB of a cylindrical vessel, ABDE, *Tab. Surveying*, fig. 26. that holds one of the measures wherein the fluid is estimated, *e. gr.* gallons; and join it at right angles to the indefinite line A 7. From B to 1, fet off a right line equal to AB; then will B 1 be the diameter of a vessel, that holds two measures, or gallons, of the same height as the former.

Again, let $A 2 = B 2$; then will B 3 be the diameter of a vessel that holds three measures, but of the same height as that which only holds one. And after the same manner, find the diameters of other larger vessels, B 4, B 5, B 6, B 7, &c. Lastly, fet off the several divisions thus found, A 1, A 2, A 3, &c. upon the side of a rod, or rule; and on the other, the height, or depth of a cylinder, that holds one measure or gallon, repeated as oft as it will go. Thus is the *gauging-rod* complete.

For cylinders, that have the same altitude, are to each other as the squares of their diameters; consequently the square of the diameter that holds 2, 3, or 4 gallons, must be double, triple, or quadruple of that which only holds one. And since in the first, $AB = A 1$, the square of B 1 is double, that of B 2 triple, that of B 3 quadruple, &c. it is evident, that the right lines A 2, A 3, A 4, &c. are the diameters of the vessels required.

These divisions, therefore, being applied to the side of a cylindrical vessel, it will immediately appear how many measures, *e. gr.* gallons, a cylindrical vessel of that bafe and of the height of that which holds one gallon, will contain.

Wherefore, finding by the divisions on the other side of the rod, how often the height of one gallon is contained in the height of the given vessel; and multiplying the diameter before found by this number: the product will be the number of gallons the vessel contains.

Thus, *e. gr.* if the diameter of the cylindrical vessel be 8, and its height 12, its content will 96 gallons.

Note, 1^o. The less you take the height of the cylinder, containing one gallon, the greater will the diameter of the bafe be: whence both that, and the diameters of the cylinders, containing several gallons, will be the more easily divisible into lesser parts. Bayer directs such height to be only one digit, or tenth of an inch.

2^o. The diameters of vessels holding one or more decimal parts of a gallon, will be had by dividing one or more decimal parts of the vessel holding a whole gallon, by its height; which gives us the area of the circular bafe; from whence the diameter is easily found by the rules delivered under DIAMETER, CIRCLE, &c. And after the same manner the diameters are found for the divisions of vessels that hold two or more gallons.

Use of the GAUGING-Rod.—To find the content of a cask; that is, to determine the number of measures, *e. gr.* gallons, it will hold: apply the *gauging-rod* to the vessel, as directed in the preceding article; and find both the length of the cask, A C, fig. 27. and both diameters GH, and AB. Now, as we find by experiment, how far soever it may be from geometrical exactness, that a common cask of this form may safely enough be reputed as a cylinder, whose bafe is a medium between the head and the belly; find such medium, which call the *equated diameter*.

Then multiplying the number thus found by the length of the cask AC; the product will be the number of measures the vessel contains.

Suppose, *e. gr.* $AB = 8$, and $GH = 12$, and $AC = 15$; the equated diameter will be 10; which multiplied by 15, gives the capacity of the cask, 150 measures.

If it happen that the diameters of the two ends be not equal; measure them both, and take half their sum for the diameter to work by.

There is another method, whereby the content of a vessel is had without any calculation at all, which obtains in divers parts of the many and the Low Countries: but as this supposes all vessels to be similar to each other; and their length double of

the equated diameter, that is, of half the sum of the diameters AB, and GH; it is not safe to use it in all places. Kepler, however, prefers it so much before all others, as including all the precautions possible; that he recommends it to the public, to enact it by law, that all casks be made in this proportion.

The methods of *gauging*, which chiefly obtain among us, are by the four-foot *gauging-rod*, and Everard's *sliding-rule*.

Description and use of the four-foot GAUGING-rod.—The four-foot *gauging-rod*, represented in *Tab. Surveying*, fig. 18. n. 2 is usually made of box, and consists of four rules, each a foot long, and about three eighths of an inch square, joined together by three brass joints; by which means the rod is rendered four foot long, when the four rules are quite opened; and but one foot when they are all folded together.

On the first face of this rod, marked 4, are placed two diagonal lines; one for beer, and the other for wine: by means of which the content of any common vessel in beer or wine gallons may be readily found, by putting the rod in at the bung-hole of the vessel, till it meets the intersection of the head of the vessel with the staves opposite to the bung-hole. For distinction of this line, there is writ thereon, *beer and wine gallons*.

On the second face, 5, are a line of inches, and the gauge-line; which is a line expressing the areas of circles, whose diameters are the correspondent inches in ale gallons. At the beginning is writ, *ale area*.

On the third face, 6, are three scales of lines; the first, at the end of which is writ *hoghead*, is for finding how many gallons there is in a hoghead, when it is not full, lying with its axis parallel to the horizon. The second line, at the end of which is writ *B. L.* signifying a *butt lying*, is for the same use as that for the hoghead. The third line is to find how much liquor is wanting to fill up a butt when it is standing; at the end of it is wrote *B. S.* signifying a *butt standing*. Half way the fourth face of the *gauging-rod*, 7, there are three scales of lines, to find the wants in a firkin, kilderkin, and barrel, lying with their axes parallel to the horizon. They are distinguished by letters *F. K. B.* signifying a *firkin, kilderkin, and barrel*.

Use of the diagonal lines on the GAUGING-rod.—To find the content of a vessel in beer or wine gallons, put the brafed end of the *gauging-rod* into the bung-hole of the cask, with the diagonal lines upwards; and thrust this brafed end to the meeting of the head and staves: then, with chalk, make a mark at the middle of the bung-hole of the vessel; and also on the diagonal lines of the rod, right against, or over one another, when the brafed end is thrust home to the head and staves. Then turn the *gauging-rod* to the other end of the vessel, and thrust the brafed end home to the end as before.

Lastly, see if the mark made on the *gauging-rod* come even with the mark made on the bung-hole, when the rod was thrust to the other end; which if it be, the mark made on the diagonal lines, will, on the same lines, shew the whole content of the cask in beer or wine gallons.

If the mark made on the bung-hole, be not right against that made on the rod, when you put it the other way; then, right against the mark made on the bung-hole, make another on the diagonal lines: and the division on the diagonal line, between the two chalks, will shew the vessel's whole content in beer or wine gallons.

Thus, *e. gr.* if the diagonal line of a vessel be 28 inches four tenths, its content in beer gallons will be near 51, and in wine gallons 62.

If a vessel be open, as a half-barrel, tun, or copper, and the measure from the middle on one side, to the head and staves, be 38 inches; the diagonal line gives 122 beer gallons; half of which, *viz.* 61, is the content of the open half tub.

If you have a large vessel, as a tun or copper, and the diagonal line taken by a long rule, prove 70 inches; the content of that vessel may be found thus:

Every inch at the beginning-end of the diagonal line, call ten inches. Thus, ten inches become 100 inches; and every tenth of a gallon call 100 gallons; and every whole gallon call 1000 gallons.

Exam. at 44.8 inches, on the diagonal beer-line, is 200 gallons; so that 4 inches 48 parts, now called 44 inches 8 tenths, is just two tenths of a gallon, now called 200 gallons; so also if the diagonal line be 76 inches and 7 tenths, a close cask, of such diagonal, will hold 1000 beer gallons; but an open cask but half so much, *viz.* 500 beer gallons.

Use of the GAUGE-line.—To find the content of any cylindrical vessel in ale gallons: seek the diameter of the vessel in inches, and just against it, on the *gauge-line*, is the quantity of ale gallons contained in one inch deep: this multiplied by the length of the cylinder, will give its content in ale gallons.

For example, suppose the length of the vessel 32.06, and the diameter of its bafe 25 inches; to find what is the content in ale gallons?

Right against 25 inches, on the *gauge-line*, is one gallon, and .745 of a gallon; which multiplied by 32.06, the length, gives 55.9447 gallons for the content of the vessel.

The bung diameter of a hoghead being 25 inches, the head diameter 22 inches, and the length 32.06 inches; to find the quantity of ale gallons contained in it?

Seek 25, the bung diameter, on the line of inches; and right against it on the *gauge-line*, you will find 1.745; take one third of it, which is .580, and set it down twice: seek 22 inches the head diameter, and against it you will find on the *gauge-line* 1.356; one third of which added to twice .580, gives 1.6096; which multiplied by the length 32.06, the product will be 51.603776, the content in ale gallons.

Note, this operation supposes, that the aforesaid hoghead is in the figure of the middle frustum of a spheroid.

The use of the lines on the two other faces of the rod, is very easy; you need only put it down right into the bunghole (if the vessel you desire to know the quantity of ale gallons contained therein be lying) to the opposite staves; and then, where the surface of the liquor cuts any one of the lines appropriated to that vessel, will be the number of gallons contained in that vessel.

The description and use of Everard's sliding rule for gauging, see under the article *SLIDING RULE*.

GAUGING-*Rad*, see the article *GAUGING*.

GAULISH *Language*, see *ROMAN* and *FRENCH*.

GAUNT, an old word for lean, or lank.—Thus we say, a gaunt-bellied or light-bellied horse, when his belly shrinks up towards his flanks.

GAUNTLET, see the article *GANTLET*.

GAURES, or rather GAVRES, or GABRES; see the article *GABRES*.

GAWZE, in commerce, a very thin, slight, transparent kind of stuff, wove sometimes of silk, and sometimes only of thread.

To warp the silk for making of *gawzes*, they use a peculiar kind of mill, upon which the silk is wound: this mill is a wooden machine, about six foot high; having an axis perpendicularly placed in the middle thereof, with six large wings, on which the silk is wound from off the bobbins, by the axis turning round.

When all the silk is on the mill, they use another instrument, to wind it off again on to two beams: this done, the silk is passed through as many little beads as there are threads of silk; and thus rolled on another beam, to supply the loom. The *gawze* loom is much like that of the common weavers, though it has several appendages peculiar thereto. See *LOOM*.

There are figured *gawzes*; some with flowers of gold and silver, on a silk ground: these last are chiefly brought from China.

GAYAC, see the article *GUAIACUM*.

GAZE-*Hound*, see the article *HOUND*.

GAZETTE*, a news-paper, or printed account of the transactions of divers countries, in a loose sheet, or half sheet.

* The word is formed of *Gazetta*, a kind of coin, formerly current at Venice; which was the ordinary price of the first news-papers printed there: though others derive it, by corruption, from the Hebrew *izgad*, which signifies *nuntius*, a messenger; but this etymology is too much forced.

We say, the *London Gazette*, *Paris Gazette*, *Gazette à la main*, &c.—*Gazettes*, which most people look on as trivials, are by some held the most difficult kind of compositions that have appeared. They require a very extensive acquaintance with the languages, and all the terms thereof; and a great facility, and command of writing, and of relating, things cleanly, and in a few words.

To write a *Gazette*, a man should be able to speak of war both by land, and sea; be thoroughly acquainted with every thing relating to geography, the history of the time, and that of the noble families: with the several interests of princes, the secrets of courts, and the manners and customs of all nations.

Vigneu de Marville recommends a set of *Gazettes* well wrote, as the fittest books, for the instruction of young persons, coming into the world.

The first *Gazette* published in these parts, is said to have been that of Paris, begun in the year 1631, by Theophrast Renaudot, a physician of Montpellier, in his office of intelligence.

GAZONS, in fortification, turfs, or pieces of fresh earth covered with grass, cut in form of a wedge, about a foot long, and half a foot thick: to line or face the out-sides of works made of earth, in order to keep up the same, and prevent their mouldering.

GEERS, a general term for trappings, harness, and all other things, that belong to draught-horses, or oxen.

GEHENNA, *Gehenna*, a scripture term, which has given some pain to the critics. It occurs in St. Matthew v. 22, 29, 30. x. 28. xviii. 9. xxiii. 15, 33. Mark ix. 43, 45, 47. Luke xii. 5. James iii. 6.

The authors of the Louvain, and Geneva versions, retain the word *Gehenna*, as it stands in the Greek; the like does M. Simon: the English translators render it by *hell*, and *hell*.

fire; and the like do the translators of Mons, and father Bouhours.

The word is formed from the Hebrew *gebinnom*, i. e. valley of Hinnom. In that valley, which was near Jerusalem, there was a place named *Tophet*, where some Jews sacrificed their children to Moloch, by making them pass through the fire. King Josias, to render this place for ever abominable, made a cloaca, or common store thereof, where all the filth and carcases in the city were cast.

The Jews observe further, that there was a continual fire kept up there, to burn and consume those carcases; for which reason, as they had no proper term in their language, to signify *hell*, they made use of that of *gehenna*, or *gebinnom*, to denote a fire unextinguishable.

GELALEAN *Calendar*, see the article *CALENDAR*.

GELATINOUS, among physicians, is applied to any thing approaching the glutinous consistence of a jelly.

GELD, or GILD, in our ancient customs, a mulct, or compensation for a crime, or delinquency. See *GILD*.

Hence, *verrigild* was antiently used for the value or price of a man slain; and *orsgild*, of a beast, * &c.

* *Et sint quiriti de Geldis, & De negellis, Horn geldis, & Fortgeldis, & de Blodwita & Flitwita, & Leirwita, & Hingwita, & Freminsleda, & Werdeni, & Awerpeni, & Hundredpeni, & Tellingpeni.* Charta Ric. II. Priorat. de Hatland in Devon.

Foot-GELD, } see the articles { FOOT-Geld.
Horn-GELD, } { HORN-Geld.
Wood-GELD, } { WOOD-Geld.

GELDABLE, see the article *GILDABLE*.

GELDING, the operation of castrating, and particularly horses.

The same term is also applied to a horse thus castrated; or whose testicles are cut out, to disable him from being a stallion.

In *gelding* of horses, regard is to be had to their age, the season of the year, and, as the farriers say, to the state of the moon.—For the first, if it be a colt, the operation may be performed at nine, or at fifteen days old, if the testicles be come down; in regard the sooner he is *gelded*, the better it will be for his growth, shape, and courage; though a horse may be *gelded* at any age, it care be taken in the cure.—As for the second, the best time is about April, or May; or else about the latter end of September. And for the third, the wane of the moon is preferred as the fittest time.

The manner of *gelding* is thus: the beast being cast on some soft place, the operator takes the testicles between his fore and great finger; slits the cod, and presses out the stones; then taking a pair of nippers made very smooth, either of steel, box, or brass, he claps the strings of the stones between them, very near to where the stones are set on; and presses them so hard, that there may be no flux of the blood; and then tears away the stone with a thin drawing cauterizing iron, made red-hot.

This done, he takes a hard plaister, made of wax, rosin, and washed turpentine melted together, and melts it on the head of the strings with the hot iron; and afterwards fears the strings, and melts more of the salve, till there is a good thickness of the salve laid on the strings.

This being done to one stone, the nippers are loosened, and the like is done to the other; and the two slits of the cod are then-filled with white salt; and the out-side of the cod anointed with hogs grease: and thus they let him rise, and keep him in a warm stable, without tying him up.

If he swells much in his cod, or sheath, they chase him up and down, and make him trot an hour in a day; and he soon recovers.

GELOSCOPY, GELOSCOPIA, a kind of divination, drawn from laughter: or, a knowledge of any person's character, and qualities, acquired from the consideration of his laughter.

GEM, or GEMM, GENMA, a common name for all precious stones, or jewels.

Among *gems*, the principal are the diamond, ruby, sapphire, emerald, turcoise, opal, agat, &c. See each under its proper article, *DIAMOND*, *RUBY*, *SAPPHIRE*, *EMERALD*, &c. Pearls are also ranked among *gems*; though not stones.

Several authors, both ancient and modern, relate wonders of the virtues, and medicinal properties of *gems*: but their reputation, in this respect, is now not a little fallen; and many even deny them any virtue at all. Yet are the fragments of such stones still preserved by some physicians, in some of the most celebrated compositions; and there are several chemical preparations made of them.

In effect, as several persons of the greatest candour and experience, have related some considerable effects of certain *gems*, on their own particular observations; and, as it is no ways improbable that some of the softer stones may have considerable operations on the human body; it might be imprudent indiscriminately to exclude them all from any medicinal virtue at all.

When much the greatest part of their traditory qualities are set aside as fabulous; there will still remain some, on as real, and well warranted a footing, as many of our other medicines.

On such considerations, Mr. Boyle was induced to give us a treatise of the *origin and virtues of gems*; the purport whereof is to make appear, that such stones were originally in a fluid state, or made up of such substances as were formerly fluid; and that many of their general virtues are probably derived from the mixture of metalline, and other mineral substances usually incorporated with them; while the great variety, and the particular efficacy of their virtues arise from some happy concurrent circumstances of that commixture; *e. gr.* the peculiar nature of the impregnating liquor, the proportion wherein it is mixed with the perfect juice, and the like.

To support this hypothesis of the virtues of *gems*, he shews that several of them are not simple concretions of any pretentious liquors, but that they consist also of other mineral adventitious parts; which he argues from the separableness of such substances in some stones, the specific gravity in others, and the different waters or tinctures to be met with in *gems* of the same species, as rubies, sapphires, garnates, and even diamonds; of which last some are yellow, some of other colours, and some green, almost like emeralds.

There may therefore be in some *gems*, numberless adventitious corpuscles: but there is great reason to think that some of these corpuscles may be indued with several properties and medicinal virtues: there is a great difference among these impregnating particles, and probably a greater variety than known by us; and lastly, many *gems* are very richly impregnated with these particles: why, then, may not they exert some power? This is the substance of what is directly alleged, in behalf of *gems*.

The strefs of what is objected against them, is, that the mineral substances they contain, are so closely locked up, that they can communicate nothing to the body, and so can have no medicinal operation, being unconquerable by so small a heat, as that of the stomach, and other parts of the body.

Which objection might be plausible enough to prevent one's ascribing any medicinal virtues to them a priori; but can conclude nothing against what is warranted by so many facts, and observations; especially, when there are several particulars, that obviate this objection.

For, a vigorous loadstone, though frequently harder than many *gems*, is known to emit copious effluvia: and there are many which have been found to have a manifest and inconvenient operation on the human body, by being wore in the pocket, or long held in the hand. Mr. Boyle has found divers transparent pebbles, which, when cut, would resemble diamonds, that might be immediately brought to emit copious, and strong scented steams. And if electrical attractions be owing to the effluvia of bodies excited by rubbing; very slight alterations may suffice to procure exspirations from transparent *gems*, many of which are electrical, and even the hardest of all, *viz.* diamonds; one of which Mr. Boyle kept by him, which upon a little friction would attract very vigorously.

To that part of the objection, which pretends *gems* not to be digestible by the heat of the stomach, it may be replied, that we do not know how far the digestion of things in the stomach is owing to heat: nor is it proved, that such materials can have no operation on the body, without being digested, *i. e.* in passing through it, without undergoing any sensible change of bulk, figure, &c. as *gems*, when swallowed, are supposed to do.

For some chemists make a kind of bullets of regulus of antimony, which they call *pillule perpetuae*, because when they have performed their operation in the body, and are cast forth with the excrements, they may be us'd again and again for the same purpose. Nor do we know, what analogy there may be between some juices in the body, and those mineral parts which impregnate *gems*: for though the oculus mundi be reckoned among the rare *gems*, yet if one of the best sort be, for a while, kept in common water, it will undergo an alteration, obvious to the eye.

Add that Mr. Boyle has, without heat, obtained a manifest tincture from several hard bodies, and even from a transparent sort of *gems*, by means of a faint liquor, distilled from a vegetable substance, as hartsels, and as plentifully eaten as bread. And whether some juices of the body, assisted by the natural heat thereof, may not serve for menstrua to some *gems*, we will not say; but even the natural heat of a human stomach, may perhaps of the external parts of the body, may be able, though not to digest precious stones, yet to fetch out some of their virtues: for it is certain, it makes a sensible alteration in the hardest sort of them: witness a diamond of Mr. Boyle's, whose electrical faculty might be excited without rubbing, only by a languid degree of adventitious heat: and another, which, by means of water made a little more than luke warm, might be brought to shine in the dark. See PHOSPHORUS.

Lastly, if it be yet objected, that it is not likely *gems* should part with any effluvia, or portions of themselves, inasmuch as they lose none of their weight: it may be answered, that the animonial glass and cup imbue wine and other liquors, with a strong emetic quality, without undergoing any sensible diminution of weight. Add, that though common water be not allowed a menstruum fit to draw any thing from mercury; yet, both Helmont, and others inform us, that a large quantity of it being kept a day or two upon a small proportion of that drug, will acquire a virtue of killing worms; though the mercury retains its former weight.

GEM, GEMMA, in botany, an eye. See GEMMA.
GEMARA*, or GHEMARA, the second part of the Babylonian Talmud.

* The word גמרא Gemara, is commonly supposed to denote a supplement; but, in strictness, it rather signifies complement, perfection; being formed of the Chaldee גמר Gemar, or Ghemar, to finish, perfect, or complete any thing.

The Rabbins call the Pentateuch, simply the *Law*. The first part of the Talmud, which is only an explication of that law, or an application thereof to particular cases, with the decisions of the ancient Rabbins thereon, they call the *Mischna*, *i. e.* second law: and the second part, which is a more extensive and ample explication of the first law, and a collection of decisions of the Rabbins posterior to the *Mischna*, they call *Gemara*, *q. d.* perfection, completion, finishing; by reason they esteem it the finishing of the law, or an explication, beyond which there is nothing further to be desired.

The *Gemara* is usually called simply *Talmud*, the common name of the whole work. In this sense we say, there are two *Gemara's*, or Talmuds; that of Jerusalem, and that of Babylon; though in strictness, the *Gemara* is only an explication of the *Mischna*, given by the Jewish doctors in their schools: much as the commentaries of our school divines on St. Thomas, or the master of the sentences, are an explication of the writings of those authors.

A commentary, Monsr. Tillemont observes, was wrote on the *Mischna*, by one Jochanan, whom the Jews place about the end of the second century: but Fa. Morin proves from the work itself, wherein mention is made of the Turks, that it was not wrote till the time of Heraclius, or about the year 620: and this is what is called the *Gemara*, or *Talmud of Jerusalem*, which the Jews do not use or esteem much, by reason of its obscurity.

They set a much greater value on the *Gemara*, or *Talmud of Babylon*, begun by one Asa; discontinued for seventy-three years, on occasion of the wars with the Saracens and Persians; and finished by one Josa, about the close of the seventh century.

Though the name Talmud, in its latitude, includes both the *Mischna*, and the two *Gemara's*; yet it is properly that of Asa and Josa alone which is meant under that name.

This the Jews prize above all their other writings; and even set it on a level with scripture itself: in effect, they conceive it as the word of God, derived by tradition from Moses, and preserved without interruption to their time.—Ra. Jehuda, and afterwards R. Jochanan, R. Asa, and R. Josa, fearing the traditions should be lost in the dispersion of the Jews, collected them into the *Mischna* and the *Gemara*.

GEMATRIA*, or GAMETRIA, the first kind of artificial cabala, used by the Jews.

* The word is formed from the Rabbinical Hebrew גמטריא formed by corruption of the Greek Γεωμετρία. *Gematria* is a geometrical, or arithmetical method of explaining words; whereof there are two kinds: the first bearing a more immediate relation to arithmetic; and the latter, to geometry.

The *first* consists, in taking the numerical value of each letter in a word, or phrase; and giving it the sense of some other word whose numerical letters, taken after the same manner, make the same sum.—For it is to be observed, that neither the Hebrews, nor Greeks, have any other numeral figures, beside the letters of the alphabet.

Thus, a cabalistic, taking the two first words in Genesis, בראשית ברא, and by addition getting the sum total of all the numbers, signified by those letters; finds that these two words signify the same as those other three, בראש; בראשית ברא, as to the first; ב, is 2; ר, 200; א, 1; ש, 300; י, 10; ת, 400; ב, 2; ל, 200; and נ, 1: which, together make 1116. And as to the latter; ב, signifies 2; ר, 200; א, 1; ש, 300; ו, 5; ל, 50; י, 300; ח, 5; ג, 50; ב, 2; ל, 200; and א, 1: which summed up, yield the same number 1116.

Whence the cabalistic concludes, בראשית ברא, in the beginning he created: signifies the same thing as בראש השנה ברא, it was created at the beginning of the year; and accordingly, the received opinion of the cabalists, is, that the world was created at the beginning of the month Thisi, which was antiently the first month in the year, and answers to our first month in autumn, *viz.* September.

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So, again, in the prophecy of Jacob, *Gen.* xlix. 10. the words $\text{לְבַנְיָאֵי שְׂרָאָה}$ are understood of the Messiah; by reason they make the same number with לְבַנְיָאֵי which signifies the Messiah. The second kind of *Gemat'ia* is much more obscure, and difficult; and accordingly is less used: it is employed in seeking for abstruse, and hidden interpretations in the dimensions and parts of the buildings mentioned in scripture, by dividing, multiplying, &c. those measures by each other.—Of this we shall give an example from some christian cabbalists. The scripture says, that Noah's ark was 300 cubits long, 50 wide, and 30 high: now, the cabbalist takes the length for the basis of his operations; 300, in the Hebrew, is expressed by the letter Ψ ; which length, divided by the height 30, gives the quotient 10: the Hebrew character whereof is י , this is to be placed on the right side of Ψ . He then divides the same length by the width, 50; the quotient whereof, 6, is expressed by a ו ; which being placed on the left side of Ψ , makes, together with the other two letters, the name *JESUS*, וִשְׁׁוֹ .—Thus, by the rules of the Cabbala, it appears, that there is no salvation, but in Jesus Christ; as, at the deluge, no person was saved but those in the ark.

After the like manner, is the same name וִשְׁׁוֹ found in the dimensions of Solomon's temple.—But it is rather an injury than an advantage to the christian religion, to support it by such frivolous evidences.

GEMELLES, in heraldry, a bearing of bars by pairs, or in couples in a coat of arms.—He beareth gules on a chevron argent, three bars gemelles fable, by the name of Throgmorton. See **BAR**.

GEMELLUS, in anatomy, a muscle of the arm, called also *biceps externus*, as having two heads.—See *Tab. Anat. (Myol.)* fig. 1. n. 26. fig. 6. n. 14. fig. 7. n. 13. 13. 13. See also the article **BICEPS**.

One of the heads of this muscle rises tendinous from the upper part of the inferior costa of the scapula; whence passing between the muscles to the back part of the humerus, it joins the other head; and both run together to their insertion at the ancon or tip of the elbow.

The *gemellus* is the first extensor of the cubit; and is by many reckoned two distinct muscles; the first called *longus*, the latter *brevis*.

GEMINATED Column, see the article **COLUMN**.

GEMINI, in astronomy, the *twin*; a constellation, or sign of the Zodiac; the third in order; representing Castor and Pollux. See **SIGN**, and **CONSTELLATION**.

The stars in the sign *Gemini*, in Ptolemy's catalogue are 24; in Tycho's 29; in the Britannic catalogue 89. The order, names, longitudes, latitudes, magnitudes, &c. whereof, are as follow:

Names and situations of the stars.	Longi- tude.	Latitude.	Magni- tude.
That preced. Castor's foot, $\mu\sigma\pi\sigma\gamma\delta$ II	26 37 24	0 12 19 A	4
	27 13 25	0 9 50 B	8
	27 54 29	0 21 05 A	8
	28 5 24	0 28 05 A	7
	28 18 11	0 57 59 B	7
5			
In preced. foot of Castor	28 30 25	0 32 35 A	7
	29 6 43	0 56 00 A	4
	29 23 55	0 32 20 B	7 8
	29 33 51	0 18 48 B	7
	00 0 9	0 11 25 B	8
10			
Subseq. in the same foot	0 5 39	0 3 40 B	8
	0 6 35	0 8 05 A	8
	0 58 10	0 51 22 A	3
	1 38 30	1 42 18 A	7 8
	1 54 12	0 34 25 A	7
15			
	2 9 43	2 32 13 A	7
	2 13 30	2 50 09 A	7
In extrem. of Castor's hind foot.	2 38 20	3 06 03 A	4
	3 19 16	7 22 33 A	7
	3 23 4	5 29 15 A	7 8
20			
	3 38 19	5 28 26 A	7
	3 27 46	4 46 30 B	6
	3 50 57	3 48 39 A	7
	4 20 7	6 14 57 A	7
	4 6 16	5 47 05 B	6
25			
Lucid in foot of Pollux.	4 46 18	6 47 19 A	2 3
	4 24 39	5 4 50 B	6
	4 48 34	5 2 43 B	7
	5 48 2	5 27 34 A	7
	5 36 37	2 1 30 B	3
In Castor's upper-knee			
30			
	5 30 22	5 52 00 B	6
	5 35 25	5 51 40 B	6 7
	6 31 48	9 50 24 A	7
In extrem. of Pollux's hind-foot	6 52 53	10 07 57 A	5 4
	7 2 57	10 20 13 A	7

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Names and situations of the stars.	Longi- tude.	Latitude.	Magni- tude.
35			
In Castor's fore-arm	7 41 5	6 45 00 A	6 7
	6 47 30	10 58 25 B	4 3
That preced. Pollux's knee	8 5 48	9 31 38 A	7
	7 37 39	1 11 15 A	6
	8 9 46	2 29 09 B	6
40			
In the heel of Pollux's hind-foot	9 8 19	9 40 15 A	6
	8 53 7	3 15 36 B	6 7
	9 2 13	3 7 12 B	6
In Castor's thigh	9 52 20	1 30 14 B	6
In hind-knee of Pollux	10 39 40	2 5 27 A	3
45			
In Castor's groin	10 42 25	0 0 11 B	6 7
	12 11 13	6 34 25 A	6 5
In fore-arm of Castor	11 9 53	7 43 03 B	5
	11 34 30	4 21 25 B	6
Lowest in Castor's loins	12 9 12	1 41 05 B	6
50			
	12 3 8	3 17 36 B	7
	13 13 35	7 13 25 A	7
	13 21 51	6 13 13 A	6 7
Upper in Castor's loins	12 33 46	2 29 56 B	5
That against Pollux's leg	14 27 14	5 40 37 A	5
55			
In Pollux's groin	14 11 20	0 13 07 A	3
In Pollux's belly	14 49 39	1 40 58 A	6 7
That against Pollux's side	14 32 05	2 55 41 B	5 6
	14 49 33	0 50 57 B	7 8
	14 23 25	5 31 06 B	7
60			
In hind-shoulder of Castor	14 38 10	5 43 35 A	4 5
South against Pollux's side	16 00 45	1 41 55 A	6
Against Castor's ear	17 44 46	9 45 10 B	5
North against Pollux's side	16 01 29	0 29 28 A	6
Against Castor's hind-shoulder	15 22 58	6 09 23 B	6
65			
Contiguous thereto, but more S.	15 30 51	5 58 20 B	7
In the head of the foremost twin, <i>Castor</i>	15 55 20	10 03 48 B	1 2
	18 13 58	6 02 17 A	7 8
Preced. of 4 under Pollux's side	18 15 24	5 50 21 A	6
Subseq. in Castor's shoulder	17 01 34	5 11 01 B	5
70			
Over Castor's head	16 10 28	13 18 13 B	6
	16 23 22	12 52 49 B	5
	17 35 36	6 26 15 B	6
	17 43 29	6 14 26 B	7
	19 20 32	3 47 19 A	6
75			
Between the two heads	18 17 56	7 25 46 B	5
Over Pollux's hind-shoulder	19 01 13	4 24 00 B	6
In the hind shoulder of Pollux	19 20 18	3 02 23 B	4 5
In the head of Pollux, and called by his name	18 56 09	6 39 27 B	2
80			
Over Pollux's head	20 12 59	0 57 03 A	7
Third under Pollux's side.	18 20 47	12 01 41 B	6
	20 45 53	2 40 59 A	6
	20 29 59	1 57 19 B	6
Preced. of those that follow Pollux	20 55 12	5 44 38 B	6
	21 40 57	1 21 33 B	5
85			
Last of four under Pollux's side	22 43 34	0 54 41 A	7
Middle of those that follow Pollux	22 54 28	7 11 26 B	5
	24 07 46	7 08 01 B	6
North of those that follow Pollux	24 35 27	9 27 22 B	6

GEMINI, in anatomy, two muscles of the thigh, which arise from the protuberance of the ischium, and are inserted with the pyriformis into the dent at the root of the great trochanter.

GEMMA, see the article **GEM**.

Sal GEMMÆ, is peculiarly used for rock salt, or salt dug out of mines.

The name *Gemma* is applied hereto, on occasion of its lustre, and brilliancy; which is not unlike that of crystal.

The principal mines of this salt are those of Willica in Poland; those of Eperie, in Upper Hungary; and those of Cardonia, in Catalonia.

The chief use of this salt is for the powdering, or pickling of meats, in places destitute of salt-springs, &c. See **SALT**.

GEMMA, or **GEM**, among old botanists, the turgid bud of a vine, or other tree, when it is beginning to bear; called also *oculus*, eye.

* *Gemma est a qua oriens uva se ostendit.* Cic. de Senect. c. 15.

GEMONIÆ Scabæ, or *gradus GEMONII*, among the Romans, were much the same as gallows, or gibbets in England.

* Some say, they were thus denominated from the person who raised them: others, from the first criminals, that suffered on them: and others, from the verb *gemo*, I sigh, or groan.

The *gradus gemonii*, according to Publius Victor, or Sextus Rufus, was a place raised on several steps, from whence they precipitated their criminals. Others represent it as a place whereon

whereon offenders were executed, and afterwards exposed to public view.—The *genia scale* were in the tenth region of the city, near the temple of Juno. Camillus first appropriated the place to this use, in the year of Rome 358.

GEMOTE, or **GEMOT**, *conventus*, a Saxon word, denoting a meeting, or assembly *.

* *Omnis homo pacem habet eundo ad Gemotum & rediens de Gemoto, nisi probatus fur fuerit.* LL. Ed. Conf. See WIT-TENA.

GENÆ *Quadratus*, see the article **QUADRATUS**.

GENDARMES, or **GENS D'ARMES**, *q. d.* men of arms; a term used among the French, for a select body of horse-guards; by reason that they succeeded the ancient men of arms, who were armed at all points, and thence were called *gendarmes*.

At present, the troops of the king's guard de corps, the musqueteers, and light horse, are reputed to belong to the *gendarmerie*.

The *grand gendarmes*, sometimes called simply the *gendarmes*, are a troop of gentlemen, to the number of about 250, who guard the king's person. The king himself is their captain; and one of the prime peers, the captain-lieutenant. When the king marches with all his household troops, the *gens d'armes* close the march.

Their device is, a thunder-bolt, falling from heaven, with the motto, *Quo jubat iratus Jupiter*. There are also, beside these, *gens d'armes* of the queen, the dauphin, &c.

GENDARMERY, or **GENS D'ARMERIE**, the French cavalry, and particularly that of the king's household.

The *gendarmery* at present is a body of horse, consisting of sixteen companies, *viz.* the Scotch gendarmes, the English gendarmes, the Burgundian gendarmes, and the Flemish gendarmes; which four companies compose the king's *gens d'armes*, or life-guard.

The other companies take their names from the princes who command them, as captains, *viz.* the queen's gendarmes; the queen's light horse: the dauphin's gendarmes; the dauphin's light horse: the duke of Burgundy's gendarmes; the duke of Burgundy's light horse: the duke of Orleans' gendarmes, &c. each troop, at a medium, consists of seventy-six gendarmes, or light horse.

GENDER, **GENUS**, in metaphysics; see **GENUS**, and **KIND**.

GENDER, in grammar, denotes a division, or distinction of nouns, or names, according to the different sexes of the things they denote.

It has been thought proper, in order to render discourse more express and distinct, as also to embellish it by a variety of terminations, to contrive certain diversities in adjectives, accommodated to the substantives they are applied to: whence, from a regard to that notable difference there is between the two sexes, all nouns substantives have been distinguished into masculine and feminine; and the nouns adjectives also varied to correspond therewith.

But as there was an infinity of words, which had no proper relation, either to the one sex, or the other; they had genders assigned them, rather out of caprice, than reason: and hence it is that the *gender* of a noun is frequently dubious and fluctuating.

It should here however be observed, that this institution of *genders* was not made with design and deliberation, by the masters of language; but was introduced by custom and usage. At first, there was only a difference between the names of animals, when spoke of males and females; and by degrees, the same regulation was extended to other things: the grammarians have only noted and allowed, what usage had established.

The oriental languages frequently neglect the use of *genders*; and the Persian language has absolutely none at all, which is no disadvantage; the distinction of genders being in great measure useless.

The Latins, Greeks, &c. generally content themselves to express the different *genders* by different terminations, as *bonus equus*, a good horse; *bona equa*, a good mare, &c. But in English we frequently go further, and express the difference of sex by different words: as boar, sow; boy, girl; buck, doe; bull, cow; cock, hen; dog, bitch; &c.

We have only about twenty-four feminines, distinguished from the males, by the variation of the termination of the male into *efs*; of which number are abbot, abbess; count, countess; actor, actress; heir, heiress; prince, princess; &c. which is all that our language knows of any thing like *genders*.

The eastern languages, as well as the vulgar languages of the west, have only two *Genders*; the masculine and feminine. The Greek and Latin have likewise the neuter, common, and the doubtful *Gender*; and beside these, they have the epicene, or promiscuous, which under one single *Gender* and termination includes both the kinds.

GENDER, in geometry.—Geometrical lines are distinguished into *Genders*, classes, or orders, according to the number of the dimensions of the equation that expresses the relation between their ordinates, and the abscissides. See **GEOMETRICAL-LINE**.

GENDER, in botany, }
GENDER, in music, &c. } see **GENUS**.

GENEALOGICA Arbor, see **ARBOR**.

GENEALOGY *, a series or succession of ancestors, or progenitors: or, a summary account of the relations and kindred of a person, or family, both in the direct, and collateral lines.

* The word is Greek, γενεαλογία, which is formed of γενεα, *genus, profusio, race, lineage*; and λογος, *sermo, discourse*.

In divers chapters, and military orders, it is required that the candidates produce their *Genealogy*, to shew that they are noble by so many descents.

Genealogical table, genealogical tree, genealogical trunk, or column, &c. see **ARBOR**.—The *genealogical degrees* are usually represented in circles, ranged over under, and aside of each other. The antients had the like; which they called *stemma*, from a Greek word, signifying *crown, garland*, or the like.

GENERAL, something that comprehends all, or extends to a whole genus, or kind.

We say, a *general rule, q. d.* an universal rule; a *general loss, &c.* It is disputed by many, whether Noah's flood was *general*, or no.

All the sciences have some *general principles*, or axioms. See **AXIOM**. A *general court*: *general councils* are particularly called *oecumenical*. See **OECUMENICAL**.

GENERAL offices,	} See	ASSISE.
GENERAL avowment,		AVERTMENT.
GENERAL council,		COUNCIL.
GENERAL diet,		DIET.
GENERAL fee tail,		FEE-TAIL.
GENERAL geography,		GEOGRAPHY.
GENERAL gravity,		GRAVITY.
GENERAL issue,		ISSUE.
GENERAL nature,	NATURE.	

GENERAL officers, in an army, are those who do not only command over a single company, or regiment; but whose office, and authority extends over a body of several regiments of horse and foot.

Such are lieutenant-generals; major-generals, generals of the horse, of the foot; paymaster-general, commissary-general, chirurgeon-general, muster-master-general, &c.

The term is also now used in a more extensive sense; and comprehends such as may command, by virtue of their rank, over several bodies of forces, though all of the same kind.—In which sense brigadiers are *general officers*, notwithstanding that they are attached to one kind of forces, either infantry, or cavalry.

The pay of a lieutenant-general, when in service, is 4 l. per day: of a major-general, 2 l. of a brigadier-general, 1 l. 10 s. of a captain-general, 10 l. See **LIEUTENANT-general**, **MAJOR-general**, &c.

We have also officers in the law, in the revenues, &c. distinguished by the appellation of *general*: as, attorney-general, solicitor-general, &c. see **ATTORNEY**, and **SOLICITOR**.—Receiver-general, controller-general, &c. See **RECEIVER**, and **CONTROLLER**.

GENERAL pause,	} See	PAUSE.
GENERAL qualities,		QUALITY.
State-general,		STATES.
GENERAL tail,		TAIL.

GENERAL terms, or *words*, are such as express, or denote *general ideas*.

Ideas become *general*, by separating from them, the circumstances of time, place, or any other ideas that may determine them to this or that particular existence.

By this way of abstraction they become capable of representing more individuals than one; each of which having a conformity to that abstract idea, is of that sort.

All things, Mr. Locke observes, that exist, being particulars, it might be expected that words should be so too in their signification; but we find it quite contrary; for most of the words that make all languages, are *general terms*.

This is the effect of reason and necessity: for, 1^o, it is impossible that every particular thing should have a distinct, peculiar name: because it is impossible to have distinct ideas of every particular thing, to retain its name with its peculiar appropriation to that idea. 2^o, It would be useless, unless all could be supposed to have the same ideas in their minds: for names applied to particular things, whereof one alone has the ideas in his mind, could not be significant, or intelligible to another, who is not acquainted with all those particular things which had fallen under his notice. 3^o, It would be of no great use for the improvement of knowledge; which, though founded in particular things, enlarges itself by *general views*, to which things reduced into sorts under general names, are properly subvertient.

In things, where we have occasion to consider and discourse of individuals, and particulars, we use proper names: as in persons,

fons, countries, cities, rivers, mountains, &c. Thus we see that jockeys have particular names for their horses, because they have often occasion to mention this, or that horse particularly, when he is out of sight.

The first ideas children get, are only particular; as those of the nurse, or mother; and the names they give them, are confined to these individuals: afterwards, observing that there are a great many other things in the world that resemble them in shape, and other qualities, they frame an idea, which they find those many particulars do partake in: to that they give, with others, the name, *man*, for example. In this they make nothing new, but only leave out of the complex idea they had of Peter, James, Mary, &c. that which is peculiar to each, and retain only what is common to all. And thus they come to have a *general* name, and a *general* idea.

By the same method they advance to more *general* names and notions: for, observing several things that differ from their idea of man, and which cannot, therefore, be comprehended under that name, to agree with man in some certain qualities; by retaining only those qualities, and uniting them into one idea, they have another, more *general* idea; to which, giving a name, they make a term of a more comprehensive extension.

Thus, by leaving out the shape, and some other properties signified by the name, man; and retaining only body, with life, sense, and spontaneous motion; we form the idea signified by the name *animal*. After the same manner, the mind proceeds to body, substance, and at last to being, thing, and such universal terms, which stand for any ideas whatsoever.

Hence we see the whole mystery of genus and species, is nothing but abstract ideas, more or less comprehensive, with names annexed to them: this shews us the reason, why in defining words, we make use of the genus; namely to save the labour of enumerating the several simple ideas, which the next general term stands for.

From what has been said, it is plain, that *general* and universal belong not to the real existence of things: but are the inventions of the understanding, made by it for its own use, and concern only signs, either words, or ideas.

General words do not barely signify one particular thing; for then they would not be *general* terms, but proper names: neither do they signify a plurality; for then man and men would signify the same thing: but what they signify, is a sort of things: and this they do, by being made signs of abstract ideas in the mind; to which ideas, as things existing are found to agree, so they come to be ranked under that name, or to be of that sort.

The essences then of the sorts, or species of things, are nothing but these abstract ideas.

It is not denied here, that nature makes things alike; and so lays the foundation of this sorting and classing: but the sorts or species themselves are the workmanship of human understanding; so that every distinct abstract idea, is a distinct essence; and the names that stand for such distinct ideas, are the names of things essentially different. Thus oval, circle, rain, and snow are essentially different. See this further illustrated under ESSENCE, and SUBSTANCE.

GENERAL *verdict*, }
 Vicar-GENERAL, } See { VERDICT.
 GENERAL *wind*, } } { VICAR.
 } } { WIND.

GENERAL is also used in a monastic sense, for the chief of an order; or of all the houses, or congregations established under the same rule.

Thus we say, the *general* of the Cistercians, the Franciscans, &c.

Fa. Thomassin derives the origin of *generals* of orders, from the privileges granted by the ancient patriarchs to the monasteries situate in their capital cities. By such means they were exempted from the jurisdiction of the bishop, and immediately subjected to that of the patriarch alone.

GENERAL is also used in the military art for a particular march, or beat of drum; being the first which gives notice, commonly in the morning early, for the infantry to be in a readiness to march.

GENERALISSIMO, called also *Captain-GENERAL*, and simply the *GENERAL*; is an officer, who commands all the military powers of a nation; who gives orders to all the other general officers; and receives no orders himself but from the king.

Monf. Balzac observes, that the cardinal de Richieu first coined this word, of his own absolute authority, upon his going to command the French army in Italy.

GENERATED, or GENITED, is used by some mathematical writers for whatever is produced, either in arithmetic, by the multiplication, division, or extraction of roots; or in geometry, by the invention of the contents, areas, and sides; or of extreme and mean proportionals, without arithmetical addition, and subtraction. Harris.

GENERATING *line*, or *figure*, in geometry, is that which by its motion or revolution produces any other figure, plane, or solid. See GENESIS.

GENERATION, in physics, denotes the act of procreating, or producing a thing which before was not: or, the total change, or conversion of a body, into a new one, which retains no sensible part, or mark of its former state.

Thus, fire is said to be *generated*, when we perceive it to be where before was only wood, or other fuel; or, when the wood is so changed, as to retain no sensible character of wood: thus also, a chick is said to be *generated*, when we perceive the chick, where before was only an egg; or when the egg is changed into the form of a chick.

In *generation*, there is not properly any production of new parts, but only a new modification or manner of existence of the old ones; by this *generation* is distinguished from *creation*.

It is distinguished from *alteration*, in that the subject, in this latter, remains apparently the same; and only the accidents, or affections are changed: as when the same body is to day well, and to morrow sick; or that brass, which before was round, is now square.

Lastly, *generation* stands opposite to *corruption*, which is the utter extinction of a former thing: as, when that which before was wood, or an egg, is no longer the one or the other; whence it appears, that the *generation* of one thing is the corruption of another.

The peripatetics explain *generation* by a change, or passage from a privation, or want of a substantial form, to the having of such a form.

The moderns allow of no other change in *generation*, than what is local: according to them, it is only a transposition, or new arrangement of parts; and thus, the same matter shall successively undergo an infinity of *generations*.

A grain of wheat, *e. gr.* is committed to the ground; this imbibing the humidity of the soil, becomes turgid, and dilates to such degree, that it becomes a plant, and, by a continual accession of matter, ripens by degrees into an ear; and at length into new feed. This feed, ground in the mill, appears in form of flower; which, mixed up with water, makes a paste; and whereof, with the addition of yeast, fire, &c. bread is *generated*: and this bread, broke with the teeth, digested in the stomach, and conveyed through the canals of the body, becomes flesh.

Now, in all this series of *generations*, the only thing effected, is a local motion of the parts of the matter, and their settling again in a different order; so that, in reality, wherever there is a new arrangement, or composition of elements, there is a new *generation*; and therefore *generation* is finally reducible to motion.

GENERATION is more immediately understood of the production of animal and vegetable bodies, from seed, or the coition of others of different sexes, but of the same genus, or kind.

Some modern naturalists maintain, after Monf. Perrault, that there is not properly any new *generation*: that God created all things at first: and that what we call *generations*, are only augmentations and expansions of the minute parts of the bodies of seeds; so that the whole species to be afterwards produced, were really all formed in the first, and inclosed therein; to be brought forth and disclosed to view in a certain time, and according to a certain order and economy.

Thus, Dr. Garden: "It is most probable, that the stamina of all the plants and animals that have been, or ever shall be in the world, have been formed ab origine mundi, by the Almighty Creator, within the first of each respective kind. And he who considers the nature of vison, that it does not give us the true magnitude, but only the proportion of things; and that what seems to our naked eye but a point, may truly be made up of as many parts as appear to be in the whole universe, will not think this an absurd or impossible thing." *Mod. Theor. of Generat.*

The manner, wherein the seed of the male animal acts on that of the female, in order to impregnate, and render it prolific, has long been inquired after; and yet remains still a mystery. Some, with Aristotle, hold the male semen to do the office of a coagulium; and the female that of milk: which some later authors have improved on, by supposing the male seed an acid; and the female an alkali.—Others consider the thicker seed of the male, as the flower; and the thinner seed of the female, as water, out of which two an animal paste is wrought, and baked by the heat of the womb.—But the moderns are generally agreed, that what effect soever the male seed produces on the female, it is by motion and mechanics, that it produces it.

GENERATION of animals, or animal GENERATION, is a process in the oeconomy of nature, very difficult to be traced. The parts concurring hereto, are numerous; and their functions are mostly discharged in the dark.

The antients distinguished two kinds of *generation*: *regular*, called *univocal*; and *anomalous*, called also *equivocal*, or *spontaneous*.

The first is that effected by parent-animals of the same kind; as that of men, birds, beasts, &c.—The second was supposed

supposed effected by corruption, the fun, &c. as that of insects, frogs, &c. But this latter kind is now generally and deservedly exploded.

There are two principal theories, or methods of accounting for the Generation of animals: the one supposes the embryo, or fetus, to be originally in the feed of the male; the other, in the ovum, or egg of the female.

The first supposes the animalcules found in the male feed, to be the first rudiments of the fetus; and that the female only furnishes a proper nidus, and nutriment to bring them forwards.

The second supposes the first rudiments of the animal to be in the ova; and that the male feed only serves to warm, cherish, and ripen the ova, till they fall off out of the ovary into the womb.

The first system is well illustrated by Dr. Geo. Garden.—That author, upon comparing the observations and discoveries of Harvey, Malpighi, De Graaf, and Leewenhoek together, concludes it most probable, “That all animals are ex animalculo: that these animalcules are originally in feminine marium, and not in that of the female; but that they can never come forward, nor be formed into animals, without the ova in the female.”

The 1st of these points he argues from the three following observations.—

1^o, That something has often been observed by Malpighi, in the cicatricula of an egg before incubation, like the rudiments of an animal, in form a tadpole.

2^o, From the sudden appearance and displaying of all the parts, after incubation, it seems probable, that they are not then actually formed out of a fluid; but that the stamina of them have been formerly there existent, and are now expanded.— The first part of the chick, which is discovered with the naked eye, is the punctum saliens, and that not till three days and nights of incubation are past; on the fifth day the rudiments of the head and body appear. This made Dr. Hervey conclude, that the blood had a being before any other part of the body, and that from it all the organs of the fetus were both formed and nourished: but by Malpighi’s observations it appears that the parts are then only so far extended, as to be made visible to the naked eye; and that they were actually existent before, and discernible by glasses. After a further incubation of thirty hours, we see the head, the eyes, and the carina, with the vertebrae, distinct, and also the heart. After forty hours its pulse is visible, and all the other parts more distinct, which cannot be discerned by the naked eye, before the beginning of the fifth day: from whence it seems very probable, that even the so early discovery of those parts of the fetus by the microscope, is not the discerning of parts newly formed; but only parts more dilated and extended by receiving of nutriment from the colligamentum; so that they seem all to have been actually existent before the incubation of the hen. And what Swammerdam has discovered in the transmutation of insects, gives no small light to this; since he makes it appear, that in those large crua’s which feed upon cabbage, if they be taken about the time they retire to be transformed into aurilia’s, and plunged often in warm water to make a rupture of the outer skin; you will discern, through the transparency of their second membrane, all the parts of the butterfly, the trunk, wing, feelers, &c. folded up: but, that after the crua is changed into an aurelia, none of these parts can be discerned; being so much dried with moisture; though they be there actually formed.

3 From the analogy between plants and animals. All vegetables, we see, do proceed ex plantula; the seeds of vegetables being no other but little plants of the same kind, folded up in coats and membranes: whence we may infer, that so curiously an organized creature, as an animal, is not the sudden product of a fluid, or colligamentum, but does much rather proceed from an animalcule of the same kind, and has all its little members folded up according to their several joints and plicatures, which are afterwards enlarged and distended, as we see in plants.

The 2^d point, which our late discoveries have made probable, is, that these animalcules are originally in the feed of the male, and not in the female.— For, 1^o, There are observed innumerable animalcula in feminine masculino, of all animals. Leewenhoek has made this so evident, that there seems little room to doubt of it.

2^o, We observe the rudiments of a fetus in eggs, which have been fecundated by the male; though no such thing is visible in those not yet fecundated. Malpighi, in his observations, makes it very probable, that these rudiments proceed originally from the male; and not from the female.

3^o, The resemblance between the rudiments of the fetus in ova, both before and after incubation, with the animalcule, makes it very probable that they are one and the same. The same shape and figure, which Mr. Leewenhoek gives us of the animalcule, Malpighi gives of the rudiments of the fetus, both before and after incubation; yea, and even the fetus’s of viviparous animals appear so at first to the naked eye, whence Dr. Harvey acknowledges, that all animals, even the most perfect, are formed of a worm.

4^o, This gives a rational account of many fetus’s at one birth, especially that of the countess of Holland: and how, at least, a whole cluster of eggs in a hen are fecundated by one coition of the male.

5^o, This gives a new light, as it were, to the first prophecy concerning the Messiah, that “the feed of the woman shall bruise the head of the serpent,” all the rest of mankind being thus most properly and truly the feed of the man.

6^o, The analogy already mentioned, which we may rationally suppose between the manner of the propagation of plants and animals, does likewise make this probable. Every herb and tree bears its seed after its proper kind; which seed is nothing else but a little plant of that kind; which being thrown into the earth, as into its uterus, spreads forth its roots, and receives thence its nourishment; but has its form within itself: and we may rationally conjecture some such analogy in the propagation of animals.

The 3^d thing, which our discoveries make probable, is, that animals cannot be formed of these animalcula, without the ova in feminis, which are necessary for supplying them with proper nutriment; and this is evinced from the following considerations.

1^o, It appears, that an animalcule cannot come forward, if it do not fall into a proper nidus: this we see in the cicatriculae in eggs; and though a million of them should fall into one egg, none of them would come forward, but what were in the center of the cicatricula; and perhaps the nidus, necessary for their formation, is so proportioned to their bulk, that it can hardly contain more than one animalcule; which may be the reason why there are so few monsters. This, we see, is absolutely necessary in the oviparous kinds; and the only difference which lies between them and the viviparous, seems to be this, that in the latter the ova are properly nothing but the cicatricula, with its colligamentum, so that the fetus must spread forth its roots into the uterus, to receive its nourishment; but the egg in oviparous animals may be properly termed an uterus, in relation to the fetus; as it contains not only the cicatricula, with its amnion and colligamentum, which is the immediate nourishment of the fetus, but also the materials which are to be converted into that colligamentum; so that the fetus spreads forth its roots no farther than into the white and yolk of the egg, from whence it derives all its nourishment. Now, that an animalcule cannot come forward without some such proper nidus, will not be denied; for if there were nothing needful but their being thrown into the uterus, we do not see why many hundreds of them should not come forward at once, at least while scattered in so large a field.

2^o, That this cicatricula is not originally in utero, seems evident from the frequent conceptions which have been found extra uterum: such as the child which continued twenty-six years in the abdomen of Theolouf’s belly; and the little fetus found in the abdomen of Mad de St. Mere, together with the testicle torn, and full of clotted blood: such also seem to be the fetus in the abdomen of the woman of Copenhagen, mentioned in the *Nouv. de la Rep. des Lett.* for Sept. 1685, all the members of which were easily to be felt through the skin of the belly, and which she had carried in her belly for four years: the seven years gravidation related by Dr. Cole; and many other the like instances. Now, granting once the necessity of a proper nidus for the formation of an animalcule into an animal, these observations make it probable, that the testes are the ovaria appropriated for this use: for though the animalcule’s coming thither in such cases, may seem to be extraordinary, and that usually the impregnation is in utero; yet it may be collected from hence, that the cicatriculae or ova to be impregnated, are in testibus feminis; for if they were not so, the accidental coming of animalcules thither, could not make them come forward more than in any other part of the body; since they cannot be formed and nourished without a proper nidus.

3^o, It is acknowledged, that the fetus in utero, for some considerable time after conception, has no connection with the womb; that it sits wholly loose in it, and is no other than a little round egg, with the fetus in the midst; which sends forth its umbilical vessels by degrees, and at last lays hold of the uterus. Now, from hence it seems evident, that the cicatricula, which is the fountain of the animalcule’s nourishment, does not spout from the uterus, but has its origin elsewhere; and falls in thither as into a fit soil, from whence it may draw nutriment for the growth of the fetus: else it cannot be easily imagined how it should not have an immediate connection with the uterus, from the time of conception.

It is indeed difficult to conceive, how these eggs should be impregnated per semen matris, both because there is no connection between the fallopian tubes, and the ovary for its transmission; and for that Dr. Harvey could never discover any thing of it in utero: but as to the last, M. Leewenhoek has cleared that difficulty by the discovery of innumerable animalcula in the tubae; or cornua uteri, and those living a considerable time after coition. And as to the former, we may

either suppose that there is such an inflation of the tubæ, at the time of coition, as make them embrace the ovaries; and such an approach of the uterus and its cornua, as that it may easily transmit the seed into the ovary: or else, that the ova are impregnated by the animalcules after they descend into the uterus, and not in the ovary. The former seems probable for this reason, that at least a whole cluster of eggs in a hen will be fecundated by one tread of the cock: now this fecundation seems to be in the vitellary, and not in the uterus, as the eggs pass along from day to day: for it can hardly be supposed, that the animalcules should subsist so long, being scattered loosely in the uterus, as to wait there, for many days, for the fecundation of the eggs as they pass along. The latter conjecture has this to strengthen it; that the animalcules are found to live a considerable time in the uterus, and that if they should impregnate the ova in the ovary itself, the fetus would increase so fast, that the ova could not pass through the tubæ uteri; but would either burst the ovary, or fall down into the abdomen, from the orifices of the tuba: and from hence probably proceed those extraordinary conceptions in the abdomen, out of the uterus. Thus much is urged for the system *ab animalculo*.

The retainers to the system of *Generation ab ovis*, contend, that the rudiments of the fetus are laid in the ovary, and that the female furnishes the whole matter of the body; which they chiefly support from the conformation in rabbits, sheep, cows, &c. where the vagina of the womb is so long, and sinuous, that it is scarce possible the male seed should ever arrive within the body of the uterus; especially in cows, whose vagina is filled with a thick, viscid ichor, and the inner orifice of the womb is exactly closed: beside, that the thickness of the membranes of the ova should seem impenetrable to so crass a matter as the male seed. Add, that if animalcula be found in the male seed, which, however, will admit of some dispute (that intestine motion and agitation of the grosser particles thereof, which gave rise to the opinion, being accountable for, from the common laws of warm fluids) yet are the same observed in vinegar, pepper, water, &c. Add, that it is highly improbable, that those animalcules should contain the rudiments of a future body; since their large numbers would produce too plentiful an offspring; inasmuch that it would be necessary for 9999 parts of them to be in vain, and perish: which is contrary to the economy of nature in other things.

Analogy is likewise urged in favour of this system: thus all plants are maintained to arise from eggs; seeds being no other than eggs under another denomination. All oviparous animals do unexceptionably arise from eggs; which the female cast forth; and it is highly probable, that the viviparous only differ from oviparous, in that the females lay and hatch their eggs within themselves.

Against this hypothesis it is urged, that what are usually called *ova*, or *eggs*, in women, are no other than little cells, or bladders, full of a certain liquor: and how can a drop of liquor pass for an egg? Add, that these imaginary eggs have no proper membrane belonging to them, nor any covering but that of the cell; which seems so inseparable therefrom, that when they are discharged, it is hard to conceive how they should take it with them. And beside, how should they make themselves a passage through the common membrane wherewith the ovary is invested, which is of so close a texture, that it must seem absolutely impenetrable by a round body of so soft a consistence, as one of these vesicles. Lastly, vesiculae, in all respects perfectly like ova, have been found in other parts of the body, where it is apparent they could not serve for any purposes of *Generation*. *Mem. de l'Acad. Royal des Scien.* an. 1708, 1709.

To this it is answered, that ova or vesiculae have been actually found in dissections, detached and separated from the ovary, and the ruptures in the membrane of the ovary, through which they had passed, remaining still visible. M. Litre even observed some of these separated ova spread with blood vessels, like those in the yolks of birds' eggs. Nay more, the same author is positive, that he saw an embryo in one of the ova not yet separated; and could discern its head, mouth, nose, trunk, and funiculus umbilicalis. whereby it adhered to the membranes of the ovary. But this will come to be farther considered under *GENERATION of man*.

Sir John Floyer starts a difficulty, which seems to press equally against each system, taken singly: it is fetched from monsters. In a male, for instance, which is the production of a venereal coition between an stallion and a mare, the bulk of the body partakes of the form of the dam; and the feet, tail, and ears, of that of the sire. Hence it is argued, that the rudiments of the greater part of the fetus are laid in the ovum; and that the impregnation either conveys, or changes the extremities. If the male supplied the animalcula, the fetus should always be of the same species as the male: if the female supply it, it should be of her kind; whereas monsters are of both.

GENERATION of man. — As it is in human subjects that the

gradual process of *Generation* has been principally inquired into, and the structure and office of the organs subservient thereto, chiefly examined: what the latest naturalists, and anatomists have settled with regard thereto, is reserved for this head.

The parts of *Generation*, then, are different in the different sexes. — Those, proper to the male, are the penis, the testicles, the vesiculae seminales, the vasa deferentia, the parastate, and the vasa preparantia; which see described each under its proper article, *PENIS, TESTICLE, &c.*

The parts of *Generation* proper to the female, are the pudendum, the clitoris, nymphæ, hymen, uterus, fallopian tubes, and ovaries or testes. See *GENITAL, CLITORIS, NYMPHÆ, HYMEN, MATRIX, FALLOPIAN tubes, and OVARIES*.

The process of *Generation*, so far as the male contributes to it, is as follows. — The penis being erected by an affusion of blood; as shewn under *ERECTION*; the glans at the same time tumified; and the nervous papillæ in the glans much rubbed, and highly excited in coitu; an ejaculatory contraction follows, by which the seed is pressed out of the seminal vesicles, and expelled with some considerable force.

The process of *Generation* on the part of the female, is thus: the clitoris being erected, after the like manner as the penis in man; and the neighbouring parts all distended with blood, they more adequately embrace the penis in coitu: and by their intumescence press out a liquor from the glands about the neck of the womb, to facilitate the passage of the penis.

At the same time, the fibres of the womb contracting, open its mouth (which at other times is extremely close) for the reception of the finer part of the seed.

Thus, the seed, pregnant with animalcules, is conveyed, with some impetus, into the uterus; where being retained by the convulsive contraction of the inner membrane thereof, and further heated and agitated therein, it is prepared to impregnate the ovum.

During the act of coition, the fallopian tubes growing stiff, embrace the ovaries with their strong muscular edges, like fingers; and compress them; till, their mouths being dilated and expanded by this embrace, force the egg, now ripened, into their cavities, and gradually drive it forwards, by their vermicular motion, till at last they protrude it into the cavity of the womb, to meet the seed, some of the animalcules whereof entering the dilated pores of the glandulous membrane of the egg, are there retained, nourished, grow to its navel, and suffocate the rest of the less lively animalcula. And thus is conception performed.

Others rather suppose the seed conveyed from the uterus, through the fallopian tubes, to the ova; and thus take the impregnation to be first performed in the ovaries; or even in the tubæ themselves, the ova and seed meeting by the way.

Others, considering the closeness of the mouth of the womb, and the thickness of the membranes of the ovaries, judge it impossible for the seed to pass that way, and therefore suppose it taken up by the veins, which open into the cavity of the vagina, or even womb; where circulating, it ferments with the mass of blood; and hence all the symptoms which appear in conception. At length it enters and impregnates the egg by the small twigs of arteries, which are upon its membranes. This fermentation swelling the membranes of the tube, they open their cavity and make room for the ova to pass into the womb.

The egg impregnated, and close shut up in the womb, swims in the humours thereof; which growing more and more subtil, enter the patent pores found on one side the ovum, and soon distend, fill, and augment it; and there being still further attenuated, nourish the embryo; thicken and expand the membranes of the ovum, especially in that part by which it grew to the ovary, and thus form the rudiments of a placenta.

The same causes still continuing, and the pores both of the placenta, and the membranes being enlarged; the egg begins to fill the capacity of the womb; and at length its stem or calyx grows to the concave surface thereof: and thus is the navel-string, or funiculus, formed. See *funiculus UMBILICALIS, &c.* See also *FŒTUS*.

This system is founded on the supposition of animalcula in the male seed. — They who set them aside as unconcerned in *Generation*, account for it thus: the seed, containing volatile, oily, and saline parts, as appears from its fetid smell, oleaginous substance, &c. being lodged in the womb, and there further digested and exalted; grows yet more volatile, fetid, pungent, and stimulating; and thus, adding to the heat occasioned by coition, velleitates the nervous fibres of that part, and occasions a fermentation, and gentle inflammation; and by that means an extraordinary flux of humours to that, and the adjacent parts.

By this means the tubæ become rigid, and fit to grasp the ovaries, which are also heated by the effluvia of the semen,

and the warmth of the parts surrounding. Upon this, there is a greater flux into the ovaries; till at length, the ova, some of them at least, by such greater supply of nourishment, increase in bulk; and as those grasped by the edges of the tube, will be kept warmest, and the greatest flux be made thereto, they will soonest be ripened, fall off, and be received by the tube, and conveyed to the womb: where growing, after the manner of the seeds of plants, the placenta at length takes hold of, and adheres to the uterus; from which time the embryo begins to be nourished after a different manner. See GESTATION; see also NUTRITION, and CIRCULATION.

GENERATION of insects, see the article INSECT.

GENERATION of plants bears an admirable analogy to that of animals.—See the process delivered at large under the article generation of PLANTS.

The parts of generation of plants, are the flowers; and particularly the stamina, apices, farina fecundans, and pistils thereof. See FLOWER; see also STAMINA, FARINA, and PISTIL.

GENERATION of minerals, or fossils, see MINERAL, and FOSSIL.

GENERATION of mushrooms, see the article MUSHROOM.

GENERATION of shells, see the article SHELL.

GENERATION of stones, see STONE, SPAR, TROCHITES, and CRYSTAL.

GENERATION, in theology. The Father is said to have produced his Word, or Son, from all eternity, by way of generation; on which occasion the word generation raises a peculiar idea: that procession, which is really effected in the way of understanding, is called generation, by reason the Word, in virtue thereof, becomes like to him from whom he takes his original; or, as St. Paul expresses it, is the figure, or image of his substance, i. e. of his being and nature. See TRINITY, and PERSON.

And hence it is, that the second person in the Trinity is called the Son.

GENERATION is also used, though somewhat improperly, for genealogy; or the series of children, issued from the same stock.—Thus, the gospel of St. Matthew commences with the book of the generation of Jesus Christ, &c.

The latter, and more accurate translators, instead of generation, use the word genealogy.

GENERATION is also used to signify a people, race, or nation; especially in the literal translations of the scripture: where the word generally occurs, wherever the Latin has generatio; and the Greek, γενεα, or γενεαι.

Thus, “A wicked and perverse generation seeketh a sign, &c.” “one generation passeth away, and another cometh,” &c.

GENERATION is also used in the sense of an age, or the ordinary period of man's life.

Thus, we say, to the third, and fourth generation.—In this sense, historians usually reckon a generation the space of thirty-three years, or thereabouts. See SECVLUM.

Herodotus makes three generations in an hundred years; which computation appears from the later authors of political arithmetic, to be pretty just. See ANNUITY, and POLITICAL arithmetic.

GENERIS secundis, see the article SECUNDI.

GENEROSA, a gentlewoman, see GENTLEMAN.

Generosa is a good addition; and if a gentleman be named *springer*, in any original writ, appeal, or indictment, he may abate and quash the same. 2 Inst. fol. 668. See ADDITION.

GENESIS, the first book of the Old Testament; containing the history of the creation, and the lives of the first patriarchs.

The book of Genesis stands at the head of the Pentateuch. Its author is held to be Moses; it contains the relation of 2367 years; viz. from the beginning of the world, to the death of Joseph.—The Jews are forbid to read the beginning of Genesis, and the beginning of Ezekiel, before thirty years of age.

The Hebrews call this book *Bereschit*, in regard it begins with that word, which in their language signifies in principio, or, in the beginning. It was the Greeks who gave it the name *Genesis*, γενεαι, q. d. production, generation; by reason it begins with the history of the production, or generation of all beings.

Cædrenus makes mention of an apocryphal book, entitled the *little Genesis*, *Genesis parva*, containing several incidents, not in the other; some of which he has preserved: particularly that Cain was buried under the ruins of a house. that an angel taught Abraham the Hebrew tongue: that Matiphah, prince of the devils, advised God to order Abraham to sacrifice his son, for a trial of his obedience: that the children of the Israelites were only cast into the Nile for ten months, &c.

GENESIS, in geometry, denotes the formation of a line, plane, or solid, by the motion, or flux of a point, line, or surface. See LINE, and SURFACE; see also POINT, FLUXION and CURVE.

The *Genesis*, or formation, e. gr. of a globe, or sphere, is conceived by supposing a semi-circle to revolve upon a straight line, drawn from one extreme thereof to the other; and

its axis, or axis of circumvolution: the motion or revolution of that semi-circle, is the *genesis* of the sphere, &c. See AXIS, SPHERE, and GLOBE.

In the *genesis* of figures, &c. the line, or surface that moves, is called the *describer*; and the line around which, or according to which the revolution, or motion is made, the *dirigent*.

GENET, or *genet*, in the manage, &c. a small sized, well proportioned Spanish horse.

Some also give the term *geneta* to well-made Italian horses.

To ride a la GENETTA, is to ride in the Spanish fashion, i. e. with the stirrups so short, that the spurs bear upon the flanks of the horse.—This is deemed a piece of gallantry in Spain, but not among us.

GENETHLIACI*, in astrology, persons who erect horoscopes; or pretend to foretell what shall befall a man, by means of the stars which presided at his nativity.

* The word is formed of the Greek γενεαι; origin, generation, nativity.

The antients called them *chaldæi*, and by the general name, *mathematici*; accordingly, the several civil, and canon laws which we find made against the mathematicians, only respect the *genethliaci*, or astrologers.

They were expelled Rome, by a formal decree of the senate; and yet found so much protection from the credulity of the people, that they remained therein unmolested.—Hence an antient author speaks of them as *hominum genus quod in civitate nostra semper est vetabitur & retinabitur*.

Antipater, and Achinapolis have shewn that genethiology should rather be founded on the time of the conception, than on that of the birth. Vitruvius.

GENETHLIACUM, GENETHLIAC poem, is a composition in verse, on the birth of some prince, or other illustrious person: wherein the poet promises him great honours, advantages, successes, victories, &c. by a kind of prophecy or prediction.

Such is the eclogue of Virgil to Pollio, beginning, *Sicelides Mose, paulo majora canamus*.

There are also *genethliac* speeches, or orations; made to celebrate a person's birth day.

GENEVA, a popular name for a compound water; which is or ought to be procured from the berries of the Juniper-tree, distilled with brandy, or malt-spirits.

* The word is formed from *genevre*, the French name of the juniber-berry.

GENEVIEVE, St. GENEVIEVE, or St. GENEVIEFVE,—Fathers or religious of St. Genevieve, the name of a congregation of regular canons of the order of St. Augustin; established in France.

The congregation of St. Genevieve is a reform of the Augustin canons. It was begun by St. Charles Faure, in the abbey of St. Vincent de Senlis, whereof he was a member, in the year 1618.

The reform soon spread into other houses; particularly that of Notre Dame d'Eu, and the abbey of St. Genevieve at Paris, chiefly by the interest of the cardinal de la Rochefoucaut, who was chose abbot thereof in 1619; and in 1621. proposed the reform to the religious of his abbey.

In the year 1634. the abbey was made elective; and a general chapter, composed of the superiors of fifteen houses who had now received the reform, chose F. Faure co-adjutor of the abbey of St. Genevieve, and general of the whole congregation. Such were its beginnings.

It has since increased very much, and it now consists of above an hundred monasteries; in some whereof the religious are employed in the administration of the parishes, and hospitals; and in others, in the celebration of divine service, and the instruction of ecclesiastics in seminaries for the purpose.

The congregation takes its name from the abbey of St. Genevieve, which is the chief of the order; and whose abbot is the general thereof.—The abbey itself took its name from St. Genevieve, the patroness of the city of Paris: who died in the year 512. Five years after her death, Clovis erected the Church of St. Genevieve under the name and invocation of St. Peter; where her relics are still preserved, her shrine visited, and her image carried with great processions and ceremonies, upon extraordinary occasions, as when some great favour is to be intreated of heaven.

GENIAL*, GENIALIS, an epithet, applied by the antients to certain deities, whom they supposed to preside over the affair of generation.

* They were thus called a *gerendo*, from bearing; or, according to the correction of Scaliger and Vossius, a *gerendo*; to yearn, produce. Yet Festus says, that they were also called *gerui*, which seems to require the former reading. M. Dacier, in a note, shews that *gerere* has the sense of *gerere*.

Among the *genial* gods, *di geniales*, says Festus, were water, earth, fire, and air, which the Greeks called *elements*.—The twelve signs were sometimes also ranked in the number: as also the sun, and moon.

GENICULI, in botany, the joints or knots, which appear in the shoots of plants. Whence botanist call these marked therewith *geniculate plants*.

GENIOGLOSSI*, in anatomy, the name of a pair of muscles, proceeding inwardly from the fore part of the lower jaw, under another called *genioboidæus*; and which, enlarging themselves, are fastened into the basis of the tongue.—They serve to pull the tongue forward; and to thrust it out of the mouth.

* The word is formed from *γενος*, *mentum*, the chin, and *γλωσσα*, *lingua*, the tongue.

GENIOHYOIDÆUS*, in anatomy, a muscle of the os hyoides, which, with its partner, is short, thick, and fleshy, arising from the internal parts of the lower jaw-bone, called the chin; and dilating themselves, are soon lessened again, and inserted into the superior part of the fore-bone of the os hyoides.—These pull upwards and forwards the os hyoides, and assist the genioglossi in thrusting the tongue out of the mouth.

* The word is formed from *γενος*, *mentum*, the chin, and *ὕοιδης*, *hyoides*.

GENITAL, GENITALIS, in medicine, something that relates to generation.

Genital parts, denote the parts in both sexes employed in the affair of generation, otherwise called *Adosa*, *pudenda* or *pudendum*. See *Tab. Anat. (Splanchn.)* fig. 8, 9, 10, 11, 13, 15, &c. See also **PENIS, TESTICLE, CLITORIS, HYMEN, &c.**

GENITAL gods, dii genitales, are sometimes used in the ancient Roman poets for those we otherwise call *indigetes*. See **INDIGETES**. Ausonius, in the argument of the fourth book of the *Aeneid*, takes the word in a different manner: the *dii genitales*, he observes, were not such as were born of human parents, were not thus called *quasi geniti ex hominibus*, but rather because they themselves had begot human children.

GENITALIA, or GENITORIES, in anatomy, a name sometimes given the testes, or testicles of man; on account of their office in generation. See **TESTICLE**.

GENITES, γεννητες, or GENETEE, among the Hebrews, those descended from Abraham, without any mixture of foreign blood.

The Greeks distinguished by the name of *genites* such of the Jews, as were issued from parents who, during the Babylonish captivity, had not allied with any Gentile family.

GENITED, in geometry, see **GENERATED**.

GENITIVE, in grammar, the second case of the declensions of nouns.

The relation of one thing considered as belonging in some manner to another, has occasioned a peculiar termination of nouns, called the *genitive case*.

In English, the *genitive case* is made by prefixing the particle *of*; in French, *de*, or *du*, &c. though in strictness, there are no cases at all in either of those languages, inasmuch as they do not express the different relation of things by different terminations, but only by additional prepositions.

In the Latin, this relation is expressed in divers manners: Thus we say, *caput hominis*, the head of a man; *color rosæ*, the colour of a rose; *opus Dei*, the work of God, &c.

As the *genitive case* serves to express very different, and even opposite relations, there sometimes arises an ambiguity therefrom: thus in the phrase *vulnus Achillis*, the wound of Achilles, the *genitive, Achillis* may either signify the relation of subject, in which sense it is taken passively for the wound Achilles has received; or the relation of a cause, in which sense it is taken actively for the wound Achilles has given: thus in that passage of St. Paul, *certus sum quod neque mors, neque vita, &c. nos poterit separare a caritate Dei in Christo, &c.* The *genitive, Dei*, has been taken by interpreters in two different senses; some giving it the relation of object, and understanding the passage of the love which the elect bear to God in Jesus Christ, whereas others give it the relation of subject, and explain it of the love which God bears the elect in Jesus Christ.

In the Hebrew tongue, the *genitive case* is marked after a manner very different from that of the Greek and Latin; for whereas in those languages the noun governed is varied; in the Hebrew the noun governing undergoes the alteration.

GENITURA, GENITURE, a name, which some authors give to the seed; both that of the male, and female. See **SEED**.

GENIUS, a good, or evil spirit, or daemon, whom the antients supposed set over each person, to direct his birth, accompany him in life, and to be his guard.

Among the Romans, Festus observes, the name *genius* was given to the god who had the power of doing all things, *deum qui vim obtinet rerum omnium generandam*; which Voisius, de *Isid.* rather chuses to read *generandorum*, who has the power of producing all things; by reason Censorinus frequently uses *genere* for *generare*. Accordingly, St. Augustin, de *Civitat. Dei*, relates, from Varro, that the *genius* was a god who had the power of generating all things; and presided over them when they were produced.

Festus adds, that Aufullius spake of the *genius* as the Son of God, and the Father of men, who gave them life; others, however, represented the *genius* as the peculiar or tutelary god of each place: And it is certain, this last is the most usual meaning of the word.

The antients had their *genii* of nations, of cities, of provin-

ces, &c. Nothing is more common than the following inscription on medals, **GENIUS POPULI ROM.** the *genius* of the Roman people: or, **GENIO POP. ROM.** to the *genius* of the Roman people.

In this sense, *genius* and *lar* were the same thing; as, in effect, Censorinus and Apuleius affirm they were.

The Platonists, and other eastern philosophers, supposed the *genii* to inhabit the vast region, or extent of air between earth and heaven. They were a sort of intermediate powers, who did the office of mediators between gods and men. They were the interpreters, and agents of the gods; communicated the wills of the deities to men; and the prayers, and vows of men, to the gods. As it was unbecoming the majesty of the gods to enter into such trifling concerns; this became the lot of the *genii*, whose nature was of a middle kind between the two; who derived immortality from the one, and passions from the other; and who had a body framed of an aerial matter. Most of the philosophers, however, held that the *genii* of particular men were born with them, and died; thus Plutarch attributes the ceasing of oracles partly to the death of the *genii*.

The heathens, who considered the *genii* as the guardian spirits of particular persons, believed that they rejoiced and were afflicted at all the good, and ill fortune that befel their wards. They never or very rarely appeared to them; and then only in favour of some person of extraordinary virtue or dignity. They likewise held a great difference between the *genii* of different men; and that some were much more powerful than others; on which principle it was, that a wizard in Appian bids Anthony keep at a distance from Octavius, by reason Anthony's *genius* was inferior to, and stood in awe of that of Octavius.

There were also evil *genii*, who took a pleasure in persecuting men, and bringing them evil tidings: such was that in Paterculus, &c. which appeared to Brutus the night before the battle of Philippi. These were also called *larvæ*, and *lemures*.

GENIUS is more frequently used for the force or faculty of the soul considered as it thinks or judges.

Thus we say, a happy *genius*, a superior *genius*, an elevated *genius*, a narrow confined *genius*, &c.— In the like sense we also say, a work of *genius*, a want of *genius*, &c.

GENIUS is also used in a more restrained sense for a natural talent, or disposition to one thing more than another.

In which sense we say, a *genius* for verse; for the sciences, &c.

GENS D'ARMERIE, see **GENDARMERY**.

GENS D'ARMES, see the article **GENDARMES**.

GENTIAN, a medicinal root, the product of a plant of the same name: which the antients, to render it the more considerable, denominated from Gentius, king of Illyria, who is supposed to have been the first that discovered the admirable virtues thereof.

The root *gentian* is of a yellowish colour, and intolerably bitter; it is sometimes as thick as the arm, but more commonly divided into branches no bigger than the thumb: its stem grows several feet high, being very smooth and glossy, though divided by knots from space to space, out of which arise the leaves, which somewhat resemble those of plantain. Its flowers, which likewise accompany the knots, are yellow: and its seed is flat, round, smooth, and light.

This root is held excellent against poisons, and even against the plague. It stands at the head of stomachics, warming and strengthening the stomach, and helping digestion. It is also sudorific, and used with success in intermitting fevers, whence some call it the *European quinquina*; and it is also an ingredient in Venice treacle. Externally it is used for wounds.

The plant affects moist places, and is found commonly enough in Burgundy, the Alps, and Pyreneas. It is called by botanists, *gentiana vulgaris major, ellebori albi folio*: The little *Gentians* growing in England are called *Gentianella*.

The root is to be chosen dry, new, of a moderate thickness, free from earth, and furnished with little branches or fibres; and, if possible, that which is dried by the air, which is distinguishable by the colour, it being blackish within side, when dried in the oven; and of a golden yellow, when in the air.

GENTIAN water, see the article **WATER**.

GENTILE, GENTILIS, a pagan, or person who adores false gods.

The Hebrews applied the name גֵּוֹיִם *gentes*, nations, to all the people of the earth, who were not Israelites or Hebrews.—

Some will have it, that the *Gentiles* were thus called in contradistinction to the Jews, by reason these latter have a positive law to observe in matters of religion, whereas the *Gentiles* have only the natural law; hence they are called *Gentiles*, *quia sunt uti genti suarum*, because they remain as in a state of nature.

The Jews apply the denomination *Gentiles* much as the Christians do that of infidels.— St. Paul is called the *doctor, or apostle of the Gentiles*, which appellation he first gave himself, Rom. xi. 13. “As I am the apostle of the *Gentiles*, I magnify mine office.”

The calling of the *Gentiles* to christianity, had been predicted in the Old Testament, as it was accomplished in the New.

See Psal. ii. 8. If. ii. 2. Joel. ii. 29. Math. viii. 11. xiii. 18. Acts xi. 18. xiii. 47, 48. xviii. 28. Rom. i. 5. iii. 29. xi. 12, 13, 25. Eph. ii. 11. Revel. xi. 2. xxii. 2.

GENTILE, GENTILIS, in the Roman law and history, a name which sometimes expresses those whom the Romans otherwise called *Barbarians*: whether they were allies of Rome, or not. In which sense the word occurs in Ammianus, Aufonius, and the *Notitia Imperii*.

GENTILIS was also used in a more peculiar sense, for all strangers, or foreigners, not subject to the Roman empire; as we see in the *Theodosian code*, in the title *de muptis gentiliu*, where the word *Gentilis* stands opposed to *Provinciales*, or the inhabitants of the provinces of the empire.

The word is likewise used in this sense in the Greek; but it was not introduced either into that, or the Latin tongue, till after christianity was established; it being taken from scripiture.

GENTLEMAN*, a person of noble birth, or descended of a family which has long bore arms.

* The word is formed of the French *gentilhomme*, or rather of *gentil*, fine, fashionable, or becoming; and the Saxon *man*, q. d. *honestus*, or *homo loco natus*.—The same signification has the Italian *gentilissimo*, and the Spanish *hidalgo*, or *hijo dalg*, that is, the son of somebody, or of a person of note.—If we go farther back, we shall find *gentleman* originally derived from the Latin *gentilis homo*, which was used among the Romans for a race of noble persons of the same name, born of free or ingenuous parents, and whose ancestors had never been slaves or put to death by law.—Thus Cicero, in his *Topics*, *Gentiles sunt, qui inter se eodem sunt nomine ab ingenuis oriundi, quorum majorem nomo hereditatem servavit, qui capite non sunt diminuti*, &c. Some hold that it was formed from *gentile*, i. e. pagan, and that the ancient Franks, who conquered Gaul, which was then converted to christianity, were called *gentiles* by the natives, as being yet heathens.—Others relate, that towards the declension of the Roman empire, as recorded by Ammianus Marcellinus, there were two companies of brave soldiers, the one called *gentiliu*, and the other *scutariu*; and that it was hence we derived the names *gentleman* and *esquire*. See **ESQUIRE**.—This sentiment is confirmed by Pasquier, who supposes the appellation *gentilis* and *esquires* to have been transmitted to us from the Roman soldiery; it being to the *gentiles* and *scutarii*, who were the bravest of the soldiery, that the principal benefices and portions of lands were assigned. See **BENEFICE**.—The Gauls observing, that during the empire of the Romans, the *scutarii* and *gentiles* had the best tenements, or appointments, of all the soldiers on the frontiers of the provinces, became insensibly accustomed to apply the same names, *gentilhomme*, and *esquires*, to such as they found their kings gave the best provisions or appointments to. *Pass. Recb. l. 2. c. 15.*

In strictness, Chamberlayne observes, a *gentleman* is one whose ancestors have been freemen, and have owed obedience to none but their prince: on which footing, no man can be a *gentleman* who is not born so.

Among us, the term *gentleman* is applicable to all above yeomen; so that noblemen may be properly called *gentlemen*.

In our statutes, *gentilis homo* was adjudged a good addition for a *gentleman*, 27 Edw. III. The addition of knight is very ancient, but that of *esquire* or *gentleman*, was rare, before 1 Hen. V.

GENTLEMAN usher of the black rod, see **BLACK**.

GENTLEMAN of the bed-chamber, see **BED-CHAMBER**.

GENTLEMEN of the chapel, are officers, whose duty and attendance is in the royal chapel; being in number thirty-two: twelve whereof are priests, and the other twenty called *clerks of the chapel*, who assist in the performance of divine service.

One of the first twelve is chosen for confessor of the household, whose office it is to read prayers every morning to the household servants; to visit the sick; examine, and prepare communicants, and administer the Sacraments.

Another, well versed in musick, is chosen first organist; who is master of the children to instruct them in musick, and what is necessary for the service of the chapel: a second is likewise an organist: a third a lutanist; and a fourth a violist.

There are likewise three *surgers*, so called from the silver rods they usually carry in their hands, being a sergeant, yeoman, and groom of the vestry: the first attends the dean, and sub-dean, finds surplices, and other necessaries for the chapel: the second has the whole care of the chapel, keeps the pews, and seats the nobility and gentry: the groom has his attendance within the chapel door, and looks after it.

GENTLEMEN of honour, } See } **HONOUR**.

GENTLEMEN pensioners, } See } **PENSIONER**.

GENUFLEXION, the act of bowing, or bending the knee; or rather, of kneeling down.

The jesuit Roswey, in his *Onomasticon*, shews that *genuflexion*, or kneeling, has been a very ancient custom in the church; and even under the Old Testament dispensation: and that this practice was observed throughout all the year, excepting on Sundays, and during the time from Easter to Whitsonide, when kneeling was forbid by the council of Nice.

Others have shewn, that the custom of not kneeling on Sundays had obtained from the time of the apostles; as appears from St. Irenaeus, and Tertullian: And the *Ethiopic* church,

scrupulously attached to the antient ceremonies, still retains that of not kneeling at divine service. The Russians esteem it an indecent posture, to worship God on the knees. Add, that the Jews usually prayed standing.—Roswey gives the reasons of the prohibition of *genuflexion* on Sundays, &c. from St. Basil, Anafafus, St. Justin, &c. Baronius is of opinion that *genuflexion* was not established in the year of Christ 58; from that passage in *Acts* xx. 36, where St. Paul is expressly mentioned to kneel down at prayer; but Saurin shews that nothing can be thence concluded.

The same author remarks also, that the primitive christians carried the practice of *genuflexion* so far, that some of them had worn cavities in the floor where they prayed: and St. Jerome relates of St. James, that he had contracted a hardness on his knees, equal to that of camels.

GENUS, Kind, in logicks and metaphysics, is that which has several species under it; or, it is the origin, and radix of divers species, joined together by some affinity or common relation between them.

Genus is a nature, or idea, so common and universal, that it extends to other general ideas, and includes them under it.

Thus, animal is said to be a *genus*, in respect of man, and brute, in regard man and brute agree in the common nature and character of animal: to a right-lined figure of four sides, is a *genus*, in respect of a parallelogram, and a trapezium; and so likewise is substance, in respect of substance extended, which is body; and thinking substance, which is mind.

A good definition, say the schoolmen, consists of *genus*, and difference.

In the general, *genus* may be said to be a class of a greater extent than species; and which is not convertible therewith. For though we may say, that all body is substance; yet it cannot be said all substance is body.

Add, that whatever may be said of the *genus*, may likewise be said of the species under it; e. gr. whatever is said of *ens*, being, will equally hold of the body.

The schoolmen define the *genus logicum* to be an universal which is predicable of several things of different species; and divide it into two kinds: the one, the *summum*, which is the highest or most general, and has nothing above it to respect as a *genus*: the other the *subaltern*, which they likewise call *medium*.

GENUS summum is that which holds the uppermost place in its class, or predicament; or that which may be divided into several species, each whereof is a *genus* in respect of other species placed below it.

Thus in the predicament of things subsisting of themselves, *substance* has the place and effect of *genus summum*, and is predicated of all the things contained in that class; for both Plato and man, and animal, and even spirit, are properly called substance.

Accordingly there are as many *summum genera*, as there are classes of predicaments or categories.

Subaltern GENUS is that which being a medium between the highest *genus*, and the lowest species, is sometimes considered as a *genus*, and sometimes as a species.

Thus bird, when compared with animal, is a species; when to a crow, and eagle, or the like, it is a *genus*.

Genus, again, is divided into *remotum*, remote, where between it and its species, there is another *genus* and *proximum*, or next, where the species is immediately under it; as man, under animal.

GENUS is also used for a character, or manner, applicable to every thing of a certain nature, or condition.—In which sense it serves to make capital divisions in divers sciences; as music, rhetoric, botany, anatomy, &c. e. gr.

GENUS, GENDER, in botany, denotes a system, or assemblage of several plants, agreeing in some one or more common characters in respect of the structure of certain parts; whereby they are distinguished from all other plants.

The distribution of plants into *genera*, and species, is absolutely necessary to ease the memory, and prevent its being oppressed, and overburdened with an infinity of different names. The knowledge of a *genus* comprehends, in a kind of miniature, that of all the plants belonging thereto; each being denominated from some circumstance, common to the whole kind, to save the embarrass of so many particular names.

Something like this, even the common people do, especially in the instance of ranunculus, &c. but in many other plants the difficulty is infinitely greater, as it is hard to find any thing in common among them, whereon to found their *genus*.

Hence botanists differ as to the manner of regulating these *genera*, and the characters whereon they are to be established; Mr. Ray's distribution, see under the article **PLANT**.

One of the later writers, Monf. Tournesort, after a long and accurate discussion, has chose, in imitation of Gesner, and Columna, to regulate them by the flowers, and fruit considered together; so that all plants, which bear a resemblance in those two respects, are of the same *genus*: after

which the respective differences as to root, stem, or leaves make the different species, or sub-divisions.

Mr. Ray made some objections to this distribution; which grew into a considerable controversy between the two authors. The question was, whether the flowers and fruits were sufficient to establish *genera*, and to determine whether a plant was of this *genus*, or that?

The same M. Tournefort introduces another higher kind of *genus*, or class, which is only regulated by the flowers: he observes, that he has never hitherto met with above fourteen different figures of flowers; which, therefore, are all that are to be retained in the memory; so that a person who has a plant in flower, whose name he does not know, will immediately see what class it belongs to in his *Elements of botany*: and the fruit appearing some days afterwards, determines its *genus* in the same book; and the other parts give its species.

It is a wonderful ease to the memory, to have only fourteen figures of flowers to retain, and by means hereof to be enabled to descend to six hundred and seventy three *genera*, which comprehend eight thousand eight hundred and forty-six species of plants; which was the number of those then known by land and sea.

GENUS, in music, by the antients called *genus melodicæ*, denotes a certain manner of subdividing the principles of melody, *i. e.* the consonant intervals, into their concinnous parts.

The moderns, considering the octave, as the most perfect interval, and that whereon all the other concords depend in the present theory of music; the division of that interval is considered as containing the true division of the whole scale.

But the antients went to work somewhat differently: the diatessaron, or fourth, was the least interval which they admitted as concord; and therefore they sought first how that might be most concinnously divided; from which they constituted the diapente, or fifth; and diapasen, or octave.

The diatessaron being thus, as it were, the root or foundation of the scale; what they call the *genera*, kinds, arose from its various divisions; and hence they defined the *genus modulandi*, the manner of dividing the tetrachord, and disposing its four sounds as to succession.

The *genera* of music were three, *viz.* the *enharmonic*, *chromatic*, and *diatonic*: the two last whereof were variously subdivided; and even the first, though it is commonly reckoned to be without any species, yet different authors have proposed different divisions under that name, though without giving particular names to the species, as was done to the other two.

For the character, &c. of the several *genera*, see **ENHARMONIC**, **CHROMATIC**, and **DIATONIC**.

The parts, or divisions of a diatessaron they called the *diatessans* of the several *genera*, upon which their differences depend; and which in the enharmonic are particularly called the *diejis* and *ditonium*; in the chromatic, the *hemitonium*, and *trimitonium*; and in the diatonic, the *hemitonium*, or *limma*, and the *tonus*.

But under these general names, which distinguished the *genera*, there are several other different intervals, or ratios which constitute the *colores generum*, or species of enharmonic, chromatic, and diatonic. Add, that what is a diatessan in one *genus*, is a system in another.

GENUS, in rhetoric.—Authors distinguish the art of rhetoric, as also orations, or discourses produced thereby, into three *genera*, or kinds: *demonstrative*, *deliberative*, and *judiciary*.

To the *demonstrative* kind belong panegyrics, genethiacons, epithalamiums, funeral harangues, &c. See each under its head, **PANEGYRIC**, **EPITHALAMIUM**, &c.—To the *deliberative* kind belong persuasions, dissuasions, commendations, &c.—To the *judiciary* kind belong defences, and accusations. See **RHETORIC**, **ORATION**, &c.

GENUS, in algebra.—The antient algebraists distributed that art into two *genera*, or kinds; the *logistic*, and *specious*. See **LOGISTIC**, and **SPECIOUS**.

GENUS, in anatomy.—The *genus nervosum*, or nervous kind, or, as others say, the *nervous system*, is an expression, pretty frequent among authors; signifying the nerves, considered as an assemblage or system of similar parts, distributed throughout the body.

Tobacco contains a deal of sharp, caustic salt, proper to cause irritations in the nervous kind: vinegar, taken in too great quantity, incommodes the nervous kind.

GEOCENTRIC, in astronomy, is applied to a planet, or its orbit, to denote it concentric with the earth; or, as having the earth for its centre, or the same centre with the earth.

All the planets are not *geocentric*: the moon alone is properly *geocentric*.

GEOCENTRIC latitude of a planet, is its latitude seen from the earth; or the inclination of a line connecting the planet and the earth, to the plane of the earth's (or true) ecliptic.

Or, it is the angle, which the aforesaid line (connecting the planet, and the earth) makes with a line drawn perpendicular

to the plane of the ecliptic. See **LATITUDE**.

Thus, in *Tab. Astronom.* fig. 40. the angle $\angle T e$ is the measure of that planet's *geocentric* latitude, when the earth is in T , and the angle $\angle e q$, the measure of it when the earth is in a .

GEOCENTRIC place of a planet, is the place wherein it appears to us, from the earth; supposing the eye there fixed: or, it is a point in the ecliptic, to which a planet seen from the earth is referred.

GEODÆSIA*, that part of practical geometry, which teaches how to divide, or lay out lands, or fields, between several owners.

* The word is Greek, $\gamma\eta\delta\alpha\iota\sigma\tau\iota\alpha$, formed of $\gamma\eta$, terra, earth, and $\delta\alpha\iota\sigma$, divide, I divide.

GEODÆSIA is also applied by some to all the operations of geometry, which are performed in the field.

This is more usually called *surveying*, when employed in measuring of lands, grounds, roads, countries, provinces, &c. See **SURVEYING**.

Vitalis defines *geodæsia* the art of measuring surfaces, and solids, not by imaginary right lines, as is done in geometry, but by sensible and visible things, as by the sun's rays, &c.

GEOGRAPHICAL mile, is the minute, or sixtieth part of a degree of a great circle. See **MILE**, and **DEGREE**.

GEOGRAPHICAL table, see the article **MAP**.

GEOGRAPHY*, the doctrine or knowledge of the earth, both as in itself, and as to its affections; or a description of the terrestrial globe, and particularly of the known inhabitable part thereof, with all its parts.

* The word is Greek, $\gamma\eta\gamma\gamma\alpha\phi\iota\alpha$, formed of $\gamma\eta$, terra, earth, and $\gamma\gamma\alpha\phi\omega$, scribo, I write, I describe.

Geography makes a branch of mathematics, of the mixed kind; in that it considers the earth, and its affections, as depending on quantity, and consequently as measurable, *viz.* its figure, place, magnitude, motion, celestial appearances, &c. with the several circles imagined on its surface.

Geography is distinguished from cosmography, as a part from the whole: this latter considering the whole visible world, both heaven and earth.

From topography, and chorography, it is distinguished as the whole from a part. See **TOPOGRAPHY**, and **CHOROGRAPHY**.

Golnitz considers *geography* as either *exterior*, or *interior*: but Varenus more justly divides it into *general*, and *special*; or, *universal*, and *particular*.

General, or *universal GEOGRAPHY*, is that which considers the earth in general, without any regard to particular countries; or the affections, common to the whole globe, as its figure, magnitude, motion, land, sea, &c.

Special, or *particular GEOGRAPHY*, is that which considers the constitution of the several particular regions, or countries; their bounds, figure, &c. with the mountains, forests, mines, waters, plants, animals, &c. therein: as also their climates, seasons, heat, weather, distance from the equator, &c. And their inhabitants, arts, foods, commodities, customs, language, religion, policy, cities, &c.

Geography is very antient; at least the special part thereof: for the antient writers scarce went beyond the description of countries.

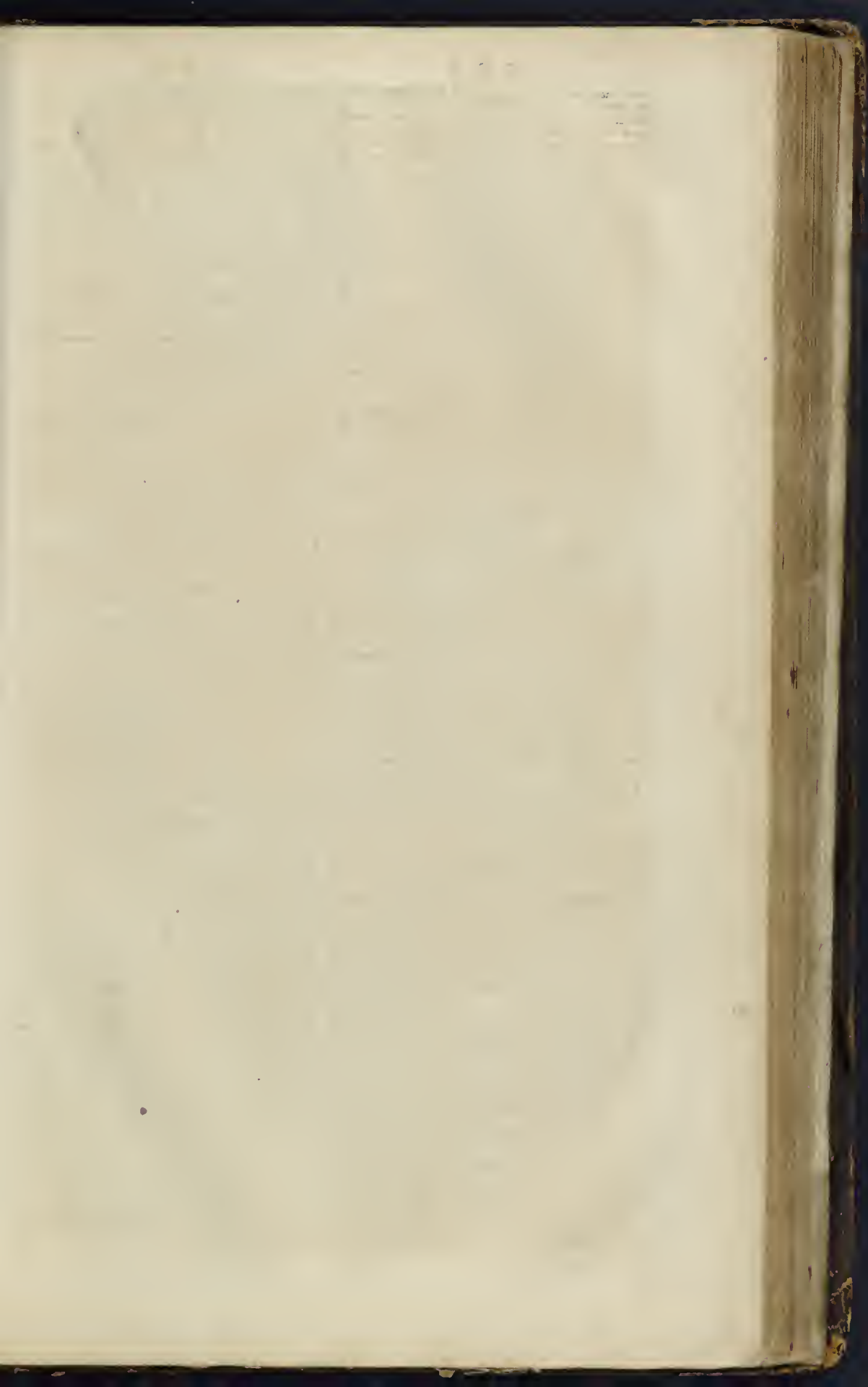
It was a constant custom among the Romans, after they had conquered and subdued any province, to have a map, or painted representation thereof carried in triumph, and exposed to the view of the spectators.

Historians relate that the Roman senate, about a hundred years before Christ, sent geographers into divers parts, to make an accurate survey and mensuration of the whole globe; but they scarce ever saw the twentieth part thereof.

Before them, Neco, king of Egypt, ordered the Phœnicians to make a survey of the whole coast of Africa, which they accomplished in three years: Darius procured the Ethiopian sea, and the mouth of the Indus to be surveyed: and Pliny relates, that Alexander, in his expedition into Asia, took two geographers, Diogenetus, and Baton, to measure and describe the roads; and that from their itineraries the writers of the following ages took many particulars. Indeed, this may be observed, that whereas most other arts are professed by war, *geography* and fortification alone have been improved thereby.

The art, however, must needs have been exceedingly defective; as a great part of the globe was then unknown; particularly all America, the Northern parts of Europe, and Asia, with the Terra Australis, and Magellanica; and as they were ignorant of the earth's being capable of being sailed round, and of the Torrid Zone's being habitable, &c.

The principal writings on this art, among the antients, are Ptolemy's eight books: among the moderns are, Johannes de sacro Bosco *de Sphæra*, with Clavius's *Comment.*: Ricciolus's *Geographia*, and *Hydrographia Reformata*: Weigelius's *Speculum Terræ*; De Chales's *Geography*, in his *Mundus Mathematicus*; and above all Varenus's *Geographia generalis*, with Jurin's additions: to which may be added Liebknecht's *Elementa*



TAB. GEOGRAPHY & HYDROGRAPHY.

Fig. 2. Map.

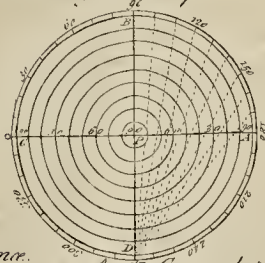


Fig. 3. Map.

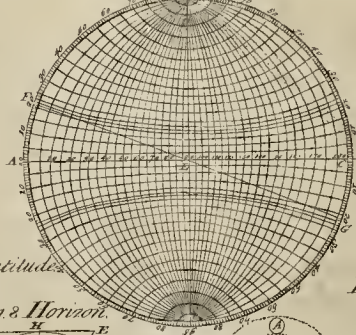


Fig. 4. Map.

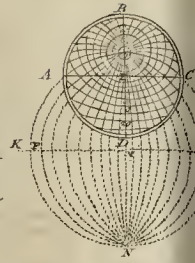


Fig. 4. Distance.

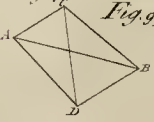


Fig. 5. Distance.

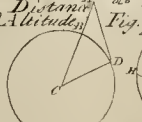


Fig. 6. Distance.

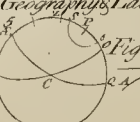


Fig. 7. Meridian.



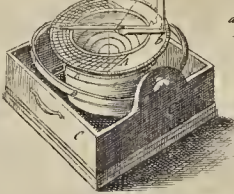
Fig. 7. Meridian.



Fig. 1. Compass.



Fig. 2. Azimuth Compass.



NAVIGATION.

Fig. 3. Sailing.

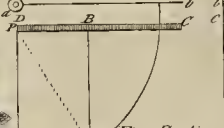


Fig. 4. Sailing.



Fig. 5. Sailing.

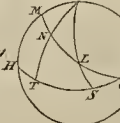


Fig. 6. Sailing.

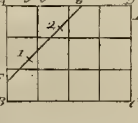


Fig. 6. Backstaff.



Fig. 7. Mercators Chart & Sailing.

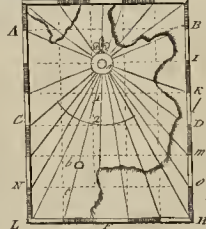


Fig. 8. Sailing.



Fig. 9. Sailing.

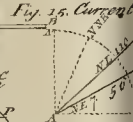


Fig. 11. Dipping Needle.



Fig. 12. Mercators.

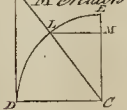


Fig. 13. Nocturnal.

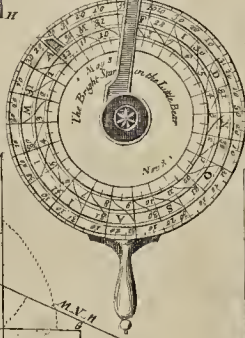


Fig. 14. Forestaff.



Fig. 15. Current.

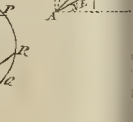


Fig. 17. Traverse.

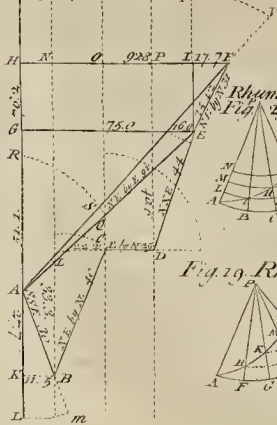


Fig. 17. Traverse.



Fig. 18. Simical Quadrant.

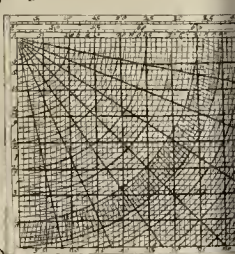


Fig. 19. Rhumb Line.

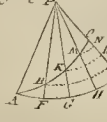


Fig. 20. Astrolabe.

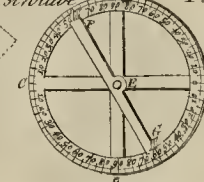
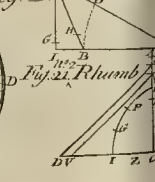


Fig. 21. Rhumb.



Elementa Geographica generalis: Sturmiius's *Compendium Geographicum*, and Wolfius's *Geographia*, in his *Elementa Mathematica*.

GEOMANCY*, **GEOMANTIA**, a kind of divination, performed by means of a number of little points, or dots, made on paper at random; and considering the various lines and figures, which those points present; and thence forming a pretended judgment of futurity, and deciding any question proposed.

* The word is formed of the Greek $\gamma\epsilon\omicron$, *terra*, earth; and $\mu\alpha\upsilon\lambda\alpha$, divination; it being the ancient custom to cast little pebbles on the ground, and thence to form their conjectures; instead of the points now made use of.

Polydore Vergil defines *Geomancy* a kind of divination performed by means of clefts or chinks made in the ground; and takes the Persian magi to have been the inventors thereof. *De Invent. Rer. lib. i. c. 23.*

GEOMETRICAL, something that has a relation to *Geometry*.

Thus we say, a *geometrical method*, a *geometrical genius*, *geometrical strictness*, a *geometrical construction*, *geometrical demonstration*, &c.

Geometry itself seems to lead us into errors: after once reducing a thing to *geometrical* consideration, and finding that it answers pretty exactly, we pursue the view, are pleased with the certainty and agreeableness of the demonstrations, and apply the *Geometry* further and further, till we often out-run nature. Hence it is, that all machines do not succeed: that all compositions of music, wherein the concords are the most rigidly observed, are not agreeable: that the most exact astronomical computations do not always foretel the precise time and quantity of an eclipse, &c.

The reason is, that nature is not a mere abstract; mechanical levers and wheels are not *geometrical* lines and circles; as they are often supposed to be: the taste for tunes is not the same in all men; nor at all times in the same man: and as to astronomy, as there is no perfect regularity in the motions of the planets; their orbits hardly seem reducible to any fixed, known figure.

The errors, therefore, we fall into in astronomy, music, mechanics, and the other sciences to which *geometry* is applied, do not properly arise from *geometry*, which is an infallible science; but from the false use, or the misapplication of it. Malebr. *Recher. de la Ver.*

GEOMETRICAL construction of an equation, is the contriving and drawing of lines and figures, whereby to demonstrate the equation, theorem, or canon to be geometrically true. See **CONSTRUCTION of equations**.

GEOMETRICAL line, or *curve*, called also *algebraic line*, or *curves*, is that wherein the relation of the abscissas to the semi-ordinates may be expressed by an algebraic equation.

Thus, suppose in a circle, *Tab. Geometry*, fig. 52. $AB = a$, $AP = x$, $PM = y$; then will $PB = a - x$, and consequently, since $PM^2 = AP \cdot PB$, $y^2 = ax - x^2$. — Again, supposing $PC = x$, $AC = a - PM = y$; then will $MC^2 = PC^2 = PM^2$, that is, $a^2 - x^2 = y^2$. *Tab. Anal.* fig. 8. See **EQUATION**.

Geometrical lines are distinguished into classes, orders, or genera, according to the number of the dimensions of the equation that expresses the relation between the ordinates and the abscissas: or, which amounts to the same, according to the number of points in which they may be cut by a right line.

Thus, a line of the first order will be only a right line: those of the second, or quadratic order, will be the circle, and the conic sections; and those of the third, or cubic order, will be the cubical and Neilian parabolas, the cissoid of the ancients, &c.

But a curve of the first gender (because a right line cannot be reckoned among the curves) is the same with a line of the second order; and a curve of the second gender, the same with a line of the third order; and a line of an infinitesimal order is that, which a right line may cut in infinite points; as the spiral, cycloid, the quadratrix, and every line generated by the minute revolutions of a radius.

However, it is not the equation, but the description, that makes the curve a *geometrical* one: the circle is a *geometrical* line, not because it may be expressed by an equation, but because its description is a postulate: and it is not the simplicity of the equation, but the easiness of the description, which is to determine the choice of the lines for the construction of a problem. The equation that expresses a parabola, is more simple than that which expresses a circle; and yet the circle, by reason of its more simple construction, is admitted before it.

The circle and the conic sections, if you regard the dimensions of the equations, are of the same order, and yet the circle is not numbered with them in the construction of problems, but by reason of its simple description is depressed to a lower order, viz. that of a right line; so that it is not improper to express that by a circle, which may be expressed by a right

line: but it is a fault to construct that by the conic sections; which may be constructed by a circle.

Either, therefore, the law must be taken from the dimensions of equations, as observed in this law is so universal as to be taken away between plane and solid problems: or the law must be allowed not to be strictly observed in lines of superior kinds; but that some, by reason of their more simple description, may be preferred to others of the same order, and be numbered with lines of inferior orders.

In constructions that are equally *geometrical*, the most simple are always to be preferred: this law is so universal as to be without exception. But algebraic expressions add nothing to the simplicity of the construction; the bare descriptions of the lines here are only to be considered; and these alone were considered by those geometers, who joined a circle with a right line. And as these are easy or hard, the construction becomes easy, or hard: and therefore it is foreign to the nature of the thing, from any thing else to establish laws about constructions.

Either, therefore, with the ancients, we must exclude all lines besides the circle, and perhaps the conic sections, out of *geometry*; or admit all according to the simplicity of the description: if the trochoid were admitted into *geometry*, we might, by its means, divide an angle in any given ratio: would you therefore blame those, who would make use of this line to divide an angle in the ratio of one number to another, and contend that this line was not defined by an equation, but that you must make use of such lines as are defined by equations?

If, when an angle were to be divided, for instance, into 1001 parts, we should be obliged to bring a curve defined by an equation of above an hundred dimensions to do the business; which no body could describe, much less understand; and should prefer this to the trochoid, which is a line well known, and described easily by the motion of a wheel, or circle, who would not see the absurdity?

Either, therefore, the trochoid is not to be admitted at all in *geometry*, or else in the construction of problems, it is to be preferred to all lines of a more difficult description: and the reason is the same for other curves.

Hence, the trisections of an angle by a conchoid, which Archimedes in his *Lemma's*, and Pappus, in his *Collections*, have preferred to the invention of all others in this case, must be allowed to be good, since we must either exclude all lines, beside the circle, and right line, out of *geometry*, or admit them according to the simplicity of their descriptions; in which case, the conchoid yields to none, except the circle. Equations are expressions of arithmetical computation, and properly have no place in *geometry*, except so far as quantities truly geometrical (that is, lines, surfaces, solids, and proportions) may be said to be some equal to others: multiplications, divisions, and such sort of computations are newly received into *geometry*, and that apparently contrary to the first design of this science; for whoever considers the construction of problems by a right line and a circle, found by the first geometers, will easily perceive, that *geometry* was introduced, that we might expeditiously avoid, by drawing lines, the tediousness of computation.

It should seem, therefore, that the two sciences ought not to be confounded together: the ancients so industriously distinguished them, that they never introduced arithmetical terms into *geometry*; and the moderns, by confounding both, have lost a great deal of that simplicity, in which the elegance of *geometry* principally consists. Upon the whole, that is arithmetically more simple which is determined by more simple equations; but that is geometrically more simple which is determined by the more simple drawing of lines; and in *geometry*, that ought to be reckoned best, which is geometrically most simple.

GEOMETRICAL locus, or *place*, called also simply, *locus*. See **LOCUS**.

GEOMETRICAL medium, see the article **MEDIUM**.

GEOMETRICAL osculum, see **EVOLUTA** and **OSCULUM**.

GEOMETRICAL pace, is a measure consisting of five feet. See **PACE**, and **FOOT**.

GEOMETRICAL plan, in architecture, see **PLAN**.

GEOMETRICAL plane, see the article **PLANE**.

GEOMETRICAL progression, is a series of quantities, in continued *geometrical* proportion, i. e. increasing or decreasing in the same ratio.

Thus, e. gr. 1, 2, 4, 8, 16, 32, 64, and 128: 729, 243, 81, 27, 9, 3, 1, are *geometrical* progressions. See **GEOMETRICAL PROGRESSION**.

GEOMETRICAL proportion, called also absolutely and simply, *proportion*, is a similitude or identity of ratios. See **RATIO**.

Thus, if A be to B, as C to D, they are in *geometrical* proportion: so 8, 4, 30 and 15, are *geometrical* proportionals. See **PROPORTION**.

GEOMETRICAL scale, see **DIAGONAL scale**.

GEOMETRICAL solution of a problem, is when the problem is directly solved according to the strict principles and rules of *geometry*, and by lines that are truly *geometrical*.

In this sense we say, *geometrical* solution, in contradistinction to a mechanical, or instrumental solution, where the problem is only solved by ruler, and compasses.

The same term is likewise used in opposition to all indirect, and inadequate kinds of solutions, as by infinite series's, &c.

We have no *geometrical* way of finding the quadrature of the circle, the duplicature of the cube, or two mean proportionals: mechanical ways, and others, by infinite series's, we have.

The ancients, Pappus informs us, in vain endeavoured at the trisection of an angle, and the finding out of two mean proportionals by a right line, and a circle. Afterwards they began to consider the properties of several other lines, as the conchoid, the cissoid, and the conic sections, and by some of these endeavoured to solve those problems. At length, having more thoroughly examined the matter, and the conic sections being received into geometry, they distinguished *geometrical* problems into three kinds, *viz.*

1^o *Plane* ones, which deriving their original from lines on a plane, may be regularly solved by a right line, and a circle.

2^o *Solid* ones, which are solved by lines deriving their original from the consideration of a solid, that is, of a cone.

3^o *Linear* ones, to the solution of which are required lines more compounded.

According to this distinction, we are not to solve solid problems by other lines than the conic sections; especially if no other lines but right ones, a circle, and the conic sections must be received into geometry.

But the moderns advancing much farther, have received into geometry all lines that can be expressed by equations; and have distinguished, according to the dimensions of the equations, those lines into kinds; and have made it a law, not to construct a problem by a line of superior kind, that may be constructed by one of an inferior kind.

GEOMETRICAL square, see the article **SQUARE**.

GEOMETRICAL table, see the article **PLAIN table**.

GEOMETRICALLY proportional, are quantities in continual proportion; or which proceed in the same constant ratio; as 6, 12, 24, 48, 96, 192, &c.

They are thus called, in contradistinction to equidifferent quantities; which are called, though somewhat improperly, *arithmetically proportional*. See **arithmetically PROPORTIONAL**.

GEOMETRY*, the science, or doctrine of extension, or extended things; that is, of lines, surfaces, and solids.

* The word is Greek, *γεωμετρικη*, formed of *γη*, *terra*, earth, and *μετρον*, *metron*, to measure; it being the necessity of measuring the earth, and the parts and places thereof that gave the first occasion to the invention of the principles and rules of this art; which has since been extended and applied to numerous other things; inasmuch that *geometry*, with arithmetic, are now the general foundation of all mathematics.

Geometry is commonly divided into four parts, or branches; planimetry, alimetry, longimetry, and stereometry. See each under its proper article, **PLANIMETRY**, **ALIMETRY**, **LONGIMETRY**, and **STEREOMETRY**.

Geometry, again, is distinguished into *theoretical* or *speculative*, and *practical*.

The first contemplates the properties of continuity; and demonstrates the truth of general propositions, called *theorems*.

The second applies those speculations and theorems to particular uses in the solution of problems. See **PROBLEM**.

Speculative Geometry, again, may be distinguished into *elementary*, and *sublime*.

Elementary, or *common* **GEOMETRY**, is that employed in the consideration of right lines, and plain surfaces, and solids generated therefrom.

Higher, or *sublime* **GEOMETRY**, is that employed in the consideration of curve lines, conic sections, and bodies formed thereof.

Herodotus, lib. ii. and Strabo, lib. xvii. assert the Egyptians to have been the first inventors of *geometry*; and the annual inundations of the Nile to have been the occasion of it; for that river bearing away all the bounds and land-marks of mens estates, and covering the whole face of the country, the people, say they, were obliged to distinguish their lands by the consideration of their figure, and quantity; and thus by experience and habit, formed themselves a method, or art, which was the origin of *geometry*.—A farther contemplation of the draughts or figures of fields thus laid down and plotted in proportion, might naturally enough lead them to the discovery of some of their excellent and wonderful properties; which speculation continually improving, the art became gradually improved, as it continues to do to this day. Josephus, however, seems to attribute the invention to the Hebrews; and others among the ancients make Mercury the inventor. Polyd. Vergil, *de Invent. Rer.* l. i. c. 18.

The province of *geometry* is almost infinite: few of our ideas,

but may be represented to the imagination by lines; upon which they straight become of *geometrical* consideration; it being *geometry* alone that makes comparisons, and finds the relations of lines.

Astronomy, music, mechanics, and, in a word, all the sciences which consider things susceptible of more, and less; *i. e.* all the precise and accurate sciences, may be referred to *geometry*: for all speculative truths consisting only in the relations of things, and in the relations between those relations, they may be all referred to lines. Consequences may be drawn from them; and these consequences, again, being rendered sensible by lines, they become permanent objects, which may be constantly exposed to a rigorous attention, and examination: and thus we have infinite opportunities both of inquiring into their certainty, and pursuing them farther.

The reason for instance, why we know so distinctly, and mark so precisely, the concords called *octave*, *fifth*, *fourth*, &c. is, that we have learnt to express sounds by lines, *i. e.* by chords accurately divided; and that we know that the chord, which sounds octave, is double of that which it makes octave withal; that the fifth is in the sesquialterate ratio, or as three to two; and so of the rest.

The ear itself cannot judge of sounds with such a nice precision; its judgments are too faint, vague, and variable to form a science. The finest, best tuned ear, cannot distinguish many of the differences of sounds; whence many musicians deny any such differences; as making their sense their judge. Some, for instance, admit no difference between an octave and three ditones: and others, none between the greater and lesser tone; the comma, which is the real difference, is insensible to them; and much more the scisma, which is only half the comma.

It is only by reason, then, that we learn, that the length of the chord which makes the difference between certain sounds, being divisible into several parts, there may be a great number of different sounds contained therein, useful in music, which yet the ear cannot distinguish. Whence it follows, that had it not been for arithmetic and *geometry*, we had had no such thing as regular, fixed music; and that we could only have succeeded in that art by good luck, or force of imagination, *i. e.* music would not have been any science founded on incontestable demonstrations: though we allow that the tunes composed by force of genius and imagination, are usually more agreeable to the ear, than those composed by rule.

So, in mechanics, the heaviness of a weight, and the distance of the centre of that weight from the fulcrum, or point it is sustained by, being susceptible of plus and minus, they may both be expressed by lines: whence *geometry* becomes applicable hereto; in virtue whereof, infinite discoveries have been made, of the utmost use in life.

Geometrical lines and figures, are not only proper to represent to the imagination the relations between magnitudes, or between things susceptible of more and less; as spaces, times, weights, motions, &c. but they may even represent things which the mind can no otherwise conceive, *e. gr.* the relations of incommensurable magnitudes.

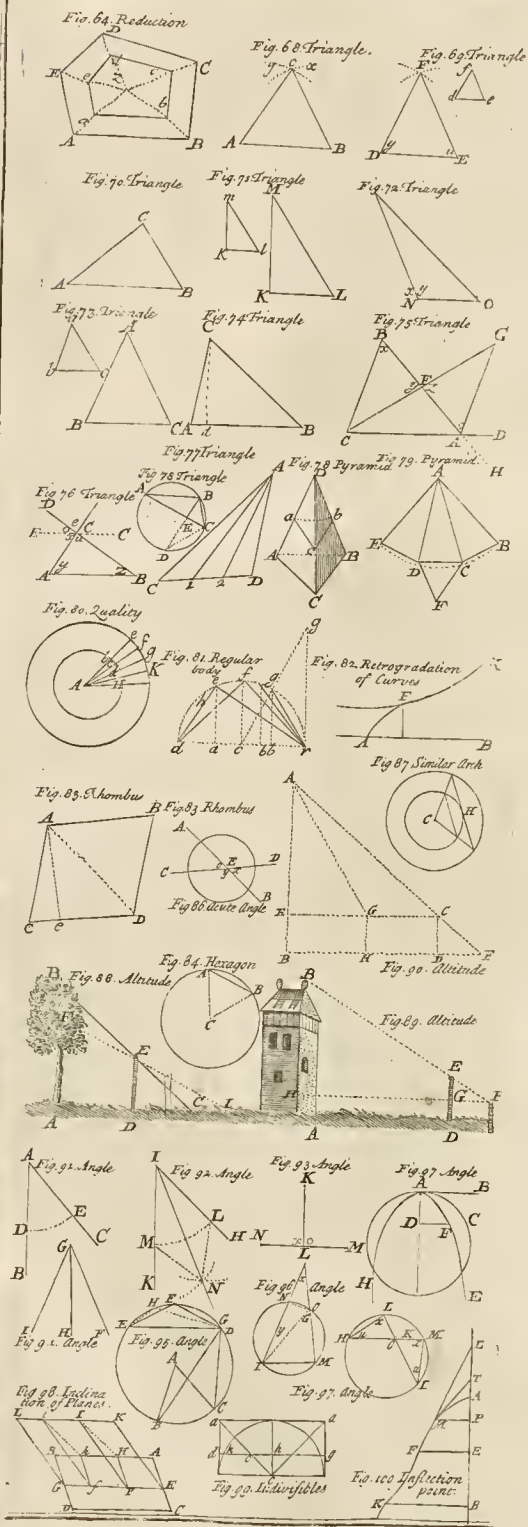
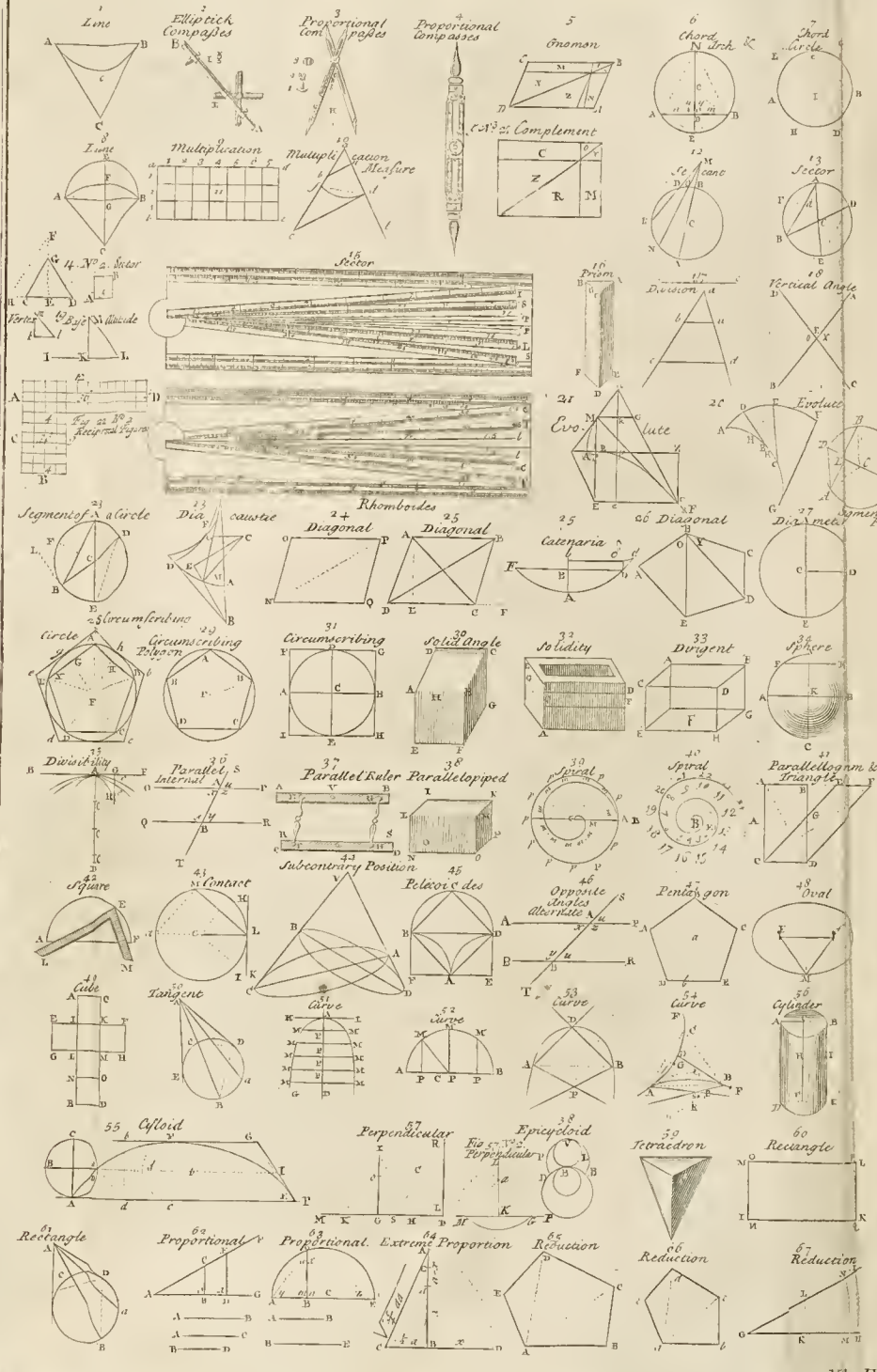
We do not, however, pretend, that all subjects men may have occasion to enquire into, can be expressed by lines. There are many not reducible to any such rule: thus, the knowledge of an infinitely powerful, infinitely just God, on whom all things depend, and who would have all his creatures execute his orders, to become capable of being happy, is the principle of all morality, from which a thousand undeniable consequences may be drawn, and yet neither the principle, nor the consequences can be expressed by lines, or figures. Malebr. *Recher. de la Ver.* T. ii.

Indeed, the ancient Egyptians, we read, used to express all their philosophical, and theological notions by *geometrical* lines. In their researches into the reason of things, they observed, that God, and nature affect perpendiculars, parallels, circles, triangles, squares, and harmonical proportions; which engaged the priests and philosophers to represent the divine and natural operations by such figures: in which they were followed by Pythagoras, Plato, &c. Whence that saying of Boethius, *nulum divinarum scientiam arismetras attingere posse*.

But it must be observed, that this use of *geometry* among the ancients was not strictly scientific, as among us; but rather symbolical: they did not argue, or reduce things and properties unknown from lines; but, represented or delineated by them things that were known. In effect, they were not used as means or instruments of discovering, but as images or characters, to preserve, or communicate the discoveries that were already made.

“The Egyptians (Gale observes) used *geometrical* figures, “not only to express the generations, mutations, and destructions of bodies; but the manner, attributes, &c. of the “Spirit of the universe, who diffusing himself from the centre of his unity, through infinite concentric circles, pervades all bodies, and fills all space. But of all other figures “they

TAB. GEOMETRY.



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“ they most affected the circle, and triangle; the first, as being
 “ the most perfect, simple, capacious, &c. of all figures :
 “ whence Hermes borrowed it to represent the divine nature ;
 “ defining God to be an intellectual circle or sphere, whose
 “ centre is every where, and circumference no where ” See
 Kirch. *Osisp. Ægyptiacæ*, and Gale *Phil. General.* lib. i. c. 2.

The ancient *Geometry* was confined to very narrow bounds, in
 comparison of the modern. It only extended to right lines and
 curves of the first order, or conic sections ; whereas into the
 modern *Geometry* new lines of infinitely more and higher orders
 are introduced

The writers who have cultivated and improved *Geometry*, may
 be distinguished into elementary, practical, and those of the
 sublimer *Geometry*.

The principal writers of elements, see enumerated under the
 article ELEMENTS.

Those of the higher *Geometry* are Archimedes, in his books of
Sphæra, *Cylindro*, and *Circuli Dimensione*; as also *de Sphaeribus*;
Conoidibus, *Sphaeroidibus*, *de Quadratura Parabolæ*, and *Arenarius*;
 Kepler, in his *Stereometria Nova*; Cavalarius, in his *Geometria*
Indivisibilium; and Torricellius, *de Solidis Sphaeroidibus*;
 Pappus Alexandrinus, in *Collectionibus Mathematicis*; Paulus
 Guldinus, in his *Mechanics and Statics*; Barrow, in his *Lectiones*
Geometricæ; Huygens, *de Circuli Magnitudine*; Bullialdus,
de Lineis Sphaericis; Schooten, in his *Exercitationes Mathematicæ*;
 et de Billy, *de Proportionibus Harmonicæ*; Lalovera, *de Cycloide*;
 Fer. Ernest. Com. ab Herbenstein, in *Diatome Circulorum*; Vi-
 viani, in *Exercit. Mathemat. de Formatione, and Mensura For-
 nicum*; Bap. Palma, in *Geomet. Exercitation.* and Apoll. Per-
 gæus, *de Sectione Rationis*.

For practical *Geometry*, the fullest and completest treatises are
 those of Mallet, written in French, but without the demon-
 strations: and those of Schwenter, and Cantzlerus, both in
 High-dutch.—In this class are likewise to be ranked Clavius's
Tacquet's, and Ozanam's *Practical Geometries*; De la Hire's
Ecole des Arpenturs; Reinholdus's *Geodæsia*; Hartman Beyers's
Stereometria; Voigtel's *Geometria Subterranea*, all in High-
 dutch; Hulfius, Galileus, Goldmannus, Scheffel, and Oza-
 nam, on the sector, &c.

CHARACTERS IN GEOMETRY, } See } CHARACTER.
 SPHERICAL GEOMETRY, } See } SPHERICAL.

GEOPONIC, something describing or relating to agriculture.

See AGRICULTURE. Cato, Varro, Columella, Palladius,
 and Pliny, are sometimes called *geoponic* writers.

St. GEORGE, a name whereby several orders, both military
 and religious, are denominated. It took its rise from a saint,
 famous throughout all the east; called by the Greeks, *Μεγα-
 λομαρτυρῆς, q. d. great martyr*.

On some medals of the emperors John, and Manuel Comne-
 ni, we have the figure of St. George armed, holding a sword,
 or javelin in one hand, and in the other a buckler, with this

inscription, an O, and therein a little A, and ΓΕ—ΓΙΟC, mak-

ing O ΑΓΙΟΣ ΓΕΩΡΓΙΟΣ, O Holy George. He is generally
 represented on horseback, as being supposed to have frequently
 engaged in combats in that manner.

He is highly venerated throughout Armenia, Muscovy, and all
 the countries which adhere to the Greek rite: from the Greek,
 his worship has long ago been received into the Latin church;
 and England and Portugal have both chose him for their patron
 saint.

St. GEORGE is particularly used for an English order of knights.
 more commonly now called the *order of the garter*. See GAR-
 TER.

Our king Edward VI. out of a spirit of reformation, made
 some alterations in the ceremonial, laws, and habit of the or-
 der, that the Romish saint might have less share therein. It
 was he first commanded that the order should no longer be
 called the *order of St. George*, but that of the *garter*.

Knights of St. GEORGE.—There have been various orders un-
 der this denomination, most of which are now extinct; parti-
 cularly one founded by the emperor Frederic III. in the year
 1470, to guard the frontiers of Bohemia and Hungary against
 the Turks.—Another, called *St. George of Aſama*, founded
 by the kings of Arragon.—Another in Austria and Carinthia.
 —And another in the republic of Genoa, still subsisting, &c.

Religious of the order of St. GEORGE. Of these there are divers
 orders, and congregations; particularly canons regular of *St.*
George in Alga, at Venice, established by two noble Vene-
 tians, in the year 1404.—Another congregation of the same in-
 stitute in Sicily, &c.

St. GEORGE'S CROSS, see the article CROSS.

GEORGIC *, something that relates to the culture, or tilling
 of the ground.

* The word is borrowed from the Latin *georgicus*, and that of
 the Greek *γεωργικός, q. d. terra, earth, and γεωργία, opera, I*
work, labour; of γεω, q. d. opus, work.

The *Georgics* of Virgil, are four books composed by that poet
 on the subject of agriculture.

Vol. I.

GEOSCOPY *, a kind of knowledge of the nature, and qua-
 lities of the ground, or soil; gained by viewing, and consider-
 ing it.

* The word is formed of the Greek *γῆ, earth, and σκοπέω, I see,*
 view.

Geoscropy is only conjectural; but its conjectures are very well
 grounded.

GERESOL, in music, one of the clefs. See CLEF.

GERFALCON, or GYRFALCON, a bird of prey, of a size
 between a vultur and a hawk; and of the greatest strength next
 the eagle. See FALCON, and HAWK.

GERM, see the article GERMIEN.

GERMAN, in matters of genealogy, signifies whole, entire,
 or own.

Germani quasi eadem stirpe geniti. Fest. Hence,
Brother GERMAN denotes a brother both by the father's and
 mother's side, in contradistinction to uterine brothers, &c.
 who are only so, by the mother's side.

Cousins GERMAN are those in the first or nearest degree; being
 the children of brothers or sisters.

Among the Romans we have no instance of marriage between
 cousins *german* before the time of the emperor Claudius; when
 they were very frequent.

Theodosius prohibited them under very severe penalties, even
 fine and proscription. See CONSANGUINITY.

GERMAN acacia,	} See {	ACACIA.
GERMAN bezoar,		BEZOAR.
GERMAN black,		BLACK.
GERMAN coin,		COIN.
GERMAN compass,		COMPASS:
GERMAN empire,		EMPIRE.
GERMAN flute,		FLUTE.
GERMAN language,		TEUTONIC, and LANGUAGE.
GERMAN measures,		MEASURE.
GERMAN monies,		MONEY.

GERMIEN, or GERM, that part of a seed which germinates,
i. e. sprouts or shoots out the first, for the production of a new
 plant. See SEED.

Botanists call it the *plume*, see PLUME; see also PLANT,
 SEED, and GERMINATION.

GERMINATION, the act of germinating; that is, of a
 plant's sprouting, or shooting in the ground.

Some use the word in a more extensive sense; so as likewise to
 include the first shooting out of leaves, blossoms, branches,
 flowers, fruits, and seeds.

The modern philosphers have been very attentive to the *Ger-
 mination* of plants, as well as the formation of the chick in the
 egg.

The progress of *Germination* has been very accurately observed
 by the curious Malpighi, in the seed of a gourd. The day af-
 ter it was committed to the ground, he found the outer coat or
 integument a little tumid, and in its tip there appeared a small
 cleft or aperture, through which the plume or germ was seen.

The second day, the outward coat, or secundine, appeared much
 softer, the inner torn and corrupted, the plume, or plantule,
 somewhat longer and more tumid, and the beginning of the
 roots shewed themselves.

The third day the outward secundine was become dusky, and
 the leaves of the plantule inflated; and the root or radicle had
 made itself a passage through the secundines near the former
 aperture: the plume, or stem, as also the seed leaves being
 now grown much bigger.

On the sixth day, more of the seed leaves had broke through
 the secundines, and they were found thicker and harder; the
 root having now emitted a great number of fibres, and the
 stem grown a finger's length.

The following days the root still shot further, other roots
 arising from them, and others from these; and the stem, in
 its progress grew hollow, or fistulous, and the seed leaves
 broader and greener.

About the twenty-first day, the plant seemed complete; from
 which time the seed leaves began to droop, and at length died
 away. See SEMINAL Leaves.

GERONTES *, in antiquity, a kind of judges, or magistrates,
 in ancient Sparta, answering to what the Arcopagites were at
 Athens. See AREOPAGITE.

* The word is formed of the Greek *γῆρας*, which signifies old
 man. Whence also the words *gerontic*, something belonging
 to an old man; and *geronticum*, a famous book among the mo-
 dern Greeks, containing the lives of the ancient monks. The
 senate of *gerontes* was called *gerusia*, that is, assembly or coun-
 cil of old men.

The *Gerontes* were originally instituted by Lycurgus: their
 number, according to some, was twenty-eight; and according
 to others thirty-two. They governed in conjunction with the
 king, whose authority they were intended to balance, and to
 watch over the interests of the people.

None were to be admitted into this office under sixty years
 of age, and they held it for life.—They were succeeded by the
 Ephori.

GERUND *, in grammar, a sort of tense, or time of the infinitive mood; very like to the participle, but indeclinable.

* The word is formed of the Latin *gerundius*, and that from the verb *gerere*, to bear.

The *Gerund* expresses not only the time, but also the manner of an action; as, he fell in running *poft*.

It differs from the participle, in that it expresses the time, which the participle does not.

And from the tense properly so called, in that it expresses the manner, which the tense does not.

Grammarians are much embarrassed to settle the nature and character of the *Gerunds*: it is certain, they are no verbs, nor distinct moods of verbs, in regard they do not mark any judgment or affirmation of the mind, which is the essence of a verb.—And beside, they have their several cases, which verbs have not.

Some therefore will have them to be adjectives passive, whose substantive is the infinitive of the verb: on this footing they denominate them *verbal nouns*, or names formed of verbs, and retaining the ordinary regimen thereof. See **NOUN**.

Thus, say they, *tempus est legendi libros, or librorum*, is as much as to say, *tempus est re legere libros, vel librorum*. But others stand up against this decision.

GESSERIT—*quamdiu*, see **QUAMDIU** *se bene gesserit*.

GESSES, in the furniture belonging to an hawk. See **JESSES**.

GESTATION, the time of a woman's going with child; or the interval between conception and delivery. See **DELIVERY**; see also **FOETUS**, and **CONCEPTION**.

GESTATION is also a term in the ancient medicine, used for a sort of exercise, by us called carriage.

It consisted in making the patient ride on horse-back, or in a chariot, or a boat; or even in rocking him in his bed, if he could not endure a more violent agitation.

Aesclepiades first brought frictions and *Gestation* into practice.

—The design of *Gestation* was to recover strength after a fever, &c. was gone.

GESTICULATION, the making of affected, indecent, or unsuitable gestures, or even of proper ones in too great number. *Gesticulation* is a grievous fault in an orator.

GESTURE, a motion of the body, intended to signify some idea, or passion of the mind.

Quintilian defines *Gesture*, *totius corporis motus & conformatio*. *Gestures* are a kind of natural language, which supplies the use of speech in those naturally dumb. The Mimes and Pantomimes were very great proficient in the style of *Gesture*.

Gesture consists principally in the action of the hands, and face.

GHEMARA, see the article **GEMARA**.

GIAGH, or **JERAGH**, a cycle of twelve years, in use among the Turks and Cathayans.

Each year of the *Giagh* bears the name of some animal: the first, that of a mouse; the second, that of a bullock; the third, of a lynx, or leopard; the fourth, of a hare; the fifth of a crocodile; the sixth, of a serpent; the seventh, of a horse; the eighth, of a sheep; the ninth, of a monkey; the tenth, of a hen; the eleventh, of a dog; and the twelfth of a hog.

They also divide the day into twelve parts, which they call *Giaghs*; and distinguish them by the names of the same animals.—Each *Giagh* contains two of our hours, and is divided into eight *keh*, as many as there are quarters of hours in our day.

GIANT, *Fryas*, a man of extraordinary, enormous stature and bulk.

The reality of *Giants*, and of nations of *Giants*, is much controverted among the learned. Travellers, historians, and relations, both sacred and profane, furnish various instances thereof; a great part of which, naturalists and antiquaries set aside.

Those among the ancients who speak of *Giants*, as historians, and affirm there were such things, are Cæsar, *de Bello Gallico*, l. i. Tacitus, *de Morib. Germanor.* and *Anal.* l. ii. Florus, l. 3. c. iii. St. Augustin, *de Civit. Dei*, l. xv. c. 9. and Saxo Grammaticus, at the end of his preface: among the moderns, Hieron. Magius, *Miscellan. de Gigantibus*, Chastagnon, *de Gigantibus*, Kercher *Mund. Subterr.* l. viii. sect. ii. c. 4. and so many others, that Stephanus, in his notes on Saxo Grammaticus, affirms nothing can be more extravagant than to deny, or allegorize the authorities we have thereof.

Mr. Derham observes, that though we read of *Giants* before the flood, Gen. vi. 4. and more plainly after it, Numb. xiii. 33. yet it is highly probable, the size of man has always been the same from the creation; for as to the Nephilim, Gen. vi. the ancients vary about them; some taking them for monsters of impiety, atheism, rapine, tyranny; and as to thofe, Numb. xiii. which were evidently spoke of as men of a gigantic size, it is probable the fears of the spies might add thereto.

Be this as it will, it is manifest that in both these places *Giants* are spoken of as rarities and wonders of the age, not of the common stature: and such instances we have had in all ages. There are many fabulous relations; such as we take to be that of Theutobocchus, who is said to have been dug up anno 1613.

and to have been higher than the trophies, and twenty-six feet long: and no better we suppose the *Giants* to have been, which Ol. Magnus gives an account of, in his fifth book, such as Harthen and Starchater among the men; and among the women, *reperit est* (saith he) *puella—in capite vulnerata, mortua, induta chlamyde purpurea, longitudinis cubitorum 50, latitudinis inter humeros quatuor*. Ol. Mag. *Hist.* l. v. c. 2.

But, as for the more credible relations of Goliath (whose height was six cubits, and a span, 1 Sam. xvii. 4. which, according to bishop Cumberland, is somewhat above eleven feet English) of Maximinus the emperor (who was nine foot high) and others in Augustus's and other reigns, of about the same height; to which might be added the dimensions of a skeleton, dug up lately in the palace of a Roman camp, near St. Albans, by an urn inscribed Marcus Antoninus; of which an account is given by Mr. Chefelden, who judged, by the dimensions of the bones, that the person was eight foot high. *Philos. Transact.* N^o 333. For these antique examples and relations, we say, they may be matched, nay out-done, with modern ones; of which we have divers in J. Ludolph. *Comment. in Hist. Ethiop.* l. ii. c. 2. sect. 22. Magius, Conringius, D. Hakewell, and others; which last speaks from Nannez, of porters and archers belonging to the emperor of China, fifteen foot high; and others from Purchas, of ten and twelve foot high, and more. See that learned author's *Apol.* p. 208.

GIBBOUS, in medicine, is used to denote a person bunched or hump-backed.

That part of the liver, out of which the vena cava arifes, is also called the *gibbous* part.

GIBBOUS is also used in reference to the enlightened parts of the moon, while she is moving from full to the first quarter, and from the last quarter to full again; for all that time the dark part appears horned, or falcated, and the light one bunched out, convex, or *gibbous*.

GIBBELINS, **GIBELINS**, or **GIBELLING**, a famous faction in Italy, opposite to another called the *Guelphs*.

The *Guelphs* and *Gibelins* ravaged, and laid waste Italy for a long series of years; so that the history of that country, for the space of two centuries, is only a detail of their mutual violencies, and mortal wars.

We have but a very obscure account of their origin, and the reason of their names: the generality of authors affirm, that they arose about the year 1240, upon the emperor Frederic the III^d's being excommunicated by pope Gregory the IXth.

That prince, say they, making a tour among the cities of Italy, gave the name *Gibelins* to such as he found well affected to him; and that of *Guelphs* to those who adhered to the pope. But as to the reason, and signification of those words, there is a deep silence; *Gibellin* might possibly be formed of *gebietor*, *imperator*; whence *gebietersich*, *imperies*. Of *gebietor*, the Italians might make, by corruption *Gibelin*; so that *Gibelins*, in this light, should be the same with *Imperialists*, or such as followed the emperor's party.

By the way, some writers maintain, that the two factions arose ten years before; though still under the same pope and emperor.

Other historians relate, that Conrad III^d marching into Italy, in the year 1139, against the Neapolitans, Roger, count of Naples and Sicily, in order to defend his states, called to his assistance *Guelph*, duke of Bavaria; and that one day, when the two armies were ready to join battle, the Bavarians cried out in High Dutch, *hie, Guelph!* or, as others say, in Flemish, *hier, Guelph!* that is, *here, Guelph!* and that the Imperialists answered, on their side, with the words *hie, or hier Gibelin!* *here, Gibelin!* calling the emperor by the name of the place where he had been bred.

Hornius refers the names to the war in 1140, between Henry the proud, duke of Bavaria and Saxony, and Conrad the III^d, duke of Suabia; the two princes preparing to engage near the town of Winflberg, the Bavarians began to cry out, *Guelph!* which was the name of duke Henry's brother; and the partisans of the emperor, *Weibelingen*, which was the name of the place where that prince was born and bred, in the duchy of Wirttemberg, whose surname he bore: from which *Weibelingen*, the Italians at length formed *Gibelin*.

This account is confirmed by Martin Crusius: *initium Gibeline (Webeline a patria Conradi regis) & Welfice convariationis*. Conrad being of *Weibelingen*, that word, says Crusius, gave rise to *gibelling*, and that to *gibelling*, *Gibelins*, *Gibellini*. Platina, on the other hand, assures us, that the name *Gibelins* arose from that of a German at Pistoia; whose brother, named *Guelph*, gave likewise his name to the opposite faction; the two brethren, it seems, bearing an irreconcilable hatred. Others maintain, that the emperor gave the appellation *Gibelins* to those of his party, from the German word *giffel*, signifying ridge, or top; by reason the empire rested on them, as the rafters of a house lean on the ridge, which joins them a-top. Karus, a learned canon of Strasbourg, in the lives of the emperors of the house of Brunswick, is of the second opinion above related: in a battle, says he, between *Welf*, or *Guelph*, and *Frederic*, the army of the first crying out, *hie, Welf*, *hie,*

bie, Welff! the second commanded his, to cry out, *bie, Gibeling!* *bie, Gibeling!* the name of his birth place; and the French and Lombards asking the signification of those words, they were answered, that by *Welff* was meant the pope's party; and by *Gibeling*, the emperor's.

Yet others contend, that the word *Gibelin* is only a softening of the word *gibertin*, or *guibertin*; and that it arose from Guibert, an anti-pope, set up by the emperor Henry III, in the year 1080, *Acta Sancti. Propyl. Maii.* p. 198.

Maimbourg, in his *Hyst. de la Decad. de l'Emp.* advances another opinion: the two factions, and their names, says he, arose from a quarrel between two very antient and illustrious houses, on the confines of Germany, that of the Henry's of *Gibeling* and that of the Guelphs of Adorf: which account appears the most probable of them all.

GIBET*, a machine in manner of a gallows, whereon notorious criminals, after execution, are hung in irons, or chains: as spectacles, in terrorem.

* The word in French, *gibet*, properly denotes what we call *galloves*, it is supposed to come originally from the Arabic *gibel*, mount, elevation of ground: by reason *gibets* are usually placed on hills, or eminences.

GIBLETS*, the offalls, or entrails of a goose; including the heart and liver, with the feet, gizzard, &c.

* The word is supposed to be formed of *goblets*, from the French *gobeau*, mouth-full.

Giblets make a considerable article in cookery: they boil *giblets*, *new giblets*, make ragouts of *giblets*, *giblet-pies*, &c.

GIGANTIC, see the article **GIANT**.

F. Bouhours relates, that one of the artifices of the Indian Bramins consists in persuading the simple people, that the gods eat like us; and, that they may bring them store of victuals, they represent those gods as of a *gigantic* size, and above all, give them a huge tun belly.

GIGANTOMACHIA*, the battle of the giants against the fabulous gods of the antient heathens.

* The word is Greek γιγαντομαχία, formed of γίγας, γίγαντες, giant, and μάχη, combat, of μάχημα, pugna, I fight.

Several of the poets have composed *gigantomachia's*: that of Scarron is the finest of all his pieces.

GIGG*, **GIGA**, or **JIG**, in music and dancing, a gay, brisk, sprightly, composition, and yet in full measure, as well as the allemand, which is more serious.

* Menage takes the word to arise from the Italian *giga*, a musical instrument mentioned by Dante.

GILBERTINES, an order of religious, thus called from St. Gilbert, of Sempringham, in the county of Lincoln, who founded the same, about the year 1148.

Antiently, none were received into it but married people: the monks observed the rule of St. Augustin; and were accounted canons; and the nuns that of St. Benedict.

The founder of this order erected a double monastery, or rather two different ones, contiguous to each other, the one for men, the other for women, but parted by a very high wall.

The order, afterwards, consisted of ten such monasteries: all which were suppressed at the general dissolution of monastic orders under king Henry VIII.

GILD*, or **GUILD**, originally signifies a fraternity, or company.

* The word is formed from the Saxon *gildan*, to pay, because every man was *gildare*, i. e. to pay something towards the charge and support of the company. Hence also our Guild-hall, *g. d.* the hall of the society or fraternity, where they meet and make orders and laws among themselves.

The original of *gilds*, or *gUILts*, is thus related: it being a law amongst the Saxons, that every freeman of fourteen years old should find sureties to keep the peace, or be committed; certain neighbours entered into an association, and became bound for each other, either to produce him who committed an offence, or to make satisfaction to the injured party: this, that they might the better do, they raised a sum of money among themselves, which they put into a common stock; and when one of their pledges had committed an offence, and was fled, then the other nine made satisfaction out of this stock, by payment of money, according to the offence.

Because this association consisted of ten families, it was called a *decemary*: and from hence came our later kinds of fraternities. But, as to the direct time when these *gilds* had their origin in England, there is nothing of certainty to be found; since they were in use long before any formal licence was granted to them for such meetings.

Edward the third, in the fourteenth year of his reign, granted licence to the men of Coventry, to erect a merchant's *gild* and fraternity, of brethren and sisters, with a master, or warden; and that they might found chantries, bestow alms, do other works of piety, and constitute ordinances touching the same, &c. So Henry the fourth, in his reign, granted a licence to found a *gild* of the holy cross, at Stratford upon Avon.

GILD in the royal boroughs of Scotland, is still used for a company of merchants, who are freemen of the borough.

Every royal borough has a dean of *gild*, who is the next ma-

gistrate below the bailiff. He judges of controversies among men concerning trade; disputes between inhabitants touching buildings, lights, water-courses, and other nuisances; calls courts, at which his brethren of the *gild* are bound to attend; manages the common stock of the *gild*, and amercees and collects fines.

GILD, or **GELD**, according to Camden, also signifies a tribute, or tax. See **GELD**.

GILD, according to Crompton, also signifies an amercement. As in foot-geld, which he interprets a prelation within the forest.

Hence to be quit of all manner of *gild*, is to be discharged of all manner of prelations to be made for gathering sheafs of corn, lamb, and wool, to the use of foresters.

GILE, or **GELD**, is also used among our antient writers for a compensation, or mulct for a fault committed. See **UNGELD**.

Hence, *weregeld*, is the price of a man; *orsgeld*, is the price of cattle; *angeld*, the single value of a thing; *twogeld* the double value, &c.

There are divers other words, which end with *geld*, and shew the several kinds of payments; as *danzgeld*, *vadegeld*, *senegeld*, *hornegeld*, *fosegeld*, *penigeld*, &c. which see.

GILD, or **GUILD** *rents*, are rents payable to the crown by any *gild*, or fraternity; or such rents as formerly belonged to religious *gilds*; and came to the crown at the general dissolution: being ordered for sale by the stat. 22 Car. II.

GILDABLE, or **GELDABLE**, denotes a person tributary, that is, liable to pay tax, or tribute.

Camden, dividing Suffolk into three parts, calls the first *gildable*, because liable to tax; from which the other two parts were exempt, because ecclesiæ donatæ.

GILDABEE is also explained in an antient MS. to be that land or lordship which is *sub distributione curie viccom*.

GILDHALDA *Teutoniarum*, was used for the fraternity of Easterling merchants in London; called also the *stillhard*. See **STILLYARD**.

GILD-HALL, *q. d.* *Gildæ aula*, the chief hall in the city of London. See **GUILD-HALL**.

GILD-MERCHANT, *Gilda mercatoria*, was a certain privilege, or liberty, granted to merchants, whereby they were enabled among other things to hold certain pleas of land within their own precincts.

King John granted *gildam mercatoriam* to the burghesses of Nottingham.

GILDING, or **GUILDING**, the art, or act of spreading or covering a thing over with gold, either in leaf, or in amalgam with quicksilver.

The art of *gilding* was not unknown among the antients, tho' it never arrived among them at the perfection to which the moderns have carried it.

Pliny assures us, that the first *gilding* seen at Rome, was after the destruction of Carthage, under the ensorship of Lucius Mummius, when they began to *gild* the ceilings of their temples, and palaces; the capitol being the first place on which this enrichment was bestowed. But he adds, that luxury advanced on them so hastily, that in a little time you might see all, even private and poor persons, *gild* the very walls, vaults, &c. of their houses.

We need not doubt but they had the same method with us, of beating gold, and reducing it into leaves; though, it should seem, they did not carry it to the same height; if it be true, which Pliny relates, that they only made seven hundred and fifty leaves four fingers square of a whole ounce. Indeed he adds that they could make more: that the thickest were called *bractæe præstantiæ* by reason of a statue of the goddess Fortune at Præneste gilt with such leaves; and that the thinner sort were called *bractæe questoriæ*.

The modern *gilders* do also make use of gold leaves of divers thicknesses: but there are some so fine, that a thousand don't weigh above four or five drachms. The thickest leaves are used for *gilding* on iron, and other metals: and the thinnest on wood. But we have another advantage over the antients, in the manner of using, or applying the gold: the secret of painting in oil, discovered of late ages, furnishes us with means of *gilding* works that shall endure all the injuries of time and weather, which to the antients was impracticable. They had no way to lay the gold on bodies that would not endure the fire but with whites of eggs, or size; neither of which will endure the water: So that they could only *gild* such places as were sheltered from the moisture of the weather.

The Greeks called the composition on which they applied their *gilding* on wood, *leucophaean* or *leucophorum*; which is described as a sort of glutinous, compound earth, serving, in all probability, to make the gold stick, and bear polishing. But the particulars of this earth, its colour, ingredients, &c. the antiquaries and naturalists are not agreed upon.

There are several methods of *gilding* in use among us; *viz.* *gilding on an oily size*; *gilding on a water size*; *gilding by the fire*, which is peculiar to metals; *gilding of books*, &c.

Method of GILDING in oil, or on oily size.—The basis, or matter, whereon the gold is applied, in this method, according to M. Felibien, is the remains of colours found settled

to the bottom of the pots wherein the painters wash their pencils. This matter, which is very viscid, they first grind; then pass it through a linen cloth; and thus lay it with a pencil on the matter to be gilt, after having first washed it once or twice over with fize; and if it be wood, with some white paint.

But however this method may obtain in France, the English gilders, in lieu hereof, generally make use of a gold fize, made of yellow oker ground fine with water, and laid to dry, on a chalk-stone; and then ground up with a due proportion of fat drying oil, to give it the body or degree of stiffness required.

With this fize they wash over the thing to be gilt, by means of a brush or a large pencil.—And, when almost dry, but while yet unctuous enough to catch and retain the gold, they spread their gold leaves thereon, either whole, or cut in pieces. To take up and apply the leaves, they make use of a piece of fine, soft, well carded cotton; or of a pallet for the purpose; or barely the knife, wherewith the leaves were cut, according to the parts of the work they are to gilt, or the breadth of the gold to be applied.

In proportion as the gold is laid, they press it down smooth with a bunch of cotton, or a hare's foot, to make it stick, and, as it were, incorporate with the ground: and with the same hare's foot, or a camel's hair pencil, they mend any cracks that may happen therein, after the same manner as will be hereafter shewn in *water-GILDING*.

This sort of gilding is chiefly used for domes, and the roofs of churches, courts, banqueting-houses, &c. and for figures of plaster, lead, &c. that are to stand exposed to the weather.

Method of GILDING on a water fize.—Water gilding is not performed without more apparatus; nor is it used so frequently, nor on such large works, as the former: wooden works, and those of stucco, are almost the only ones gilt in this way: which, beside, must be sheltered from the weather. The fize made use of for gilding, is to be made of shreds, &c. of parchment, or gloves, boiled in water, to the consistence of a jelly. If it be wood that is to be gilt, they first give it a wash of this fize, boiling hot; and when this is dry, another of whitening, mixed up with the same fize. For this whitening, some use plaster of Paris, well beaten and sifted; others Spanish white, or ceruse, &c. It is laid on with a stiff brush, and ofener, or seldomer repeated, according to the nature of the work: for pieces of sculpture, seven or eight lays suffice; for flat, or smooth works, they use ten, or twelve. In the latter case they are applied by drawing the brush or pencil over the work; in the former, by dabbing it smartly on, that the fize may enter all the dents of the carving.

When the whole is dry, they moisten it with fair water, and rub it over with several pieces of coarse linen, if it be a flat; otherwise, they beat or twitch it with several slips of the same linen tied to little sticks, to make it follow and enter all the cavities and depressures thereof.

The white thus finished, they proceed to yellow it; observing that if it be a piece of sculpture in relieve, they always first touch up, and repair the several parts which the white ground may have disfigured, with little iron instruments, as gravers, chisels, gouges, &c.

The yellow, which they use, is only common oker well ground and sifted, and thus mixed up with the fize used for the white, only weaker by one half. This colour is laid on hot; and in works of sculpture it serves to supply the place of gold, which frequently cannot be carried into all the cavities and dentings of foliage and other ornaments.

Over this yellow is applied a lay, which is to serve for the ground whereon the gold is to be immediately laid: it is usually composed of the Armenian bole, blood stone, black lead, and a little fat, to which some add soap and olive oil; others, burnt bread, bistre, antimony, tin-glass, butter, and sugar-candy. These ingredients being all ground together, with hot fize, they apply three lays of the composition upon the yellow, each after the other is dried; taking care not to put any in the small cavities of the work, to hide the yellow. The brush used in this application, is to be soft; and when the matter is well dried, they go over it with a stronger brush, to rub it down, and take off the little prominent grains, and thus facilitate the burnishing of the gold.

In order to proceed to gilt, they must have three sorts of pencils; one to wet; another to touch up, and amend; and a third to flatten: there is also required a cushion, to spread the gold leaves on, when taken out of the book; a knife to cut them; and a hare's foot, or squirrel's tail, fitted with a handle, or else a piece of cotton, to take them up, direct, and apply them.

They begin with the wetting pencils, by which they moisten the layer last laid on with water, that it may the better receive and retain the gold: the leaves are then laid on the cushion; and taken up, if whole, with the squirrel's tail; if in pieces, with the other instrument, or even the knife they are cut withal, and laid, and spread gently on the parts of the work before moistened.

When the leaves happen to crack, or break in laying on, they

make up the breaches with little pieces of leaf taken up on the repairing pencil; and with the same pencil, or another somewhat bigger, they smooth the whole; pressing the gold into the dents, where it could not so well be carried with the squirrel's tail.

The work being thus far gilt, when dry, remains either to be burnished, or mated.

To burnish it, is to smooth, and polish it with a burnisher, which is usually a dog's, or wolf's tooth, or a blood-stone, an egg, or a pebble, or something else very smooth, fitted in a handle for the purpose.

To mat, is to give it a light lick in the places not burnished, with a pencil dipt in fize, wherein a little vermilion sometimes has been mixed. This helps to preserve and prevent its flawing, when handled.

The last thing is to apply a vermeil, or lacker, in all the little lines, and cavities; and to stop and amend any little faults with shell gold.

The composition here called *vermeil*, is made of gum gutta, vermilion, and a little of some ruddy, brown colour, ground together, with Venice varnish, and oil of turpentine. Some gilders, in lieu hereof, content themselves with fine laca, or dragons blood, with gum water.

Sometimes, instead of burnishing the gold, they burnish the ground or composition laid on last before it; and content themselves afterwards to wash the part over with fize. This method is chiefly practised for the hands, face, and other nudities in relieve; which, by this means, do not appear so very brilliant as the parts burnished; though much more so than the parts perfectly flat, or mated.

To gilt a work, and yet preserve white grounds; they use to apply a layer of Spanish white mixed with a weak fish glue, on all the parts of the ground whereon the yellow, or the layer next under the gold, might run.

Method of GILDING metals, or of gilding by the fire.—There are two ways of gilding by fire, viz. that with liquid gold, and that with leaf gold.

The first is performed with gold amalgamated with mercury, in the proportion of about an ounce of mercury to a drachm of gold.

In order to this operation, they heat a crucible red hot, then put the gold and mercury in it, and stir them gently about, till the gold be found melted and incorporated into a mass with the mercury. This done, they cast them into water, to wash and purify; and thence into other waters, repeating the lotion, in order to take away the blackness. From the mass they separate the mercury not united therewith, by squeezing it between the fingers through a piece of flamy skin, or a linen cloth.

To prepare the metal to receive this amalgam, they scrub it with a wire brush, and wet it with water or beer; continuing to rub, and wet it till all the foulness which might hinder the close union of the metals be removed: which done, to quicken the work further, they rub a mixture of quicksilver and aqua fortis over it.

They proceed now to apply the gold, in order to which they use a little knife, or a brush made of brass wire for the purpose; with which they spread or overlay the whole work, as evenly as may be, being careful to miss no part. Then giving the work a gentle heat before the fire, with a hair brush they dab and spread the amalgam a further and evener thereon.

Thus far advanced, the metal is set over the fire, upon a grate, or in a sort of cage, under which is a pan of coals, by which means the mercury is raised in fumes, and leaves the gold alone adhering to the work: in proportion as the mercury evaporating and flying off discovers places where gold is wanting, they take care to supply them, by adding new pieces of amalgam with the knife or brush.

The work is then rubbed over, with the wire brush dipt in beer, or vinegar, this leaves it in a condition to be heated, or helled, i. e. to have its colour and lustre heightened, which is the last part of the process, and which the gilders keep to themselves as a mighty secret; though we apprehend it cannot differ much from what we have elsewhere shewn of the manner of giving gold species their colour, under the article COINING.

The method given by Parker, is to dip the work in a decoction of argal, sulphur, salt, and as much water as will cover it, holding it therein till it have acquired the colour that pleases: then dipping it in cold water.

To have the gilding more rich and lasting, they sometimes quicken the work over again with quicksilver and aqua fortis, and then gilt it a second time, after the same manner; proceeding, if occasion be, even to a third or fourth time, till the gold lies the thickness of a nail on the metal.

GILDING by the fire with gold leaves.—To prepare the metal for this gilding, it must be first well scratched, or raked; then polished with a polisher; and thus set to the fire to blue, i. e. to heat, till it appear of a blue colour. This done, the first lay of gold is clapped thereon, and lightly rubbed down with a polisher; and thus exposed to a gentle fire.

They usually only give it three such lays, or four at most; each lay consisting of a single leaf for the common works, and

and of two for the extraordinary ones: after each lay they set it a-fresh to the fire. After the last day, the gold is in a condition to be burnt.

GILDING of books, see the article *Book-BINDING*.

GILEAD—*Balm* of GILEAD, see the article *BALSAM*.

GILGUL *hamethin*, a Hebrew phrase, literally signifying the *rolling of the dead*.—To conceive the use of this expression, it is to be observed that the Jews have a tradition, that at the coming of the Messiah, no Israelite shall rise any where but in the holy land. What then shall become of all the faithful interred in other parts? shall they perish, and remain in the state of death?

No, say the Jewish doctors: but God will dig them subterranean canals, or cavities, through which they shall roll from their tombs to the holy land; and when they are arrived there, God will blow on them, and raise them again.

This imaginary passage of the carcases or ashes of the Jews, from their tombs, to the holy land, by rolling under ground, is what they call *gilgul hamethin*, the rolling of the dead.

GILL, *ground-ivy*, a medicinal plant, which gives the denomination to a sort of medicated ale, or drink, commonly called *Gill*, or *Gill-ale*, made by infusing the dried leaves of the plant therein.

Gill is absterfivè and vulnerary, and prescribed in disorders of the lungs, and breast; and also esteemed in obstructions of the viscera; whence it passes for hepatic, diuretic, splenic, and nephretic. It is said to do wonders in tubercles and tartarous indurations of the lungs. Willis commends its powder in obstinate coughs; and Etmuller gives the history of a scorbutic consumption cured by a strong decoction of this herb, after a vomit.

GILLA, in chemistry and pharmacy, is an Arabic term for salt; peculiarly used among us for the emetic salt of vitriol.

This salt is prepared from that mineral, by three, or four, repeated operations, *viz.* dissolution, in May dew; filtration; and crystallation. In defect of May dew, rain water may serve.

Gilla is used in tertians, and all fevers arising from a corruption of humours in the first passages. It destroys worms, and prevents putrefaction. The dose is from twenty grains to half a drachm, taken in broth, or in cordial waters.

GILLS, *Branchiæ*, in natural history, those membranous, cartilaginous parts in fishes, whereby they respire.

What we call *Gills* in fishes, serve the purposes of lungs: respiration of air is as necessary to fishes, as to terrestrial animals; there is always a deal of air inclosed among water; and it is this air that fishes respire. The whole mechanism of their *Gills* is contrived with this view, *viz.* to separate and imbibe this air from the water, and present it to the blood, after the same manner as it is presented to the lungs of other animals.

M. du Verney has unravelled this infinitely complicated piece of mechanism, in the *Gills* of a carp: the first thing that offers, is a fabric, consisting of a great number of bony laminae, each subdivided into an infinity of bony fibres, whose office is to sustain the innumerable ramifications of an artery dispatched thither from the heart. The use of these ramifications is to present the blood extremely subdivided, and, as it were, each globe of blood by itself, to the water. Between these laminae, and throughout the whole texture of the *Gills*, are an infinite number of very narrow passages, destined to receive and subdivide the water which the fish takes in by the mouth, into little parcels. In this state the air, its prison doors being now in some measure opened, makes its escape, and joins itself to the blood of all the little arteries.

The *Gills* have necessarily an alternate motion of dilatation and compression, which is effected by another very curious piece of mechanism: when they dilate, the water is taken in, and when they contract, it is expelled again. Hence it is probable, that it is in the very instant of contraction, that the air expressed from the water is forced to enter the pores of the little blood vessels; by reason the force is then greater than at any other time; and this action requires a considerable force. The same reason holds with respect to the lungs of men; accordingly M. du Verney maintains, that though the air enter the lungs in the time of inspiration, it is only received into the blood in that of expiration, when the superfluous air is carried off by the trachea; so that the real inspiration, *i. e.* the entrance of the air into the blood, should be the expiration.

The water is taken in by the mouth, and carried off again, stripped of its air, by the *Gills*; and the air gained from it, is distributed first to the arterioles of the *Gills*, and thence by the law of circulation to all the little veins inoculated therewith. See *Supplement*, article *BRANCHIE*.

GILT *varnish*, see the article *VARNISH*.

GINGER, *GINGIBER*, or *Zingiber*, an aromatic root, of considerable use both as a spice, and a medicine.

It is chiefly brought from Calicut, in the East-Indies; though of late it has been cultivated with good success in the Caribbee islands.

The plant which affords it, somewhat resembles our reed, both in respect of stem and leaves. The root goes no great depth under ground, but spreads itself near the surface, in form not unlike a man's hand, but very knotty.

When arrived at maturity, they dig it up, and dry it on hurdles, either in the sun, or an oven: the best is that which is new, dry, well filled, hard to break, of a brownish colour without, resinous within, and of a hot, pungent taste.

They use to candy the root, when green, with sugar, and honey; having first steeped it some time in water, to take away part of its acrimony, and to dispose it to let go the outer-skin. They also make a marmelade of it, and dry cakes.

The northern people make great use of this confection, as holding it sovereign against the scurvy. The Indians eat the root, when green, by way of sallet, first chopping it small, mixing it with other herbs, and seasoning it with oil and vinegar.

As to its medicinal use, it is hot and penetrating; it is also held good to strengthen the stomach, and promotes appetite. It promotes also digestion, prevents putrefaction, &c.

GINGERBREAD, a richer kind of bread, the flavour and taste whereof are heightened and improved with spices, and particularly *Ginger*, whence the name.

There are various forms and preparations of *Gingerbread*: we shall content ourselves with the following receipt, which is well recommended.

Into a pound of almonds, grate a penny white loaf, sift, and beat them together: to the mixture add an ounce of *Ginger*, scraped fine, and liquorice and aniseed in powder, of each a quarter of an ounce: pour in two or three spoonfuls of rose-water, and make the whole into a paste, with half a pound of sugar: mould and roll it, print it, and dry it in a stove. Others make it of treacle, citron, lemon, and orange peel, with candied *Ginger*, coriander, and caraway seeds, mixed up with as much flour as will make it into a paste.

GINGIVA, in anatomy, the *Gum*; a hard sort of flesh, investing the alveoli, or sockets of the teeth.

The *Gingivæ* are formed by the union of two membranes; one of which is a production of the periosteum, and the other of the internal membrane of the mouth.

GINGLYMUS, Γίγγυμος, in anatomy, one of the species of articulation.

The *Ginglymus* is that jointure of the bones, where each bone mutually receives the other; so that each both receives, and is received.

There are three species of *Ginglymus*: the first, when the same bone, at the same extremity, receives and is reciprocally received by another bone; after the manner of a hinge: such is that of the cubitus and humerus.

The second, when a bone receives another at one of its extremities, and is received into another, at the other: as the vertebrae do.

The third, is that where a bone is received into another, after the manner of a wheel, or axis of a wheel in a box: such is that of the second vertebra of the neck in the first.

GING-SENG, or *GIN-SEM*, or *GIN-ZENG*, in natural history, a very extraordinary and wonderful plant, principally found in Tartary.

The *Ging-seng* is one of the principal medicines of the Chinese and Tartars: and their most eminent physicians have wrote many a volume of its virtues.

It is known among them by divers other names, expressing the only *spirit*, or the *pure spirit of the earth*; the plant that gives immortality, &c. It makes, in effect, the whole materia medica, for the people of condition; but is too precious for the populace.

All the writers of the Chinese affairs make mention of the *Ging-seng*: as Martinus, in his *Atlas*; F. Kercher, in his *China illustrata*; F. Tachard, in his *Voyages*; and F. le Comte, in his *Memoirs*.

And yet we know but very little of this plant, before F. Jar-toux, a Jesuit, and missionary in China; who being employed by order of the emperor, in making a map of Tartary, in the year 1709, had an opportunity of seeing it growing in a village about four leagues from the kingdom of Corea, inhabited by Tartars, called *Enka-Tarsæ*.

That father took this opportunity to make a draught of the plant, and give an accurate description thereof, with its virtues, and the manner of preparing it; which, being a great curiosity, we shall here gratify the reader withal.

The *Ging-seng*, represented *Tab. Nat. History*, fig. 10. has a white root, somewhat knotty, about thrice the thickness of the stem, and which goes tapering to the end: at a few inches from the head, it frequently parts into two branches, which gives it some resemblance of a man, whose thighs the bran-

ches represent: and it is hence it takes the denomination *Ging-feng*, which signifies a figure of a man.

From the root rises a perfectly smooth, and tolerably round stem: its colour is usually a pretty deep red, except toward the foot, where, by the neighbourhood of the earth, it is turned somewhat whiter. At the top of the stem is a sort of joint or knot, formed by the flooring out of four branches, which spread as from a centre: the under side of each branch is green, mixed with white; and the upper part, much like the stalk, of a deep red: the two colours gradually decrease, and at length unite on the sides.

Each branch has five leaves, well enough represented in the figure; and it is observable that the branches divide equally from each other, both in respect of themselves and of the horizon; and with the leaves make a circular figure, neatly parallel to the surface of the ground.

The fibres of the leaves are very distinguishable, and on the upper side are beset with small whitish hairs: the membrane, or pellicle between the fibres, rises a little in the middle, above the level of the fibres.

The colour of the leaf is a dark green, above; and a shining, whitish green underneath; and all the leaves are finely jagged or indented on the edges.

From the centre of the branches arises a second stalk, DE, very straight, smooth, and whitish, from bottom to top, bearing a bunch of round fruit, of a beautiful red colour. This bunch, in the plant viewed by our missionary, was composed of twenty-four berries, two of which are here represented, 9, 9.

The red skin, that covets the berry, is very thin, and smooth, and contains within it a white pulp: as these berries were double, each had two rough stones, of the size and figure of our lentils.

The pedicles, whereon the berries were supported, all arose from the same centre; and spreading exactly like the radii of a sphere; made the bunch of berries of a circular form. The fruit is not good to eat; and the stone includes a kernel: it has also a small beard at the top, diametrically opposite to the pedicle.

The plant dies away every year; the number of its years may be known by the number of stalks it has shot forth; of which there always remains some mark, as is shewn in the figure, by the letters *bbb*, &c. From whence it appears, that the root A was seven years old.

As to the flower, F. Jartoux owns he had never seen it; and therefore could not describe it: some have assured him, that it is white, and very small, others, that there is no flower at all, and that no body had ever seen it. He rather inclines to think it so small as to have escaped notice; and, what confirms him in the opinion, is, that those who seek the *Ging-feng*, having nothing in view but its root, overlook and despise the rest of the plant, as useless.

As they have sowed the seed in vain, without any plant ever arising therefrom; it is probable this might give occasion to the fable which is current among the Tartars:—They say, that a bird eats it, as soon as in the earth; and not being able to digest it, it purifies it in its stomach, and afterwards springs up in the place where it was cast by the bird with its dung.—The missionary rather believes that the stone remains a long time in the ground, before it takes root; which opinion appears the more probable, as there are some roots no longer or bigger than one's little finger, which yet have shot forth at least ten stalks.

Though the plant here described had but four branches; yet there are some which have but two; others three; and others five, six, or seven; but each branch has always five leaves.

The height of the plant is proportionable to its bigness, and the number of branches the root has: the larger and more uniform it is, and the fewer small strings or fibres it has, the better it is accounted.

It is hard to say, why the Chinese should call it *Ging-feng*, a word which signifies figure, or representation of a man: neither that father, nor any he enquired of, could ever find that it bore more resemblance to the figure of a man, than is ordinarily seen among other roots. The Tartars, with more reason, call it *Orbata*, that is, the skirt of plants.

Those who gather the *Ging-feng*, preserve only the root; and all they can get of it in ten or fifteen days time, they bury together in some place under ground. Then they take care to wash it well, and scour it with a brush: then dip it in scalding water, and prepare it in the fumes of a sort of yellow miller, which gives it part of its colour.

The miller is put in a vessel, with a little water, and boiled over a gentle fire; the roots are laid over the vessel upon small, transverse pieces of wood, being first covered with a linen cloth, or some other vessel placed over them.

They may also be dried in the sun, or by the fire; but then, though they retain their virtue well enough, they have not that yellow colour, which the Chinese so much admire. When the roots are dried, they must be kept close in some very dry place; otherwise they are in danger of corrupting, or being eaten by worms.

As to the place where this root grows, it is between the thirty-ninth and forty-seventh degree of north latitude, and between the tenth and twentieth degree of east longitude, reckoning from the meridian of Peking. Here is found a long tract of mountains, which the thick forests that cover and encompass them, render almost impassable. It is upon the declivities of these mountains, and in these thick forests, upon the banks of torrents, or about the roots of trees; and amidst a thousand other different sorts of plants, that the *Ging-feng* is found. It is not to be met with in plains, valleys, marshes, the bottoms of rivulets, or in places too much exposed and open.

If the forest takes fire, and be consumed, this plant does not appear till two or three years after: it also lies hid from the sun as much as possible; which shews that heat is an enemy to it.

The places where the *Ging-feng* grows, are on every side separated from the province of Quang-tong, by a barrier of wooden stakes which encompasses this whole province, and about which guards continually patrol, to hinder the Chinese from going out, and looking after this root.

Yet, how vigilant soever they are, greediness after gain incites the Chinese to lurk about privately in these deserts, sometimes to the number of two or three thousand; at the hazard of losing their liberty, and all the fruit of their labour, if they are taken, either as they go out of, or come into the province.

The emperor having a mind that the Tartars should reap all the advantage that is to be made of this plant, rather than the Chinese, gave orders, in 1709, to ten thousand Tartars, to go and gather all that they could of the *Ging-feng*, upon condition that each person should give him two ounces of the best; and that the rest should be paid for, weight for weight, in pure silver. It was computed, that by this means the emperor would get this year about twenty thousand Chinese pounds of it, which would not cost him above one fourth part of its value.

We met, by chance, says F. Jartoux, with some of those Tartars, in the midst of those frightful deserts; and their mandarins, who were not far out of the way, came one after another, and offered us oxen for our subsistence, according to the commands they had received from the emperor.

This army of herbarists observed the following order: after they had divided a certain tract of land among their several companies, each company, to the number of an hundred persons, spread itself out in a right line, to a certain fixed place; every ten of them keeping at a distance from the rest.

Then they searched carefully for the plant, going on leisurely in the same order; and in this manner, in a certain number of days, they run over the whole space of ground appointed them.

When the time was expired, the mandarins, who were encamped with their tents in such places as were proper for the subsistence of their horses, sent to view each troop, to give them fresh orders, and to inform themselves if their number was complete.

If any one of them was wanting, as it often happened, either by wandering out of the way, or being attacked by wild beasts, they always looked for him a day or two, and then returned again to their labour, as before.

The *Ging-feng*, we have observed, is an ingredient in most of the medicines which the Chinese physicians prescribe to the better sort of patients: they affirm that it is a sovereign remedy for all weaknesses occasioned by excessive fatigues, either of body or mind; that it attenuates and carries off pituitous humours; cures weakness of the lungs, and the pleurisy; stops vomitings; strengthens the stomach; and helps the appetite; disperses lumes or vapours; fortifies the breast; is a remedy for short and weak breathing; strengthens the vital spirits; and is good against dizziness of the head, and dimness of sight; and that it prolongs life to extreme old age. No body can imagine, that the Chinese and Tartars would set so high a value upon this root, if it did not constantly produce a good effect: those that are in health, often make use of it to render themselves more vigorous and strong: and I am persuaded, adds the father just mentioned, it would prove an excellent medicine in the hands of any European who understands pharmacy, if he had but a sufficient quantity of it, to make such trials as are necessary to examine the nature of it chemically, and to apply it in a proper quantity, according to the nature of the disease for which it may be beneficial.

It is certain that it subtilizes, increases the motion of, and warms the blood; that it helps digestion, and invigorates in a very sensible manner.

After I had designed the root (he goes on) I observed the state of my pulse, and then took half of a root, raw as it was, and unprepared; in an hour after, I found my pulse much fuller and quicker: I had an appetite, and perceived myself much more vigorous, and could bear labour better and easier than before. Four days after, finding myself so fatigued and weary, that I could scarce sit on horseback, a mandarin, who was in company with us, perceiving it, gave me one of these roots: I took half of it immediately, and an hour after I was not in the least sensible of any weariness. I have often

made use of it since, and always with the same success. I have observed also, that the green leaves, and especially the fibrous part of them, chewed, would produce nearly the same effect.

The Tartars often brings people the leaves of *gin-fong*, instead of tea; and I always find myself well afterwards, that I should readily prefer them before the best tea. Their decoction is of a grateful colour; and when one has taken it twice, or thrice, its taste and smell become very agreeable.

As for the root, it is necessary to boil it a little more than tea, to allow time for extracting its virtue; as is practised by the Chinese, when they give it to sick persons; on which occasion they seldom use more than the fifth part of an ounce of the dried root.

To prepare the root for exhibition, they cut it into thin slices, and put it into an earthen pot well glazed, with about half a pint of water; the pot is to be well covered, and set to boil over a gentle fire; and when the water is consumed to the quantity of a cup full, a little sugar to be mixed with it, and to be drank: immediately after this as much more water to be put on the remainder, and to be boiled as before, to extract all the juice, and what remains of the spirituous part of the root.

These two doses to be taken, the one in the morning, and the other in the evening. See Supplement, article GIN-SENG.

GIRDERS, in architecture, the largest pieces of timber in a floor.—Their ends are usually fastened into the summers, or breast-sommers, and the joists are framed in at one end to the *girders*.

By the statute for rebuilding London, no *girder* is to lie less than ten inches into the wall; and their ends are to be always laid in loam, &c.

Girders and Sommers in length	From to		must be in		
	F. In.	F. In.	Breadth, Inches.	Depth, Inches.	
10	0	15	0	11	8
15	0	18	0	13	9
18	0	21	0	14	10
21	0	24	0	16	12
24	0	26	0	17	14

GIRDING—*beams*, in building, the same as *girders*. See **GIRDER**.

GIRDLE, *Cingulus*, or *Zona*, a belt, or band of leather, or other matter, tied about the reins; to keep that part more firm, and tight.

It was antiently the custom for bankrupts, and other insolvent debtors, to put off, and surrender their *girdle*, in open court.—The reason hereof, was, that our ancestors used to carry all their necessary utensils, as purses, keys, &c. tied to the *girdle*; whence the *girdle* became a symbol of the estate. History relates, that the widow of Philip I. duke of Burgundy, renounced her right of succession, by putting off her *girdle* upon the duke's tomb.

The Romans always wore a *girdle*, to tuck up the tunic when they had occasion to do any thing. This custom was so general, that such as went without *girdles*, and let their gowns hang loose, were reputed idle, dissolute persons.

Maiden, or *Virgins* **GIRDLE**.—It was the custom among the Greeks and Romans, for the husband to untie his bride's *girdle*. Homer, lib. xi. of his *Odyssæ*, calls this *girdle* *μαρτυριον* *Γυναικος*, *maid's girdle*. Festus relates, that it was made of sheep's wool; and that the husband untied it in bed. He adds, that it was tied in the Herculean knot; and that the husband untied it, as a happy presage of his having as many children as Hercules, who at his death left seventy behind him.

The poets attribute to Venus a particular kind of *girdle*, called *cestus*; to which they annex a faculty of inspiring the passion of love.

Quicksilver **GIRDLE**, in medicine, is a sort of *girdle* smeared over with mercury, or having mercury inclosed within it.

It is made of leather, linen, cloth, cotton, stuff, or the like, and the mercury is prepared or killed various ways; as with falling spittle, fat, or the like.

It is applied as a topical medicine about the waist, sometimes with good effect, but frequently it proves dangerous, principally in weak constitutions, and those subject to convulsions.—Its intention is, the cure of the itch, driving away vermin, killing lice, &c.

Queen's **GIRDLE**, is an ancient duty, or tax, raised at Paris every three years, at the rate of three deniers upon each muid of wine, and six for each queue. It was intended for the maintenance of the queen's household: afterwards they augmented and extended it to other commodities, as coals, &c.

Vigenero supposes it to have been originally thus called, by reason the *girdle* antiently served for a puric; but he adds, that a like tax had been raised in Persia, and under the same name, above two thousand years ago; as appears from Plato, in his *Alcibiades*, Cicero, Athenæus, &c.

Christians of the GIRDLE. Motavackkel, tenth caliph of the family of the Abassides, enjoined the Christians, and Jews, in the year of the Hegira, 235, of Jesus Christ 856, to wear a large leathern *girdle*, as a badge of their profession; which they bear to this day throughout the east: from which time the Christians of Asia, and particularly those of Syria and Mesopotamia, who are almost all Nestorians, or Jacobites, have been called *Christians of the girdle*.

Order of the GIRDLE, the order of Cordeliers; see **CORD**, and **CORDELIER**.

GIRDLE, in architecture; see **CINCTURE**.

GIRLE, among hunters, is a roe-buck of two years.

GIRON*, or **GIURON**, in heraldry, denotes a triangular figure, having a long sharp point, not unlike a wedge, terminating in the centre of the escutcheon.

* The word is French, and literally signifies the *gremium*, or lap; by reason, in sitting, the knees being supposed somewhat asunder, the two thighs, together with a line imagined to pass from one knee to the other, form a figure somewhat similar hereto.

When a coat has six, eight, or ten of these *girons*, meeting or centering in the middle of the coat, it is said to be *gironné*, or *gironny*.

GIRONNE, **GIRONNY**, in heraldry, is when a shield or coat is divided into several *girons*, which are alternately colour and metal. See *Tab. Herald.* fig. 63, which is blazoned *gironné* of six argent and sable.

When there are eight pieces or *girons*, it is absolutely said to be *gironné*; when there are more, or fewer, the number is to be expressed.—*Gironné* of four, of fourteen, &c.

Some, instead of *gironné*, say, *parti, coupé, tranché, and taillé*, by reason the *girons* are formed by such divisions of the field.

—Four *girons* form a saltier, and eight, a cross. See **SALTEER**, &c.

GIVEN, *Datum*, a term very frequently used in mathematics, signifying a thing which is supposed to be known.

Thus, if a magnitude be known, or we can find another equal to it, we say, it is a *given* magnitude, or that such a thing is *given* in magnitude.

If the position of any thing be supposed as known, we say, *given* in position.

Thus, if a circle be actually described on a plain, its centre is *given* in position; its circumference *given* in magnitude; and the circle is *given* both in position, and magnitude.

A circle may be *given* in magnitude only, as when only its diameter is *given*, and the circle not actually described.

If the kind, or species of any figure be *given*, they say, *given* in specie.—If the ratio between any two quantities is known, they are said to be *given* in proportion.

GLACIALIS*, *icy*, something relating to ice; and particularly, a place that abounds in ice.

* The word is formed of the Latin *glacis*, *ice*.

Thus, we say, the *mare glaciale*, or *congelatum*, that is, the *icy*, or frozen sea; called also the *Chronian*, or *Sarmatian* sea.

GLACIS, in building, an easy, insensible slope, or declivity. The descent, or inclination of the *glacis* is less steep than that of the *talut*.—In gardening, a descent sometimes begins in *talut*, and ends in *glacis*.

The *glacis* of the cornich is an easy, imperceptible slope in the cymatium of a cornich, to promote the descent and draining off of the rain-water.

GLACIS, in fortification, is particularly used for that of the counter-carp; being a sloping bank which reaches from the parapet of the counter-carp, or covert-way, to the level side of the field.—See *Tab. Fortif.* fig. 21. lit. *a a a* and *c*.

The *glacis*, otherwise called *esplanade*, is about six foot high, and loses itself by an insensible diminution in the space of ten fathoms.

GLADE, in agriculture, gardening, &c. a vista, or open and light passage, made through a thick wood, grove, or the like; by lopping off the branches of trees along the way.

GLADIATORS, in antiquity, persons who were retained to fight, ordinarily in the *Arena*, for the entertainment of the people. See **COMBAT**.

The *gladiators* were usually slaves, and fought out of necessity; though, sometimes, freemen made profession thereof, like our prize-fighters, for a livelihood.—After a slave had served on the *Arena* three years, he was dismissed. See **SLAVE**.

The Romans borrowed this cruel diversion from the Asiatics: some suppose that there was policy herein; the frequent combats of *gladiators* tending to accustom the people to despise dangers, and death.

The origin of such combats seems to be as follows: from the earliest times we have any acquaintance withal in profane history, it had been the custom to sacrifice captives, or prisoners of war, to the manes of the great men who had died in the engagement: thus Achilles, in the *Iliad*, lib. xxiii. sacrifices twelve young Trojans, to the manes of Patroclus; and in *Virgil*, lib. xi. ver. 81. *Aeneas* sends captives to Evander, to be sacrificed at the funeral of his son *Pallas*.

In course of time they came also to sacrifice slaves at the funerals of all persons of condition: this was even esteemed a necessary part of the ceremony; but as it would have appeared barbarous to have massacred them like beasts, they were appointed to fight with each other, and do their best to save their own lives, by killing their adversary. This seemed somewhat less inhuman, by reason there was a possibility of avoiding death; and it only lay on themselves, if they did not do it. This occasioned the profession of *gladiator* to become an art: hence arose masters of arms; and men learned to fight, and exercise therein.

These masters, whom the Latins called *lanistæ*, bought them slaves to train up to this cruel trade; whom they afterwards sold to such as had occasion to present the people with so horrible a show.

Junius Brutus, who expelled the kings, is said to have been the first who honoured the funeral of his father with these inhuman diversions.—They were at first performed near the sepulchre of the deceased, or about the funeral pile; but were afterwards removed to the circus and amphitheatres, and became ordinary amusements.

The emperor Claudius restrained them to certain occasions; but he soon afterwards annulled what he decreed, and private persons began to exhibit them at pleasure, as usual; and some carried the brutal satisfaction so far as to have them at their ordinary feasts.

And not slaves only, but other persons would hire themselves to this infamous office.

The master of the *gladiators* made them all first swear, that they would fight to death; and if they failed therein, they were put to death, either by fire, or swords, clubs, whips, or the like.

It was a crime for the wretches to complain when they were wounded; or to ask for death; or seek to avoid it, when overcome: but it was usual for the emperor, or the people to grant them life, when they gave no signs of fear, but waited the fatal stroke with courage and intrepidity. Augustus even decreed that it should always be granted them.

From slaves, and freed men, the wanton sport at length spread to people of rank and condition; and Nero is related to have brought upwards of four hundred senators, and six hundred Roman knights upon the arena; and though Lippus takes both those numbers to be falsified, and not without reason reduces them to forty senators, and sixty knights; yet Domitian, that other monster of cruelty, refused upon Nero, exhibiting combats of women in the night time.

Constantine the Great is said to have first prohibited the combats of *gladiators*, in the east; at least, he forbid those who were condemned to death for their crimes, to be employed herein: there being an order still extant to the *Præfectus Prætorii*, rather to send them to work in the mines, in lieu thereof: it is dated at Berytus in Phœnicia, the first of October 325.

The emperor Honorius first forbid them at Rome, on occasion of the death of St. Telemachus, who, coming out of the east into Rome, at the time of one of these spectacles, went down into the arena, and used all his endeavours to prevent the *gladiators* from continuing the sport: upon which the spectators of that carnage, fired with anger, stoned him to death. Theodoret. *Hist. Eccles.* lib. v. c. 26.

It must be observed, however, that the practice was not entirely abolished in the west before Theodoric, king of the Ostrogoths. Honorius, on the occasion first mentioned, had prohibited them; but the prohibition does not seem to have been executed. Theodoric, in the year 500, abolish'd them finally.

Sometime before the day of battle, the person who presented the people with the shows, gave them notice thereof, by programmes, or bills, containing the names of the *gladiators*, and the marks whereby they were to be distinguished; for each had his several badge, which was most commonly a peacock's feather, as appears from the Scholiast of Juvenal, on the 158th verse of the third satyr; and Turnebus, *Advers.* l. ii. c. 8.

They also gave notice what time the shows would last, and how many couples of *gladiators* there were: And it even appears from the 52d verse of the seventh satyr of the second book of Horace, that they sometimes made representations of these things in painting; as is practised among us, by those who have any thing to shew at fairs.

The day being come, they began the entertainment by bringing two kinds of weapons: the first were staves, or wooden files, called *rudes*; and the second, were effective weapons, as swords, poniards, &c.

The first were called *arma lustria*, or *exercitoria*; the second *decretoria*, as being given by decree, or sentence of the prætor; or of him at whose expence the spectacle was exhibited.

They began to fence, or skirmish with the first, which was to be the prelude to the battle: And from these, when well warmed, they advanced to the second, with which they fought naked.

The first part of the engagement was called *ventilare*,

præludere; and the second, *dimicare ad certum*, or *versis armis pugnare*: And some authors think with much probability, that it is to these two kinds of combat that St. Paul alludes in the passage 1 Cor. ix. 26, 27. 'I fight, not as one that beatech the air; but I keep under my body, and bring it into subjection.'

If the vanquished surrendered his arms, it was not in the victor's power, to grant him life: It was the people, during the time of the republic; and the prince, or people, during the time of the empire, that were alone empowered to grant the boon.

The reward of the conqueror was a branch of palm tree, and a sum of money: Sometimes they gave him his congé, or dismissed him, by putting one of the wooden files, or rudes in his hand; and sometimes they even gave him his freedom.

The sign, or indication whereby the spectators shew'd that they granted the favour, was, to fall the thumb; or clench it between the other fingers: And when they would have the combat finished, and the vanquished slain, they raised the thumb, and directed it towards the combatants: Which we learn from Juvenal, sat. iii. v. 36.

The *gladiators* challenged, or defied each other, by shewing the little finger; and by extending this or some other during the combat they own'd themselves vanquish'd, and begged mercy from the people: *Vidit ostentam digiti ventum a populo pertulabant*, says the old Scholiast on Persius.—*Vid. Plin. L. xxviii. c. 2. Prudentius, l. ii. contra Symm. v. 1098. Horace, l. iv. 18. v. 66. Politian. Miserr. c. 42. Turneb. Advers. l. xi. c. 6. Lipp. Saturn. l. ii. c. 22.*

There were divers kinds of *gladiators*, distinguished by their weapons, manner, and time of fighting, &c. as,

The *andabææ*; of whom we have already given an account under the article *ANDABATÆ*.

The *castrarii*, who always fought in troops, or companies: number against number, or, according to others, who fought promiscuously without any certain order. *Lippi. lib. ii. c. 16.*

The *consuennati*, whom authors mention as a species of *gladiators*, the same with the *rudarii* and *veterani*; founding the opinion on a passage in Pliny, l. viii. c. 7. But Lippus shews, that they have mistaken Pliny; *Saturn. lib. ii. c. 16. and Turneb. Advers. l. xxx. c. 36.*

The *cubicularii*; which are a little precarious, being chiefly founded on a passage in Lampridius, in the life of the emperor Commodus: *Inter hæc habitu victimarii, victimas immolavit, in arena rudibus, inter cubicularios gladiatores pugnavit lucentibus aliquando mucronibus.*

Turnebus reads *rudarii*, in lieu of *cubicularios*, and understands it of those who had been dismissed, and could no longer be obliged to fight, except with files.

Salmastius reads *gladiator*, and refers it to the emperor, who fought not only on the arena, and with files, or blunted instruments; but at home, with his servants, and valets de chambre, and with sharps.

Lippius will have nothing altered in the text: The *gladiatores cubicularii*, he observes, were those who fought at private houses, during feasts, &c. Accordingly, Dio says expressly, that Commodus sometimes fought at home, and even killed some persons in such encounters; but that in public he only fought with blunted weapons.

The *dimacha*, who fought armed with two poniards, or swords; or with sword and dagger. *Lippi. Saturn. l. ii. c. 13.*

The *essedarii*, who fought in cars; called also, in an inscription lately discovered at Lyons, *essedarii*. *Saturn. seim. l. ii. c. 13.*

The *fuscarii*, or *caesariani*, who belonged to the emperor's company, and who being more robust and dexterous than the rest, were frequently called for; and therefore named also *postulatii*. *Saturn. l. ii. c. 16.*

The other kinds were, the *diplomachi*, *meridiani*, *millenarii*, *ordinarii provocatores*, *retarii*, *rudarii*, *secutores*, *spectatores*, and *thraces*: Which see described under their several articles *MERIDIANI*, *RETARI*, *SECUTOR*, &c.

Some authors, and particularly Vigenere on Livy, rank the *obsequentes*, mentioned by Spartian in his life of Marcus Aurelius, among the number of *gladiators*. Lippius laughs at him, *Saturn. l. ii. c. 16.* and with some reason: The *obsequentes* properly were the troops which that emperor raised among the *gladiators*, or whom of *gladiators* he made soldiers.

GLADIATORS war, bellum GLADIATORUM, or Spantianum, called also the *servile war*, was a war which the Romans sustained about the year of their city 630.—Spartacus, Crinus, and Oenomaus, having escaped with other *gladiators*, to the number of 74, out of the place where they had been kept, at Capua, gathered together a body of slaves, put themselves at their head, rendered themselves masters of all Campania, and gained several victories over the Roman prætors.—At length they were defeated, in the year 682, at the extremity of Italy, having in vain attempted to pass over into Sicily.

This war proved very formidable to the Romans. Crassus was not able to finish it: The great Pompey was forced to be sent as general.

GLADIUS*, sword. *Jus GLADI*, or, right of the sword, is used in our ancient Latin authors, and in the Norman laws, for supreme jurisdiction.

* Camden in *Britannia*, writes *comitatus Flint pertinet ad gladium Cestrie*. And Selden, *Tit. of Honour*, p. 640. *curiam suam liberam domibus placitis, &c. exceptis ad gladium jus pertinentibus*.

And it is probably from hence, that at the creation of an earl, he is *gladio succindus*, to signify that he had a jurisdiction over the county.

GLAND, **GLANDULA**, in anatomy, a soft, spongy, lax kind of body; serving to separate some particular humour from the mass of blood. See **BLOOD**, and **HUMOUR**.

The ancients took the glands to be nothing more than a kind of pillows, or cushions, for the neighbouring parts to rest on.—Some of them, at length, began to fancy them sponges; destin'd to receive and imbibe the superfluous moisture of the other parts.

Later physicians thought proper to assign them nobler, and more important uses.—They considered them as cisterns, which contained proper ferments, whereby the blood, upon its mixing therewith, was put into a fermentation, in the progress whereof it worked, or threw off certain of its parts, and sent them away by excretory ducts.

The moderns who allowed the glands to be the organs whereby the vital fluids are separated for the uses of the body, considered them as filters, the pores whereof being all of different figures, would only admit of similarly figured particles, to pass through them.

But the latest authors rather conceive the glands, as sieves, whose perforations being of different sizes, though of the same figure, only separate such particles whose diameters are less than their own.

The glands, to the eye, appear a sort of whitish, membranous masses, composed of an outer cover, or integument, within which a vascular plexus is contained.—They are denominated from their resemblance in form, to acorns, which the Latins call *glandet*.

By dissection, and the microscope, they are found to be real plexus's or pelotons of vessels, variously wound, and implicated among themselves. But the modern anatomists, Malpighi, Bellini, Wharton, Nuck, Peyer, &c. have gone further, and discovered them to be more than continued convolutions of the capillary arteries.

Their formation appears to be thus—An artery arriving at a certain part, is divided into an infinite number of exceedingly fine branches, or ramifications: These capillary branches are laid in various bends and circumnutations; and from the returns thereof, arise new branches, or vessels for veins; which, a little further, unite, or terminate in some larger branch.

All these ramifications, both veins and arteries, are rolled up in a bundle; making numerous gyres, and circumnutations: And from the various bends and angles formed by both kinds, arise numerous other minute vessels, which make the principal and most essential part of the gland.

The blood brought from the heart-ward, by the artery, into the glandular plexus, pursues all the turns and meanders in the arterial part thereof, till arriving at the venal part, it is by it brought back again to the heart. In the mean time, during its progress through the arterial and venal folds, some part of it is absorbed, or drained off, at the orifices of the tubules arising from the flexures thereof.

What is thus received into these, which we may call the *secretory ducts*, is commonly taken up by other tubules, springing out of them: These, joining together, form a single canal, which is called the *excretory duct*; which, passing out of the body of the gland, carries off the secreted matter into some proper receptacle destined to retain, or receive it.

Though, sometimes, the secretory vessels themselves terminate in a basin, or reservoir; and deposit their contents therein.—Such is the general structure, and office of the glands; which we shall further illustrate under the article **SECRETION**.

A gland, then, is a composition of divers kinds of vessels; viz. an artery, and a vein; secretory, and excretory ducts. To which may be added a nerve, which is found in every gland, diffused through the whole substance thereof, to furnish spirits for promoting the secretion; and a membrane which supports the convolutions of the vein and artery, accompanying them through all their minutest divisions, to which add lymphatics, which have been discovered in several glands.

The secretory tubes, however, are what we principally consider as the organ of the gland. These alone do sometimes form the greatest part of what is called a gland, or glandular body.

M. Winflow has discovered a kind of tomentum, or down within their cavity; which he supposes to do the office of a

filter, and to be that whereby such a certain humor is separated from the common mass of blood.—His system will be explained when we come to treat of **SECRETION**.

The down-vessels being the grand organ of secretion, its structure and application is diversified according to the different purposes nature has in view. Sometimes the liquor filtrated through it, trickles out, drop by drop, upon a membrane, to which one extremity of the vessel is fastened; as where the filtration is only intended for moistening and lubricating the part, with that liquor: In which case the down-vessel is both secretory, and excretory; which is the most simple case. Such are those innumerable glands spread through the greater part of the viscera.

Sometimes a great number of these down-vessels are spread over the inner surface of a little membranous cell, into which they all pour their liquor, which is discharged hence at a little aperture in the cell:—Such are the solitary glands of the intestines, which appear like so many little separate grains.

Sometimes a vessel is bent, and has only down in the first part thereof, which alone is secretory, and the rest excretory, pouring the liquor into some other common cavity.—Such are the glands that compose a calf's kidney.

The secretory vessels are sometimes of a very great length, notwithstanding that they take up but little room, being wound over themselves again and again; sometimes in a single peloton, or knot, and sometimes in several, inclosed in a common membrane.—Whence the distinction of glands into conglomerate, and conglomerate.

The glands are of several kinds, in respect of their form, structure, office, and use: Authors usually divide them into conglomerate, and conglomerate.

Conglobate, or **simple GLANDS**, are those consisting of one continuous mass, with an uniform surface.—Such are the subcutaneous glands.

A conglomerate gland, is, more strictly, a little, smooth body, wrapped up in a fine, double skin, by which it is separated from all the other parts; only admitting an artery and nerve to pass in, and a vein and excretory duct to go out.

These glands either discharge their secreted humor into the chyle, or venous blood; or else it transpires through the pores of the skin, or the coats of the looser membranes found in most parts of the body.

Of the conglomerate kind are the glands in the cortical part of the brain, in which the animal spirits are supposed to be secreted. Such also are the labial glands, and the testes.

Conglomerate, or **compound GLAND**, is an irregular assemblage of several simple glands, tied together, and wrapped up under one common membrane.—Such are the maxillary glands, &c.

The humors secreted in these glands, are sometimes discharged at a common excretory duct, formed of an union of the excretory ducts of all the particular ones: this is the case in the pancreas and carotides.

Sometimes, the ducts uniting form several tubes, only communicating with each other by cross canals; as in those of the breasts.

Some, again, have several excretory tubes, without any communication together; as the glandulae lacrymales, and prostaticae.

Others, have their several excretory ducts inserted into a common canal, which opens at last into some of the greater cavities; as the salivary glands, intestinal glands, &c.

Lastly, in others, each gland has its own excretory duct, through which it transmits its liquor to a common basin; such are those of the kidneys.

The glands are again divided into vascular, and vascular.

Vascular GLANDS are only clusters of little vessels, which uniting together, form the canal or excretory duct through which their secreted juice is discharged.

Vesicular GLANDS are assemblages of vesiculae communicating with each other, and all terminating in two or three larger vessels; by a prolongation whereof the excretory duct is formed.

The glands, again, are divided into adventitious; and the perpetual or natural.

Adventitious GLANDS, are those kernels arising occasionally under the arm-pits, on the neck, &c.—Such are the strumae, and the tumors found on the larynx, and middle of the trachea.

Perpetual, or natural GLANDS are of two kinds, conglomerate, and conglomerate, as above described.

Buccal GLANDS. See the article **BUCCALES**.

Lachrymal GLANDS. See the article **LACHRYMAL**.

Lumbol GLANDS, *Glandulae lumbares*, are three glands thus called by Bartholine, as lying on the loins.

The two largest lie upon one another, betwixt the descending cava and aorta, in the angle made by the emulgents with the cava: The third and smallest stands over the former under the appendices of the diaphragm. They communi-

cate, and are connected together by small lacteal vessels. Bartholin concluded them to serve as a common receptacle of the chyle; but Dr. Wharton's opinion is more probable, viz. that they supply the place of those larger glands found in the mesenteries of brutes.

Miliary GLANDS, *Glandulae miliares*. See MILIARY glands.
Mucilaginous GLANDS, are a kind of glands first described by Dr. Havers. See MUCILAGINOUS glands.

Mucous GLANDS, *Glandulae mucosae*. See MUCOUS glands.
Myrtleform GLANDS, are contractions of the hymen, broke by the first act of venery. See MYRTIFORMES *glandulae*; see also HYMEN.

Nuckian GLANDS. See the article NUCKIANÆ.
Odoriferous GLANDS, *Glandulae odoriferae*, are certain small glands discovered by Dr. Tyson, in that part of the penis, where the prepuce is contiguous to the balanus.

He gave them this name from the brisk scent which their separated liquor emits. In such persons as have the prepuce longer than ordinary, these are not only more in number, but larger, and separate a greater quantity of juice; which, lodging there, often grows rancid, and corrupts the glands. These glands are very conspicuous in most quadrupeds, especially in dogs, and boars.

Pineal GLAND, *Glandula pinealis*. See PINEAL gland, and CONARIUM.

Pituitary GLAND, *Glandula pituitaria*. See PITUITARY gland.

Renal GLANDS, *Glandulae renales*, called also *capsulae atrabiles*, are two glands first discovered by Eustachius, between the aorta, and the kidneys, a little above the emulgent vessels; though their situation and figure is varied: In some they are round; in others square, triangular, &c. The right is usually bigger than the left, and each about the size of a nux vomica: They are enclosed in fat.

Their use is not certainly known: It is supposed to be to separate a liquor from the arterial blood, before it goes to the kidneys.

Sabaceous GLANDS. See the article GLANDULA.

Sublingual GLANDS. See the article SUBLINGUAL.

Thyroid GLANDS. See the article THYROIDEÆ.

GLANDERS, a filthy disease in a horse, consisting in a running, corrupt, slimy matter from the nose, of a different colour, according to the degree of the malignity, or as the infection has been of a shorter or longer continuance; being white, yellow, green, or black.

Authors ascribe it to various causes: some to infection; some, to a disorder of the lungs; others, to the spleen; some, to the liver; and others, to the brain.—After it has been of so long standing, that the matter is become of a blackish colour, which is usually in its last stage, they suppose it to come from the spine; and hence they call it the *mourning of the chine*.

Kernels and knots are usually felt under the caul in this disorder: And as these grow bigger and more inflamed, so the glanders increase more.

A late author is of opinion, that the chief seat of this distemper is in a little, soft, spongy flesh, which is easily dilated by the least influx of the blood. And thence it is that some horses have a running at the nose from a very slight cold; but that when this spongy substance happens to be very much relaxed, the running is increased in proportion.

GLANDULA*, in anatomy, the same as *gland*. See GLAND.

* The word is a diminutive of the Latin *glans*, acorn; and is here used on account of some external resemblance between the glands of the body, and the fruit of the oak.

GLANDULÆ buccales. See the article BUCCALÆ.

GLANDULÆ nuckianæ. See the article NUCKIANÆ.

GLANDULÆ sebaceæ, are a number of glands plac'd under the skin of the auricle of the ear, first discovered by Valsalva, and thus denominated, by reason they separate a greasy matter, like sebum, or tallow.

This sebum, he asserts, being carried to the surface of the skin turns into a scaly substance, not unlike bran.

GLANDULÆ thyroideæ. See the article THYROIDEÆ.

GLANDULE, in English, signifies a little gland.—Thus, the amygdalæ, or almonds of the ears are by some called *glandules*.

GLANDULA guidonis, among surgeons, is a tumor resembling a gland, soft, single, moveable, without roots, and separate from the adjacent parts.

GLANDULOUS, or **GLANDULAR**, something composed of glands; or that abounds with glands.

The breasts are *glandulous* bodies. See BREASTS.—The cortical substance of the brain is commonly reputed to be *glandulous*: Though Ruysch, from the discoveries made by his admirable injections, holds that there is no such thing as a gland therein.

The ancients distinguished a particular kind of flesh, which they

called *caro glandulosa*, or *glandulous flesh*. See FLESH.

GLANDULOUS body, *Glandulosum corpus*, more particularly denotes the proflata.

GLANS, *acorn*, in natural history, a fruit contained within a smooth, but hard bark, including a single seed; its hind-part being covered with a kind of cup, and the fore-part bare.

GLANS, in anatomy, the tip, or button of the penis; or that part covered with the prepuce; called also *balanus*.—See Tab. Anat. (Splanch.) fig. 10. lit. d. fig. 15. lit. o.

The *glans* is only a dilatation of the extremity of the spongy substance of the urethra, which is here bunched and turned back on the two conical tips of the corpora cavernosa, which terminate therein.

The extremity of the prepuce is apt to grow so strait in old men, that they cannot bare the *glans*; perhaps through the defect of frequent erections.

GLANS is also used to denote the tip, or extremity of the clitoris; from its resemblance both in form and use, to that of the penis.—See Tab. Anat. (Splanch.) fig. 13. lit. c.

The principal difference consists in this, that it is not perforated: This *glans* is also covered with a preputium, formed of the inner membrane of the labia.

GLASS*, *vitrum*, a transparent, brittle, facitious body, produced of a salt, and sand or stone, by the action of fire.

* The word is formed of the Latin *glans*, a plant called by the Greeks *statis*, by the Romans *vitrum*, by the ancient Britains, *quadum*, and by the English, *wood*. We find frequent mention of this plant in ancient writers, particularly Cæsar, Vitruvius, Pliny, &c. who relate, that the antient Britons painted, or dyed their bodies with gallum, quadum, vitrum, &c. i. e. with the blue colour procured from this plant. And hence, the facitious matter we are speaking of came to be called *glass*; as having always somewhat of this bluishness in it. See WORD.

The chemists hold that there is no body but may be vitrified, i. e. converted into *glass*.—By intense heat even gold itself gives way to the sun's rays collected in a burning-glass, and becomes *glass*. See GOLD, and BURNING-glass.

Add, that as *glass* is the effect, or fruit of fire, so it is the last effect of that element: All the chemist's art, and all the force of fire not being able to carry the change of any natural body beyond its vitrification. Whence Dr. Merret mentions it as a merry saying of a very great artist in the business of *glass*, that their profession would be the last in the world: For that when God should consume the universe with fire, all things therein should be turned to *glass*.

Nature and characters of GLASS.—Naturalists are divided, in what class of bodies to rank *glass*.—Agricola considers it as a concrete juice: Bellowacensis, as a stone: Fallopius ranks it among the media mineralia; and the workmen, when in fusion, call it metal. But Dr. Merret with reason sets aside all these opinions, from this consideration, that all the fore-mentioned bodies are natural concretes; whereas *glass* is a compound made by art, and is never found in the earth, as the others are.

Fallopius, indeed, contends, that *glass* is no more artificial than a metal; and that they are both equally extracted, or oduced from other bodies: The one from sand; the other from its ore.—He adds, that though salts or ashes be added to sand, for the making of *glass*, yet it is false that they contribute to the composition of *glass*; their use, according to him, being only for the better extracting of the *glass* from the mineral stone.

This Dr. Merret easily confutes: For if *glass* were extracted from the stones, or sand only, the weight of the metal must be much less than that of the stones alone; whereas, it is in reality much greater; an hundred weight of sand sufficing for one hundred and fifty of *glass*.

In effect, the ashes contribute a deal of salt to the composition of *glass*.—Accordingly, in pieces of old *glass*, one may sometimes pick out grains of salt, easily discoverable to the taste; beside that the finest *glass* standing long in a subterraneous place, will moulder or resolve into its first ingredients, salt and sand, by the decay of the union thereof. Whence it appears that the salt remains in the *glass*, in specie: To which may be added that experiment of Van Helmont. "Melt *glass*-dust with sandever, and set them in a moist place; and the *glass* will resolve into water. Pour on aqua regia, enough to saturate the sandever; and the sand will precipitate to the bottom in the same quantity, and weight, as was first used." Helmi. cap. de Terra.

Here, then, is a true analysis of *glass*, or a solution into its first principles, or ingredients: The salt being imbibed by the sandever, and aqua regia. Merret. Not. in Ant. Neri de Art. vitrar.

The learned and curious author just mentioned, gives us the following characters, or properties of *glass*; whereby it is distinguished from all other bodies; viz. 1° That it is an artificial concrete of salt, and sand, or stones. 2° Fusible, by a strong fire. 3° When fused, tenacious and coherent. 4° It does not waste, or consume in the fire. 5° When melted, it cleaves to iron. 6° Ductile, when red hot, and fashionable into any form; but not malleable: and capable of being blown into a hollow neck; which no mineral is. 7° Frangible, when thin, without annealing. 8° Friable, when cold. 9° Always diaphanous, whether hot, or cold. 10° Flexible and elastic. 11° Dissoluble by cold and moisture. 12° Only capable of being graven, or cut with diamond or other hard stones, and emery. 13° Receives any colour, or dye, both externally, and internally. 14° Not dissoluble by aqua fortis, aqua regia, or mercury. 15° Neither acid juices, nor any other matter extract either colour, taste, nor any other quality from it. 16° It admits of polishing. 17° Neither loses of weight, nor substance by the longest, and most frequent use. 18° Gives fusion to other metals, and softens them. 19° The most pliable thing in the world, and that which best retains the fashion given it. 20° Not capable of being calcined. 21° An open *glass*, filled with water in the summer-time, will gather drops of water on the outside just so far as the water on the inside reaches; and a man's breath blown upon it will manifestly moisten it. 22° Little *glass* balls filled with water, mercury, or other liquor, and thrown into the fire; as also drops of green *glass* broken, fly asunder with a loud noise. 23° Neither wine, beer, nor any other liquor, will make it rusty, nor change its colour, nor rust it. 24° It may be cemented as stones, and metals. 25° A drinking *glass*, partly filled with water, and rubbed on the brim with a wet finger, yields musical notes, higher or lower, as the *glass* is more or less full, and this makes the liquor rattle and leap.—

For the flexibility of GLASS, see further under FLEXIBILITY of *Glass*.

For the malleability of GLASS, see MALLEABLE, &c.

Origin and history of GLASS.—De Neri will have *glass* as ancient as Job: For that writer, ch. xxviii. ver. 17. speaking of wisdom, says, gold and *glass* shall not be equalled to it.

This, we are to observe, is the reading of the septuagint, vulgar Latin, St. Jerom, Pineda, &c. For in the English version, instead of *glass*, we read *crystal*; and the same is done in the Chaldee, Aras, Montanus, and the King of Spain's edition: In other versions, &c. it is read *stone*; in others, *beryl*: In the Italian, Spanish, French, high and low Dutch, &c. *diamond*; in others, *carbuncle*; and in the Targum, *looking-glass*.

In effect, the original word is *zachuchih*, which is derived from the root *zaac*, to purify, cleanse, shine, be white, transparent: And the same word, Exod. xxx. 34. is applied to frankincense, and rendered in the septuagint, pelucid.—Hence the reason of so many different renderings: For the word signifying beautiful and transparent in the general, the translators were at liberty to apply it to whatever was valuable and transparent.

Most authors will have Aristophanes to be the first author who mentions *glass*: That poet, in his comedy called the *Clouds*, scen. 1. act 2. uses the word *hyalus*, *υαλος*, which is now ordinarily rendered *glass*. He there introduces Strepsiades, teaching Socrates a new way to pay old debts, viz. “by placing a fair transparent stone told by the druggists, from which the fire is struck, between the sun and the writing; and so melting away the letters thereof.” This stone Socrates calls *υαλος*; which the scholiast on Aristophanes derives from *υαυ*, to ram, from the likeness it bears to ice, which is rain, or water congealed; though, it must be owned, the word *υαλος* is ambiguous, and signifies crystal as well as *glass*: And Gortius observes that the antients had a kind of yellow amber, transparent as *glass*, called by some, *υαλος*.

Aristotle has two problems upon *glass*; the first, Why we see through it? The second, why it is not malleable? If these problems be Aristotle's, which the learned doubt very much; this would properly be the earliest piece of antiquity of *glass*: but the first author, who makes unquestionable mention of this matter, is Alexander Aphrodisiæus, who uses it in a simile: “As the floridness of a colour is seen through *glass*,” &c. After him the word occurs commonly enough: Lucian mentions large drinking glasses; and Plurarch, in his *Synopsiæon*, says that the fire of tamarisk wood is the fittest for the making of *glass*.

Among the Latin writers, Lucretius is the first that takes notice of *glass*. *Nisi recta faramina tranant. Qualia sunt vitri.* Dr. Merret, however, adds, that *glass* could not be unknown to the æmians; but that it must needs be as ancient as pottery itself, or the art of making bricks: For scarcely can a kiln of bricks be burnt, or a batch of pottery ware be made, but some of the bricks, and ware, will be at least superficially turned to *glass*: And therefore, without doubt it was known at the building of Babel.

Hence, Ferrar Imperatus, lib. xxv. c. 7. “*Glass*, like the common kind, is found under ground, in places where great fires have been.—Other *glasses* are found in round clods, like firestone, some brittle, others firm, &c. This fossil *glass* is wrought by the Americans, and used instead of iron.” And no doubt but vitrifications were more common in the antient bricks than they are in ours: as they tempered their earth two years together, and burnt them better.

Pliny relates the manner of the discovery of *glass*. It was found, according to that author, by accident, in Syria, at the mouth of the river Belus, by certain merchants driven thither by the fortune of the sea. Being obliged to live there, and dress their victuals, by making a fire on the ground; and there being store of the plant kali upon the spot; this herb being burnt to ashes, and the sand or stones of the place, accidentally mixed with it, a vitrification was undesignedly made. From whence the hint was taken, and easily improved.

Indeed, how old soever *glass* may be; the art of making, and working it, appears of no great antiquity. The first place mentioned for the making hereof, is Sydon in Syria, which was famous for *glass* and *glass*-houses, as observed by Pliny, l. xxvii. c. 26. The first time we hear of *glass* made among the Romans, was in the time of Tiberius; when Pliny relates that an artist had his house demolished for making *glass* malleable, or rather flexible. Though Petronius Arbiter and some others assure us that the emperor ordered the artist to be beheaded for his invention. Venice, for many years, excelled all Europe in the fineness of its *glasses*. The great *glass*-works were at Muran, or Mouran, a village near the city; which furnished all Europe with the finest and largest *glasses*. But within these fifty years the French and English have not only come up to, but even surpassed the Venetians; so that we are now no longer supplied from abroad.

The French made a considerable improvement in the art of *glass*, by the invention of a method to cast very large plates; till then unknown; and scarce practised yet, by any but themselves and the English.

That court applied itself with a laudable industry to cultivate and improve the *glass* manufacture. A company of *glass*-men was established by letters patent; and it was provided by an act, not only that the working in *glass* should not derogate any thing from nobility, but even, that none but nobles should be allowed to work therein.

Ingredients of GLASS. The materials used in the composition of *glass*, we have observed, are salt; and sand, or else some kind of stone.

The salt is of the fixt kind; such as will not evaporate with the most intense heat. The sand, or stone must be such as will melt easily: This is what gives firmness and consistence to the *glass*.

1° This salt is procured chiefly from a kind of ashes, called *polyverine*, or *rachetta*, brought from the Levant, and particularly from Alexandria and Tripoli. The ashes are those of a vegetable, frequent in the country, commonly called *kali*; sometimes *kalli*; *kullu*; *cali*; by Geiner, *abkali*; by Lobel, *soda*; by Dodonæus, *salsola*; and by Camer, Gordolus, Eucherius, &c. *anthyllis*. Dr. Merret calls it *English salt-wool*, from its saline taste; and *glass-wood*, from the use made of its ashes in making of *glass*.

Rubin mentions ten species of this plant; whereof there are four used by the Alexandrians, &c. for the making of polyverine, and soap; viz. *kali geniculatum*, *kali secunda species*, *kali ægyptiacum*, and *kali spinosum*.

The first and last, our own coasts afford, where they are called by the people *frog-grass*, and *sea-grass*; but they are of no use for making of *glass*: being laid on a hot iron, they fly off almost wholly in fumes, leaving almost no ashes at all; whereas the *kali* brought from the Levant, applied on the same iron, are soon converted almost wholly into polyverine, i. e. very saline ashes, of a dark colour.

To get the salt from this polyverine, they pulverize, and sift it very fine; then boil it in a bras copper, with fair water and tartar, till a third part of the water is consumed; taking care to stir it from time to time. Then, filling up the copper with fresh water, they boil it a second time, till half be consumed: This done, they have a lee impregnated with salt. To get the salt from the lees, they boil them, till the salt shoots at the top; which they scum off as it rises. An hundred pounds of good ashes, thus way, usually yields eighty or ninety of salt.

When the salt is dry, they beat it grossly, and put it into a furnace, to dry it further with a gentle heat. When it is made sufficiently dry, they pound and sift it very fine, and lay it by to make lrit. See FRIT.

Note, Instead of the ashes of the plant kali, those of fern will also yield a salt, which makes excellent *glass*; nothing inferior to that of polyverine. The method of preparation is the same. Add, that the ashes of the cods, and stalks of beans; as also those of coleworts, bramble bush, millet

stalks, rushes, cyperus's, and many other plants may be used for the like purpose, and after the same manner.

2^d For stone, the second ingredient in *glafs*.—The best, we have observed, is that which will melt, is white, and transparent. This is found principally in Italy, being a sort of marble, called *tarso*: The next is puocoli, or cuogolo, a sort of pebbles found at the bottoms of rivers.

Indeed, nothing makes finer and clearer *glafs* than common flint, but the charge of preparing it, deters the *glafs*-men from using it. The preparation necessary for stone, is to calcine, powder, and fierce it.

Ant. Neri observes, that all white, transparent stones, which will not burn to lime, are fit to make *glafs*; and that all stones which will strike fire with steel, are capable of being employed in making of *glafs*. But this latter rule, Dr. Merret observes, does not hold universally.

Where proper stone cannot be had, sand is used. The best for the purpose is that which is white and small; for green *glafs* that which is harder, and more gritty: It is to be well washed; which is all the preparation it needs.—Our *glafs*-houses are furnished with white sand for their crystal *glasses* from Maidstone; and with the coarser, for green *glafs*, from Woolwich.

Some mention a third ingredient in *glafs*, viz. Manganese, or sydere, a kind of pseudo loadstone, dug up in Germany, Italy, and even in Mendip hills in Somersetshire. But the proportion hereof to the rest, is very inconsiderable; beside, that it is not used in all *glafs*. Its office is to purge off the natural greenish colour, and give it some other tincture required.

Method of making white and crystal GLASS.—There are three sorts of furnaces used in the *glafs*-works: One to prepare the frit, called the *calcar*: A second to work the *glafs*; and a third called the *leer*, to anneal it. See them all described under the article FURNACE.

To make crystal *glafs*, take of the whitest tarso, pounded small, and fierce as fine as flower, two hundred pounds; of the salt of polyverine, an hundred and thirty pounds. Mix them together, and put them into the furnace called the *calcar*, first heating it. For an hour keep a moderate fire, and keep stirring the materials, that they may incorporate and calcine together. Then increase the fire for five hours: After which take out the matter; which being now sufficiently calcined, is called *frit*.—From the *calcar* put the frit in a dry place, and cover it up from the dust, for three or four months. See FRIT.

Now, to make the *glafs*, or crystal: Take of this crystal frit, called also *bolito*; set it in pots in the furnace, adding to it a due quantity of manganese: When the two are fused, cast the fluor into fair water, to clear it of the salt, called *sandever*; which would otherwise make the crystal obscure and cloudy. This lotion must be repeated again, and again, as often as needful, till the crystal be fully purged. Then set it to boil four, five, or six days; which done, see whether it have manganese enough; and if be yet greenish, add more manganese, at discretion, by little and little at a time; taking care not to overdose it, by reason the manganese inclines it to a blackish hue. Then let the metal clarify, till it becomes of a clear, and shining colour: Which done, it is fit to be blown, or formed into vessels at pleasure.

There are three principal kinds of *glasses*, distinguished by the form, or manner of working them; viz. round *glafs*, as those of our vessels, phials, drinking *glasses*, &c. table or window *glafs*, of which there are divers kinds, viz. crown *glafs*, jealous *glafs*, &c. and plate *glafs*, or looking *glafs*.

Working or blowing round GLASS.—The working furnace, we have observed, is round, and has six boccas, or apertures: At one of these, called the *great bocca*, the furnace is heated, and the pots of frit are at this fit in the furnace: Two other, smaller holes, called *boccellas*, serve to lade or take out the melted metal, at the end of an iron, to work the *glafs*. At the other holes they put in pots of fusible ingredients, to be prepared and at last emptied into the lading pot.

There are six pots in each furnace, all made of tobacco-pipe clay, proper to sustain not only the heat of the fire, but also the effect of the polyverine, which penetrates every thing else. There are only two of these pots that work: The rest serve to prepare the matter for them. The fire of the furnace is made and kept up with dry, hard wood, cast in, without intermission, at the six apertures. This they never omit, not even on the most solemn festivals.

When the matter contained in the two pots is sufficiently vitrified, they proceed to blow, or fashion it: The process whereof we shall here deliver from Agricola, Dr. Merret, the French *Diction. de Commerce*, &c.

The operator, or servitor (the vessel being now sufficiently refined) takes his blowing iron, which is a hollow tube, about two foot and a half long; and dipping it in the melting pot, turns it about: The metal sticks to the iron, like some glutinous, or clammy juice, much like, but more firmly, than turpentine, or honey.

For each *glafs* he dips four times, and at each dip rolls the end of his instrument, with the *glafs* thereon, on a piece of iron, over which is a vessel of water: the coolness whereof helps to consolidate the *glafs* more readily, and disposes it the better to bind with the next to be taken out of the pot.

After they have dipped a fourth time, and when there is now matter enough on the instrument, the operator begins to blow gently through the iron; by which he raises or lengthens it nearly a foot; much as we do by blowing in a bladder, or globe: And to give it a polish, he rolls it to and fro on a stone, or marble.

This done, he blows a second time, and thus forms the bunch, or belly of the *glafs*. The matter by this second blast assumes the figure of a gourd, or calabash, eighteen or twenty inches in diameter. As often as the operator blows into the iron (which must be very often) he removes it hastily from his mouth to his cheek, lest he should draw the flame into his mouth, when he re-applies it to the iron.

The operator whirls his iron many times round his head, to lengthen and cool the *glafs*; sometimes the *glafs* thus blown round, is returned to the fire, where it flattens a little of itself: When flattened, it is again taken out, and cooled; and, if needful for the design, the workman flats its bottom, by pressing it on the marble; or moulds it in the stamp-irons; and thus delivers it to the master workman, to break off the collet.

The collet, or neck, is the narrow part which close to the iron: To set the *glafs* at liberty, they lay a drop of cold water on the collet; which by its coldness, cuts or cracks about a quarter of an inch: After which, giving it a slight blow, the fracture is communicated all around the collet. The waste piece to be thrown by to make green *glafs*.

This done, they dip an iron rod, or ponteggio in the melting pots, and with the matter that sticks thereto, they apply and fasten it to the bottom of the vessel, opposite to the collet.—The vessel thus sustained by the iron rod, is carried to the great bocca to be heated, and scalded; and while another person takes care thereof, the former operator rests and prepares himself for the branching.

To branch, or make the bowl, they thrust in an iron instrument, called the *passago*; and the aperture, opened thereby, they further augment, and widen with the *procello*: In turning this instrument about, to form the bowl, the edge becomes thickened; the *glafs* being, as it were, doubled in that part: Whence the hem observed on the circumference of our *glasses*.

—What is superfluous, they cut off with the shears. The vessel thus opened, is returned to the great bocca; where being sufficiently heated a second time, the workman gives the bowl its finishing, by turning it about with a circular motion; which it increases, in proportion as the bowl opens, and enlarges by means of the heat and agitation.

The *glafs* thus finished, they carry it from the bocca, still turning it round, to a kind of earthen bench, covered with brands, or coals extinguished: Here they let it cool a little, and come to its consistence, having first detached it from the iron rod, by a stroke or two with the hand.

Thus, with blowing, pressing, scalding, amplifying, and cutting, the *glafs* is framed into the shape preconceived in the workman's mind. If need be, he proceeds to put on a foot and handle; and with the spici puts on rigarines, and marblings.

When the master has finished a number of these, another servitor takes them with an iron fork, and speedily places them in the tower, or leer, to anneal and harden.

What has been here said of white, or crystal *glafs*, holds equally of common, or green *glafs*; the working being the same in all; and the difference only in the salt, or polyverine, made use of.

So many masters as there are, so many pots, at the least, and so many boccas there must be; each man having his proper station: where, says Dr. Merret, they receive those scorching heats falling directly into their faces, mouths, and lungs; whence they are forced always to work in their shirts, like the cyclopes, and nud-membra pyramones, with a straw broad-brimmed hat on their heads, to defend their eyes from the excessive heat and light.—They sit in large, wide, wooden chairs, with two long elbows, to which their instruments are hung. They work six hours at a time, measured by a single *glafs*; after which they are relieved by others, for the like time: So that the furnaces are never idle.

Working, or blowing WINDOW, or TABLE-GLASS.—The method of making crown window *glafs*, now practised in England, is said to have been borrowed from the French.—An English *glafs*-maker went over, to work in France, on purpose to get into the secret; which, when he had attained to, he returned, and set up a *glafs*-work, wherein he far outdid the French, his teachers.

This *glafs* is blown much after the manner of looking-*glafs*. Some writers, from wrong intelligence, have said that

that it was run, or cast in sand: But the real process is as follows.

The furnace, melting pots, materials, and fire are the same for window, or table *glass*, as they are for round *glass*; and the difference in the operation only commences after the fervitor has dipped his blowing-iron the fourth time in the melted metal.

The *glass*, then, being in this condition, they blow it; but instead of rounding, or forming it into a bunch, the particular motion the workman gives it in the directing and managing the wind, and the way of rolling it on the iron, make it extend in length two or three foot, and form a cylinder, which at first is but two inches in diameter; but which, by being recommitted to the fire, and blown afresh when taken out, becomes of the extent required for the table of *glass* to be formed. With this circumstance, however, that the side which is fastened to the iron, goes gradually diminishing, and ends in a kind of cone, or pyramid.

Under the two ends nearly of the same diameter, after adding a little *glass* to that opposite to the iron, they draw it out with a pair of iron pincers. Then they incise, or cut off the same end with a little water; and carrying the cylinder back to the bocca, they incise it likewise with water in two other places; one, eight or ten inches from the iron; and the other, the whole length.

The *glass* cylinder thus abridged of both its extremities, is, next, heated on a kind of earthen table, somewhat raised in the middle, in order to promote its opening at the place incised longitudinally. The workman, here, makes use of an iron, wherewith he alternately lowers and raises the twoides, or halves of the cylinder, which now begin to open, and unfold like a sheet of paper, and at length grow perfectly flat.—The table of *glass* is now in its last perfection, and needs nothing farther but to be heated over again. When taken out, they lay it on a table of copper; whence, after it has cooled and come to its consistence, they carry it on forks to the tower of the furnace, where they leave it to anneal for twenty-four hours.

The number of tables annealed at a time, which sometimes amount to an hundred, or more, with the perpendicular situation they are set in, occasioned, antiently, that those set in first, sustaining in some measure the pressure of all the last, were bent; and thus rendered inconvenient for use; but this inconvenience is now remedied, by separating them into tens, with an iron shiver; which diminishing the weight, by dividing it, keeps the tables as flat, and even as they were put in.

Kinds of table or window GLASS.—There are divers sorts of this *glass* made in divers places, for the use of building: those most known among us, are given us by the author of the *Builder's Dictionary*, as follows:

Crown GLASS, of which, says Neve, there are two kinds; distinguished by the places where they are wrought, *viz.* 1^o, *Ratcliff crown glass*, which is the best and clearest; and was first made at the bear-garden, on the bank-side, Southwark; but since at Ratcliff: of this there are 24 tables to the case, the tables being of a circular form, about three foot six inches in diameter. See TABLE, and CASE.
2^o, *Lambeth crown glass*, which is of a darker colour than the former, and more inclining to green.

French GLASS, also called *Normandy glass*, and formerly *Lorraine glass*, because made in those provinces: at present it is made wholly in the nine *glass* works; five whereof are in the forest of Lyons, four in the county of Eu; the last, at Beaumont, near Rouen.—It is of a thinner kind than our crown *glass*; and when laid on a piece of white paper, appears of a dirty green colour. There are but twenty-five tables of this to the case.

German GLASS, is of two kinds, the *white*, and the *green*: the first is of a whitish colour, but is subject to those small, curved streaks, observed in our *Newcastle glass*; though free from the spots and blemishes thereof. The *green*, beside its colour, is liable to the same streaks as the white: but both of them are straighter, and less warped, than our *Newcastle glass*.

Dutch GLASS, is not much unlike our *Newcastle glass*, either in colour or price. It is frequently much warped, like that, and the tables are but small.

Newcastle GLASS, is that most used in England. It is of an ash colour, and much subject to speck, streaks, and other blemishes and beside is frequently warped. Leybourn says, there are forty-five tables to the case, each containing five superficial feet: some say there are but thirty-five tables, and six foot in each table.

Working of PLATE, or LOOKING GLASS.—The materials whereof *looking glass* is made, are much the same as those of other works of *glass*, *viz.* an alkali salt, and sand.

The salt, however, it is to be observed, should not be that extracted from pulverine, or the ashes of the Syrian kali; but that from barilla, or the ashes of a plant of that name, of the genus of kalis, but growing about Alicant in Spain.—It is very rare that we can have the barilla pure; the Spaniards, in burning the herb, make a practice of mixing another herb along with it, which alters its quality; or of adding sand to it, to

increase the weight: which is easily discovered, if the addition be only made after the boiling of the ashes; but next to impossible, if made in the boiling. It is from this adulteration that those threads and other defects in *plate glass* arise.—To prepare the salt, they clean it well of all foreign matters; pound or grind it with a kind of mill, and finally fit it pretty fine.

As to the sand, it is to be sifted and washed, till such time as the water come off very clear; and when it is well dried again, they mix it with the salt, passing the mixture through another sieve. This done, they lay them in the annealing furnace for about two hours; in which time the matter becomes very light, and white: in this state they are called *frit*, or *fritta*, and are to be laid up in a dry clean place, to give them time to incorporate: they lie here for at least a year.

When they would employ this frit, they lay it for some hours in the furnace, adding to some, the fragments, or shards of old, and ill-made *glasses*; taking care first to calcine the shards, by heating them red hot in the furnace, and thus casting them into cold water. To the mixture must likewise be added manganese, to promote the fusion and purification.

The matter thus far prepared, is equally fit for *plate glass*, to be formed by blowing, or by casting.

Blowing LOOKING GLASS PLATES.—The work-houses, furnaces, &c. used in the making of this kind of *plate glass*, are the same as those in the following article, to which the reader is referred.

The melting pots, wherein the materials to be blown, are fused, are thirty-eight inches in diameter, and thirty-five inches high. After those materials are vitrified by the heat of the fire; and the *glass* is sufficiently refined; the master workman dips in his blowing-iron, once and again, till he has got matter enough thereon.

This done, he mounts on a kind of block, or stool, five foot high, to be more at liberty to balance it, as it lengthens in the blowing. If the work be too heavy for the workman to sustain on his blowing iron, two or more attendants assist him, by holding pieces of wood under the *glass*, in proportion as it stretches, for fear it should fall off the iron by its own weight.

When, after several repeated heatings, and blowings, the *glass* is at length brought to the compass, proper for its thickness, and the quantity of metal taken out; they cut it off with forces, at the extremity opposite to the iron, in order to point it with the pointil.

The pointil is a long, firm piece of iron, have a piece going across one of its ends, in manner of a T: to point the *glass*, they plunge the head of the T into the melting-pot; and with the liquid *glass* sticking thereto, they fasten it to the extremity of the *glass* before cut off. When this is sufficiently fastened, they separate the other extremity of the *glass* from the blowing-iron; and instead thereof make use of the pointil to carry it to the furnaces appointed for that end: where, by several repeated heatings, they continue to enlarge it, till it be equally thick in every part.

This done, they cut it open with the forceps; not only on the side by which it stuck to the blowing-iron, but likewise the whole length of the cylinder: after which, giving it a sufficient heating, it is in a condition to be entirely opened, extended, and flattened. The manner of doing which is much the same as for table *glass*, and need not be here repeated.

Lastly, the *glass* being sufficiently flattened, is laid to anneal, for ten, or fifteen days, according to the size and thickness.

It may be observed, that *looking glasses* thus blown, should never be above forty-five, or at most fifty inches long, and of a breadth proportionable. Those exceeding these dimensions, as we frequently find among the Venice *glasses*, cannot have the thickness sufficient to bear the grinding; and beside are subject to warp, which prevents them from regularly reflecting objects.

Casting, or running large LOOKING GLASS PLATES.—This art is of French invention; and not above fifty years old. It is owing to the Sieur Abraham Thevart, who first proposed it to the court of France, in 1688.

It is performed much like the casting of sheet lead, among the plumbers; and by means hereof we are not only enabled to make *glasses*, of more than double the dimensions of any made the Venetian way of blowing; but also to cast all kinds of borders, mouldings, &c.

The furnaces for melting the materials of this manufacture, are of enormous size; and those for annealing the *glasses*, when formed, are much more so. Round a melting-furnace, there are at least twenty-four annealing furnaces or ovens, each from twenty to twenty-five foot long; they are called *carquasses*; each *carquasse* has two tilts, or apertures, to put in wood, and two chimneys. Add, that beside the annealing furnaces, &c. there are others for the making of frit, and calcining old pieces of *glass*.

All these furnaces are covered over with a large shed; under which are likewise forges, and work-houses for smiths, car-

penters, &c. continually employed in repairing, and keeping up the machines, furnaces, &c. As also lodges, and apartments for these, and the other workmen employed about the *glafs*; and in keeping up a perpetual fire in the great furnace: So that the *glafs-houfe*, as that in the castle of St. Gobin, in the forest of Fere, in the Soissonois, appears more like a little city, than a manufactory.

The inside of the furnaces is formed of a sort of earth, proper to sustain the action of fire; and the same earth serves also for melting-pots, cisterns, &c. The furnaces seldom last above three years; after which they are to be rebuilt, from bottom to top: And to keep them good, even for that time, the inside must be refitted every six months. The melting pots are as big as hogheads, and contain above two thousand weight of metal. The cisterns are much smaller, and serve for the conveyance of liquid *glafs*, which is drawn out of the pots, to the casting-tables.

When the furnace is in a condition to receive the pots, and cisterns, they heat it red hot: This done, they fill the pots with materials; which is done at three times, to facilitate the fusion. When the matter is sufficiently vitrified, refined, and settled, which usually happens in twenty four hours; they fill the cisterns, which are in the same furnace, and which are left there about six hours longer, till such time as they appear all white, through the excessive heat.

To get the cisterns with the metal out of the furnace; they make use of a large iron chain, which opens and shuts with hooks and eyes. From the middle hereof, on each side, arise two massive iron pins, whereby, with the assistance of pulleys, the cisterns are rais'd upon a kind of carriage of a proper height; and thus conducted to the table where the *glafs* is to be run. Here, slipping off the bottom of the cistern, there rushes out a torrent of matter, all on fire, wherewith the table prepared for that purpose, is presently cover'd.

The table, whercon the *glafs* is to be run, is of pot meal, about nine foot long, and broad in proportion. It is supported on a wooden frame, with truckles, for the convenience of removing from one carquasse, or annealing furnace to another, in proportion as they are filled.

To form the thickness of a *glafs*, there are two iron rulers or rims, placed around the edge of the table, and on these, rest the two extremes of a kind of roller, which serves to drive the liquid matter before it to the end of the table, or mould. The iron rulers, being moveable, and capable of being set closer, or further a-part at pleasure, determine the width of the *glasses*, and retain the matter, that it does not run off at the edges.

As soon as the matter is arrived at the end of the table, and the *glafs* is come to a consistence, which is in about a minute; they shove it off into the annealing furnace, where it slides with ease enough, by reason of the sand strewed thereon.

What is most surprizing throughout the whole of this operation, is, the quickness and address, wherewith such massy cisterns, filled with so flaming a matter, are taken out of the furnace, convey'd to the table, poured therein, the *glafs* spread, &c. The whole is inconceivable to such as have not been eye-witnesses of that surprizing manufacture.

As fast as the cisterns are emptied, they carry them back to the furnace, and take fresh ones, which they empty as before.

This they continue to do, so long as there are any full cisterns; laying as many plates in each carquasse as it will hold, and stopping them up as soon as they are full; to let them anneal, and cool again, which requires at least ten days.

The first running being dispatch'd, they prepare another, by filling the cisterns a-new, from the matter in the pots: and after the second, a third; and even a fourth time, till the melting pots are quite empty.

The cisterns, at each running, should remain at least six hours in the furnace, to whiten; and when the first annealing furnace is full, the casting-table is to be carried to another. It need not here be observed, that the carquasses, or annealing furnaces must first have been heated to the degree proper for them. When the pots are emptied, they take them out, as well as the cisterns, to scrape off what *glafs* remains, which otherwise would grow green by continuance of fire, and spoil the *glasses*.

The manner of heating the large furnaces, is singular enough: the tisor, or person employed for that purpose, quite naked to his shirt, runs round the furnace without making the least stop, with a speed scarce inferior to that of the lightest courier: as he goes along, he takes two billets, or pieces of wood, which are cut for the purpose; these he throws into the first fissure; and continuing his course, does the same for the second. This he holds on without interruption for six hours, successively; after which he is reliev'd by another, &c. It is surprizing that two such small pieces of wood, and which are consumed in an instant, should keep the furnace to the proper degree of heat; which is such, that a large bar of iron, laid at one of the mouths of the furnace, becomes red hot in less than half a minute.

It is computed that a furnace, before it be fit to run *glafs*, costs above three thousand five hundred pounds: that at least six months are required for the building it a-new; and three months

for the refitting it: and that when a pot of matter bursts in the furnace, the loss of matter and time amounts to above two hundred and fifty pounds.

The *glafs* when taken out of the melting furnace, needs nothing further but to be ground, polished, and foliated.—For the grinding of *GLASS*, see GRINDING.—For the polishing of *GLASS*, see POLISHING.—For the foliating of *GLASS*, see FOLIATING.

Axungia of *GLASS*, see the article AXUNGIA.

Painting in GLASS.—The primitive manner of painting in *glafs* was very simple, and of consequence very easy: it consisted in the mere arrangement of pieces of *glafs* of different colours, in some sort of symmetry; and constituted a kind of what we call *Mosaic work*. See PAINTING and MOSAIC.

Afterwards when they came to attempt more regular designs, and even to represent figures rais'd with all their shades, their whole address went no further than to the drawing the contours of the figures in black, with water-colours, and hatching the draperies, after the same manner, on *glasses* of the colour of the object intended to be painted. For the carnations, they chose *glafs* of a bright red; upon which they design'd the principal lineaments of the face, &c. with black.

At last, the taste for this sort of painting being considerably improv'd, and the art being found applicable to the adorning of churches, basilicas, &c. they found means of incorporating the colours with the *glafs* itself, by exposing them to a proper degree of fire, after the colours had been laid on.

A French painter of Marfeilles is said to have given the first notion hereof, upon going to Rome, under the pontificate of Julius II. But Albert Durer, and Lucas of Leyden were the first that carried it to any height.

The colours used in painting on *glafs*, are very different from those used either in painting in oil, or water. See COLOUR.—The black is made of two thirds of flakes, or scales of iron, beaten up, and mix'd with another third of roccaille, or little *glafs* beads.—*White*, with sand, or little white pebbles, calcined, pounded in a mortar, and afterwards ground on marble; with one fourth part of salt-petre added thereto, and the mixture calcined and pulveris'd over again: to which, when they are ready to use it, is added a little gypsum, or plaster of Paris well ground, &c.—For *yellow*, they use leaf-silver ground, mixed up in a crucible with sulphur, or salt-petre; then, well beaten and ground on a porphyry stone; and, at length, ground over again with nine times as much red oker.—*Red* is made of litharge of silver, and scales of iron, gum arabic, ferretta, *glafs*-beads, and blood-stone, nearly in equal quantities. This is one of the most difficult colours; and the preparation only to be learned by experience.—*Green*, is made of asstium, one ounce; as much black lead, and four ounces of white sand, incorporated by the fire. After calcination, they add a fourth part of salt-petre; after a second calcination, a sixth part more: after which they make a third coction before it is used.—*Azure, purple, and violet*, are prepared like green, only leaving out the asstium, and in lieu thereof using sulphur, for azure; perigueux, for purple; and both those drugs for violet.—*Carnations* are made of ferretta and roccaille.—And lastly, colours for the hair, trunks of trees, &c. are made of ferretta, roccaille, &c.

This account of the colours we have from M. Felibien's excellent work *des Principes d'Architecture*, &c. Though it must be own'd, that all the painters on *glafs* do not use them; there being few artists of that kind but have invented their own particular ones, whereof they usually make great secrets. But this is certain, that these above described are sufficient for the best paintings of all sorts; provided the person has but the skill to manage them.

In the windows of divers ancient churches, chapels, colleges, &c. we meet with the most beautiful, and lively colours imaginable; such as far exceed any used among us: but it is not that the secret of making those colours is lost; but that the moderns would not go to the expence of them, nor take all the necessary pains; by reason this sort of painting is not now so much esteem'd as formerly.

Those beautiful works, which were made in the *glafs-houfes*, were of two kinds: in some, the colour was diffused through the whole body of *glafs*; in others, which were the more common, the colour was only on one side, scarce penetrating within the substance above one third of a line; though this was more, or less, according to the nature of the colour; the yellow being always found to enter the deepest.

These last, though not so strong and beautiful as the former, were of more advantage to the workmen; by reason, on the same *glafs*, though already colour'd, they could show other kind of colours, where there was occasion to embroider draperies, enrich them with foliages, or represent other ornaments of gold, silver, &c.

In order to this, they made use of emery; grinding, or wearing down the surface of the *glafs*, till such time as they were got through the colour, to the clear *glafs*: this done, they applied the proper colours on the other side of the *glafs*.—By this means the new colours were prevented from running, and mixing among the former, when the *glasses* came to be expos'd to the fire, as will be hereafter shew'd.

When the intended ornaments were to appear white, or silver'd, they contented themselves to bare the *glass* of its colour with emery, without applying any new colour at all; and it was in this manner, that they wrought the lights and heightenings on all kinds of colours.

The first thing to be done, in order to paint on *glass*, in the modern way, is to design, and even colour the whole (subject on paper. Then they make choice of pieces of *glass* proper to receive the several parts, and proceed to divide, or distribute the design itself, or the paper it is drawn on, into pieces suitable to those of *glass*: having always a view that the *glasses* may join in the contours of the figures, and the folds of the draperies; that the carnations, and other finer parts may not be damaged by the lead wherewith the pieces are to be joined together.

The distribution being made, they mark all the *glasses*, as well as papers, with letters, or numbers; that they may be known again. Which done, applying each part of the design on the *glass* intended for it, they copy, or transfer the design upon this *glass*, with the black colour, diluted in gum-water; by tracing and following all the lines, and strokes, as they appear through the *glass*, with the point of a pencil.

When these first strokes are well dried, which happens in about two days, the work being only in black and white, they give it a slight wash over, with urine, gum arabic, and a little black; and this several times repeated, according as the shades are desired to be heightened: with this precaution, never to apply a new wash, till the former is sufficiently dried. This done, the lights and risings are given, by rubbing off the colour in the respective places, with a wooden point, or the handle of the pencil.

As to the other colours above-mentioned, they are used with gum-water, much as in painting in miniature; taking care to apply them lightly, for fear of effacing the out-lines of the design; or even for the greater security, to apply them on the other side, especially yellow, which is very pernicious to the other colours, by blending therewith.

And here, too, as in pieces of black and white, particular regard must always be had, not to lay colour on colour, or lay on a new lay, till such time as the former are well dried. It may be added, that the yellow is the only colour that penetrates through the *glass*, and incorporates therewith by the fire: the rest, and particularly the blue, which is very difficult to use, remaining on the surface, or at least entering very little. When the painting of all the pieces is finished, they are carried to the furnace, or oven, to anneal, or bake the colours. The furnace here used is small, built of brick, from eighteen to thirty inches square: at six inches from the bottom is an aperture, to put in the fuel, and maintain the fire. Over this aperture is a grate, made of three square bars of iron, which traverse the furnace, and divide it into two parts. Two inches above this partition is another little aperture, through which they take out pieces, to examine how the coction goes forward.

On the grate is placed a square earthen pan, six or seven inches deep; and five or six inches less, each way, than the perimeter of the furnace. On one side hereof is a little aperture, through which to make the trials, placed directly opposite to that of the furnaces destined for the same end.

In this pan are the pieces of *glass* to be placed in the following manner: first, the bottom of the pan is covered with three strata, or layers of quick-lime, pulverized; those strata being separated by two others, of old, broken *glass*: the design whereof is to secure the painted *glass* from the too intense heat of the fire. This done, the *glasses* are laid horizontally on the last, or uppermost layer of lime.

The first row of *glasses* they cover over with a layer of the same powder, an inch deep; and over this they lay another range of *glasses*: and thus alternately, till the pan is quite full; taking care that the whole heap always end with a layer of the lime powder.

The pan thus prepared, they cover up the furnace with tiles, on a square table of earthen ware, closely luted all round; only having five little apertures, one at each corner, and another in the middle, to serve as chimneys.

Things thus disposed, there remains nothing but to give the fire to the work.—The fire for the two first hours, must be very moderate; and must be increased, in proportion as the coction advances, for the space of ten, or twelve hours; in which time it is usually completed. At last, the fire, which at first was only of charcoal, is to be of dry wood: so that the flame covers the whole pan, and even issues out at the chimneys.

During the last hours, they make essays from time to time; by taking out pieces laid for the purpose, through the little aperture of the furnace, and pan, to see whether the yellow be perfect, and the other colours in good order. When the annealing is thought sufficient, they proceed with great haste to extinguish the fire, which otherwise would soon burn the colours, and break the *glasses*. See FIRE.

Glasses are distinguished with regard to their form, use, &c. into various kinds; as *drinking glasses*, *optic glasses*, *looking glasses*, *burning glasses*, &c.

Drinking GLASSES are simple vessels of common *glass* or crystal; usually made in form of an inverted cone.

Each *glass* consists of three parts, *viz.* the calyx, or bowl; the bottom; and the foot; which are all wrought, or blown separately.

Nothing can be more dexterous, and expeditious, than the manner wherein these parts are all blown; two of them opened, and all three joined together. An idea is only to be had thereof, by seeing them actually at work.

The *glasses* chiefly used in England, are made of the ashes of fern; crystal *glasses* being less frequent in use. The exceeding brittleness of this commodity, notwithstanding the easy rate of each *glass*, renders the consumption hereof very considerable.

Optic GLASSES, are those made use of to strengthen, improve, or preserve the sight. See *OPTIC glass*.

Convex GLASSES	} See	CONVEX.
Concave GLASSES		CONCAVE.
Lenticular GLASSES		LENS.
Meniscus GLASSES		MENISCUS, &c.
Plain GLASSES		PLAIN <i>glass</i> .
Planoconvex GLASSES		PLANOCONCAVE.
Planoconvex GLASSES		PLANOCONVEX.
Telescope GLASSES		TELESCOPE.
Object GLASS		OBJECT <i>glass</i> .
Eye GLASSES		EYE <i>glass</i> .
Magnifying GLASS		MAGNIFYING.
Multiplying GLASS		MULTIPLYING.
Perspective GLASS		PERSPECTIVE.
Looking GLASS		LOOKING <i>glass</i> ; see also MIRROR, and FOLIATING.
Burning GLASS		BURNING <i>glass</i> ; see also MIRROR.
Weather GLASS	WEATHER <i>glass</i> .	
Cupping GLASS	CUPPING <i>glass</i> .	
GLASS window	WINDOW.	
GLASS drop	DROP.	
GLASS body	BODY.	
Axis of a GLASS	AXIS.	
Pole of a GLASS	POLE.	
Hour GLASS	HOURLY <i>glass</i> .	
Tin GLASS	BISMUTH.	
Watch GLASS	WATCH.	
GLASS of Antimony	ANTIMONY.	

GLASSY humour, see the article HUMOUR.

GLAUCOMA *, Γλαυκωμα, in medicine, the name of a disease of the eye, wherein the crystalline humour is turned of a bluish or greenish colour, and its transparency hereby diminished.

* The word comes from the Greek γλαυκος, *glaukos*, castus, sea-green, sky-coloured, or greyish.

Those in whom this disorder is forming, discover it hence, that all objects appear to them as through a cloud or mist: when entirely formed, the visual rays are all intercepted, and they see nothing at all.

It is reckoned incurable, when inveterate, and in aged persons: and even under other circumstances, is very difficult of cure; externals proving of little service.

The internals best suited to it, are those used in the gutta serena.—Jul. Cæsar Claudinus, *Consul* 74. gives a remedy for the *glaucoma*.

The *glaucoma* is usually distinguished from the cataract or suffusion, in this, that in the cataract the whiteness appears in the pupil, very near the cornea, but it shews deeper in the *glaucoma*.

Some late French authors, however, maintain the cataract and *glaucoma* to be one and the same disease.—According to them, the cataract is not a film, or pellicle formed before the pupil, as had always been imagined; but an inspissation or induration, or the humour itself, whereby its transparency is prevented; which brings the cataract to the *glaucoma*. See CATARACT.

GLEAM, is popularly used for a ray, or beam of light. See RAY. Among falcons, a hawk is said to *gleam*, when she casts or throws up silt from the gorge.

GLEANNING, the act of gathering, or picking up the ears of corn, left behind after the field has been reaped, and the crop carried home.

By the customs of some countries, particularly those of Melun, and Estampes, all farmers, and others, are forbid, either by themselves, or servants, to put any cattle into the fields, or prevent the *gleaning* in any manner whatever, for the space of twenty four hours, after the carrying off the corn, on penalty of confiscation, &c.

GLEBE, GLEBA, in natural history, chemistry, &c. a clod, or piece of stone or earth, frequently containing some metal, or mineral.

The *glebes* are carried to the forges to be washed, purified, melted, &c.

GLEBE, OR GLEBE-land, is properly used for church-land. *Dei vel terra ad ecclesiam pertinens.*

Glebe-land is most commonly used for land belonging to a parish church, beside the tithes *.

* Thus, Lindwood: *Glebe est terra in qua consistit dos ecclesiarum; generaliter tamen sumitur pro solo, vel pro terra culta.*

Though in the more general, and extensive use of the word, *glebe* is applicable to any land, or ground belonging to any benefice, fee, manour, inheritance, or the like.

ADDITI GLEBE. In the civil law, slaves were said to be annexed to the *glebe*, i. e. they went with it, were sold with it, &c.—The right of patronage should be annexed to a *glebe*. See **PATRONAGE**.

GLEET, in medicine, a flux of thin humour from the urethra.

A gleet, or a gonorrhœa simplex, often succeeds the cure of a gonorrhœa virulenta, and sometimes remains obstinate, even after the use of a salivation.

The *gleet* may happen either from a too great relaxation of the glands of the urethra, or from a corrosion or exulceration of them. It appears most frequently after a gonorrhœa has been of long standing, or ill managed in the cure; as by the use of acrid or corroding injections, and the like.

The glands may here also happen to be ulcerated by the matter of the running, which is often sharp and corrosive enough for that purpose.

A *gleet* is distinguished from a gonorrhœa simplex, not only by the colour, and consistence of the matter evacuated, but also by the manner wherein it comes away: The matter of a *gleet* comes away as well at one time as at another; but that of a gonorrhœa simplex chiefly in erections, and when the patient goes to stool. The matter of a *gleet* is commonly brownish, but that of a gonorrhœa simplex is white. Add that the continuance of a true *gleet* is unattended with weakness, or other ill consequences, and dangerous symptoms; nor does it unfit men for procreation, as a gonorrhœa simplex will.

An astringent regimen is the most suitable in both; coffee and claret are supposed proper liquors in these cases: So are all those made acid with juice of lemons, vinegar, &c.

GLENE, Γληνη, properly signifies the cavity, or socket of the eye. See **EYE**.

GLENE is more frequently used by anatomists for the shallower cavities of bones, into which some other bone is received, and articulated.

By which it stands distinguished from *coyle* or *acetabulum*, which is a deeper cavity, intended by nature for the like purpose.

GLENOIDES*, an appellation given to the two cavities in the lower part of the first vertebra of the neck.

* The word is Greek, composed of γληνη; and ειδος, form

GLICYRRHIZA, or **GLYCYRRHIZA**, *liquorice*. See **LICORICE**.

GLOBE, in geometry, a round or spherical body; more usually called a *sphere*.

The earth, and water, together, are supposed to form a *globe* hence called the *terraguous globe*.

The planets, both primary, and secundary, are supposed, as well as our earth, to be solid *globes*.

The earth is, in a peculiar sense, called the *globe*, or *globe of earth*.

Resistance of a GLOBE. See the article **RESISTANCE**.

GLOBE is more particularly used for an artificial sphere of metal, plaster, paper, or some other matter; on whose convex surface is drawn a map, or representation, either of the earth, or heavens, with the several circles conceived thereon.

Globes are of two kinds, *terrestrial*, and *celestial*; each of very considerable use, the one in astronomy, and the other in geography, to perform many of the operations thereof in an easy, sensible manner, so as to be conceived without our any knowledge of the mathematical grounds of those arts.

The fundamental parts, common to both *globes*, are an axis, representing that of the world; and a spherical shell, or cover, which makes the body of the *globe*, on whose external surface the representation is drawn.

Globes, we have observed, are made of divers materials, viz. silver, brass, paper, plaster, &c. Those commonly used, are of plaster, and paper: The construction whereof is as follows:

Construction of GLOBES.—A wooden axis is provided somewhat less than the intended diameter of the *globe*, and into the extremes hereof two iron wires are driven, for poles: This axis is to be the beam, or basis of the whole structure.

On the axis are applied two spherical, or rather hemispherical caps, formed on a kind of wooden mould, or block.—These caps consist of pasteboard, or paper, laid, one lay after another, on the mould, to the thickness of a crown-piece; after which, having stood to dry, and imbody; making an incision along the middle, the two caps thus parcel, are stripped off the mould.

They remain now to be applied on the poles of the axis, as before they were on those of the mould: And to fix them in their new place, the two edges are sown together with pack-thread, &c.

The rudiments of the *globe* thus laid, they proceed to strengthen, and make it smooth and regular. In order to this, the two poles are haped in a metalline semicircle, of the size intended; and a kind of plaster, made of whiting, water, and glue heated, melted, and incorporated together, is daubed all over the paper-surface. In proportion as the plaster is applied, the ball is turned round in the semicircle, the edge whereof pares off whatever is superfluous, and beyond the due dimension; leaving the rest adhering in places that are short of it.

After such application of plaster, the ball stands to dry; which done, it is put again in the semicircle, and fresh matter applied: Thus they continue alternately to apply the composition, and dry it, till such time as the ball every where accurately touches the semicircle; in which state it is perfectly smooth, regular, firm, &c.

The ball thus finished, it remains to paste the map, or description thereon: In order to this, the map is projected in several gores, or gusses; all which join accurately on the spherical surface, and together cover the whole ball. To direct the application of these gores, lines are drawn by a semicircle on the surface of the ball, dividing it into a number of equal parts corresponding to those of the gores, and subdividing those again answerably to the lines and divisions of the gores.

The papers thus pasted on, there remains nothing but to colour and illuminate the *globe*; and to varnish it, the better to resist dust, moisture, &c.

The *globe* itself, thus finished, they hang it in a brass meridian, with an hour circle, and quadrant of altitude; and thus fit it into a wooden horizon.

Description of the GLOBES.—The things common to both *globes*, are either delineated on the surface; or added as appendages, without it.

Without the surface, are 1^o The two poles, whereon the *globe* is turned, representing those of the world. See **POLES**.

2^o The brazen meridian, which is divided into degrees, and passes through the poles.—3^o The wooden horizon, whose upper side represents the horizon; and is divided into several circles: The innermost whereof contains the twelve signs of the zodiac, subdivided into their degrees; the next, the julian; and the third, the gregorian calendar: Without side of all these, are drawn the points of the winds.—4^o A brass quadrant of altitude, divided into 90 degrees, to be fastened on the meridian at the distance of 90 degrees from the horizon.

—5^o The hour circles, divided into twice twelve hours, and fitted on the meridian, round the poles, which carry on index pointing to the hour.—A mariner's compass is sometimes added on the bottom of the frame; and sometimes, a semicircle of position.

On the surface are delineated, 1^o The equinoctial line, divided into 360 degrees; commencing from the vernal interfection.

—2^o The ecliptic, divided into twelve signs, and these subdivided into degrees.—3^o The zodiac.—4^o The two tropics.—And 5^o The polar circles, all which see under their proper articles.

What else belongs to *globes*, either as to construction, or description, is different, as the *globe* is either celestial, or terrestrial. See *celestial* and *terrestrial GLOBES*.

Celestial GLOBE, is an artificial sphere, on whose convex surface the fixed stars are laid down, at proportionable distances, together with the principal circles of the sphere.

The use of these *globes*, is to exhibit the phenomena of the motions of the sun, and stars, in an easy, and obvious manner; which, though somewhat inaccurate, is yet exact enough for the common uses of life, and may save the trouble of trigonometrical calculation.

To exhibit the stars, circles, &c. on the surface of a given sphere, or ball, and fit it for the uses of astronomy.—1^o Assume any two points diametrically opposite to each other, as P, and Q, (*Tab. Astronomy*, fig. 58.) and in these, fix up axes, P A, and Q C, for the ball to turn round on. The points P and Q, or A and C, will exhibit the poles of the world.

2^o Divide a brazen circle ABCD into four quadrants, A E, E C, C F, and F D; and subdivide each quadrant into 90 degrees, numbered from the points E, and F towards the poles A, and C.

3^o Incline the *globe* in this circle, as in a meridian, at the points A, and C, so as it may freely turn therein.

4^o Apply a style, or pin, to the surface of the *globe*, in the first degree of the meridian, and turn the ball round; by this means will a circle be described on the surface, representing the equator, to be divided into degrees.

5^o From the pole of the world P, towards M, and from the other pole C, towards N, number 23 ½ degrees; the points M and N will be the poles of the ecliptic.

6° Apply a style to the meridian, in the point M, and turn the globe round; by this rotation will the arctic polar circle be described: And after the same manner is the antarctic polar to be described about the point O.

7° Number $23\frac{1}{2}$ deg. from the equator towards the poles P, and Q; and note the points H, and I. Then, applying a style to the meridian, as before, two circles will be described parallel to the equator; whereof that drawn through H, will be the tropic of cancer, and the other through I, the tropic of capricorn.

8° Hang the globe within the meridian, in the poles of the ecliptic, as before in the poles of the world; and applying a style to E, turn it round: by this means will the ecliptic be delineated; which remains to be divided into 12 signs; and each of these again divided into 30 degrees.

9° While the globe remains thus suspended, bring the degree of longitude of any star under the meridian; and in the meridian, number as many degrees towards the pole as is the degree of latitude of the place: The point of intersection is the place of that star on the surface of the globe. After the like manner may the place of the star be determined from the right ascension and declination given; the globe being supposed suspended from the poles of the world, or the equator.

10° All the stars of a constellation thus laid down; the figure of the constellation is to be designed; after which it may either be coloured, or engraven.

11° Place the globe with the meridian, in a wooden frame, or horizon D B L, supported on four feet; in such manner, as to be divided thereby into two hemispheres; and that the pole A may be raised or depressed at pleasure.

12° On the limb, or edge of the horizon describe a circle, which divided into 360 degrees, and insert the calendars, and winds.

13° Lastly, to the pole A, fit a brazen circle, divided into 24 horary parts, and numbered twice twelve, so that the line or division of XII, may be in the plane of the meridian, on either side the pole. And on the pole itself apply an index, to turn round with the globe.—Thus is the globe complet.

It may be here observed, that as the longitude of the stars is continually growing, a globe does not remain of perpetual use; but the increase in seventy-two years only amounting to a degree, the whole will make no considerable error in an hundred years; the design of a globe being only to represent things something near the truth.

To make a celestial GLOBE.—This method is that the most frequently used; and we only premised the former as being the most easily conceived; and leading more naturally to this.

1° From the given diameter of the globe, find a right line A. B. fig. 59. n. 2. equal to the circumference of a great circle; and divide it into twelve equal parts.

2° Through the several points of division, 1, 2, 3, 4, &c. with the interval of 10 of them, describe arches, mutually intersecting each other in D and E. These figures, or pieces duly passed or joined together, will make the whole surface of the globe.

3° Divide each part of the right line A B, into 30 equal parts; so that the whole line A B, representing the periphery of the equator, may be divided into 360 degrees.

4° From the poles D, and E, fig. 60. with the interval of $23\frac{1}{2}$ deg. describe arches *a b*; these will be twelfth parts of the polar circles.

5° After the like manner, from the same poles D, and E, with the interval of $66\frac{1}{2}$ deg. reckoned from the equator, describe arches *c d*; these will be twelfth parts of the tropics.

6° Through the degree of the equator *e* corresponding to the right ascension of any given star, and the poles D and E, draw an arch of a circle; and taking in the compasses the complement of the declination from the pole D, describe an arch, intersecting it in *i*; this point *i* will be the place of that star.

7° All the stars of a constellation being thus laid down, the figure of the constellation is to be drawn according to Bayer, Hevelius, or Flamsteed.

8° Lastly, after the same manner are the declinations, and right ascensions of each degree of the ecliptic *d g* to be determined.

9° The surface of the globe thus projected on a plane, is to be engraven on copper, to save the trouble of doing this over again for each globe.

10° A ball, in the mean time, is to be prepared of paper, plaster, &c. after the manner above directed, and of the intended diameter of the globe. On this, by means of a femicircle, and style, is the equator to be drawn; and through every 30th degree, a meridian. The ball thus divided into twelve parts, corresponding to the segments before projected; they are to be cut from the printed paper, and pasted on the ball.

11° Nothing now remains but to hang the globe as before in a brazen meridian, and wooden horizon. To which may be added a quadrant of altitude H I, fig. 61. made of brass, and divided in the same manner, as the ecliptic and equator.

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If the declinations, and right ascensions of the stars be not given; but their longitudes, and latitudes, in lieu thereof; the surface of the globe is to be projected after the same manner as before, except that in this case D, and E, fig. 59, are the poles of the ecliptic, and *f h* the ecliptic itself; and that the polar circles, and tropics, with the equator *g d*, and the parallels thereof, are to be determined from their declinations.

One of the fullest catalogues of the stars is that of Mr. Flamsteed, wherein the right ascensions and declinations, as well as the longitudes, latitudes, &c. are every where expressed.

Use of the celestial GLOBE.—The use of this instrument is very extensive: Scarcely any thing in the spherical astronomy; but may be exhibited thereby.

The principal points are contained in the following problems with their solutions; which will let the reader enough into the nature and reason of this noble instrument to apply it, of his own accord, in any other cases.

To find the right ascension, and declination of a star, represented on the surface of the GLOBE.—Bring the star to the graduated side of the brazen meridian: Then, the number of degrees intercepted between the equator, and the point of the meridian cut by the star, gives its declination; and the degree of the equator, which comes under the meridian together with the star, is its right ascension.

To find the longitude and latitude of a star.—Apply the centre of the quadrant of altitude over the pole of the ecliptic in the same hemisphere with the star; and bring its graduated edge to the star: The degree on the quadrant cut by the star is its latitude, reckoned from the ecliptic; and the degree of the ecliptic cut by the quadrant, its longitude.

To find the sun's place in the ecliptic.—Seek the day of the month in the proper calendar on the horizon; and against the day in the circle of signs is the sign and degree the sun is in for that day. This done, find the same sign upon the ecliptic, on the surface of the globe: This is the sun's place for that day.

To find the declination of the sun.—The sun's place for the day given being brought to the meridian; the degrees of the meridian intercepted between the equinoctial and that place, are the sun's declination for that day, at noon.

To find the place of a planet, with its right ascension and declination; its longitude, and latitude, for the time being given.—Apply the centre of the quadrant of altitude on the pole of the ecliptic (the pole, we mean, of the same denomination with the latitude;) and bring it to the given longitude in the ecliptic: this point is the planet's place: And bringing it to the meridian, its right ascension, and declination will be found as already shewn of a star.

To rectify the GLOBE, or adjust it to the place, &c. so as it may represent the present state, or situation of the heavens.—

1° If the place be in north latitude, raise the north pole above the horizon; if in south, raise the south pole; till the arch intercepted between the pole and horizon be equal to the given elevation of the pole. 2° Fix the quadrant of altitude on the zenith, *i. e.* on the latitude of the place. 3° By means of a compass or meridian line place the globe in such manner as that the brazen meridian may be in the plane of the terrestrial meridian. 4° Bring the degree of the ecliptic the sun is in, to the meridian, and set the horary index to 12. Thus will the globe exhibit the face of the heavens for the noon of that day. 5° Turn the globe till the index come to any other given hour: thus will the globe shew the face of the heavens for that time.

To know all the stars and planets by means of the GLOBE.—

1° Adjust the globe to the state of the heavens, for that time. 2° Look on the globe for some one star, which you know; *e. g.* the middlemost star in the tail of the great bear. 3° Observe the positions of the other more conspicuous stars in the same constellation: and by transferring the eye from the globe to the heavens, you will easily note the same there. 4° After the same manner may you proceed from this to the neighbouring constellations; till you have learned them all.

If the planets be represented on the globe, after the manner above described, by comparing them with neighbouring stars, you will likewise know the planets.

To find the sun's oblique ascension, his eastern amplitude, and azimuth, with the time of rising.—1° Rectify the globe for the hour of 12; and bring the sun's place to the eastern side of the horizon: Then, the number of degrees intercepted between that degree of the equator now come to the horizon, and the beginning of aries, is the sun's oblique ascension.

2° The degrees on the horizon intercepted between the east point thereof, and the point wherein the sun is; is the oblique, or rising amplitude. 3° The hour pointed to by the index, is the time of the sun's rising. 4° Turning the globe, till the index points to the present hour; lay the quadrant to the sun's place; the degree cut by the quadrant, in the horizon, is the sun's azimuth.

To find the sun's oblique descension, western amplitude, and azimuth, with the time of setting.—The solution of this problem

is the same as that of the former; excepting that the sun's place must be here brought to the western side of the horizon; as in the former it was to the eastern.

To find the length of day and night. 1° Find the time of the sun's rising; which being numbered from midnight, the double thereof gives the length of night. 2° Subtract the length of the night from the whole day, or 24 hours; and the remainder is the length of the day.

To find the rising, setting, and culminating of a star, its continuance above the horizon, for any place and day; together with its oblique ascension, and descension; and its eastern and western amplitude and azimuth. 1° Adjust the globe to the state of the heavens, at 12 a-clock, that day. 2° Bring the star to the eastern side of the horizon: Thus will its eastern amplitude, and azimuth, and the time of rising be found; as already taught of the sun. 3° Bring the same star to the western side of the horizon: Thus will the western amplitude and azimuth, and the time of setting be found. 4° The time of rising (subtracted from that of setting, leaves the continuance of the star above the horizon. 5° This continuance above the horizon subtracted from 24 hours, leaves the time of its continuance below the horizon. 6° Lastly, the hour to which the index points, when the star is brought to the meridian, gives the time of its culminating.

To find the altitude of the sun, or a star, for any given hour of the day, or night. 1° Adjust the globe to the position of the heavens; and turn it till the index point at the given hour. 2° Fix on the quadrant of altitude, at 90 degrees from the horizon, and bring it to the sun's or star's place. The degrees of the quadrant intercepted between the horizon, and the sun or star is the altitude required.

The altitude of the sun by day, or of a star by night being given, to find the time of that day, or night. 1° Rectify the globe as in the preceding problem. 2° Turn the globe, and quadrant till such time as the star, or degree of the ecliptic of the sun is in, cut the quadrant in the given degree of altitude; then does the index point at the hour sought. See TIME, HOUR, &c.

The azimuth of the sun, or a star, given; to find the time of day, or night. Rectify the globe; and bring the quadrant to the given azimuth in the horizon: Turn the globe, till the star come to the same: Then will the index shew the time.

To find the interval of time between the risings of two stars; or their culminations. 1° Raise the pole of the globe to many degrees above the horizon, as is the elevation of the pole of the place. 2° Bring the first star to the horizon; and observe the time the index points to. 3° The same do by the other star. Then subtracting the former time from the latter; the remainder is the interval between the risings.

After the like manner is the interval between two culminations found; by bringing both stars to the meridian.

To find the beginning and ending of the crepusculum or twilight.—1° Rectify the globe; and set the index to the twelfth hour; the sun's place being in the meridian. 2° Note the sun's place, and turn the globe westward, as also the quadrant of altitude, till the point opposite to the sun's place cut the quadrant of altitude in the eighteenth degree above the horizon. The index will then shew the time when the twilight commences in the morning. 3° Taking the point opposite to the sun; bring it to the eastern hemisphere, and turn it, till it meet with the quadrant of altitude in the eighteenth degree: Then will the index shew the time when the twilight ends.

Terrestrial GLOBE, is an artificial sphere, on whose surface are delineated the principal places of the earth, in their proper situations, distances, &c. together with the circles imagined on the surface of the terrestrial sphere.

The use of the terrestrial globe, is to exhibit the several affections, and phenomena of the different places of the earth, depending on magnitude, &c. in an easy, obvious manner, without the trouble of trigonometrical calculation.

To construct a terrestrial GLOBE.—The construction of a terrestrial globe, whether of metal, plaister, paper, &c. is the same as that of a celestial. The same circles are delineated on both: And as for the places, viz. cities, towns, &c. they are laid down from the longitudes, and latitudes given; as the stars are from their right ascensions, and declinations.

Hence, all problems depending on the circles, may be equally wrought on either globe; as the ascensions, descensions, amplitudes, azimuths, arisings, settings, altitudes, &c. of the sun; the lengths of day and night; hours of the day and night; crepuscula, &c.

We shall here, therefore, only give what is peculiar to the terrestrial globe.

Use of the terrestrial GLOBE.—*To find the longitude and latitude of any place delineated on the globe.*—Bring the place to the graduated side of the brass meridian: the degree of the meridian it cuts, is the latitude required; and the degree of the equator at the same time under the meridian, is the longitude required.

The longitude and latitude given, to find the place on the GLOBE.—Seek, in the equator, the given degree of longitude, and bring it to the meridian: then count from the equator on the meridian the degree of latitude given, towards this or that pole, as the latitude is either north, or south: the point under this is the place required.

To find the antipodes, peripodes, and antipodes of any place. 1° The given place being brought to the meridian; count as many degrees on the meridian from the equator towards the other pole. The point which is thus arrived at, is the place of the antipodes. 2° Note the degrees of the meridian over the given place and its antipodes; and turn the globe till the opposite degree of the equator, come under the meridian; or, which amounts to the same, till the index, which before stood at twelve, come to the other twelve: then will the place corresponding to the former degree, be the peripodes; and the latter, that of antipodes.

To find what place of the earth the sun is vertical to at any time assigned. 1° Bring the sun's place found in the ecliptic to the meridian, and the index to the hour of twelve: noting what point of the meridian corresponds thereto. 2° If the given hour be before noon; subtract it from twelve hours; and turn the globe towards the west, till the index point at the hours remaining. Thus will the place required be under the point of the meridian before noted. 3° If the hour be after noon, turn the globe in the same manner towards the west, till the index point at the given hour: thus again will the place required be found under the point of the meridian before noted.

If, at the same time, you note all the places which are under the same half of the meridian with the place found, you will have all the places to which the sun is then in the meridian: and the opposite half of the meridian will shew all the places, in which it is then midnight.

A place being given in the torrid zone, to find the two days in the year wherein the sun is vertical to the same. 1° Bring the given place to the meridian; and note the degree of the meridian corresponding thereto. 2° Turn the globe about, and note the two points of the ecliptic passing through that degree. 3° Find on what days the sun is in those points of the ecliptic: For on those days he is vertical to the given place.

To find those places in the torrid zone to which the sun is vertical on a given day.—Bring the sun's place in the ecliptic to the meridian: then turning the globe round, note all the places which pass through that point of the meridian. Those are the places required.

After the same manner may be found what people are *ascii*, for any given day. See ASCII.

A place being given in the frigid zone, to find on what days of the year the sun does not rise; and on what days he does not set to the same.—1° Count as many degrees in the meridian from the equator towards the pole, as is the distance of the given place from the pole. 2° Turning the globe round, note all the points of the ecliptic passing through each point noted in the ecliptic: by this means you will have the arches which the sun describes while he neither rises, nor sets; and the points themselves give the places of the sun, when he neither rises nor sets; at the beginning and ending. 3° Find what days of the year the sun is in those places: these are the answer to the question.

To find the latitude of the places wherein any given day is of any given length. 1° Bring the sun's place for the given day to the ecliptic, and set the index to the hour of twelve. 2° Turn the globe, till the index point at the hour of rising or setting. 3° Raise and depress the pole till the sun's place appear in the eastern or western side of the horizon. Then will the pole be duly elevated, and consequently the latitude given.

To find the latitude of those places in the frigid zone, where the sun does not set for a given number of days. 1° Count so many degrees from the next tropic, towards the equinoctial point, as there are units in half the number of the given days; by reason, the sun, in its proper motion, goes nearly a degree every day. 2° Bring the point of the ecliptic, thus found, to the meridian: and its distance from the pole will be equal to the elevation of the pole, or latitude of the places required.

Any hour of the day, or night being given, to shew all those places to which the sun rises, and sets; where it is noon, or midnight, and where day, or night. 1° Find what place the sun is at that time vertical to, as already taught. 2° Let this place be brought to the zenith of the wooden horizon, i. e. elevate the pole as the latitude of that place requires. Then will the places on the eastern side of the horizon, be those the sun is setting to; and on the western side, those he rises to; those under the upper semicircle of the meridian, have it noon; and those under the lower, midnight. Lastly, to those in the upper hemisphere it is day; and to those in the lower, night.

Hence, as, in the middle of an eclipse, the moon is in that degree

degree of the ecliptic opposite to the sun's place; by the present problem it may be shewn what places of the earth then see the middle of the eclipse; and what, the beginning, or ending.

To find what places of the earth a planet, e. g. the moon, is vertical to, any day of the year.—1° Mark the planet's place on the globe, as above taught. 2° Bring this place to the meridian; and note the degree over it. 3° Turn the globe round; and the places which pass under the point, are those required.

The declination of a star, or any other phenomenon given; to find what parts of the earth the same is vertical to.—Count as many degrees in the meridian, from the æquator towards one pole as are equal to the given declination; viz. towards the north if the declination be northward; and towards the south if the declination be south. Then, turning it round, the places that pass through the extremity of this arch in the meridian, are the places required.

To determine the place of the earth where any star, or other celestial phenomenon, will be vertical at a given hour. 1° Elevate the pole according to the latitude of the place, from whose noon or midnight the hours are numbered. 2° Bring the sun's place for that day to the meridian, and set the index at twelve a-clock. 3° Determine the place of the star on the surface of the globe, and bring it to the meridian: the index will shew the difference of time between the appulse of the sun and star to the meridian of the place: Note the point of the meridian over the place of the star. 4° Find in what places of the earth it is then noon, and set the index to twelve a-clock. 5° Turn the globe towards the west, till the index have passed over the interval of time between the culmination of the sun and star. Then, under the point of the meridian before observed, will the place required be found.

And hence may always be found what place a star, or other phenomenon rises or sets to, at any given time.

To place the GLOBE in such manner, under any given latitude, as that the sun shall illuminate all those regions, which he actually illuminates on earth.—1° Rectify the globe, i. e. elevate the pole according to the latitude of the place: bring the place to the meridian; and set the globe north and south by the compasses: thus, the globe having the same situation with regard to the sun, as the earth has; that part thereof will be illumined, which is illumined on earth.—Hence also the globe being situate in the same manner when the moon shines, it will shew what parts are then illumined by the moon.

And, in the like manner, may we find where the sun and moon rise, and set at any given time.

To find the distance of two places on the GLOBE.—Take the given places in the compasses; and apply them to the æquator. The degrees which they there subtend, being reduced into miles, leagues, or the like, give the distances required.

The same may be done, and that more commodiously, by laying the graduated edge of the quadrant of altitude over the two places; and noting the degrees intercepted.

Dialling GLOBE, see the article DIALLING.

GLOBULAR Chart, a representation of the surface, or some part of the surface, of the terraqueous globe, upon a plane; wherein the parallels of latitude are circles nearly concentric; the meridians, curves bending towards the poles and the rhumb-lines also curves.

The merits of this chart consist in this, that the distances between places upon the same rhumb, are all measured by the same scale of equal parts, and the distance of any two places in the arch of a great circle, is nearly represented in this chart by a straight line.—Hence, land maps made according to this projection, would indubitably have great advantages above those made any other way. See MAP.

But for sea charts, and the uses of navigation, it is yet controverted, whether the globular chart be preferable to mercator's, where the meridians, parallels, and particularly the rhumb-lines, are all straight lines; inasmuch as straight lines are found more easy to draw, and manage than curves, especially such as the rhumb-lines on the globular chart are.—This projection is not new, though not much taken notice of till of late. It is mentioned by Ptolemy, in his Geography; as also by Blundeville in his Exercises.

GLOBULAR sailing; see Great circle SAILING.

GLOBULE, GLOBULUS, a little globe; otherwise called a spherule. See GLOBE.

Thus the red particles of the blood are called globules of the blood, on account of their redness, and smallness.

The microscope discovers the blood to consist of red, globular particles, swimming in a limpid, transparent water, or serum; and these, when at a due distance, may be discerned to attract each other, and unite into larger globules, like the spheres of quick-silver.

The Cartesian call the particles broken off the matter of their first element, globules of the second element. See ELEMENT, CARTESIAN, &c.

GLOBULUS Nasi, is used for the lower flexible, cartilaginous part of the nose.

GLORIA Patri, in the liturgy, a formula of words repeated at the end of each psalm, and on other occasions, to give glory to the holy trinity; called also the doxology. See DOXOLOGY.

It is thus denominated, because beginning in the Latin offices with these words, gloria Patri, q. d. glory be to the Father, &c. Pope Damascus is commonly held to have first ordered the rehearsal, or rather singing the gloria Patri at the ends of psalms. Baronius, indeed, will have it to have been used in the times of the apostles: but its use, then, he allows to have been more obscure; and that it did not become popular till after the rise of arianism, when it was made a kind of symbol of orthodoxy.

The fifth canon of the council of Vaison, held in 529, decrees, "that the name of the pope shall always be rehearsed in the churches of France, and after the gloria Patri, shall be added sicut erat in principio, as is done at Rome, in Africa, &c. on account of the heretics, who say that the Son of God had his beginning in time." Fleury.

GLORIA in excelsis, is also a kind of hymn rehearsed in divine service, beginning with the words gloria in excelsis Deo, & in terra pax hominibus, &c. Glory be to God on high, on earth peace, &c.

GLOSS*, GLOSSA, a comment on the text of any author, to explain his sense more fully, and at large; whether in the same language, or in any other.

* The word, according to some, comes from the Greek γλωσσα, tongue; the office of a gloss being to explain the text; as that of the tongue is to discover the mind. Others derive it from the Latin glos, a filter-in-law; which among the lawyers sometimes stands for filter; the gloss being, as it were, filter to the text.—

Nic. de Lyra composed a posill or gloss on the bible in six volumes, folio.—The French say proverbially of an ill comment, that it is glose d' Orleans, plus obscure que le texte.

Gloss is also used for a literal translation; or an interpretation of an author in another language, word for word.

Young scholars need an Interlineary gloss for the understanding of Juvenal, Horace, Sallust, Perlius, &c.

Gloss is also used in matters of commerce, &c. for the lustre of a silk, stuff, or the like.

GLOSSARY, GLOSSARIUM, a kind of dictionary for explaining the obscure, ancient, and barbarous words, and phrases of an altered, corrupted, or refined language.

Spelman's glossary, intituled Archæologicum, is an excellent work; though that author did not begin to study in this way till fifty years of age.—M du Cange's Latin glossary in three volumes, and his Greek glossary in two volumes folio, are excellent performances, full of uncommon erudition.—Lindembroek has a glossary on the laws of Charlemaign, &c.

GLOSSOCOMON*, Γλωσσόκομον, a churgeon's instrument, antiently used in setting broken, and dislocated thighs and legs; as also in extending those which remained too short after setting.

* The word is formed of the Greek Γλωσσα, tongue, and κομον, to have care; and was properly and primarily given by the antients to a little box, wherein they kept the reeds of their hautbois, &c.

The glossocanon is described as consisting of an hollow trunk, wherein the thigh, or leg is laid: at the bottom hereof is a kind of wheel; and towards the top are two pulleys on each side. Several thongs of leather are tied both above and below the fractured place. Those below are fastened to the axis of the wheel, which they are near: Those above go over the pulleys to come to the axis, which they are likewise fastened to; so that the same turning of the wheel, both draws the part of the leg, or thigh, which is above the fracture, upwards; and that below, downwards.

GLOSSOCOMON, in mechanics, is a name given by Hiero to a machine composed of divers dented wheels, with pinions serving to raise huge burdens.

GLOSSOPETRA, or Γλωσσοπέτρα, in natural history, a kind of extraneous fossil somewhat in form of a serpent's tongue; frequently found in the island of Malta, and divers other parts.

Naturalists have been much divided as to the nature, and origin of these bodies.—Steno, de corpore solido intra solidum contento; Ol. Wormius, aiffert. de glossopetra; and Reyfchius de glossopetris Lunbergenfisbus, treat of them at large.

The vulgar notion is, that they are the tongues of serpents petrified; and hence their name, which is a compound of Γλωσσα, tongue, and πέτρα, stone.—Hence also their traditionary virtue in curing the bites of serpents.

The people relate that since the viper which bit St. Paul without doing him any harm, all the serpents of the island of Malta have had the same virtue: and that the glossopetræ are the tongues of those formerly dead.—But this is palpable fable, which the sole figure of the glossopetræ refutes; they having very little of the shape of a serpent's tongue; beside that they are too big.

The general opinion of naturalists is that they are the teeth of fishes, left at land by the waters of the deluge; and since petrified.

They even specify the very kind of fish; and take it to be that which Theophrastus, and the Greek writers call καρχαρις and the moderns, the *shark* or *sea-dog*.

Camerarius cannot persuade himself that the *glassopetra* found in England, Malta, and around Montpellier, were ever the teeth of a sea-dog, or any other fish. The chief difficulty, he suggests, is the small quantity of volatile salt and oil which they afford by distillation. To which Dr. Woodward answers, in defence of the common system, that having lain so long buried under ground, 'tis no wonder they should have lost the best part of their volatile principles. It is certain that human bones and skulls long immerged, do not afford near the quantity of those principles, that they would have done immediately after the person's death.

Another scruple proposed by Camerarius, is that the *glassopetra*, when exposed to the naked fire, turn to a coal, and not to a calc; contrary to what is asserted by Fabius Columa. Dr. Woodward answers, that it is likely enough the *glassopetra*, in burning, may assume the form of coal, before it arrive at that of a calc. See Supplement, article LAMIODONTES.

GLOTTIS, in anatomy, a cleft, or chink in the larynx, serving for the formation of the voice.

The *glottis* is in form of a little tongue; whence its name, from *γλωττα* tongue. For the same reason the Latins call it *lingula*, i. e. little tongue.

Through this chink the air descends, and ascends in respiring, speaking, singing, &c. It has an apparatus of muscles, whereby we contract and enlarge it; and hence all the variety of tones of the voice.

The *glottis* is covered and defended with a thin, soft cartilage called the *epiglottis*.

GLOTTOPETRA, see the article GLOSSOPETRA.

GLOVE, *Chirahoca*, a habit, or covering for the hand, and wrist; used both for warmth, decency, and as a shelter from the weather.

Gloves, are distinguished, with respect to commerce, into leather *gloves*, silk *gloves*, thread *gloves*, cotton *gloves*, worsted *gloves*, &c.

There are also *gloves* of velvet, satin, taffaty, &c. Leather *gloves* are made of shabby, kid, lamb, doe, elk, buff, &c. There are also perfumed *gloves*; washed, glazed, waxed *gloves*; and white, black, buff-colour, &c. *gloves*; single, lined, top'd, laced, fringed with gold, silver, silk, fur, &c.

It is a proverb, that for a *glove* to be good, and well made, three kingdoms must contribute to it: Spain, to dress the leather; France, to cut it; and England, to sew it. But, of late, the French seem to have appropriated the functions of the other two; the *gloves* of the French manufacture being now said to have the advantage in point of dressing and sewing, as much as of cutting.

To *throw the GLOVE*, was a practice or ceremony very usual among our forefathers; being the challenge, whereby another was defied to single combat. It is still retained at the coronation of our kings; when the king's champion casts his *glove* in Westminster-hall.

Fayn supposes the custom to have arose from the eastern nations, who in all their sales, and deliveries of lands, goods, &c. used to give the purchaser their *glove* by way of livery, or investiture. To this effect he quotes Ruth iv. 7. where the Chaldee paraphrase calls *glove*, what the common version readers by *shoe*. He adds, that the Rabbinis interpret by *glove*, that passage in the civith Psalm, in *Iudaeam extendam calcamentum meum*, over *Edom* will I cast out my shoe. Accordingly, among us, he who took up the *glove*, declared thereby his acceptance of the challenge; and as a part of the ceremony, continua Fayn, took the *glove* off his own right-hand, and cast it upon the ground, to be taken up by the challenger. This had the force of a mutual engagement on each side, to meet at the time and place which should be appointed by the king, parliament, or judges.

The same author asserts, that the custom which still obtains of blessing *gloves* in the coronation of the kings of France, is a remnant of the eastern practice of giving possession, with the *glove*, l. xvi. p. 107, &c.

Antiently it was prohibited the judges to wear *gloves* on the bench. And at present in the stables of most princes, it is not safe going in without pulling off the *gloves*.

GLUE, GLUTEN, a vitid, tenacious matter serving as a cement to bind, or connect divers things together.

There are divers kinds of *glues* made use of in the divers arts; as the common *glue*; *glove glue*; parchment *glue*. But the two last are more properly called *size*.

The common or strong *GLUE* is a commodity used by numerous kinds of artificers; as joiners, cabinet-makers, case-makers, haters, book-binders, &c. And the consumption thereof is very considerable. The best is that made in England, in square pieces, of a ruddy, brown colour. Flanders *glue* is held the next after the English.

Glue is made of the skins of all kinds of beasts, as oxen, cows, calves, sheep, &c. The older the beast is, the better is the *glue* that is made of its hide. Indeed, it is rare they use whole skins for this purpose; those being capable of being applied to

better purpose: But they make use of the shavings, parings, or scraps thereof: and sometimes they make it of the feet, sinews, nerves, &c. of beasts.

That made of whole skins is the best; and that of sinews &c. the worst: and hence chiefly arises the difference of *glues*; and the advantage of the English and Flemish *glue*; for, as our tanners generally make the *glue* themselves; they are not sparing of the parings of the skins, which they never sell: whereas, in France, &c. the *glue-makers* being a peculiar kind of manufacturers, and having no parings but what they buy, make use chiefly of sinews, feet, &c.

Method of making *GLUE*.—To make *glue* of parings, they first steep them two or three days in water; then washing them well out, they boil them to the consistence of a thick jelly. This done, they pass the jelly, while yet hot, through oser baskets, to separate from it any impurities; and in order to purify it still further, they let it rest some time. When the ordures, or foreign matters are precipitated to the bottom of the vessel; they melt and boil it a second time.

This done, they pour it into flat frames, or moulds; whence it is taken out, when pretty hard and solid, and then cut into square pieces, or cakes. Nothing now remains, but to dry it in the wind, on a sort of coarse net, and afterwards to string it, to finish the drying.

The *glue* made of feet, sinews, &c. is managed after the same manner; with this only difference, that they bone and scour the feet, and don't lay them to steep.

The best *glue* is that which is oldest: the surest test of goodness is to lay a piece to steep three or four days in water; if it swell considerably without melting, and when taken out resume its former dryness, it is excellent.

Fish *GLUE*, is a sort of *glue* made of the nervous and mucilaginous parts of a large fish, found chiefly in the Russian seas.

These parts being boiled, bear a near resemblance to that viscid matter found on the skins of codfish. When boiled to the consistence of a jelly, they spread it on a leaf of paper, and form it into cakes; in which state it is sent to us.

Fish *glue* is of considerable use in medicine, and divers other arts; where it is better known under the names of *ising-glase* and *ichthyocolla*.

GLUTÆUS, in anatomy, is a name common to three muscles, whose office is to extend the thigh.—The first,

GLUTÆUS major, or the greater, arises semicircularly from the os coccygis, the spines of the sacrum, the spine of the ilium, and a strong ligament which runs between the sacrum, and tubercle of the ilium; and descending, is inserted into the linea aspera, four fingers breadth below the great trochanter. See Tab. Anat. (Myol.) fig. 1. n. 51. fig. 6. n. 33.

GLUTÆUS medius, or the middle one, called minor, or less, arises from the spine of the ilium, under the former, and is inserted into the superior and external part of the great trochanter. See Tab. Anat. (Myol.) fig. 1. n. 50. fig. 2. n. 33. fig. 6. n. fig. 7. n. 13.

GLUTÆUS minimus, or least, arises from the lower part of the external side of the ilium, under the former, and is inserted at the superior part of the great trochanter. See Tab. Anat. (Myol.) fig. 7. n. 2.

GLUTINATIVE, AGGLUTINATIVE, or CONGLUTINATIVE, in medicine, and pharmacy. See CONGLUTINATIVE.

GLYCONIAN, GLYCONIUS, in the Greek and Latin poetry. A *Glyconian* verse is that consisting of two feet and a syllable. At least this is Scaliger's opinion, who adds, that the *Glyconian* verse was also called the *Euripidean* verse. See VERSE.

Others hold that the *Glyconian* verse consisted of three feet; a spondee, and two dactyls; or rather, a spondee, choriambus, and an iambus, or apyrrhic; which opinion is the most followed.

Sic te diva potens cypri, is a *Glyconian* verse.

GLYCYRRHIZA, in medicine, liquorice. See LIQUORICE.

GLYPHE *, or GLYPHIS, in sculpture and architecture, a general name for any cavity, or canal, whether round, or terminating in an angle; used as an ornament, in any part. See Tab. Archit. fig. 28. lit. x, x.

* The Greek word is, γλυφω, which literally signifies graving, nitching.

ΓΥΦΙΣ is properly a nitch, or indentation made in graving; or more properly, it is the notch in the end of an arrow, in which the string goes.

GLYSTER; see the article CLYSTER.

GNOMES, GNOMI, a name which the cabalists give to certain invisible people, whom they suppose to inhabit the inner parts of the earth, and to fill it to the centre.

They are represented as very small of stature, tractable, and friendly to men; and are made the guardians of mines, quarries, hidden treasures, &c. Vigenere calls them *gnomans*. The females of this species are called *gnomides*.

Vignoul de Marville in his *Mélange de Histoire & de Littérature*, t. 1. p. 100. gives a relation of a conference with a philosopher of this clais, who held that an infinity of spirits inhabited each of the four elements, fire, air, water, and earth, under the denomination of *salamanders*, *syphis*, *oudins*, and

gnomes;

gnomes; that the gnomes are employed in working, or actuating the machines of brutes upon earth.

He added, that some philosophers of that sect, held that these spirits were of two sexes, for the two sexes of beasts, or moving machines; that they were even more or less perfect as the brutes were; and that there was an infinite number of exceedingly small ones, to actuate the infinite number of insects, and animals, both those that are visible, and those which are too small to come under our senses; that all these spirits in general govern their respective machines according to the disposition of the parts, or organs, the humours, temperaments, &c. that they do not lay hold of all machines indifferently, but of those suited to their own character, element, &c. that a haughty one, for instance, seizes a Spanish gennet; a cruel one, a tyger, &c.

GNOME, Γνωμη, or *Chria*, is also used for a short, pithy, and sententious observation, reflexion, or the like: which is worthy to be treasured up, and remembered.

Such is that of Juvenal, — *Orandum est ut sit mens sana in corpore sano*.— The writers of rhetorics distinguish several kinds of gnomes, according as they turn on words, on actions, or both; denominated them *verbal, active, and mixed gnomes, or chriae*.

GNOMON*, in dialling, is the style, pin, or cock of a dial; the shadow whereof pointeth out the hours.

* The word is Greek γνομων, which literally imports somewhat that makes a thing known; by reason the style, or pin, indicates or makes the hour, &c. known.

The *gnomon* of every dial is supposed to represent the axis of the world; and therefore the two ends or extremities thereof, must directly answer to the north and south poles.

GNOMON, in geometry. If a parallelogram be divided into four lesser ones, by two lines intersecting each other; and one of these parallelograms be retrenched, or taken away; the other three will make a *gnomon*, ordinarily called a *square*.

Or, a *gnomon*, in a parallelogram, may be said to be a figure formed of the two complements, together with either of the parallelograms about the diameter. Thus, in the parallelogram A B, *Tab. Geometry*, fig. 5. the *gnomon* is M + x + z + N; or M + N + X + Z.

GNOMON, in astronomy, denotes an instrument, or apparatus for measuring the meridian altitudes and declinations of the sun, and stars.

Those conversant in observations, prefer the *gnomon*, by some called the *astronomical gnomon*, to the smaller quadrants, both as more accurate, easier made, and more easily applied.

Accordingly, both antients and moderns have made use of *gnomons*, for the making of their more considerable observations: Ulugh Beigh, King of Parthia, &c. used a *gnomon*, in the year 1437, which was one hundred and eighty Roman feet high: that erected by Ignatius Dantes, in the church of St. Petronius at Boulogna, in the year 1576, was sixty-seven feet high: M. Cassini erected another twenty foot high, in the same church, in the year 1655.

To erect an astronomical GNOMON, and observe the meridian altitude of the sun by the same—Erect a perpendicular style, of a considerable height, on the meridian line: note the point where the shadow of the *gnomon* terminates when projected along the meridian line: measure the distance of that extreme from the *gnomon*, i. e. the length of the shadow. Thus having the height of the *gnomon*, and the length of the shadow; the meridian altitude of the sun is easily found.

Suppose, e. gr. T S (*Tab. Optics*, fig. 13.) the *gnomon*, and T V the length of the shadow. Here, on the rectangled triangle S T V, having the two sides T V and T S; and the angle V, which is the quantity of the sun's altitude, is found out by this analogy: as the length of the shadow T V: is to the altitude of the *gnomon* T S:: so is the whole sine: to the tangent of the sun's altitude above the horizon.

Or, more accurately, thus—Make a circular perforation in a brass plate, to transmit enough of the sun's rays to exhibit his image on the floor: fix it parallel to the horizon in a high place, proper for observation: then let fall a line and plummet, where-with to measure the height of the perforation from the floor. Take care the floor be perfectly level, and exactly horizontal; and let it be whitened over, to exhibit the sun more distinctly. Draw a meridian line thereon, passing through the foot of the *gnomon*, i. e. through the point the plummet points out: note the extreme points of the sun's diameter on the meridian line K and L, and from each subtract a right line equal to the semi-diameter of the aperture, viz. K H (*Tab. Astron.* fig. 57.) on one side, and L I on the other. Then will H L be the image of the sun's diameter, which bisected in B, gives the point on which the rays fall from the centre of the sun.

Now having given the right line A B, and the altitude of the *gnomon*, with the angle A, which is right; the angle A B G, or the apparent altitude of the sun's centre, is easily found: for, assuming one of the given sides A B for radius: A G will be the tangent of the angle B. Then say, as the length A B: is to the other A G:: so is the whole sine: to the tangent of the angle B.

GNOMONIC column. See the article COLUMN.

GNOMONIC polyhedron. See the article POLYHEDRON.

GNOMONICA, Γνωμωνικη, or **GNOMONICS**, the art of dialling; or of drawing sun and moon dials, &c. on any given plane.

It is thus called, as it shews how to find the hour of the day, &c. by the shadow of a *gnomon*, or style.

GNOSIMACHI*, an antient sect in religion, whose distinguishing character was, that they were professed enemies of all studied knowledge in divinity.

* The word is Greek, γνωσιμαχοι, g. d. an enemy of wisdom; or knowledge.

Damascenus says that they were perfectly averse to all the gnosis of christianity, i. e. to all the science, or technical knowledge thereof. They held it an useless labour to seek for gnosis in the holy scriptures; and said that God requires nothing of men but good works; that it were, therefore, much better to walk with more simplicity, and not to be so solicitous about the dogmata of the gnostic life.

Some authors take the word gnosis to have a further meaning, and think that, in the first ages of christianity, it signified much the same with what we call *spirituality*; and the *gnostic life*, Γνωστικη ζωη.—In which sense the *gnosimachi* must have been such as were enemies of the spiritual life; who contended for the doing of good works in all simplicity; and blamed such as aimed to render themselves more perfect by meditation; a deeper knowledge and insight into the doctrines and mysteries of religion, and the sublimer, and more abstracted exercises.

GNOSTICKS*, antient heretics, famous from the first rise of christianity; principally in the east.

* The word is formed of the Latin *gnosticus*, and that of the Greek γνωσκω, knowing, learned; witty, enlightened, spiritual; of γνωσκω, I know.

The name *gnostic* was adopted by those of this sect, as if they were the only persons who had the true knowledge of Christianity. Accordingly, they looked on all other christians as simple, ignorant, and barbarous persons, who explained and interpreted the sacred writings in a too low, literal, and unedifying signification.

At first, the *gnostics* were only the philosophers, and wits of those times; who formed themselves a peculiar flem of theology, agreeable to the philosophy of Pythagoras and Plato; to which they accommodated all their interpretations of scripture. But

GNOSTICKS afterwards became a general name, comprehending divers sects, and parties of heretics, who rose in the first centuries; and who, though they differed among themselves as to circumstances, yet all agreed in some common principles.—Such were the Valentinians, Simonians, Carpocratians, Nicolaitans, &c.

GNOSTICKS was sometimes also more peculiarly attributed to the successors of the first Nicolaitans, and Carpocratians, in the second century, upon their laying aside the names of the first authors. Such as would be thoroughly acquainted with all their doctrines, reveries, and visions, may consult St. Irenæus, Tertullian, Clemens Alexandrinus, Origen, and St. Epiphanius; particularly the first of these writers, who relates their sentiments at large, and consults them at the same time: indeed, he dwells more expressly on the Valentinians, than on any other sort of *gnostics*; but he shews the general principles whereon all their mistaken opinions were founded, and the method they followed, in explaining scripture.

He accuses them with introducing into religion certain vain and ridiculous genealogies, i. e. a kind of divine processions, or emanations; which had no other foundation, but in their own wild imagination.

In effect, the *gnostics* confessed that these æons; or emanations, were no where expressly delivered in the sacred writings; but insisted at the same time, that Jesus Christ had intimated them in parables, to such as could understand him.

They built their theology not only on the gospels, and the epistles of St. Paul; but also on the law of Moses, and the prophets. These last laws were peculiarly serviceable to them, on account of the allegories and allusions which they abound withal; which are capable of different interpretations.

They set a great value on the beginning of the gospel of St. John; where they fancied they saw a great deal of their æons, or emanations under the word, the life, the light, &c. They divided all nature into three kinds of beings; viz. *hylic*; or material; *psychic*, or animal; and *pneumatic* or spiritual.

On the like principle they also distinguished three *kosms* of men; *material animal*, and *spiritual*.—The first, who were material, and incapable of knowledge, inevitably perished both soul and body: the third, such as the *gnostics* themselves pretended to be, were all certainly saved: the *psychic*, or animal, who were the middle between the other two, were capable either of being saved, or damned, according to their good, or evil actions.

The appellation **GNOSTIC** sometimes also occurs in a good sense, in the ancient ecclesiastical writers, and particularly Clemens Alexandrinus, who, in the person of his *gnostic*, describes the characters and qualities of a perfect Christian. — This point he labours in the seventh book of his *Stromata*, where he shews that none but the *gnostic*, or learned person, has any true religion. He affirms, that were it possible for the knowledge of God to be separated from eternal salvation; that the *gnostic* would make no scruple to chuse the knowledge: and that if God should promise him impunity in doing of any thing he has once spoken against, or offer him heaven on those terms, he would never alter a whit of his measures.

In this sense that father uses *gnostic*, in opposition to the heretics of the same name; affirming, that the true *gnostic* is grown old in the study of the holy scripture; and that he preserves the orthodox doctrine of the apostles, and of the church: whereas the false *gnostic* abandons all the apostolical traditions, as imagining himself wiser than the apostles.

At length the name *gnostic*, which originally was the most glorious, became infamous, by the idle opinions, and dissolute lives of the persons who bore it; much as, in the present age, has fared with the name *quiesist*, *pietist*, &c.

G O, is sometimes used in law, in a special signification. — Thus to go *without day*, and, to go to *God*, denote as much as to be dismissed the court, and to be acquitted.

GOAD, *Stimulus*, a stick armed at one end with a pointed iron, to prick, and urge on a horse, ox, or the like.

In speaking of horses, we more commonly use the French name *vaut*; reserving *good* for oxen.

GOAL, or rather **GAOL**. See the article **GAOL**.

GOATS-EYE. See the article **EV**.

G O B E L I N S, a celebrated manufactory, established at Paris, in the Faubourg St. Marcel; for the making of tapestry, and other furniture, for the use of the crown.

The house where this manufactory is carried on, was built by two brothers, Giles and John *Gobelins*, both excellent dyers, and the first who brought to Paris the secret of dying that beautiful scarlet colour still known by their name; as well as the little river Bievre, on whose banks they fixed their dye-house; and which is now known by no other name than that of the river of the *Gobelins*.

It was in the year 1667, that this place, till then called *Gobelins's folly*, changed its name into that of *hotel royal des Gobelins*, in consequence of an edict of Louis XIV.

Monf. Colbert, having re-established, and with new magnificence enriched and completed the king's palaces, particularly the Louvre and Tuilleries, began to think of making furniture suitable to the grandeur of those buildings: with this view he called together all the ablest workmen in the divers arts and manufactures throughout the kingdom; particularly painters, tapestry-makers, sculptors, goldsmiths, ebonyists, &c. and by splendid offers, pensions, privileges, &c. called others from foreign nations.

And to render the intended establishment more firm and lasting, he brought the king to purchase the *Gobelins*, for them to work in; and drew up a system of laws, or policy, in seventeen articles.

By these it is provided that the new manufactory shall be under the administration of the super-intendant of the king's buildings, arts, &c. that the ordinary masters thereof shall take cognizance of all actions, or processs brought against any of the persons in the said manufactory, their servants and dependants: that no other tapestry work shall be imported from any other country, &c.

The *Gobelins* has ever since remained the first manufactory of this kind in the world. The quantity of the finest and noblest works that have been produced by it; and the number of the best workmen bred up therein, are incredible. In effect, the present flourishing condition of the arts and manufactures of France is in a great measure owing thereto.

Tapestry work, in particular, is their glory. During the superintendance of M. Colbert, and his successor, M. de Louvois, the making of tapestry is said to have been practised to a degree of perfection, scarce inferior to what was before done by the English and Flemish.

The battles of Alexander, the four seasons, the four elements, the life of Louis XIV. from the time of his marriage to the first conquest of Franche Comte, done from the designs of M. le Brun, director of the manufactory of the *Gobelins*, are masterpieces in their kind.

G O B L E T *, or **G O B E L E T**, a kind of drinking-cup, or bowl, ordinarily of a round figure, and without either foot, or handle.

* The word is French, *goblet*; which Salmastus and others derive from the barbarous Latin, *cupa*: Budens deduces it from the Greek, *κοπιλλοι*, a sort of cup.

G O B L E T S, made of the wood tamarisc, are ranked among medi-

cinal drugs; in regard the liquors infused a while therein, are supposed to acquire a quality which renders them good in diseases of the spleen.

G O B O N E, or **G O B O N Y**, in heraldry, the same as *compant*.

G O D *, an immaterial, intelligent, and free being; of perfect goodness, wisdom, and power; who made the universe, and continues to support it, as well as to govern and direct it by his providence.

* The Rabbins, and Hebraists, particularly St. Jerom, and the interpreters reckon up ten different names of *God* in scripture; which are אלהים, *El*, אלהים, *Elahim*, אלהי, *Elahy*, or in the singular, אלה, *Elaab*, אלהות, *Ishaah*, אלהות, *Elyon*, אלהים, *Elyah*, אלהי, *Adnai*, אלהים, *Yah*, אלהים, *Yehovah*: but it is wrong to divide אלהים into אלהים אלהים אלהים; it should be but one name אלהים אלהים, *Elobistibantia*, i. e. *God of hosts*. — Of these names there are three which express the essence of *God*, and are proper names, viz. אלהים, *Elahy*, אלהי, *Iah*, and אלהים, *Iehovah*: the others are only names of attributes. St. Jerom gives a particular explanation of these ten names, in his epistle to Marcella; and Buxtorf the younger has an express dissertation on the same; *Differetia de nominibus Dei*. The Jewit Societ has three several discourses on the three names, *El*, *Shaddai*, and *Iehovah*, printed at Paris, 1715. — The Hebrews call the name of *God*, אלהי אלהים, and the Greeks, after this example, *Τετρασυσυμμετρον*; as consisting of four letters, which it is observed to do in most languages; thus, in the Hebrew, *God* is called אלהים, *Iehovah*; in Greek, θεος; in Latin, *Deus*; in Spanish, *Dios*; in Italian, *Idio*; in French, *Dieu*; in the ancient Gaulish, *Diex*; in ancient German, *Diex*; in the Slavonic, *Buch*; in Arabic, *Ala*; in the Polish, *Bug*; in the Pannonian, *Ihu*; in the Egyptian, *Teny*; in the Persian, *Sire*; in the language of the Magi, *Orfi*. But a distinction ought here to be made, between the name *God*, and the name of *god*; it being the latter, not the former, that in the Hebrew consists of four letters. The name or word *god*, in the Hebrew, is אלהי, *Elaab*, which consists but of three letters; or in the plural אלהים, *Elobim*, which consists of five. The name of *God* is אלהים, *Iehovah*; which is the true *tetrasysymmetron*, or name of four letters, among the Hebrews and Greeks. But it is not this name that answers to the Greek θεος, Latin *Deus*, English *God*, &c. In reality none of these languages have any proper name of *God*, as אלהים, *Iehovah*, is in the Hebrew.

By his immateriality, intelligence, and freedom, *God* is distinguished from fate, nature, destiny, necessity, chance, anima mundi, and from all the other fictitious beings, acknowledged by the Stoics, Pantheists, Spinologists, and other sorts of atheists.

The knowledge of *God*, his nature, attributes, word, and works, with the relations between him and his creatures, make the subject of the extensive science called *theology*.

In scripture, *God* is defined by, I am that I am; alpha and omega; the beginning and end of all things.

Among philosophers he is defined a being of infinite perfection; or in whom there is no defect of any thing which we conceive might raise, improve, or exalt his nature.

Among men, he is chiefly considered as the first cause, the first being, who has existed from the beginning, has created the world, or who subsists necessarily, or of himself.

Sir Isaac Newton chuses to consider, and define *God*, not as is usually done, from his perfection, his nature, existence, or the like; but from his dominion. — “The word *God* (according to him) is a relative term, and has a regard to servants: it is true, it denotes a being eternal, infinite, and absolutely perfect; but a being, however eternal, infinite, and absolutely perfect, without dominion, would not be *God*.”

“The word *God* (the same author observes) frequently signifies *Lord*; but every lord is not *God*: it is the dominion of a spiritual being or lord, that constitutes *God*; true dominion, true *God*; supreme, the supreme; feigned, the false *god*.”

“From such true dominion it follows, that the true *God* is living, intelligent, and powerful; and from his other perfections, that he is supreme, or supremely perfect: he is eternal, and infinite; omnipotent, and omniscient: that is, he endures from eternity to eternity, and is present from infinity, to infinity.”

“He governs all things that exist, and knows all things that are to be known: he is not eternity, or infinity, but eternal and infinite: he is not duration, or space, but he endures, and is present: he endures always, and is present every where; and by existing always and every where, he constitutes the very things duration and space, eternity and infinity.”

“Since every particle of space is always, and every indivisible moment of duration every where, the creator and lord of all things can never be *unquam*, or *unquam*.”

“ He is omnipresent, not only virtually; but also substantially; for power without substance cannot subsist.
 “ All things are contained, and move in him; but without any mutual passion: he suffers nothing from the motions of bodies; nor do they undergo any resistance from his omnipresence.

“ It is confessed that *God* exists necessarily; and by the same necessity he exists always, and every where.—Hence also he must be perfectly similar; all eye, all ear, all brain, all arm, all the power of perceiving, understanding, and acting; but after a manner not at all corporeal, after a manner not like that of men, after a manner wholly to us unknown.

“ He is destitute of all body, and all bodily shape; and therefore cannot be seen, heard, nor touched; nor ought to be worshipped under the representation of any thing corporeal.

“ We have ideas of the attributes of *God*, but do not know the substance even of any thing: we see only the figures, and colours of bodies; hear only sounds, touch only the outward surfaces, smell only odours, and taste tastes; and do not, cannot, by any sense, or any reflex act know their inward substances, and much less can we have any notion of the substance of *God*.

“ We know him by his properties, and attributes; by the most wise, and excellent structure of things, and by final causes; but we adore, and worship him only on account of his dominion: for *God*, setting aside dominion, providence, and final causes, is nothing else but fate, and nature.” *Newt. Philof. Nat. Princip. Math. in calc.*

An ingenious divine has wrought these thoughts of that admirable philosopher into form, and ripened them into a more express system; in a discourse on this subject.—“ The great principle or proposition he lays down, is, that *God* is not rightly defined a being absolutely perfect, but a spiritual being endued with absolute dominion.—Not that he denies the self-existent being to be infinitely perfect; but only he holds, that it is his dominion, not his perfection, that is intended by the word *God*.”

The self-existent being, he observes, may be considered either absolutely, or relatively: absolutely, as he is in his own nature, and as he is considered by the metaphysician: relatively, as he stands related to his creatures, and as he is considered by the religionist, his worshipper. Now, in treating of the definition of *God*, we intend a nominal, not a real definition; not what the nature of that self-existent being is, which we call *God*; but what it is that we mean by the word *God*: Which, on this system, is that self-existent being, considered not absolutely, but relatively; not as he is abstractedly in his own nature, but as he stands related to the universe, whose sovereign lord he is.

It is added, that the names given this being in most languages, denote, not his abstract, metaphysical, and absolute idea: but his religious, popular, and relative one.

Indeed, every worshipper of *God* will allow that he worships that self-existent being for no other reason, but because he is *God*; that is, because he is the proper lord and sovereign: for one would be under no obligation to worship a being, though absolutely perfect, that had no dominion over him. A perfect being without dominion, would be only an object of contemplation, and admiration; not of worship: for worship is only a payment of homage, an acknowledgment of subjection; which, where there is no dominion, cannot be due, and is therefore always due in proportion to the degree of dominion.

The word *God* then signifies *Lord*, and not a being absolutely perfect: thus when I say, my *God*, the *God* of the universe, it seems plain, that the notion of *God* is relative, not absolute, that is, includes dominion, not absolute perfection; and if I were to express the same in any other words, could I do otherwise than thus, my Lord, the Lord of the universe; and not thus, my perfect being, the perfect being of the universe?

Indeed, it seems impossible to prove the existence of a *God*, in the sense asixed to that name a priori, or any otherwise than from his dominion; that is, by arguing from the effect to the cause. The following propositions, it is true, are undeniably demonstrable a priori. 1^o That there is a self-existent; i. e. necessarily existent being; because the universe could not produce itself. 2^o That a necessarily existent being must be eternal, and omnipresent, that is, co-extended with infinite duration, and infinite space; because whatever exists by an absolute necessity of nature, has no relation to difference of time, place, &c. and consequently must exist always and every where. 3^o This being must be perfectly similar, simple, and uncompounded, without the least variety, or difference imaginable, or possible, because absolute necessity is every where and always the same. From which proposition it also follows, as a corollary, that this being is immutable.

It is apparent therefore, a priori, that there is a self-existent being, which is not matter; and that this being is eternal, omnipresent, similar, and unchangeable, by necessary connexion between self-existence, and these attributes: but it is impossible to shew any necessary connexion between self-existence and understanding; and if so, it is impossible to prove that the self-existent being is intelligent a priori, or any otherwise than by arguing from the effect to the cause; that is, from the consideration of the frame of the universe, the laws of nature, and final causes. *Maxwel. Disc. concern. GOD.*

Cicero in his treatise *de Natura Deorum* puts this ridiculous argument against the existence of a *God* in the mouth of Cotta: “ How shall we conceive any thing of a *God*, when we cannot possibly attribute any virtue to him? Shall we say he has prudence? No: for prudence consisting in making a choice, between good and evil, what need has *God* of such choice, when he is by his own nature incapable of any evil? Shall we say he has understanding and reason? No: for understanding and reason only serve to discover things unknown to us, by things that are known; but there can be nothing unknown to *God*. Nor can we attribute justice to *God*; that being a thing which only relates to human society: nor temperance; since he has no pleasure to refrain: nor courage, in regard he is not susceptible of any pain, labour, or fatigue, nor exposed to any danger. How then can a thing be *God*, which has neither virtue, nor understanding?”

God, is also used in speaking of the false deities of the heathens; many of which were only creatures, to which divine honours and worship were superstitiously paid.

The Greeks and Latins, it is observable, did not mean by the name *God* an all-perfect being, whoseof eternity, infinity, omnipresence, &c. were essential attributes; with them, the word only implied an excellent and superior nature; and accordingly they give the appellation *Gods* to all beings of a rank, or class higher and more perfect than that of men.

Thus, men themselves, according to their system, might become *Gods*, after death; inasmuch as their souls might attain to a degree of excellence superior to what they were capable of in life.

The first divines, father Bossu observes, were the poets: the two functions, though now separated, were originally combined, or rather were one and the same thing.

Now the great variety of attributes in *God*, that is, the number of relations, capacities, and circumstances wherein they had occasion to consider him; put these poets, &c. under a necessity of making a partition, and to separate the divine attributes into several persons; by reason the weakness of the human mind could not conceive so much power and action in the simplicity of one single divine nature.

Thus the omnipotence of *God* came to be represented under the person and appellation of Jupiter; the wisdom of *God*, under that of Minerva; the justice of *God*, under that of Juno.

The first idols, or false *Gods* that are said to have been adored were the stars, sun, moon, &c. in regard of the light, heat, and other benefits we derive from them.

Afterwards, the earth came to be desired for furnishing fruits necessary for the subsistence of men and animals: then fire and water became objects of divine worship, for their usefulness to human life. See *FIRE*, and *WATER*.

When things were thus got in the train, *Gods*, by degrees, became multiplied to infinity; and there was scarce any thing but the weakness, or caprice of some devotee or other, elevated into the rank; things useless, or even destructive, not excepted.

To authorize their own crimes, and justify their vices and debaucheries, men constituted criminal, vitious, and licentious *Gods*, unjust, rapacious, and tyrannical *Gods*, covetous and thievish *Gods*, drunken *Gods*, impudent *Gods*, cruel and bloody *Gods*.

The principal of the antient *Gods*, whom the Romans called *Dii majorum gentium*, and which Cicero calls *caelestia Gods*, Varro, *selesti Gods*, Ovid, *nobiles Deos*, others, *conferentes Deos*; were Jupiter, Juno, Vesta, Minerva, Ceres, Diana, Venus, Mars, Mercury, Neptune, Vulcan, and Apollo. Jupiter is considered as the *God* of heaven; Neptune as *God* of the sea; Mars, as the *God* of war; Apollo of eloquence, poetry, and physic; Mercury of thieves; Bacchus of wine; Cupid of love, &c.

A second sort of *Gods*, called *demi gods*, *semi-dii*, *dii minorum gentium*, *indigetes*, or *Gods* adopted, were men canonized and deified.—As the greater *Gods* had possession of heaven by their own right, these secondary deities had it by right and donation; being translated into heaven for that they had lived as *Gods* upon earth.

The heathen *Gods* may be all reduced to the following classes.

1° Created spirits, angels, or dæmons; whence good and evil *Gods*; Genii, Lares, Lemures, Typhons, guardian *Gods*; infernal *Gods*, &c.

2° Heavenly bodies, as the sun, moon; and other planets, also the fixed stars, constellations, &c.

3° Elements, as air, earth, ocean, ops, vesta; the rivers, fountains, &c.

4° Meteors; thus the Persians adored the wind; thunder and lightning were honoured under the name of Geryon. And several nations of India and America have made themselves *Gods* of the same. Castor, Pollux, Helena, and Iris have also been preferred from meteors to be *Gods*; and the like has been practised in regard to comets; witness that which appeared at the murder of Cæsar. Socrates deified the clouds, if we may give credit to Aristophanes; and the primitive christians, Tertullian assures us, were reproached with the same thing.

5° They erected minerals, or fossils into deities; such was the Bætylus; the Finlanders adored stones; the Scythians iron; and many nations silver and gold.

6° Plants have been made *Gods*; thus leeks and onions were deities in Egypt: The Sclavi, Lithuanians, Celtæ, Vandals and Peruvians adored trees, and forests: The antient Gauls Britons, Druids, bore a particular devotion to the oak; and it was no other than wheat, corn, feed, &c. that the antients adored under the names of Ceres, and Proserpina.

7° They took themselves *Gods* from among the waters: The Syrians, and Egyptians adored fishes; the Oxyrhynchites, Latopolitan, Siennite, and inhabitants of Elephantis had each a fish for their *God*; and the Tritons, Nereids, Syrens, &c. what were they but fishes? Several nations have adored serpents, particularly the Egyptians, Prussians, Lithuanians, Samogitians, &c.

8° Insects, as flies, and ants had their priests and votaries; these among the Thebians, and those in Acarnania, where bullocks were offered to them.

9° Among birds, the stork, raven, sparrowhawk, ibis, eagle, griffon, and lapwing have had divine honours; the last in Mexico, the rest in Egypt, and at Thebes.

10° Four footed beasts have had their altars, as the bull, dog, cat, wolf, baboon, lion, and crocodile in Egypt and elsewhere; the hog in the island of Crete; rats and mice in the Troas, and at Tenedos; weasels at Thebes, and the porcupine throughout all Zoroaster's school.

11° Nothing was more common than to place men among the number of deities; and from Belus, or Ball, to the Roman emperors before Constantine, the instances of this kind are innumerable. Frequently they did not wait so long as their deaths for the apotheosis. Nebuchadnezzar procured his statue to be worshipped while living; and Virgil shews that Augustus had altars and sacrifices offered to him, Eclog. i. ver. 6, 7. As we learn from other hands, that he had priests called *Augustales*; and temples, at Lyons, Narbona, and several other places, and he must be allowed the first of the Romans, in whose behalf idolatry was carried to such a pitch. The Æthiopians deemed all their kings, *Gods*: The Velleda of the Germans; the Janus of the Hungarians; and the Thaut, Woden, and Asa of the northern nations were indisputably men.

12° Not men only, but every thing that relates to man has also been deified; as labour, rest, sleep, youth, age, death, virtues, vices, occasion, time, place, numbers, among the Pythagoreans; the generative power, under the name of Priapus: infinity alone had a cloud of deities; as Vegetanus, Lovana, Rumina, Edusa, Potina, Cuba, Cumina, Carna, Offilago, Stalutinus, Pabulinus, &c.

They also adored the *gods* health, fever, fear, love, pain, indignation, shame, impudence, opinion, renown, prudence, science, art, fidelity, felicity, calumny, liberty, money, war, peace, victory, triumph, &c.

Lastly, nature, the universe, or *to pan*, was reputed a great *god*.

Hesiod has a poem under the title of *Θεογονια*, i. e. the generation of the *Gods*; wherein he explains their genealogy and descent, sets forth who was the first and principal; who next descended from him, and what issue each had: the whole making a sort of system of heathen theology.

Beside this popular theology, each philosopher had his separate system; as may be seen from the *Timæus* of Plato, and Cicero, *de natura deorum*.

Justin Martyr, Tertullian in his *Apologetics*, and in his book *contra Gentes*; Arnobius, Minucius Felix, Lactantius, Eusebius, *Pædagog. & Demonst. Evangel.* St. Augustin *De Civit. Dei*; and Theodoret *advers. Gentes*, shew the variety of the heathen *Gods*.

It is very difficult to discover the real sentiments of the heathens, with respect to their *Gods*: they are exceedingly intricate and confused, and even frequently contradictory. They admitted for many superior and inferior *Gods*, who shared the empire, that all was full of *Gods*. Varro reckons up no less than thirty thousand adored within a small extent of ground, and yet their number was every day growing. The way to

heaven was so easy for the great men of those days, that Juvenal brings in Atlas complaining he was ready to sink under the load of such a number of new *Gods* as were daily paced in the heavens; yet father Mourguet seems to have proved, that all the philosophers of antiquity have acknowledged that there was but one *God*. *Plin. Theol. des Sèts. Savani. de la Grece.*

} See {	<i>Act of GOD,</i>	DISABILITY.
	<i>Peace of GOD,</i>	PEACE.
	<i>Son of GOD,</i>	SON.
	<i>Truce of GOD,</i>	TRUCE.
<i>Worship of GOD,</i>	WORSHIP.	

GOD-BOTE, in our antient Saxon customs, an ecclesiastical or church fine; for crimes and offences committed against *God*.

GODDESS, *Dea, Diva*, a heathen deity, to whom they attributed the female sex.

The antients had almost as many *goddesses* as gods: Such were Juno, the *goddess* of air; Diana, the *goddess* of woods, and chastity; Proserpina, the *goddess* of hell; Venus of beauty; Thetis, of the sea: such also were victory, fortune, &c.

Nay, they were not contented to make women gods, and admit both sexes into the roll; but they had also hermaphrodite gods: thus Minerva, according to several of the learned, was both man and woman, and worshipped both under the appellation of Lunus, and Luna. Mithras the Persian deity, was both god and *goddess*; and the sexes of Venus and Vulcan are very dubious: whence, in the invocations of those deities, they used this formula, *Be thou god or goddess*; as we learn from A. Gellius.

It was a privilege peculiar to *goddesses*, that they might be represented on medals, naked: the imagination, it was supposed, must be awed, and kept from taking liberties, by the consideration of the divine character.

GOD-FATHERS, and **GOD-MOTHERS**, persons who direct, and attend at the baptism of infants, or other persons; and who give the name.

The number of *god-fathers*, and *god-mothers*, is now reduced to three in the church of England, and to two in that of Rome: antiently, they had as many as they pleased.

The Romanists have also *god-fathers* and *god-mothers* at their confirmation. They even give *god-fathers*, &c. to bells, at their baptism.

Among the antients it was the custom for persons of quality to have others of like quality cut their childrens hair, the first time; by which they became reputed a sort of *god-fathers*. And the like was practised with regard to the hair of the beard.

GOD-FATHER was also a name antiently given to a kind of fecunds, who attended and assisted the knights in tournaments, or single combats.

The *god-fathers* of duels were a kind of advocates, who were chosen by the two parties, to represent the reasons of their combat to the judges.

Something of this kind was long retained at solemn carroufals. There were two, or more, in each quadrille. See **QUADRILLE**.

The institution of *god-fathers*, and *god-mothers*, *patrims*, and *matrims*, is originally Roman: they are said to have been people, who in the games of the circus attended the chariots, shews, and images of the gods. Cicero makes mention of them in his oration de *Hurupicum responso*.—Their office was much like that of the children in some romish ceremonies, who are dressed in the habit of angels, to strew flowers, bear incense pots, lights, &c. and accompany the relics, and images of saints.

GOD-GILD, in our antient customs, that which is offered to *God*, or for his service.

GOLD, *Aurum*, a yellow metal; the heaviest, purest, most ductile, and shining, and on those accounts the most valuable of all metals.

The chemists call gold *sol*, the sun, to denote its pre-eminence over the other metals which are called by the names of the planets: its symbol, or character is O, which in their hieroglyphical way of writing, denotes perfection, simplicity, solidity, &c.

The weight of *gold* is that of water, as, 10626 to 1000.—A cubic inch of pure *gold* weighs twelve ounces, two drachms, fifty-two grains; and the cubic inch of silver six ounces, five drachms, twenty-eight grains. The pound weight, or twelve ounces troy of *gold* is divided into twenty-four carats.

The value of *gold* is that of silver as fourteen to one; antiently it was only as twelve to one. Indeed, this proportion varies as *gold* is more or less plentiful: for Suetonius relates, that Cæsar brought such a quantity of *gold* from Italy, that the pound of *gold* was only worth seven pounds and a half of silver. Standard *gold* is worth 4*l*. 10*s*. sterling the pound weight: standard silver is worth 3*l*. the pound; or 5*s*. the ounce. See **STANDARD**; see also **SILVER**, and **MONEY**.

The first characteristic, or property of *gold* is that it is the heaviest of all bodies. So that whoever would make *gold*, must be able to add to the weight of other matters, and make them equiponderate with *gold*.

In every mass of matter, therefore, heavier than mercury there must of necessity be a share of *gold*; there being no body in nature of intermediate gravity; i. e. no body whose gravity is to that of *gold*, more than as fourteen to nine-teen.

Its second character is, that of all known bodies it is the most ductile and malleable, and of all bodies its parts have the greatest degree of attraction, i. e. they cohere with the greatest force. Our gold-beaters, and wire-drawers furnish us with proof of this property. They every day reduce *gold* into leaves, or lamella, inconceivable thin; yet without leaving the least aperture, or chasm, visible to the best microscope, or even pervious to the light. See this property considered more at large under the article DUCTILITY.

This tenacity, or cohesive force of *gold*, depends altogether on its being free from sulphur: for mix but a single grain of common sulphur with one thousand times the weight of *gold*, and the mass ceases to be malleable.

The third character of *gold* is its fixedness in the fire: in which it exceeds all other bodies. This property seems to result from the homogeneity, and equality of its parts, which equally aid, and support each other, and have equal pores, or interstices through which the fiery corpuscles find an easy passage. The prince of Mirandola, Mr. Boyle, and most other chemists, furnish divers experiments to illustrate this wonderful fixity. After laying a quantity of *gold* two months in the intensest heat imaginable, it is taken out without any sensible diminution of weight.

It must be added, however, that in the foci of the large burning glasses of Mess. Tschirnhausen, and Vilette, even *gold* itself volatilizes and evaporates. After this manner, we are told from the royal academy at Paris, a quantity of pure *gold* was vitrified; being first fused into a sort of calx, which emitted fumes, and lost of its weight. But the same calx fused again with a quantity of grease, was restored into *gold*.

Its fourth character is, not to be dissoluble by any known menstruum in nature, except aqua regia, and mercury.

The basis of aqua regia is sea salt, which is the only salt we know of that has any effect on *gold*. But this salt has its effect in what form or manner soever applied, whether as a fluid, or a solid; in substance, or in spirit.

Mr. Boyle made a menstruum of butter of antimony, which dissolved *gold* with great facility; and hence concluded that *gold* might be dissolved without sea salt: but by mistake, the effective part even of this menstruum being still sea salt; which is an ingredient in sublimate of mercury, wherewith butter of antimony is made.

The seventh character is, that it readily, and spontaneously, as by some magnetic virtue, attracts, and absorbs mercury; though what my lord Bacon writes, viz. that *gold*, in imbibing mercury, increases in specific gravity, we doubt, is but ill warranted. It is more than probable it must be increased in bulk, more than in weight, and consequently must be specifically lighter.

It may be added, that as soon as the mercury enters the *gold*, the metal becomes soft, like a paste.

The eighth character is, that it withstands the violence both of lead and antimony, i. e. being fused in the coppel along with either of those matters, it does not dissipate and fly off with them in fume, but remains fixed, and unchanged.

All other metals, except *gold*, and silver melted with lead, perish with it, and evaporate by fire; and in antimony, all other metals, except *gold*, even silver itself, undergo the same fate. Thus, if a mass consisting of *gold*, silver, stones, copper, &c. be fused together with antimony, the several matters become separated, and all but the *gold* rises to the surface in form of a scoria, and is blown off with bellows: but the *gold* remains behind, much purified, as having lost all its heterogeneous parts along with the other metals. And hence antimony is used as the test of *gold*.

The ninth character is, that of all bodies it is the simplest (the primary elements being here excepted.) By simple we here mean that whose minutest part has all the physical properties of the whole mass. Thus, if a grain of *gold* be dissolved in aqua regia; and a single drop of the solution be taken, a quantity of *gold* may be separated therefrom, which shall only be the millionth part of the grain, and yet shall have all the characters of *gold*. Or, if you fuse a grain of *gold* with a large mass of silver, and mix the two together, so that the *gold* becomes equally diffused through the whole mass; you will have in every particle of the mass a particle of perfect *gold*. Accordingly, dissolve any part of the mixture in aqua fortis, and a quantity of *gold* will precipitate to the bottom, bearing the same proportion to the grain that the

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part dissolved did to the whole mass. On which principle depends the art of assaying. See Essay.

All the known parts of the earth afford this precious metal; though with a deal of difference, in point of purity, and abundance: Europe, so fertile in other respects, comes short of all other quarters in *gold*. America furnishes the most; and particularly the mines of Peru, and Chili. That of Asia is esteemed the finest, particularly that of Menaricabo in the East-Indies; though the Spaniards assure us that they get *gold* out of some of their Peruvian mines, twenty-three carats fine before it be purified. Add, that the *gold* of Axima, on the coast of Africa, is found from twenty-two to twenty-three carats.

Glauber, an eminent chemist, asserts that there is not any sand, or stone, but *gold* may be procured from; limestone only excepted: the misfortune is, that the expence of separating it, much surmounts the profits.

Gold is chiefly found in mines: though there is some also found in the sand, and mud of rivers, and torrents; particularly in Guinea. This last is in form of a fine dust, and is called *apuroguros*, *gold-dust*. Glauber tells us that there is a third sort of *gold*, scarce found any where but in the drains of the mountains of Chili, which they separate from the earth by washing; whence the places where it is found, or separated are called *lavadero's*.

This earth is usually reddish, and very fine, at about six foot deep it is mixed with grains of large dust; and from hence commences the stratum, or bed of *gold*. Between are banks of soft blueish stone, mixed with yellow threads, which yet are not *gold*, but only pyrites, or marcasite of *gold*.

When they have discovered any of this earth, they endeavour to bring rivulets to it (which in those mountains are very frequent) in order, by force thereof, to tear off the upper earth, and lay the golden stratum bare. This they forward by loosening it, and digging with spades, &c. As soon as the golden earth is uncovered, they turn off the water; and dig up the soil by force of arm; and loading it on mules, carry it to the *lavadero's*, i. e. a sort of basins of water, where the earth undergoing divers repeated lotions, in different waters, the earthy, and impure part is all separated and carried off by the stream, and the *gold* left at bottom.

This method of getting *gold* is immensely gainful; the expences being but trifling, compared with those accruing in the common way by machines, fire, and quicksilver: the richest of these *lavadero's* is that de l'Estancia del Rey, twelve leagues from the Conception, a port of the South Sea. —Thuringia, and some other places along the Rhine, are the only places in Europe, where *gold* is got in this manner.

The *gold* of mines is of two kinds; the one in small pieces, or grains of various forms, and weights. Of this sort, among the specimens sent by Columbus into Spain, to let them see the richness of his discovery, there were some of eighteen ounces weight; and the relations of those days assure us, that in 1502 there were others found of thirty two pounds weight.

The other kind of *gold* is dug up in stony gleans, which is what they call the *mineral*, or *ore* of *gold*: these gleans are of various colours, and lie usually one hundred and fifty, or one hundred and sixty fathom deep. Along with the *gold* they usually contain some other mineral matter, as antimony, vitriol, sulphur, copper, or silver; particularly the last; without some share of which it is scarce ever found.

Manner of separating GOLD.—They first break the metalline stone with iron mallets, pretty small; then carry it to the mills, where it is ground into a very fine powder; and lastly pass it through several brass-wire sieves one after another, the last as fine as any of our silk sieves.

The powder thus prepared is laid in wooden troughs with a proper quantity of mercury and water, and there left to knead and saturate in the sun and air for twice twenty four hours. After this the water, with the recementitious earth is drove out of the tubs by means of other hot waters, poured thereon. This done there remains nothing but a mass of mercury with all the *gold* that was in the ore. The mercury they separate from it by distillation in large alembicks. The *gold*, in this state, is called *virgin gold*; as well as that found in the sand of rivers, or that in grains in the mines; in regard none of them have passed the fire. After this, they usually fuse it in crucibles, and cast it into plates, or ingots.

Manner of refining GOLD.—There are three principal manners of refining *gold*; the first with antimony; the second with sublimate; and the third with aqua fortis. This last, which is called *departing*, or *parting*, is already described under the article DEPART, and the two former see under REFINING.

Beside these three, there are other methods of refining *gold*; particularly that called *cupellation*, which is performed with lead and ashes; and that called *cementation*, by means of a composition of brick dust, common salt, sal ammoniac, sal

gemma, and urine. See COPPEL, CEMENT, and CEMENTATION.

The assaying of GOLD, is performed with the touchstone, but more securely by fire. See TOUCH-STONES, and ESSAYING.

For the making of GOLD, see PHILOSOPHERS STONES, and TRANS-MUTATION.

GOLD WIRE, is a cylindrical ingot of silver, superficially gilt, or covered with gold, at the fire; and afterwards drawn successively through a great number of little round holes of a wire-drawing iron, each less than the other, till it be sometimes no bigger than a hair of the head. See WIRE.

It may be observed, that before the wire be reduced to this excessive fineness, it is drawn through above an hundred and forty different holes; and that each time they draw it, it is rubbed with new wax, both to facilitate its passage, and to prevent the silver's appearing through.

It is amazing to what degree of fineness the gold is here drawn; and yet it still keeps firm together, and never shews the least signs of the silver underneath it. The reader may see a computation hereof, as also a more particular account of the manner of proceeding, under the article DUCTILITY of gold.

GOLD WIRE flattened, is the former wire flatted between two rollers of polished steel, to fit it to be spun on silk, or to be used flat as it is, without spinning, in certain stuffs, laces, embroideries, &c.

GOLD THREAD, or spun GOLD, is a flatted gold wrapped, or laid over a thread of silk, by twisting it with a wheel, and iron bobbins.

The methods of managing and drawing gold and silver both real and seeming in all these kinds, are very curious, and of great use in commerce.

Manner of forming GOLD WIRE, and GOLD THREAD, both round and flat.—First, an ingot of silver of twenty-four pound is forged into a cylinder of about an inch in diameter: then it is drawn through eight or ten holes of a large, coarse, wire-drawing iron, both to finish the roundness, and to reduce it to about three-fourths of its former diameter. This done, they file it very carefully all over, to take off any filth remaining of the forge: then they cut it in the middle, and thus make two equal ingots thereof; each about twenty-six inches long; which they draw through several new holes to take off any inequalities the file may have left, and to render it as smooth, and equable as possible.

The ingot thus far prepared they heat it in a charcoal fire: then, taking some gold leaves, each of about four inches square, and weighing twelve grains; they join four, eight, twelve, or sixteen of these together, as the wire is intended to be more, or less gilt; and when they are so joined as only to form a single leaf, they rub the ingots, reeking hot, with a burnisher.

These leaves being thus prepared, they apply over the whole surface of the ingot to the number of six, over each other burnishing or rubbing them well down with the blood-stone, to close and smoothen them.

When gilt, the ingots are laid a-new in a coal fire; and when raised to a certain degree of heat, they go over them a second time with the blood-stone, both to folder the gold more perfectly, and to finish the polishing.

The gilding finished, it remains to draw the ingot into wire. In order to this, they pass it through twenty holes of a moderate drawing iron, by which it is brought to the thickness of the tag of a lace: from this time, the ingot loses its name, and commences gold wire. Twenty holes more of a lesser iron, leave it small enough for the least iron; the finest holes of which last, scarce exceeding the hair of the head, finish the work.

To dispose the wire to be spun on silk, they pass it between two rollers of a little mill: these rollers are of nicely polished steel, and about three inches in diameter. They are set very close to each other, and turned by means of a handle fastened to one of them, which gives motion to the other. The gold wire in passing between the two, is rendered quite flat; but without losing any thing of its gilding; and is rendered so exceedingly thin, and flexible; that it is easily spun on silk thread, by means of a hand-wheel; and so wound on a spool, or bobbin.

GOLD LEAF, or beaten GOLD, is gold beaten with a hammer, into exceedingly thin leaves.

It is prodigious to consider the fineness they will thus reduce a body of gold to: it is computed, that an ounce may be beaten into sixteen hundred leaves, each three inches square; in which state it takes up more than 159092 times its former space.

This gold they beat on a block of marble, commonly black marble, about a foot square, and usually raised three foot high: They make use of three sorts of hammers, formed like mallets, of polished iron. The first, which weighs three or four pounds, serves to chafe, or drive; the second, of eleven or twelve pounds, to close; and the third, which weighs fourteen or fifteen pounds, to stretch and finish.

They also make use of four moulds, of different sizes; viz. two of vellum, the smallest whereof consists of forty or

fifty leaves, and the larger, of two hundred: the other two, consisting each of five hundred leaves, are made of bullocks guts, well scoured and prepared. See MOULD.

The method of preparing, and beating GOLD.—They first melt a quantity of pure gold, and form it into an ingot: this they reduce, by forging, into a plate about the thickness of a sheet of paper: which done, they cut the plate into little pieces about an inch square, and lay them in the first, or smallest mould, to begin to stretch them. After they have been hammered here a while with the smallest hammer, they cut each of them into four; and put them in the second mould to be extended further.

Upon taking them hence, they cut them again into four, and put them into the third mould; out of which they are taken, divided into four, as before, and laid in the last, or finishing mould; where they are beaten to the degree of thinness required.

The leaves thus finished, they take them out of the mould, and dispose them in little paper books prepared with a little red bole, for the gold to stick to: each book ordinarily contains twenty-five gold leaves.

There are two sizes of these books: twenty-five leaves of the smallest only weighs five or six grains; and the same number of the largest nine, or ten grains.

It must be observed that gold is beaten more, or less, according to the kind, or quality of the work it is intended for: that for the gold-wire-drawers to gild their ingots withal, is let much thicker, than that for gilding the frames of pictures, &c. withal.

Shell GOLD is that used by the illuminers; and wherewithal we write gold letters.—It is made of the parings of leaf gold, and even of the leaves themselves, reduced into an impalpable powder, by grinding on a marble, with honey. After leaving it to infuse some time in aqua fortis, they put it in shells, where it sticks. To use it, they dilute it with gum water, or soap water.

Burnished GOLD, is that smother'd, or polished with a steel instrument called a burnisher, if it be wrought gold, or gilding on metal; or with a wolf's tooth, if it be gilding in water.

Million of GOLD, is a phrase often used to signify a million of crowns. See CROWN.

Tun of GOLD, is a kind of money of account, used by the Dutch, and in some other countries; containing an hundred thousand florins.

A hundred pounds of, or in, gold is found to weigh two pound ten ounces: the same sum in silver, weighs twenty-six pound, four ounces. Twenty-two pence, in copper farthings and half-pence, weigh one pound avoirdupois.

A tun of gold, at 4*l.* the ounce, amounts to 6000*l.* a tun of silver, at 5*s.* 2*d.* the ounce, to 6200*l.* A pound sterling of gold, to 48*l.* An ounce is worth 4*l.* The penny-weight 4*s.* One grain, 2*d.* A pound of sterling silver amounts to 3*l.* 2*s.* An ounce is worth 5*s.* 2*d.* The penny-weight, 3*d.* and something more; one grain, a half-penny. A pound of silver avoirdupois comes to 3*l.* 5*s.* 3*d.* halfpenny.

GOLD COIN, or Species of GOLD. See COIN.

Mosaic GOLD, is gold applied in panels on a proper ground, distributed into squares, lozenges, and other compartments; part whereof is shadowed to raise, or heighten the rest. See MOSAIC.

Virgin GOLD, is pure gold, just as it is taken out of the mines before it has undergone any action, or preparation of fire: whence the Greeks call it *αργυρος*. See VIRGIN. Such is the *αυροχρυσος*, or gold dust, and that got by lotion in the lavender's in Chili: it is added, that there are masses, or lumps of pure gold found in the mines, particularly those of Hungary. Accordingly, in the emperor's collection are still preserved, several plates of gold, said to have been thus found.

Virgin gold is sometimes very pale, and so soft that it may be moulded into any figure with the hand: it even takes an impression from a seal, like the softest wax. To harden it, as also to heighten its colour, they mix emery with it.

Fine, or pure GOLD, is that purged by fire of all its impurities, and all alloy.—The Latins call it *aurum purum*, *aurum primum*, *aurum orbisum*, and *aurum coctum*.

The moderns frequently call it gold of twenty-four carats; but, in reality, there is no such thing as gold so very pure; and there is always wanting at least a quarter of a carat. Gold of twenty-two carats has one part of silver, and another of copper: that of twenty-three carats has half a part, i. e. half a twenty-fourth of each.

Bouteroue maintains, that the electrum of the antients was gold of nineteen carats; or four parts gold, and a fifth silver.—From an ordinance of king John of France, it appears that the gold then struck at Paris was of nineteen carats; and yet it is added that it was the best and finest gold then known on earth. In England, at this time, the standard of crown gold is twenty-two carats.

GOLD chain, see the article CHAIN.

Cloth of GOLD, } See { CLOTH of Gold.
GOLD money, } See { MONEY.

Queen GOLD, see the article **QUEEN**.

Potable GOLD, *aurum potabile*, see **POTABLE GOLD**.

Fulminating GOLD, *aurum fulminans*, see **AURUM**.

GOLD, in medicine, and chemistry—The chemists make several preparations of *gold* for medicinal uses; as salts, mercuries, and tinctures of *gold*; but it is a point not yet well agreed on, whether *gold* have any real property whereby it may be of use in medicine.

The most ancient writers among physicians are all silent on the matter; the Arabs are the first who mention it in this quality.—*Avicenna* attributes extraordinary virtues to it; but he speaks on conjecture more than experiment. And yet it is pretty certain *gold* must have an effect: a quantity of *gold* slings being taken by a person in a bolus, he was very well purged thereby; but this might be owing to the great weight of its particles, which impinging violently against the glands of the intestines, promoted their vibrations, and thus expressed the humour secreted therein. *Borhhi*, in a letter to *Bartholin*, relates, that having heated an ingot of fine *gold* several times red hot, and extinguished it as often in water, he found the weight of the ingot considerably diminished; upon which, proceeding to evaporate the water, he drew a little quantity of *gold* from it. Hence it appears, that the subtle parts of the *gold* pass into the liquors it is extinguished in; and hence, it is argued, it may have considerable effects on the body.

Notwithstanding the small number of experiments whereon the medicinal efficacy of *gold* is founded; the alchemists will have it that this metal contains the radical balm of life, for the retrieving of health and youth, and the removal of all diseases. *Gold*, according to them, contains a sulphur friendly to nature, like that of the sun, which animates the whole universe; and on this principle they have formed a thousand airy projects for an universal remedy.

In effect, 'tis probable the Arabs and alchemists were only brought to attribute all these virtues to *gold*, from their perceiving certain qualities therein, which they supposed it must communicate to other bodies. Thus, *e. gr.* *gold* being commonly said to be incapable of being destroyed; it is hence concluded to be proper to preserve animal matters, and defend them from putrefaction: which is just as reasonable as some physicians prescribing the blood of an ass's ear as an appeasing remedy, by reason the ass is a very peaceable animal. See **AURUM POTABILE**.

GOLD, in heraldry, is one of the metals; more usually called by the French name, *or*. See **METAL**, and **OR**.

GOLDEN, something that has a relation to *gold*, or consists of *gold*, is valuable like *gold*, or the like. See **GOLD**.

GOLDEN BULL, *bulia aurea*, see the article **BULL**.

GOLDEN CALF, was a figure of a calf, which the Israelites cast in that metal, and set up in the wilderness, to worship; during *Moses*'s absence in the mount; and which that legislator, at his return, burnt, ground to powder, and mixed with the water the people were to drink of; as related *Exod. xxxii*. The commentators have been greatly divided on this article: the pulverizing of *gold*, and rendering it potable, is an operation in chemistry, of the last difficulty; and it is hard to conceive how it should be done at that time, before chemistry was ever heard of, and in a wilderness too! Many therefore, suppose it done by a miracle: and the rest, who allow of nothing supernatural in it, advance nothing but conjectures, as to the manner of the process.

Moses could not have done it by simple calcination, nor amalgamation, nor antimony, nor calcination; nor is there one of those operations, that quadrates with the text.

M. Stahl has endeavoured to remove this difficulty. The method *Moses* made use of, in making his *aurum potabile*, according to this author, was the same with that which now obtains; only instead of tartar, he made use of the Egyptian natron, which is common enough throughout the east.

GOLDEN FLEECE, in the ancient mythology, was the skin, or fleece of the ram, upon which *Phryxus* and *Hella* are supposed to have swam over the sea to *Colchis*; and which being sacrificed to *Jupiter*, was hung upon a tree in the grove of *Mars*, guarded by two brazen-hoof'd bulls, and a monstrous dragon that never slept; but at last taken and carried off by *Jason*, and the *Argonauts*.

Many authors have endeavoured to shew that this fable is an allegorical representation of some real history, particularly of the philosopher's stone.

Order of the GOLDEN FLEECE, is a military order instituted by *Philip the Good*, duke of *Burgundy*, in 1429. See **ORDER**. It took its denomination from a representation of the *golden fleece*, bore by the knights on their collars, which consisted of flints and steels. The king of *Spain* is now grand master of the order, in quality of duke of *Burgundy*: the number of knights is fixed to thirty-one.

It is usually said to have been instituted on occasion of an immense profit which that prince made by wool; though others will have a chemical mystery couched under it, as under that famous one of the ancients, which the adepts contend to be no other than the secret of the elixir, wrote on the fleece of a sheep.

Oliver de la Marche writes that he had suggested to *Philip I.* archduke of *Austria*, that the order was instituted by his grandfather *Philip the Good*, duke of *Burgundy*, with a view to that of *Jason*; and that *John Germain*, bishop of *Chalons*, chancellor of the order, upon this occasion made him change his opinion, and assured the young prince that the order had been instituted with a view to the fleece of *Gideon*. *William* bishop of *Tournay*, chancellor likewise of the order, pretends that the duke of *Burgundy* had in view both the golden fleece of *Jason*, and *Jacob's fleece*, *i. e.* the speckled sheep belonging to this patriarch, according to agreement made with his father-in-law *Laban*. Which sentiment gave birth to a great work of this prelate in two parts: in the first, under the symbol of the fleece of *Jason*, is represented the virtue of magnanimity, which a knight ought to possess; and under the symbol of the fleece of *Jacob*, he represents the virtue of justice.

Paradin is of the same mind, and tells us that the duke designed to insinuate that the fabulous conquest which *Jason* is said to have made of the golden fleece in *Colchis*, was nothing else but the conquest of virtue, which gains a noble victory over those horrible monsters vice, and our evil inclinations.

GOLDEN NUMBER, in chronology, a number shewing what year of the moon's cycle, any given year is. See **CYCLE OF THE MOON**, and **NUMBER**.

To find the **GOLDEN NUMBER** of any year since *Christ*.—Since the lunar cycle commences with the year before our Saviour's birth; to the year of our Lord add 1: then dividing the sum by 19; the sum remaining after the division is the golden number required: if there be nothing remaining, the golden number is 19. Suppose, *e. gr.* the golden number of the year 1725, were required: 1725 ÷ 19 = 1726. And 1726, divided by nineteen, gives a quotient of nine, and leaves a remainder of sixteen, which is the golden number of that year.

The golden number is used in the Julian calendar, to shew on what days the new moons fall: in succession of time, however, it must be observed, that the golden numbers, through the defect of the lunar cycle, recede, and do no longer shew the true time of new moons, &c.

Hence, in the Gregorian reformation of the calendar, the golden number is thrown out; and the epact introduced in lieu thereof.

GOLDEN PREBENDARY of *Hersford*, see **PREBENDARY**.

GOLDEN RULE, in arithmetick, a rule or praxis, of great use, and extent in the art of numbers; whereby we find a fourth proportional to three quantities given.

The golden rule is also called the *Rule of Three*, and *Rule of Proportion*. See its nature and use under the article **RULE OF THREE**.

GOLDEN sulphur of antimony, } See { **ANTIMONY**.
Order of the GOLDEN Stole. } See { **STOLE**.

GOLPS, in heraldry, are roundels, or torteaux of a purple colour.

GOMPHOSIS *, in anatomy, a kind of articulation of the bones, wherein one is chafed, or fitted immovably into another, after the manner of a peg, or nail. See **ARTICULATION**.

* The word is Greek γομφος, formed of γομφος, clavus, a nail, or peg.

The teeth are set in the jaws by gomphosis. See **TOOTH**, and **MAXILLA**.

GONAGRA *, in medicine, the gout in the knee. See **GOUT**.

* The word is composed of γονυ, knee, and αγκυ, captura, seizing.

GONARCHA, a term in the ancient dialling.—*Mr. Perrault*, in his notes on *Vitruvius*, lib. ix. c. 9. takes the gonarcha to have been a dial drawn on divers surfaces, or planes; some of which being horizontal, others vertical, others oblique, &c. formed divers angles *.

* Whence the appellation; from γονυ, knee, or γωνια, angle.

GONDOLA *, a little, flat boat, very long and narrow; chiefly used at *Venice*, to row on the canals. See **BOAT**.

* The word is Italian, gondola: *Du Cange* derives it from the vulgar Greek κωνιδιαις, a bark, or little ship; *Lancelot* deduces it from γωνια, a term in *Athenæus* for a sort of vase.

The middle sized gondola's are upwards of thirty foot long, and four broad: they always terminate at each end in a very sharp point, which is raised perpendicularly the full height of a man.

The address of the Venetian gondoliers, in passing along their narrow canals, is very remarkable: there are usually two to each gondola; and they row by pushing before them. The foreman rests his oar on the left side of the gondola: the hindman is placed on the stern, that he may see the head over the tilt, or covering of the gondola; and rests his oar, which is very long, on the right side of the gondola.

GONFALON, or **GONFANON**, a kind of round tent, bore as a canopy, at the head of the processions of the principal churches at *Rome*, in case of rain; its verge, or banner, serving for a shelter, where there is not a great deal of attendance.

GONORRHOEA *, *Porrephia*, in medicine, an involuntary flux or dripping of seed, or other humour, by the penis; without erection, or titillation.

* The word is formed of the Greek *γενε*, *genitura*, seed, and *ρροια*, a flow.

The *Gonorrhoea* is of two kinds; the one *simple*, the other *virulent*.

Simple GONORRHOEA, or that without virus, or malignity, takes its rise from violent exercises, and frainings; the immoderate use of hot foods, and particularly fermented liquors, as wine, beer, cyder, &c. It is cured by indulging rest, nourishing foods, broths, &c.

This species is again divided into two; the one *true*, the *gonorrhoea vera*, wherein the humour discharged is real seed: the other *spurious*, the *gonorrhoea notha*, wherein the dripping humour is not seed, but a matter from the glands about the prostate. See PROSTATES.

This latter kind bears some resemblance to the fluor albus, or whites, in women; and frequently remains a long time, without much diminution of the patient's strength. Some call it a *catarrhal gonorrhoea*. Its seat is in the glands of the prostate, which are either too much relaxed or ulcerated.

Virulent GONORRHOEA, *gonorrhoea virulenta*, arises from some impure commerce, and is the first stage of the venereal disease; being what we properly call a *clap*.

The parts here primarily affected, are the prostate in men, and lacryæ in women, which being ulcerated by some contagious matter received in coition, emit, first, a whitish, watery liquor, with an acute pain: this afterwards grows yellowish, then sharper, and at length greenish or bluish, and frequently foetid. It is attended with a tension and inflammation of the yard, and an ardor urinæ, or sharpness of urine, which gives a painful sensation in the emission; the urinary passage being torn and excoriated by the acrimony of the humour.

Hence arise tumors of the prepuce, and glans, with ulcers on the fame; and sometimes in the urethra.

The cause of the virulent *gonorrhoea*, according to M. Litre, is some sharp or acid humour, heated, rarified, and raised at the time of coition, from the internal parts of the pudendum of a woman infected, and lodged in the urethra of the man. It has different seats in the body: sometimes it only fixes on Cowper's mucous glands; sometimes on the prostate; and sometimes on the vesiculae seminales: sometimes it possesses two; and sometimes all three of these places at once.

From this diversity of seats of the *gonorrhoea virulenta*, M. Litre makes two sorts; *simple*, which only affects one of the three parts; and *compound*, or complicated, where several are affected.

That seated in the mucous glands, he observes, may remain simple, through the whole course of the disease, by reason the mouths of those glands open into the urethra an inch and half on this side the prostate, and also look down towards the glans; so that their liquor is easily discharged. The other two sorts mutually produce each other; by reason the ducts of the vesiculae seminales terminate in the urethra in the middle of those of the prostate; so that there is an easy communication between them.

That seated in the mucous glands, is much the rarest case, and is the easiest cured. The cure is effected by emollient cataplasms, and fomentations upon the part, and a half-bath. *Mém. de l'Acad. ann. 1711.*

For the other species, more powerful means are to be used.—

The principal remedies are mercurial purges, an emulsion of green hempseed, cuttle-fish-bone, turpentine, sacch. saturni, &c. We have likewise great commendations of green precipitate of mercury, and mercur. dulcis. Bals. saturni terebinthinatum, prepared with a gentle fire, of sacch. saturni, and oil of turpentine, is much applauded where the heat is great about the reins and genitals; as also camphor. An infusion of cantharides in wine, is the nostrum of a noted Dutch physician. Resin of the wood guaicum is also recommended; and balsam of cupaiba is held a sort of specific: to which must be added antimonium diaphoreticum, bezoardicum minerale, water wherein mercury has been boiled; injections of lime-water, mercurius dulcis, saccharum saturni, &c.

Pitcairn's method of curing the *Gonorrhoea virulenta*, is as follows: in the beginning of the disease, he purges with a laxative pilsau of senna, salt of tartar, and melilot flowers; and gives the patient whey for his drink. After three, or four days spent in this purging, if the scalding of the matter improved; he administers bolus of turpentine, and rhamnium, for six or seven days; and if they keep the body loose, so much the better. By all means, astringents to be avoided; the *Gonorrhoea* being scarce ever known to degenerate into a pox, unless too hastily stopped. Pitcairn in MS. Du Blegny directs the cure of the *Gonorrhoea*, to begin with a gentle cathartic of castia, senna, crystal mineral, tamarinds, althæa, and thubarb, administered every other day: then,

diuretics, particularly those of turpentine; and lastly, gentle astringents; as mineral waters, crocus martis astringens, tincture of roses, tincture of coral in cochineal, &c.

A pyalasin, or salivation, never cures a *Gonorrhoea*.

GOOD, or GOODNESS, denotes whatever tends, or conduces to preserve, or improve human nature, or society; in opposition to *evil*, which tends to destroy, injure, or impair the same.

Hence *Good* is divided by the philosophers into, 1^o, *bonum sui*, private *good*; which is that whereby a thing tends to preserve, &c. itself; under which comes that popular division of *goods* of body, mind, and fortune.

2^o, *Bonum communionis*, whatever promotes the interest and welfare of society; as all the civil offices, &c.

GOOD, in metaphysics, or metaphysical GOOD, called also *absolute*, or *real GOOD*, and *Good per se*, is the essential perfection, or integrity of a thing, whereby it has every thing that belongs to its nature.

In this sense all things that are, are *good*; inasmuch as they have the perfections naturally belonging to things of their kind. Thus, a thinking substance is *good*, or perfect, as it has all the essential attributes of thought: so an extended substance is *good*, as it possesses all the parts necessary to constitute it such.

In effect, as it is absurd to imagine a being without its essence; so is it, to imagine a being without the requisites of its essence: so that it appears an error in some philosophers, who divide beings into good or perfect, and evil or imperfect. See ESSENCE.

Others define metaphysical, or transcendental *goodness*, by congruency with the divine will; as making that the measure of all real *goodness*.

Physical, or *natural GOOD*, is that whereby a thing possesses all things necessary to its *bonè esse*, i. e. its well-being, or second perfection; and to the performance of its functions, and uses.

In this sense, physical *goodness* coincides with physical perfection.

To this are required the several powers and faculties, in their proper degree; a due situation, figure, and proportion of parts, &c.

Note, beside absolute physical *goodness*, there may be a *relative* one; as in foods, which to one man are salutary, to another poison, &c. To this head also belong the things *good pro tempore*, or according to circumstances; as the amputation of a mortified limb; &c.

Moral, or *ethical GOOD*, is the agreement of a thinking, reasonable being, and of the habits, acts, and inclinations thereof, with the dictates of right reason, and the will of the creator, as discovered by natural light. See VIRTUE.

In order to this, it is not enough that a thing done, said, thought, desired, be just and *good*; but it must be done, thought, &c. well, i. e. from *good* principles, and to *good* ends.

Others define moral *good* more largely. *Moral*, which they also call *relative good*, according to them, is something that is good to another, or that tends some way to the perfection thereof.—In this sense they divide it into three kinds, *bonestum*, *jucundum*, and *utile*.

The first, *bonum honestum*, is what agrees with right reason; and is desirable for itself; as all things virtuous: *i. gr.* to love God, respect our parents, &c. It is considered without any regard to pleasure; not but that there is a sincere pleasure annexed to it. Zeno, and the Stoics allow of no other *goods*; those of the body, &c. they call *commoda*, conveniences, not *goods*.

Bonum jucundum, is that which is good, as it tends to give us pleasure, and is desired on that account: but without any repugnancy to virtue, or right reason: as music, to the ears; painting, to the eyes, &c.

Bonum utile, or *commodum*, is that which is good on account of something else for which it is desired; as money, riches, &c.

Chief, or *supreme GOOD*, *summum bonum*; see SUMMUM BONUM.

Philosophers are divided as to what the *chief good* of man consists in; whether in the *goods* of fortune, of body, or of mind. Some hold riches and honours the supreme *good*; others, as Aristippus, and the Cyrenaic school, bodily pleasures; and others, as Zeno and the Stoics, virtue.

GOOD will, } See } COMMON place.

GOOD works, } See } MERIT, and SUPEREROGATION.

GOOD abearing, *bonus gestus*, in a law sense, is particularly used for an exact carriage, or behaviour of a subject towards the king, and his liege people; to which some men, upon their misbehaviour, are bound.

He that is bound to this, Lambard says, is more strictly bound than to the peace; because, whereas the peace is not broken without an affray, battery, or such like, this *bonus gestus* may be forfeited by the number of a man's company, or by his, or their weapons, or arms.

G O R

Good *aller*, }
 Good *behaviour*, } see { ALLER.
 Good *taste*, } { GOOD *abearing*, and PEACE.
 } { TASTE.

GOODS, *bona*, in law, and particularly the civil law, include all kinds of effects, riches, lands, possessions, &c.

There are two kinds of goods; *moveable, res moventes*, or *mobiles*; and *immoveable*, called *res non moventes* or *immobiles*.

It is a maxim in the civil jurisprudence, that he who confiscates the body, confiscates the goods; meaning that all the effects of a person condemned to a capital punishment, or perpetual banishment, are forfeited to the king.

A man is said to bind himself body and goods; meaning that besides his goods he obliges his person, and submits to remain in prison, provided he do not execute his promise.

Goods, again, are divided into 1^o, *proper, paternal, patrimonial, hereditary*; 2^o, *acquired, or acquisit, alio quam hereditatis jure acquisita*; and 3^o, *conquests; viro & uxori stante societate acquisita*.

Goods again are divided into *real and personal*. See **REAL**, and **PERSONAL**.—And lastly, into *noble, or free*; and *servile, or base*. See **FREE**, **BASE**, &c.

Goods belonging to the domain of the crown, *ad fiscum spectantia*, cannot be alienated for ever; unless it be done by way of exchange: they may be sold under the faculty of perpetual redemption.

Adventitious Goods, *adventitia*, are those which arise otherwise than by succession from father or mother; or from direct ancestor to descendant.

Dotal Goods, *dotalia*, those accruing from a dowry, and which the husband is not allowed to alienate. See **DOWRY**.

Fugitive Goods; see the article **FUGITIVE**.

Paraphernal Goods, *paraphernalia*, are those which the wife gives her husband to enjoy, on condition of withdrawing them when she pleases.

Prohibited Goods; see the article **PROHIBITED**.

Profecitious Goods, *profecitia*, are those arising by direct succession.

Receptitious Goods, were those which the wife might reserve the full property of to herself, and enjoy them independently of her husband: so called in distinction from *dotal*, and *paraphernal goods*.

Vacant Goods, *vacantia*, are those abandoned, or left at large, either by reason the heir renounces them, or that the defunct has no heir.

Allotting of Goods, }
 Consignment of Goods, } see { ALLOTING.
 Running of Goods, } { CONSIGNMENT.

GORDIAN, a term in history.—**GORDIAN knot** was a knot made in the leathers, or harness of the chariot of Gordius, king of Phrygia, and father of Midas; so very intricate, that there was no finding where it began, or ended.

The inhabitants had a tradition, that the oracle had declared that he should be master of Asia who could untie this knot. Alexander having undertaken it, and fearing that if he should not be able to effect it, it would be deemed an ill augury, and prove a check in the way of his conquests; cut it asunder with his sword: and thus, says Quintus Curtius, either accomplished the oracle, or eluded it.

Some will have the phrase derived from Gordius, who tied the fatal knot; others, from Gordio, a city in Phrygia, where the knot was made.

GORE, in heraldry, denotes one of the regular abatements, used, according to Gwillim, to denote a coward. See **ABATEMENT**.

It consists of two arches, or curve lines, drawn, one from the sinister chief, the other from the sinister base, and meeting in an acute angle in the middle of the fess-point; as represented in *Tab. Herald.* fig. 64.

GOREL, a name, or title, given to the prince of Georgia.—The *Gorel* is always a Mahometan. The Sophi of Persia obliges him to observe the religion of the Alcoran, in order to preserve the dignity of *Gorel* in his family.

GORGE, in falconry, is the uppermost bag, or stomach of a hawk, or falcon; being that which receives the food the first.

The *gorge, ingluviæ*, is the fame in birds of prey with what we call the *craw*, or *crop*.—When the bird is fed, he is said to be *gorged*.

GORGE, in architecture, denotes a sort of concave moulding, wider, but not so deep as a scotia; used chiefly in frames, chambranes, &c. See *Tab. Archit.* fig. 6, and 8. See also **SCOTIA**.

GORGE of a chimney, is the part between the chambrane, and the crowning of the mantle.—Of this there are divers forms, straight, perpendicular, in form of a bell, &c.

GORGE is sometimes also used for a moulding that is concave in the upper part, and convex at bottom; more properly called *gula*, and *cygnatium*. See **GULA**, and **CYGNATIUM**.

GORGE is also used for the neck of a column; more properly called *collarino*, and *gorgerin*. See **GORGERIN**, &c.

G O T

GORGE, in fortification, the entrance of a bastion; or of a ravelin, or other out-work. See **BASTION**, **RAVELIN**, &c.

The **GORGE of a bastion** is what remains of the sides of the polygon of a place, after retrenching the curtains: in which case it makes an angle in the centre of the bastion.—Such is *AHD Tab. Fortif.* fig. 1.

In flat bastions, the *gorge* is a right line on the curtain, reaching between the two flanks.

GORGE of a half-moon, or ravelin, is the space between the two ends of their faces next the place.

Gorge of the other out-works, is the interval betwixt their sides next the ditch.

All the *gorges* are to be made destitute of parapets; otherwise, the besiegers having taken possession of a work might make use thereof to defend themselves from the shot of the place: so that they are only fortified with paliadoes, to prevent a surprize.

Half the GORGE, demi-GORGE, that part of the polygon between the flank and the centre of the bastion, as *AH*. See **DEMI-gorge**.

GORGED, in heraldry, is when a crown, coronet, or the like thing is bore about the neck of a lion, a swan, &c. In that case they say, the lion, or cygnet, is *gorged* with a ducal coronet, &c.

Gorged is also used when the gorge, or neck, of a peacock, swan, or the like bird, is of a different colour, or metal from the rest.

GORGED, among farriers, &c. signifies as much as swelled.—In which sense they say, the legs of a horse are *gorged*; the paster joint is *gorged*: you must walk him out to *disgorge* his shoulder.

GORGERIN, a part of the antient armour; being that which covered the throat, or neck of a person armed at all points.

GORGERIN, or **GORGE**, in architecture, the little frieze in the doric capital, between the astragal, at the top of the shaft of the column, and the annulets.—See *Tab. Archit.* fig. 24. lit. e. fig. 28.

Some call it *collarino*. Vitruvius gives it the name *hypotrachelium*.

GOTHIC, or **GOTHICK**, something that has a relation to the Goths, an antient people, originally inhabiting that part of Sweden called *Gothland*; whence they spread themselves over Greece, Dalmatia, Bulgaria, Italy, Spain, &c.

We say, the *gothic manner, gothic ignorance*: the tyrant Maximin was of *gothic* race.

GOTHIC Bibles; see the article **BIBLE**.

GOTHIC character, or writing, is a character, or manner of writing, which, in the main, is the same with the Roman, only that it is very full of angles, turns, and bendings; especially at the beginning and ending of each letter.

The manuscripts in *gothic* characters are not very antient.—Ulphilas, bishop of the Goths, was the first inventor of the *gothic* characters; and the first that translated the bible into the *gothic* tongue.

The runic characters are also frequently called *gothic* characters. See *Mabillon, de re Diplomat.* l. i. c. 2.—But they who take the *gothic* characters to be the same with the runic, are mistaken; as is shewn by Ol. Wormius, Junius in his preface to the gospels wrote in *gothic* letters, and Dr. Hicks on the runic tongue.

GOTHIC architecture, is that which deviates from the proportions, characters, &c. of the antique.

The *gothic* architecture, it frequently very solid, heavy, and massive; and sometimes, on the contrary, exceedingly light, delicate, and rich. An abundance of little, whimsical, impertinent ornaments, are its most usual character.

Authors distinguish two kinds of *gothic* architecture; the one antient, the other modern.—The antient is that which the Goths brought with them from the north, in the fifth century: the edifices built in this manner were exceedingly massive, heavy, and coarse.

Those of the *modern gothic* run into the other extreme, being light, delicate, and rich to a fault: witness Westminster abbey, the cathedral of Litchfield, the cross of Coventry, &c.

The last kind continued long in use, especially in Italy, viz. from the thirteenth century, to the restauration of the antique building in the sixteenth. All the antient cathedrals are in this kind.

The inventors of the *gothic* architecture thought, no doubt, they had far surpassed the Greek architects: a Greek building has not a single ornament but what adds a beauty to the whole. The parts necessary to sustain, or shelter it, as the columns, corniches, &c. derive all their beauty from their proportions: every thing is simple, measured, and restrained to the use it is intended for. No daring, out of the way strokes; nothing quaint to impose on the eye: the proportions are so just, that nothing appears very grand of itself, though the whole be grand. On the contrary, in the *gothic* archi-

architecture, we see huge vaults raised on slender pillars, which one would expect every minute to tumble down, though they will stand for many ages. Every thing is crammed with windows, roses, crosses, figures, &c.

GOTHICK column, is any round pillar, in a *gothic* building, either too thick, or too small for its height.

There are some found even twenty diameters high; without either diminution, or swelling.

GOTHIC medals; see the article **MEDAL**.

GOUD, or **GAUD**; see the article **WELD**.

GOVERNMENT, a quality, or office, which gives a man power, or right, to command, or rule over a place, a city, a province, a kingdom, or the like; either supremely, or by deputation.

Government is either *general*, and supreme, as that of a whole kingdom, empire, sovereign state, &c. or *particular*, and subordinate; which again is subdivided into *civil*, *military*, and *ecclesiastical*.

The *government* of the king's household belongs to the lord steward.

Our cities, corporations, and boroughs are usually *governed* by mayors, with aldermen, and common-council-men.

The king was called the *government* of England, by the free voices of the parliament, and the people. Such a lord bought the *government* of such a province, island, &c. The East India company nominate to the *government* of Fort St. George, &c.

GOVERNMENT is also used for the country, city, or place, to which the power of governing, or commanding, is extended.

Sanfon has given us maps of France, divided into its several *governments*. There are thirty-eight *governments*, or provinces in that kingdom, independent of each other. Beside these, there is another division into *governments*, called *grand governments*, whereof there are twelve, *viz.* those of the Isle of France, Burgundy, Normandy, Brittany, Picardy, Dauphiny, &c. which are not proper provinces, commanded each by its several governor, but rather so many classes of governors, or *governments*, contrived for the better, and easier regulating the seats, &c. of so many governors, bailiffs, prevoists, &c. as were obliged to assist at the holding of the general estates.

GOVERNMENT, again, is used for the manner, or form of *governing*, i. e. for the policy of a country, state, &c.

In this sense *governments* are divided into *monarchies*, *aristocracies*, and *democracies*.

The *government* of France is *monarchic*; that of Venice, *aristocratic*; and that of the United Provinces *democratic*: The *government* of England is *mixt*, being *monarchical*, *aristocratic*, and *democratic* all in one.

GOVERNMENT, in grammar, is understood of that construction of nouns, and verbs, wherein they require some alteration to be made in others joined, or constructed with them.

Construction is divided into two parts; that of *concord*; and that of *government*; called also *regimen*. See **CONCORD**.—The rules, or measures of *government*, or *regimen*, see under the article **REGIMEN**.

GOVERNOUR, an officer vested by a king, or sovereign prince, with the command and administration of a province, place, &c.

Such a *governour* being charged with mal-administration, was recalled, and brought to his trial.—A *governour* represents the king; and not only commands the garrison, troops, &c. but the citizens, &c.—A *governour* of a fortified place was antiently required to hold out three attacks, before he surrendered.

GOVERNOUR is also frequently used for a president, or superintendent.

Thus we say, the *governour* of the bank; the *governour* and directors of the South-Sea company; the *governour* of an hospital, &c.

GOUGE, an instrument used by diverse artificers; being a sort of round, hollow chisel; serving to cut holes, channels, grooves, &c. in wood, stone, &c.

GOUST, *Gout*, a French term, for what the Italians call *gusto*, and we, *taste*. See **TASTE**.

GOUT, *arthritis*, in medicine, a painful disease, occasioned by a flux of sharp humor, upon the joints of the body.

Some physicians define the *gout*, an inflammation, swelling, and painfulness of the joints.—Its origin is usually attributed to wine, venery, glutinous, and idleness.

The *gout* is supposed to arise from two causes: a redundancy of humors, and a weakness of the joints. Its proper seat is in the limbs; not in the trunk of the body: in the latter case it frequently proves mortal, not in the former.

Musgrave makes the apoplexy a *gout*, because arising from the abundance of pituita, or phlegm. According as this redundant pituita throws itself on the lungs, the liver, or any other part, it

makes, according to him, an apopleptic *gout*, a *gout* of the liver, of the lungs, of the spleen, &c.

The *gout* may be considered as a painful, periodical, and critical paroxysm, tending to free the body of an offensive, or corrosive matter, by throwing it upon the extremities; breathing it out insensibly; or communiting it so as to render it harmless, or capable of circulating freely along with the juices, till by collecting again, gradually increasing, or separating from the blood, it causes another paroxysm.

The *gout* is either *regular*, or *irregular*.—*Regular*, when it appears to be seated in the extremities of the body, returns at stated periods, and with a gradual increase and decline of the symptoms.—*Irregular*, when the paroxysms are frequent, and uncertain; when the symptoms vary, or happen promiscuously, and the disease appears to be seated in the internal parts of the body; as the stomach, brain, &c. leaving the extreme parts, as the hands, feet, &c. free from pain. According as different parts are affected by this distemper, it goes by several different names: when it seizes the feet, it is called *podagra*; when the knees, *gonagra*; when the hands, *chiragra*; and when the hip joints, *sciatica*, &c. See **PODAGRA**, **CHIRAGRA**, **SCIATICA**, &c.

Sometimes it attacks the whole body at the same time, and then it is called the *general* or *universal gout*.

The *gout* may be hereditary, or natural to the constitution, proceeding from a too great constriction of the capillary vessels, whence the gouty humor is more easily lodged, or detained in them. It may also proceed from high living, crapula's, and eating such things as are hard of digestion; a sedentary life, drinking too freely of tartarous wines; irregular living, excess in venery; an obstructed perspiration, and a suppression of the natural evacuations.

The immediate cause of the *gout* appears to be an alkaline, or acrimonious matter in the blood; which being separated from it at particular times, falls upon the joints, but most frequently upon the feet, and hands; which, if it be repelled, or if the blood be overcharged therewith, so that a crisis cannot be procured in the extremities (as generally happens in old age) it falls upon the nobler parts; and then produces the *irregular gout*.

The regular *gout* chiefly and immediately affects the tendons, nerves, membranes, and ligaments of the body, about the joints.—Sometimes a cold shivering fit precedes it, and generally a fever accompanies its first appearance, which soon goes off, and returns by intervals. A slight pain is felt in the joints, where the crisis is performed, which increases gradually; and in the *podagra* generally fixes first on the great toe; thence proceeding to the tarsus and metatarsus; sometimes, especially in old age, it attacks the knees and hands; and wherever it is, by distending and irritating the parts, it causes a violent pain, not unlike to that of a dislocated bone. When the pain is at its state, there appears an inflammation and swelling; both which increase as the pain increases; and upon their remission, the paroxysm is ended; though the tenderness and swelling in severe fits, will sometimes remain a longer time, and cause an uneasiness upon motion.

It is observed, that women, children, and young men, are seldom troubled with the *gout*, unless it be hereditary; and that it rarely attacks before the patient is thirty-five, or forty years old, and sometimes not till the decline of life; that the corpulent are more subject to it, than those who are spare, and lean; that the pain increases towards night, and decreases towards the morning; that the longer the intervals between the paroxysms, the more severe they prove, and the longer they generally continue.

The disease usually returns twice a year, *viz.* in the spring, and autumn; and in the latter the paroxysm is sometimes two, or three months, before it comes to a period: though its duration is at other times not above three or four weeks.

These are called *cardinal paroxysms*, to distinguish them from others of less duration, which happen between the spring and autumn. The more high-coloured the urine, and the less sediment it deposits; the further is the disease from the state of *concoction*, as it is termed. According to the violence and continuance of the fever, the paroxysm proves more or less severe.

In constitutions much broke or shattered with the *gout*, there are usually stony, or chalky concretions formed in the joints of the fingers, or toes, and thence translated to the viscera; which case is often attended with irregular, frequent, and short paroxysms in the extremities. In the decline of life, when the usual fits do not happen; or if the *gouty* matter be suddenly repelled from the extremities by an improper regimen, or medicines; it usually seizes the internal parts, and frequently the stomach, head, intestines, &c. causing want of appetite, reaching to vomit, indigestion, a cachexia, the jaundice, asthma, diarrhæa; and at last, so obstructs the fine capillary, nervous tubes (especially those of the stomach, and brain) as possibly to hinder the flux of the animal spirits: upon which death suddenly ensues.

Sydenham gives us an accurate history of a regular fit of the

gout in the feet: it begins towards the close of January, or beginning of February, without the least previous notice; except, perhaps, a crudity, or apoplexy for some weeks beforehand; with a sort of windy intumescence, and a heaviness of the body, which continually increases, till at last, a paroxysm breaks out; being preceded, some days, with a sort of torpor, and a sensible descent of the flatulencies through the flesh of the thighs, with some spasmodic symptoms. The day before the paroxysm, the patient's appetite is very greedy; an hour or two after midnight he is waked by a pain, commonly in his great toe, sometimes in the heel, ankle, or the calf of the leg, not unlike the pain felt upon a dislocation of the said bones; with a sense as if water were sprinkled on the part affected. This is succeeded by a chilliness, and some approach to a fever: the pain in the mean time, which at first was more remis, gradually encreases; and in proportion to this the chilliness abates. By night, it is arrived at its height, and settled about the ligaments of the bones of the tarsus, and metatarsus; where it sometimes resembles a violent tension; and sometimes a laceration of these ligaments; sometimes the biting, or gnawing of a dog; or a squeezing, or coarctation. Thus far the part affected has such an exquisite sense, that it cannot bear the weight of the linen, nor even the shaking of the room occasioned by a person's stepping. Hence, a thousand vain endeavours to get ease, by changing the posture of the body, the position of the foot, &c. till about two or three a-clock in the morning (the space of a nycthemeron from its access) when a remission is first perceived; the morbid matter being by this time tolerably digested, or even dissipated. The patient hereupon drops asleep, and at his waking finds his pains much abated, but the part newly swelled. A few days after this the other foot undergoes the same fate: sometimes both are attacked from the first. From the time it has seized on both legs, the symptoms become more irregular, and precarious both as to the time of invasion, and the duration thereof. But this still holds, that the pain recruits in the night, and remits again the morning.—A series of these little, alternate accessions, &c. constitutes a fit, or paroxysm of the *gout*, which holds longer, or less, according to the age, &c. of the patient. In strong people, and those who have not had it often, fourteen days is a moderate paroxysm: in old people, and those long used to it, it will hold two months.

For the first fourteen days the patient is usually covfite: a loss of appetite, chilliness towards evening, and a heaviness, and uneasiness even of the parts not affected, attend the whole paroxysm. As it goes off, he is seized with an intolerable itching, especially between the fingers; a furur falls off, and his toes scale, as if he had drank poison.

Such is the course of a regular *gout*; but when through improper treatment it is disturbed, or prolonged, it seizes the hands, wrists, elbows, knees, and several other parts: sometimes distorting the fingers, and taking away their use; sometimes generating tophaceous concretions, or knots about the ligaments of the joints, resembling chalk, or crabs eyes: sometimes raising a whitish, inflammable tumor, almost as big as an egg, about the elbows, &c. See *NODE*, *TOPHUS*, &c.

It may be added, that where a person has laboured under the *gout* for many years, the pain is sensibly lessened each paroxysm, till at length it becomes rather an uneasiness than a pain: hence that reflection of the great Sydenham, *dolor in hoc morbo amarissimum est naturæ pharmacum*.

The *gout* is ranked among the number of incurable diseases: in effect, we have no thorough, and assured remedy yet discovered for it; those that now obtain are little more than palliatives: they tend to assuage the pain, to diminish it for a time; but not to extirpate it.

Bleeding and purging are found absolutely prejudicial; and diaphoretics are of no service. Emetics, according to Pitcairn, and Ettmuller, may do good in the beginning of the disease. But, upon the whole, nothings, in Sydenham's opinion, proves of more service than digestives, or medicines which strengthen the stomach, and promote digestion: as, angelica root, Enul. Campan. the racia. Andromach. the jesuit's bark, and antiscorbutics: these are chiefly to be administered in the intervals between the paroxysms. Musgrave, however, recommends internally repellents, and principally cardiacs: externally, emplasters of gum. caran. or oxycroc. or cephalic. with Burgundy pitch; or the green scar-cloth, commonly called *bat-cass*, &c. Yet Dolzeus affirms, that repellents do more harm than good; and gives us the following recipe, as more than equal to all others.—*B. Confelt. Hamoch. ʒij. Pulv. Jalap. ʒss. extract. Trifol. fibrin. ʒij. Litharg. aur. ʒvj. Sapa. Antimon. ʒs. Sacchar. Cantb. ʒvij. Ol. Olivær. q. f. Cera et Piceis parum. F. f. a. an emplaster to be laid on the joint affected, till the pain, and the morbid matter be driven away.—See Supplement, article ARTHRITIS.*

GOVERNMENT, } see GOVERNMENT.
 GOVERNOUR, }
 GOVERNOR, }
 GOVERN, a long upper garment, wore by lawyers, divines,

and other graduates; who are hence called *men of the gown*, or *gown men*.

The *gown* is an ample sort of garment wore over the ordinary cloaths, hanging down to the feet.—It is fashioned differently for ecclesiastics, and for laymen.

At Rome they gave the name *virile gown*, *toga virilis*, to a plain kind of *gown* which their youth assumed when arrived at puberty. This, they particularly denominated, *pretexta*.

In some universities, physicians wear the scarlet *gown*.—In the Sorbonne the doctors are always in *gowns* and caps. Besides, &c. wear *gowns* of two colours

Among the French officers, &c. they distinguish those of the *short gown* or robe; which are such as have not been regularly examined.—They have also labrets of the *short gown*, who are such as are obliged to practise in an inferior way to surgeons, or those of the long robe.

GOWN is also taken in the general for the civil magistrature, or the profession opposite to that of arms.

In this sense it was that Cicero said, *cedent arma togæ*.

*GRABATARII**, or *GRABATARI*, in church antiquity, such persons as deferred the receiving of baptism, till the hour of death; or who did not receive it till they were dangerously ill, and out of hopes of life: from an opinion, that baptism absolutely washed away all former sins.

* The word is formed of the Latin *grabatum*, bed; and that from the Greek *γρεβάτιον*, a hanging bed, of *χρῆμα*, I suspend; such as was the bed of slaves, poor people, Cynic philosophers, &c. who were enemies of luxury and ease.

GRACE, *GRATIA*, in theology, any gift which God confers on men, of his own free liberality, and without their having deserved it at his hands; whether such gift regard the present, or a future life.

Grace is usually divided into *natural* and *supernatural*.

Natural GRACES include the gifts of being, of life, of such and such faculties, of preservation, &c.—St Jerom. *Epist.* 139. allows it a *grace* of God, that man was created: *gratia Dei est quod homo creatus est*. So also it is by the *grace* of God, that angels and human souls are immortal; that man has free-will, &c.

Supernatural GRACE, is a gift from above conferred on intelligent beings, in order to their salvation.

It is these, only, that are called *graces* in the rigour of theology; and it is for the conveyance, improvement, and strengthening of these that the sacraments are conferred, the ministry of the word instituted, &c.

Divines distinguish *supernatural grace* into *habitual*, and *actual*; *justifying*, and *sanctifying*.

Habitual GRACE, is that which resides stably in us; is fixed in the soul, and remains till some grievous, wilful sin expunge it.

This is also called *justifying grace*, as it makes us appear righteous and innocent before God: and *sanctifying grace*, as it makes us holy and devoted to God.

Actual GRACE, is that which God gives us for the special performance of some particular good thing, as to convert us, enable us to resist a temptation, &c.

This, the divines subdivide into divers kinds, *preventing*, *concomitant*, and *subsequent grace*.

It is an article of faith, 1^o That *actual grace* is necessary for the beginning, carrying on, and finishing every good work.

2^o That the will is able to resist this *grace* and reject it. And hence *grace* becomes further divided into *efficacious*, and *sufficient*.—It is *efficacious*, or efficient, when it produces the effect; and *sufficient* when it does not, though it might have produced it.

Some of the more rigid Calvinists, &c. admit a necessitating *grace*.

We also say, *the law of grace*; the *covenant of grace*, in opposition to the Mosaic law, &c. See LAW, see also REVELATION, &c.

Days of GRACE, or *respite*, are a certain number of days, allowed for the payment of a note, or bill of exchange, after the same becomes due. See DAY of Grace.

Act of GRACE, properly denotes an act of amnesty, or oblivion; for the pardon of all offenders who are qualified, or come within the conditions of it.

The term is also sometimes extended to an act made for relief of insolvent debtors in the several prisons; by setting those who are qualified, at liberty from their debts, and confinement.

GRACES, *GRATIA*, in the canon law, are the same with what we otherwise call *provisions*.

Expectative GRACES, *gratia expectativa*, are a sort of reverentary benefices, disposed of before the time, or before they become vacant. See EXPECTATIVE.

GRACE is also a term in the formula of all patents, &c. which begin, "George, by the *grace* of God king of Great Britain," &c.—The Romish bishops frequently begin their mandates in the like manner: such as—*by the grace of God*, and the holy see, bishop of, &c.

The English archbishops say, by *divine grace*, or *divine providence*. See ARCHBISHOP, &c.

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All sovereigns use the phrase *Grace* of God; as emperors, kings, princes, &c. Antiently dukes, counts, and even lords talked in the same style. In the new collection of Fath. Martene we meet with a mere seigneur, or lord, qualified by the *Grace* of God seigneur de Comborn. Louis XI. forbid the duke of Brittany to style himself by the *Grace* of God.

GRACE is also a title of dignity, attributed to princes of inferior rank, and who are not qualified for that of highness.

Till the time of king James I. the kings of England were addressed under the title of *Grace*, as they now are under that of majesty.

Our English dukes and archbishops are still addressed to under the title of *Grace*. But that title is most frequent in Upper Germany, and particularly Austria; where it is born by the Barons, as being inferior to that of excellence.

GRACES, GRATIE, charites, in the heathen theology, were a set of fabulous deities, three in number, who attended on Venus. See **GOD**.

Their names are Aglaia, Thalia, and Euphrosine; and they were supposed to be the daughters of Jupiter. *Vossius de Idol.* l. xiii. c. 15.

Some will have the *Graces* to have been four, and make them the same with the *horæ*, hours, or rather with the four seasons of the year. See **HOURS**.

A marble in the king of Prussia's cabinet represents the three *Graces* in the usual manner, with a fourth, seated, and covered with a large veil, with the words underneath, *AD SORORES III.* Yet Monf. Beger will by no means allow the *Graces* to have been four: the company there present, he understands to be the three *Graces*, and Venus, who was their sister, as being daughter of Jupiter and Dione.

They were always supposed to have hold of each other's hands, and never parted. They were painted naked, to shew that the *Graces* borrow nothing from art, and that they have no other beauties but what are natural.

Yet, in the first ages, they were not represented naked, as appears from Pausanias, l. vi. and l. ix. who describes their temple and statues. They were of wood, all but their head, feet, and hands, which were white marble. Their robe, or gown was gilt; one of them held in her hand a rose, another a dye, and the third a sprig of myrtle.

The poets feign the *Graces* to have been very small of stature; to intimate, that the things which charm, and delight us, are frequently little matters; as, a gesture, a laugh, a careless air, or the like.

GRACILIS, in anatomy, a muscle of the leg, thus called from its slender shape.—See *Tab. Anat.* (Myol.) fig. 1. n. 54. fig. 2. n. 37. fig. 6. n. 37.

It arises partly tendinous, and partly fleshy, from the os pubis internally, between the first and second heads of the triceps; and in its descent on the inside of the thigh, grows narrow, and becomes tendinous a little below the sartorius, and is thus inserted into the tibia. It assists in bringing the thigh and leg inwards.

GRADATION, the act of ascending step by step, to any pitch or eminence: from the Latin *gradus*, degree, step.

GRADATION, in rhetoric, is when a series of considerations or proofs is brought, rising by degrees, and improving each on the other.

Such is that in Cicero to Herennius: *Africanæ industria virtutem, virtus gloriam, gloria æmulos comparavit.*

GRADATION, in logic, is an argumentation, consisting of four, or more propositions, so disposed, as that the attribute of the first, is the subject of the second; and the attribute of the second, the subject of the third; and so on, till the last attribute come to be predicated of the subject of the first proposition. As in Porphyry's tree: man is an animal; an animal is a living thing; a living thing is a body; a body is a substance: therefore man is a substance.

An argument of this kind is liable to a world of fallacies; both from the ambiguity of words, and things; *e. gr.* Peter is a man; man is an animal; animal is a genus; genus is a universal: therefore Peter is a universal.

GRADATION, in chemistry, is a kind of process belonging to metals.—It consists in gradually raising, or exalting them to a higher degree of purity, and goodness, so as both to increase their weight, colour, consistence, &c.

GRADATION, in architecture, signifies an artful disposition of parts, rising, as it were, by steps, or degrees, after the manner of an amphitheatre; so that those placed before, do no disservice, but rather service to those behind.

The painters also use the word *Gradation* for an insensible change of colour, by the diminution of the tints, and shades.

GRADUAL*, **GRADUALE**, was antiently a church-book, containing divers prayers, rehearsed, or sung after the epistle.

* In some of our antient writers it is read *gradile, graduale, &c.*

After reading the epistle, the chanter ascended the ambo with his *Gradual*, and rehearsed the prayers, &c. therein; being

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answered by the choir: whence the name *Gradual*, on account of the steps, or degrees of the ambo. See **AMBO**.

In the Romish church, *Gradual* is an appellation still given to a verse which they sing after the epistle, and which was antiently rehearsed on the steps of the altar: though Ugutio gives us another account, and says it took its denomination *Gradual*, because sung in a gradual ascent from note to note. Magri speaks differently still, and will have it to have taken its name, because sung while the deacon went up the steps to the pulpit, to sing the gospel.

GRADUAL, GRADUALIS, is also applied to the fifteen psalms sung, among the Hebrews, on the fifteen steps of the temple.—Others are rather of opinion, that they were thus denominated, because the fingers raised their voice by degrees, from the first to the last.

Cardinal Bona, in his treatise of divine psalmody, says, the fifteen *gradual* psalms are intended to represent to the mind, that we only arrive at the perfection of goodness, or holiness, by degrees: he goes on to lay down the fifteen degrees of virtue, corresponding to the fifteen psalms; five of them are for beginners; five for proficients; and the rest for the perfect.

GRADUATE, a person who has the degrees in any faculty.

A *Graduate* in physic, in divinity, &c. See **FACULTY, DOCTOR, &c.**—In France, one third of the benefices of the kingdom are appropriated to *Graduates*, *viz.* all that become vacant in the months of January, and July, April, and October.

This privilege of *Graduates* is no older than the fifteenth century: it being observed that men of learning were much neglected by the collators, and patrons of churches, complaint therefore was made to the council of Basle, where this decree was made; which was afterwards confirmed by the Pragmatic sanction, and again by the concordat.

GRADUATION, is used in mathematics, for the act of *graduating*, or dividing any thing into degrees.

The *Graduation* of this quadrant, theodolite, or the like, is just and clean.

GRADUS gemonii, see the article **GEMONII**.

GRÆCUM—*album* **GRÆCUM**; see **ALBUM**.

GRAFT*, or **GRAFF**, in agriculture and gardening, a little shoot, cion, bud, or eye of a tree, inserted into another tree, to make it yield fruit of the same nature and kind, as those of the tree whence the *Graft* is taken.

* The word is formed of the French *greffe*, which signifies the same thing; and *greffe*, in this sense, is supposed to have been derived from the resemblance the shoot bears to the point of a penknife, which was antiently called *greffe*. Du Cange goes farther, and derives the antient *greffe* from *graphitulum*; Menage, from *graphium*, a Latin word, signifying a little style, or iron bodkin, one end whereof was pointed, and served to write withal on waxen tablets; and the other flat, serving to efface, or rub out what was wrote.

A *graft*, is a little portion of a tree, inclosed in a cleft, or incision made in another, in order to correct, qualify, or improve the taste of its fruit; or even to make it bear a different sort of fruit.

GRAFTING, or **GRAFFING**, or **INGRAFTING**, in agriculture, and gardening. See **ENGRAFTING**.

GRAFTING wax. See the article **WAX, &c.**

GRAIN, GRANUM, primarily denotes a fruit, or seed, growing in a spica, or ear.

In this sense, *Grain* comprehends all sorts of corn; as wheat, rye, barley, oats, &c.

GRAIN is also applied to the fruits or seeds of divers plants; as a grain of millet, of pepper, &c.

The kingdom of heaven is compared to a *Grain* of mustard seed.

GRAIN is also extended to a minute body, or parcel of a body pulverized.—In which sense we say, a *Grain* of sand, a *Grain* of salt, a *Grain* of gunpowder, &c.

GRAIN denotes also a small weight, used in estimating divers substances.

The *Grain* is the smallest of all the weights known in England.—It is taken from the weight of a *Grain* of wheat, gathered out of the middle of the ear, and well dried. Twenty-four grains make a penny-weight, and twenty penny-weights an ounce.

The *Grain* is troy-weight, and used in the weighing of gold, silver, jewels, bread, and liquors.

Among the antients, the *Grain* was the fourth part of the siliqua, or twelfth of the obolus, and the seventy-second of the drachma. It coincided with lens.

Fernelius, l. iv. c. 6. *Method. Mtdend.* affirms it as a thing known and certain, that the *Grain* is of the same weight, every where; but he is mistaken. Mr Greaves, in his treatise of the Roman foot, has shewn, that 179 Dutch *Grains*, which Snellius had found to be the weight of a Philip of gold, only amount to 134½ English *Grains*. Add, that Monf. Perrault has computed the French *Grain* to be less than the

English;

English; and yet bigger than the Dutch: to the English, it is as 158 to 134½; and to that of Holland, as 158 to 179. The *grain* used by the apothecaries, is the same with that of the goldsmiths; though they make a difference in the weights raised therefrom. Thus, 20 grains, with them, make a scruple, ʒ; 3 scruples, a drachm, ʒ; 8 drachms, an ounce, ʒ, &c.

The carat used in estimating the finest of gold, as well as in weighing diamonds and precious stones, is also divided into four grains.

GRAIN is also used for the figure, or representation of *grains* on stones, stuffs, leathers, &c.—Thus we say, morocco has a bolder and richer, that is, a larger *grain*, than flagreen. In some marbles, the *grain* is very fine; in others coarser. Steel is known by its *grain*, which is much finer than that of iron.

Cochineal GRAIN, } see } COCHINEAL.
Scarlet GRAIN, } see } SCARLET.
GRAINED medals, } see } MEDAL.
Crawf GRAINED stuff, } see } CROSS grained.

GRAINING board, is a board used by the carriers, to give the grain to their leather.

It is made with teeth, or notches, running quite a-crofs; into which, the soft, moistened, suppled leather being pressed, its surface readily takes the impression.

GRAMINEA, in antiquity, is applied to a crown formed of grass, *gramen*, bestowed, by the Romans, on certain of their generals, in consideration of their having saved, or rescued an army.

The *grassy* crown, *corona graminea*, was but rarely conferred; and for some signal exploit; when, through the courage or dexterity of a general, an army reduced to the last extremities had been saved, or delivered, and the enemy put to flight.

GRAMINEOUS herbs, among botanists, are such as have a long, narrow leaf, with no foot stalk.

GRAMMAR, the art of speaking properly; that is, of expressing one's thoughts, by signs mutually agreed on for that purpose.

The signs, here found most convenient, are articulate sounds, but, as these are transient, others have been invented more permanent, viz. *grammata*, γραμμαται, letters, whence the name *grammar*.

Grammar is more accurately defined, after Mr. Johnson, the art of expressing the relations of things in construction, with due quantity in speaking, and orthography in writing, according to the custom of those whose language we learn. See LANGUAGE.

Grammar is divided by some authors into four parts, *orthography*, *prosody*, *etymology*, and *syntax*.

Others chuse to divide *grammar* somewhat more obviously into the doctrine of letters, or sounds, which coincides with orthography and orthoepy; that of syllables, their accent, time, &c. which falls in with prosody; that of words, their kinds, derivations, changes, analogy, &c. which amounts to etymology; and that of sentences, which considers the placing, or joining of words together, called *syntax*.

The chief business of *grammar*, is to decline, conjugate, construct, and spell nouns, verbs, and other parts of speech.—It teaches the propriety, and natural force of each part of discourse; and the reason of all expressions used therein.

Some have called *grammar* the door, or gate of the arts and sciences; by reason none of these are attainable, but by means hereof.—*Grammar*, according to Quintilian, is that to eloquence, which the foundation is to the building; they who despise it, as only dealing in low, trivial things, are exceedingly mistaken: it has really more solidity than these.

The authors of the *Art of thinking* consider *grammar*, as not less necessary to try, and exercise the abilities of the most knowing, than to form the minds of beginners: the advantages of *grammar* are well set forth by Perizonius, in the preface to his edition of Sanctius's *Minerva*, Amsterd. 1714.

Diogenes Laertius relates, after one Hermippus, that Epicurus was the first who gave the rules of *grammar* for the Greek tongue; but that Plato was the first who had taken the thing into consideration, and that he had even made some discoveries on that subject.

At Rome, Crates, surnamed Mallotes, cotemporary with Aristarchus, gave the first lectures on *grammar* to the Romans, during the time of his being ambassador for king Attalus, to the commonwealth, between the second and third Punic wars, soon after Ennius's death. Before him, it was not known at Rome what *grammar* meant. Polydore Vergil de Invent. rer. l. i. c. 7.

Grammar is the same in all languages, as to its general principles, and notions, which it borrows from philology to explain the order and manner wherein we express our ideas by words: but, as each language has its particular turns, its

several character, and genius, different from the genius and character of other languages; hence arise as many *grammars* as languages.—An example will suffice to shew this: we say in English, *draw a straight line*, not, *a line straight*: in French, they say, *tirer ligne droite*, a line straight, no *droite ligne*, a straight line: and in Latin there is a liberty to say it either the one way, or the other; *rectam lineam*, or *lineam rectam*, *ducere*: And if there be a language which in the phrase abovementioned follows the same analogy as the English, it differs from it on a hundred other occasions.

Hence Dr. Wallis very justly finds fault with our English grammarians, where he says, that all of them, forcing our English tongue too much to the Latin method, have delivered many useless things concerning cases, genders, and declensions of nouns; tenses, moods, and conjugations of verbs; as also the government of nouns and verbs, which our language has nothing to do with.

GRAMMAR is also used for a book containing the rules of grammar, which obtain in any language. See LANGUAGE.

The ancient *grammars*, are; for the Hebrew, that of rabbi Juda Chug, which is commonly held the first Hebrew *grammar* that appeared; though it is certain, rabbi Saadiah Haggagon, who lived before rabbi Juda, composed two works in the same kind: one, expressly of *grammar*; and the other of the elegancies of the Hebrew tongue.

For the Greek, the oldest *grammar* is that of Gaza: the Latin ones, are the works of Martianus Capella, Priscian, and Afconius Pedianus.

The best of the modern *grammars*, are, 1° For the Hebrew, that of Pagninus, the edition of Hen. Stevens, or le Preux at Geneva, in 1592; that of Petrus Martinus at Rochel 1592; that of Buxtorf; that of Ludovicus Deus, in three languages; that of Sixinus Amama, which is a collection from Martinus and Buxtorf; that of Bellarmine with the notes of Muis; that of F. Sglanther is useful for beginners.—2° For the Chaldee, the best are those of Martinus, Buxtorf, and Lud. Deus, in three languages.—3° For the Syriac, those of Amira, Myricæus, Waterus, and Beveridge; with the Chaldee and Syriac ones of Buxtorf, of Lud. Deus in three languages, and that of Lemben.—4° For the Coptic, the *Prodromus Coptus*, and *Lingua Aegyptiaca Restituta* of Kircher.—5° For the Arabic, that of Erpenius, and that of Golius, which is only Erpenius's a little augmented.—6° For the Ethiopic, that of J. Ludolphus.—7° For the Persian, that of Lud. Deus.—8° For the Armenian, those of Schroder, and Galanus.—9° For the Greek, those of Mart. Rulandus, Sylburgius, F. Mocquet, Vossius, Busby, and Port Royal.—10° For the Latin, those of Despiuer, the *Minerva* of Sanctius, those of Vossius, and Sprat; that of Port Royal, which is only a collection from the rest; and that of Lowe, the most exact of all.—11° For the Italian, those of Berger, Lanfredini, Port Royal, and Veneroni.—12° For the Spanish, those of Salazar, Port Royal, the abbot de Vairac, &c.—13° For the Portuguese, that of Pereira.—14° For the French, those of the abbe Regnier, and F. Buffier.—15° For the High Dutch, those of Claius, Herfburgensis, Schottelius, Boedicher, and Steinbach.—16° For the English, those of Wallis, Brightland, and Greenwood

CHARACTERS in GRAMMAR; see the article CHARACTER.

GRAMMARIAN, GRAMMATICUS, a person well versed in grammar; or who teaches grammar.

The denomination *grammarians*, is, like that of critic, now frequently used as a term of reproach; a mere *grammarians*; a dry, plodding *grammarians*, &c.—The *grammarians* is conceived as a person wholly attentive to the minutiae of language; industriously employed about words, and phrases; and incapable of perceiving the beauties, the delicacy, fineness, extent, &c. of a sentiment.

Scaliger, however, considered *grammarians* in another light. *Utinam estis*, says he, *bonus grammaticus; sufficit enim ei, qui omnes auctores probe vult intelligere, esse grammaticum*

The title *grammarians*, it is certain, was antiently a title of honour; being given not only to such as applied themselves to grammar, or excelled in philology; but to all who were reputed learned in any art, or faculty whatever, as is shewn by Ger. Vossius, in his book of *grammar*.

The word was properly a title of literature and erudition, and was frequently given to persons who excelled in all, or many arts, called also *polyhistor*.

Thus, Philoponus, a famous philosopher in Justinian's time, remarkable for the extent, and variety of his knowledge, was surnamed *grammaticus*, as appears from Photius's *Bibliothec*. So Saxo, the Danish historian, in the thirteenth century, got the appellation *grammaticus*: and as late as the year 1580, Thomas d'Averia, a celebrated Neapolitan lawyer, was surnamed the *grammarians*.

The title *grammarians* was antiently bestowed on those we now call critics, men of learning, erudition, letters, &c. and particularly such as wrote well, and politely in every kind.

It is in this sense that Suetonius entitles his book which he wrote on the best Latin authors, *Of the celebrated grammarians*; and that Cornelius Nepos calls the commentators on the orators, and poets, *grammarians*; and lastly, it is in this sense the appellation is attributed by the antients to Apion, Philoponus, and Selenus.

The most celebrated *grammarians* of the second century were Aper, Pollio, Eutyclus, Proculus, Athenæus, Julius Pollux, Macrobius, and Aulus Gellius: the works of these last authors are an assemblage of abundance of very different things, and subjects, relating to the criticism of the antient writers, and the polite literature.

If the name have lost its antient honour, it is through the fault of those who have assumed it; by their treating of grammar in a low, pedantic, dogmatic manner; reducing it to words and syllables; and dwelling altogether on trifling, puerile remarks, and censures: whereas its antient office was to make an accurate, and thorough examen of an author; to enter into all his views, to point out the beauties, and the defects thereof; to distinguish the true beauties from the false; and the genuine productions of an author, from the supposititious: that is, a *grammarian* was then, what we call a *critic* now.

Those who only taught to read, understand, and explain authors, were called *grammatists*, *grammatistæ*; in contradistinction from *grammatici*: though, in course of time, the *grammatistæ* have rose into the place of *grammatici*; who are now preferred to that of *critici*.

GRAMMATICAL, something relating to grammar. See **GRAMMAR**.

We say, *grammatical construction*; *grammatical signification*, &c. Idioms, as anglicisms, latinisms, grecisms, gallicisms, &c. deviate from *grammatical strictness*. Such a phrase is not *grammatically just*; it is an idiom.

GRAMMATICAL criticism; see the article **CRITICISM**.

GRANADIER, **GRÉNADIER**, or **GRANADEER**, a soldier who is armed with a sword, a firelock flung, and a pouch full of hand-granado's to be thrown among the enemy.

There are companies of *foot granadiers*, and *horse granadiers*, or *granadiers of horse*, by the French called *granadiers volans*, or *flying granadiers*, who are mounted on horseback, but fight on foot.

Every battalion of foot, of late years, has generally a company of *granadiers* belonging to it; or else four or five *granadiers* belong to each company of the battalion; which, on occasion, are drawn out, and form a company of themselves. These always take the right of the battalion; and are the first in attacks.

To each troop of horse-guards, Chamberlayn tells us, there is added, by establishment, a troop of *granadiers*, consisting of sixty-four men, beside officers, commanded by the captain of the troop of guard.

One division of *granadiers* mounts with a division of the troop; they also go out on small parties from the guard; perform centinels duty, &c.

GRANADO*, or **GRANADA**, in the military art, a hollow ball or shell, of iron, brass, or even glass, or potters earth, filled with gunpowder, and fitted with a fuze to give it fire.

* The name *granado* takes its rise hence, that it is filled with grains of powder, as a pomegranate is with kernels.

Of these there are two kinds; the one large, the other small: the first are to be thrown at the enemy by a mortar, properly called *bombs*; see **BOMB**.—The latter to be cast with the hand; and thence denominated *hand-granado's*.

Casimir, indeed, makes another distinction; where the ball, or shell is round, whatever the size be, he calls it a *granado*; and where oval, or cylindrical, a *bomb*: but custom allows only the former division.

The best way, Casimir observes, to secure a man's self from the effect of a *granado*, is, to lie flat down on the ground, before it burst.

Historians relate, that at the siege of Ostend there were above fifty thousand *granado's* thrown in one month into the city: and that the citizens threw above twenty thousand into the works of the besiegers.

The common, or hand *granado*, is a little, hollow ball of iron, tin, wood, pasteboard, or other matter, filled with strong powder, lighted with a fuze, and thus thrown by hand into places where men stand thick; and particularly into trenches, and lodgments.

Their composition is the same with that of **BOMBS**; which see.—For size, they are usually about the bigness of an iron bullet, and weigh about three pounds: as to dimensions, they are commonly in thickness one eighth, one ninth, or one tenth of their diameter; their aperture, or orifice about $\frac{1}{2}$ wide, as prescribed by Casimir.

Thunus observes, that the first time *granado's* were used, was at the siege of Wachtendonck, a town near Gueldres;

and that the inventor was an inhabitant of Venlo, who in making an experiment of the effect thereof, occasioned two thirds of that city to be burnt; the fire being kindled by the fall of a *granado*.

Bombs were known long before the invention of *granado's*.—The antients had a sort of ollæ, or firepots, somewhat of the same nature with our *granado's*, but they were much less perfect.

Casimir mentions a sort of *blind granado's*, without any aperture, or fuze, as not needing to be lighted; but being thrown with a mortar, take fire of themselves whenever they fall on any hard, solid object.

GRANARY, a place to lay, or store corn in, particularly for keeping.

Sir Henry Wotton advises, to make it look towards the north, as much as may be; because that quarter is most cool and temperate.

Mr. Worlidge observes, that the best *granaries* are built of brick, with quarters of timber wrought in the inside, whereto to nail the boards, with which the inside of the *granary* must be lined so close to the bricks, that there be no room for vermin to shelter themselves. There may be many stories one above another, and let them be near the one to the other; for the shallower corn lieth the better, and it is the easier turned.

Some have had two *granaries*, the one above the other, and filled the upper with wheat, or other corn: this upper one had a small hole in the floor, by which the corn descended into the lower one, like the sand in an hour glass; and when it was all come down into the lower *granary*, it was then carried up again into the upper one; and so it was kept continually in motion: which is a great preservation to the corn.—A large *granary*, full of square wooden pipes, may also keep corn from heating. See *Supplement*, article **GRANARY**.

GRANATE, popularly called **GARNET**, a gem, or precious stone, of a high red colour; thus called from the resemblance it bears to that of the kernel of a pomegranate.

Granates are either *oriental*, or *occidental*: the first are brought from divers parts of the East Indies; the second from Spain, Bohemia, and Silesia.

Those from the *east*, are distinguished by their colour into three kinds: the first, of a deep brownish red, like black clotted blood; of which kind there are some as big as an hen's egg: the second, are nearly of the colour of a hyacinth, with which it were easy to confound them, but for their superior redness.

The last, having a mixture of violet with their red, are called by the Italians, *rubini della rocha*.

The *occidental granates* are of divers reds, according to the places they are found in. Those of Spain imitate the colour of the kernel of a pomegranate: those of Bohemia have a golden cast with their red, glittering like a live coal: those of Silesia are the darkest of all, and seldom thoroughly transparent.

Of the *occidental granates*, those of Bohemia are the most valued: some even give them the preference to the oriental kind. They are found near Prague; not in any particular mines, but picked up by peasants in the fields, from among the sands, and pebbles.

The *granate* is of some use in medicine: its powder is sometimes an ingredient in the cordial electuaries. The antients held it excellent against heaviness, and melancholy. See *Supplement*, article **GARNET**.

GRAND, a term rather French than English, though used on many occasions in our language. It has the same import with *great*; being formed of the Latin *grandis*.

In this sense, we say, the *grand master* of an order; the *grand master* of Malta; of the free masons, &c.

So also, the *grand signor*, the *grand visier*, &c. *Grand father*, *Grand mother*, &c.

In the French polity and customs, there are divers officers thus denominated, which we frequently retain in English; as *grand almoner*, *grand ecuyer*, *grand chambellan*, *grand voyer*, &c.

GRAND assise; see the article **ASSISE**.

GRAND cape; see the articles **CAPE** and **ATTACHMENT**.

GRAND distrefs, *distressio magna*, a writ of distrefs so called on account of its extent, which reaches to all the goods and chattles of the party within the county.

This writ lies in two cases: either when the tenant, or defendant is attached, and appears not, but makes default; or where the tenant, or defendant hath once appeared, and after makes default.—On such occasions, this writ lies by common law, in lieu of a petit cape.

GRAND guiso, is a term used by painters, to express, that there is something in the picture very great, and extraordinary, calculated to surprize, please, and instruct.

Where this is found, they say, the painter was a man of the *grand gusto*: and they use the words sublime, and marvellous, when they speak of a picture in much the same sense.

GRA

GRAND *elixir*, }
 GRAND *guard*, } See { ELIXIR.
 GRAND *jury*, } GUARD.
 GRAND *prior*, } PRIOR.
 GRAND *provost of France*, } PROVOST.
 GRAND *seignaty*, } CHIVALRY, and SERJEANTY.
 GRANDEE, is understood of a lord of the first rank, or prime quality.

In Spain, the term *grandees*, is used absolutely to denote the prime lords of the court, to whom the king has once given leave to be covered in his presence; there are some *grandees* for life only; made by the king's saying, simply, Be covered. Others, are *grandees* by descent; made by the king's saying, Be covered for thyself, and heirs. These last are reputed far above the former.

There are some who have three, or four *grandeeships* in their family.

GRANGE*, an ancient term for a barn; or place wherein to lay up, and thrash corn.

* The word is formed of the Latin *granca*; or of *granum*, grain, corn, &c. Hence also *granger*, or *grangier*, a grange keeper, or farmer.

GRANGE is also used, in a more extensive sense, for a whole farm; with all the appendages of stables for horses, stalls for cattle, &c. and for an inn.

GRANI*, in our ancient writers, mustaches, or whiskers of a beard.

* The word seems formed from the ancient British, or Irish, *grann*, a beard.

It is given for a reason why the cup is refused to the lady, *Quia barbati, & proluxas habent granos, dum poculum inter epulas sumunt, prius liquore pilos inficiunt quam ori infundunt.*

GRANITE, GRANITA, or GRANITES, a sort of marble, extremely hard, rough, and difficultly wrought, and polished: thus called as being sprinkled over with a great number of little stains, resembling grains of sand.

There are three sorts of *granite*: that of Egypt; that of Italy; and that of Dauphiny.—The first redish, variegated with white and black. It is found in very large pieces; and is that chiefly used by the Egyptians, in their obelisks, and pyramids, on the tombs of their great men. There are columns of this stone above forty foot high. The *granite* of Italy is softer than that of Egypt; especially in the quarry, where it cuts with much more ease. There is also a sort of green *granite*, which is a species of serpentine, spotted with green, and white spots. The *granite* of Dauphiny, a quarry whereof has of late years been found, is only a very hard sort of flint. See Supplement, article GRANITA.

GRANIVOROUS, an epithet, or denomination given to such animals as feed upon corn, or any other grain, or seeds. *Granivorous* animals are chiefly of the bird kind. See BIRD. These have a peculiar provision for the digesting of so dry and hard a food.

GRANT, in law, a gift in writing, of something incorporeal, not lying in livery, and which cannot apply be passed, or conveyed by word only; as rents, reversions, services, advowsons in gross, tithes, &c. Or, it is a gift made by such persons as cannot give but by deed; as the king and all bodies politic. See DONATION. This difference is often, in speech, neglected; and the word *grant* taken generally for every gift whatsoever, made of any thing, by any person.

In this sense he that granteth is named *granter*, and he to whom it is made, the *grantee*.

A thing is said to *lie in grant*, which cannot be assigned without deed.

GRANULATED oil; see the article OIL.

GRANULATION, in chemistry, an operation performed on metals, whereby they are reduced into small grains, or globules. It is done by melting them; and when in fusion, casting them into cold water; in which they congeal into granules, as required: and are hereby rendered more easy to be dissolved.—The best way is to pour the fluid metal through a colander, or a new birchen broom.

We also say, the *granulation* of gun-powder. See GUN powder.

GRAPE, see the articles VINE, RAISIN, and WINE.

GRAPHOIDES, or GRAPHIOIDES, Γραφιοειδής, in anatomy, an appendage of the bones of the temples, long, small, sharp, and a little crooked, like a cock's spur; called also *styloides*. The same name is sometimes also applied to the musculus digastricus.

Likewise, to an extension of the brain, resembling a writing-pen.

GRAPHOMETER, a name which some authors, particularly the French, give to a surveying instrument, by us commonly called a *semicircle*.

GRAPPLE, in the manage—A horse is said to *grapple* with one, or both legs, when he catches, or raises them more

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hastily, and higher than ordinarily; as if he were curvetting.

GRASS plots, and walks, make a considerable article in gardening, &c.

Grass, or *green plots* are had either by sowing of hayseed, or laying of turf: for the first, which is the cheapest way, the seed of the finest upland pastures is to be chose, well sifted and cleaned.

For the second, the turf should be cut on a down, or green, or common, or sheep-walk, where the *grass* is short and fine; if there be any knobs, or roughnesses, the place must be cleaned and rolled after a shower, before it be cut up. The turf is cut in squares, marked out with lines, raised with a knife, and rolled up: about three inches thick. The quarters, or verges are to be prepared with a fine coat of poor earth to lay the turf on; and after laying, the turf must be well watered, rolled, &c.

Small pieces of *grass* work, as knots, shell-work, and volutes of parterres, cut-work, verges about balcons, &c. must always be laid with turf.

To sow *grass* for plots, &c. the ground ought to be first dug or broke with a spade, then dressed, laid even, raked fine, and covered an inch thick with good mould to facilitate the growth of the seed. Then the seed is to be sown pretty thick, that it may come up close and short; and lastly, to be raked up, and covered. The best season is the latter end of August: when it is well come up, it must be mowed, and this often repeated; since the sower it is mowed, the thicker and handsomer it grows. It must be also rolled from time to time.

Five leaved Grass, in heraldry, see the article Five-leaved.

GRATICULATION, a term some writers use for the dividing a draught, or design into squares, in order to the reducing it thereby.

GRATIOLOA, a medicinal plant, resembling hyssop; of considerable virtues; though little known in the ordinary practice, as being supposed dangerous of application. In English it is called *hedge-hyssop*, and *god's-grace*.

Its most noted effects are to evacuate hydropic waters, both upwards and downwards, taken either in infusion, or decoction; to cleanse wounds, and to kill worms.—Its bark, taken in powder, is said to be scarce inferior in virtue to ipecacuanha for dysenteries.

It is of a very bitter taste; whence, probably, its vermifugous power; and its root is astringent, whence its use in the dysentery.

M. Boulduc made an extract of this plant, which purged gently, and was very diuretic: another extract made of the faces, or refuse, proved much more efficacious. *Hist. de l'Acad. an. 1705.*

GRAVE, in music, is applied to a sound, which is in a low, or deep tune.

The thicker the chord, or string, the more *grave* the tone, or note; and the smaller, the acuter.

Notes are supposed to be the more *graves*, in proportion as the vibrations of the chord are less quick.

GRAVE, in grammar, a species of accent opposite to acute.

The *grave* accent is expressed thus (`) and shews that the voice is to be depressed, and the syllable over which it is placed, pronounced in a low, deep tone.

GRAVE is also an ingredient in the composition of divers terms in history, and policy *. Thus we say, Landgrave, Burgrave, Margrave, Palgrave, &c. See PALE grave, &c.

* The word, in this sense, is formed of the German *graf*, signifying *comes*, count; called in the barbarous Latin, *grævis*, and *græpio*.

GRAVE is also used for a tomb, wherein a person defunct is interred.

GRAVEDO, a heaviness, or listlessness, which accompanies a lessened transpiration, or taking cold, as it is commonly called. Hence also, the case being frequently accompanied with a running of the nose, and eyes, *gravidis* and *coriza* are sometimes used promiscuously.

GRAVEL*, in natural history, coarser sand, found at the bottom, and the sides of rivers.

* The word is formed of the French *gravier*; which Du Cange derives from the barbarous Latin *graveria*, signifying the same.

Monf. Perault and Dr. Woodward lay down the difference between sand, and *gravel*—The first, is small, and consists of finer, evener grains: the latter is bigger, and consists of little pebbles, and flints of various kinds, and mixed with the sand and the finer fragments of other stones.

Gravel is chiefly used in laying yards, courts, and walks in gardens.

GRAVEL, in medicine, a disease of the bladder, and kidneys, occasioned by a sandy, or gritty matter gathered therein, which cohering into a stony mass, prevents the due secretion, and excretion of the urine.

The *gravel* is generally considered as the same disease with the calculus, or stone.

Gravel soil; see the article SOIL.

GRAVEL walk, in gardening.—To lay, or form a walk with gravel, all the good soil is to be pared away, below the roots of any grass, or weeds; then the place to be filled two or three inches with coarse gravel unferried, laying it highest in the middle; then rolling it; a new stratum of finer gravel to be thrown on, two, or three inches thick: and the rolling to be repeated again and again.

Note, the sides next the beds should be laid a foot and an half, or two foot with turf, from whence the heat of the sun cannot be reflected as it is from gravel, to the prejudice of the neighbouring flowers.

GRAVELLING, among farriers, a disorder incident to travelling horses, occasioned by little gravel-stones getting in between the hoof and the shoe, which settling to the quick, frets, and fetters the part.

It is cured by pulling off the shoe, drawing the place to the quick, picking out all the gravel, and stopping up the foot with horse-grease, and turpentine poured in hot.

GRAVER, a steel instrument, serving to engrave on metals.

The graver consists of four sides, or faces; and the point usually terminates in a lozenge. The other end is fixed into a wooden handle.

Beside engravers, the seal-cutters, locksmiths, gunsmiths, goldsmiths, armourers, spurriers, &c. likewise make use of gravers.

GRAVING, the act, or art of cutting lines, figures, and other designs on metals; more properly called engraving. See ENGRAVING.

GRAVITATION, the exercise of gravity, or the pressure a body exerts on another body underneath it by the power of gravity.

It is one of the laws of nature, discovered by Sir Isaac Newton, and now received by most philosophers, that every particle of matter in nature gravitates towards every other particle; which law is the hinge whereon the whole Newtonian philosophy turns. See NEWTONIAN philosophy.

What we call gravitation, with respect to the gravitating body, is properly called attraction with respect to the body gravitated to.

The planets, both primary and secondary, as also the comets, do all gravitate toward the sun, and toward each other; and the sun toward them; and that in proportion to the quantity of matter in each.

The peripatetics, &c. hold that bodies only gravitate when out of their natural places; and that gravitation ceases when they are restored to the same; the intention of nature being then fulfilled. The final cause of this faculty, they hold, is only to bring elementary bodies to their proper places where they may rest.—But the moderns shew that bodies exercise gravity even when at rest, and in their proper places.

This is particularly shewn of fluids; and it is one of the laws of hydrostatics, demonstrated by Mr. Boyle, and others, that fluids gravitate in proprio loco, the upper parts pressing on the lower, &c.

For the laws of gravitation of bodies in fluids specifically lighter or heavier than themselves; see SPECIFIC gravity, FLUID, &c.

Center of GRAVITATION, }
Line of GRAVITATION, } see { CENTER.
Plane of GRAVITATION, } } PLANE.

GRAVITY, in physics, the natural tendency, or inclination of bodies toward a centre.

In this sense gravity coincides with centripetal force. See CENTRIPETAL force.

Gravity is defined by others, more generally, to be the natural tendency of one body towards another; and by others more generally still, the mutual tendency of each body, and each particle of a body towards all others: in which sense the word coincides with what we more usually call attraction.

The terms gravity, centripetal force, weight, and attraction, do, in effect, all denote the same thing; only in different views, and relations: which different relations, however, authors are apt to confound; and accordingly, the four are frequently used promiscuously.

In propriety, when we consider a body as tending towards the earth, the force wherewith it tends we call gravity, force of gravity, or gravitating force: the same force, when we consider it as immediately tending to the centre of the earth, we call centripetal force: the same, when we consider the earth, or body toward which it tends, we call attraction, or attractive force; and when we consider it, in respect of an obstacle, or a body in the way of its tendency, upon which it acts, we call it weight.

Philosophers conceive very differently of gravity: its nature, use, phenomena, cause, effects, and extent have afforded various speculations in all ages.

Some consider it as an active property, or innate vis in bodies, whereby they endeavour to join their centre. Others hold gravity in this sense, to be an occult quality, and as such to be excluded out of all sound philosophy.

Sir Isaac Newton, though he frequently calls it a vis, power, or property in bodies; yet explains himself, that all he intends by the word, is the effect, or the phenomenon. He does not consider the principle, the cause whereby bodies tend downwards, but the tendency itself, which is no occult quality, but a sensible phenomenon; be its cause what it will, whether a property essential to body, as some make it; or superadded to it, as others; or even an impulse of some body from without, as others.

It is a law of nature long observed, that all bodies near the earth, have a gravity, or a tendency towards the centre of the earth; which law, the moderns, and particularly the immortal Sir Isaac Newton, have found, from certain observation, to be much more extensive, and to hold universally with respect to all the known bodies in nature.

It is now, therefore, acknowledged a principle or law of nature, that all bodies, and all the particles of all bodies, gravitate towards each other, mutually: from which single principle, Sir Isaac Newton has happily deduced all the great phenomena of nature. See NEWTONIAN philosophy.

Hence gravity may be distinguished into particular, and general.

Particular GRAVITY is that whereby heavy bodies descend towards the centre of the earth. See EARTH.

Phenomena, or properties of particular GRAVITY.—1^o All circumterrestrial bodies do hereby tend towards a point, which is either accurately, or very nearly the centre of magnitude of the terraqueous globe.

2^o This point, or centre is fixed within the earth; or at least hath been so ever since we have had any authentic history.—For a consequence of its shifting, though ever so little, would be the overflowing of the low lands, on that side of the globe towards which it approached. Dr. Halley suggests, it would well account for the universal deluge, to have the centre of gravitation removed for a time towards the middle of the then inhabited world: for the change of place but the 2000th part of the radius of our earth would be sufficient to lay the tops of the highest hills under water. See DELUGE.

3^o In all places which are equi-distant from the centre of the earth, the force of gravity is nearly equal.—Indeed all places of the earth's surface are not at equal distances from the centre; because the equatorial parts are something higher than the polar parts: the difference between the earth's diameter and axis being about thirty-four English miles, which hath been proved by the necessity of making the pendulum shorter in those places, before it will swing seconds.

4^o Gravity equally affects all bodies, without regard either to their bulk, figure, or matter: so that, abstracting from the resistance of the medium, the most compact and loose, the greatest and smallest bodies would descend equal spaces in equal times; as appears from the quick descent of very light bodies in the exhausted receiver.

Hence, a very great difference may be observed betwixt gravity and magnetism; the latter affecting only iron, and that towards its poles; the former, all bodies alike, and that in every part. Hence it follows, that gravity, in all bodies, is proportionable, to their quantity of matter; so that all bodies consist of matters equally heavy.

Hence also may be concluded that there is no such thing as positive levity; those things which appear light, being only comparatively so.

If several things ascend, and swim in fluids, it is only because they are not, bulk for bulk, so heavy as those fluids; nor is there any reason, why cork, for instance, should be said to be light, because it swims on water, any more than iron, because it will swim on mercury.

5^o This power increases as we descend, and decreases as we ascend from the centre of the earth, and that in the proportion of the squares of the distances therefrom reciprocally; so as, for instance, at a double distance, to have but a quarter of the force, &c.

6^o As all bodies gravitate towards the earth; so, does the earth equally gravitate towards all bodies, i. e. the action of gravity is mutual on each side, and equal. See REACTION. Hence also the attractive powers of bodies, at equal distances from the centre, are as the quantities of matter in the bodies.

Hence also it appears that the attractive force of the entire bodies consists of the attractive force of the parts: for by the adding, or taking away any part of the matter of a body, its gravity is increased, or diminished in the proportion of the quantity of such particle to the entire mass.

General, or universal GRAVITY.—The existence of the same principle of gravity in the great regions of the heavens, as well as on earth, is easily proved.

That all motion is naturally rectilinear, is allowed by all; those bodies, therefore, which move in curves, must be retained therein by some power continually acting on them.

Hence, the planets being found to revolve in curvilinear orbits,

orbits, we infer that there is some power, by whose constant influence, they are prevented from flying off in tangents.

Again, it is proved by mathematicians, that all bodies moving in any curve line described in a plane, and which by radii drawn to any certain point, describe areas about the point proportionable to the times; are impelled, or acted on by some power tending towards that point: now it is shewn by the astronomers, that the primary planets round the sun, and the secondary planets, round the primary ones, do describe areas proportionable to the times. Consequently, the power whereby they are retained in their orbits, is directed towards the bodies placed in the centres thereof.

Lastly, it is demonstrated, that if several bodies revolve with an equable motion in several concentric circles, and the squares of their periodical times be as the cubes of the distances from the common centre; the centripetal forces of the revolving bodies will be reciprocally as the squares of the distances. Or, if bodies revolve in orbits approaching to circles, and the apices of those orbits be at rest; the centripetal forces of the revolving bodies will be reciprocally as the squares of the distances.

Now, the astronomers all agree, that both these cases obtain in all the planets: whence it follows, that the centripetal powers of all the planets are reciprocally as the squares of the distances from the centres of the orbits. See PLANET.

Upon the whole, it appears, that the planets are retained in their orbits by some power which is continually acting on them: that this power is directed toward the centre of their orbits: that the intensity, or efficacy of this power encreases upon an approach toward the centre, and diminishes as it receds from the same; and that it increases in the same proportion as the distance diminishes; and diminishes in the same as the distance encreases. — Now, by comparing this centripetal force of the planets, with the force of Gravity on earth, they will be found perfectly alike.

This we shall illustrate in the case of the moon, the nearest to us of all the planets. — The rectilinear spaces described in any given time by a falling body, urged by any powers, reckoning from the beginning of its descent, are proportionable to those powers. Consequently, the centripetal force of the moon revolving in its orbit, will be to the force of Gravity on the surface of the earth; as the space which the moon would describe in falling, any little time, by her centripetal force towards the earth, had she no circular motion at all, to the space a body near the earth would describe in falling, by its gravity towards the same.

Now, by an actual calculus of those two spaces, it appears, that the first of them is to the second, *i. e.* the centripetal force of the moon revolving in her orbit, is to the force of Gravity on the surface of the earth, as the square of the earth's semidiameter, to the square of the semidiameter of her orbit: which is the same ratio as that of the moon's centripetal force in her orbit, to the same force near the surface of the earth.

The moon's centripetal force, therefore, is equal to the force of Gravity. These forces, consequently, are not different, but they are one and the same: for, were they different, bodies acted on by the two powers conjointly, would fall towards the earth, with a velocity double to that arising from the sole power of Gravity.

It is evident, therefore, that the moon's centripetal force, whereby she is retained in her orbit, and prevented from running off in tangents; is the very power of Gravity of the earth, extended thither.

The moon, therefore, gravitates towards the earth; and the earth reciprocally towards the moon: which is further confirmed by the phenomena of the tides. See TIDES.

The like reasoning might be applied to the other planets. — For, as the revolutions of the primary planets round the sun, and those of the satellites of Jupiter and Saturn round their primaries, are phenomena of the same kind as the revolution of the moon round the earth; as the centripetal powers of the primary are directed towards the centre of the sun, and those of the satellites, towards the centre of their primaries; and lastly, as all these powers are reciprocally as the squares of the distances from the centres, it may safely be concluded that the power and cause is the same in all.

Therefore, as the moon gravitates towards the earth, and the earth towards the moon; so do all the secondaries to their primary ones; the primaries to their secondary ones; so, also, do the primary ones to the sun, and the sun to the primary ones.

Phænomena, or properties of universal GRAVITY. — I. All the several particles of all bodies in nature gravitate to all the particles of all other bodies.

To what has been urged in proof hereof, from the analogy between the motions of the several bodies in our system; it may be added, that saturn is actually observed by astronomers to change its course when nearest to jupiter; and jupiter, also, is found to disturb the motion of the satellites of saturn. So that the gravitation of those bodies is matter of actual observation.

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2. The quantity of this Gravity at equal distances, is always proportional to the quantity of matter in the gravitating bodies. — For, the powers of Gravity, are as the quantities of motion they generate; which quantities, in unequal bodies, equally swift, are to each other as the quantities of matter. Consequently, since unequal bodies, which are equally swift, are to each other as the quantities of matter; therefore, in regard unequal bodies at the same distance from the attracting body are found to move equally swift, by Gravity, it is evident, the forces of Gravity are proportionable to the quantities of matter.

3. The proportion of the increase, or decrease, of Gravity in the approach, or removal of bodies from each other, is this; that the force is reciprocally in a duplicate ratio, *i. e.* it is as the squares, of the distance. — Thus, suppose a body of an hundred pounds, at the distance of ten diameters from the earth; the same body, if its distance were but half so great, would have quadruple the weight: if its distance were but one third of the former, its weight would be nine times as great, &c. Hence we gather the following corollaries. 1^o, That at equal distances from the centre of homogeneous bodies, the Gravity is directly as the quantity of matter, and inversely as the square of the diameter. 2^o, That on the surfaces of equal, spherical, and homogeneous bodies, the Gravities are as the densities. 3^o, That on the surfaces of spherical, homogeneous, equally dense, but unequal bodies, the Gravities are inversely as the squares of the diameters. 4^o, That if both the densities and diameters differ, the Gravities on the surfaces will be in a ratio compounded of the densities and the diameters. Lastly, that a body placed any where, within a hollow sphere, which is homogeneous, and every where of the same thickness, will have no Gravity wherefoever it be placed; the opposite Gravities always precisely destroying each other. For the particular laws of the descent of bodies, by the force of Gravity, see DESCENT of bodies, and CENTRIPETAL force.

Cause of GRAVITY. — We have various theories advanced by the philosophers of various ages to account for this grand principle of gravitation. The antients, who were only acquainted with particular Gravity, or the tendency of sublimar bodies towards the earth, aimed no further than at a system which might answer the more obvious phenomena of the same; but the moderns, as their principle is higher and more extensive, so should their theory be.

Aristotle and the peripatetics, content themselves to refer Gravity or weight to a native inclination in heavy bodies to be in their proper place or sphere, the centre of the earth.

Copernicus ascribes it to an innate principle in all parts of matter, whereby, when separated from their wholes, they endeavour to return to them again the nearest way.

But neither of these systems assigns any physical cause of this great effect: they only amount to this, that bodies descend, because they are inclined to descend.

Gallendus, Kepler, Gilbert, and others, ascribe Gravity to a certain magnetic attraction of the earth. — These authors conceive the earth to be one great magnet continually emitting effluvia, which lay hold on all bodies, and draw them toward the earth. But this, we have observed, is inconsistent with the several phenomena.

Des Cartes, and his followers, Rohault, &c. attribute Gravity to an external impulse, or trusion of some subtle matter. — By the rotation of the earth, say they, all the parts and appendages thereof necessarily endeavour to recede from the centre of rotation: but they cannot, all, actually recede, as there is no vacuum or space to receive them.

If now, we suppose the earth ABCD, *Tab. Mechanic.* fig. 8. and L a terrestrial body placed in the pyramidal space, AEB: it follows, that the matter in this pyramid will have so much less endeavour to recede from the centre, as the body L has a less endeavour than the fluid matter whose place it possesses. Hence it will follow, that the matter of adjacent pyramids receding with more force; that in the pyramid AEB, and particularly the body L will be thereby driven toward the centre for the same reasons as cork, though a heavy body, ascends in water.

This hypothesis, though ingenious enough, yet, as it is founded on the supposition of a plenum, it is overturned by what has been since proved of the existence of a vacuum.

Dr. Hook inclines to an opinion much like that of Des Cartes: Gravity, he thinks, deducible from the action of a most subtle medium, which easily pervades and penetrates the most solid bodies; and which, by some motion it has, detaches all earthly bodies from it, toward the centre of the earth.

Volfius, and many others, give partly into the Cartesian notion, and suppose Gravity to arise from the diurnal rotation of the earth round its axis.

Dr. Halley, despairing of any satisfactory theory, chuses to have immediate recourse to the agency of the almighty. — So Dr. Clark, from a view of several properties of Gravity, concludes, that it is no adventitious effect of any motion, or subtle matter, but an original and general law impressed by the Almighty on all

matter, and preserved therein by some efficient power penetrating the very solid and intimate substance thereof; as being found always proportionable, not to the surfaces of bodies or corpuscles, but to their solid quantity and contents.—It should, therefore be no more enquired, why bodies gravitate, than how they came to be first put in motion! *Annal. in Robault. Phys. P. I. c. xi. § 16.*

Dr. S. Græfende, in his *Intruduct. ad Philosoph. Newton.* contends, that the cause of *Gravity* is utterly unknown; and that we are to look on it no otherwise than as a law of nature, originally and immediately impressed by the creator, without any dependance on any second law or cause at all. Of this he thinks the three following considerations sufficient proof.

1^o, That *Gravity* requires the presence of the gravitating or attracting body: so the satellites of jupiter, *e. gr.* gravitate towards jupiter, wherever he be.

2^o, That the distance being supposed the same, the velocity wherewith bodies are moved, by the force of *Gravity*, depends on the quantity of matter in the attracting body: and that the velocity is not changed, let the mass of the gravitating body be what it will.

3^o, That if *Gravity* do depend on any known law of motion, it must be some impulse from an extraneous body; whence, as *Gravity* is continual, a continual stroke must also be required.

Now, if there be any such matter continually striking on bodies, it must be fluid, and subtle enough to penetrate the substance of all bodies: but how shall a body subtle enough to penetrate the substance of the hardest bodies, and so rare as not sensibly to hinder the motion of bodies, be able to impel vast bodies towards each other with such force? how does this force increase in the ratio of the mass of the body toward which the other body is moved? Whence is it that all bodies, supposing the same distance, and the same body gravitated to, move with the same velocity? Can a fluid, which only acts on the surface either of the bodies themselves, or of their internal particles, communicate such a quantity of motion to bodies, which in all bodies shall exactly follow the proportion of the quantity of matter in them?

Mr. Cotes goes yet further; giving a view of Sir Isaac Newton's philosophy, he asserts that *Gravity* is to be ranked among the primary qualities of all bodies; and deemed as essential to matter, as extension, mobility, or impenetrability. *Præfat. ad Newton. Princip.*

But this author may seem to have overshot the mark. His great master, Sir Isaac Newton himself, disclaims the notion; and to shew that he does not take *Gravity* to be essential to bodies, he gives us his opinion about the cause; chusing to propose it by way of query, as not being yet sufficiently satisfied about it by experiments.

This query we shall subjoin at large.—After having shewn that there is a medium in nature vastly more subtle than air, by whose vibrations light communicates heat to bodies, and is itself put into alternate fits of easy reflexion and easy transmission, and found propagated; and by the different densities wherewith the refraction and reflexion of light is performed.

—He proceeds to enquire.

“Is not this medium much rarer within the dense bodies of the suns, stars, planets, and comets, than in the empty celestial spaces between them? and in passing from them to great distances, doth it not grow denser and denser perpetually, and thereby cause the *Gravity* of those great bodies towards one another, and of their parts towards the bodies; every body endeavouring to recede from the denser parts of the medium towards the rarer?”

“For if this medium be supposed rarer within the sun's body, than at its surface, and rarer there than at the hundredth part of an inch from his body, and rarer there than at the fiftieth part of an inch from his body, and rarer there than at the orb of saturn; I see no reason why the increase of density should stop any where, and not rather be continued through all distances from the sun to saturn, and beyond.”

“And though this increase of density may at great distances be exceeding slow; yet if the elastic force of this medium be exceeding great, it may suffice to impel bodies from the denser parts of the medium towards the rarer with all that power which we call *Gravity*.”

“And that the elastic force of this medium is exceeding great, may be gathered from the swiftness of its vibrations. Sounds move about 1140 English feet in a second of time, and in seven or eight minutes of time, they move about one hundred English miles: light moves from the sun to us in about seven, or eight minutes of time, which distance is about 7000000 English miles, supposing the horizontal parallax of the sun to be about twelve seconds; and the vibrations, or pulses of this medium, that they may cause the alternate fits of easy transmission, and easy reflexion, must be swifter than light, and by consequence, above 700000 swifter than sounds; and therefore the elastic force of this medium, in proportion to its density, must be above 700000 x 700000 (that is, above 490000000000) times greater than the ela-

“stic force of the air, is in proportion to its density: for the velocities of the pulses of elastic mediums, are in a subduplicate ratio of the elasticities and the rarities of the mediums taken together.”

“As magnetism is stronger in small loadstones than in great ones, in proportion to their bulk; and *Gravity* is stronger on the surface of small planets, than those of great ones, in proportion to their bulk; and small bodies are agitated much more by electric attraction than great ones: so the smallness of the rays of light may contribute very much to the power of the agent by which they are refracted; and if any one should suppose that æther (like our air) may contain particles which endeavour to recede from one another (for I do not know what this æther is) and that its particles are exceedingly smaller than those of air, or even than those of light; the exceeding smallness of such particles may contribute to the greatness of the force by which they recede from one another, and thereby make that medium exceedingly more rare and elastic than air, and of consequence exceedingly less able to resist the motions of projectiles, and exceedingly more able to press upon gross bodies by endeavouring to expand itself.” *Optics, p. 325, &c.*

GRAVITY, in mechanics, denotes the conatus, or tendency of bodies toward the centre of the earth.

That part of mechanics which considers the motion of bodies arising from *Gravity*, is peculiarly called *statics*. See *STATICS*.

Gravity, in this view, is distinguished into *absolute*, and *relative*.

Absolute GRAVITY, is that wherewith a body descends freely through an unresisting medium.

The laws of absolute *Gravity*; see under the article *DESCENT of bodies*.

Relative GRAVITY, is that wherewith a body descends after having spent part of its weight in overcoming some resistance.

Such is that wherewith a body descends along an inclined plane, where some part is employed in overcoming the resistance, or friction of the plane.

The laws of relative *Gravity*, see under the articles *inclined PLANE, DESCENT, FLUID, RESISTANCE, &c.*

Centre of GRAVITY; see *CENTRE of Gravity*.

Diameter of GRAVITY; see *DIAMETER of Gravity*.

Paracentric solicitation of GRAVITY; see *PARACENTRIC*.

Plane of GRAVITY; see *PLANE of Gravity*.

Retardation from GRAVITY; see *RETARDATION*.

GRAVITY, in hydrostatics.—The laws of bodies gravitating in fluids, make the business of hydrostatics. See *HYDROSTATICS*.

Gravity is here divided into *absolute* and *specific*.

Absolute, or true GRAVITY, is the whole force wherewith the body tends downward.

Specific GRAVITY, called also *relative, comparative, and apparent GRAVITY*, is the excess of *Gravity* in any body, above that of an equal quantity or bulk of another.

For the laws of specific *Gravity*, with the methods of determining it both in solids and fluids; see *SPECIFIC gravity*, and *HYDROSTATICAL balance*.

GRAVITY of the air; see *WEIGHT of the air*: see also *AIR and PRESSURE*.

GRAVITY, in music, is an affection of sound, whereby it becomes denominated *grave, low, or flat*.

Gravity stands in opposition to *acuteness*, which is that affection of sound, whereby it is denominated *acute, sharp, or high*.

The relation of *Gravity* and acuteness, is the principal thing concerned in music; the distinctness, and determinateness of which relation, gives sound the denomination of *harmonical, or musical*.

The degrees of *Gravity, &c.* depend on the nature of the sonorous body itself, and the particular figure and quantity thereof: though, in some cases, they likewise depend on the part of the body where it is struck. Thus, *e. gr.* the sounds of two bells of different metals, and the same shape and dimensions, being struck in the same place, will differ as to acuteness and *Gravity*; and two bells of the same metal will differ in acuteness, if they differ in shape or magnitude, or be struck in different parts.

So in chords, all other things beings equal, if they differ either in matter, or dimensions, or tension, they will also differ in *gravity*.

Thus again, the sound of a piece of gold is much graver than that of a piece of silver of the same shape and dimensions; and, in this case the tones are; *cæteris paribus*, proportional to the specific *gravities*: so a solid sphere of brass, two foot in diameter, will sound graver than another of one foot diameter; and here the tones are proportional to the quantities of matter, or the absolute weights.

But it must be observed, that acuteness and *gravity*, as also loudness and lowness, are but relative things. We commonly call

call a found *acute* and loud, in respect to another which is *grave*, or low with respect to the former: so that the same found may be both *grave* and acute, and also loud and low, in different comparisons.

The degrees of acuteness, and *gravity*, make the different tones, or tunes of a voice, or found: so we say one found is in tune with another, when they are in the same degree of *gravity*.

The immediate cause, or means of this diversity of tones lies very deep. The modern musicians fix it on the different velocity of the vibrations of the honourable body: in which sense *gravity* may be defined, a relative property of found, which, with respect to some other, is the effect of a lesser number of vibrations accomplished in the same time, or of vibrations of a longer duration.—In which sense also, acuteness is the effect of a greater number of vibrations, or vibrations of a shorter duration.

If two, or more founds be compared in the relation of *gravity*, &c. they are either *equal*, or *unequal*, in the degree of tune.—Such as are *equal*, are called *unisons*. See UNISON.

The *unequal* including, as it were, a distance between each other, constitute what we call an *interval* in music; which is properly the difference, in point of *gravity*, between two founds.

Upon this inequality, or difference, does the whole effect depend; and in respect hereof, it is that these intervals are divided into *concord*s, and *discord*s.

GRAVY, in cookery, &c. the juices of flesh, or fish, obtained therefrom by coction, elixation, frission, or the like.

The procuring of *gravies* is no inconsiderable part of cookery, inasmuch as these are required to heighten the gusto, and refresh of most dishes. There are divers processes for *beef gravy*; one of the mostest and simplest, is to cut a pound or two of lean beef flakes into slices, beat them well, fry them till brown, and then add a pint of strong broth, and an onion; letting the whole boil a little, and then straining it for use.

To make *mutton gravy*, they roast a shoulder of mutton a little more than half, cut it with a knife, squeeze out the *gravy* with a press; then moisten the meat again with broth, and press it a second time: adding a little salt, they then keep it for use.

Veal-gravy is chiefly had by cutting flakes off a fillet, beating them, and stewing them with sliced onions, carrots, and parsnips; and at last adding strong broth, parsley, &c. letting them stew a-fresh, and straining them for use.

To make *fish gravy*, carps and tenches are slit length-ways, and stewed with butter, onions, carrots, &c. till brown; then a little flower is put in, and stewed till brown. Lastly, some fish-broth is strained in through a cloth, and the whole seasoned with salt, lemon, cloves, and favoury herbs.

GRAY, or GREY, a mixed colour, partaking of the two extremes, black and white.

In the manage they make several sorts of *grays*: as, the *branded* or *blackened gray*, which has spots quite black, dispersed here and there.—The *dappled gray*, which has spots of a darker colour than the rest of the body.—The *light* or *silver gray*, wherein there is but a small mixture of black hairs.—The *sad* or *iron gray*, which has but a small mixture of white.—And the *brownish* or *sandy-coloured gray*, where there are bay-coloured hairs mixed with the black.

GRAY-bound, } see HOUND.
GRAY order, } ORDER.

GREASE, among farriers, &c. a swelling and gourdiness of the legs of a horse, very frequently happening after a journey.

If the *grease* be an attendant of some other disease, it will be in vain to attempt the cure before the disease be removed that is the original cause of it: and therefore, if it be a hectic, the yellows, or the farcin, &c. the directions given for those diseases are to be followed, and in the mean time proper applications are to be used outwardly for the *grease*.

If the *grease* proceed from common and ordinary accidents, and the horse has no other distemper upon him; then applications that are peculiar to that distemper are to be followed:—If the horse has been well fed and pampered, begin the cure with bleeding and purging, so as to diminish the redundancy of the humours; but these ought to be used with moderation, and it may be better to effect it with spare diet and daily labour. After moderate evacuations, it may be proper to make a rowel on the inside of the thigh, or in the belly; and to keep it open for a month, or longer, as there shall be occasion; and in the mean time to give the horse the cinnabar or antimonial balls.

GREAT, a term of comparison, denoting a thing to have more extension than some other to which it is referred. See COMPARISON.

Thus we say a *great space*: a *great distance*: a *great figure*: a *great body*, &c.

GREAT is likewise used figuratively, in matters of morality, &c. to signify ample, noble, elevated, extraordinary, important, &c.

Thus we say, Shakespear was a *great genius*: queen Elizabeth had a *great soul*: Cromwell was a man of *great designs*: Da Vinci, a *great painter*: Galileo a *great philosopher*: Bossu a *great critic*, &c.

GREAT is also a title or quality appropriated to certain princes, and other illustrious personages.

Thus we say the *great Turk*: the *great Mogul*: the *great chamberlain*: the *great duke of Florence*, &c.

GREAT is also a surname bestowed on several kings and emperors.

Thus we say, Alexander the *Great*: Cyrus the *Great*: Charles the *Great*, or Charlemaign: Henry the *Great* of France, &c. So the English frequently say, Edward the *Great*, or the *Great* Edward: William the *Great*, meaning king William III. or the *Great* William. The French say, Louis the *Great*, le *Grand*, speaking of the late Louis XIV. Gyles of Paris, says Charlemaign, first got the surname *Great* from the tallness and eminence of his stature. Helgaud adds, that Hugh the *Great* of France was thus denominated on account of his great piety, goodness, &c.

GREAT is also applied to several officers, who have pre-eminence over others.

Thus we say, the lord *great chamberlain*: the *great marshal* of Poland, &c.

GREAT circles of the sphere, are such as divide the sphere into two equal parts or hemispheres; or whose planes pass through the centre of the sphere: in contradistinction from the lesser circles, which cut the sphere into unequal parts, &c.

The equator, meridian, ecliptic, verticals, &c. are *great* or *greater* circles of the sphere; and the parallels, tropics, &c. lesser circles. See EQUATOR, MERIDIAN, &c.

GREAT apparatus,	} see	APPARATUS.	
GREAT artery,		ARTERY.	
GREAT hairam,		BAIRAM.	
GREAT bear,		URSA major.	
GREAT diachylon,		DIACHYLON.	
GREAT gun,		CANNON and GUN.	
GREAT letters,		CAPITAL.	
GREAT mafs,		MASS.	
GREAT officers,		OFFICER.	
GREAT repeat,		REPEAT.	
GREAT seal,		SEAL.	
GREAT tithes,		TITHES.	
GREAT wardrobe,		WARDROBE.	
GREAT ER barons,		} see	BARON.
GREAT ER enbarmonical distift,			DIESIS.
GREAT ER excommunication,	EXCOMMUNICATION.		
GREAT ER fasti,	FASTI.		
GREAT ER hexachord,	HEXACHORD.		

GRECIAN Coins, see the article COINS.
GREE*, in our law-books, signifies agreement, contentment, or good liking.—Thus to make *gree* to the parties, is to satisfy them for an offence done. “Judgment shall be put in full-
pence, till *gree* be made to the king of his debt.” Stat. 25 Edward III.

* The word is formed from the French *gré*, good will, good liking, or allowance.

GREEK, GRECIAN, something belonging to the people of Greece.

GREEK, absolutely so called, or the *GREEK language*, or *antient GREEK*, is the language spoken by the antient Grecians, and still preserved in the works of their authors, as Plato, Aristotle, Ilociates, Demosthenes, Thucydides, Xenophon, Homer, Hesiod, Sophocles, Euripides, &c.

The *Greek* has been preserved entire longer than any other language known, notwithstanding all the revolutions that have happened in the country where it was spoke. See ENGLISH. Yet, from the time of the removal of the seat of empire to Constantinople, in the fourth century, it has been gradually altering: the alterations at first did not affect the analogy of the tongue, the construction, inflections, &c. There were only new words, new riches acquired, by taking in the names of new dignities and offices, and the terms of art it was before unacquainted with: but, at length, the incursions of the Barbarians, and especially the invasion of the Turks, wrought much more considerable alterations. See modern GREEK.

The *Greek* has a great copia or flock of words: its inflexions are as remarkable for their variety, as those of most of the other European tongues, for their simplicity.

It has three numbers, singular, dual, and plural, and abundance of tenses in its verbs, which makes a variety in discourse, prevents a certain driness which always accompanies a too great uniformity, and renders the language peculiarly fit for all kinds of verse.

The use of the participles of the aoristus, and preterit, together with the compound words, wherein it abounds, give it a peculiar force and brevity, without taking any thing from its perspicuity.

The proper names in the *Greek* language, are significative, as in the oriental, as well as in most of the modern languages, where the learned still find some, though remote, character of their origin.

The *Greek* was the language of a polite people, who had a great taste for arts and sciences, which they cultivated with success. In the living tongues, are still preserved a vast number of *Greek* terms of art: some descended to us from the *Grecians*, and other formed a-new. When a new invention, machine, rite, order, instrument, &c. has been discovered, recourse has commonly been had to the *Greek* for a name; the facility wherewith words are there compounded, readily affording us names expressive of the use, effect, &c. of such instruments. Hence *aræometer*, *thermometer*, *barometer*, *micrometer*, *logarithm*, *telescope*, *microscope*, *loxodromy*, &c.

Modern or vulgar GREEK, is the language now spoke in Greece.

There have been few books writ in this language, from the taking of Constantinople by the Turks; scarce any thing but some catechisms, and the like pieces, composed or translated into the vulgar *Greek*, by the Latin missionaries.

The native *Greeks* are contented to speak the language without cultivating it. The misery they are reduced to under the dominion of the Turks, renders them ignorant of necessity; the Turkish politics not allowing any of the subjects of their estates, to apply themselves to the arts and sciences.

Whether it be out of a principle of religion, or politics, or barbarism, they have industriously destroyed all the monuments of ancient Rome; despising the study of a language which might have rendered them polite, their empire happy and flourishing, and have made the people forget their former masters, and even their antient liberty.

In this, widely different from the Romans, those antient conquerors of Greece, who after they had subdued the country, applied themselves to learn the language; in order to imibe their politeness, delicacy, and taste for arts and sciences. It is not easy to assign the precise difference between the *vulgar* and the *antient Greek*. It consists in the terminations of nouns, pronouns, verbs, and other parts of speech, which make a difference between those two languages much like that observed between some of the dialects of the Italian or Spanish: we instance in those languages, as being the most known; but we might have said the same of the Hebrew, Selavonic, &c. dialects.

Beside, the modern *Greek* has divers new words not in the antient; particularly several particles which appear as expletives, and which were introduced to characterise certain tenses of verbs, and other expressions, which would have had the same meaning without such particles, had custom dispensed with them; divers names of dignities and offices, unknown to the antient *Greeks*; and abundance of words borrowed from the vulgar tongues of the neighbouring nations.

Accordingly one may distinguish three ages of the *Greek* tongue: the first ends at the time when Constantinople became the capital of the Roman empire; not but there were several books, especially of the fathers of the church, wrote with great purity after that time; but as religion, law, and policy, both civil and military, began then to introduce new words into the language, it seems necessary to begin the second age of the *Greek* tongue from that epocha; which lasted to the taking of Constantinople by the Turks, where the last age commences.

GREEK accents, } See ACCENT.
GREEK bible, } See BIBLE.

GREEK church, is that part of the christian church which is established in Greece; extending likewise to some other parts of Turkey.

It is thus called in Europe, Asia, and Africa, in contradistinction from the *Latin*, or *Romish* church; as also the *Eastern* church, in distinction from the *Western*.

The Romanists call the *Greek* church, the *Greek schism*, because the *Greeks* do not allow the authority of the pope, but depend wholly, as to matters of religion, on their own patriarchs. They have treated them as schismatics ever since the revolt, as they call it, of the patriarch Photius.

The learned are divided as to the peculiar doctrines and sentiments of the *Greek* church. It is certain many errors are usually charged on them, which they are free of. The point has been warmly contested between *Caucus*, archbishop of *Corfu*, and the *Sieur de Moni*, on the one side: and *Lucas Holstadius*, and *Leo Allatius*, a *Greek*, on the other; the two first accusing, the last excusing them. *Caucus*, &c. will have them agree with the protestants, in rejecting abundance of the rules and observances established in the *Romish* church; while *Allatius*, &c. endeavours to find the same observances among the *Greeks*, as among the *Latins*, only under other forms, and with other circumstances.

Of the seven Latin sacraments, says *Caucus*, the *Greeks* only admit of five: confirmation and extreme unction, they set aside. *Allatius*, on the contrary, insists, that they do not properly

set them aside, but only differ as to the manner of administering them. Instead of confirming long after baptism, they always join baptism and confirmation together: beside that confirmation among them, is conferred by the ordinary priests. The like error is charged on *Caucus*, with regard to extreme unction.

But it is to be here added, that from the answer of *Jeremy*, patriarch of *Constantinople*, to the divines of *Wirttemberg*, it appears, that the *Greeks*, like the reformed, do really own no more than two sacraments instituted by *Christ*, viz. baptism and the eucharist.

The *Greeks*, says the same *Caucus*, offer no worship to the eucharist: *Allatius* replies, it is true, they do not adore it, as the *Romanists* do, immediately after the speaking those words, *this is my body*, yet do they really adore it after the words wherein consecration consists, viz. after the prayer called the invocation of the holy Spirit.

As to confession, *Caucus* is certainly in the right, that they do not hold it to be of divine appointment, but only of positive, or ecclesiastical right; which they likewise affirm of all the other sacraments, except the two above-mentioned: yet have they the use of auricular confession.

As to marriage, *Caucus* is just to them, in saying, that they do not esteem it an indissoluble band; they maintain with great zeal, the necessity and validity of divorce.

As to the primacy of the pope, *Caucus* does them justice in saying they deny it. It is certain the *Greeks*, *Melchites*, and other orientals, do not allow the primacy of the pope over the other patriarchs, in the sense it is allowed of among the *Latins*.

Nor do they allow of more than seven general councils. All those held by the *Latins*, since *Photius*, they set aside.

GREEK cross, }
GREEK grammar, } See CHURCH.
GREEK lexicon, } See GRAMMAR.
GREEK masonry, } See LEXICON, &c.
GREEK mass, } See MASONRY.
GREEK mass, } See MASS.

GREEK orders, in architecture, are the doric, ionic, and corinthian; in contra-distinction to the two *Latin* orders, the tuscian and composite. See ORDER.

GREEK pitch, see the article PITCH.

GREEK rite, or ritual, is distinguished from the *Latin*. See RITE, and RITUAL.

GREEK statue, }
GREEK testament, } See STATUE.
GREEK wine, } See BIBLE.
GREEK year, } See WINE.
GREEK year, } See YEAR.

GREEN, one of the original colours of the rays of light.

If urine, citron juice, or spirit of vitriol, be cast on a green ribbon, it becomes blue; by reason the yellow of the green-weed is thereby exhaled and consumed; so that nothing but blue remains behind.

Grass and herbs, and even all vegetables in places exposed to the open air, are green; and those in subterraneous places, or places inaccessible to the air, white and yellow. Thus, when wheat, or the like, germinates under ground, it is white or yellow; and what is in the open air, green: though this too is yellow before it be green.

Artificial GREENS are very rarely simple colours, but produced by the mixture of yellow and blue.

Two powders, the one blue, and the other yellow, well mixed, appear perfectly green; though when viewed with a microscope, we observe a chequer of blue and yellow.

The dyers make divers shades, or casts of green, as light green, yellow green, grass green, laurel green, sea green, dark green, parrot green, and celadon green.

All the greens are first dyed in blue, then taken down with woad, verdgrease, &c. and then greened with the weed, there being no one ingredient that will give green alone.

Mountain GREEN, or Hungary GREEN, is a sort of greenish powder found in little grains, like sand, among the mountains of *Kernaufen* in *Hungary*, and those of *Moldavia*.

Though some hold that this mountain green is factitious, and the same with what the antients called *fos aris*, prepared by casting water, or rather wine, on copper red-hot from the furnace, and catching the fumes thereof on copper plates laid over for the purpose; or by dissolving copper plates in wine, such as in making verdgrease. The painters make use of this colour for a grass green. It is sometimes counterfeited by grinding verdgrease with ceruse.

Calined GREEN, and dyed GREEN; see VERDEGREASE.

GREEN cap, }
GREEN copperas, } See CAP.
Earth GREEN, } See COPPERAS.
GREEN fish, } See VEKITER.
GREEN glass, } See FISH.
GREEN glass, } See GLASS.

GREEN hide, is that not yet tanned, or dressed, but such as taken off from the carcase. See HIDE, and CURRYING.

GREEN *plots, walks, &c.*

GREEN *soaps,*

GREEN *vitriol,*

GREENCLOTH, a board, or court of justice, held in the counting-house of the king's household, for the taking cognizance of all matters of government and justice within the king's court royal; and for correcting all the servants therein, that shall any way offend.

To this court also belongs the authority of maintaining the peace for twelve miles round the king's court, wherever it shall be, excepting at London.

The judge of this court is the lord steward, assisted by the treasurer, comptroller, cofferer, clerks of the *greencloth*, &c.

It takes its name *greencloth*, from a green cloth spread over the board where they sit, whereon are the arms of the counting-house.

Clerks of the GREENCLOTH, are two officers of the board of *greencloths*, who attend there, and have business assigned them by the board.—All bills of comptrolments relating to the office, are summed up, and allowed by the clerks comptrollers, and audited by the clerks of the *greencloth*.

They also appoint the king's, queen's and household's diet, and keep all records, leigers, and papers relating thereto; make up bills, parcels, and debentures for salaries, &c. and provisions and necessaries for the officers of the pantry, buttery, cellar, &c.

GREENHOUSE, or *conservatory*; a house of shelter in a garden; contrived for preserving the more tender and curious exotic plants, which will not bear the winter's cold abroad in our climate.

Greenhouses, as now built, serve not only as conservatories, but likewise as ornaments of gardens; being usually large and beautiful structures, in form of galleries, wherein the plants are handsomely ranged in cases for the purpose.

The *greenhouse*, Mr. Mortimer directs to be open to the south, or very little declining therefrom: the height and breadth to be about twelve foot, and length according to the number of plants intended to be kept therein. It should be situate on the driest ground, and so contrived, as that nothing may obstruct the sun's rays in winter. In the building it, care must be taken, not to plaster it on the inside with lime and hair: dampness being observed to continue longer on such plaster, than on bricks or waincoat. To preserve it the more from moisture and colds, an artificial heat is to be used: in order to this, some hang up fires, and others place pans of coals in holes in the ground. The better way is, to have a stove behind the *greenhouse*, and to convey the heat thereof through trills, made under the floor for that purpose. The best method of all, according to Bradley, is the new stove invented by M. Gauger, and published in English by Dr. Desaguliers.

Some have glasses, casements, and doors of glass; others prefer moveable canvas doors, to be taken off, and put on at pleasure.

The pots and cases with plants in them, are to be ranged in the *greenhouse* so, as not to incommode one another, or hinder any from readily receiving both sun, air, &c. As to the management of the plants herein, Mortimer recommends the opening of the mould about them, from time to time, and sprinkling a little fresh mould in them, and a little warm dung on that; as also to water them when the leaves begin to wither and curl, and not oftener, which would make them fade and be sickly; and to take off such leaves as wither and grow dry.

Bradley advises, that in the colder parts of England, the front of the *greenhouse* be built in a sweep, or semicircle, to receive the sun's rays, one part or other of it, all day: that all the windows, &c. in the front have close, thick, wooden shutters, to be shut every night in winter, for fear of frost, nipping winds, &c.—Dutch tiles he thinks the best lining for the walls, as being dry, and reflecting a great deal of heat; and square tiles for the pavement, which readily imbibe the wet, and never sweat, as marble and the harder stones do.—The plants in the *greenhouse* are not to fill above a quarter part of the space thereof; the rest being left vacant for the air to circulate about the plants. If the house be crowded with plants, the effluvia they are continually emitting by perspiration, and the vapours from the mould, will condense the air, and cause dampness. The plants are to be disposed, as much as possible, about the middle parts of the *greenhouse*, where they will be safer from the cold, which is usually greatest near the glasses and walls: the tenderest plants to be disposed nearest to where the heat comes in.

It is a general rule among gardeners, to set exotic plants into the *greenhouse*, about the second week in September; and to take them out again about the middle of May; though there should be some distinction made herein; the tenderest sorts from places near the line, as the aloes, &c. being to be confined longer to the *greenhouse*, than oranges, myrtles, &c.

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GREENLAND *fishery*; see the article *Whale FISHERY*.

GREENWICH *hospital*; see the article *HOSPITAL*.

GREGORIAN *calendar* is that which shews the new and full moon, with the time of Easter, and the moveable feasts depending thereon, by means of epacts disposed through the several months of the Gregorian year.

The *Gregorian calendar*, therefore, differs from the *Julian*, both in the form of the year, and in that it uses epacts, instead of golden numbers.

This reformation of the calendar was made in 1582, by order of pope Gregory XIII. and with the advice of Aloysius Lilius, and other mathematicians: at the same time, ten days were cut off from that year, and cast away, to bring the equinoxes to their antient seat, viz. the 21st of March. And to keep them constantly there, the same pope introduced a new form of year.

Gregorian chant; see the article *CHANT*.

Gregorian year, is the Julian year corrected, or modelled, in such manner, as that three secular years, which in the Julian account are bissextile, are here common years, and only every fourth secular year, is made a bissextile year.

The *Gregorian year*, though it comes nearer to nature and truth, than the Julian, is not strictly just: in four hundred years it gets one hour and twenty minutes; and consequently in seven thousand two hundred, a whole day.

The *Gregorian year*, is that now used in most countries of Europe; England, most of the United Provinces, Sweden, and Denmark, excepted; where the Julian year still obtains.

From this difference arises the distinction of the *old*, or *Julian*, and *new* or *Gregorian* style.

The old style is now eleven days behind the new: so that the same day which in the *Gregorian* account is the eleventh day of any month, in the Julian is only the first.

Gregorian epocha, is the epocha, or time whence the *Gregorian* calendar, or computation took place.

The year 1726, is the 144th year of the *Gregorian* epocha.

GRENADA, } see { GRANADO.

GRENADIER, } see { GRANADIER.

GRENATE, } see { GRANATE.

GRESHAM-colleges; see the article *COLLEGE*.

GREVE*, GEREFA, among our antient writers, is a denomination of power and authority; signifying as much as *comes*, or *vicecomes*. See the articles *COUNT*, and *VICOUNT*.

* The word is formed from the Anglo-Saxon *grith*, peace. Thus Hoveden, Greve dicitur, id est quod jure debeat grith, i. e. pacem ex illis facere, qui patria inferunt vae, i. e. miseriam vel malum.

Lambard makes *greve* the same with *reeve*.

Hence also the words *shireve*, *portreeve*, &c. which were antiently written *seiregerefa*, *portgeresa*, &c.

GREY, } see { GRAY.

GREYHOUND, } see { GRAYHOUND.

GRIFFON, GRYPHUS, γρυψ, in natural history, the name of an imaginary bird of prey, of the eagle kind.

The antients speak fabulously of the *griffon*; they represent it with four legs, wings, and a beak; the upper part representing an eagle, and the lower a lion; they supposed it to watch over gold mines, hidden treasures, &c.

The animal was consecrated to the sun; and the antient painters represented the chariot of the sun as drawn by *griffons*.—M. Spanheim observes the same of those of Jupiter and Nemesis.

We find mention of the *griffon* in holy scripture; but are not to understand the text of that chimerical animal just described, which no body ever saw but in painting and armories, notwithstanding what Servius, in his comment on the eighth eclogue of Virgil and Isidore, says of it.—The *griffon*, in scripture, is that species of eagle, called in Latin *effrugas*, the osprey, and גריפון, *peres* of the verb גריפון, *peras* to break.

God prohibited the Jews to eat divers kinds of birds of prey, as the kite, vultur, &c. and the divers species of eagles, which are distinguished in Latin by the names of *aquila*, *gryps*, *halietur*.—Pausanias, in *Arcaidicus*, says the *griffon* has his skin spotted like a leopard.

The *griffon*, we mean the fabulous one, is frequently seen on antient medals; and is still bore in coat armour. Or, a *griffon* rampant, with wings displayed, fable, is born by the family of Morgan in Monmouthshire, &c.

Guillim blazons it *rampant*; alleging that any very fierce animal may be so blazoned, as well as a lion.—Sylvester, Morgan, and others, use the term *griffon* instead of *rampant*.

GRILLADE, in cookery, meat broiled on the gridiron; thus called from the French *griller*, to broil.

The word is also used for the browning of any dish, by rubbing a hot iron over it.—To *grill* oysters, is to put them into scollop-shells, season them with salt, pepper, and parsley shred, and pour their own liquor to them; covering them

with grated bread; stewing them half an hour on the fire, and browning them with a red-hot iron.—Shrimps are *grilled* after the same manner.

GRINDING, trituration, the act of breaking, or comminuting a solid body, and reducing it into powder, dust, flower, farina, or the like.

Grinding is one of the species of dissolution.—The painters colours are *ground* on a marble, or porphyry, either with oil or gum water.

Some late physicians contend, that digestion is performed by *grinding* the food in the stomach.—It is alledged, that every part in the body is a vessel, or vessels; that all the vessels have a motion of systole and diastole; and that all the operations of the body consist in the attrition, or *grinding* of the humours or matters contained in such vessels.

GRINDING is also used for the rubbing, or wearing off, the irregular or otherwise redundant parts of the surface of a body, and reducing it to the destined figure, whether that be flat, concave, or the like.

The *grinding of glasses* is a considerable art, and as such, necessarily requires to be here insisted on; especially that off optic glasses.

Method of GRINDING optic glasses.—For convex glasses, the first step is to provide a dish, or bafon, within whose cavity the glass is to be formed.

In order to this, they take a piece of brass, copper, iron, or wood, and form it into a segment of a circle, having the radius of the bafon, or dish intended. This done, a bafon is forged by a smith, either of iron or copper; having its cavity exactly fitting or corresponding to the segment above mentioned: though sometimes they chuse to have the bafon cast; in which case, the rules elsewhere delivered for concave mirrors, are to be here observed.

The figure of the bafon thus roughly formed, is to be finished in the pewterers lathe; or on a stone mould A, *Tab. Miscellany*, fig. 12. fixed to an iron axis, with a pinion B C, moveable by a wheel D E, and that by a winch or handle F. The bafon being ground on the mould, till it exactly fit in all parts, they take it off, and cementing it to a wooden block (loaden, if need be, with lead) strew it over with fine sifted sand, and thus *grind* it over again on the mould, till all the furrows or scratches be quite taken away.

Lastly, they *grind* large pieces of glass in a bafon, with fine sand between; till such time as its surface being well smoothed, there is no longer any opposition to the motion.

Note, the dish is known to be perfectly finished, when a hair being stretched over it, its shadow projected in the cavity, especially in a camera obscura, does not appear any way distorted.

The bafon finished, they proceed to chuse glasses for the purpose: in order to this, lay them on clean paper, and observe what colours are projected thereon; for the same are the colours of the glasses. Always set aside those of the darker colours, and chuse the brighter: but as the whitest and brightest have usually veins; and beside, in tract of time, by the humidity of the air, are apt to rust, and lose their polish; for this reason Huygens recommends those a little yellowish, reddish, or greenish; Hevelius, the blueish. A glass is found to be free from bubbles, sands, veins, knots, and spires, by holding it to the sun, and receiving the rays through it on a white paper; for the flaws abovementioned, will each project a shadow thereon.

If, instead of lenticular, or at least spherical glasses, you make use of plate glass; it must be divided, and cut with a diamond, into squares, and if it be too thick to break otherwise, you may do it by laying it on a table covered with a cloth, in such manner, as that the side or part to be severed hang over the edge: for being struck with an iron instrument, in this situation it easily breaks in the direction of the line drawn by the diamond.

Having thus got a square piece, describe two concentric circles thereon, with a pair of compasses, one of whose legs carries a diamond; the diameter of the inner circle, to be equal to the breadth of the intended lens, and that of the outer somewhat more; and break off the corners, as above directed; and the lesser inequalities take off on a grind-stone, or the like. Examine now whether the piece of glass be every where equally thick; if it be not, reduce it to such equality by *grinding* it on an iron plate with sand and water. Lastly, glue or cement the glass thus prepared to a wooden handle N M O, fig. 13. with a cement made of pitch, and a fourth part of rosin; or one part of wax, and eleven of colophony. Care to be taken that the base, or bottom of the handle N O, be equal to the glass; and that the centre of the glass and handle meet together. Smaller lens's, as those used for microscopes, are fixed on with sealing-wax.

Now, to grind the glass, and bring it to the convexity required; smear over the dish equally with fine sifted sand moistened with water: then taking the handle with the glass thereon, work it on the bafon sometimes this way, and some-

times that, to prevent the form of the bafon from being disturbed; never leaning too hard thereon. When the glass has got the figure of the bafon, clean it well of all the sand, and filth adhering; and sprinkle the bafon over with emery moistened in water; *grinding* the glass thereon, till all the roughnesses and inequalities are taken away. After this, the fine sand used in hour-glasses may be of service, applied and used as before; remembering to take out the sand when too much worn, and substitute new in its stead. Some in lieu hereof, chuse several sorts of emery, each finer than other, or even the powder of flints calcined and pounded. Lastly, grind the same glass in another bafon, or dish, which is a segment of a lesser sphere, making use of the like sand as before; till it have got a pretty high rim, or margin, all around. In regard the pressure is not here determined accurately enough upon the middle of the glass, by the mere guidance of the hand; some have chose to make use of the following machine, especially for *grinding* object-glasses.

Fix the dish H I, fig. 14. on a horizontal table; exactly over its centre let the aperture D be, through which pass an iron arm five or six inches long, fastened to the staff A B. Let the other extreme of the staff be fitted into a hole cut in the dish, and fastened therein. Now to grind the glass, instead of the dish, take hold of the said staff, and work with sand, &c. as before.

Huygens tells us, that he always first used coarse emery, then a finer powder of the same, which would be fifty seconds in sinking to the bottom of a vessel of water, putting in fresh every half or quarter of an hour. Sometimes too, he used emery of fifty seconds, for $\frac{3}{4}$ of an hour; then emery of four hundred seconds, for $\frac{1}{2}$ of an hour; and lastly, emery of forty-five minutes for $\frac{1}{4}$ of an hour. The same effect is had from powder of flints, broke in an iron mortar, mixed with water, and stirred sometimes with a wooden spatula, taking the powder as it precipitates in some certain time to the bottom of the vessel, by decanting the water.—What remains is, to polish the glass.

GRINDING is also used for a coarser, and less accurate method of smoothing or polishing the surface of a body; particularly glass for looking glasses, &c.

In the new method of working large plates of glass for looking-glasses, coach-glasses, &c. by moulding, and, as it were, casting them, somewhat after the manner of metals, described under the article GLASS: the surface being left uneven, it remains to be ground and polished.

In order to this, the plate of glass is laid horizontally on a stone in manner of a table; and to secure it the better, plastered down with mortar, or stucco, that the effort of the workman, or of the machine used therein, may not shake or displace it. To sustain it, there is a strong wooden frame that surrounds it an inch or two higher than the glass. The bottom, or base of the *grinding* engine, is another rough glass, about half the dimensions of the former: On this is a wooden plank, cemented thereto; and upon this are proper weights applied to promote the triture; the plank or table, being fastened to a wheel, which gives it motion.—This wheel, which is at least five or six inches diameter, is made of a very hard but light wood, and is wrought by two workmen placed against each other, who push and pull it alternately: and sometimes, when the work requires it, they turn it round. By such means, a constant mutual attrition is produced between the two glasses, which is favoured by water and sands of several kinds bestowed between; sand still finer and finer being applied, as the *grinding* is more advanced: at last emery is used. We need not add, that as the upper or incumbent glass polishes and grows smoother, it must be shifted from time to time, and others put in its place.

It is to be noted, that only the largest size glasses are thus ground with a mill; for the middling and smaller sorts are wrought by the hand, to which end there are four wooden handles at the four corners of the upper stone, or carriage, for the workmen to take hold of, and give it motion.—What remains to the perfection of glass, comes under the denomination of polishing.

GRIP, or **GRIFE**, in husbandry, is a small ditch cut a-crofs a meadow, or ploughed land; in order to drain it.—It also signifies an handful; as, a *grife* of corn.

GRIFE of a ship, is the compass or sharpness of her stem under water; chiefly towards the bottom of her stem.

The design of shaping her so, is to make her *grife* the more, or keep a good wind; for which purpose sometimes a false stem is put on upon the true one.

GRIFE is also a sea-pharse for a ship's being apt to run her head or nose too much into the wind: in such case they say, she *grifes*; of which there are two causes: 1^o Overloading her a-head, the weight of which presses her head so down, that it is not apt to fall off from the wind. 2^o The staying or setting her masts too much aft; which will always be a fault in a small ship that draws much water, and will cause her to be continually running into the wind. Though in stately ships, if the masts be not stayed far aft, they will never keep a good wind.

GRIPES, *termina ventris*, in medicine, a sort of cholick, or painful disorder of the lower belly, occasioned by some sharp pungent matters vellicating the parts, or by wind pent up in the intestines.

The *gripes* are a very common symptom in young children, and may be caused by the aliment they use, which is considerably different from what they had been accustom'd to in the uterus.

The retention of a part of the meconium may also give occasion hereto, as being somewhat acrimonious.

This disorder sometimes proves so violent, as to throw the child into universal convulsions, or to cause what is vulgarly called *convulsions of the bowels*.

GRIST denotes corn ground, or ready for grinding. See **CORN**, &c.

GROANING, in hunting, a term used for the cry or noise of a buck.

GROAT, an English money of account, equal to four pence.

Other nations, as the Dutch, Polanders, Saxons, Bohemians, French, &c. have likewise their *groats*, groots, groches, gros, &c.

We had no silver money in the Saxon times bigger than a penny; nor after the conquest, till Edward III. who about the year 1351, coined groates, i. e. *groats*, or great pieces, which went for 4 d. a piece; and so the matter stood till the reign of Henry VIII. who, in 1504, first coined shillings.

GROGERS, by the stat. 37 Edward II. cap. 5. is used for those who engross merchandise. See **ENGROSSING**.

GROGRAM, in the manufactory, a sort of stuff, all silk; being in reality no more than a tawesty, coarser and thicker than ordinary.

GROOM*, denotes a servant in some inferior post:—In which sense it amounts to the same with the old word, *garçon*, and the French *garçon*.

* The word is formed from the Flemish, *grom*, *puer*, a boy.

GROOM is the denomination of several officers and servants in the king's household.

There are *grooms* of the almonry, *grooms* of the compting-house, *grooms* of the chamber, the privy-chamber, *grooms* of the robes, of the wardrobe, &c.

GROOM of the stole; see the article **STOLE**.

GROOM porter is an officer of the household, whose business is to see the king's lodging furnished with tables, chairs, stools, and firing; as also to provide cards, dice, &c. and to decide disputes arising at cards, dice, bowling, &c.

GROOM is more particularly used for a servant, appointed to attend on horses in the stables. See **EQURY**.

GROS, a foreign money, in divers countries, answering to our *groat*.

A pound *gros*, *livre de gros*. See **POUND and LIVRE**.

GROSS, or **GROSSUS**, in our antient law writers, denotes a thing absolute, and not depending on another.—Thus, *villain in gross*, villanus in grosso, was a servant, who did not belong to the land, but immediately to the person of the lord; or a servile person not appendant, or annexed to the land or manour, and to go along with the tenures as appurtenant to it, but like the other personal goods and chattels of his lord, at his lord's pleasure and disposal.

So an advowson *in gross*, is a right of patronage not annexed to the fee or manour, but belonging to the patron himself, distinct from the manour.

Common in Gross; see the article **COMMON**.

GROSS weight, is the weight of merchandizes, and goods with their dust and dross, as also of the bag, cask, chest, &c. wherein they are contained; out of which *gross-weight*, allowance is to be made for tare and tret.

GROSS average; see the article **AVERAGE**.

GROSS is also used for the quantity of twelve dozen.

GROSSA, a groat—*concessa est regi una grossa, que continet quatuor denarios, de qualibet viro et muliere*. Knighton, anno 1378.

GROSSE-bois, in our antient law-books, signifies such wood as hath been, or is, either by the common law, or custom of the country, reputed timber.

GROTESQUE, **GROTESCO**, or **GROTTESCUE**, a wild whimsical figure, or design of a painter, or engraver; having something ridiculous, extravagant, and even monstrous in it. The name arises hence, that figures of this kind were antiently much used to adorn the grotto's wherein the tombs of eminent persons, were inclosed. Such was that of Ovid, whose grotto was discovered near Rome about seventy years ago.

Calot, a celebrated engraver of Lorrain, had a wonderful genius for designing *grotesques*: the like is said of Leonardo da Vinci.

We also extend the word *grotesque* to any thing whimsical, or wildly pleasant, in a person's dress, discourse, &c.—Masquerade habits are the more valued, the more *grotesque* they are: our theatres present us with entertainments in *grotesque* characters, i. e. persons quaintly dressed; as harlequins, scara-

mouches, &c. Planudes has given us a very *grotesque* picture of Æsop. Ariosto and the Italian poets are full of *grotesque* descriptions.

GROTESQUE-work, **GROTESK-work**, or **GROTTESCO**, denotes a work, or composition in painting, and sculpture, in the *grotesque* manner or taste; consisting either of things which are merely imaginary, and have no existence in nature, or of things things turned and distorted out of the way of nature, so as to raise surprize, and ridicule.

Grotesque-work is much the same with what we sometimes also call *antique* and morisco.

GROTESQUES, or **GROTESKS**, are particularly used for little fanciful ornaments, of animals, compounded with foliage, fruit, &c.

Such are those painted by Raphael in the apartments of the Vatican, and those carved by Michael Angelo in the ceilings of the Portico of the capitol.—Vitruvius calls compartments of this kind *harpaginetti*.

GROTTÖ*, or **GROTTA**, in natural history, a large deep cavern or den in a mountain or rock.

* The word is Italian, *grotta*, formed, according to Menage, &c. from the Latin *crypta*: Du Cange observes, that *grotta* was used in the same sense in the corrupt Latin.

The antient anachorets retired into dens, and *grotto's*, to apply themselves the more attentively to meditation.

Okay-hole, Elden-hole, Pool's-hole, and the Devil's A—se in the Peak, are famous among the natural caverns or *grotto's* of our country.

Elden-hole is a huge profound perpendicular chasm, three miles from Buxton, ranked among the natural wonders of the Peak. Its depth is unknown, and is pretended to be unfathomable.

Cotton tells us he sounded 884 yards, yet the plummet still drew. But he might easily be deceived, unless his plummet were very heavy; the weight of a rope of that length might well make the landing of the plummet scarce perceivable. *Phil. Transf. N^o 407. p. 24.*

Peak's-hole, and Pool's-hole, called also the Devil's A—se, are two remarkable horizontal springs under mountains; the one near Caffleton, the other just by Buxton.—They seem to have owed their origin to the springs which have their current through them: when the water had forced its way through the horizontal fissures of the frata, and had carried the loose earth away with it, the loose stones must fall down of course: and where the frata had few or no fissures, they remained intire; and so formed there very irregular arches, which are now so much wondered at.—The water which passes through Pool's-hole is impregnated with particles of limestone, and has incrusted the whole cave in such a manner that it appears as one solid rock.—Martyn, in *Phil. Transf. N^o 407. p. 27. & seq.*

In *grotto's* are frequently found crystals of the rock, stalactites, and other natural conglaciations, and those often of an amazing beauty.

M. Homberg conjectures, from several circumstances, that the marble pillars in the *grotto* of Antiparos, vegetate or grow.

That author looks on this *grotto* as a garden, whereof the pieces of marble are the plants; and endeavours to shew that they could only be produced by some vegetative principle. *Mem. Acad. anno 1702.*

At Foligno in Italy, is another *grotto*, consisting of pillars and orders of architecture of marble, with their ornaments, &c. scarce inferior to those of art; but they all grow downwards: so that if this too be a garden, the plants are turned upside down. *Mem. de l' Acad. anno 1711.*

The Zirchnitzer-sea, or lake, in Carniola, famous for being full of water, fish, &c. the best part of the year, and quite dry, and bearing grass, corn, &c. the rest; proceeds from some subterraneous *grotto*, or lake; as is made highly probable by Mr. Valvafor; *Philosoph. Transf. N^o 191.*

We have several *grotto's* famous in natural history; as,

GROTTA del Cane, a little cavern near Pozzuoli, four leagues from Naples, the steams whereof are of a mephitical or noxious quality; whence also it is called *Bocca venenosa*, the poisonous mouth. See **MEPHITES**.

Two miles from Naples, says Dr. Mead, just by the Lago de Agnano, is a celebrated mofeta, commonly called *la Grotta del Cane*, equally destructive to all within the reach of its vapours.

It is a small *grotto* about eight foot high, twelve long, and six broad; from the ground arises a thin, subtle, warm fume, visible enough to a discerning eye, which does not spring up in little parcels here and there, but in one continued stream, covering the whole surface of the bottom of the cave; having this remarkable difference from common vapours, that it does not, like smoke, disperse itself into the air, but quickly after its rise, falls back again, and returns to the earth; the colour of the sides of the *grotto* being the measure of its ascent: for so far it is of a darkish green, but higher only common earth. And as I myself found no inconvenience by standing in it, so no animal, if its head be above this mark, is the least injured. But when, as the

manner is, a dog, or any other creature, is forcibly kept below it; or by reason of its smallness, cannot hold its head above it; it presently loses all motion, falls down as dead, or in a swoon, the limbs convulsed and trembling, till at last no more signs of life appear, than a very weak and almost insensible beating of the heart and arteries; which if the animal be left a little longer, quickly ceases too, and then the case is irrecoverable; but if it be snatched out, and laid in the open air, soon comes to life again, and sooner if thrown into the adjacent lake.

The fumes of the *grotto*, the same author argues, are no real poison, but act chiefly by their gravity; else the creatures could not recover so soon; or, if they did, some symptoms, as faintness, &c. would be the consequence of it. He adds, that in creatures killed therewith, when dissected, no marks of infection appear; and that the attack proceeds from a want of air, by which the circulation tends to an entire stoppage, and this so much the more, as the animal inspires a fluid of a quite different nature from the air, and so no ways fit to supply its place.

Taking the animal out while yet alive, and throwing it into the neighbouring lake, it recovers: this is owing to the coldness of the water, which promotes the contraction of the fibres, and so assists the retarded circulation; the small portion of the air which remains in the vesiculae, after every expiration, may be sufficient to drive out the noxious fluid. After the same manner, cold water acts in a deliquium animi: the lake of Agnani has no other virtue in it than others.

GROTTA dei serpi, is a subterraneous cavern near the village of Salsia, eight miles from the city of Braccano in Italy; described by Kircher thus:

The *grotta del serpi*, is big enough to hold two persons; it is perforated with several fistular apertures, somewhat in manner of a sieve; out of which, at the beginning of the spring season, issues a numerous brood of young snakes of divers colours, but all free of any particular poisonous quality.

In this cave they exposed their lepers, paralytics, arthritics, and elephantiac patients quite naked; where, the warmth of the subterraneous steams resolving them into sweat, and the serpents clinging variously all around, licking and sucking them, they become so thoroughly freed of all their vitious humours, that upon repeating the operation for some time, they became perfectly restored.

This cave Kircher visited himself, and found it warm, and every way agreeable to the description given of it. He saw the holes, and heard a murmuring, hissing noise in them. Though he missed seeing the serpents, it not being the season of their creeping out, yet he saw a great number of their exuviae, or sloughs, and an elm growing hard by laden with them.

The discovery of this cave, was by the cure of a leper going from Rome to some baths near this place; who losing his way, and being benighted, happened upon this cave, and finding it very warm pulled off his cloaths, and being weary and sleepy, had the good fortune not to feel the serpents about him till they had wrought his cure. *Museum Wormian.*

MILKY GROTTA, *crypta lactea*, a mile distant from the antient village of Bethlehem; is said to have been thus denominated, on occasion of the blessed virgin, who let fall some drops of milk in giving suck to the little Jesus in this *grotto*.—And hence it has been commonly supposed, that the earth of this cavern has the virtue of restoring milk to women that are grown dry, and even of curing fevers.

Accordingly, they are always digging in it, and the earth is sold at a good rate to such as have faith enough to give credit to the fable.—An altar has been built on the place, and a church just by it. See *Supplement, article CAVERN*.

GROTTA is also used for a little artificial edifice made in a garden, in imitation of a natural *grotto*.

The outides of these *grotto's* are usually adorned with rustick architecture, and their inside with shell-work, furnished likewise with various jet-d'eau, or fountains, &c.

The *grotto* at Versailles is an excellent piece of building.—Solomon de Caux has an express treatise of *grotto's* and fountains.

GROVE, in agriculture, &c. a little thick wood.

The antient Romans had a sort of *groves* near several of their temples, which were consecrated to some god, and called *luci*, by antiphrasis, à non lucendo, as being shady and dark. In large and magnificent gardens a *grove* is usually a plot of trees, inclosed with paliades, consisting of tall trees, as elms, horse-chestnuts, &c. the tops whereof make a tuft or plump, and shade the ground below.

At the foot of the tall trees, which generally run all along the paliades at equal distance, other lesser trees are often planted, whose tufts, form a resemblance of a sort of copse within the former.

GROUND, in agriculture, a piece of land, or soil; or a portion of earth, whether fit or unfit to be tilled, and cultivated.

All sorts of *ground* may be reduced to boggy, or marshy, chal-

ky, gravelly, and stony. See **MARSH**, **CHALK**, **SAND**, **GRAVEL**, &c.

<i>Batable GROUND,</i>	} see	{	BATABLE.
<i>Breaking GROUND,</i>			BREAKING.
<i>Commanding GROUND,</i>	} see	{	COMMANDING.
<i>Manuring GROUND,</i>			MANURING.
<i>GROUND niche,</i>	} see	{	NICHE.
<i>Oazy GROUND,</i>			OAZY.
<i>GROUND Pasture,</i>	} see	{	PASTURE.
<i>GROUND sell, or GROUND plate.</i>			SELL.

GROUND, in painting, is the surface, upon which the figures, and other objects, are raised or represented. See **PAINTING**.

Ground is properly understood of such parts of the piece as have nothing painted on them, but retain the original colour, upon which the other colours are applied to make the representations.

A drapery, piece of building, or the like, are said to serve as a *ground* to a figure, when the figure is painted on the drapery or building.

In the like sense, we also say the *ground* of a piece of tapestry, of an embroidery, of a medal, coin, &c.

The **GROUND** of a shield, or escutcheon, in heraldry, is properly called the *field*.

GROUND, in etching, denotes a gummy composition, smeared over the surface of the metal to be etched, to prevent the aqua fortis from eating, or having effect, except in places where this *ground* is cut through, or pared off, with the points of needles.

GROUND tackle, a sea term, denoting a ship's anchor, cables, &c. with whatever is necessary to make her ride safe at anchor in a proper *ground*.

GROUND work, in building; see **FOUNDATION**.

GROUNDING of a ship, is the bringing her on *ground*, to be trimmed, made clean, or to have some leak stopped in her.

GROUP*, or **GRUPPE**, in painting and sculpture, an assemblage or knot of two or more figures of men, beasts, fruits, or the like, which have some apparent relation to each other.

* The word is French, formed of the Italian *gruppo*, a knot or cluster.

In a good painting, it is necessary that all the figures be divided into two or three *groups*, or separate collections. Such and such a thing make a *group*, with such and such others of different nature and kind. The antique Laomedon is a fine *group* of three beautiful figures.

A *group* has somewhat in it of the nature of a symphony or concert of voices: as, in the one the voices must sustain each other, in order to fill the ear with an agreeable harmony from the whole; whence, if any part were to cease, something would necessarily be missed: so, in the other, if the parts or figures be not well balanced, something will be found disagreeable.

There are two sorts of *groups*, or two manners of considering *groups*; with regard to the design, and to the clear obscure. The first is common both to works of painting, and those of sculpture; the latter is peculiar to painting.

Groups, with regard to the design, are combinations of divers figures, which have relation to each other, either on account of the action, or of their proximity, or of the effect they have.

These we conceive, in some measure, as representing so many different subjects, or at least so many distinct parts or members of one greater subject.

Groups, with regard to the clear obscure, are bodies of figures wherein the lights and shadows are diffused in such manner that they strike the eye together, and naturally lead it to consider them in one view.

In architecture we sometimes say a **GROUP** of columns, speaking of three or four columns joined together on the same pedestal.—When there are but two together, we say a *couple*, not a *group* of columns.

In music, a **GROUP** is one of the kinds of diminutions of long notes, which in the writing forms a sort of *group*, or cluster. The *group* usually consists of four crotchets, quavers, or semi-quavers tied together, at the discretion of the composer.

GROUPADES is corruptly used, in the manage, for *croupades*. See **CROUPADE**.

GROUPED column; see the article **COLUMN**.

GRUPPE; see the article **GROUP**.

GRUBBING a cock, a term used by cock-fighters, for the cutting off the feathers under the wings.—It is a thing not allowed by cockpit law, nor to cut off his feathers in any handling place.

GRUBBS, in medicine, a white unctuous kind of pimples or little tumors, arising upon the face, chiefly the alae of the nose.

They are usually owing to hard drinking, and an obstructed perspiration; though natural in some constitutions.—They begin with a small black point, which gradually spreads; and sometimes the matter tends to suppurations, upon which the heads

heads of the eruptions grow white or yellow.—They are usually reputed salutary; whence to check their growth suddenly, has proved of ill consequence. They are cured by evacuation, and acrimonious lotions.

GRUME, GRUMUS, in medicine, &c. a little mass or lump of blood, milk, or other fluid, which is coagulated, thickened, hardened, &c.

Phthical people frequently spit up *grumes*, i. e. clots of blood. *Grumes* of milk, are what we popularly call *curds*.

GRUMOUS blood, denotes that state or consistence of the blood, wherein it is too viscid, and thick, for a due, brisk circulation: the effects whereof are, that it stagnates in the capillary vessels, and produces divers diseases.

GRUS, in antiquity, a dance performed yearly by the young Athenians, around the temple of Apollo, on the day of the Delia.

The motions and figures of this dance were very intricate, and variously interwove; some of them being intended to express the windings of the labyrinth, wherein the Minotaur was killed by Theseus.

GRY, a measure containing one tenth of a line. See **LINE**. A line is $\frac{1}{10}$ of a digit; and a digit $\frac{1}{10}$ of a foot; and a philosophical foot $\frac{1}{60}$ of a pendulum, whose diadromes, or vibrations, in the latitude of forty-five degrees, are each equal to one second of time, or one sixtieth of a minute.

GRYPHUS, a kind of enigma; or an artful obscure description of a thing. See **ÆNIGMA**.

GUADUM, in natural history, an herb, by the ancient Romans called *glastum*, and *vitrum*; by the Greeks *ifatis*; by the Britains *guadum*; and by us now, *wood*. See **WOOD**. The ancient Britains, Cæsar informs us, painted their faces with this herb, to appear the more terrible to their enemies. And Pliny relates, that the same was practised by the women in divers sacrifices.

GUAIAC, GUAIACUM, a medicinal wood, brought from the Indies, and much used in venereal disorders; called also *lignum vitæ*; and by the Spaniards, *ligno santo*. See **WOOD**.

Guaiac grows equally in the East and West Indies: that of the latter is brought in large pieces, some of them weighing four or five hundred pound; by which it is by the druggists distinguished from the former.

The *guaiac* tree is of the height of our walnut-tree; and is distinguished into two kinds, male and female; only differing as their leaves are more or less round; being all equally green, the flowers blue, and of a starry form; and having a little orange coloured fruit, about the size of a small nut, at the tip thereof.

The wood *guaiac* is extremely hard and heavy, and on that account is often used as ebony, in mosaic work, &c. as also for the making of button moulds.

But its principal use is in medicine, being found to warm, dry, rarify, attenuate, attract and promote sweats and urine. The usual way of applying it, is in decoction.

The best is that in large pieces, of a dusky colour, fresh, gummy, heavy, of an agreeable smell, and a brisk pungent taste; the bark sticking close to the wood.

The bark of *guaiac* is held of as much virtue, as the wood itself; the rind is of no efficacy; so that to make a sudorific decoction or tincture of the wood, they first pare off all the white part, which in reality is the rind; and only chip or rasp the hard, solid part, which is black, heavy, and resinous.—The chirurgeons frequently substitute box-wood, instead of *guaiac*, and, it is said, with equal success.

The resin drawn from *guaiac*, is held much more effectual in venereal cases, than either the wood, or bark. It is brought us in large pieces, not unlike common resin; but very different in respect of smell: the former, when cast on the coals, yielding a very agreeable balsamic fume.

GUANNAGIUM; see the article **WANNAGE**.

GUARANTEE, or *warrantee*, in law, a term relative to *warrant*, or *warranter*; properly signifying him whom the warranter undertakes to indemnify, or secure from damage.

GUARANTEE, is more frequently used for a warranter, or a person who undertakes and obliges himself to see a second person perform, what he has stipulated to the third.

GUARANTEE of a treaty, is a prince, or power, pitched on by the contracting parties, to see, or engage, that each side shall perform the articles.

The *guarantees* of the treaty of Oliva, of Westphalia, &c. The antient lords were obliged to *guaranty* the lands of their vassals, i. e. to defend them against their enemies; otherwise they lost their fee, and their vassals were no longer bound to do them homage and service.—Kings alone did not forfeit their fiefs by not *guarantying* them; and yet we read that Borel, count of Barcelona, threatened the king of France, Hugh Capet, to swear fealty to the Saracens, in case he did not *guaranty* him; and under Lewis the Young, the count of Champagne did homage to the emperor, on the like account. See **FEU**.

To *guaranty* a fee, had likewise another meaning, being used to denote, that where a fee was divided between the eldest son, and the younger, the eldest did homage to the lord both for himself and all the rest; and by that homage *guarantied* the whole.

GUARD*, or **GARD**, in its general sense, implies defence, custody, or conservation of any thing; the act of observing what passes, to prevent surprize; or the care and precaution taken to hinder any thing's being done contrary to the intention and desire of another.

* The word is formed of the French, *garde*, and that of the corrupt Latin *suarda*; and that of the German *wahren*, to keep, to defend.

GUARD is also used in a figurative sense, for the act or service of guarding, and the persons appointed for that purpose.

Thus we say, to be upon *guard*, to set the *guard*, mount the *guard*. Also, a strong *guard*, an attempt on the *guard*; 2000 men are necessary for the *guard* of the city, &c.

So again, those to whom the king commits the safety of his person, are called his *guard*, *life guard*, *body-guard*. And so, those who have the education and guardianship of infants, or idiots, are called their *guards*, or *guards*.

GUARD, or **GARD** is also applied to a writ relating to the office of ward, whereof there are three kinds: one called *droit de garde*, the second *ejément de garde*, the third *ravissement de garde*. See **WARD**, and **GUARDIAN**.

GUARD, in the military sense, is properly the duty or service done by the soldiers, to secure the army or place, from the attempts and surprizes of an enemy.—Of this there are divers kinds, as

Advanced GUARD, a party of horse or foot which marches before a corps, to give notice of approaching danger.

When an army is upon the march, the grand *guards*, which should mount that day, serve as an advanced *guard* to the army.

That small body also of fifteen or twenty horse, commanded by a lieutenant, beyond, but within sight of the main, or before the grand *guard* of a camp, are called the *advanced guard*.

Grand GUARD: this consists of three or four squadrons of horse, commanded by a field officer, and posted before the camp on the right and left wing, towards the enemy; for the security of the camp.

In a camp, every battalion posts a small *guard*, commanded by a subaltern officer, about one hundred yards before its front. This is called the *quarter guard*.

That small *guard* of foot, which a regiment of horse mounts in their front, under a corporal, is called the *standard guard*.

Main GUARD, is that from whence all the other *guards* are detached.—Those who are to mount the main *guards*, meet at the respective captains quarters, and from thence they go to the parade; where, after the whole *guard* is drawn up, the small *guards* are detached for the posts and magazines; and then the subaltern officers draw lots for their *guards*, and are commanded by the captain of the main *guard*.

Piquet GUARD, is a number of horse and foot, who keep themselves always in a readiness in case of an alarm; the horses being saddled, and the riders booted all the while: the foot draw up at the head of the battalion at the beating of the tattoo, but afterwards return to their tents, where they remain in a readiness to march on any sudden alarm.

This *guard* is to make resistance in case of an attack, till the army can get ready.

<i>Rear GUARD,</i>	} See	{	<i>REAR guard.</i>
<i>Safe GUARD,</i>			<i>SAFE guard.</i>
<i>Van GUARD,</i>			<i>VAN guard.</i>

GUARD is more particularly understood of a soldier, as a musketeer, archer, or the like, detached from a company or corps, to protect, detain, or secure any person, or to survey his actions.

A *guard* was set over each party, to prevent the duels taking place.

GUARDS is also understood of the troops or companies kept up to guard the king: called also *royal guards*, *life guards*, *gardes du corps*, &c.

There are also usually bodies of *guards* to wait on the princes of the blood, in the same capacity.

The *guards* are distinguished into *horse*, *foot*, *grenadiers*, and *yeomen*.

The English *horse GUARDS* are distinguished by troops: first, &c. troop of horse *guards*.

The *foot GUARDS* are distinguished by regiments: first regiment, Coldstream regiment, royal regiment of four *guards*.

Guards, no doubt, are as antient as monarchy. The remotest antiquity affords instances hereof. The scripture mentions those of Saul the first king of the people of God, 1 Sam. xix. 11. and those of Achish king of the Philistines, 1 Sam.

xxviii. The Grecian kings had also their *guards*: Justin mentions those of Pisistratus, tyrant of Athens, lib. xi. c. 8. those of the tyrants of the same city, established by Lyfander, lib. v. c. 8. those of Agis, king of Sparta, lib. xii. c. 1. those of Alexander, lib. xxii. c. 8. those of the Ptolemys, kings of Egypt, lib. xvi. c. 2. &c. Tarquin the Proud is said to have been the first who took guards at Rome. Dionys. Halicarnassicus, lib. iv. And yet we find that Romulus formed himself a *guard*, consisting at first of twelve sictors, and afterwards of three hundred soldiers, whom he called *celeris*.

The Roman emperors had, for their *guard*, the prætorian cohorts, established by Augustus, as Dion and Suetonius relate: Those of the emperors of Constantinople were called *bucellarii*.

Captain of the *guards*, colonel of the *guards*, brigadier of the *guards*, exempt of the *guards*, &c. See CAPTAIN, COLONEL, BRIGADIER, &c.

Yeoman of the GUARDS; see YEOMAN of the *guards*.

The French *guards* are divided into those *within*, and those *without* the palace: the first consists of the *gardes du corps*, or body guard; part whereof are *gardes de la manche*, q. d. of the sleeve; of the hundred Swisses; and the *guards* of the gate.

The *guards without*, are the gens d'armes, light horse, musqueteers, and two regiments of guards, the one French, the other Swiss. See GENDARMES.

The *garde du corps*, or *life guard*, consists of four companies of horse; the first was antiently Scotch, and still retains the name; though it now consists wholly of Frenchmen. Not only the name, but they also retain the antient phrase or formula of answering when called upon, *I am here*.

The *Scotch guard* was first established in France by Charles VII, who chose himself a *guard* out of such Scots as were sent by the earls of Buchan, Douglas, and other Scotch lords, to drive out the English.

Prætorian GUARDS; see *PRETORIAN*.
White GUARDS; see *SCHOLARES*.

Counter GUARD, in fortification; see *COUNTER guard*.

GUARD, in fencing, an action or posture proper to defend or screen the body from the efforts, or attacks of an enemy's sword.

There are four general *guards* of the sword; to conceive which, it will be necessary to imagine a circle drawn on an upright wall, and divided into four cardinal points, viz. top, bottom, right, and left.

Now, when the point of the sword is directed to the bottom point of the circle, and consequently the head of the sword tilted up to the top point, with the body inclining forwards; this is called *primes*, or the *first guard*.—The *second guard*, which some improperly call the *third*, is when the point of the sword is directed to the right or second point of the same circle, a quadrant distant from the first, with the fort of the sword turned to the right, and the body raised proportionably. *Tierce*, or the *third guard*, is performed by directing the sword's point to the uppermost point of the same circle diametrically opposite to that of prime: in which case the body, arm, and sword, are in their natural disposition, being the mean between the extremes of their motion.—*Quart*, or the *fourth guard*, is when the point of the sword is directed to the fourth point of the circle, descending to the right as far as one fourth of tierce, with the external side of the arm and the flat of the sword turned towards the ground; and the body out of the line to the right, and the fort of the sword towards the line to the left.—There is also *Quint*, or a kind of *fifth guard*, being the return of the point of the sword on the right, after traversing the circle, to the point of the prime whence it had departed; and yet with a different disposition of the body, arm, and sword.

These *guards* are also called by the masters, *figures* and *postures*; and the common centre of all their motions is to be in the shoulder.

In all these kinds of *guards*, there are high *advanced*, high *retired*, and high *intermediate guards*, when disposed before the upper part of the body, either with the arm quite extended, quite withdrawn, or in a mean state.—*Mean advanced guard*, or simply *mean guard*, is when the sword is disposed before the middle part of the body.—*Low advanced*, *retired*, or *intermediate guards*, are those where the arm and sword are advanced, withdrawn, or between the two extremes, before the lower part of the body.

Some will have prime the principal *guard*; others, quint; others, with better reason, tierce, in regard it consists of right lines, which are more easily defended than oblique ones, such as those of prime, second, quart, and quint.

GUARDS, in astronomy, is a name sometimes applied to the two stars nearest the pole, being in the hind part of the chariot, at the tail of the little bear.

Their longitude, latitude, &c. see among those of the other stars in the constellation *URSA minor*.—One of them is the pole star.

GUARDANT, or *GARDANT*, in heraldry, a term applied

to a beast when born in a coat of arms full faced, or with his face turned towards the spectator, and thus appearing in a posture of guard, and defence.

Heralds say, a lion is never fo represented, but a leopard always. *GUARDIAN*, or *GARDIAN*, he to whom the charge or custody of any person or thing is committed.

The notion of *guardian* angels is very antient in the east. See *ANGEL*.

In the convents of Franciscans, the officer is called *guardian*, who in the others is called *superior*.

In the order of the garter, the officer, who in other military orders, is called *grand-master*, is called the *sovereign guardian* of the order.

GUARDIAN, *GARDEYN*, in law, is a person entrusted with the education, tuition, &c. of such as are not of sufficient discretion to guide themselves, and their own affairs; as children, and idiots.

The word *guardian*, with us, includes the offices both of the tutor, and curator of the civilians: the tutor, for instance, had the government of a youth till he arrived at fourteen years of age. And the curator had the disposition and ordering of his effects thence forward, till twenty-five years of age; or the charge of a lunatic, during his lunacy. All which purposes our guardian alone answers.

We have three kinds of *guardians*: one appointed by the father in his will; another by the judge afterwards; and a third cast upon a minor by the custom of the land: but the antient law relating to *guardians* is much altered by stat. 12. Car. II, which ordains, that "Where any person has a child under the age of twenty-one years, and unmarried at the time of his death, it shall be lawful for the father of the child, whether born at the time of his decease, or yet in ventre de mere, either by deed or will, to dispose of the custody and tuition of such child while under age, or for any lesser time, to any person, popish recusants excepted: which disposition shall be good against all persons claiming such child as *guardian* in focage, or otherwise. And in case the father appoint no *guardian*, the ordinary may appoint one to look to his goods and chattels till the age of fourteen; at which time the child may chuse a *guardian* himself. And for his lands, the next of kin on that side by which the lands descend, may be *guardian*, as heretofore in case of a tenure in focage."

GUARDIAN of the *spiritualities*, is he to whom the spiritual jurisdiction of a diocese is committed, during the time of the vacancy of the see.

This *guardian* may be either such *in law*, i. e. *jure magistratus*, as the archbishop is of any diocese within his province; or by delegation, as he whom the archbishop, or vicar-general, does for the time depute.

The dean and chapter of Canterbury, are *guardians* both for the diocese, and the whole province, during a vacancy of the archbishopric.

GUARDIAN, or *warden* of the Cinque ports, is an officer who has the jurisdiction of the Cinque ports, with all the power that the admiral of England has in other places.

Camden relates, that the Romans after they had settled themselves, and their empire in our island, appointed a magistrate or governor over the east parts where the Cinque ports lie, with the title of *Comes littoris Saxonici per Britanniam*; having another who bore the like title, on the opposite side of the sea. Their business was to strengthen the sea coast with munition against the outrages and robberies of the Barbarians. And that antiquary takes our warden of the Cinque ports to have been erected in imitation hereof. *Britannia*, p. 228.

GUARDIAN of the *peace*. See *CONSERVATOR* of the *peace*.

GUDGEON. See *FISHING*.

GUELPHS, or *GUELFs*, a celebrated faction in Italy, antagonists of the Gibelins.

The *Guelphs* and Gibelins filled Italy with blood and carnage for many years. The *Guelphs* stood for the pope, against the emperor. Their rise is referred by some to be the time of Conrad III. in the twelfth century; by others to that of Frederic I. and by others to that of his successor Frederic II. in the thirteenth century.

The name *Guelph* is commonly said to have been formed from *Welfe*, *Welfe*, on the following occasion: the emperor Conrad III. having taken the duchy of Bavaria from Welfe VI. brother of Henry duke of Bavaria, Welfe, assisted by the forces of Roger king of Sicily, made war on Conrad, and thus gave birth to the faction of the *Guelphs*.

Others derive the name *Guelphs* from the German *Wolff*, on account of the grievous evils committed by that cruel faction: others deduce the denomination from that of a German called *Guelph*, who lived at Pistoys; adding, that his brother, named *Gibel*, gave his name to the *Gibelins*: under which head the reader will find a more ample account of the origin and history of those celebrated factions.

GUERITE, in fortification, a centry-box, being a small tower of wood, or stone, placed usually on the point of a bastion,

G U L

bation, or on the angles of the shoulder; to hold a sentinel, who is to take care of the ditch, and watch out against a surprize.—

GUEST-TAKERS, or GIST-TAKERS. See **AGISTORS.**

GUET; see the article **WATCH.**

GUIDAGE, GUIDAGIUM, in ancient law writers, that payed for safe conduct through unknown ways, or a strange country.

GUEULE, in architecture; see **GULE.**

GUIDON, a sort of flag, or standard bore by the king's life-guard; being broad at one extreme, and almost pointed at the other, and slit or divided into two.

The *guidon* is the ensign or flag of a troop of horse-guards. See **GUARD.**

GUIDON also denotes the officer who bears the *guidon*.—The *guidon* is that in the horse-guards, which the ensign is in the foot. The *guidon* of a troop of horse takes place next below the cornet.

GUIDONS, GUIDONES, or schola guidonum, was a company of priests established by Charlemaign at Rome, to conduct and guide pilgrims to Jerusalem, to visit the holy places; they were also to assist them in case they fell sick, and to perform the last offices to them in case they died.

GUIDONIS glandula; see **GLANDULA.**

GUILD, GILD, or GELD. See **GILD, and GELD.**

GUILD-HALL, or GILD-HALL, the great court of judicature for the city of London.

In it are kept the mayor's court, the sheriffs court, the court of hushings, court of conscience, court of common-council, chamberlain's court, &c.

Here also the judges sit upon nisi prius, &c. See **HUSTING.**

GUILT rents; see the article **GILD.**

GUINEA, a gold coin struck, and current in England.

The value or rate of *guineas* has varied: it was first struck on the footing of twenty shillings; by the scarcity of gold was afterwards advanced to twenty-one shillings and six-pence; but it is now sunk to twenty-one shillings.

The pound weight troy of gold is cut into forty-four parts and an half; each part makes a *guinea*. See **GOLD.**

This coin took its denomination *guinea*, by reason the gold whereof the first were struck, was brought from that part of Africa called *Guinea*; for which reason it likewise bore the impression of an elephant.

GUINEA company; see the article **COMPANY.**

GUINEA pepper; see the article **PEPPER.**

GUIRON; see the article **GIIRON.**

GULA, in anatomy, the oesophagus or gullet; that conduit by which animals take down food into the stomach.

GULÆ vaginalis; see the article **VAGINALIS.**

GULA, GUEULE, or GOLA, in architecture, a wavy member, whose contour resembles the letter S; called by the Greeks *cyamium*, q. d. a little wave; and by our workmen an *ogee*.—See **Tab. Archi.** fig 8, and 26.

This member is of two kinds, *recta* and *inversa*.—The *first*, and principal, has its cavity above, and convexity below.

This always makes the top of the corona of the cornice, jetting over the drip of the cornice like a wave ready to fall. It is called *gula recta*, and by the French *doublecine*. Sometimes it is absolutely called the *antabature*, as being the first or uppermost member thereof.

The *second* is just the reverse of the former, its cavity being at the bottom; so that it appears inverted, with regard to the former. This is used in the architrave, and sometimes in the cornice, along with the former, only separated by a reglet.

Some derive the word from the resemblance these members bear to the *gula*, or throat of a man: others from the herald's term *gules*; as supposing the moulding formed from the ancient manner of wearing their garments, which consisted of slips or swaths, alternately furr and stuff of various colours; the intervals between which were called *gules* or *guales*.

GULES*, in heraldry, signifies the colour red.

* The word is French, *guales*, which Fa. Monet derives from the Hebrew *gulud*, and *guludis*, a reddish pellice or skin appearing on a wound when it begins to heal; but F. Menestrier reproaches him, that there are no such words in the Hebrew tongue. This, however, is not strictly true: all the eastern languages, the Hebrew, Chaldee, Syriac, and Arabs, say גולד, *Guld*, for *cutis*, *pellis*; whence the Arabic *gulud*. And in the general, the word *gules* signifies red among most of the oriental nations: the Arabs and Persians give the name to the rose.—Others, with Nicod, derive the name *gules* from *gula*, the throats of animals, being generally red; or from the Latin *culcalium*, which is the κόκκος of the Greeks, or scarlet grain.

The same colour, in the coats of noblemen, is, by some called *ruby*; and in those of sovereign princes *ruars*: but this is no standing practice.

G U M

In engraving, *gules* is expressed by perpendicular strokes drawn from the top of the escutcheon to the bottom; it is also marked with the letter **G.**

This colour is reputed a symbol of charity, valour, hardiness, generosity; and represents blood-colour, cinnabar, and true scarlet. It is the first of all colours used in armoury; and is of that account, that antiently it was prohibited any person to wear *gules* in his coat armour, unless he were a prince, or had permission from the prince.

Spelman, in his *Apologia*, says that this colour was particularly honoured by the Romans, as it had been before by the Trojans; and that they painted the bodies of their gods, and of their generals that triumphed, with vermilion. Under the consuls, the Roman soldiers wore red; whence they were denominated *Ruffati*. Joan de Bado aureo adds, that the red dye which the Greeks call *phœnician*, and we *scarlet*, was first used by the Romans, to prevent seeing the blood issue from wounds in fight.

In effect, *gules* has always been esteemed an imperial colour; the emperors were clothed, shod, and had their apartments furnished with red; their edicts, dispatches, signatures, and seals, were of red ink, and red wax; whence the name *rubrics*.

GULF; see the article **GULPH.**

GULLET; see the article **OESOPHAGUS.**

GULPH*, or **GULF,** in geography, an arm or part of the ocean running up within the land.

* The word comes from the French *golfe*, and that from the Italian *golfo*, which signify the same. Some deduce these further from the Greek κόλπος; which Guichart again derives from the Hebrew גול, *gol*; Du Cange derives them from the barbarous Latin *gulphum*, or *gulfus*, which signify the same thing.

Such is the *gulph* of Venice, called also the *Adriatic sea*; the *gulph* of Lyons, the *gulph* of Mexico, of Florida, &c.

A *gulph* is strictly distinguished from a *sea*, in that the latter is larger; see **SEA.** From a *bay*, or *sinus*, it is again distinguished by its being greater than the same.

Some will have it essential to a *gulph*, to run into the land through a freight or narrow passage.

The sea is always most dangerous near *gulphs*, by reason of the currents being penned up by the shores.

GUM, GUMMI, a vegetable juice exuding through the pores of certain plants, and there hardening into a tenacious, transparent mass.

Gum is properly one of the juices of the bark: it is drawn thence by the sun's warmth, in form of a glutinous humour; and by the same cause is afterwards inspissated, concocted, and rendered tenacious.

The chemical character of *gums*, whereby they are distinguished from *resins*, and other vegetable juices, is, that they are dissoluble in water, and at the same time inflammable by fire. But this character, it is to be observed, excludes a great part of those commonly called *gums*.

In the general, *gums* are more viscid, and less friable, and are generally dissoluble in any aqueous menstruum; whereas *resins* are more sulphurous, and require a spirituous, or oily dissolvent. Boerhaave considers a *gum* as a sort of saponaceous fat; which, beside its oily principle in common with a resin, has some other ingredient that renders it miscible with water.

Gums are different, according to the different trees, roots, &c. which they ouze from. Some authors distinguish them into *aqueous*, and *resinous gums*; the first, those dissoluble in water, wine, and the like fluids; the second, those only dissoluble in oil. To these two some add a third anomalous kind, *viz.* those soluble with much difficulty, either in water or oil.

Among the class of *gums* are usually ranked, *gum arabic*, gamboge, adraganth, ammoniac, assa fetida, euphorbium, manna, myrrh, and tacamahacha. See each described under its proper article.

Theophrastus speaks of a way of multiplying plants, performed *per lachrymas*, by means of the *gum* or resin; but Agricola takes this to be only practicable where there are seeds accidentally fallen into the *gum*.

GUM-anime, is a resinous juice ouzing from a tree by the Portuguese called *courbari*, growing in divers parts of America. This *gum* is very hard and transparent, of an agreeable smell, not unlike amber: it does not dissolve in water, and consequently is not properly accounted a *gum*. In lieu of this, they frequently substitute copal.

GUM-arabic, called also *Thebaic*, *Saracenic*, *Babylonic*, and *Acanthine*, from the places, or the tree, which produce it, is the juice of a little tree growing in Egypt, of the *Acacia* kind, called in Latin *Acacia vera*. It is very transparent, glutinous upon the tongue, almost insipid to the taste, and often twisted somewhat in manner of a worm.

It is esteemed good to incrassate, to stop the pores, blunt the points

points of too pungent medicines, and temper the acrimony of the trachea in coughs, &c.

GUM-gutta, or *gutta-gamba*, or *ghitta-gemou*, popularly *gamboge*, is a resinous gum brought from the kingdom of Siam, &c. in large pieces fashioned not unlike faucides, hard, brittle, and very yellow.

It oozes from incisions made in a kind of prickly shrub, which climbs up the neighbouring trees. It purges violently both upwards and downwards; and is particularly used in dropsies, the itch, &c. but it is dangerous. It serves also to make a yellow colour, for painting in miniature.

GUM-fenega, or *feneca*, is the gum ordinarily sold by the druggists for gum-arabic, which it resembles very nearly both as to form and virtue: it is either white, bordering on yellow, or of a deep amber colour, transparent &c. It oozes out of a prickly shrub common enough in Africa. The gum is brought to us from Senegal, whence its name.

GUM, among gardeners, is a disease incident to fruit trees, of the stone kind, as peaches, plumbs, apricots, cherries, &c. The *gum* is a kind of gangrene, arising from a corruption of the sap, which extravasates and hardens. It usually begins on some naked or broken part, and spreads itself to the rest. To avoid its spreading, M. Quintinie directs to cut off the morbid branch two or three inches below the part affected.

This *gum* is no more than a thick, distempered, viscid juice, which not being able to make its way through the fibres of the body of the tree, to feed and supply them, is obliged, by the protrusion of other succeeding juice, to burst its vessels, which lie between the wood and bark, and to ouze out upon the bark.

When the distemper surrounds the branch, it admits of no remedy: when it is only on one side of a bough, the *gum* must be taken off to the quick of it, and then some cow-dung clapped on the wound, and the part covered over with a linen cloth, and tied down.

GUM-water; see the article **WATER**.

GUMMI-resina, **GUMMO-resina**, or **GUM-resin**, is a hardened juice of a middle nature between a gum and a resin, being both dissoluble in aqueous menstrua like a gum; and in oleaginous ones like a resin.—Such are camphor, storax, &c.

Some naturalists make a class of *irregular gummo resins*, being such as dissolve, though with difficulty, and not perfectly, both in aqueous and oleaginous liquors; as bdellium, myrrh, &c.

GUN, a fire arm, or weapon of offence; which forcibly discharges a ball, shot, or other offensive matter, through a cylindrical barrel, by means of gun-powder.

Gun is a general name, under which are included divers, or even most species of fire arms.—They may be divided into *great* and *small*.

Great GUNS, called by the general name *canon*, make what we also call *ordnance*, or *artillery*; under which come the several sorts of canon, as cannon-royal, demi-cannon, &c. culverins, demi culverins, fakers, minions, falcons, &c. See **ORDNANCE**; see also **CANNON**, **CULVERIN**, &c.

Small GUNS include muskets, musketoons, carabines, blunderbusses, fowling-pieces, &c.

Pistols and mortars are almost the only kinds of regular weapons charged with gunpowder, that are excepted from the denomination of *guns*.

For the history and invention of *guns*, see **CANNON**, and **GUN-POWDER**.

For the use and application of *guns*, see **GUNNERY**.

<p>Bed of a GUN, Carriage of a GUN, Chase GUNS, Chase of a GUN,</p>	}	} see	<p>BED. CARRIAGE. CHASE guns. CHASE.</p>
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GUNNERS, officers of the tower, and other garrisons, whose business is to manage and look after the ordnance mounted on the lines, and batteries, which are all fixed and ready with cartouches and ball, for service, on the shortest warning.

One or more of them are on duty day and night; they carry a field staff, and a large powder horn in a string over the left shoulder: in which equipage they march by the guns.

Master GUNNER of England, is an officer appointed to teach and instruct all such as desire to learn the art of gunnery, and to administer to every scholar an oath; which, beside the duty of allegiance, obliges him not to serve any foreign prince or state without leave; nor to teach the art of gunnery to any, but such as have taken the said oath; and to certify to the master of the ordnance, the sufficiency of any person recommended to be one of his majesty's *gunners*.

The *gunner*, Sir J. Moor observes, should know his pieces, and their names, which are taken from the height of the bore, the

names of the several parts of a piece of ordnance, how to tertiate his gun, and how to dipart it, &c.

GUNNERS level; see the article **LEVEL**.

GUNNERY, the art of shooting with guns and mortars, *i. e.* of charging, directing, and exploding those fire-arms to the best advantage.—See *Tab. Fortif.* fig. 16.

Gunnery is sometimes considered as a part of the military art, and sometimes as a part of pyrotechny.

To the art of *gunnery* belongs the knowledge of the force, and effect of gun-powder, the dimensions of pieces, and the proportions of the powder and ball they carry; with the methods of managing, charging, pointing, fusing, &c.

Some parts of *gunnery* are brought under mathematical consideration, which, among mathematicians, are called absolutely by the name *gunnery*, viz. the method of elevating or raising the piece to any given angle, and of computing its range; or of raising and directing it so, as it may hit a mark or object proposed.

The instruments chiefly used in this part of *gunnery*, are the calipers, or gunners compasses, quadrant, and level; the methods of applying which see under the articles **CALIPER**, **LEVEL**, and **QUADRANT**.

The line or path in which the bullet flies, whatever direction or elevation the piece is in, is found to be the same with that of all other projectiles, viz. a parabola.

Hence, the particular laws observed in the motion or flight of the ball, its velocity, extent, &c. with the rules for hitting objects, are delivered under the article **PROJECTILE**.

Maltus, an English engineer, is mentioned as the person who first taught the regular use of mortars, in the year 1634; but all his knowledge was experimental and tentative; he knew nothing of the curve the shot describes in its passage, nor of the difference of range at different elevations. And most of the gunners and engineers employed about batteries, &c. to this day go by no better rules; if the range does not hit right, they raise or lower the piece, till they bring it to a truth: and yet there are certain rules, founded on geometry, for all these things: most of which we owe to Galileo, engineer to the grand duke of Tuscany, and his disciple Torricellius.

A ball or bomb going out of a piece, we find, never proceeds in a straight line towards the place it is levelled at, but it always begins to rise from its line of direction the moment it is out of the mouth of the piece.—This some account for thus: the grains of powder nearest the breech, taking fire first, press forward, by their precipitated motion, not only the ball, but likewise those grains which follow the ball along the bottom of the piece; where successively taking fire, they strike, as it were, the ball underneath, which because of a necessary vent, has not the same diameter as the diameter of the bore; and so insensibly raise the ball towards the upper edge of the mouth of the piece, against which it so rubs in going out, that pieces very much used, and whose metal is soft, are observed to have a considerable canal there, gradually dug by the friction of balls. Thus the ball going from the cannon, as from the point of the parabola E, *Tab. Fortif.* fig. 16. raises itself, in its progress, to the vertex G; after which it descends by a mixed motion.

Ranges made from the elevation of forty-five degrees are the greatest; and those made from elevations equally distant from forty-five degrees are equal; that is, a piece of cannon, or a mortar, levelled to the fortieth degree, will throw a ball, or bomb, the same distance, as when they are elevated to the fiftieth degree, and as many at thirty as sixty, and so of others.

It has been shewn, that to find the different ranges of a piece of artillery in all elevations, we must, 1. Make a very exact experiment by firing off a piece of cannon, or mortar, at an angle well known, and measuring the range made, with all the exactness possible; for by one experiment well made, we may come at the knowledge of all others, in the following manner.

To find the range of a piece, at any other elevation required, say, as the sine of double the angle under which the experiment is made: is to the sine of double the angle of any elevation proposed: : so is the range known by the experiment to the other required.

GUNPOWDER a composition of salt-petre, sulphur, and charcoal mixed together, and usually granulated; which easily takes fire, and when fired rarefies or expands with great vehemence, by means of its elastic force.

It is to this powder we owe all the action, and effect of guns, ordnance, &c. so that the modern military art, fortification, &c. depend wholly thereon.

The invention of *gunpowder* is ascribed, by Polydore Vergil, to a chemist, who having accidentally put some of this composition in a mortar, and covered it wit stone; it happened to take fire, and a law up the air, it a

Thevet says, the person here spoke of, was a monk of Fribourg, named Constantine Anelzen; but Belleforest and other authors, with more probability, hold it to be Bartholdus Schwartz, or the black: at least it is affirmed, that he first taught the use of it to the Venetians, in the year 1380, during the war with the Genoese; and that it was first employed in a place antiently called *Fossa Claudia*, now *Chioggia*, against Laurence de Medicis, and that all Italy made complaints against it, as a manifest contravention of fair warfare.

But what contradicts this account, and shews *gunpowder* to be of an older era, is, that Peter Mexia, in his *various Readings*, mentions, that the Moors being besieged in 1343, by Alphonsus XI. king of Castile, discharged a sort of iron mortars upon them, which made a noise like thunder: which is seconded by what Don Pedro, bishop of Leon, relates in his chronicle of King Alphonsus who reduced Toledo, viz. that in a sea combat between the king of Tunis, and the Moorish king of Seville, above four hundred years ago, those of Tunis had certain iron tuns or barrels, wherewith they threw thunder-bolts of fire. Du Cange adds, that there is mention made of *gunpowder* in the registers of the chambers of accounts in France as early as the year 1338.

To say no more, it appears that our Roger Bacon knew of *gunpowder* one hundred and fifty years before Schwartz was born: that excellent fryar mentions the composition in express terms, in his treatise *De naturalitate magie*, published at Oxford in 1216. "You may raise thunder and lightning at pleasure," says he, by only taking sulphur, nitre, and charcoal, which singly have no effect, but mixed together, and confined in "a close place, cause a noise and explosion greater than that of a clap of thunder."

Preparation of GUNPOWDER.—There are divers compositions of *gunpowder*, with respect to the proportions of the three ingredients, to be met withal in pyrotechnical writers: but the process of making it up is much the same in all.

The sulphur and salt-petre being purified, and reduced to powder, are put, with the charcoal dust, in a mortar, moistened with water or spirit of wine, or the like, and pounded twenty-four hours together; taking care to wet the mass from time to time, to prevent its taking fire: lastly, squeezing it through a sieve, it is formed into little grains, or globules; which being dried, the powder is complete; and the salt spark being struck thereon from a steel and flint, the whole will be immediately inflamed, and burst out with extreme violence.

The effect is not hard to account for: the charcoal part of the grain whereon the spark falls, catching fire like tinder, the sulphur and nitre are readily melted, and the former also breaks into flame; and at the same time the contiguous grains undergo the same fate. Now it is known that salt-petre, when ignited, rarefies to a prodigious degree.

Sir Isaac Newton reasons thus on the point: the charcoal and sulphur in *gunpowder*, easily take fire, and kindle the nitre; and the spirit of the nitre being thereby rarefied into vapour, rushes out with an explosion much after the manner that the vapour of water rushes out of an æolipile: the sulphur also being volatile, is converted into vapour, and augments the explosion: add that the acid vapour of the sulphur, namely, that which diffils under a bell into oil of sulphur, entering violently into the fixt body of the nitre, lets loose the spirit of the nitre, and excites a greater fermentation, whereby the heat is farther augmented, and the fixt body of the nitre is also rarefied into fume, and the explosion is thereby made more vehement and quick.

For if salt of tartar be mixed with *gunpowder*, and that mixture be warmed till it takes fire, the explosion will be greatly more violent and quick than that of *gunpowder* alone, which cannot proceed from any other cause than the action of the vapour of the *gunpowder* upon the salt of tartar, whereby that salt is rarefied. See *Pulvis FULMINANS*.

The explosion of *gunpowder* arises, therefore, from the violent action whereby all the mixture being quickly and vehemently heated, is rarefied and converted into fume and vapour; which vapour, by the violence of that action, becoming so hot as to shine, appears in the form of flame.

M. de la Hire ascribes all the force and effect of *gunpowder* to the spring or elasticity of the air included in the several grains thereof, and in the intervals or spaces between the grains: the powder being kindled, sets the springs of so many little parcels of air a playing, and dilates them all at once; whence the effect: the powder itself only serving to light a fire which may put the air in action; after which the whole is done by the air alone.

Gunpowder is a commodity of such consequence, both in respect of speculation, of war, and of commerce (the consumption thereof being incredible) that it will deserve a more particular detail.—To make *gunpowder* duly, then, regard is to be had, that the salt-petre be pure, and in fine large crystals or shavings: otherwise, it is to be purified, by taking away its fixt or common salt, and earthy part, thus: dissolve ten pounds of nitre in a sufficient quantity of fair water, settle, filtrate, and evaporate it in a glazed vessel, to the diminution

of half, or till a pellicle appear on it: the vessel may then be taken off from the fire, and set in a cellar: in twenty-four hours the crystals will float, which separate from the liquor; and after the like manner may the liquor be crystallized several times, till all the salt be drawn forth: this done, put it into a kettle, and that on a furnace with a moderate fire, which gradually increase till it begins to smoke, evaporate, lose its humidity, and grow very white: it must be kept continually stirring with a ladle, for fear it should return to its former figure, whereby its greatness will be taken away; after that, so much water is to be poured into the kettle as will cover the nitre; and when it is dissolved and reduced to the consistency of a thick liquor, it must be stirred with a ladle, without intermission, till all the moisture is again evaporated, and it be reduced to a dry and white meal.

The like regard is to be had to the sulphur, chusing that which is in large lumps, clear, and perfectly yellow; not very hard, nor compact, but porous; nor yet too much shining; and if, when set on the fire, it freely burns away all, leaving little or no residuum matter, it is a sign of its goodness: so likewise if it be pressed between two iron plates that are hot enough to make it run, and in the running appear yellow, and that which remains of a reddish colour, it may be concluded to be fit for the purpose.—But in case the same be foul and impure, it may be purified in this manner; melt the sulphur in a large iron ladle, or pot, over a very gentle coal fire, well kindled, but not flaming; then scum off all that rises on the top, and swims upon the sulphur; take it presently after from the fire, and strain it through a double linen cloth, letting it pass at leisure; so will it be pure, the gross filthy matter remaining behind in the cloth.

For the charcoal, the third ingredient, such should be chosen as is large, clear, and free from knots, well burnt, and cleaving.

There are three kinds of powder, viz. *cannon powder*, *musk powder*, and *pistol powder*; of each of these again there are two sorts, a *stronger*, and a *weaker*; all which differences arise only from the various proportions.

The proportions are thus: in the stronger *cannon powder*, to every hundred pounds of salt-petre, twenty-five pounds of sulphur are generally allowed, with the same quantity of charcoal; and in the weaker *cannon powder*, to every hundred pounds of salt-petre, twenty pounds of sulphur, and twenty-four of charcoal. As for the stronger *musk powder*, an hundred pounds of salt-petre require eighteen pounds of sulphur, and twenty of charcoal; and in the weaker there go to an hundred pounds of salt-petre, fifteen of sulphur, and eighteen of charcoal. In the stronger *pistol powder*, an hundred pounds of salt-petre require twelve of sulphur, and fifteen of coal; whereas the weaker has an hundred pounds of salt-petre, only ten of sulphur, but eighteen of charcoal.

Other authors prescribe different proportions: Semenowitz, for mortars, directs an hundred pounds of salt-petre, twenty-five of sulphur, and as many of charcoal; for great guns, an hundred pounds of salt-petre, fifteen of sulphur, and eighteen of charcoal: for muskets and pistols, an hundred pounds of salt-petre, eight of sulphur, and ten of charcoal.

Miethius extols the proportion of one pound of salt-petre to three ounces of charcoal; and two, or two and a quarter of sulphur: than which, he affirms, no *gunpowder* can possibly be stronger.

He adds, that the usual practice of making the *gunpowder* weaker for mortars, than guns, as in the example above, is without any foundation, and renders the expence needlessly much greater: for, whereas, to load a large mortar twenty-four pounds of common powder is required, and consequently to load it ten times, two hundred and forty pounds; he shews, by calculation, that the same effect would be had by one hundred and eighty pounds of the strong powder.

As to the process of making the GUNPOWDER.—All the ingredients are first to be finely powdered, then moistened with fair water, or vinegar, or spirit of wine, or with water and spirit of wine mixed together, or urine, which is usual; afterwards all must be well beat for the space of twenty-four hours at least, and then granulated after the following manner: a sieve is to be prepared with a bottom of thick parchment made full of round holes, and the former beaten mass moistened before-hand with twenty ounces of spirit of wine, twelve of spirit of wine vinegar, thirteen of spirit of nitre, two of spirit of sal armoniac, and one ounce of camphire dissolved in spirit of wine: and let all these be mingled together. Otherwise, take forty ounces of brandy, and one of camphire, and let them be mixed and dissolved for the said purpose: when the whole compound is made up into balls as big as eggs, put them into the sieve, and with them a wooden ball; which move up and down about the sieve, so that it may break the balls of powder, and make it pass through the little holes in corns.

For greater quantities, mills are usually provided, by means of which, more work may be performed in one day, than a man can do in an hundred. See *MILL*.

Gunpowder may also be made of several colours, but the *black* is the most serviceable of any.

To make *white powder* proceed thus.—Take ten pounds of saltpetre, one of sulphur, and two of the sav-dust of elder, or the like wood, powdered fine; mix them together, and use the former method. Or thus, with ten pounds of nitre, and a pound and a half of sulphur dried and finely powdered, mix two pounds of saw-dust, &c. or, instead of that, rotten wood dried and powdered, with two pounds and three ounces of salt of tartar; whereof make powder to be kept close from the air. It is also to be noted, that in making of *pisitol powder*, if you would have it stronger, it should be stirred up several times while in the mortar, and moistened with water distilled from orange or lemon peels, or some other oily vegetable substance in an alembic, and then beaten for twenty hours, as aforesaid.

Corn powder is of so much greater force than when in dust or meal, that it is generally concluded, the larger grains are stronger than the smaller: for which reason, *cannon powder* is granulated larger than other powders; and therefore *powder* in loading should not be beat home into the piece, so as to bruise the grains. There are three ways to prove the goodness of *gunpowder*. 1. By sight; for if it be too black, it is too moist, or has too much charcoal in it; so also if rubbed upon white paper, it blackens it more than good *powder* does: but if it be of a kind of azure colour, somewhat inclining to red, it is a sign of good *powder*. 2. By touching: for if in crushing it with your fingers ends, the grains break easily and turn into dust, without feeling hard, it has too much coal in it; or if, in pressing upon your fingers upon a smooth hard board, some grains feel harder than the rest, or, as it were, dent your fingers ends, the sulphur is not well mixed with the nitre, and the *powder* is naught. 3. By burning, wherein little heaps of *powder* are laid upon white paper three inches or more asunder, and one of them fired; which, if it only flies all away, and that suddenly, and almost imperceptibly, without firing the rest, and make a small thundering noise, and a white smoke rises in the air almost like a circle, the *powder* is good; if it leaves black marks, it has too much coal, or is not well burnt: if it leaves a greatness, the sulphur or nitre are not well cleaned or ordered. Again, if two or three corns be laid on paper an inch distant, and fire be put to one of them, and they all fire at once, leaving no sign behind, but a white smoky colour in the place, and the paper not touched, the *powder* is good. So also if fired in a man's hand, and it burns not: but if black knots appear, which burn downwards in the place where proof was made, after firing, it is not strong enough, but wants nitre. To recover damaged *powder*, the method of the *powder* merchants is this; they put part of the *powder* on a sailcloth, to which they add an equal weight of what is really good; and with a shovel mingle it well together, dry it in the sun, and barrel it up, keeping it in a dry and proper place. Others again, if it be very bad, restore it by moistening it with vinegar, water, urine, or brandy; then they beat it fine, scarce it, and to every pound of *powder*, add an ounce, an ounce and half, or two ounces (according as it is decayed) of melted saltpetre; afterwards these ingredients are to be moistened and mixed well, so that nothing can be discerned in the composition; which may be known by cutting the mass, and then they granulate it as aforesaid.

In case the *powder* be in a manner quite spoiled, the only way is to extract the saltpetre with water, according to the usual manner, by boiling, filtrating, evaporating, and crystallizing; and then with fresh sulphur and charcoal, to make it up anew again.

GUN-SHOT wounds; see the article WOUND.

GUNTER'S-LINE, called also *line of lines*, and *line of numbers*, is a graduated line usually placed on scales, rules, sectors, &c.

This line is only the logarithms transferred upon a ruler, from the tables, so as to answer much the same purposes, instrumentally, as the logarithms themselves do arithmetically. What the logarithms do by addition and subtraction, is done in this line by turning a pair of compasses this way and that.

This line has been contrived various ways, for the advantage of having it as long as possible. As, first, on the two-foot ruler, contrived by Edmund Gunter, and called *Gunter's scale*; whence also the line itself took its popular denomination *Gunter's line*.

After this, Wingate doubled the line, or laid it together, so as one might either work right on, or a cross. Then it was projected in a circle, by Oughtred, and made to slide by the same author: and lastly, it was projected in a kind of spiral, by Brown.

The method of using or applying it, is much the same in all; except that in Gunter's and Wingate's way, common compasses are used; in Oughtred's and Brown's, flat compasses, or an opening index; and in the sliding rules, no compasses at all.

Description of GUNTER'S line. The line is usually divided into an hundred parts, whereof every tenth is numbered, beginning with 1 and ending with 10: so that if the first great

division 1, signify one tenth of any whole number or integer, the next, 2, will signify two tenths; 3 three tenths, &c. and the intermediate divisions so many 100th parts of the same integer, or tenths of one of the former tenths. For numbers greater than 10, the sub-divisions must signify integers, and the greater divisions 10 integers, so that the whole line will express 100 integers; and if you would have it still more, then the sub-divisions to be each 10 integers, and each great divisions 100, so that the whole be 1000; and after the same manner, may it be extended to 10000, by making each sub-division 100.

A whole number, under four figures, being given, to find the point on the line of numbers that represents the same. Look for the first figure of the number among the large figured divisions; this leads you to the first figure of your number. For the second, count so many tenths from that division forwards, as that second figure amounts to. For the third figure, count from the last tenth so many centesims as the third figure contains: and so for the fourth figure, count from the last centesim so many thousandths as the fourth figure has units, or is in value; that will be the point where the number propounded is, on the line of numbers.

For an example. To find the point representing the number 1728, for 1000 take the first grand division marked 1 on the line; then for 7 reckon seven tenths forwards, this is 700; for 2, reckon two centesims from the seventh tenth, 20; and for 8, estimate the following centesim to be divided into 10 parts, if it be not expressed, which in lines of ordinary length cannot be done; and 8 of that (supposed 10 parts, is the precise point for 1728, the number propounded to be found; and the like of any other number.

To find a fraction, consider that the line properly only expresses decimal fractions, as thus, $\frac{1}{10}$, or $\frac{1}{100}$, or $\frac{1}{1000}$, and nearer the rule cannot well come than as one inch: one tenth, one hundred, or one thousand part of an inch: so that for other fractions, as quarters, half quarters, &c. you must either estimate them as near as you can reasonably, or else reduce them into decimals.

Use of GUNTER'S-LINE. 1^o Two numbers being given, to find a third geometrically proportional to them; and to three a fourth number, to four a fifth, &c. Extend the compasses on the line from one number to another; then that extent applied upwards or downwards, as you would either increase, or diminish the number from either of the numbers, the moveable point will fall on the third proportional number required. Again, the same extent applied the same way from the third, will give a fourth; and from the fourth a fifth, &c.

For example: let the two numbers 2 and 4, be proposed to find a third proportional, &c. to them; extend the compasses on the first part of the line of numbers, from 2 to 4; which done, and the same extent being applied upwards from 4, the moveable point will fall on 8, the third proportional required; and from 8 it will reach to 16, the fourth proportional; and from 16 to 32, the fifth, &c. Contrariwise, if you would diminish, as from 4 to 2, the moveable point will fall on 1, and from 1 to $\frac{1}{2}$, or $\frac{1}{4}$; and from $\frac{1}{4}$ to $\frac{1}{8}$, &c.

But, generally, in this, and in most other works, make use of the small divisions in the middle of the line; that you may the better estimate the fractions of the numbers you make use of; for how much you miss in setting the compasses to the first and second term, so much the more you will err in the fourth; therefore the middle part will be most useful. For example; as 8 to 11, so is 12 to 16, &c. if you imagine one integer to be divided but into 10 parts, as they are on the line on a two foot rule.

2^o One number being given to be multiplied by another, to find the product. Extend the compasses from 1 to the multiplier; and the same extent applied the same way from the multiplicand, will make the moveable point fall on the product: thus, if 6 be given to be multiplied by 5; extending the compasses from 1 to 5, the same extent will reach from 6 to 30, the product sought.

3^o One number being given to be divided by another, to find the quotient. Extend the compasses from the divisor, e. g. 25, to 1, and the same extent will reach from the dividend, e. g. 750, to the quotient 30; or extend the compasses from the divisor to the dividend, the same extent will reach the same way from 1 to the quotient.

4^o Three numbers being given, to find a fourth in direct proportion. Extend the compasses from the first number, suppose 7, to the second, v. g. 14: that done, the same extent applied the same way from the third, 22, will reach to the fourth proportional sought, viz. 44.

5^o Three numbers being given, to find a fourth in inverse proportion. Extend the compasses from the first of the given numbers, suppose 60, to the second of the same denomination, viz. 30; if that distance be applied from the third number backwards, 5, it will reach to the fourth number sought, 25.

6^o Three numbers being given, to find a fourth in duplicate proportion. If the denominations of the first and second terms be lines, extend the compasses from the first term to the second,

of the same denomination: this done, that extent being applied twice the same way from the third term, the moveable point will fall on the fourth term required. *E. gr.* the area of a circle, whose diameter is 14, being 154, what will the content of a circle be, whose diameter is 28; applying that extent the same way from 154 twice, the moveable point will fall on 616, the fourth proportional or area sought.

- 7^o, To find a mean proportional between two given numbers. — Bisect the distance between the given numbers, the point of bisection will fall on the mean proportional sought. Thus the quotient of the two extremes divided by one another, extremes being 8 and 32, the middle point between them will be found 16.
- 8^o, To find two mean proportionals between two given lines. — Trisect the space between the two given extremes; the two points of trisection will give the two means required. — Thus if 8 and 27 be the two given extremes, the two means will be found 12 and 18.
- 9^o, To find the square root of any number under 1000000. — The square root of a number is always a mean proportion between 1, and the number whose root is required; yet with this general caution, that if the figures of the number be even, that is 2, 4, 6, 8, 10, &c. then you must look for the unit at the beginning of the line, and the number in the second part or radius, and the root in the first part; or rather, reckon 10 at the end to be unity; and then both root and square will fall backwards towards the middle in the second length or part of the line. — If they be odd, the middle 1 will be most convenient to be counted unity, and both root and square will be found from thence forwards towards 10. — On this principle the square root of 9 will be found to be 3; the square root of 64, to be 8, &c.

10^o, To find the cube root of any number under 1000000000. — The cube root is always the first of two mean proportionals between 1 and the number given, and therefore to be found by trisecting the space between them. Thus the cube root of 1728 will be found 12; the root of 17280, nearly 26; the root of 172800 almost 56.

Though the point on the line representing all the square numbers is in one place, yet by altering the unit, it produces various points and numbers for their respective roots. — The rule to find this, is to put dots, or to suppose them put over the first figure to the left hand, the fourth figure, the seventh, and the tenth: if then the last dot on the left hand falls on the last figure, as it does in 1728, the unit must be placed at 1 in the middle of the line, and the root, the square, and the cube, will all fall forwards towards the end of the line.

If it fall on the last but 1, as in 17280, the unit must be placed at 1 in the beginning of the line, and the cube in the second length; or the unit may be placed at 10 at the end of the line; and then the root, the square, and cube, will all fall backwards, and be found in the second part between the middle and the end of the line. — Thus will the cube root of 8 be found 2; that of 27, 3; that of 64, 4; that of 125, 5; that of 216, 6, &c.

For the particular uses of *Gunter's line* in the measuring of timber, gauging of vessels, &c. see SLIDING-RULE. For other uses in geometry, trigonometry, &c. see SECTOR, and GUNTER'S SCALE.

GUNTER'S QUADRANT, is a quadrant made of wood, brass, or some other substance; being a kind of stereographic projection on the plane of the equinoctial, the eye supposed in one of the poles: so that the tropic, ecliptic, and horizon, are arches of circles, but the hour-circles all curves, drawn by means of several altitudes of the sun, for some particular latitude every day in the year.

The use of this instrument is to find the hour of the day, the sun's azimuth, &c. and other common problems of the globe; as also to take the altitude of an object in degrees.

See its description and use more at large under the article *Gunter's QUADRANT*.

GUNTER'S SCALE, also called by navigators absolutely the *gunter*, is a large plane scale, with divers lines thereon; of great use in working questions in navigation, &c. See SCALE, and SAILING.

On one side the scale, represented *Tab. Trigonom. fig. 35*, are the line of numbers, marked *numbers*; the line of artificial sines, marked *sines*; the line of artificial tangents, marked *tangents*; the line of artificial versed sines, marked *V. S.* the artificial sines of the rhumbs, marked *S. R.* the artificial tangents of the rhumbs, marked *T. R.* the meridian line in mercator's chart, marked *Merid.* and equal parts, marked *E. P.*

To which, on the shorter scales of a foot long, are usually added lines of latitudes, hours, and inclinations of meridians. On the backside of the scale are the lines usually found on a plane scale. The lines of artificial sines, tangents, and numbers, are so fitted on this scale, that by means of a pair of compasses, any problem, whether in right-lined or spherical trigonometry, may be solved very expeditiously, and with tolerable exactness; whence the instrument becomes extremely useful in all parts of mathematics where trigonometry is concerned; as navigation, dialling, &c. See TRIGONOMETRY, &c.

The same lines are also occasionally laid down on rulers to slide by each other; hence called *sliding-gunters*; so as to be used without compasses: but he that understands how to use them with, may, by what we have said of Everard's and Coggeshall's sliding-rules, use them without. See SLIDING-RULE.

Use of GUNTER'S scale. — 1^o, The base of a right-lined right-angled triangle being given, 30 miles, and the opposite angle thereto 26 degrees; to find the length of the hypotenuse. — The trigonometrical canon or proportion is thus. — As the sine of the angle, 26 degrees, is to the base 30 miles, so is radius to the length of the hypotenuse. — Set one foot of the compasses, therefore, on the 26th degree of the line of the sines; and extend the other to 30 on the line of numbers, and the compasses remaining thus opened, set one foot on 90 degrees, or the end of the line of sines, and extend the other on the line of numbers: this will give 68 mides and a half, for the length of the hypotenuse sought.

2^o, The base of a right-angled triangle being given, 25 miles, and the perpendicular 15; to find the angle opposite to the perpendicular. — As the base 25 miles is to the perpendicular 15 miles, so is radius to the tangent of the angle sought. — Extend the compasses, then, on the line of numbers, from 15 the perpendicular given, to 25 the base given; and the same extent will reach the contrary way, on the line of tangents, from 45 degrees, to 31 degrees, the angle sought.

3^o, The base of a right-angled triangle being given, suppose 20 miles, and the angle opposite to the perpendicular 50 degrees, to find the perpendicular. — As radius is to the tangent of the given angle 50 degrees, so is the base 20 miles to the perpendicular sought. — Extend the compasses then on the line of tangents, from the tangent of 45 degrees to the tangent of 50 degrees; and the same extent will reach on the line of numbers the contrary way, from the given base 20 miles, to the required perpendicular 23 $\frac{1}{2}$ miles.

Note, the extent on the line of numbers is here taken from 20 to 23 $\frac{1}{2}$ forwards; that the tangent of 50 degrees may be as far beyond the tangent of 45 degrees, as its complement forty degrees wants of forty-five degrees.

4^o, The base of a right-angled triangle being given, suppose 35 miles, and the perpendicular 48 miles; to find the angle opposite to the perpendicular.

As the base 35 miles is to the perpendicular 48 miles, so is radius to the tangent of the angle sought. — Extend the compasses from 35 on the line of numbers, to 48; the same extent will reach the contrary way on the line of tangents, from the tangent of 45 deg. to the tangent of 36 deg. 5 min. or 53 deg. 55 min. — To know which of those angles the angle sought is equal to, consider that the perpendicular of the triangle being greater than the base, and both the angles opposite to the perpendicular, and the base, making 90 deg. the angle opposite to the perpendicular, will be greater than the angle opposite to the base; and consequently the angle 53 deg. 55 min. will be the angle sought.

5^o, The hypotenuse of a right-angled spherical triangle being given, suppose 60 degrees, and one of the sides 20 degrees, to find the angle opposite to that side. — As the sine of the hypotenuse 60 deg. is to radius, so is the sine of the given side 20 deg. to the sine of the angle sought. — Extend the compasses on the line of sines, from 60 deg. to the radius, or 90 deg. and the same extent will reach on the line of sines the same way, from 20 deg. the given side to 23 deg. 10 min. the quantity of the angle sought.

6^o, The course and distance of a ship being given, to find the difference of latitude and departure. — Suppose a ship sails from the latitude of 50 deg. 10 min. north, S. S. W. 48.5 miles: as radius is to the distance sailed 48.5 miles, so is the sine of the course, which is two points, or the second rhumb, from the meridian, to the departure. — Extend the compasses from 8 on the artificial sine rhumb-line, to 48.5 on the line of numbers; the same extent will reach the same way from the second rhumb, on the line of artificial sines of the rhumbs, to the departure westing 18.6 miles.

Again, as radius is to the distance sailed 48.5 miles, so is the cosine of the course 67 deg. 30 min. to the difference of latitude. — Extend your compasses from the radius, on the line of sines, to 48.5 miles on the line of numbers; the same extent will reach the same way, from 67 deg. 30 min. on the line of sines, to 44.8 on the line of numbers; which converted into degrees, by allowing 60 miles to a degree, and subtracted from the given north latitude 50 deg. 10 min. leaves the remainder 49 deg. 25 min. the present latitude.

7^o, The difference of latitude and departure from the meridian being given; to find the course and distance. — A ship from the latitude 59 deg. north, sails north eastward till she has altered her latitude 1 deg. 10 min. or 70 miles, and is departed from the meridian 57.5 miles, to find the course and distance. — As the difference of latitude 70 miles is to radius, so is the departure 57.5 miles to the tangent of the course 39 deg. 20 min. or three points and a half from the meridian. — Extend the compasses from the fourth rhumb, on the line of artificial tangents of the rhumbs, to 70 miles on the line of numbers, the

the same extent will reach from 57.5 on the line of numbers, to the third rhumb and a half on the line of artificial tangents of the rhumbs.

Again; as the sine of the course 39 deg. 20 min. is to the departure 57.5 miles, so is the radius to the distance 90.6 miles.—Extend the compasses from the third rhumb and a half, on the artificial lines of the rhumbs, to 57.5 miles on the line of numbers; that extent will reach from the sine of the eighth rhumb, on the lines of the rhumbs, to 90.6 miles on the line of numbers.

8° *Three sides of an oblique spherical triangle being given, to find the angle opposite to the greatest.*—Suppose the side AB, fig. 36. be 40 deg. the side BC 60 deg. and the side AC 96 deg. to find the angle ABC. Add the three sides together, and from half the sum subtract the greater side AC, and note the remainder: thus, *e. gr.* the sum will be 196 deg. half of which is 98 deg. from which subtracting 96 deg. the remainder is two deg.

Then extend the compasses from the sine of 90 deg. to that of the side AB 40 deg. and applying this extent to the sine of the other side BC 60 deg. you will find it reach to a fourth sine 34 deg.

Again; from this fourth sine extend the compasses to the sine of half the sum, *i. e.* the sine of 72 deg. the complement of 98 deg. to 180; this second extent will reach from the sine of the difference 2 deg. to the sine of 3 deg. 24 min. against which, on the versed sines, stands 151 deg. 50 min. the quantity of the angle sought.

GUSSET, in heraldry, denotes one of the abatements of honour; appropriated to lascivious, effeminate, or wanton persons.—It is formed of a line drawn from the dexter, or sinister angle of the chief, and descending diagonally to the chief point; from whence another line falls perpendicularly upon the base: as represented *Tab. Herald.* fig. 65.

GUST; see TASTE and GUSTU.

GUST*, is used by Bracton and other ancient writers, for a stranger, or guest, who lodges with a person the second night. See UNCUTH.

* In the laws of St. Edward, published by Lambard, the word is written *gust*.

GUSTATION; see the article TASTING.

GUSTO *grand*; see the article GRAND.

GUTT A, a Latin term for what in English we call *drop*. See DROP.

GUTTÆ *Anglicanæ*, *English drops*, *volatile English drops*, or *Goddard's drops*, a name of a medicinal liquor prepared from divers ingredients; of sovereign efficacy against coagulations of the blood, malignant fevers, and particularly the small-pox, obstructions, epilepsies, drowsy diseases, vapours, &c.

The inventor of these celebrated drops was Dr. Goddard, a physician of London. The secret of their composition was purchased by King Charles II. at the price of 5000 l. sterl. whence they were denominated *guttæ Anglicanæ*.

This costly receipt, we shall here gratify the reader withal, à meilleur marche: "Take five pounds of human cranium of a person hanged, or dead of some violent death, two pounds of dried vipers, two pounds of hart's-horn, and two of ivory; mince the whole small, put it in two or three retorts, and distill it in a reverberatory furnace, with the same precautions as are ordinarily used in distilling hart's-horn and vipers, to extract their volatile salt. When the vessels or receivers are cold, unlute them, and shake them well, in order to loosen the volatile salt from the sides of the vessels. Pour the whole into a large glass cucurbit, and filtrate it through a brown paper, in order to separate the oil, which is here useless: put the filtrated liquor in a glass retort, and place it in a sand heat, and fit another glass retort thereto, as a recipient: take care all things be well luted, and make a cohobation of the said matters at three times. But, by the way, add all the salt before separated from the receivers; and after the said three cohobations, unlute the retorts, and pour the whole into a matras with a long neck, to which fit a suitable capital, and a receiver; lute all the joinings on each side with a wet bladder, and set the vessel in a sand heat: by this means, the volatile salt will be sublimed, and stick to the capital, and upper part of the matras. Continue the fire till spirit enough hath rose to fuse and dissolve the salt which arose first: then take all the fire out of the furnace, that the distillation may proceed no further; which is a circumstance of the last importance; without which the medicine would be weakened by too much phlegm." Biet, in *Mém. de Trev.* 1713.

As to the dose of this remedy, they begin with seven or eight drops, increasing by degrees, to forty or fifty, on pressing occasions, as in apoplexies, lethargies, weaknesses, &c.

The real composition of the *guttæ*, however, is somewhat controverted. Dr. Lister assures us, that he had the secret communicated to him by king Charles II. and that it is no other than the volatile spirit of raw silk rectified with oil of cinnamon, or some other essential oil. See SILEX.

The same author assures us, he had found by experience that the *guttæ Anglicanæ* were not in any respect preferable to the common volatile spirits of hart's-horn and sal ammoniac, except that the smell is more supportable.—*Mém. de l'Acad. des Scien.* an. 1700.

GUTTÆ, in architecture, are ornaments in form of little cones, used in the plafond of the doric cornice, or on the architrave, underneath the triglyphs; representing a fort of drops, or bells; they are usually six in number. See *Tab. Archit.* fig. 28. lit. e and O. They are sometimes also called *lobrymæ*, tears; and *campanæ*, or *campantiles*, bells. Leon Baptista Alberti calls them *nail*.

GUTTA-SERENA, is a disease of the eyes, being an entire privation of sight, without any apparent fault or disorder of the parts, excepting that the pupil looks somewhat larger and blacker than before.

Its cause is supposed to be a compression or obstruction of the optic nerves, which prevents the due flux of the animal spirits into the retina. Pitcairn ascribes it to an indisposition of the retina, occasioned by the vessels thereof being too much distended with blood.

The *gutta-serena* is one of the most dangerous and untractable of all the diseases of the eyes. The cure, according to Pitcairn, is to be attempted with mercurials, and sometimes even with salivation, and with decoctions of guaiacum.

The *muçæ volitantes* are a pathognomonic sign of a growing *gutta-serena*. The Greeks call it *amaurosis*.

GUTTE; see the article GUTTY.

GUTTERS, in building, a kind of canals in the roofs of buildings, serving to drain, receive, and carry off the rain waters. See ROOF.

GUTTER *tyles*; see the article TYLE.

GUTTURAL letters, are those pronounced, or formed, as it were, in the throat.

Dr. Wallis distinguishes the vowels in our language, into labial, palatine, and *guttural*; according to the three several degrees of opening of the mouth to pronounce them, larger, middle, and less. On this footing he makes three *guttural* vowels, and three labial, and as many palatines.

GUTTUS, a Latin term, used among antiquaries, for a sort of vase used in the Roman sacrifices, to take the wine and sprinkle it, *guttatim*, drop by drop, upon the victim.

Viginere on T. Livy, gives the figure of the *guttus*, as represented on divers medals and other ancient monuments.

GUTTY, or GUTTE, in heraldry, is when a thing is represented as charged or sprinkled with drops.

In blazon, the colour of the drops is to be named: thus, *guty* of sable, of gules, &c.

Some authors will have red drops called *guty de sang*, or drops of blood; black ones, *guty de poix*, of pitch; white, *guty de lait*, of water, &c.

GUY'S hospital; see the article HOSPITAL.

GUZES, in heraldry, roundles of a sanguine, or murky colour. GYMNASIARCH*, GYMNASIARCHA, in antiquity, the master, or director of a gymnasium.

* The word is Greek, γυμνασιάρχης, compounded of γυμνασιον, and αρχη, government.

The Greeks did not rank the *gymnasiarcha* among the number of magistrates; though his office was of great consideration, as having the care of all their youth, who were trusted to him to be formed to exercises of the body.

He had two principal officers under him, who were to assist him in the government of the gymnasium: the first named *xyffarch*, and the second *gymnast*. The former was master of the athlete, and presided over the wrestling. See XYSTARCH, ATHLETA, &c. The latter had the direction of all the other exercises; taking care they were performed in due time and manner; that they were not too severe; and that the youth attempted nothing beyond their strength; and that nothing were done that might be injurious to their health.

These had several subaltern officers or servants under them, for the service and instruction of the youth committed to them.

GYMNASIUM*, a place fitted for performing exercises of the body.

* The word is Greek, γυμνασιον, formed of γυμνος, naked; by reason they anciently put off their clothes, to practise with the more freedom.

Among the ancients, *gymnasium*, was a public edifice destined for exercise, and where people were taught, and regularly disciplined therein, under proper masters.

If we may credit Solon in Lucian's *Anacharsis*, and Cicero de *Orat.* lib. 2. The Greeks were the first who had *gymnasia*; and among the Greeks the Lacedæmonians; after them the Athenians; from whom the Romans borrowed them.

There were three principal *gymnasia* at Athens, the *academy*, where Plato taught; the *lyceum*, noted for Aristotle's lectures; and the *cynearges*, allotted for the populace.

Vitruvius describes the structure and form of the ancient *gymnasiums*, lib. v. c. 11.—They were called *gymnasia*, because the champions performed *naked*; and *paulestra*, from *wrestling*, which was one of the most usual exercises there: cause

the Romans sometimes also called them *thermae*; because the baths and bagnio's made a principal part thereof.

It appears that they did not perform their exercises quite naked, so early as the time of Homer, but always in drawers; which they did not lay aside before the thirty-second olympiad. One Orpippus is said to have been the first who introduced the practice; for having been worsted by means of his drawers undoing, and entangling him, he threw them quite aside; and the rest afterwards imitated him.

The *gymnasia* consisted of several members or apartments. M. Burette, after Vitruvius, recites no less than twelve, viz. 1^o, The exterior *portico's*, where the philosophers, rhetoricians, mathematicians, physicians, and other virtuosi, read public lectures, and where they also disputed, and rehearsed their performances. 2^o, The *ephebeum*, where the youth assembled very early, to learn their exercises in private, without any spectators. 3^o, The *corymbium*, *apodyteron*, or *gymnasterion*, a kind of wardrobe, where they strip, either to bathe, or exercise. 4^o, The *eleuthesium*, *alisterion*, or *unctorium*, appointed for the unctions which either preceded or followed the use of the bath, wrestling, pancratis, &c. 5^o, The *conisterium*, or *conistra*, in which they covered themselves with sand, or dust, to dry up the oil, or sweat. 6^o, The *palaestra*, properly so called, where they practised wrestling, the pugilate, pancratis, and divers other exercises. 7^o, The *spheristerium*, or tennis court, reserved for exercises wherein they used balls. 8^o, Large un paved alleys, which comprehended the space between the portico's and the walls wherewith the edifice was surrounded. 9^o, The *xystra*, which were portico's for the wrestlers in winter or bad weather. 10^o, Other *xystra*, or open alleys, allotted for summer and fine weather; some of which were quite open, and others planted with trees. 11^o, The *baths*, consisting of several different apartments. See BATH. 12^o, The *stadium*, a large space, of a semicircular form, covered with sand, and surrounded with seats for the spectators. See STADIUM.

For the administration of the *gymnasia*, there were divers officers; the principal were, 1^o, The *gymnasiarcha*, who was the director and super-intendant of the whole. 2^o, The *xytarcha*, who presided in the *xystra*, or stadium. 3^o, The *gymnastæ*, or master of the exercises, who understood their different effects, and could accommodate them to the different complexions of the athletes. 4^o, The *pedotriba*, whose business was mechanically to teach the exercises, without understanding their theory or use. Under these four officers were a number of subalterns, whose names distinguished their different functions.

For the kinds of exercises practised in the *gymnasia*, they may be reduced to two general classes, as they depend either on the action of the body alone, or as they require external agents, or instruments. The former are chiefly of two kinds; *orehesticæ*, and *palaestricæ*.

The *orehesticæ* comprehended, 1^o, *Dancing*. 2^o, *Cubisticæ*, or the art of tumbling. 3^o, *Spheristicæ*, or tennis, including all the exercises with palle, or balls.

The *palaestricæ* comprised all exercises under the denomination *palaestra*; as *wrestling*, *boxing*, *pancratis*, *heptamachia*, *running*, *leaping*, *throwing the discus*, the exercise of the *javelin*, and that of the *hoop*, denominated by the Greeks *τεταρα*, which consisted in rolling an iron hoop, five or six foot in diameter, beset with iron rings, the noise of which apprising the people to give way, afforded them also an amusement. Both strength and skill were requisite in directing this hoop, which was to be driven with an iron rod.

To these must also be added the exercises belonging to the medicinal gymnastics: as, 1^o, *Walking*. 2^o, *Vociferation*, or shouting. 3^o, *Holding one's breath*.

The bodily exercises which depend on external agents, may be reduced to *mounting the horse*, *riding in a chaise*, *litter*, or other wheeled vehicle; *rocking in beds*, or *cradles*, and sometimes *swinging*: to which may be added, the art of *swimming*. — Hoffman enumerates no less than fifty-five sorts of *gymnastic* exercises.

GYMNASTICKS, GYMNASTICÆ, or the GYMNASTIC ART, denotes the art of performing exercises of the body, whether for defence, health, or diversion.

The *gymnastic* art is divided into three species, or branches; *military*, *medicinal*, and *athletic* or *sportive*.

Several modern writers have treated of this art, as Mercurialis, *de arte Gymnastica*; Faber, in *Aegonistic*. Joubert, *de Gymnasticis*; Cagnatius, *de Sanit tuend Vitiis*; de Quator *Artib Popular*. Meursius, *de Orehestia*; Fuller, in *Medicina Gymnastica*; and M. Burette, in several dissertations on the *antient Dancing*, *Spheristicæ*, *Athleticæ*, *Wrestling*, *Pugillate*, *Discus*, &c.

M Burette has given the history of *gymnastics*, in the *Memoirs of the Royal Academy of Inscriptions*.— According to him, this art is coeval with the world. In reality, we can hardly suppose mankind to have ever been without some sort of exercises of the body; which the defence of their persons, the preservation of

health, and even recreation, and mirth, would necessarily lead them to. See EXERCISE.

On the first establishment of society, men, being apprised of the necessity of military exercises, for repelling the insults of their neighbours, instituted games, and proposed prizes, to animate their youth to combats of divers kinds. See GAME. And as running, leaping, strength and dexterity of arm, in throwing the javelin, driving a ball, or tossing a quoit, together with wrestling, &c. were exercises suited to the manner of fighting in those days; so the youth vied to excel in them, in the presence of the aged, who sat their judges, and dispensed prizes to the conquerors: till what was originally only amusement, became at length a matter of such importance, as to interest famous cities and entire nations in its practice.

Hence arose an emulation and eagerness to excel, in hopes one day of being proclaimed and crowned conquerors in the public games, which was the highest honour a mortal could arrive at. Nay, they went so far as to imagine, that even gods and demigods were not insensible of what men were so captivated withal; and in consequence hereof, to introduce the greatest part of these exercises into their religious ceremonies, the worship of their gods, and the funeral honours done the manes of the dead.

Though it be hard to determine the precise epocha of the *gymnastic* art, yet it appears from several passages in Homer, and particularly the xxiii^d book of the *Iliad*, where he describes the games celebrated at the funeral of Patroclus, that it was not unknown at the time of the Trojan war.— From that description, which is the earliest monument now extant of the Grecian *gymnastics*, it appears that they had chariot races, boxing, wrestling, foot races, gladiators, throwing the discus, drawing the bow, and hurling the javelin; and it should seem from the particular account Homer gives of these exercises, that even then the *gymnastic* art wanted little of perfection: so that when Galen says, there was no *gymnastic* art in Homer's days, and that it began to appear no earlier than Plato, he is to be understood of the medicinal *Gymnastics* only. This last, indeed, had its rise later; because, while men continued sober and laborious, they had no occasion for it. But when luxury and idleness had reduced them to the sad necessity of applying to physicians; these who had found that nothing contributed so much to the preservation and re-establishment of health, as exercises proportioned to the different complexions, ages, and sexes, did not fail to remit them to the practice of *gymnastics*.

According to Plato, one Herodicus, prior a little time to Hippocrates, was the first who introduced this art into phylis; and his successors, convinced by experience of its usefulness, applied themselves in earnest to improve it.

Hippocrates, in his book of *Regimen*, has given instances of it; where he treats of exercise in general, and of the particular effects of walking, with regard to health; also of the different sorts of races, either on foot or horseback, leaping, wrestling, the exercise of the suspended ball, called *corycus*, chironomy, unctions, frictions, rolling in the sand, &c.

But as physicians did not adopt all the exercises of the *gymnastic* art into their practice, it became divided between them and the masters of martial and athletic exercises, who kept schools, the number of which was greatly increased in Greece.

At length the Romans also caught the same taste, and adopting the military and athletic exercises of the Greeks, they improved and advanced them to the utmost pitch of magnificence; not to say extravagance. But the declension of the empire involved the arts in its ruin; and, among others, *Gymnastics* and medicine; which last unhappily their relinquished the title it had to the former, and has neglected to resume it ever since.

GYMNIC, GYMNICUS, something belonging to the exercises of the body.

Gymnic games, *heli gymnici*, are those wherein the body is exercised; such are wrestling, running, dancing, the use of this lance, quoit-playing, &c.

It was these made the chief diversions of the Olympic, Nemean, Pythian, and Isthmian solemnities; being called by the Greeks *Πελοποννησια*, and the Latins *quinguentium*. See OLYMPIC, NEMEAN, PITHIAN, ISTHMIAN, &c. See also PENTATHLON.

GYMNOPÆDIA*, a kind of dance, in use among the antient Lacedæmonians; performed during their sacrifices, by young persons who danced naked, singing at the same time a hymn in honour of Apollo.

* The word is also written *gymnopedice*. It is compounded of *γυμνός*, naked, and *παις*, child.

One Terpander is recorded as the inventor of the *Gymnopedia*. Athenæus describes it as a Dædic dance, performed by youths stripped quite naked, with certain interrupted, though agreeable motions and gestures of the body; the arms and legs being flourished and directed after a peculiar manner, representing a sort of real wrestling.

GYMNOSOPHISTS*, a set of Indian philosophers, famous in antiquity; so denominated from their going barefooted.

* The word is formed of the Greek *γυμνοσολογιστής*; *g. d.* a sophist, or philosopher, who goes naked.

This name was given to the Indian philosophers, whom the excessive heat of the country obliged to go naked; as that of *peripateticks* was given those who philosophized walking. Læcius, Vives, &c. will not have *gymnosophists* to have been the name of any particular sect, but a common name of all the philosophers in the Indies; and hence they divide them into Brachmans and Germani.

Among the Germani, called also by Porphyry, *samanæi*, and by Clemens Alexand. *sermanæ*, some were called *hylobii*; by Clemens Alexand. *allobii*, as inhabiting the woods; which last seem to come nearest to the notion of *gymnosophists*. Clemens relates, that these *allobii* neither inhabit cities nor towns, are clothed mostly with the leaves of trees, eat acorns and berries, and drink water out of their hands, abstaining from marriage and procreation.

Apuleius, *Florid.* lib. 1. describes the *gymnosophists* thus: "They are all devoted to the study of wisdom, both the elder masters, and the younger pupils; and what to me appears the most amiable thing in their character, is, that they have an aversion to idleness and indolence: accordingly, as soon as the table is spread, before a bit of victuals be brought, the youths are all called together from their several places and offices, and the masters examine them what good they have done since the sun-rise. Here one relates something he has discovered by meditation; another has learned something by demonstration: and as for those who have nothing to allege why they should dine, they are turned out to work fasting."

The great leader of the *gymnosophists*, according to Jerom, was one Buddas, called by Clemens, *Butta*; who is ranked by Suidas among the Brachmans. That last author makes Buddas the preceptor of Manes the Persian, the founder of the *gymnosophists*.

GYNÆCEUM *, Γυναικειον, among the ancients, the apartment of the women; or a separate place in the inner part of the house, where the women kept themselves retired, employed in their spinning, out of the sight of the men.

* The word is compounded of the Greek, *γυν*, a woman, and *οικος*, an house.

Under the Roman emperors there was a particular establishment of *gynæcea*; being a kind of manufactories managed chiefly by women, for the making of clothes, furniture, &c. for the emperor's household. Mention is made of these *gynæcea*, in the Theodosian and Justinian code, and by divers other authors. In imitation hereof, divers of the modern manufactories, particularly those of silk, where a number of women and maids are associated and formed into a body, are called *gynæcea*.

GYNÆCIARIUS, a workman employed in the *gynæceum*. In the ancient *gynæcea* there were men to weave, and shape; the rest, as spinning, &c. being performed by women.

Criminals were sometimes condemned to serve in the *gynæcea*, much as now in the galleys. Frequently, also, this was a kind of service which princes exacted of their subjects, or vassals, both men and women, whom they made to work for them in their *gynæcea*.

GYNÆCOCRATUMENI *, an ancient people of Sarmatia Europæa; inhabiting the eastern banks of the river Tanais, near its opening into the Palus Mæotis; thus called, as

authors relate, because they had no women among them: or rather, because under the dominion of women.

* The word is formed of *γυν*, woman; and *κρατωμαι*, vanquished; of *κρατω*, I overcome; *g. d.* overcome by women.

Fa. Hardouin, in his notes on Pliny, says they were thus called, by reason, after a battle which they lost against the Amazons on the banks of the Thermodoon, they were obliged to have a venereal commerce with them, in order to get them children: *Et quod vitricibus obsequantur ad procurandam eis sobolem.*

Hardouin calls them the husbands of the Amazons, *Amazonum connubia*. For, as that author observes, the word *unde* must be retrenched from Pliny; having been foisted into the text by people who were not masters of the authors meaning, *unde Amazonum connubia*.

They who take the Amazons for a fabulous people, will conclude the fame of the *Gynæocratumenians*. See **AMAZON**.

GYNÆCOCRACY *, **GYNÆCOCRATIA**, a petticoat government; or a state where women have, or may have, the supreme command.

* The word is formed of *γυν*, *γυναικες*, woman, and *κρατος*, authority, power, government.

In this sense, England and Spain are *gynæcocracies*: the French value themselves, and think they are greatly happy that their monarchy is not *gynæcocratic*.

GYNÆCONOMUS *, the name of a magistrate of Athens, who had the censure, and inspection of the women.

* The word is compounded of the Greek *γυν*, *γυναικες*, woman; and *νομος*, law.

There were ten *gynæconomi*: their business was to inform themselves of the lives and manners of the ladies of that city, and to punish such as misbehaved themselves, or transgressed the common bounds of modesty and decency.

They had a list hanging out, of the names of all those whom they had censured, or condemned to any mulct, forfeiture, penance, or other penalty.

GYNGLIMUS, in anatomy, &c. See **INGLYMUS**.

GYPsum, Γυψος, in natural history, a talky sort of stone, found in quarries; which being burnt, and diluted, or wrought up with water, serves to make what we call *parget*, or *plaster of Paris*.

GYPsum, or **GYPSE**, is also used for a coarse sort of talk; or a shining transparent stone chiefly found in the quarries of Montmartre, near Paris, among the plaster stones.

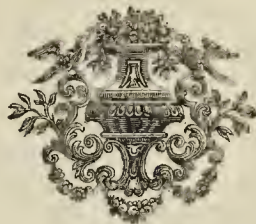
The generality confound this with the former, on account of the conformity of its name with the Latin *gypsum*; but unhappily enough; as the French *gyp*, or *gypse*, is not fit for the making of the common plaster.

This stone being calcined in a kiln, beaten in a mortar, and sifted, and mixed up with gum, or size water and colours, serves to counterfeit marble, which it does to that perfection, that both the eye and touch may be deceived.

The method of preparing it, will be shewn under the article **MOSAIC**.

GYROMANCY *, **GYROMANTIA**, a kind of divination, performed by walking round, or in a circle. See **DIVINATION**.

* The word is compounded of the Greek *γυρος*, circle, and *μαντευς*, divination.



H, Is the eighth letter of the alphabet, and the sixth consonant.

Varro, *De re rustica*, Lib. III. cap. 1. calls the *h*, *affatus*; and Martianus Capella says it is pronounced by only a gentle contraction of the trachea. — Hence it has been disputed, whether or no the *h* be a real letter.

Some will only have it an aspiration, or spirit, in regard its found is so weak. And accordingly the Greeks, of later ages at least, do not place it in the line with the other letters, but put it over the head of the letter which follows it: though it should seem they antiently wrote it in the same line with the rest.

The Latin grammarians, as they were religious imitators of the Greeks, have on their authority generally disallowed the *h* as a letter; and the moderns have herein followed the Latins. But the *h*, like all the other aspirates, from the time it is aspirated, and for this very reason that it is aspirated, is not only a letter, but a real consonant; it being a motion, or effort of the larynx, to modify the found of the vowel that follows; as is evident in the words heaven, health, hero, &c. where the vowel *e* is differently modified from what it is in the words *en*live, eating, elect, &c. and such modification is all that is essential to a consonant.

Upon the whole, the *h* is either a letter, or *h* and *z* are none; those being no more than hissing aspirations: and they who exclude the *h* from among the letters, as conceiving it only a mark of aspiration, might as well exclude the labial consonants *b* and *p*, and say they are only marks of certain motions of the lips, &c.

The *h* then is a letter, and a consonant of the guttural kind, *i. e.* a consonant, to the pronunciation whereof, the throat concurs in a particular manner, more than any other of the organs of voice.

It is true, in many words beginning with *h*, the aspiration is very weak, and almost insensible; the *h* in those cases not doing its office: but it does not cease to be a consonant on that score, more than various other consonants, which we write, but do not pronounce; as the *k* in quick, &c. and several other letters, particularly in the Hebrew, French, &c. Nor does it cease to be a consonant, because it does not hinder the elision of the foregoing vowel, when another vowel follows in the subsequent word; for then *h* would undergo the same disqualification.

M. Menage distinguishes two kinds of *h*; the one an aspirate, which he allows a consonant, the other a mute, which he considers as a vowel. — Now, it is certain, the aspirated *h* is a consonant; but the mute *h* is no vowel, as having no peculiar or proper sound distinct from that of the vowel, or diphthong immediately following it.

When the *h* is preceded by a *c*, the two letters together have frequently the found of the Hebrew ח, with a point over the right horn; as in charity, &c.

In most words derived from the Greek, and beginning in that language with the letter *χ*, the *ch* which begins them in English, has generally the found of a *h*, as in echo, chorus, &c. though it is sometimes softened a little, as in Chersonesus, &c. After a *β*, the *h* is always pronounced together with the *β*, like an *f*; as in phrases, Philistines, phlegm, phlebotomy, philosophy, Phœceans, &c. — Most words of this class are either proper names, or terms of art, borrowed from the Greek, or the Oriental languages; and wrote in Greek with a *β*, and with a *Ϸ* in the others.

In antient authors, we frequently meet with *h* put instead of *f*; as *hava* for *faba*; but this is principally observable in the Spanish tongue, where most of the words borrowed from the Latin beginning with an *f*, take the *h* in lieu of it; as *hablar*, for *fabulari*; *havo*, for *fabus*; *hado*, for *fatum*. — For the intercourse which *h* has with the Æolic digamma, see the letter *F*.

The aspirate or sharp accent of the Greeks, which is the same with our *h*, is also frequently changed in the Latin for an *s*; as *hæres*, *hæresis*, *septem*; *hæresis*, *sex*; *hæresis*, *serpo*; *hæresis*, *semis*; *hæresis*, *sex*; &c. — The *h* is also used for some other letters, enumerated at large by Passerat, *De literarum inter se cognatione & permutatione*.

Antiently, the *h* was put for *ch*; thus of *Chlodoveus* was formed *Hlodoveus*, as it is read on all the coins of the ninth and tenth centuries; and it was on this account, that they wrote *Hlodoveus* with an *h*. — In course of time, the found of the *h* being much weakened, or entirely suppressed, the *h* was dropt, and the word was wrote *Ludovicus*. In like manner we read *Hlotaire*, *Hloviv*, &c.

F. Lobineau, will have this difference to have arose from the differences in the pronunciation. — Such, says he, as could not

pronounce the guttural, wherewith those two words begin, substituted a *c* for it; and they who pronounced it *fo*, wrote it after the same manner: but such as were accustomed to pronounce the guttural, wrote it likewise. — He might have added, that such as could not pronounce it, at length absolutely rejected it, and both wrote and spoke *Louis*, *Lotaire*, &c.

— Some learned men have conjectured that the *h* should have been detached from the name; and that it signified lord, from the Latin *herus*, or the German *herr*. Much as the *D*, which the Spaniards prefix to their proper names, as *D. Philippe*, for *Don Philip*. — But as it is likewise found before the names of several cities, it is more probable the letter was there used to denote the rough harsh pronunciation of the antient Franks.

In reality, the most antient way of writing the names of these French kings, was not by *h*, but by *ch*; where the *c* seems to have stood for *konig*, king, and the *h* was inserted to give the *c* a guttural found.

The *h* is sometimes also found prefixed to the *c*; as *Hcalulus*, *hcalendæ*, &c. for *Carolus*, *calendæ*, &c.

H, among the antients, was also a numeral letter signifying 100, according to the verse:

H quoque ducentos per se designat habendos.

When a dash was drawn at the top of the $\overline{\text{H}}$, it signified two hundred thousand. — See what has been observed on this subject, under the letter *A*.

HABAKKUK*, or **HHABAKKUK**, one of the twelve lesser prophets, whose prophecies are taken into the canon of the Old Testament.

* The name is wrote in the Hebrew with חבקוק ; and signifies a wrestler, or grappler. The Greek translators call him *Abakkoum*.

The precise time is not known when *Habakkuk* prophesied; but from his predicting the ruin of the Jews by the Chaldeans, it may be concluded he prophesied before *Zedekiah*, or about the time of *Manasses*. — His prophecy only consists of three chapters.

HABDALA*, or **HABDALAH**, a Jewish ceremony, practised among that people every sabbath-day evening.

* The word is Hebrew, and literally signifies separation: It is formed of חלה *chalah*, to separate, divide; the ceremony being looked upon, as the division or parting of the sabbath from the rest of the week. It was established to prevent their being too hasty in ending the sabbath.

Towards the close of the sabbath, when the stars begin to appear, every master of a family lights a torch, or flambeau, or at least a lamp with two wicks. — A little box of spices is then prepared, and a glass of wine taken; then singing, or rehearsing a prayer, and blessing the wine and the spices, they all smell at them; and after a few ceremonies performed about the torch, or lamp, they cast a little of the consecrated wine into the flame; every body tastes; and thus they break up, wishing each other, not a good night, but a good week.

HABEAS Corpus, in law, a writ, which a man indicted and imprisoned for any crime, or trespass, before the justices of peace, or in a court of franchise; having offered sufficient bail, which is refused, though the case be bailable; may have out of the King's Bench, thereby to remove himself thither, at his own costs, to answer the cause at the bar thereof.

The order in this case, is first to procure a *certiorari* out of the Chancery, directed to the said justices, for removing the indictment into the King's Bench; and upon that to procure this writ to the sheriff, for causing his body to be brought at a certain day.

HABEAS Corpora, is also a writ, that lays for bringing in a jury, or so many of them as refuse to come upon the *venire facias*, for the trial of a cause brought to issue. See **JURY**.

HABENDUM, a word of course in a conveyance. — In every conveyance are two principal parts, the *premisses*, and the *habendum*: the office of the first is to express the name of the grantor, the grantee, and the thing granted.

The *habendum* is to limit the estate, so that the general implication, which, by construction of law, passeth in the premisses, is by the *habendum* controlled and qualified.

Thus, in a lease to two persons, the *habendum* to one for life, alters the general implication of the jointenancy in freehold, which should pass by the premisses, if the *habendum* were not.

HABERE facias seisinam, a judicial writ, which lies where a man has recovered lands in the king's court; directed to the sheriff, commanding him to give him the seisin thereof.

H A B

This writ sometimes also issues out of the records of a fine, directed to the sheriff of the county, where the lands lie; commanding him to give to the cognizee, or to his heirs, seisin of the land, whereof the fine is levied.

The writ lies within the year after the fine, or judgment, upon the *fine facias*; and may be made in divers forms.

There is also a writ called *HABERE facias seisinam, ubi rex habuit annum, diem & vastum*; which lies for the delivery of lands to the lord of the fee, after the king had taken his due of a person's lands, who was convicted of felony.

HABERE facias visum, is a writ that lies in divers cases, as in dower, formodon, &c. where a view is to be taken of the land, or tenements in question.

HABERGION*, or **HAUBERGEON**, **HABERGETUM**, a coat of mail; an antient piece of defensive armour, in form of a coat, descending from the neck to the middle; and formed of little iron rings, or meshes, linked into each other.

* The word is also written *haberge*, *banberge*, *haubere*, *haubert*, *haubers*, *haubert*, and *hauberk*. Spelman takes it to have been formed from the antient French *haul*, high, and *berg*, armour, covering; as serving to defend the upper part of the body. Du Cange and Skinner choose to derive it from the Belgic *hals*, or Teutonic *hals*, neck, and *bergen*, to cover:—As if it were a peculiar defence for the neck. Others will have it formed of *al*, *alla*, q. d. all, and *bergen*, to cover; as importing it a cover for the whole body.

HABILIMENTS of war, in our antient statutes, signify armour, harness, utensils, or other provisions for war; without which there is supposed no ability to maintain war.

HABIT, in philosophy, an aptitude, or disposition, either of mind or body, acquired by a frequent repetition of the same act.

Some of the Schoolmen call this a *qualitative habit*, *habitus qualitativus*; and define it a quality adventitious to a thing, fitting and disposing it either to act or suffer.

Others define *habit* an affection of mind or body, persisting by long use and continuance.—In which sense *habit*, a constant *habit*, is distinguished from *dispositio*, a present disposition, liable soon to alter.

Habits may be distinguished into those of the mind, and of the body.—Thus virtue is called an *habit* of the mind; strength, an *habit* of the body.

All natural *habits*, whether of body or mind, are no other than the body and mind themselves, considered as either acting or suffering; or they are modes of the body or mind, wherein either perseveres, till effaced by some contrary mode.

Aristotle enumerates five *habits* of the mind, *viz.* understanding, knowledge, wisdom, prudence, and art: which division the later writers set aside, and only admit of three intellectual *habits*, *viz.* science, prudence, and art: agreeable to the three kinds of objects, about which the mind has occasion to be facilitated; which are either theoretical, practical, or effective. Virtues and vices are considered by philosphers under the notion of good and bad *habits*.

The archbishop of Cambray defines *habits*, in the general, to be certain impressions left in the mind; by means whereof, we find a greater ease, readiness, and inclination to do any thing formerly done, by having the idea ready at hand to direct us how it was done before.—Thus, *e. g.* we form a *habit* of sobriety, by having always before us the inconveniences of excess; the reflections whereof, being often repeated, render the exercise of that virtue continually more and more easy.

F. Malebranche gives a more mechanical theory of the *habits*.—His principle is, that they consist in a facility which the spirits have acquired, of passing easily from one part of the body to another. He argues thus: If the mind act on, and move the body, it is, in all probability, by means of a stock of animal spirits lodged in the brain, ready to be sent at the motion of the will, by means of the nerves which open or terminate in the brain, into the muscles of the body.

Now, an influx of spirits into a muscle, occasions a swelling, and, of consequence a shortning of the muscle; and consequently a motion of the part that muscle is fastned to.

Farther, the spirits do not always find all the roads open and free, which they are to pass through; whence that difficulty we perceive of moving the fingers with that quickness necessary to play on a musical instrument; or of moving the muscles necessary to pronounce the words of a foreign language. But, by degrees, the spirits, by their continual flux, smoothen the ways; so that at length they meet with no resistance at all. Now it is in this facility the spirits find of passing, when directed into the members of the body, that *habits* consist.

On this hypothesis, it is easy accounting for an infinity of phenomena relating to the *habits*.—Why, for instance, children acquire new *habits* with more ease than grown persons? Why it is difficult getting rid of inveterate *habits*? Whence that incredible quickness in the pronunciation of words, even without thinking of them; as is particularly observable in those long accustomed to formula's, &c.

On this footing, the faculty of memory appears to have very much the nature of a *habit*; inasmuch that in one sense it may pass for a *habit*.

H A D

HABIT, in medicine, is what we otherwise call the temperament, or constitution of the body; whether obtained by birth, or occasioned by the manner of living.

An ill, distempered *habit*, without any particular apparent disease, the physicians usually call a *cachexia*, or *cachymia*.

A thing is said to *enter the habit*, when it becomes intimately diffused throughout the body, and is conveyed to the remotest stages of circulation.

HABIT is also used for a dress, or garb; or the composition of garments wherewith a person is covered.

In this sense we say, the *habit* of an ecclesiastic; of a religious, &c. the military *habit*, &c.

The ecclesiastical *habit* only commenced about the time of Gregory the great, *i. e.* it only began at that time to be distinguished from the lay *habit*, *viz.* in the sixth century.—

The establishment of the barbarous nations was the occasion thereof: for the laymen took the *habit* of the nations they had submitted to, but the priests kept to the Roman dress.

The abbot Boileau has an express treatise *On the ecclesiastical habit*; wherein he maintains, contrary to the common opinion and custom, that the ecclesiastical *habit* should be a short one, and that a *short habit* is more decent than a long one.

HABIT is particularly used for the uniform garments of the religious, conformable to the rule and order whereof they make profession.

The *habit* of S. Benedic't, of S. Auguftine, &c. In this sense, we say absolutely, such a person has taken the *habit*; meaning, he has entered upon a noviciate in a certain order.—So, he is said to quit the *habit*, when he renounces the order. See **NOVICIATE**, **VOWS**, &c.

The *habits* of the several religious, are not supposed to have been calculated for singularity or novelty: the founders of the orders, who were at first chiefly inhabitants of deserts and solitudes, gave their monks the *habit* usual among the country people. Accordingly, the primitive *habits* of S. Anthony, S. Hilariion, S. Benedic't, &c. are described by the antient writers, as consisting chiefly of sheep-skins, the common dress of the peasants, shepherds, and mountaineers of that time: and the same they gave their disciples.

The orders established in and about cities, and inhabited places, took the *habit* wore by the other ecclesiastics at the time of their institution.—Thus, S. Dominic gave his disciples the *habit* of regular canons, which he himself had always wore to that time. And the like may be said of the Jesuits, Barnabites, Theatins, Oratorians, &c. who took the common *habit* of the ecclesiastics at the time of their foundation. And what makes them differ so much from each other, as well as from the ecclesiastical *habit* of the present times, is, that they have always kept invariably to the same form; whereas the ecclesiastics have been changing their mode on every occasion.

HABITATION, a dwelling-place, or house. See **HOUSE**. **HABITATION**, is sometimes also used for *cohabitation*. See **COHABITATION**.

HABITUAL, something that is become, or turned into an habit, or habitude.

Thus we say, an *habitual* or inveterate disease, *habitual* sin, &c. An *habitual* disposition is the same thing with an habitude itself.

HABITUAL Grace, is conveyed to us by baptism, and afterwards augmented and improved by the eucharist, and other appointed means.

The Romish divines hold *habitual grace* only necessary in order to be saved; and actual grace to the doing any thing meritorious.

HABITUDE, **HABITUDO**, in the schools, signifies the respect or relation which one thing bears to another. See **RELATION**.

In this sense, *habitude* is one of Aristotle's categories. Some of the more precise and accurate schoolmen, consider *habitude* as a genus; and subdivide it into two species. Where it is considered as quiescent, they call it *respect*; where as moved, *relation*: To which some add a third species, considered in respect of figure, which they call *nude*.

HABITUDE is also used in philosophy, for what we popularly call *habit*, *viz.* a certain disposition or aptitude, for the performing, or suffering of certain things; contracted by reiterated acts of the same kind.

HACHES, and **HACHING**. See **HATCHING**.

HACKNEY. See the article **HACKNEY**.

HACKNEY Coach. See the article **HACKNEY COACH**.

HADRIANA, or **HADRIANALIA**, in antiquity, games instituted in honour of the emperor Hadrian, or Adrian.

There were two sorts of *Hadrianalia*, the one held every year, and the other every five years.

HÆMATITES*, **AIMATITE**, in natural history, the *blood-stone*; a kind of ruddy mineral Substance; thus called, either on account of its resembling dry, curdled blood, or of the faculty it has of staining blood.

* The word is formed from the Greek *αἷμα*, *fangui*, blood.

Pliny reckons five kinds of blood-stone, viz. the *Ethiopic*, the *Andromedas*, the *Arabic*, the *elatites*, or *milites*, and the *schistos*; besides that commonly called in his time the *magnes hematites*, from the property it had of attracting iron.

The five sorts differ chiefly in point of hardness: the best, according to Dioscorides, is that which is friable, hard, black, and smooth, without either gritty parts, or veins.

That commonly used by the painters is factitious; being made of Armenian bole, and other drugs.

The common native, or fossil kind, comes from Egypt, Bohemia, &c. It has divers uses in medicine; being held cooling and astringent, and in that quality prescribed in hæmorrhages.—It is given in substance, in form of a fine powder.

The golders use it for burnishes, to polish their gold withal. Bauhæsius has an express treatise on the *Lapis hematites*. See supplement: article HÆMATITES. See there also *Elatites*, and *Andromedas*.

HÆMATOSIS*, in medicine, the action whereby the chyle is converted into blood; called also *sanguification*. See SANGUIFICATION.

* The word is formed of the Greek αἷμα, sanguis, blood.

The chief of the vital actions, are the chylosis, and hæmatosis.

HÆMOPTYSIS*, Αἰμοπτυσις, corruptly also called HÆMORPTOSIS, and HÆMOPTOE, in medicine, a spitting of blood, occasioned by the rupture or erosion of some vessel of the lungs; and accompanied, usually, with a cough, and a sense of pressure on the breast.

* The word comes from αἷμα, blood; and πτυσι, to spit.

The hæmoptysis differs from a vomiting of blood, in that in the hæmoptysis, the blood comes from the lungs, and for that reason is florid and frothy; whereas in the vomiting of blood, it comes from the stomach, and is blackish.

The hæmoptysis, is usually occasion'd by violent shouts, or cries; by strains, falls, or vehement coughs; by the suppression of some ordinary evacuation, or by the abundance of some sharp corrosive humor.

The hæmoptysis is either accidental or habitual.—The latter is a symptom of the phtisis. It is best cured, according to Morton, by the cortex: it is stopped by astringents, as *Armen. bol. sing. dracon. lapis hemat.* &c. See supplement: article HÆMOPTOE.

HÆMORRHAGE*, Αἱμορραγία, in medicine, a flux of blood at any part of the body; arising either from a rupture of the vessels, as when they are too full, or too much pressed; or from an erosion of the same, as when the blood is too sharp and corrosive.

* The word is compounded of the Greek αἷμα, sanguis, blood; and ῥραγία, frango, rumpo, erumpo, I break, burk forth, &c.

The hæmorrhage, properly speaking, as understood by the Greeks, was only a flux of blood at the nose; but the moderns extend the name to any kind of flux of blood, whether by the nose, mouth, lungs, stomach, intestines, fundament, matrix, or whatever part.

Hypochondriac, scorbutic, and cachectic persons, are liable to various and immoderate hæmorrhages.—The cure of hæmorrhages arising from a plethora, is by evacuations, and particularly phlebotomy, to cause a revulsion.—That which arises from an increased velocity of thin acrimonious blood, is to be attacked by coolers, and agglutinants.

The principal simple remedies in hæmorrhages, are album græcum, spirit or oil of vitriol, chalcantum rubified, colophony pulverized, oil of turpentine, decoction of catechu, and cortex peruv.

A ligature on the limb has frequently a good effect: as have also the *elect.*, *Boylean.* *pulvis Galeni*; *elect.* *Syptic. tinctur. rosar. epithem. de sacchar. saturn.* &c.

An hæmorrhage at the anus, is more usually called a *dyſentery*. See DYSENTERY.

HÆMORRHOIDAL, an epithet given to the veins and arteries of the intestinum rectum, and the fundament, as being the seat of the hæmorrhoids, or piles.

The hæmorrhoidal arteries are two; the one *internal*, the other *external*.

The *internal* is a branch of the lower mesenteric, which running along the rectum, terminates at the fundament.—The *external* springs from the hypogastric artery.

The hæmorrhoidal veins are also *internal* and *external*.

The *internal* carries back the blood of the rectum and fundament, which it embraces regularly; and is inserted sometimes into the splenic branch of the porta, and sometimes into the mesenteric. The *external* brings back the blood from the muculous parts about the fundament, and terminates in the hypogastric vein.

HÆMORRHODS*, in medicine, a disease of the fundament, popularly called the *piles*.

* The word is formed of the Greek αἱμορροειδης, sanguinis profusivum, flux of blood; which is compounded of αἷμα, blood, and ῥοει, I flow.

The hæmorrhoids are a painful, periodical tumor, in the lower part of the intestinum rectum; usually appearing externally in the anus.—They may be considered as a sort of varicous tumours in the hæmorrhoidal veins; arising from the too great abundance of morbid blood therein.

The disease is either *simple*, as when the veins alorie are tumified; or *compound*, as when the neighbouring parts become also infected, or an excrescence arises therefrom; as a *ſcus*, *criſta Galli*, *condyloma*, or the like.

Hæmorrhoids again are either open, *ſutantes*; that is, such as yield blood; or blind, *cæcæ*, where the parts are only tumid.—In the first, the vessels of the rectum are open; in the latter, there is some obstruction which occasions them to swell.

The hæmorrhoids sometimes are internal, and cause great pain in going to stool; especially if the feces be indured: after which they often appear externally, and blood is seen upon the excrements.

Etmuller is careful in distinguishing the genuine hæmorrhoidal flux, from a bloody diarrhoea; frequent in scorbutic cases.

—The hæmorrhoids are usually opened by the attrition of the excrements in a stool, so that the blood flows at the same time with the excrements; but if it flows profusively before as well as after the excrements, and without pain, it is a scorbutic flux.

Where the flux is excessive, plebotomy, and cupping are good; by way of revulsion; and internally, astringents and opiates.—Upon a suppression of the usual flux, without removing the cause, the open hæmorrhoids degenerate into the blind ones: in which case they must be opened again with aloeatics, &c. Tamarinds are held excellent to aſſuage the flux: chalybeates strike at the cause of the evil: scrophularia, onion and leek are much commended in it. See supplement: article HÆMORRHODS.

HÆREDE *abdatis*, is a writ which antiently lay for the lord, who, having by right the wardship of his tenant under age, could not come by his body, as being conveyed away by another.

HÆREDE *deliberando alii qui habet custodiam terræ*, a writ directed to the sheriff, willing him to command one that had the body of him who was ward to another, to deliver him to him whose ward he was on account of his land. See WARD.

HÆREDIPETA, in our antient law-books, the next heir. See HEIR.

Et nullus hæredipeta sua propinquo vel extraneo periculoſa ſane custodia committatur. Leg. H. I. cap. 70.

HÆREDITAS. See the article ANTEYANCE.

HÆRESIARCH, HÆRESIARCHA, of the Greek ἡρησιάρχης, an arch heretic. See HERETIC.

HÆRESIS, *Hereſy*. See the article HERESY.

HÆRETICO *Comburendo*, a writ which antiently lay against an heretic, who having once been convicted of hereſy by his bishop, and having abjured it, afterwards falling into it again, or into some other, is thereupon committed to the secular power.

Sir Edward Coke was of opinion, that this writ did not lie in his time: but it is now formally taken away by statute Car. II.

HÆRETICUS, *Heretic*. See the article HERETIC.

HAGARD*, in falconry, a hawk, or falcon, not taken in the nest; but after she had been inured to liberty, and preying for herself.

* The word is French, and signifies *ferce*; some derive it from the Latin *agreste*, wild: others from the German *hag*, inclosure, fortified place.—Whence M. Huet observes, the word *hagard* is sometimes applied to a man who becomes hardy and proud, in confidence of the strength of the place he is in.

Hagard hawks are hard to tame, and bring under discipline. See HAWK, and FALCON.

HAGIOGRAPHIA*, a name given to part of the books of scripture, called by the Jews *setuim*. See BIBLE.

* The word is compounded of ἅγιος, holy; and γραφω, I write.—The name is very antient: S. Jerom makes frequent mention of it, —before him, St. Epiphanius called these books simply, Γραφια.

The Jews divide the sacred writings into three classes: the Law which comprehends the five books of Moses; the Prophets, which they call *neviim*; and the *setuim*, מכתובים called by the Greeks, &c. *Hagiographia*; comprehending the book of Palms, Proverbs, Job, Daniel, Eſdras, Chronicles, Canticles, Ruth, the Lamentations, Ecclesiastes, and Esther.

The Jews sometimes call these books the Writings, by way of eminence, as being wrote by immediate inspiration of the holy Spirit.—Thus says Kimchi, in his preface to the Palms, Maimonides in *Mora Nevoch.* and Elias Levita in his *Thibsi*, under the word מכתובים.

They distinguish the *Hagiographers*, however, from the Prophets; in that the authors of the former did not receive the

matters contained in them by the way called Prophecy, which consists in dreams, visions, whippers, extasies, &c. but by mere inspiration, and direction of the Spirit.

HAGIOSIDERON*, or **HAGIOSIDIRON**.—The Greeks who are under the dominion of the Turks, being prohibited the use of bells, make use of an iron wherewith to call people to church, called *hagiosideron*.

* The word is Greek, ἀγιοςιδήρον; compounded of ἅγιος, holy; and σιδήρον, iron.

Magius gives us the description of an *hagiosideron* he had seen.—It is a plate of iron, about three inches broad, and sixteen long, fastned by the middle to a chain, or cord, whereby it is suspended at the church-door. On this they strike with an iron hammer, with some measure and cadence, so as to make no disagreeable noise.

They also carry an *hagiosideron*, before the priest in a procession of the sacrament to any sick person, beating on it from time to time, to advertise the people to adore it; much as in the Romish church they do with a bell.

HAIL, *Grando*, in physiology, an aqueous concretion, in form of white, or pellucid spherules, descending out of the atmosphere.

Hail is conceived to be formed of drops of rain, frozen in their passage through the middle region.

Others take it for the fragment of a frozen cloud, half melted, and thus precipitated, and congealed again.

Accordingly, the Cartesian define *hail* to be a cloud, either wholly, or in part liquified; which tending downward by its own gravity, is, in its passage, froze again by the action of some very cold wind; and thus precipitated, for the most part in round transparent globes.—They add, that if the cloud have been totally liquified, the *hailstones* are pellucid; otherwise they are only partly so.

Hail assumes various figures, according to the degrees of heat or cold of the air, which it passes through in its descent: sometimes it is round, sometimes angular, triangular, pyramidal, &c. sometimes thin and flat, star-like, with six equal points, &c.

Hail is observed frequently to attend thunder and lightning; the nitre that contributes to the one, having likewise a large share in the production of the other.

Natural histories furnish us with a great variety of instances of extraordinary showers of *hail*.—In the Philosophical Transactions, Dr. Halley, and others relate, that in Cheshire, Lancashire, &c. April 29, 1697. a thick black cloud, coming from Carnarvonshire, disposed the vapours to congeal in such a manner, that for about the breadth of two miles, which was the limit of the cloud, in its progress for the space of sixty miles, it did inconceivable damage: not only killing all sorts of fowls, and other small animals, but splitting trees, knocking down houses and men, and even ploughing up the earth; so that the *hailstones* buried themselves under ground, an inch, or an inch and a half deep.—The *hailstones*, many of which weighed five ounces, and some half a pound, and were five or six inches about, they were of various figures, some round, others half round; some smooth, others embossed and crenelated: the icy substance of them was very transparent and hard; but there was a snowy kernel in the middle of every one of them.

In Hertfordshire, May 4. the same year, after a severe storm of thunder and lightning, a shower of *hail* succeeded, which far exceeded the former: some persons were killed by it, their bodies beat all black and blue: vast oaks were split, and fields of rye cut down as with a scythe. The stones were measured from ten to thirteen or fourteen inches about. Their figures were various, some oval, others picked, some flat. *Philosoph. Transact.* N^o. 229.

At Lille in Flanders, in 1686. there fell *hailstones* of a very large size; some of which contained in the middle a dark brown matter, which thrown on the fire gave a very great report. *Philosoph. Transact.* N^o. 203.

Mezeray, speaking of the war of Louis XII. in Italy, in the year 1510. relates, that there was for some time an horrible darkness, thicker than that of night; after which the clouds broke into thunder and lightnings, and there fell a shower of *hailstones*, or rather (as he calls them) pebble stones, which destroyed all the fish, birds, and beasts of the country.—It was attended with a strong smell of sulphur; and the stones were of a bluish colour: some of them weighing an hundred pounds. *Hist. de France*, Tom. II. p. 339.

HAILLE, a sea-term, signifying either to call to a ship, to know from whence she comes, and whether she is bound, or else to salute her, and wish her well.

HAIR, small filaments, issuing out of the pores of the skins of animals; and serving most of them as a tegument, or covering.

In lieu of *hair*, the nakedness of some animals is covered with feathers, or wool.

Hair is found on all parts of the human body, except the soles of the feet, and the palms of the hands.—But it grows longest

est on the head, chin, breast, in the armpits, and about the privities.

Physicians distinguish the *hair* into several kinds, and give it divers denominations; but this only in Greek and Latin.—The *hair* of the head they call *capillus*: that of women particularly, *coma*, from κομᾶν, to dress and adjust: and that of men *caesaries*, from caedens, because often cut: that of the back of the head, *juba*, and *crines*: that hanging behind the ears, *cincinni*; q. d. curled and buckled.

The ancients held the *hair* a sort of excrement, fed only with excrementitious matters, and no proper part of a living body.

—They supposed it generated of the fuliginous parts of the blood, exhaled by the heat of the body to the surface, and there condensed in passing through the pores.—Their chief reasons were, that the *hair* being cut, will grow again apace, even in extreme old age, and when life is very low: that in hectic and consumptive people, where the rest of the body is continually emaciating and attenuating, the *hair* shall thrive very well; nay, and that it will grow even on dead carcases.—They add, that *hair* does not feed and grow like the other parts, by introfection, i. e. by a juice circulating within it; but like the nails by juxtaposition, each part next the root thrusting forward that immediately before it.

But the moderns are agreed that every *hair* does properly and truly live, and receive nutriment to fill and distend it like the other parts: This they argue hence, that the roots do not turn gray in aged persons sooner than the extremities, but the whole changes colour at once. And the like is observed in boys, &c. which shews that there is a direct communication; and that all the parts are affected alike.—We are told of instances of persons, who by intense grief, or fear, have grown gray in a night's time.

It may be observed, however, that, in propriety, the life and growth of *hairs* is of a different kind from that of the rest of the body; and is not immediately derived therefrom, or reciprocated therewith.—It is rather of the nature of vegetation. They grow as plants do out of the earth; or as some plants shoot from the parts of others; from which though they draw their nourishment, yet each has, as it were, its several life and a distinct oeconomy.—They derive their food from some juices in the body, but not from the nutritious juices of it; whence they may live, though the body be starved.

The *hairs*, examined by the microscope, appear to be fistulous bodies like horns. Their tubulous structure is also confirmed from the disease called *plica polonica*, wherein the blood ouzes out at their extremities.

Each *hair* is found to consist of five or six other lesser ones, all wrapped up in one common tegument: they are knotted like some sorts of grass, and send out branches at the joints.—They have each a round bulbous root, which lies pretty deep in the skin, being implanted in the pyramidal papillae; and by this they imbibe, or secrete, their proper food from the adjacent humors. Their extremities split or divide into two or three branches, especially when kept dry, and left to grow too long; so that what to the naked eye appears only a single *hair*, to the microscope seems a brush.

They turn gray on the fore-part of the head, and particularly about the temples, sooner than behind; the back-part affording them the proper juice longer than the rest.—For the like reason they also fall soonest from the crown of the head.

Their size, or thickness, depends on the magnitude of the pores they issue from.—If those be small, these are fine: if the pores be straight, the *hairs* are straight: if those be oblique or sinuous, the *hair* is curled.

They ordinarily appear in general round, or cylindrical; but the microscope also discovers triangular, and square ones; which diversity of figures arises from that of the pores; to which the *hairs* always accommodate themselves. Their length depends on the quantity of the proper humor to feed them; and their colour on the quality of that humor: whence at different stages of life the colour usually differs.

The *hair* of a mouse, viewed by Mr. Derham with a microscope, seemed to be one single transparent tube, with a pith made up of fibrous-substances, running in dark lines, in some *hairs* transversely, in others spirally. The darker medullary parts, or lines, he observes, were no other than small fibres convolved round, and lying close together, than in the other parts of the *hair*. They run from the bottom to the top of the *hair*; and, he imagines, may serve to make a gentle evacuation of some humor out of the body. (*See Tab. Nat. Hist.* fig. 28.) Hence, the *hair* of hairy animals, this author suggests, may not only serve as a fence against cold, &c. but as an organ of insensible perspiration.

It was esteemed a notable honour among the ancient Gauls, to have long *hair*; and hence came the appellation *Gallia comata*. For this reason Julius Cæsar, upon subduing the Gauls, made them cut off their *hair*, as a token of submission.—It was with a view to this, that such as afterwards quitted the world, to go and live in cloisters, procured their *hair* to be shaven off; to shew that they bid adieu to all earthly ornaments, and made a vow of perpetual subjection to their superiors.

Greg. de Tours assures us, that in the royal family of France,

it was a long time the peculiar mark and privilege of kings and princes of the blood, to wear long *hair*, artfully dressed and curled: every body else were obliged to be polled, or cut round, in sign of inferiority and obedience. Some writers assure us, that there were once different cuts of the *hair* for all the different qualities and conditions; from the prince, who wore it at full length, to the slave or villain, who was quite cropt. Hottoman treats at large of this privilege of the kings of France, *Franco Gallia*, c. 11.

To cut off the *hair* of a son of France, under the first race of kings, was to declare him excluded from the right of succeeding to the crown, and reduced to the condition of a subject. F. Daniel, *Hist. de France*, Tom. 1.

In the eighth century, it was the custom of people of quality, to have their childrens *hair* cut the first time, by persons they had a particular honour and esteem for; who, in virtue of this ceremony, were reputed a sort of spiritual parents, or godfathers to them. Though this practice appears to have been more ancient; inasmuch as we read that Constantine sent the pope the *hair* of his son Heraclius, as a token that he desired him to be his adoptive father.

The parade of long *hair* became still more and more obnoxious in the progress of Christianity; as something utterly inconsistent with the profession of persons who bore the cross. Hence numerous injunctions and canons to the contrary.—Pope Anicetus is commonly supposed to have been the first who forbid the clergy to wear long *hair*; but the prohibition is of an older standing in the churches of the east; and the letter wherein that decree is wrote, is of a much later date than that pope.—The clerical tonsure is related by Isidore Hispalensis, as of apostolical institution.

Long *hair* was antiently held so odious, that there is a canon still extant of the year 1096, importing, that such as wore long *hair*, should be excluded coming into church while living; and not be prayed for when dead.

We have a furious declamation of Luitprand against the emperor Phocas, for wearing long *hair*, after the manner of all the other emperors of the east, except Theophilus, who being bald, enjoined all his subjects to shave their heads.

The French historians and antiquaries, have been very exact in recording the heads of *hair* of their several kings.—Charlemain wore it very short, his son shorter; Charles the bald had none at all. Under Hugh Capet it began to appear again; this the ecclesiastics took in dudgeon, and excommunicated all who let their *hair* grow. Peter Lombard expostulated the matter so warmly with Charles the young, that he cut off his own *hair*; and his successors for some generations wore it very short.—A professor of Utrecht, in 1650, wrote expressly on the question, Whether it be lawful for men to wear long *hair*? and concluded for the negative.—Another divine, named Reeves, who had wrote for the affirmative, replied to him.

The Greeks, and after their example the Romans, wore false *hair*. See PERRUKE.

Wulferus, in the *Philosophical Collections*, gives an account of a woman buried at Norimberg, whose grave being opened forty three years after her death, there was *hair* found issuing forth plentifully through the clefts of the coffin; inasmuch that there was reason to imagine, the coffin had some time been covered all over with *hair*.—The cover being removed, the whole corps appeared in its perfect shape; but from the crown of the head to the sole of the foot, covered over with a thick-set *hair*, long and curled.—The sexton going to handle the upper part of the head with his fingers, the whole structure fell at once; leaving nothing in his hand but a handful of *hair*: There was neither skull nor any other bone left; yet the *hair* was solid, and strong enough.

Mr. Arnold, in the same collection, gives a relation of a man hanged for theft, who in a little time, while he yet hung upon the Gibbet, had his body strangely covered over with *hair*.

Dr. Tyson adds, that though the outward surface of the body be the usual place where the *hair* grows; yet it has been sometimes found on the tongue, in the heart, the breasts, kidneys, &c. but that there is scarce any inward part more subject to it than the ovary, or testicles of females. Hooke, *Philosoph. Collect.* No 2.

HAIR makes a very considerable article in commerce; especially since the mode of perruques has obtained.

The *hair* of the growth of the northern countries, as England, &c. is valued much beyond that of the more southern ones, as Italy, Spain, the south parts of France, &c.

The merits of a good *hair* consist in its being well fed, and neither too coarse nor too slender; the bigness rendering it less susceptible of the artificial curl, and disposing it rather to frizzle; and the smallness making its curl of too short duration.—Its length should be about twenty-five inches; the more it falls short of this, the less value it bears.

There is no certain price for *hair*, but it is sold from five shillings to five pound an ounce, according to its quality.—The gray is the most coveted.

The scarceness of gray and white *hair*, has put the dealers in that commodity upon methods of reducing other colours therto.—This is done by spreading the *hair* to bleach on the grass, like linen; after first washing it out in a viscidous water.

This lye, with the force of the sun and air, brings the *hair* to so perfect a whiteness, that the most experienced person may be deceived therein: there being scarce any way of detecting the artifice, but by building and drying it; which leaves the *hair* of the colour of a dead walnut-tree leaf.

There is also a method of dying *hair* with bismuth; which renders such white *hair* as borders too much upon the yellow, of a bright silver colour.—Boiling is the proof of this too; the bismuth not being able to stand it.

Hair which does not curl or buckle naturally, is brought to it by art; by first boiling and then baking it in the following manner: After having picked and sorted the *hair*, and disposed it in parcels, according to the lengths; they roll them up, and tie them tight down, upon little cylindrical instruments, either of wood or earthen ware, a quarter of an inch thick, and hollow'd a little in the middle called pipes; in which state they are put in a pot over the fire, there to boil for about two hours.—When taken out, they let them dry; and when dried, they spread them on a sheet of brown paper, cover them with another, and thus send them to the pastry-cook; who making a crust or coffin around them of common paste, sets them in the oven, till the crust is about three fourths baked.

The end by which a *hair* grow to the head, is called the *head* of the *hair*; and the other with which they begin to give the buckle, the *point*.—Formerly the perruque-makers made no difference between the two ends, but curled and wove them by either indifferently; but this made them unable to give a fine buckle: *hair* wove by the point never taking the right curl.—Foreigners own themselves obliged to the English for this discovery; which was first carried abroad by a perruque-maker of our country. Savar. *Diét. de Comm.*

HAIR is also used in divers arts and manufactures.

The *hair* of beavers, hares, conies, &c. is the principal matter whereof hats are made.

Spread on the ground, and left to putrify on corn lands, *hair*, as all other animal substances, viz. horns, hoofs, blood, garbage, &c. makes a good manure.

Hair also makes an ingredient in the composition of plaster: See PLASTER.

HAIR, in the manage and among farriers, is popularly called the *coat*, and makes a point of principal consideration in respect of horses, &c.

If the *hair* of a horse, especially that about the neck, and parts uncovered, be sleek and smooth, and close; it is an indication of his being in health and good case: if rough and flaring, or any way discoloured, it denotes a coldness, poverty, or some inward defect.—To make the *hair* smooth, sleek, and soft, he must be kept warm, sweated often, and when sweated, the coat must be well scraped and rubbed down.

The *hair* growing on the fetlock, serves as a defence to the prominent part thereof, in travelling on stony ways, or in frosty weather.

If a place be bare, or thin of *hair*, or the *hair* be too short; the ancient farriers used to wash it with the urine of a young boy; and after that with a lye of unslaked lime, ceruse, and litharge.—The moderns have various other ways: some wash the parts with a decoction of the roots of althaea; others with goats milk, wherein agrimony has been pounded; others rub the part with nettleseed, bruised with honey water, and salt: others anoint it with the juice of an onion, or radish: others with a mixture of alum, honey, goats dung, and swines blood: others with the root of the white lilly, boiled in oil: others with tar, oil of olives, and honey: and others with green walnut shells powdered, and mixed with honey, oil, and wine.—To take off *hair* in any part, they apply a plaster made of unslaked lime, boiled in water, with orpiment added.

HAIRS breadth, this is accounted the forty-eighth part of an inch.

HALBARD*, or HALBERT, an offensive weapon, consisting of a shaft, or staff, five foot long; with a steel head, partly in form of a crescent.

* The word is formed of the German *hal*, hall, and *bard*, an hatchet. Vossius derives it from the German *hillebaert*, of *hel*, clarus, splendens, and *baert*, ax.

The *halbard* was anciently a common weapon in the army; where, there were companies of *halbardeers*: It is still carried by the sergeants of foot, and dragoons.

It was called the *Danish ax*, because first bore by the Danes; they carried it on the left shoulder. From the Danes it was derived to the Scots; and from the Scots to the English, and from them to the French.

THAERL, among farriers, &c. is a piece of iron an inch broad, and three or four inches long, soldered to the toe of an horse's shoe, that jets out before; to hinder a lame horse from resting or treading upon his toe.

Halbert-Shoes of necessity constrain a lame horse to tread or rest on his heel, when he goes a moderate pace; which lengthens and draws out the back sinews, that was somewhat shrunk before.

HALCYON-Days*, *Dies Alcyonii*, a phrase that frequently occurs among writers, to denote a time of peace, and tranquillity.

* The expression takes its rise from a sea fowl, called among naturalists *halcyon*, or *alcyon*, which is said to build its nest about the winter solstice, when the weather is usually observed to be still and calm.

Halcyon-days, according to the ancient tradition, are the seven days before, and as many after the brumal solstice: called also *S. Martin's summer*: these are famous for the calmness of the weather, which emboldens the *halcyon* to build, and brood its eggs on the rocks, on the very brink of the sea.

Columella also gives the denomination, *halcyonit dies*, to a number of days commencing on the eighth of the calends of March; on account of the great stillness of the Atlantic ocean, then usually observed.

HALE, in the sea language, signifies *pull*; hence, to *hale* a ship, denotes to pull her on shore.

HALF-Blow, a round mass of metal, which comes out of the finery of an iron-work. See **BLOOMERY**, and **IRON-work**.

HALF-Mark*, *Dimidia Merca*, is a noble.

* Fitzherbert says, that in case a writ be brought, and the seisin of the demandant, or his ancestor, alleged; the seisin is not traversable by the defendant, but he must tender the *half mark* for the enquiry of the seisin: which is, in plainer terms, that the defendant shall not be admitted to deny, that the possessor, or his ancestor, was seised of the land in question, and to prove his denial; but that he shall be admitted to tender *half a mark* in money, to have an enquiry made, whether the demandant, &c. were seised or not?

HALF-MOON, *Demi-lune*, in fortification, an outwork, consisting of two faces, forming together a salient angle, whose gorges is turned like an *half-moon*.

Half-moons are sometimes raised before the curtain, when the ditch is wider than it ought to be; in which case it is much the same with a ravelin; only that the gorge of an *half-moon* is made bending in like a bow, or crescent, and is chiefly used to cover the point of the bastion; whereas ravelins are always strait before the curtain.—But they are both defective, as being ill flanked. See **RAVELIN**.

HALF-PENNY, a copper coin, whose value is expressed by its name.

HALF-Seal, is that used in Chancery, for the sealing of commissions to delegates appointed upon any appeal in ecclesiastical or marine causes.

HALF-Tongue, *Medietas Linguae*. See **MEDIETAS Linguae**.

HALIËUTICS, **HALIËUTICA**, *ἡλῑευτικᾶ*, books treating of fishes, or the art of fishing.

We have still extant the *Haliæutics* of Oppian.

HALIGEMOTE. See the article **HALYMOTE**.

HALL, a word antiently used for a mansion-house, or habitation.

Halls, in architecture, is a large room, at the entrance of a fine house, palace, or the like.

Vitruvius mentions three sorts of *halls*: The *tetraystyle*, which has four columns supporting the plafond, or ceiling; The *Corinthian*, which has columns all around, let into the wall, and is vaulted over; and the *Egyptian*, which had a peristyle of insulated Corinthian columns, bearing a second order with a ceiling. These were called *œci*.

The *hall* is properly the first, and finest partition, or member of an apartment; and, in the houses of ministers of state, public magistrates, &c. is that wherein they dispatch business, and give audience.

In very magnificent buildings, where the *hall* is larger and loftier than ordinary, and placed in the middle of the house, it is called a *saloon*.

A royal apartment is said to consist of an *hall*, or chamber of guards, *aula prætoriana*; an anti-chamber, *procamera*; a chamber, *camera*; a cabinet, *conclave*; and a gallery, *porticus*.

HALL is also a public building erected for the administration of the policy and justice of a city, or corporation.

In this sense we say, the *town-hall*, a *company's hall*, &c.

Guild-hall, is a stately building in the city of London, and the great court of judicature for that city. See **GUILD-hall**.

Here meetings of the citizens are held for the election of officers, solemn entertainments are given, &c.

HALL is also particularly used for a court of justice; or an edifice wherein there is one, or more tribunals.

In Westminster-hall, are held the great courts of this kingdom, *viz.* the King's-Bench, Chancery, Common-Pleas, and Exchequer.

Above stairs is likewise held the high court of Parliament. Westminster-hall, was the royal palace or place of residence of our ancient kings; who ordinarily held their parliaments, and courts of judicature, in their dwelling-houses, (as is still

done by the kings of Spain) and frequently sat in person in the courts of judicature, as they still do in parliament. A great part of this palace was burnt under Henry VIII. what remains is still reserved for the said judicatories.—The great *hall*, wherein the courts of King's-Bench, &c. are kept, is said to have been built by William Rufus; others say by Richard I. or II. It is reckoned superior, in point of dimensions, to any *hall* in Europe, being 300 foot long, and 100 broad.

HALLAGE, a fee due for cloth brought for sale to Blackwell-hall, in London.

The word is also used for toll, paid to the lord of a fair, or market, for commodities sold in the common *hall* of the place.

HALLELUJAH*, a term of rejoicing, sometimes sung, or rehearsed, at the end of verses on such occasions.

* The word is Hebrew; or rather, it is two Hebrew words joined together; one of them *הללו* *hallelu*, and the other *יהוה* *יהוה*, an abridgment of the name of God, *יהוה יהוה*. The first signifies *laudate*, praise ye, and the other *Dominum*, the Lord.

St. Jerom first introduced the word *hallelujah* into the church service: for a considerable time it was only used once a year in the Latin church, *viz.* at Easter; but in the Greek church it was much more frequent. St. Jerom mentions its being sung at the interments of the dead, which it still continues to be in that church, as also on some occasions in the time of Lent.

In the time of Gregory the great, it was appointed to be sung all the year round in the Latin church, which raised some complaints against that pope, as giving too much into the Greek way, and introducing the ceremonies of the church of Constantinople into that of Rome.—But he excused himself, by alleging that this had been the ancient usage at Rome; and that it had been brought from Constantinople at the time when the word *hallelujah* was first introduced under pope Damasus.

HALLIARDS, or **HALYARDS**, in a ship, are ropes which serve for hoisting up the yards, all but the cross jack, and the sprit-sail yards, which are slung. See *Tab. Ship. fig. 1. n. 18, 24, 64*.

HALMÖTE*, or **HALIMÖTE** (from the Saxon *heale*, *hall*, and *æmoet*, *meeting*;) is the same with what we now call a *court baron*; the word implying a meeting of the tenants of the same hall, or manor.

* *Omnia causa terminatur, vel hundredo, vel comitatu, vel halimote, facem habentem vel dominorum curia. LL. Hen. I. c. 10.—Halimote and halimote are often confounded with *folkimote*, though originally they were distinct courts.—The *halimote* being properly the lord's court, or a court baron held in the manor, in which differences between the tenants were determined. See **MANOR**, and **COURT**. The name is still retained at Iuston, and other places in Herefordshire. See *Moira*.*

HALMÖTE, is sometimes also taken for a convention of citizens in their public hall, more properly called *folkimote*. See **FOLKIMÖTE**.

HALO*, in physiology, a meteor, in form of a luminous ring, or circle, of various colours, appearing round the bodies of the sun, moon, or stars.

* The word is formed of the Greek *ἀλωε*, or *ἀλωε*, *aree*.

That around the moon is the most usual, and is also called *corona*, crown.

Naturalists conceive the *halo* to arise from a refraction of the rays of light in their passing through the fine, rare vesiculæ of a thin nebula, or vapour, toward the top of our atmosphere; which account they confirm hence, that a quantity of water being thrown up against the sun, as it breaks and disperses into drops, it forms a kind of *halo*, or iris, exhibiting the colours of the natural Rainbow.

M. Huygens supposes *halo's*, or circles round the sun to be formed by small round grains of a kind of hail, made up of two different parts, one of which is opaque, and inclosed in the other, which is transparent; which is the general structure actually observed in hail.

After the same manner he accounts for the parhelia; only that there he imagines the icy grains of an oblong figure, and rounding at the ends; like cylinders with round convex tops.—Where some of these cylinders are in an erect position, the circle they form will be white, by reason of the reflection of the rays of the sun on the surface of these cylinders. He proceeds to account for the coloured *halo's*, and parhelia, from the same hypothesis; and produces an experiment of a glass cylinder, a foot long, having within it an opaque kernel, (which was a cylinder of wood) and the ambient space filled with water: this cylinder being exposed to the sun, and the eye disposed in a proper place, the several successive reflections and refractions necessary to produce such an effect did plainly appear.

The light which comes through drops of rain by two refractions, without any reflection, Sir Isaac Newton observes, ought to appear strongest at the distance of about 26 degrees from

from the sun, and to decay gradually both ways, as the distance from him increases and decreases: and the same is to be understood of light, transmitted through spherical hailstones.—Add, that if the hail be a little flattened, as is often the case, the light transmitted may grow so strong at a little less distance than that of 26 degrees, as to form a *halo* about the sun or moon; which *halo*, as often as the hailstones are duly figured, may be coloured; and then it must be made red within by the least refrangible rays, and blue without by the most refrangible ones; especially if the hailstones have opaque globules of snow in their centre, to intercept the light within the *halo*, as Huygens has observed, and make the inside thereof more distinctly defined than it would otherwise be.

Such hailstones, though spherical, by terminating the light by the snow, may make a *halo* red within, and colourless without, and darker in the red than without, as *halo's* use to be: For of those rays which pass close by the snow, the rubiform will be least refracted, and so will come to the eye in the directest lines. *Opticæ.*

HALSFANG. See the articles **HEALFANG**, and **PILLORY**.
HALT*, in war a pause, or stop, in the march of a military body.

* Some derive the word from the Latin *halitus*, breath; it being a frequent occasion of *halting*, to take breath: others from *alio*, by reason in *halts* they raise their pikes, &c. on end.

In places full of defiles, frequent *halts* must be made:—The army made a *halt* to rest themselves.

HALTERISTÆ, in antiquity, a sort of players at discus; so denominated from a peculiar kind of discus by the Greeks called *ἀλτηρ*, and by the Latins *halter*.

Budeus, and others, take the *halter* to have been a leaden weight, or ball, which the vaulters bore in their hands, to secure and keep themselves the more steady in their leaping.—Nor will these Authors allow of any sort of *halter* besides this weight; nor other *halteristæ* but these vaulters.

Others, as Cornarius, Constantine, and Portus, will have the *halter* to be a lump, or mass of lead, or stone, with an hold, or handle, fixed to it, by which it might be carried; and that the *halteristæ* were those who exercised themselves in removing these weights from place to place.—These authors add, that the weight, or ball mentioned by Budeus, was not called *ἀλτηρ*, *halter*, but *ἀλτηρ*, *alēter*, which signifies helper, defender.

Hier. Mercurialis, in his treatise *De arte gymnastica*, L. II. c. 12. distinguishes two kinds of *halteristæ*; for though there was but one *halter*, there were two ways of applying it.—The one was to throw, or pitch it in a certain manner: the other only to hold it out at arm's end; and in this posture to give themselves divers motions, swinging the hands backwards and forwards, &c. according to the engraven figures thereof given us by Mercurialis.

The *halter* was of a cylindrical figure, smaller in the middle, (where it was held) by one diameter, than at the two ends. It was above a foot long; and there was one for each hand: it was made either of iron, stone, or lead.

Galen, *De tuend. valetud.* Lib. I. Lib. V. and Lib. VI. speaks of this exercise, and shews of what use it is in purging the body of peccant humours; making it equivalent both to purgation, and phlebotomy.

HALTING, among farmers, &c. an irregularity in the motion of an horse, arising from a lameness, or other injury in the shoulder, leg, or foot; which leads him to spare the part, or use it too timidly.

An acquaintance with this disorder, in its several circumstances, is a thing of great extent in the affairs of the manage; for which reason we shall add the principal points relating thereto.—If an horse *halts*, it is either *before*, in which case his complaint lies either in the shoulder, the legs, or feet; or *behind*, where it must lie in the hip, ham, or the like.

1^o. The signs which indicate it in the *shoulder*, are his not lifting up his leg, but trailing it on the ground, or his casting one leg more than the other, and with his knee, in a manner, unbent.—Add, that in turning short he will visibly favour the leg on the lame side. Again, if the ailment be found in the shoulder, it must either be in the top of the shoulder-blade, called the *withers*, which is known by his *balting* most when a person is on his back, his shrinking much, and offering to bite when griped, and handled about the top of the shoulder-blade, or in the bottom of the shoulder-blade, joining to the marrow-bone, which is the fore-pitch of the breast; which is known by his treading his steps thick, and shrinking, ready to fall down, when pressed in that part: or in the elbow, which joins the marrow-bone to the leg; which is known by wincing, and taking up his foot when pinched there.

2^o. If the grievance be in the *legs*, it either lies in the knee, or pattern joint, which he discovers by refusing to bow the one or the other, and going stiffly on it: or in the *shank*, which is discovered by some splint, screw, wind-gall, or other visible malady thereon.

3^o. If it be in the *foot*, it is either in the coronet, and owing to some strain, to be distinguished by some tumor, or

breaking thereon; or its appearing hot and burning to the touch: or in the *heel*, owing to an over-reach or the like, and visible to the eye, as also by his treading altogether on his toe; or in the *quarters*, between the middle of the hoof and the heel, which is known by his *balting* more when on the edge of a bank than when on plain ground.—This is sometimes occasioned by being pricked with a nail in the shoeing; and the faulty nail is distinguished by pinching the head of each nail, and the hoof together, with a pair of pinchers.

If an horse *halt behind*, from a disorder in the hip, or hucklebone, he will go side-long, and not follow so well with that leg as the others; nor will he turn on that side without favouring the leg; add, that he shows it still most in walking on the side of a bank with the worst leg highest.

If an horse has any hidden infirmity, that will bring him to *halt* when he comes to travel, it may be discovered by running him in the hand on smooth ways, at the length of the halter, and observing how he sets down his legs; if he favour none of them, he is to be further proved, by riding him roundly till well heated; then letting him stand still an hour, and after that running him in the hand at halter's length, as before.

HALYMOTE, properly signifies an holy, or ecclesiastical court. See **HALMOTE**.

There is a court held in London by this name, before the lord mayor and sheriffs, for regulating the bakers.—It was antiently held on the Sunday next before S. Thomas's day, and for this reason called the *halymote*, or holy court.—The title thereof runs thus; *Curia sancti-matus tenta in Guilbalda civitatis Londin. coram major & vicem. &c.*

HALYWERCFOLE, antiently signified such persons of the province of Durham, has held lands, on condition of defending the corps of S. Cuthbert; and who hereupon claimed the privilege, not to be forced to go out of the bishoprick either by king or bishop. *Hist. Dunelm.*

HAM, a Saxon word, properly signifying an house, or dwelling-place.

HAM is also used to denote a freet or village.

Hence it is that the names of many of our towns end with it; as Nottingham, Buckingham, Walsingham, &c.

HAM is also a part of the leg of an animal; being the inner, or hind part of the knee; or the ply, or angle, in which the leg and thigh, when bent, incline to each other.

HAM, in commerce, &c. is used for a leg and thigh of pork, dried, seasoned, and prepared to make it keep, and to give it a brisk agreeable flavour.

Westphalia *hams*, so much in vogue, are prepared by salting them with salt-petre, pressing them in a press eight or ten days, then steeping them in juniper water, and drying them by the smoke of juniper woods.

HAMADRYADES*, in antiquity, certain fabulous deities, revered among the antient heathens, and believed to preside over woods and forests, and to be inclosed under the bark of oaks.

* The word is compounded of *ἀμα*, *simul*, together; and *δρυας*, *dryad*, of trees, oak.

The *hamadryades*, *ἀμαδρυαδες*, were supposed to live and die with the trees they were attached to; as is observed by Servius on Virgil, *Eclg.* x. v. 62. after Menestarchus, the scholiast of Apollonius, &c. who mentions other traditions relating thereto.

The poets, however, frequently confound the *hamadryades* with the naiads and *napæes*; witness Catullus, *Carmin.* lxxviii. v. 23. Ovid, *Fast.* iv. 229. Propertius, *Eleg.* xx. 32. See **NAIADS**.

Festus calls them *querquetulane*, as being issued, or sprung from oaks.

An antient poet, one Pherenicus, in *Athenæus*, Lib. iii. calls the vine, fig-tree, and other fruit-trees, *hamadryades*, from the name of their mother the oak.

HAMAXOBII*. **HAMAXOBIANS**, in the antient geography, a people who had no houses, but lived in carriages.

* The word is formed from *ἀμαξια*, a carriage, or chariot, and *βιο*, life.

The *Hamaxobii*, called also *Hamaxobite*, were an antient people of Sarmatia Europæa, inhabiting the southern part of Muscovy: who instead of houses had a sort of tents made of leather, and fixed on carriages, to be ready for shifting and travel.

HAMBOROUGH Company. See the article **COMPANY**.

HAMELING, or **HAM-fringing**, the act of cutting the great tendon, vulgarly called the *ham-fring*.

Hameling, or *hambling* of dogs, amounts to the same with expeditating, or lawing. See **EXPEDITATING**.

HAMLET*, a diminutive of *ham*, signifies a little village, or rather, a part of a village.

* Spelman, upon these words, shewing the difference between *villa integra*, and *villa dimidia* & *hamleta*, says, *Hamleta vero, quæ mediocriter sibiq; non abstrahit, hoc est ubi quinque capitales plagii non deprehenso sunt.*—The statute of Exon, 14. Edw. I. mentions this word thus, *Les nages de toutes les villes & hamlets qu'ont en son ressort.*

In an antient MS. *hamlets* is expounded, the seat of a freeholder.

HAMMER,

HAMMER, an instrument of iron, with a handle of wood; used in most mechanic arts, to beat, stretch, drive &c. Bodies capable of being stretched, or extended, under the hammer, are said to be malleable.

The Latins call it *malleus*, antiently *martulus*, or *marculus*; by which name Pliny calls it, when he says, that Cynira, son of Agriopa, invented the hammer and pinchers. *Hist. Nat. L. VII. c. 56. Vid. Hardouin, not. ad loc.*

The hammers of our great forges, are moved or worked by a water-mill. See **FORGE**.

HAMMER hardening. See the article **HARDENING**.

HAMMER of a clock. See **CLOCK**.

HAMMER, in anatomy. See the article **MALLEUS**.

HAMMERING, the act of beating, or extending, and fashioning a body under the hammer.

When it is performed on iron heated for the purpose, the smiths usually call it *forging*.

HAMMERING, in coining.—A piece of money, or a medal, is said to be *hammered*, when struck, and the impression given with a hammer, and not with a mill.

For the method of coining with the **HAMMER**. See **COINING**.

HAMMOCK, or **HAMAC**, a kind of hanging-bed; suspended throughout the West-Indies, as also on board of ships.

The Indians hang their hammocks to trees, and thus secure themselves from wild beasts and insects, which render lying on the ground there very dangerous.

The people of the Caribbee islands are wonderfully superstitious in the point of their hammocks, and do not make them without a deal of ceremonies.—At each end of the room they put bags of ashes, without which, it is their opinion, that the hammock will not last. If they were to eat figs on a hammock, they believe it would rot: nor dare they eat any fish that has good teeth, as believing that would make their hammock soon wear through.

According to F. Plumier, who has often made use of the hammock in the Indies, it consists of a large, strong coverlet, or sheet of coarse cotton, about six foot square: on two opposite sides are loops of the same stuff, through which a string is run, and thereof other loops are formed, all which are tied together with a cord; and thus is the whole fastened to two neighbouring trees, in the field; or two hooks, in houses. This kind of couch serves, at the same time, for bed, quilts, sheets, pillow, &c.

HAMPER. See the article **HANAPER**.

HAMUS, or **HAMULUS**, an hook. See the article **HOOK**. SURGONS also make use of an instrument thus called, to extract the child in difficult labours.

HANAPER, or **HAMPER**, an office in Chancery; answering in some measure to the *ficus* among the Romans. See **CHANCERY**, and **FISCUS**.

Clerk of the HANAPER, sometimes styled *Warden of the Hanaper*, an officer who receives all money due to the king for seals of charters, patents, commissions, and writs; and attends the keeper of the seal daily in term time, and at all times of sealing; and takes into his custody all sealed charters, patents, and the like, which he receives into bags; but antiently, it is supposed, into *hampers*, which gave denomination to the office.

There is also an officer, who is comptroller of the hanaper. See **COMPTROLLER**.

HANCES, in a ship, are falls, or descents of the sife rails, which are placed as banisters in the poop, &c. and down to the gang-way.

HANCES, or **HANSES**, in architecture, are the ends of elliptical arches, which are arcs of smaller circles than the scheme, or middle part of the arch.

HAND, *Manus*, a part, or member of the body of man; making the extremity of the arm.

The mechanism of the hand is very curious; excellently contrived to fit it for the various uses and occasions we have for it, and the great number of arts and manufactures it is to be employed in. It consists of a compage of nerves, and little bones, joined into each other, which give it a great degree of strength, and at the same time an unusual flexibility, to enable it to handle adjacent bodies, lay hold of them, and grasp them, in order either to draw them towards us, or thrust them off. ANAXAGORAS is represented by antient authors, as maintaining, that man owes all his wisdom, knowledge, and superiority over other animals, to the use of his hands.—Galen puts the thing another way: man, according to him, is not the wisest creature, because he has hands, but he had hands given him because he was the wisest creature. For it was not our hands that taught us arts, but our reason. The hands are the organs of reason, &c. *De usu part. Lib. I. c. 3.*

HAND, in medicine.—The hand, among anatomists, extends from the shoulder to the fingers ends; this is called also the *greater hand*.

It is divided into three parts:—The first reaching from the shoulder to the elbow; properly called the *arm*, *brachium*.

The second reaches from the elbow to the wrist:—The third is the *hand*, *manus*, properly so called; called also the *lesser hand*, or *extrema manus*.—This is subdivided into three other parts, the *carpus*, which is the wrist:—The *metacarpus*, which the body of the hand, including the *dorsum*, and *vola*: and the fingers, *digiti*. See each described under its proper article, **CARPUS**, **METACARPUS**, and **FINGERS**.

The muscles whereby the hand is moved and directed, are the *palmares*; the *flexor* and *extensor*, *carpi*, *ulnaris*, and *radialis*; *perforatus*, *perforans*; *lumbricales*; *interossei*; *extensores*, *abductores*, and *flexores* of the fingers. See each in its place, **PALMARIS**, **FLEXOR**, **EXTENSOR**, &c.

The hand makes the subject of the art of palmistry, which is employed in considering the several lines and eminences of the palm of the hand, their significations, &c.

Among the Egyptians, the hand was used as a symbol of strength:—Among the Romans, it was held a symbol of fidelity; and accordingly was consecrated to that goddess, by Numa, with great solemnity.

They sometimes use an artificial hand, which is a kind of subsidiary hand, to be applied, and fitted on the stump of an arm, after the hand has been cut off.

This has most of the motions of the natural hand; which are effected by means of springs, pulleys, pinions, buttons, &c. **Amb. Paré** gives us its structure at large.

HAND, in falconry, is used for the foot of the hawk:—To have a clean, strong, slender, glutinous hand, well clawed, are some of the good qualities of a hawk, or falcon.

HAND, in the manage, is a term variously used.—Sometimes it stands for the fore feet of an horse.

Hand is also used, for a division of the horse into two parts, with respect to the rider's hand.—The *fore-hand* includes the head, neck, and fore-quarters.—The *hind-hand* is all the rest of the horse.

Spear-hand, or *svord-hand*, is used for an horseman's right hand.

Bridle-hand, is the horseman's left hand.

Your regular cavalier holds his *bridle-hand* two or three inches above the pommel of the saddle.

A horseman is said to have *no hand*, when he only makes use of the bridle unseasonably; not knowing how to give the aids or helps of the hand with discretion.

To keep a horse upon the hand, signifies to feel him in the stay upon the hand, and to be always prepared to avoid any surprize from him.—When the horse obeys and answers the effects of the hand, he is said to *rest well upon the hand*.

A horseman ought to have a *light hand*, i. e. he ought only to feel the horse upon his hand, so as to resist him whenever he attempts to slip from it: and as soon as he has made his resistance, he ought to lower the bridle, instead of cleaving it to it.

If a horse, by a too great eagerness to go forward, presses too much upon the hands, it ought to be slackened at certain times, and at other times to be kept hard, in order to disappoint him from continually pressing upon the bit. This facility, or liberty of the horseman, of slackening or stiffening the hand, makes what they call a *good hand*.

A horse is said to *force the hand*, when he does not fear the bridle, but runs away in spite of the rider.

To work a horse upon the hand, is to manage him by the effects of the bridle, without any other helps, except the calves of the legs.

To be heavy upon the hand, is understood of a horse, which by reason of the softness of his neck, the weakness of his back, the largeness of his head, and the weight of his fore quarters, or his weariness; throws himself upon the bridle, without making any resistance, or effort, to force the horseman's hand.

Harmonical HANDS, in music, is used by some writers for the antient diagramma, or scale of music, upon which they learned to sing.

The reason of the appellation was, that Guido Aretin, upon inventing the notes, *ut, re, mi, fa, sol, la*, disposed them on the fingers of the figure of a hand stretched out. He changed the letters of the alphabet, used till that time to express the notes, for these six syllables, which he took out of the first strophe of the hymn of S. John Baptist, composed by Paulus Diaconus.

Ut quænt laxius resonare fibris
Mi-ra gestorum fa-muli tuorum.
Sol-ve polluti la-bii rectorum.

Sante Joannes.

HAND of Justice, is a scepter, or baton, a cubit long, having an ivory hand at the extremity thereof; used as an attribute of certain kings, wherewith they are painted in their royal robes; as on the coronation-day.

Authors usually call it *virga*.—Louis X. of France, first took the hand of justice for his device.

Imposition of HANDS, or *laying on of HANDS*, signifies the conferring

ferring of holy orders; a ceremony wherein the *bands* are laid on the head of another, as a sign of a mission, or of a power given him to exercise the functions of the ministry belonging to the order.

The apostles began to appoint missionaries by the imposition of *bands*.

Washing one's HANDS of a thing, signifies the witnessing that a person has no part or concern in an affair; and that he will not be answerable for it: This Pilate did in respect of our Saviour's death.—In this sense, a man is said to have *clean hands*: and particularly a judge does this, to denote that he has not been corrupted by bribes or presents.

Left HAND.—To marry with the *left hand*, is to espouse a woman of inferior degree, whose children, in virtue of such marriage, are not to succeed to the father, nor share with the other children; but are to be contented with what fortune the husband shall appoint them the next day after marriage.

This method of taking *left-handed wives* obtains at this time in Germany.

HAND, is also used for the index of a clock, watch, or the like, serving to point the hour, &c. See INDEX.

Long HAND, *Longimanus*, a kind of title, or surname, assumed by certain princes. Artaxerxes, the son of Xerxes, and his successor in the Persian empire, was thus denominated; as having *hands* so long, that he could touch his knees with them when he stood upright.

Short HAND. See the article TACHYGRAPHY.

Bloody HAND. See the article BLOODY HAND.

HAND is also figuratively used in painting, sculpture, &c. for the manner, or style, of this or that matter.

HANDS, are born in coat armour, *dexter* and *sinister*; that is, right and left; expanded or open, and after other manners. Azure, a *dexter hand* coupé at the wrist, and extended in pale argent; is born by the name of Brome.—Argent, three *sinister hands*, coupé at the wrist, gules, by the name of Maynard.

Knights baronets, are to bear in a canton, or in an escutcheon, which they please, the arms of Ulster, viz. in a field argent, a *sinister hand* coupé at the wrist, gules. See BARONET.

*HAND-borow**, a pledge, or surety of the lower rank.

* *Est quasi vas, cui subijcitur manus, hoc est, minor, seu inferior; nam head-borow, vas est capitalis, vel superior.* Spelman. See HEADBOROUGH.

HAND-breadth, is sometimes used for a measure of three inches. *HAND*, or *HANDEFUL*, is also a measure of four inches, by the standard; according to the statute, 33 H. VIII. cap. 5.

The *hand*, among jockeys, is four fingers breadth, and is the measure of a fit clenched; by this the height of horses is measured.

A horse for war, should be sixteen, or eighteen *hands* high.

HAND-HABEND, in our ancient customs, denotes a thief taken in the very fact.

Hand, or *Hond-baveud*, from the Saxon, *hand*, hand, and *habend*, having; is a circumstance of manifest theft, when the party is taken with the mainor, or mainover, i. e. the thing stolen in his hand.

Bracton also uses *hand-berend* in the same sense. See *Latro manifestus*.

So in Fleta, *Furtum manifestum est ubi aliquis latro deprehensus sistens de aliquo latrocinio hand-habinde, & back-berinde, & infectus fuerit per aliquem cuius res illa fuerit, que dicitur Sachorb, & tunc licet infectori rem suam petere criminaliter ut furatam.* L. I. c. 38. § 1.

HAND-HABEND also signifies the right which the lord has to judge and determine of this offence in his court.

HANDLING, a term used in respect of fighting cocks; signifying the measuring the girth of them, by gripping one's hands and fingers round the cock's body.

HANGINGS, linings for rooms, made of arras, tapestry, or the like.

*HANGWITE**, *HANGWITA*, a mulct imposed for the hanging a thief, or felon, without course of law; or even for suffering him to escape out of legal custody.

* The word is also written corruptly, *hangwite*, or *bankwite*, it is formed from the Saxon *hangian*, to hang, and *wite*, mulct, compensation.

To be quit of *HANGWITE*, *Quietus esse de hangwita*, in royal charters, denotes an immunity, or freedom from the mulct or penalty above-mentioned. *Quit de Larron pendu sans serjeants le roy.*

*HANSE**, or *HANS*, an ancient name, for a society or company of merchants: particularly that of certain cities in Germany, &c. hence called *hanse towns*.

* The word *hanse*, is obsolete High Dutch, or Teutonic, and signifies alliance, confederacy, association, &c. Some derive it from the two German words, *anset*, that is, on the sea;

by reason the first *hanse towns* were all situate on the sea coast; whence, the society is said to have been first called, *am see steden*, that is, cities on the sea; and afterwards, by abbreviation, *hanse*, and *hanse*.

The *HANSE Towns* are certain free towns of Germany, and the North, united in strict league, under laws and magistrates of their own appointing, for the better carrying on of commerce, and for their mutual safety and assistance.

This celebrated association, which makes so great a figure in the history of commerce, is commonly supposed to have commenced at Bremen on the Weser, in the year 1164; others say in 1260, immediately after the incurious and pyracies of the Danes, Normans, &c. others say in 1206; and others in 920: but be its origin when it will, it was confirmed and re-established in 1270.

At first it only consisted of towns situate on the coasts of the Baltic sea, or not far from it.—But its strength and reputation increasing, scarce any trading city in Europe but desired to be admitted into it.

Under our king Henry III. the *hanse* consisted of no less than sixty two cities; to which were afterwards added four more.

France furnished to the confederacy, Rouen, S. Malo, Bourdeaux, Bayonne, and Marseilles: Spain, Barcelona, Sevil, and Cadiz: England, London: Portugal, Lisbon:—The Low Countries, Antwerp, Dort, Amsterdam, Bruges, Rotterdam, Ostend, and Dunkirk: and Italy, and Sicily, Messina, Leghorn, and Naples.

The *hanse* was divided into four classes, or members, which were those of Lubeck, Cologne, Brunswick, and Prussia, or Dantzick.—Those four cities were the heads of the four members; and Lubeck was the head of the whole *hanse*.

Besides this, the *hanse* had four principal factories, or staples, these were at London, Bruges, Novogrod, and Berg; that of Bruges was afterwards removed to Antwerp. But the first and principal was that of Lubeck, which still remains the head of the association. That of London was called *Guild-halla Teutoniarum*, or the *Styliard*.

The government of the *hanse* was at first aristocratical: then it came under the sole direction of the grand master of the Teutonic order; and, at length, divers princes and lords made interest for it.

The end of the fourteenth century, and the beginning of the sixteenth, were the most flourishing times of this alliance.—These towns were then in a condition to proclaim war against kings: History is not silent, as to that they waged against Waldemar king of Denmark, about the year 1348; and against Eric, in 1428; particularly this last, when the *hanseatic* fleet consisted of forty ships, containing about 12,000 regular troops, beside the seamen.

But the several princes, whose principal cities were entered into the association, began to think it policy to put some bounds to a power, which, in time, might have proved formidable to themselves.—The means were easy, and short: each withdrew the merchants of his country from the association; by which, in a little time, from the great number of cities it had comprehended, the association found itself sunk to those few which had begun the confederacy; which henceforth was called the *Teutonic hanse*. Though these are still so considerable in point of commerce, that they are admitted to make treaties with the greatest kings.

The divisions that were got among them, contributed greatly to their fall: nor must it be forgot, that the establishment of the republic and commerce of Holland had its share therein.

The four cities which formed the league, were Lubeck, Cologne, Brunswick, and Dantzick, which were called *mother-towns*; as those afterwards added thereto, were called *daughters* thereof.

A great number of towns in Germany, still retain the title of *hanse towns*; but this is rather an empty title which they affect, than any argument of their continuing to trade under the laws and protection of the antient alliance; there being scarce any but Lubeck, Hamburg, Bremen, Rostock, Brunswick, and Cologne, that are truly *hanseatic*, and that have deputies at the assemblies held on the common occasions thereof.

The great trade the Dutch maintain with the *hanse towns*, contributes not a little towards maintaining some part of them in their antient reputation; and it is principally to their alliance with that flourishing republic, that they owe the preservation of their liberties: the succours some of them have received from the Dutch, having saved them more than once from the enterprizes of the neighbouring princes.

HANSEATIC, something belonging to the alliance, or company of the *hanse*.

Thus we say, the *hanseatic* body; the *hanseatic* towns, &c. See *HANSE*.

*HANS GRAVE**, the title of an officer in Germany.—The *hansegrave* is the chief of a company, or society.

* The word is a compound of the German *hanse*, and *graf*, count. See GRAVE.

HAP, or **HAPP**, in law, signifies, to catch, or snatch a thing. Thus we meet with, to *hap* the possession of a deed pool. *Littleton*, fol. 8. also, to *hap* the rent. If partition be made between two parceners, and more land be allowed the one than the other; she that hath most of the land, charges it to the other, and *happeth* the rent whereon aſſize is brought.

HAQUENY, **HACKNEY**, an old French word for an ambulating horse.

HAQUEBUT, a kind of fire-arm, otherwife called an *hog-but*, or *barquebut*. See **HARQUEBUSS**.

HARANGUE *, a modern French name for a ſpeech, or oration, *i. e.* a diſcourſe made by an orator in public.

* *Menage* derives the word from the Italian *avenga*, which ſignifies the ſame; formed, according to *Ferrari*, from *arringo* a juſt, or place of juſting. Others derive it from the Latin *ara*, altar; by reaſon the firſt *harangues* were made before altars; whence the verſe of *Juvenal*,
Aut Lugdunenſis rhetor diſtans ad aram.

The word is alſo frequently uſed in an ill ſenſe, *viz.* for a too pompous, prolix, or unſeaſonable ſpeech or declamation.

—In *Homer* the heroes generally *harangue* ere they come to fight; as, in *England*, criminals *harangue* on the ſcaffold before they die. *S. Evrem.*

HARBINGER, an officer of the king's houſhold, having four yeomen under him, who ride a day's journey before the court when it travels, to provide lodgings, &c.

HARBOUR, a ſea-port; or a ſtation where ſhips may ride ſafe at anchor.

The word is chiefly applied to thoſe cloſed, or ſecured with a boom, or chain; and that are furniſhed with a mole, &c.

To **HARBOUR**, popularly ſignifies to lodge, receive, or entertain; or to find a retiring place.

Among hunters, a hart is ſaid to *harbour*, when he goes to reſt; whence, to *unharbour* a deer, is to diſlodge him.

HARDENING, the act of communicating a greater degree of *hardneſs* to a body than it had before.

The hardening and tempering of iron and ſteel, makes a conſiderable article in the mechanical arts.

There are divers ways of effecting it: as by the hammer; quenching it, when hot, in cold water; caſe hardening, &c.

To *harden* and temper *English*, *Flemiſh*, and *Swediſh* ſteel, they give it a pretty high heat, then ſuddenly quench it in water, to make it very *hard*: *Spaniſh* and *Venice* ſteel only need a blood-red heat, and then to be quenched.

The workmen ſometimes alſo grind indigo, and ſallad oil together, and rub the mixture upon it with a woollen rag, while it is heating, and let it cool of itſelf.

If the ſteel be too *hard* or brittle for an edge, ſpring, or pointed inſtrument, it may be let down, or made ſofter, thus:

Take a piece of grindſtone, or whetſtone, and rub *hard* on the work, to take the black ſcurf off it, and brighten it; then let it heat in the fire, and, as it grows hotter, the colour will change by degrees, coming firſt to a light goldiſh colour, then to a darker goldiſh colour, and at laſt to a blue colour: chuſe it at which of theſe colours the work requires, and quench it ſuddenly in the water.

Hammer HARDENING, is moſtly uſed on iron and ſteel plates, for ſaws, ſprings, rules, &c.

Cafe HARDENING is thus performed:—Take cow-horn, or hoof, dry it well in an oven, and beat it to powder; put as much bay-ſalt as of this powder into ſtale urine, or white-wine vinegar, and mix them well together; cover the iron, or ſteel, all over with this mixture, and wrap it up in loam, or plate iron, ſo as the mixture touch every part of the work; then put it in the fire, and blow the coals to it, till the whole lump have a blood-red heat, but no higher; laſtly, take it out and quench it.

HARDNESS, *Durities*, in philoſophy, that quality in bodies, whereby their parts cohere firmly together, ſo as to reſiſt the touch.

In this ſenſe, *hardneſs* coincides with what on other occasions we call *firmneſs*, and ſometimes *ſolidity*: in oppoſition to *fluidity*.

More ſtrictly ſpeaking, a body is ſaid to be *hard*, when its parts mutually cohere, ſo as not to yield inwards, or give way to an external impuſe; and therefore are not ſubject to any motion in reſpect of each other, without breaking the body.—In which ſenſe *hardneſs* ſtands oppoſed to *ſoftneſs*, where the parts do readily give way.

The *Peripatetics* make *hardneſs* a ſecondary quality; as ſuppoſing it to ariſe from *dryneſs*, which is a primary one, and to be in proportion thereto.

Its remote cauſes, according to them, are either heat or cold, according to the diverſity of the ſubject: heat producing *dryneſs*, and by that means *hardneſs* in clay; and cold doing the like in wax.

The *epicurean* and *corpufcular* philoſophers, account for *hardneſs*, from the figure of the component parts, and their union together.—Accordingly, ſome aſcribe it to the atoms, or particles of the body being hooked, and thus mutually catching and hanging upon one another: but this is directly bring-

ing that for an answer, which was the question. For how do thoſe hooked parts cohere?

Again: the *Carteſians* will have the cohesion of hard bodies effected by reſt; that is, by nothing at all.

Sir Isaac Newton ſhews, that the primary particles of all bodies, whether ſolid or fluid, are *hard*, perfectly *hard*; and not capable of being broke or ſoft by any power in nature.

Theſe particles he maintains to be connected together by an attractive power; and according to the circumſtances of this attraction, is the body either *hard*, or *ſoft*, or even fluid.

If the particles be ſo diſpoſed or fitted for each other, as to touch in large ſurfaces, ſuch body will be *hard*; and the more ſo, as thoſe ſurfaces are the larg-er. On the contrary, they only touch in ſmall ſurfaces, the body, by the weakneſs of the attraction, will remain ſoft.

HARDS, or **HURDS**, of flax, or hemp, denote the coarſer parts, ſeparated in the dreſſing of it, from the *tear*, or fine ſtuff. See **HEMP**.

HARE-Hunting. See the article *Hare-Hunting*.

HARIOT *, or **HERIOT**, a due, or ſervice, belonging to the lord at the death of his tenant; conſiſting of the beſt beaſt the tenant had at the time of his deceaſe.

* *Coke* on *Littleton* obſerves, that *hariot* in *Saxon* is called *hepegear*, *q. d.* the *Lord's* le ſt; *hepe*, ſignifying *Lord*, and *gear*, *beaſt*, which others reject, uſing that *hepe*, in *Saxon* ſignifies an *army*, and *gear*, a *march*, or *expedition*: and that the *Saxon* *hepegear*, whence we derive our *hariot*, ſignified *proviſion* for war, or a tribute, or relief, given to the lord of a manor, for his better preparation towards war.—*Erat enim heriotum militarium ſupplicabilis proſpectio, quem obreute vaſſallos, dominus reportavit in ſui iſſus manerium*, ſays *Speelman*. By the laws of *Canutus*, *Tit. de Heriotis*, it appears, that at the death of the great men of this nation, ſo many horſes and arms were to be paid, as they were in their reſpective life obliged to keep for the king's ſervice.

But *hariot* is now wholly taken for a beaſt, which the lord by cuſtom chuſes out of all the ſtore of his deceaſed tenant, be it horſe, ox, &c. and in ſome manors, the beſt piece of plate, jewel, or even the beſt moveable.

Hariot is of two ſorts; *viz.*—**HARIOT Custom**, where *hariots* have been paid time out of mind by cuſtom, after the death of a tenant for life.

HARIOT Service, when a tenant holds by ſuch ſervice to pay *hariot* at the time of his death; which ſervice is expreſſed in the deed of feoffment.

For this latter the lord ſhall diſtrain; and for the other he ſhall ſeiſe, and not diſtrain.

If the lord purchaſe part of the tenancy, *hariot* ſervice is extinguished; but it is not ſo of *barriot* cuſtom.

HARLEQUIN, in the Italian comedy, a buffoon, quaintly dreſſed; answering much the ſame purpoſe as a merry-andrew, or jock pudding in our drolls, on mountebanks ſtages, &c. We have alſo introduced the *harlequin* upon our theatres; and this is one of the ſtanding characters in the modern grotesque entertainments.

The term took its riſe from a famous Italian comedian, who came to *Paris* under *Henry III.* and who frequenting the houſe of *M. de Harlay*, his companions uſed to call him *Harlequina*, *q. d.* little *Harlay*; a name which has deſcended to all thoſe of the ſame rank, and profeſſion.

HARLOT *, a woman given to incontinency; or that makes a habit or a trade of proſtituting her body. See **COURTEZAN**.

* The word is ſuppoſed to be uſed for the diminutive *arch-relit*, a little whore.—Others derive it from *Arli*, miſtreſs to *Robert* duke of *Normandy*, and mother to *William* the conqueror: *Camden* derives it from one *Arletta*, concubine to *William* the conqueror.—Others from the Italian *Arletta*, a proud whore.

HARMONIA, in muſic, &c. See the article **HARMONY**.

HARMONIA, *Armonia*, in anatomy, a ſort of juncture, or articulation of the bones.

Harmonia is a ſpecies of the ſymphyſis, or juncture intended for abſolute reſt.

Two bones are ſaid to be joined *per harmoniam*, by *harmonia*, when the juncture is in one uniform, right, or circular line; or when the bones meet with even margins: in contradiſtinction from *ſutura*, where they are indented.

The hones of the upper jaw, and moſt of the epiphyſes, are joined *per harmoniam*.

HARMONICA, **HARMONICS**, a branch, or diviſion of the antient muſic.

The *harmonica* is that part which conſiders the differences, and proportions of ſounds, with reſpect to acute and grave: in contradiſtinction from *rhythmica*, and *metrica*. See **RHYTHMICA**, and **METRICA**.

The only part of their muſic the antients have left us any tolerable account of, is the *harmonica*; which itſelf is but very general and theoretical.

Mr. Malcolm has made a very industrious and learned inquiry into the *harmonica*, or harmonic principles of the antients.—They reduced their doctrine into seven parts, *viz.* of *sounds*; of *intervals*; of *systems*; of the *genera*; of the *tones*, or *modes*; of *mutations*; and of the *melopœia*. See each considered under its proper article.

HARMONICAL Arithmetic, is so much of the theory and doctrine of numbers, as relates to making the comparisons, reductions, &c. of musical intervals, which are expressed by numbers, in order to our finding their mutual relations, compositions and resolutions.

HARMONICAL Composition, in its general sense, includes the composition both of harmony and melody, *i. e.* of music, or songs, both in a single part, and in several parts.

In its more proper and limited sense, *harmonic composition* is restrained to that of harmony.—In which sense it may be defined the art of disposing and concerting several single parts together, in such manner as to make one agreeable whole.

The art of harmony has been long known under the name of *counterpoint*. See **COUNTERPOINT**.

At the time when parts were first introduced, music being then very simple, there were no different notes of time; and the parts were in every note made concord.

This they afterwards called *simple*, or *plain counterpoint*, to distinguish it from another kind, then introduced, wherein notes of different value were introduced, and discords brought in between the parts.

This they called *figurative counterpoint*. See **FIGURATIVE Counterpoint**.

HARMONICAL Interval, is an interval, or difference of two sounds which are agreeable to the ear, whether in consonance or succession. See **INTERVAL**.

Harmonical Intervals, therefore, are the same with *concord*s.

They are thus called, as being the only essential ingredients of harmony.

HARMONICAL Proportion, is a sort of proportion between three quantities, wherein the difference of the first and second, is to the difference of the second and third, as the first is to the third.

Thus, 2 : 3 : 6 are *harmonic*; because 2 : 6 :: 1 : 3 are geometrical.

So four numbers are *harmonic*, when the first is to the fourth, as the difference of the first and second, to the difference of the third and fourth.

Thus, 24 : 16 : 12 : 9 are *harmonic*; because 24 : 2 :: 8 : 3 are geometrical.

For the laws and rules of *harmonic proportion*, see *Harmonical PROPORTION*.

HARMONICAL Series, is a series of many numbers in continual *harmonic* proportion.

If there be four or more numbers, whereof every three immediate terms are *harmonic*; the whole makes an *harmonic series*, of continual *harmonic* proportionals; as, 30 : 20 : 15 : 12 : 10.

Or if every four immediately next each other are *harmonic*, it is also a continual *harmonic series*, but of another species; as, 3, 4, 6, 9, 18, 36, &c.

HARMONICAL Sound, is an appellation given by M. Sauveur to such sounds as always make a certain determinate number of vibrations, in the time that some other fundamental sound, to which they are referred, makes one vibration.

Harmonic sounds are produced by the parts of chords, &c. which vibrate a certain number of times while the whole chord vibrates once.

By this they are distinguished from the third, fifth, &c. where the relations of the vibrations are four to five, or five to six, or two to three.

The relations of sounds, had only been considered in the series of numbers, 1 : 2, 2 : 3, 3 : 4, 4 : 5, &c. which produced the intervals called *octave*, *fifth*, *fourth*, *third*, &c. M. Sauveur first considered them in the natural series, 1, 2, 3, 4, &c. and examined the relations of the sounds arising therefrom.—The result is, that the first interval, 1 : 2, is an octave; the second, 1 : 3, a twelfth; the third, 1 : 4, a fifteenth, or double octave; the fourth, 1 : 5, a seventeenth; the fifth, 1 : 6, a nineteenth, &c.

This new consideration of the relations of sounds, is more natural than the old one; it does express and represent the whole of music, and is in effect all the music that nature gives without the assistance of art.—The string of an harpichord, or a bell, besides their general sound, which is proportionate to their length, tension, &c. do also at the same time yield other subordinate and acuter sounds, which a nice ear, with a good attention, clearly distinguishes.

These subordinate sounds arise from the particular vibrations of some of the parts of the string, or bell, which are, as it were, detached from the rest, and make separate vibrations: in effect, every half, every third, every fourth, &c. of the chord, performs its vibrations apart, while a general vibration

is made of the whole chord.—Now all these subordinate sounds are *harmonic* with regard to the whole sound: the least acute which we hear is octave with the whole sound: the least acute that follows, makes a twelfth with the whole sound; the next a seventeenth, &c. till they grow too acute for the ear to perceive them. Now throughout the whole, we hear no such thing as a sound that makes a fifth, or a third, &c. with regard to the whole sound; none, in short, but what are comprized in the series of *harmonic* sounds.

Add, that if the breath, or bellows that blow a wind instrument, be played stronger and stronger, the tone will be continually raised, but this only in the ratio of the *harmonic sounds*.—So that it appears that nature, when she makes as it were a system of music herself, uses no other but this kind of sounds; and yet they had till of late remained unknown to the musicians: not but that they frequently fell into them, but it was only inadvertently, and without knowing what they did.—M. Sauveur shews, that the structure of the organ depends entirely on this so long unknown principle.

HARMONY*, *APOMIA*, in music, the agreeable result of an union of several musical sounds, heard at one and the same time; or, the mixture of divers sounds, which together have an effect agreeable to the ear.

* The word is Greek ἀμονία, formed of the verb ἀμύνω, *conquire*, *construere*, to agree, quadrate, march, &c.

As a continued Succession of musical sounds produces melody, so does a continued combination of them produce *harmony*.

Among the antients, however, as sometimes also among the moderns, *harmony* is used in the strict sense of *consonance*; and so is equivalent to the *symphony*.

The words *concord*, and *harmony*, do really signify the same thing; though custom has made a little difference between them. Concord is the agreeable effect of two sounds in consonance; and *harmony* the effect of any greater number of agreeable sounds in consonance.

Again, *harmony* always implies consonance: but concord is also applied to sounds in succession; though never but where the terms can stand agreeably in consonance.—The effect of an agreeable succession of several sounds, is called *melody*; as that of an agreeable consonance, is called *harmony*.

The antients seem to have been entirely unacquainted with *harmony*; the soul of the modern music.—In all their explanations of the *melopœia*, they say not one word of the concert, or *harmony* of parts. We have instances, indeed, of their joining several voices, or instruments, in consonance; but then those voices, &c. were not so joined, as that each had a distinct and proper melody, so making a succession of various concords; but they were either unisons, or octaves, in every note; and so all performed the same individual melody, and constituted one song.

When the parts differ, not in the tension of the whole, but in the different relations of the successive notes; it is this that constitutes the modern art of *harmony*.

Harmony is well defined the sum or result of the combination of two or more concords, *i. e.* of three or more simple sounds striking the ear all together; and different compositions of concords make different *harmony*.

To understand the nature, and determine the number, and presence of *harmonies*; it is to be considered, that in every compound sound, where there are no more than three simple ones, there are three kinds of relations, *viz.* the primary relation of every simple sound to the fundamental, or gravest, whereby they make different degrees of concord with it: the mutual relations of the acute sounds each with other, whereby they mix either concord or discord into the compound: and the secondary relation of the whole, whereby all the terms unite their vibrations, or coincide more or less frequently.

Suppose, *e. g.* four sounds, A, B, C and D, whereof A is the gravest; B next; then C; and D the acutest.—Here, A is the fundamental; and the relations of B, C, and D, to A, are primary relations: So, if B be a third *g* above A, that primary relation is 4 to 5; and if C be fifth to A, that primary relation is 2 to 3; and if D be octave to A, that is 1 to 2. For the mutual relations of the acute terms B, C, D, they are had by taking their primary relations to the fundamental, and subtracting each lesser from each greater: thus, B to C is 5 to 6, a third *l*; B to D is 5 to 8, a sixth *l*, &c.—Lastly, to find the secondary relation of the whole, seek the least common dividend to all the lesser terms or numbers of the primary relations, *i. e.* the least number that will be divided by each of them exactly: this is the thing sought; and shews that all the simple sounds coincide, after so many vibrations of the fundamental as the number expresses.

So in the preceding example, the lesser terms of the three primary relations are 4, 2, 1, whose least common dividend is 4. Consequently, at every fourth vibration of the fundamental, the whole will coincide.

Now *harmony*, we have observed, is a compound found, consisting of three or more simple sounds. — Its proper ingredients are concords; and all discords, at least in the primary and mutual relations, are absolutely forbidden.—It is true, discords are used in music; but not for themselves simply, but to set off the concords by their contrast and opposition. Hence any number of concords being proposed to stand in primary relation with a common fundamental; we discover whether or no they constitute a perfect *harmony*, by finding their mutual relations.—Thus, suppose the following concords, or primary relations, *viz.* the greater third, fifth, and octave given; their mutual relations are all concord, and therefore may stand in *harmony*. For the greater third and fifth are to one another, as 5 : 6, a lesser third. The greater third and octave, are as 5 : 8, a lesser sixth. And the fifth, and octave, are as 3 : 4, a lesser fourth. But if fourth, fifth and octave be proposed, it is evident they cannot stand in *harmony*; by reason, betwixt the fourth and fifth there is a discord, *viz.* the ratio 8 : 9. Again, supposing any number of sounds which are concord each to the next, from the lowest to the highest; to know if they can stand in *harmony*, we must find the primary, and all the mutual relations, which must be all concord. So let any number of sounds be as 4 : 5 : 6 : 8; they may stand in *harmony*, by reason each to each is concord; but the following ones cannot, *viz.* 4, 6, 9, because 4 : 9 is discord.

The necessary conditions of all *harmony*, then, are concords in the primary and mutual relations; on which footing, a table is easily formed of all the possible varieties. But to determine the preference of *harmonies*, the secondary relations are likewise to be considered. — The perfection of *harmonies* depends on all the three relations: it is not the best primary relations that make best *harmony*; for then a fourth and fifth must be better than a fourth and sixth: whereas the first two cannot stand together, because of the discord in the mutual relation. Nor does the best secondary relation carry it; for then would a fourth and fifth, whose secondary relation with a common fundamental is 6, be better than a lesser third and fifth, whose secondary relation is 10: but here also the preference is due to the better mutual relation.—Indeed, the mutual relations depend on the primary; though not so as that the best primary shall always produce the best mutual relation; however, the primary relations are of the most importance; and together with the secondary, they afford us the following rule for determining the preference of *harmonies*.

Viz. Comparing two *harmonies*, which have an equal number of terms; that which has the best primary and secondary relations, is sure to be most perfect.—But in cases where the advantage is in the primary relation of the one, and the secondary of the other, we have no certain rule: The primary are certainly the most considerable; but how the advantage in these ought to be proportioned to the disadvantage in the other, or *vice versa*, we know not. So that a well turned ear must be the last resort in these cases.

Harmony is divided into *simple* and *compound*.

Simple HARMONY, is that where there is no concord to the fundamental above an octave.

The ingredients of *simple harmony*, are the seven simple original concords, of which there can be but eighteen different combinations, that are *harmony*; which we give in the following table from Mr. Malcolm.

Table of simple HARMONIES.

	2dary rel.		2dary rel.				
fifth octave	2	third g fifth	4	third g fifth octave			
fourth octave	3	third l fifth	10	third l fifth octave			
sixth g octave	3	fourth, sixth g	3	fourth, sixth g octave			
third g octave	4	third g sixth g	12	third g sixth g octave			
third l octave	5	third l sixth l	5	third l sixth l octave			
sixth l octave	5	fourth, sixth l	15	fourth, sixth l octave			

These are all the possible combinations of the concords that make *harmony*: for the octave is compounded of a fifth and fourth, or a sixth and third, which have a variety of greater and lesser; out of these are the first six *harmonies* composed: then, the fifth being composed of the greater third and lesser third, and the sixth of fourth and third; from these proceed the next six of the table: then an octave joined to each of these six, make the last six.

The perfection of the first twelve is according to the order of the table: of the first six each has an octave; and their preference is according to the perfection of the other lesser concord joined to the octave.—For the next six, the preference is given to the two combinations with the fifth, whereof that which has the third g is best; then to these two combinations with the sixth g, of which that which has the fourth is best.—For the last six, they are not placed last as being the least perfect, but because they are the most complex, and are the mixtures of the other twelve with each other. In point of perfection they are plainly preferable to the preceding six, as

having the very same ingredients, and an octave more. *Compound HARMONY*, is that which to the simple *harmony* of one octave, adds that of another octave. For the *compound harmonies*, their variety is easily found out of the combinations of the simple *harmonies* of several octaves.

HARMONY, again, may be divided into that of *concords*, and that of *discords*.

The *first* is that we have hitherto considered, and wherein nothing but concords are admitted.

The *second* is that wherein discords are used, intermixed with the concords.

Composition of HARMONY. See *HARMONICAL Composition*.

HARMONY is sometimes also used in a laxer sense, to denote an agreement, suitableness, union, conformity, &c.

In music, we sometimes apply it to a single voice when sonorous, clear, and soft; or to a single instrument, when it yields a very agreeable sound.—Thus, we say, the *harmony* of her voice, of his lute, &c.

In matters of learning, we use *harmony* for a certain agreement between the several parts of the discourse, which renders the reading thereof agreeable.—In this sense we say, *harmonious* periods, &c.

In architecture, *harmony* denotes an agreeable relation between the parts of a building. See *SYMMETRY*.

In painting, they speak of an *harmony*, both in the ordonnance and composition, and in the colours of a picture.—In the ordonnance, it signifies the union or connection between the figures, with respect to the subject of the piece.

In the colouring, it denotes the union, or agreeable mixture of different colours. See *COLOURING*.

M. de la Chambre derives the *harmony* of colours from the same proportions as the *harmony* of sounds.—This he insists on at large, in his treatise *Of the colours of the Rainbow*. On this principle, he lays down green as the most agreeable of colours, corresponding to the octave in music; red, to a fifth; yellow, to a fourth, &c.

HARMONY, or *Evangelical HARMONY*, is also a title of divers books, composed to shew the uniformity and agreement of the accounts given by the four evangelists.

The first attempt of this kind is attributed to Tatian, or Theophilus of Antioch, in the second century.—After his example, divers other *harmonies* have been composed, by Ammonius of Alexandria, Eusebius of Cesarea, Janenius bishop of Ghent, Mr. Tonard, Mr. Whiston, &c.

HARMONY of the Spheres or Cœlestial HARMONY, is a sort of music much spoke of by many of the philosophers and fathers; supposed to be produced by the regular, sweetly tuned motions of the stars and planets.

Plato, Philo Judeus, S. Augustine, S. Ambrose, S. Isidore, Boethius, and many others, are strongly possessed with the opinion of this *harmony*, which they attribute to the various proportionate impressions of the heavenly globes upon one another; which acting under proper intervals, form an *harmony*.—It is impossible, according to them, that such spacious bodies, moving with so much rapidity, should be silent; on the contrary, the atmosphere, continually impelled by them, must yield a set of sounds, proportionate to the impulses it receives: consequently, as they do not all run the same circuit, nor with one and the same velocity, the different tones arising from the diversity of motions, directed by the hand of the Almighty, must form an admirable symphony, or concert.

S. Irenæus, S. Basil and St. Epiphianus, &c. have appeared against the notion. *Pre-established HARMONY*, a celebrated system of M. Leibnitz, by means whereof he accounts for the union, or communication between the soul and body.

The Philosophers had universally held, that the soul and body act really and physically on each other.—Des Cartes first appeared and shewed that the heterogeneity of their nature did not allow of such real union; and that they could only have an apparent one, whereof God is the mediator.

M. Leibnitz, unsatisfied with either of these hypotheses, establishes a third.—A soul or spirit he observes, is to have a certain series of thoughts, desires, and wills: A body, which is only a machine, is to have a certain series of motions, to be determined by the combination of its mechanical disposition, with the impressions of external objects.

If, now, there be found a soul and a body so framed, that the whole series of wills of the soul, and the whole series of motions of the body, exactly correspond; and at the same time, for instance, when the soul desires to go to any place, the two feet move mechanically that way: this soul and body will have a relation to one another, not by any actual union between them, but by the constant and perpetual correspondence of the several actions of both.—Now, God puts together this soul and body, which had such a correspondence antecedent to their union; such a *pre-established harmony*.—And the same is to be understood of all the other souls and bodies, that have been or ever will be joined.

In effect, the laws of motion in the body, succeeding in the order of efficient causes, do also agree and correspond with the ideas

ideas of the foul; so that the body is determined to act at the time when the soul wills.

The same principle he extends further, and makes a pre-established harmony between the kingdoms of nature and grace; to account for the apparent communication between them, and make physical and moral evil correspond.

Such is the system of pre-established harmony, *harmony pre-establie*.—The author's way of stating and enforcing it, may be seen in his *Essais de Theodicee*.

HARMONY, in anatomy. See the article HARMONIA.

HARMOSTES*, or **HARMOSTA**, in antiquity, a sort of magistrate among the Spartans, whereof there were several; whose business was to look to the building of citadels, and repairing the forts, and the fortifications of the cities.

*The word is Greek, ἄρμωστος; formed of ἄρμων, apto, concinna, I adapt, concert, &c.

HARNES*, a complete armour; or the whole equipage and accoutrements of a cavalier, heavily armed; as, cask, cuirass, &c.

*The word is formed of the French, *harnois*; which some derive from the Greek ἄρναξ, a lamb's skin; by reason they anciently covered themselves therewith. Du Cange observes, that the word *harnesum* is used in the corrupt Latin in the same sense; and that it comes from the High Dutch, *harnas*, or *harnisch*. Others derive it from the Italian, *arnese*; others from the Celtic, *harnes*, a culina.

Under king Richard II. it was expressly forbid all men to ride in *harnes*, with lance-cases, &c. *Vid. Stat. 7 R. II. c. 13.* In the statute 2 H. VI. c. 14. *harnes* seems to include all kind of furniture for offence, as well as defence, both of man and horse: as swords, buckles for belts, girdles, &c.

HARNES is also used for the furniture put on a horse, to draw in a coach, waggon, or other carriage; such as collars, leathers, traces, &c.

HARO*, **HAROU**, or **HAROL**, in the Norman customs.—*Clamor de HARO*, is a cry, or formula of invoking the assistance of justice, against the violence of some offender, who upon hearing the word *haro*, is obliged to desist, on pain of being severely punished for his outrage, and to go with the party injured before the judge.

*The word is commonly derived of *ha* and *roul*, as being supposed an invocation of the sovereign power, to assist the weak against the strong; on occasion of Raoul first duke of Normandy, about the year 912: who rendered himself venerable to his subjects by the severity of his justice; so that they called on him even after his death, when they suffered any oppression.—Guill. Guizart speaks of the *ha rouls*, or *ha rouls*, as a military cry, first brought into Normandy by the Normans, under the conduct of Raoul. Others say, that during his lifetime they used to cry a *Raoul*. I cite you to appear before Raoul; by reason he administered justice to his subjects in person. But others, as M. Caleneuve, take all these etymologies to be false; and suppose the word *haro*, to have been a cry long before duke Raoul. Some derive it from Harold king of Denmark, who in the year 826, was made grand conservator of justice at Mentz: others, from the Danish *aa roval*, q. d. help me; a cry raised by the Normans in flying from a king of Denmark, named Roux, who made himself duke of Normandy.

The letters of the French chancery have usually this clause, *Non obstant clamour de haro*, &c.

The *haro* had antiently such vast power, that a poor man of the city of Caen, named Affelin, in virtue hereof, arrested the corps of William the conqueror, in the middle of the funeral procession, till such time as his son Henry had paid the value of the land in question; which was that whereon the chapel was built, where he was interred.

HARP*, a musical instrument, of the string kind; being of a triangular figure, and placed on end between the legs to be play'd on.

*Papias, and Da Cange after him, will have the *harp* to have took its name from the *Arpi*, a people of Italy, who were supposed the first that invented it; and from whom they say it was borrowed by other nations.—Menage, &c. derive the word from the Latin *harpa*; and that from the German *berp* or *berp*. Others bring it from the Latin *carpa*, because touched or thrummed with the fingers. Dr. Hickes derives it from *harpa*, or *bearpa*, which signify the same thing; the first in the language of the Cimbric, the second in that of the Anglo-Saxons.—The English priest who wrote the life of St. Dunstan, and who lived with him in the tenth century, says, C. 2. n. 12. *Sancti fecimus ex more Citharam suam, quam paternam lingua hearpan vocamus*; which intimates the word to be Anglo-Saxon.

There is some diversity in the structure of *harps*.—That called the *triple harp* has 78 strings or chords, in three rows, 49 in each, which make four octaves: the first row is for the semi-tones; and the third is in unison with the first. There are two rows of pins, or screws, on the right side, serving to keep the strings tight in their holes, which are fastned at the other end to three rows of pins on the upper side.

This instrument is struck with the finger and thumb of both hands. Its music is much like that of the spinett; all its strings going from semi-tone to semi-tone: whence some call it an *inverted spinet*.

It is capable of a much greater degree of perfection than the lute.

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King David is usually painted with a *harp* in his hands; but we have no testimony in all antiquity, that the Hebrew *harp*, which they call *chinnor*, was any thing like ours. On a Hebrew medal of Simon Maccabeus we see two sorts of musical instruments; but they are both of them very different from our *harp*, and only consist of three or four strings.—All authors agree, that our *Harp* is very different from the lyra, cithara, or harbiton, used among the Romans.

Fortunatus, Lib. VII. *Carm. 8.* witnesses, that it was an instrument of the barbarians.

Romanusque lyra, plaudet tibi barbarus harpa

Græcus aciliacæ, crotta Britannia canat.

HARPIES, ἄΡΠΙΙΑΙ, HARPYÆ, in antiquity, a rapacious impure sort of monsters, of the bird kind, mentioned among the poets.

They are represented with wings, ears like bears, bodies like vultures, faces like women, and feet and hands hooked like the talons of birds of prey. See Virgil *Æneid.* Lib. III. who gives a description of them.

The ancients looked on the *harpies* as a sort of genii, or demons.—Some make them the daughters of Tellus and Oceanus, the earth and ocean; whence, says Servius, it is, that they inhabit an island, half on land, and half in water. Valerius Flaccus makes them the daughters of Typhon.

There were three *harpies*, Aello, Ocypete, and Celeno; which last Homer calls *Podarge*.—Hesiod, in his *Theogony*, V. 267. only reckons two, Aello and Ocypete; and makes them the daughters of Thaumus and Electra; affirming, that they had wings, and went with the rapidity of the wind. Zephyrus begat them Balus and Xanthus, Achilles's horses. Pherecydes relates, that the Boreades expelled them from the Ægean and Sicilian seas, and purified them as far as the islands, which he calls *Plata*, and Homer *Calyne*; and which have since been called the *Strapades*.

Vossius, *De idola.* L. III. c. 99. p. 63. thinks, that what the ancients have related of the *harpies*, agrees to no other birds so well as the bats found in the territories of Darien in South America.—These animals kill not only birds, but dogs and cats; and prove very troublesome to men by their peckings. But the ancients, as the same Vossius observes, knew nothing of these birds. By the *harpies*, therefore, he thinks they could mean nothing else, but the winds; and that it was on this account they were made daughters of Electra, the daughter of Oceanus. Such is the opinion of the scholiasts of Apollonius, Hesiod, and Eustathius.—Their names, Aello, Ocypete, Celeno, are supposed to be a further argument of this.

HARPINEER, or **HARPONEER**, an engineer, or fisherman, who manages, and throws the harping-iron, in the whale-fishing.

The *harpineers*, are the most robust and dextrous persons in the crew of the ships sent on whale-fishing.—Their place is at the end of the pinnace, and they direct the steersman as well as the rowers. When they come within reach of the whale, they dart their iron with great vehemence into his head, so as to penetrate the skin and fat, and enter deep into the flesh. Immediately upon this, the whale dives to the bottom, and when he returns to the air again to fetch breath, the *harpineer* takes occasion to strike him afresh; though he would have died of the former wound: it being a circumstance generally asserted, that blood never stanches, nor wounds ever heal in the water. This done, the other fishers approach aside of him, and run a long spear shod with iron under the fins, through the Integuments, into his breast. The blood now spouts out, and the carcass welters in its own fat. It remains then only to tow him to shore, there to cut off the blubber, &c. See *Whale-FISHERY*.

In the Sturgeon-Fishery, as soon as the *harpineer* perceives the sturgeon's belly, which is frequently turning, now on this side, and then on that, he darts his iron into the same, as being destitute of scales. Denis *Hist. de l'Amérique.* See *Sturgeon-FISHERY*.

HARPING-IRON, HARPAGO, HARPOON, a sort of dart, or spear, fastned to a line, wherewith they catch whales and other large fish, as sturgeons, &c.

This *harping-iron* is a large javelin of forged iron, five or six feet long, with a sharp, cutting, triangular point, barbed like that of an arrow. At the upper end is engraven the *harpineer's* name, near a ring, to which the line is fastned, which they let down as soon as the fish is struck, to give him room to dive, &c. See *Whale-FISHERY*.

HARPINGS, in a ship, properly denotes her breadth at the bow. Some also call the ends of the bends, which are fastned into the stem, the *harpings*.

HARPOCRATIANS, a sect of heretics mentioned by Celsus; the same with *Carpocratians*. See *CARPOCRATIANS*.

HARPSICHOORD, or **HARPSICHOLO**, a musical instrument of the string kind; play'd after the manner of an organ.

The Italians call it *clave cimballa*, and the French *clavocin*. In Latin it is usually called *grave cymbalum*, q. d. a low or deep cymbal.

The *harpichord* is furnished with a set of keys; sometimes

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two fets:--The touching or striking of these keys, moves a kind of little jacks, which move a double row of chords, or strings of brads and iron, stretched on the table of the instrument over four bridges.

HARQUEBUSS*, in our ancient statutes, called also **ARQUEBUSE**, **HAQUEBUT**, or **HAGBUT**; is a *hand-gun*; or a fire-arm of a proper length, &c. to be bore in the arm.

* The word is formed of the French *arquebuse*: and that from the Italian, *arcobusa*, or *arco abusa*, a bow, and *busia*, a hole; on account of the touch-hole, at which the powder is put to prime it; and that it succeeded to the bows of the ancients.

The *barquebuss* is properly a fire-arm, of the ordinary length of a musket, or fowling-piece; cocked usually, with a wheel.---Hanzelet prescribes its legitimate length to be forty calibers; and the weight of its ball one ounce, seven eighths; its charge of powder as much.

There is also a larger kind, called *barquebuss a croc*, much of the nature of our blunderbusses, used in war, for the defence of places; being usually rested on something when discharged.---The first time these instruments were seen, was in the imperial army of Bourbon, who drove Bonnavet out of the state of Milan.---They were so big and heavy, that there were two men to carry them. They are now little used except in some old castles, and by the French in some of their garisons.

HARRIER, a kind of hound, called in Latin *sagax*, from his tracing, or chafing by foot.---Being endowed with an admirable gift of smelling, and also very bold in the pursuit of his game.

There are several kinds, all differing in their services; being for the hare, fox, wolf, hart, buck, badger, otter, polecat, weasel, or coney; some, in fine, for one game, some for another, &c. See **HUNTING**.

HARROW, in husbandry, a drag made in a square form, to break the clods of earth after ploughing.

It consists of three parts: 1^o. The *barrow-bulls*; which are the holes where the nails go in; 2^o. The slots, which are the cross pins; 3^o. The *barrow-tines*, pins, or tulnes, which are great iron nails; beside these there are 4^o. The hook, being that which fastens the horse to them; 5^o. The couples, when two *barrows* are tied together.

HART, in the forest law, a stag, or male deer of five years old compleat.

If the king or queen hunt him, and he escape, he is called a *hart royal*.

And if by such hunting he be chased out of the forest, proclamation is commonly made in the places adjacent, that in regard of the pastime the beast has afforded the king or queen, none shall hurt, or hinder him from returning to the forest; upon which he is called an *hart royal proclaimed*.

HARTS-Horn, *Cornu Cervi*. See the article **HARTS-HORN**.

HART-HUNTING. See the article **HART-HUNTING**.

HARTH-Pony, or **HARTH-Silver**. See **CHIMNEY-Money**.

HARUSPEX, or **ARUSPEX**, in antiquity, a sort of priest, or diviner, who inspected and consider'd the entrails of beasts, particularly those of victims; to find signs or indications of something he wanted to know.

Cicero, de *Divinat. L. II.* explains the difference between *aruspex* an *haruspex*.

HASSOCK, denotes a bafs, or cushion made of rushes, to kneel or rest the feet on in churches.

HASTA, or **HASTA Pura**, among medalists, signifies a kind of spear, or javelin, not thod, or headed with iron; or rather, an ancient scepter, somewhat longer than ordinary, occasionally given to all the gods.

The *hasta* is supposed a symbol of the goodness of the gods, and of the conduct of providence, which is equally mild and forcible.

HASTA, in some countries, is a measure, or quantity of ground amounting to thirty paces; thus called, according to M. du Cange, from the *hasta*, or rod, wherewith it was measured.

HASTIVE, a French term, sometimes used in English for *early*, *forward*, or something that comes before the ordinary time, or season.

The *hastive* fruits are strawberries and cherries.---We have also *hastive* peas, &c.

HAT, a covering for the head, wore by the men throughout the western part of Europe.

Hats are chiefly made of hair, wool, &c. worked, fulled, and fashioned to the figure of the head.

Hats are said to have been first seen about the year 1400; at which time they became of use for country wear, riding, &c.

---F. Daniel relates, that when Charles II. made his public entry into Rouen in 1449, he had on a *hat* lined with red velvet, and furnished with a plume, or tuft of feathers.---He adds, that it is from this entry, or at least under this reign, that the use of *hats* and caps is to be dated, which

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henceforward began to take place of the chaperons and hoods, that had been wore before.

In progress of time, from the laity, the clergy likewise took this part of the habit; but it was looked on as a crying abuse, and several regulations were published, forbidding any priest, or religious person, to appear abroad in a *hat* without cornets; and enjoining them to keep to the use of chaperons, made of black cloth, with decent cornets: if they were poor, they were at least to have cornets fastned to their *hats*, and this upon penalty of suspension and excommunication.---Indeed the use of *hats* is said to have been of a longer standing among the ecclesiastics of Brittany, by two hundred years; and especially among the canons: but these were no other than a kind of caps; and it was from hence arose the square caps wore in colleges, &c.

Lobineau observes, that a bishop of Dol, in the twelfth century, zealous for good order, allowed the canons alone to wear such *hats*; enjoining, that if any other person should come with them to church, divine service should immediately stand still. T. I. p. 845.

Hats make a very considerable article in commerce.---The finest, and those most valued, are made of the pure hair of an amphibious animal, called the *castor*, or *beaver*, frequent in Canada, and other provinces of north America. See **CASTOR**.

Method of making HATS.---*Hats*, we have observed, are made either of wool, or hair of divers animals, particularly of the castor, hare, Rabbit, camel, &c. The process is much the same in all; for which reason we shall content ourselves to instance in that of castors.

The skin of this animal is covered with two kinds of hair; the one long, stiff, glossy, and pretty thin set; this is what renders the skin, or fur, of so much value. The other is short, thick, and soft; which alone is used in *hats*.

To tear off one of these kinds of hair, and cut the other, the *batters*, or rather the women employed for that purpose, make use of two knives, a large one like a shoe-maker's knife, for the long hair; and a smaller, not unlike a vine-knife, wherewith they shave, or scrape off the shorter hair.

When the hair is off, they mix the fluff; to one third of dry castor, putting two thirds of *old coat*, i. e. of hair which has been wore some time by the savages; and card the whole with cards, like those used in the woollen manufactory, only finer. This done, they weigh it, and take more or less, according to the size or thickness of the *hat* intended.---The fluff is now laid on the *burdle*, which is a square table, parallel to the horizon, having longitudinal chinks cut through it.

On this hurdle, with an instrument called a *bow*, much resembling that of a violin, but larger; whose string is worked with a little bow-stick, and thus made to play on the furs; they *fly* and mix them together, the dust and filth at the same time passing through the chinks. This they reckon one of the most difficult operations in the whole; by reason of the justness required in the hand to make the fluff fall precisely together, and that it may be every where of the same thickness. In lieu of a bow, some *batters* make use of a sieve, or sence of hair, through which they pass the fluff.

After this manner, they form gores, or two capades, of an oval form, ending in an acute angle atop.---And with what fluff remains, they supply and strengthen them in places where they happen to be slenderer than ordinary.---Though it is to be remembered, that they designedly make them thicker in the brim, near the crown, than towards the circumference, or in the crown itself.

The capades thus finished, they go on to harden them into clofer, and more consistent flakes, by pressing down a *hardening skin*, or leather thereon.---This done, they are carried to the *bafon*, which is a sort of bench with an iron plate fitted therein, and a little fire underneath it; upon which laying one of the hardened capades, sprinkled over with water and a sort of mould being applied thereon; the heat of the fire, with the water and pressing, embody the matter into a slight hairy sort of stuff, or felt: after which, turning up the edges all around over the mould, they lay it by; and thus proceed to the other.---This finished, the two are next joined together, so as to meet in an angle atop, and only form one conical cap, after the manner of a manica Hippocrates or flannel Bag.

The *hat* thus bafoned, they remove it to a large kind of receiver or trough, resembling a mill-hopper, going sloping or narrowing down from the edge, or rim, to the bottom, which is a copper kettle, filled with water and grounds, kept hot for the purpose.---On the descent or sloping side, called the *plank*, the bafoned *hat*, being first dipt in the kettle, is laid.---And here they proceed to work it, by rolling and unrolling it again and again, one part after another, first with the hand, and then with a little wooden roller; taking care to dip it from time to time: till at length by thus fulling and thickening it, four or five hours, it is reduced to the extent, or dimensions of the *hat* intended.---To secure the hands

from being injured by this frequent rolling, &c. they usually guard them with a sort of thick gloves.

The *bat* thus wrought, they proceed to give it the proper form; which is done by laying the conical cap on a wooden block, of the intended size of the crown of the *bat*; and thus tying it round with a packthread, called a *commander*: after which, with a piece of iron, or copper, bent for the purpose, and called a *stanper*, they gradually beat or drive down the commander all around, till it has reached the bottom of the block: and thus is the crown formed; what remains at bottom below the string, being the brim.

The *bat* being now set to dry; they proceed to *singe* it, by holding it over a flair of straw, or the like; then it is *pounded*, or rubbed with pumice, to take off the coarser nap; then rubbed over afresh with seal-skin, to lay the nap still finer; and lastly, carded with a fine card, to raise the fine cotton, with which the *bat* is afterwards to appear.

Things thus far advanced, the *bat* is sent, upon its block, and tyed about with packthread as before, to be dyed.—The dyer's copper is usually very large, holding ten or twelve dozen *bats*. The dye, or tincture, is made of logwood, verdigrise, coppers, and alder-bark; to which some add galls and sumac.

Here the *bat* is kept boiling for about three quarters of an hour; then taken out and set to cool, and then returned to the dye; and this for ten or twelve times successively.

The dye being compleat, the *bat* is returned to the *batter*, who proceeds to dry it, by hanging it in the top, or roof, of a stove or oven; at the bottom of which is a charcoal fire.—

When dry, it is to be sifined, which is done with melted glue, or gum seneca, applied thereon by first smearing it, and beating it over with a brush, and then rubbing it with the hand.—The next thing is to steam it, on the *steaming-bas-fen*, which is a little hearth, or fire place, raised three foot high, with an iron plate laid over it, exactly covering the hearth. On this plate they first spread clothes, which being sprinkled over with water to secure the *bat* from burnings, the *bat* is placed, brim downwards, thereon. When moderately hot, the workman strikes gently on the brim, with the flat of his hand, to make the jointings incorporate and bind, so as not to appear; turning it from time to time, this way and that way, and at last overturning and setting it on the crown.

When steamed sufficiently, and dried, they put it again on the block, and brush and trim it on a table or bench for the purpose, called the *still-board*. This they perform with a sort of irons like those commonly used in ironing linen, and heated like them; which being rubbed over and over each part of the *bat*, with the assistance of the brush, smoothens and gives it a gloss, which is the last operation; nothing now remaining but to clip the edges even with scissars, and sew a lining into the crown.

Hats for women have been made, in various forms, of silk, straw, shavings of wood, ivory, feathers, gold, and silver.

H A T, is also figuratively used for the dignity of a cardinal, or a promotion to that dignity.

In this sense they say, to expect the *bat*; to claim, or have pretensions to the *bat*, &c.

Pope innocent IV. first made the *bat* the symbol, or cognizance of the cardinals; enjoining them to wear a red *bat*, at all ceremonies and processions, as a token of their being ready to spill their blood for Jesus Christ.

H A T, in heraldry. See the article CHAPEAU.

HATCHES, in a ship, a sort of trap-doors in the mid-ship, or between the main-mast and fore mast; through which goods of bulk are let down into the hold.—Hence, the

H A T C H-way, is that place where the *hatches* are.—See Tab. Ship, fig. 2. n. 40.

To lay a thing into the *hatch-way*, is to put it so that the *hatches* cannot be come at, or opened.

H A T C H E S are also flood-gates, set in a river, &c. to stop the current of the water.

The word is particularly used for certain dams, or mounds, made of rubbish, clay, or earth, to prevent the water that issues from the stream-works, and tin-washes in Cornwall, from running into the fresh rivers.

The tenants of Bulstoke, and other manors, are bound to do certain days works to the *hatches*.

H A T C H E T, a joiner's instrument wherewith to hew wood. The *hatchet* is a smaller, lighter sort of ax, with a basal edge on its left side; having a short handle, as being to be used with one hand.

H A T C H I N G, the act whereby fecundated eggs, after feasonable incubation, exclude their young.

Hatching, with respect to the oviparous tribe, amounts to the same as parturition, or delivery, in the viviparous.

The offspring is said to lay her eggs in the sand; and that the heat of the sun does the office of a parent animal, and *hatches* them. In Egypt, they *hatch* their chickens by the heat of an oven: the method whereof is given us by Mr. Greaves, in the *Philosophical Transactions*, N^o. 117.

They have houses, it seems, built for the purpose; having a long entrance, on each side whereof are twelve or fourteen ovens, whose bottoms and sides are formed of sun-dried bricks; lined with mats, for the eggs to lie on; and the tops covered with sticks, except two spaces, which are brick, and serve as hearths to built the fires on wherewith the eggs are to be heated.—Over these is another story of ovens; having holes, which are either stopped with tow, or left open at pleasure, to govern the heat of the ovens below.

They begin to heat the ovens in the middle of January; spending on them every morning about an hundred pound weight of camels or buffalo's dung, and the like quantity at night; till the middle of February; by which time the ovens are too hot for the hand to be held upon the walls.—After this they put in the eggs to *hatch*; which they continue successively till the end of May.

The eggs are first put upon the mats in the lower ovens, upon the ground, 7 or 8000 eggs in number, and laid only double, one upon another; in the ovens over these, the fire is made in the little channels, from whence the heat is conveyed into the lower: the eggs directly under these hearths lie threefold.

At night, when they new-make their fires in the hearths they remove the eggs that were directly undermost, laying three one upon another, in the place of those which lay on the sides only double; and these being now removed, they lie treble under the hearth, because the heat is greater there, than on the sides.

These eggs continue in the lower ovens fourteen days and nights; after which they remove them into the upper. And in these, there being now no more fire used, they turn the eggs four times every twenty-four hours.

The 21st, or 22^d day, the chickens are *hatched*; which the first day eat not: the second day they are fetched away by women, who give them corn, &c. The master of the ovens hath a third part of the eggs for his cost and pains, out of which he is to make good to the owners, (who have two thirds in chickens for their eggs,) if any happen to be spoiled, or miscarry.

The fire in the upper ovens, when the eggs are placed in the lower, is thus proportioned.—The first day there is the greatest fire, the second less than the first; the fourth more than the third, the fifth less, the sixth more than the fifth, the seventh less, the eighth more, the ninth without fire, the tenth a little fire in the morning, the eleventh they shut all the holes with flax, &c. making no more fire; for if they should, the eggs would break. They take care that the eggs be no hotter than the eye of a man, when they are laid upon it, can well endure. When the chickens are *hatched*, they put them into the lower ovens.

H A T C H I N G, or H A C H I N G, in designing and engraving, signifies the making of lines with a pen, pencil, graver, or the like; and intersecting, or going across those lines, with others drawn over them another way.

The depths and shadows of draughts are usually formed by *hatching*, or *hatch-work*.

What is surprising in the gravings of Mellan and Sadelers, is, that they express the shadows exceeding well, without any *hatches*, or *hatchings*.

H A T C H I N G S are of great use in heraldry, to distinguish the several colours of an escutcheon, without its being illumined. See COLOUR.

The first kind of *hatching* in pale, or from top to bottom, signifies *gules*, or *red*.—The second in fess, across the coat, *azure*, or *blue*.

Hatching in pale, counter-hatched in fess, signifies *sable*, or *black*.—*Hatching* in bend, proceeding from right to left, signifies *green*: and that in bars, from left to right, *purple*.

When the coat is only dotted, it is supposed to be *or*, or gold. And when quite bare, or void, *argent*, or *white*.

This invention is, commonly, ascribed to F. Pietra Sancta.—Though the Sieur de la Columbiere has disputed his title to it.

H A T C H M E N T, in heraldry, the marshalling of several coats of arms in an escutcheon.

H A T C H M E N T, is also a popular name for an achievement. See A T C H I E V E M E N T.

H A T T O C K, a shock of corn, containing twelve sheaves, —Others make it only three sheaves laid together.

H A V E N *, a sea port, or harbour for ships. See P O R T, and H A R B O U R.

* The word is derived from the Saxon *hafene*, or the German *hafen*, or the French *havre*; which all signify the same thing.

H A U N C H, or H A N C H, the hip; or that part of the body between the last ribs, and the thigh.

The *haunches* consist of three bones, joined together by cartilages; which, in course of time, grow dry, hard, and bony; so that in adults, the three only seem to constitute one continued bone.

HAUNCHES, or hips of a horse, are those parts of the hind quarters which extend from the reins or back, to the hough or ham.

One of the most necessary lessons in managing the great horse, is that of *putting him upon his haunches*; which, in other terms, is called to *couple him well*, or to put him well together, or make him compact.

A horse that does not *bend*, or lower his haunches, throws himself too much upon his shoulders, and is heavy upon the bridle.—To *drag the haunches*, is to change the leading foot in galloping.

HAUNT, among hunters, the walk of a deer, or the place of his ordinary passage. See HUNTING.

HAVRE, in geography, &c. a French term, signifying the same with *haven*, or *harbour*.

HAUTBOY*, or HOBBOY, a sort of musical instrument, of the wind kind, with a reed to blow or play it withal.

* The word is French, *haut-bois*, q. d. high-wood; and is given to this instrument, by reason its tone is higher than that of the violin.

The *hautboy* is shaped much like the flute, only that it spreads, or widens more toward the bottom. The treble is two foot long: the tenor goes a fifth lower, when blown, or founded open: it has only seven holes. The bass is five foot long, and has eleven wholes.

HAW, among farriers, &c. a gristle growing between the nether eye-lid and the eye of a horse, or other beast, and which will put the Eye quite out, if not timely taken away.

It comes by gross, tough, and flegmatic humours, falling from the head, and knitting together, which in the end grow to this infirmity; the signs whereof are the watering of the eye, and involuntary opening of the nether side.

Every common farrier can cut it out:—The affected beast is to be held fast by the head, and, with a strong double thread, a needle is to be put in the midst of the upper eyelid, and tied, if it be a bullock, to his horn: then taking the needle again, with a long thread, and putting it through the gristle of the *hawk*, with a sharp knife cut the skin finely round, and so pluck out the *hawk*.—That done, they dress the eye, take out the blood, wash it with beer, or ale, and cast in a good deal of salt; then wash it again afterwards, stroking it down with their hands, and so let him go.—To cure a sheep of this malady, they drop into the eye the juice of camomile, or crows-foot.

HAWK, *Accipiter*, a bird of prey, of a bold and generous nature; whereof there are several species.

The *hawk* makes the subject of a particular art, called *hawking*, or *falconry*.

Naturalists disagree about the number and division of the *hawk* kind.—The most commodious distribution is that into *long-winged* and *short-winged* *hawks*.

To the *long-winged*, which may be also called the *falcon* tribe, belong the falcon, haggard falcon, ger-falcon, lanner, hobby, faker, merlin, and hawler: all which are reclaimed, manned, fed, and mued, much after the same manner.—Of the *short-winged* species, or *hawks* properly so called, are the *gos-hawk* and *sparrow-hawk*.

The former are generally brought to the lure; and seize their prey with the foot; breaking the neck-bone with their beak, ere they proceed to plume or tire it: the latter are brought to the fist, and kill their game by strength and force of wing, at random; and proceed immediately to plume them.

It is to be noted, that the female of all birds of prey is much larger, stronger, and more courageous than the male; which is distinguished therefrom by some diminutive name.—Those of the *falcon* and *gos-hawk*, are called *tiercels*, or *tiercelets*; that of the ger-falcon, *jerkin*; that of the merlin, *jack*; that of the hobby, *robbin*; that of the sparrow-hawk, *musket*; and that of the lanner, *lanneret*.

The *Hawk* also has different names, according to their different ages.—The first year she is called a *soarage*.—The second, an *entrevieu*.—The third, a *white hawk*.—The fourth, a *hawk of the first coat*.

Add, that they have different denominations according to the different seasons when they are taken.—Those taken in the ayrie, are called *eyesses*, or *nyesses*.—Those which had forsaken it, and were fed in some place not far off, by the old ones, *branchers*.—Those which had begun to prey for themselves, *saar-hawks*.—Those which have changed their feathers once or more *mewed-hawks*.—And those which lived at large, and preyed for themselves about the woods, *baggards*.

We shall here, according to our method in other cases, give the reader what relates to the several species of *hawks*; referring for what is common to them all, to the article HAWKING.

1^o. Of the *falcon*, or *falcon-gentle*, her nature and qualities; with the manner of luring and reclaiming, and bringing her up to the sport, we have elsewhere spoke under the article FALCON.

2^o. The *baggard falcon*, called also *pergrine falcon*, *passenger*, and *traveller*, because no native of our island; or rather, by reason of its roving, and wandering more than any other

fort; is not inferior to the best of the tribe, for strength, courage, hardiness, and perseverance. She is distinguished from the common falcon, as being larger, longer, armed with a longer beak and talons, a higher neck, &c. She will lie longer on the wing; and is more deliberate and advised in her stooping, than the others.

The haggard falcon, when wild and unreclaimed, takes the greatest liberty of all birds; living either by land or sea; and is of such absolute power, that wherever she comes, all flying fowl stoop under her subjection; even the tiercelet, though her natural companion, dares not sit by her, or approach her residence, except in cawking time; when, for procreation sake, she admits him in a fubmissive manner to come near and woo her.

When very young, she is apt to attack birds too strong for her; which she persists in, till a found beating has brought her to a better understanding.—She is an incessant pains-taker; no weather discouraging her from her game.—When, unreclaimed, as soon as she has seized her prey, and broke the ink or neck, she falls on the crop, and feeds first on what is contained there; then on the other parts. When she has filled her gorge, she flies to some solitary place, near the water, where she sits all day, and at night takes wing to some convenient place, where she had before purposed, to perch till morning.

For the method of reclaiming, manning, entering, &c. a *baggard falcon*, or other sort of hawk, with the terms of art used in respect thereof; see the article HAWKING.

3^o. The *ger-falcon*, or *gyr-falcon*, is the largest bird of the falcon kind; coming next to the size of a vulture; and is of the greatest strength next an eagle: she is stoutly armed, and in all respects a lovely bird to the eye.

Her head and eyes are like those of the haggard; her beak great and bending, her nares large:—her sails long and sharp pointed, and her train and mail much like the lanners, having a large marble seared foot; and plumed black, brown, and russet.—She may also be called a *passenger*, her ayrie or breeding place being in Prussia, Muscovy, and the mountains of Norway.

The *ger-falcon* is of a fierce and fiery nature, and is very hardy managed and reclaimed; but being once overcome, she proves an excellent *hawk*, scarce refusing to strike at any thing.—She does not naturally fly the river; but always pursues the herons, shovellers, &c. In going up to their gate, they do not hold the course, or way, which others use to do; but climb up upon the train, when they find any fowl, and as soon as they have reached her, pluck her down, if not at the first, yet at the second or third encounter.

4^o. The *faker*, or *sacre*, is the third in esteem, next the falcon and ger-falcon, but difficult to be managed, being a passenger, or *pergrine hawk*, whose ayrie has not yet been discovered, but the young are chiefly found in the islands of the Levant.

She is somewhat longer than the haggard falcon; her plume ruffy and ragged; the fear of her foot and beak like the lanner; her pounces short, and her train the longest of all birds of prey.

She is very strong and hardy against all kind of fowl, being a great deal more disposed to the field than the brook; and delighting to prey on great fowl, as the heron, goose, &c. but for the crane she is not so free as the haggard falcon.—She also excels for the lesser fowl, as pheasants, partridges, &c. and is much less dainty in her diet, as long-winged *hawks* usually are.

The *faker* makes excellent sport with a kite; who, as soon as he sees the *faker* cast off, immediately betakes himself to, and trusts in the goodness of his wings, and gets to his pitch, as high as possibly he can, by making many towers and wrenches in the air; which, together with the variety of contents and bickerings between them, affords a curious spectacle.

5^o. The *lanner*, or *lanar*, is a *hawk* common in most countries, especially in France; making her ayrie on lofty trees in forests, or on high cliffs near the sea-side.

She is less than the falcon-gentle, fair plumed and of shorter talons than any other falcon.—Such as have the largest and best fashioned heads, are esteemed the best.

Mewed lanners are not easily known from *gos-hawks*, or *fakers*; the chief marks and characteristics are, that they are blacker, have less beaks, and are less armed and pounced than any other *hawks*.

Of the whole *hawk* tribe, there is none so fit for a young falconer as this, because she is not inclined to surfeits, and seldom melts away by being overdone.

There is another sort of *lanner*, whose ayrie is in the Alps, having their heads white, and flat aloft, large and black eyes, slender nares, short and thick beaks; being less than the haggard, and falcon-gentle, though there are different sizes of them; their tail is marble, or russet; their breast-feathers white and full of russet spots, and the points and extremities of their feathers full of white drops; their sails and trains long; they are short legged, with a foot less than that of a falcon, and marble seared.—This *hawk* never lies upon the wing, after she has flown to a mark; but after once stooping, makes a point; and like the *gos-hawk*, waits the fowl.—She is more valued abroad than

in England; we looking on her as stoutheaded, and hard mettled. The truth is, a very strict hand must be kept over her; as being of an ungrateful disposition.—She is flown at field or brook, and will maintain long flights; by which means much fowl is killed. To fly them, they must be kept very sharp; and because they keep their castings long, they must have hard castings, made of tow, and knots of hemp.

6°. The merlin is the smallest of all birds of prey; and bears a resemblance to a haggard falcon in plume, as also in the fear of the foot, beak, and talons, and is not unlike her in conditions.

—When well manned, lured, and carefully looked after, she proves an excellent hawk; especially at partridge, thrush, and lark.—But she is very busy, and unruly, and special care must be had lest the unnaturally eat off her own feet and talons, as she has often been known to do. She is very bold; and will fly at birds bigger than herself, with such eagerness, as to pursue them even into a town or village.

Though the merlin be accounted a hawk of the fist, she may be brought to take delight in the lure; when you have made her come to the lure, so as she will patiently endure the hood, you should make her a train with a partridge; if the foot and kill it, reward her well: then fly her at the wild partridge, and if she take or make it at first or second flight, being retrieved by the spaniels, feed her upon it with a reasonable gorge; cheering her in such manner with the voice, that she may know it another time: If she do not prove hardy at the first or second time, she will always be good for nothing.

7° The hobby, is a sort of hawk that naturally preys on doves, larks, and other small game.

She has a blue beak, but the feet thereof and legs are yellow; the crinels, or little feathers under the eye, very black; the top of the head between black and yellow.

She has also two white seams on her neck: the plumes under the gorge, and about the brows, are reddish, without spot or drop; the breast feathers for the most part are brown, yet interspersed with white spots; her back, train, and wings, are black aloft, having no great scales upon the legs, unless a few behind: the three stretchers and pounces are very large, with respect to her short legs; her brail feathers are tinged between red and black; the pendant ones, or those behind the thigh, of a rusty, smoky hue.

She is a hawk of the lure, and not of the fist; and is an high flyer, being in every respect like the falcon, but that she is of a much less size; for she is not only nimble and light of wing, but dares encounter kites, buzzards, or crows, and will give soule for soule, and blow for blow, till sometimes they cease, and come tumbling down to the ground both together.—But she is chiefly for the lark, which poor little creature does so dread the sight of her, soaring in the air over her, that she will rather chuse to commit herself to the mercy of men or dogs, or to be trampled on by horses, than venture into the element, when she sees her mortal enemy there.

The hobby also makes excellent sport with nets and spaniels; for when the dogs range the field, to spring the fowl, and the hobby soars aloft over them, the poor birds, apprehensive of a conspiracy between the hawks and dogs to their utter ruin, dare not commit themselves to their wings, but think it safer to lie close on the ground, and so are taken in the nets.—This sport is called *daring*.

8° The *gos-hawk*, or *goss-hawk*, q. d. *gros hawk*, is a large short-winged hawk, of which there are several sorts, differing in goodness, force, and hardness, according to the diversity of their choice in cawking; at which time the several sorts of birds of prey assemble themselves with the *gos-hawk*, and gallant it together.

There are *gos-hawks* from most countries, but none better than those bred in the north of Ireland.—This Hawk ought to have a small head, a long and straight face, a large throat, great eyes deep set; the apple of the eye black; nares, ears, back, and feet large and black; a black long beak, long neck, big breast, hard flesh, long fleshy thighs, the bone of the leg and knee short, long large pounces and talons; and to grow round from the fern, or train, to the breast forward.—The feathers of the thighs, towards the train, should be large, and the train feathers short and soft, somewhat tending to an iron mail.

The brail feathers ought to be like those of the breast; and the covert feathers of the train, spotted and full of black rundles, but the extremity of every train feather, black streaked.

To distinguish the strength of the bird, tie divers of them in several places of one chamber, or mew; and that hawk that slices and nutes highest and farthest off, may be concluded to be strongest.

The *gos-hawk* flies at the pheasant, mallard, wild goose, hare and coney; nay, she will venture to seize a kid, or goat.—She is to be kept with care, as being very choice and dainty in eating, &c.

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9° *Sparrow-hawk*, is also a kind of short-winged hawk; whereof there are several sorts, different in plumes: some small plumed and black; others of a larger feather; some plumed like the quail; some brown or of a canvas-mail, &c.

The *sparrow-hawk*, so far as her strength will give her leave, is a good hawk; and he that knows how to man, reclaim, and fly with a *sparrow-hawk*, may easily attain to the keeping and managing of all others.—In this respect she really excels, that she serves both for winter and summer, with great pleasure, and will fly at all kind of game, more than the falcon.

HAWKERS*, antiently, were fraudulent persons, who went from place to place, buying and selling brags, pewter, and other merchandize, which ought to be uttered in open market.—In this sense the word is mentioned, anno 25 Hen. VIII. c. 6. and 33 ejusdem, c. 4.

* The appellation *hawkers*, seems to have grown from their uncertain wandering, like those who, with *hawkets*, seek their game where they can find it.

HAWKERS, is also now applied to those who go up and down London streets, crying news-books, and selling them by retail.

The women who furnish the *hawkers*, i. e. sell the papers by wholesale from the press, are called *mercuries*.

HAWKING, the art, or exercise of chasing and taking wild fowl, by means of *hawkets*, or birds of prey.

Hawking is the same thing with what we otherwise call *salconry*.

The word *hawking*, in its latitude, does also include the taming and disciplining of hawks, and fitting them for the sport.

Hawking, though an exercise now much disused among us, in comparison of what it antiently was, does yet furnish a great variety of significant terms, which still obtain in our language.

Thus, the parts of a hawk have their proper names.—The legs, from the thigh to the foot, are called *arms*; the toes, the *peety-fingers*; the claws, the *pounces*.—The wings are called the *ails*; the long feathers thereof, the *beams*; the two longest, the *principal feathers*; those next thereto, the *flags*—

The tail is called the *train*; the breast feathers the *mails*; those behind the thigh, the *pendant feathers*.—When the feathers are not yet full grown, she is said to be *unflammed*; when they are compleat, she is *flammed*.—The craw, or crop, is called the *gorge*:—The pipe next the fundament, where the faeces are drawn down, is called the *panel*.—The slimy substance lying in the panel, is called the *glut*.—The upper and crooked part of the bill, is called the *beak*; the nether part, the *clap*: the yellow part between the beak and the eyes, the *sear* or *scree*; the two small holes therein, the *nares*.

As to her furniture:—The leathers, with bells buttoned on her legs, are called *beavits*.—The leathern thong, whereby the falconer holds the hawk, is called the *leafe*, or *leash*; the little straps, by which the leafe is fastned to the legs, *jestes*; and a line or packthread fastned to the leafe, in disciplining her, a *creance*.—A cover for her head, to keep her in the dark, is called a *hood*; a large wide hood, open behind, to be wore at first, is called a *ruffet hood*: To draw the strings, that the hood may be in readines to be pulled off, is called *unstriking the hood*.—The blinding a hawk just taken, by running a thread through her eyelids, and thus drawing them over the eyes, to prepare her for being hooded, is called *feeling*.—A figure, or resemblance of a fowl, made of leather and feathers, is called a *lure*.—Her resting place, when off the falconer's fist, is called the *perch*.—The place where her meat is laid, is called the *back*.—And that wherein she is set, while her feathers fall and come again, the *mew*.

Something given a hawk, to cleanse and purge her gorge, is called *casting*.—Small feathers given to make her cast, are called *plumage*.—Gravel given her to help bring down her stomach, is called a *rangle*.—Her throwing up sith from the gorge after casting, is called *gleaming*.—The purging of her greafe, &c. *enfeaming*.—A being stuffed is called *gurgiting*.—The inserting a feather in her wings, in lieu of a broken one, is called *imping*.—The giving her a leg, wing, or pinion of a fowl to pull at, is called *tiring*.—The neck of a bird the hawk preys on, is called the *ink*.—What the hawk leaves of her prey, is called the *pill*, or *pelf*.

There are also proper terms for her several actions:—When she flutters with her wings, as if striving to get away, either from perch or fist, she is said to *bate*.—When standing too near, they fight with each other, it is called *crabbing*.—When the young ones quiver, and shake their wings in obedience to the elder, it is called *covering*.—When she wipes her beak after feeding, she is said to *seak*.—When she sleeps, she is said to *jouk*.—From the time of exchanging her coat, till the turn white again, is called her *intermeawing*.—Treading is called *cawking*.—When she stretches one of her wings after her legs, and then the other, it is called *mantling*.—Her dung is called *muting*; when she mutes a good way from her, she is said to *slice*; when she does it directly down, instead of yerking backwards, she is said to *slime*; and if it be in drops, it is called *dropping*.—When she as it were sneezes, it is called

led *sitting*.—When she raises and shakes herself, she is said to *rouse*.—When after mantling, she crosses her wings together over her back, she is said to *warble*.

When a hawk seizes, she is said to *bind*.—When after seizing she pulls off the feathers, she is said to *plume*.—When she raises a fowl aloft, and at length descends with it to the ground, it is called *truffing*.—When being aloft, she descends to strike her prey, it is called *flooping*.—When she flies out too far from the game, she is said to *rake*.—When forsaking her proper game, she flies at pyes, crows, &c. that chance to be taken herself to the next check, she is said to *fly on head*.—The fowl or game she flies at is called the *quarry*.—The dead body of a fowl killed by the hawk, is called a *pel*.—When she flies away with the quarry, she is said to *carry*.—When in *flooping*, she turns two or three times on the wing, to recover herself ere she seizes, it is called *canceliering*.—When she hits the prey, yet does not trust it, it is called *ruff*.—The making a hawk tame and gentle, is called *reclaiming*.—The bringing her to endure company, *manning* her.—An old french hawk, used to fly and set example to a young one, is called a *make-hawk*.

The *reclaiming*, *manning*, and *bringing up* a hawk to the sport, is not easy to be brought to any precise set of rules.—It consists in a number of little practices, and observances, calculated to familiarize the falconer to his bird, to procure the love thereof, &c.—The principal hold and foundation which the falconer has to work upon, is the bird's stomach.—This great principle of appetite he is to make use of a hundred ways, to lead the bird obliquely to what he would have from her; all he can do is to divert nature, and make her subservient to his purposes, to make it the interest of the bird, either real or apparent, to do what the falconer requires of her. The course, it is evident, will be different, according to the state and condition of the bird to be managed.—An *eyfs*, *e. g.* needs no *reclaiming*; she is to be carefully nursed, and brought up in her natural tameness.

A *brancher*, *scar-hawk*, or *ramage-hawk*, needs no nursing; she is to be brought down from her wildness, and habituated to another course of life; and in pursuance of her own views and interests, she is to be made subject to those of her master.

To *reclaim*, *e. g.* a *baggard falcon*; they begin with shutting her up from the light, by pulling a hood over her eyes; and fixing her by a *creance*, which makes her more accessible.—The next thing is to handle her frequently, taking her up, often stroking her, setting her on the hand, and carrying her about; unhooding, and presently hooding her again; and this for eight or nine days, without ever suffering her to sleep.—All the while she is to be kept sharp set, but to be frequently fed, with a little at a time; unhooding her for the purpose, and when unhooded, the voice is to be continually used to her, that she may learn it; and that the hearing of the voice may naturally put her in hopes of being fed.—This done, she is to be invited to come from the perch to the fist, by unfriking her hood, shewing her some meat, using the voice, and calling her till she come to it, and feed thereon.—If she still refuse, keep her sharp set till she will do it.—Proceed then to bring her to the lure, by giving her to some person to hold, and calling her with a lure, well garnished with meat on both sides, and give her a bit: use her to this for six or seven days; after which tempt her to come gradually further and further off to the lure, waving it, and casting it round your head, &c. and if she come to it roundly, reward her. In three or four days more call her to your lure, well garnished as above, as far as it is possible for her to see or hear you; and set her loose from all her furniture.

The hawk thus manned, reclaimed, and lured, you may go with her into the fields; and whistle her off your fist, to see whether she will rake out or no. If she mount and fly round you in circles, as a good hawk ought to do; after two or three turns call to her with your voice, and sling out the lure about your head, and upon her *flooping* or coming to it, give her a chicken, or pigeon, and let her kill and feed thereon.—Being thus far initiated, give her first stones, every evening, to prepare her body for castings; and then castings, to cleanse and scour her body, and make her eager.—This course continue, till she have endewed and muted enough to enter upon business.

If the hawk be intended for some particular sort of game, let her lure be a resemblance of that sort of game; and make a practice of frequently feeding and rewarding her thereon, or on a train of the same kind: calling her, when feeding, as if she were called to the lure: Add, that it may be proper to feed her in such sort of places as those her game is chiefly to be found in.

To enter a hawk, it may be convenient to take a well quarried hawk, and let her stoop a fowl, on brook or plash; this done, reward, hood, and set her; and taking the young hawk, go half a bow-shot up the wind, loose her hood, and softly whistle her off the fist, till she have rouzed or muted; then let her fly with her head into the wind; and when she is at

a proper height, let go a fowl for her to stoop and trust. See further under the article FALCON.

HAWSER, or HALSER, belonging to a ship, is a rope consisting of three strands; being a kind of little cable, serving for many uses on board, as to fasten the main and fore shrouds, to warp a ship over a bar, &c.

HAWSES, in a ship, are two round holes under her head, through which the cables pass when she lies at anchor.—See *Tab. Ship*, fig. 2. n. 10. See also the articles CABLE, and ANCHOR.

Burning in the HAWSE, is when the cable endures an extraordinary stress.

Clearing the Hawsse, is the untwisting of two cables, which being let out at different hawses, are entangled or twisted about one another.

Bald Hawsse, is when the holes are high above the water. *Fresh the Hawsse*. When there is reason to suspect the cable may be fretted in those holes, they veer out a little, to let another part endure the stress.—This they call to *fresh the hawsse*.

Freshing the Hawsse, is also used when new pieces are laid upon the cable in the hawsse.

Riding upon the Hawsse, is when any weighty substance lies across, or falls directly before the hawsse.

HAY, HAYA, or HAYE, a fence or inclosure, formed of rails; wherewith some forests, parks, &c. were antiently surrounded.

HAY is sometimes also used for the park itself.—And, sometimes for an hedge, or a place hedged round.

HAYS also denote a particular kind of nets, for the taking of rabbits, hares, &c.

HAYBOTE *, HEDGEBOTE, in our antient customs, a mulct, or recompence for hedge-breaking; or rather, a right to take wood necessary for making hedges, either by a tenant for life, or for years, though not expressed in the grant or lease.

* It is mentioned in the *Monest.* 2 Tom. pag. 134, & *concedo ei ut de bosco meo haybot*, &c.—In the same place, *haybote* signifies a right to take timber to repair the house.

HAYWARD, or HAWARD, a keeper of the common herd of cattle of a town; who is to look that they neither break nor crop the hedges of inclosed grounds; and is sworn in the lord's court, for the due performance of his office.

HAZARD. See the articles CHANCE, and GAMING.

HEAD, *Caput*, the uppermost, or foremost part of the body of an animal.

Pliny, and other of the antient naturalists, speak of a nation of people without heads, called *Blemmys*. See BLEM-MYES.

We have accounts in modern geographers and travellers, of people whose heads are as flat as the hand; it being the custom among them to flatten their childrens heads, when newborn, by passing them through a press, or laying them between two planks with a considerable weight thereon.—These are said to be the inhabitants of the province *Cosaguas*, on the river *Amazons*, in South America.

Anatomists account the head of man the first, or uppermost venter; being that which comes last in order of dissection, by reason its contents are not so subject to corruption as those of the others.

The head is divided into two parts: the first, the *calvaria*, or scalp, being that part covered with hair.

The second smooth, or without hair, called the *face* or *vifage*; by the Latins *vultus*; and by the Greeks, *prosepon*, *q. d.* looking forward.

The former is subdivided into four; viz. the *front*, or forehead, which is reputed the moist humid, called by physicians the *frons*, *q. d.* *fontium caput*.

The hind, or back part, called *occiput*; by the Greeks, *inion*; by reason all the nerves, which among them are called *ines*, arise herefrom.

The middle, or top part, called the *crown* of the head, and by anatomists *vertex*, à *vertendo*, by reason the hair turns round there.

Lastly, the sides are called the *temples*, *tempora*, as being the places where the hair first begins to turn gray, and discover the age.

The bone, or basis of the head, is called by one general name, *skull*, or *cranium*; consisting of several parts, or lesser bones.

The bone of the forehead is called *os frontis*, or *puppis*, or *coronale*, or *verecundum*; whence impudent persons are said to be *fronsless*.

The bone of the scalp is called *os scapitis*, or *bregma*.

The bone of the back of the head, as *occipitis*, or *proxa*.

And those of the temples, *temporalia*, or *ossa tempora*. These bones are connected or joined together by sutures. In the head are seated the principal organs of sense, viz. the eyes, ears, &c. and in it is likewise the brain, invested with its meninges, the supped feat of the soul.

The *head* is moved by ten pair of muscles, viz. the *par splenium*, *complexum*, *rectum majus externum*, *rectum minus externum*, *obliquum superius*, *obliquum inferius*, *massoideum*, *rectum internum majus*, *rectum internum minus*, and *rectum laterale*. See each described under its respective article.

The Orientals cover the *head* with a turban, or a cap.—The Occidentals with a hat, &c.

Kings, on solemn occasions, wear the crown on their *head*; bishops the mitre, &c.

The antient cavaliers wore helmets.—The soldiers, casks.

HEAD, is also used for the top of a tree, or other plant.

HEAD, is also applied to the extremity of a bone.

When a bone has a round tip, or end, which advances, or projects forward, whether in the way of an apophysis or epiphysis; it is called the *head* of the bone.

If its rise, or origin, be slender, and it enlarge by degrees, it is called the *neck*.

If it terminate in a point, it is called *corona*, *corvus*, or *coracoides*, as resembling a crow's bill.

When the *head* is flat, they call it *condylus*, or *double head*; as in the extremities of the bones of the fingers.

HEAD, is also used for the extreme of a muscle, which is fattened or inserted into the stable-bone, or the part not intended for motion.

The *head* of a muscle is always a tendon.

HEAD, again, is applied in the mechanic arts, to the parts of inanimate and artificial bodies.

In this sense we say, that some nails have *heads*; others hooks; or others, as brads, neither. See NAIL.

So also we say, the *head* of a pin, &c.

HEAD, is also used in painting, sculpture, &c. for a picture, or representation of that part of the human body; whether in colours, draught, relievo, or creux.

Those in painting, taken from the life, or supposed to bear a just resemblance to the person; are more properly called *portraits*.

HEAD, in architecture, &c. an ornament of sculpture, or carved work, frequently serving as the key of an arch, or plat-band, and on other occasions.

These *heads* usually represent some of the Heathen divinities, virtues, seasons, ages, &c. with their attributes.—As a trident for Neptune, a helmet for Mars, a crown of ears of corn for Ceres, a caduceus for Mercury, a diadem for Juno.

The *heads* of beasts are also used in places suitable thereto: as a bullock's, or sheep's *head*, for a shambles or a market-house; a dog's, for a kennel; a deer's, or boar's, for a park or forest; or a horse's, for a stable, &c.

In the metopes of the freezes, and other parts of certain antique Doric temples, we meet with representations of bullocks, or ram's *heads* head; as a symbol of the sacrifices offered there.

In heraldry, the *heads* of men, beasts, birds, &c. are bore in armoury, either full-faced and in front, or side-faced and in profile; which must be distinguished in blazoning—*Vert a chevron gules, between three Turks heads, couped, side-faced, proper*: by the name of Smith.

Among medals, the different *heads* on antient coins, are distinguished by the different dresses thereof. See MEDAL.

In the Imperial medals, where the *head* is quite bare, it is usually a sign the person was not an emperor, but one of the children of one, or the presumptive heir of the empire.

Though we have instances of those who were only Cæsars, and never adorned, being crowned with laurel, or adorned with a diadem: as on the contrary, we have some emperors *heads* entirely bare.

The *heads* which are covered, are either covered with a diadem, or a crown, or a simple cask, or a veil, or with some other foreign covering; whereof the diadem is the most antient.—The senate first granted it to Julius Cæsar, to wear the laurel crown, which his successors took after him.

The *heads* of deities are frequently distinguished by some special symbol thereof.

HEAD, is also applied to monsters; supposed most of them fabulously to have many *heads*. See MONSTER, &c.

The serpent Amphioxæna, is said by naturalists to have two *heads*.—The poets attribute three *heads* to Heate, Geryon, and Cerberus: and Typhon and Hydra are said to have an hundred *heads*.

The *head* of the gorgon Medusa, is said to have struck people dead with the very sight.—It has been since they tell us, translated into heaven, and made a constellation; where it still shines as a part or appendage of the constellation Perseus; continuing still to dispense its malific influences, as the astrologers suppose, upon our earth.

The stars, &c. in Medusa's *head*, which is also called from the Arabs, *ras algal*; see among the rest of PERSIUS.

HEAD, is also used for the horns of a deer; as a hart, buck, &c.

Harts mew, or cast their *heads* every year; and get new ones.

The old hart, or buck, casts his *head* sooner than the young; and the time is about the months of February and March.—Having cast their *heads*, they instantly withdraw into the thickets; hiding themselves in convenient places near good water, &c. and far from the annoyance of flies.

After they have mewed, they begin to baton again in March, or April, i. e. to shoot out new horns; which at first appear like little branches.

Note, If a hart be gelt before he have a *head*, he will never bear any; and if he be gelt when he has a *head*, he will never after mew or cast it.—If only one of his testicles be taken out, it is said he will want the horn of that side: and that if one of the testicles be only tied up, he will want the horn of the opposite side.

The age of a hart, or deer, is usually reckoned by the number of *heads*.—A deer of the first *head*, the second *head*, &c.

At one year they have nothing but bunches, called *significators* of horns to come. The second year they appear more perfectly, but straight and simple: this makes the first *head*, properly called *broches*, and in a fallow deer, *pricks*. The third year they grow into two *spears*, or four, *fix*, or eight small branches. At the fourth, they bear eight or ten: at the fifth, ten or twelve: at the sixth, fourteen or sixteen: at the seventh year they bear their *heads* beamed, branched and summed as much as they will bear; never multiplying further, but only growing in magnitude.

The names and diversities of *heads* in the hunting language, are as follow:

The part that bears the antlers, royals, and tops, is called the *beam*; and the little streaks therein are *glitters*.—That which is about the crust of the beam, is termed *pearls*; and that which is about the bur itself, formed like little pearls, is called *pearls bigger than the rest*.—The *bur* is next the *head* and that which is about the bur, is called *pearls*.—The first branch is called *antler*, the second *sub-antler*—all the rest which grow afterwards, till you come to the crown, palm, or croche, are called *royals* or *sub-royals*; the little buds or broches about the tops, are called *croches*.

—The *heads* also go by several names: the first *head* is called a *crown-top*, because the croches are ranged in form of a crown.

—The second is called a *palm-top*, because the croches are formed like a man's hand.—In all *heads*, which bear not above three or four, the croches being placed aloft all of one height in form of a cluster of nuts, are called *heads of so many croches*: all *heads* which bear two on the top, or have their croches doubling, are called *forked heads*.—All *heads* which have double burs, or the antlers, royals, and croches turned downwards, contrary to other *heads*, are called *simple heads*. See HUNTING.

HEAD, is sometimes also used for the whole man.

In this sense we say, to offer a reward for a man's *head*.—

In profcriptions a price is set on a man's *head*.

Capitation is a tax laid upon each *head*; called also *poll* and *head mney*.

HEAD, again, is used figuratively in speaking of communities and bodies politic, for the principal or leading member thereof.

Thus, we say, a president or master, is at the *head* of his company.—A dean is the *head* of his chapter.—The ministers are at the *head* of affairs.

The king of Great Britain, is at the *head* of the protestant world, &c.

HEAD, is also used to denote the relation of priority; or that which comes first in any thing. See PRIORITY.

In this sense, we say, the names of authors should always appear at the *head* of their books.—Prefaces, and epistles dedicatory, come at the *head*.—The governor marches out at the *head* of the garrison.

HEAD, in the military art.—HEAD of the camp, is the front, or foremost part of the ground an army is incamped on; or that which advances most towards the field, or enemy.—The *head* of the camp is always to be the best fortified.

In the like sense we say, the *head* of the trenches.—The *head* of the sap.—Of the works, &c. meaning the fronts, or those parts next the enemy, and furthest from the body of the place.

Such a night the *head* of the trenches was carried further by an hundred paces.—There are two heads of a trench; that is, two attacks. See TRENCH, and ATTACK.

The *head* of a horn-work, is that part contained between the flanked angles of the two demi-bastions.

HEAD of a ship, or other vessel, is the prow, or part that goes foremost. See Tab. Ship, fig. 2. lit. A. fig. 1. lit. L.

HEAD, in the manage. The perfections requir'd to the *head* of a horse, are that it be small, narrow, lean and dry.—

Horses with a big, gross *head*, are apt, by their weight, to rest and loll upon the bridle; and so to incommode the rider's hand.—A horse with a large *head* can never look stately, unless

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unless he have a long and very well turned neck, and place his head well.—Horses with gross fat heads, much charged with flesh, are too often subject to infirmities of the eyes.

But the chief thing in a horse's head is a good *anjet*, so as he may be able to bring his head into its natural situation; which is, that all the forehead, from the brow to the nose, be perpendicular to the ground; so that if a plummet were applied thereto, it would but just raze or shave it. See HORSE.

The head of a horse is also used to import the action of his neck, and the effect of the bridle and wrift.

Moors HEAD, is understood of a horse with a black head and feet; the body being usually of a roan colour.

Moors HEAD, is also used by engineers, for a kind of bomb or granado, shot out of a cannon.

Moors HEAD, is also used in heraldry, for a representation, usually in profile, of a black-moors head, swathed or rolled about with a bandage; frequently born as a crest.

Moors HEAD, in chemistry, is a cover, or capital, of an alembic, having a long neck, to convey the vapours raised by the fire, into a vessel, which serves as a refrigeratory.

In music, the HEAD of a lute, theorbo, or the like, is the place where the pins or pegs are screwed, to stretch or slacken the strings.

Dragons HEAD, in astronomy, &c. is the ascending node of the moon, or other planet. See NODE.

HEAD-ACH, a painful sensation in the muscles, membranes, nerves, or other parts of the head. See CEPHALALGIA.

It is supposed to arise from an extraordinary distention of those parts, either by the fluids therein being rarified, or their quantity and motion increased.

When attended with a vomiting, deafness and watching, it portends madness; with a noise in the ears, dulness of feeling in the hands, &c. an apoplexy or epilepsy.

The cure is by bleeding in the jugulars; cupping or applying leeches to the temples, and behind the ears and neck.—Issues, emetics, and diaphoretics are also occasionally to be used; with anti-epileptics and apopleptics.—A vesicatory applied to the whole scalp is the last remedy.

M. Homberg gives us an extraordinary instance of the cure of a most vehement and inveterate head-ach, by an accidental burn of the head.

HEAD-BOROW, signifies the person who is the chief of the frank-pledge; and had antiently the principal direction of those within his own pledge. See FRANK-Pledge.

He was also called *burrow-head*, *burfholder*, now *boroughholder*, *third-borow*, *tything-man*, *chief-pledge*, and *borow-elder*, according to the diversity of speech in divers places.

This officer is now usually called a *high-constable*.

The *headborow* was the chief of ten pledges; the other nine were called *hand-borow*, or *plegii manuales*, &c.

HEAD-FARCIN. See the article FARCIN.

HEAD-LAND, in husbandry, is the upper part of a ground left for turning the plow; or that part which is ploughed across, at the ends of other lands.

HEAD-MOULD-SHOT, a disease in children, wherein the sutures of the skull, generally the coronal, *ride*; that is, have their edges shot over one another; and are so close locked together, as to compress the internal parts, the meninges, or even the brain itself.

The disease usually occasions convulsions; and is supposed to admit of no cure from medicines; unless room could be given by manual operation, or a division of the futures.

The *head-mould-shot*, is the disorder opposite to the *horse-shoe head*. See HORSE-SHOE-HEAD.

HEAD-SEA, is when a great wave or billow of the sea, comes right ahead of the ship, as she is in her course.

HEAD-STALL, in the manage. See the article CAVESON.

HEALFANG*, **HEALSFANG**, or **HALSFANG**, in our antient customs, signifies *calistfrigium*, or the punishment of the pillory. See PILLORY.

* The word is compounded of two Saxon words, *halp*, neck, and *fangen*, to contain, *scena scilicet qua alicui collum stringatur*. See COLLISTRIGIUM. The *healfang* however cannot signify a pillory in the charter of Canutus, de Forestis, cap. 14. *Et pro culpa siveat regi duos solidos quos Dani vocant halfehang*.

HEALFANG*, is also taken for a pecuniary punishment, or mulct, to commute for standing in the pillory; and is to be paid either to the king, or to the chief lord.

* *Qui falsum testimonium dedit, reddat regi vel terræ domino healfang*. Leg. H. I.

HEALING in its general sense, includes the whole process of curing or removing a disorder, and restoring health. In this sense, medicine is defined the art of healing.

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In its more restrained sense, as used in chirurgery, &c. *healing* denotes the uniting or consolidating the lips of a wound or ulcer.

The medicines proper for this intention, are called *incarnatives*, *agglutinatives*, *vulneraries*, &c.

Dr. Beal has a discourse of fanative, or *healing springs* and waters, in the *Philosophical Transactions*, N^o 20.

HEALING, in architecture, denotes the covering the roof of a building.

The *healing* is various; as of lead, tyles, slate, Horsham stone, shingles, or reed, and straw.

HEALTH, a due temperament, or constitution, of the several parts whereof an animal is composed, both in respect of quantity and quality.—Or it is that state of the body wherein it is fitted to discharge the natural functions perfectly, easily, and durably.

Health, is the state or condition, opposite to *disease*. The preservation and restoration of *health*, makes the objects of the art of medicine.

The continuance of *health* depends principally on the six non-naturals, *viz.* air, food, exercise, the passions, evacuation and retention, and sleep and waking. See each in its place.

The antients personified and even deified *Health*; or rather, they erected a goddess to whom they supposed the care of *health* to belong.—The Greeks worshipped her under the name *Hygieia*, and the Latins under that of *Salus*—The place of her worship at Rome was on the *mons Quirinalis*, where she had a temple; and a statue crowned with medicinal herbs.

We frequently find the goddess *Health* on the reverse of medals.—She is represented with a serpent stretched on her left arm, and holding a patera to it with the right. Sometimes she has an altar before her, with a serpent twisted round the same, and raising its head to take something off from it.

The inscription is SAL. AUG.

House of HEALTH, a kind of hospital, or public building, for the reception and entertainment of persons infected with the plague, or coming from places infected therewith. See PEST-HOUSE, QUARANTINE, &c.

In the like sense we say, officers of *health*, certificate of *health*, &c.

HEAM, in beasts, denotes the same with *after-birth* in women.

Thyme, penny-royal, winter savory, or common horehound, boiled in white-wine, and given a mare, are esteemed good to expel the *beam*.—Dittany apply'd in a pessary, expels the *beam*, as well as the dead foal: so also do fennel, hops, favin, angelica, &c.

HEARING, *Auditus*, the act, or faculty of perceiving sounds.

Hearing, is reckoned among our external senses—Its organ is the ear, and particularly the auditory nerve diffused through the same; and its object, certain motions, or vibrations of the air.

Hence, *hearing* may be more scientifically defined a sensation, whereby from a due motion impressed on the fibrillæ of the auditory nerve, and communicated thence to the sensory; the mind perceives, or gets the idea of sounds.

Philosophers have differed as to the immediate organ of *hearing*.—Aristotle will have it to be the cochlea and tympanum; and takes the sense of *hearing* to be seated therein. *Hist. Animal* cap. 10. in which he is followed by Galen, Lib. 8. *de usu part.* See TYMPANUM.

The moderns speak of the point on much better ground.—The ear, and the several parts thereof, membranes, canals, labyrinths, nerves, &c. they say are only means, and vehicles, for the reception, modification and transmission of the sonorous matter to the brain; which is the seat of the sense.

A sound, in effect, is nothing but a certain refraction, or modulation of the external air, which being gathered by the external ear, passes through the meatus auditorius, and beats upon the membrana tympani, which moves the four little bones in the tympanum.

In like manner, as this is beat by the external air, these little bones move the internal air, which is in the tympanum and vestibulum; which internal air makes an impression upon the auditory nerve in the labyrinth, and cochlea, according as it is moved by the little bones in the tympanum; so that according to the various refractions of the external air, the internal air makes various impressions upon the auditory nerve, the immediate organ of *hearing*; which different impressions represent different sounds.

Sir Isaac Newton carries the thing somewhat farther, and supposes *hearing*, like seeing, to be performed, not immediately by the vibrations of the air, but by those of some other more subtil medium, excited in the auditory nerves by the tremors of the air, and propagated through the solid capillaments of the nerve to the place of sensation.

The curious structure of the labyrinth, and cochlea, tend to make

make the weakest sounds audible; for the whole organ of hearing being included in a small space, had the auditory nerve run in a straight line, the impression would only have been made on a very small part of it; and the strength of the impression being, *ceteris paribus*, always as the number of parts upon which the impression is made, sounds which are now low, could not have been heard at all.—If the auditory nerve had, like the retina, been expanded into a large web, which had covered or lined some wide cavity, the impression of sounds, even in this case, had been much weaker than they are now: For this large cavity had given room for the sounds to dilate; and all sounds grow weaker, as they dilate.

Both of these inconveniences are prevented by the present structure of the labyrinth and cochlea, whose canals, by their winding, contain large portions of the auditory nerve, upon every point of which the smallest found being at once impressed becomes audible; and by their narrowness, the sounds are hindered from dilating: and the impressions made upon the nerves by the first dilations are always the strongest.

The strength of the impression in narrow channels, is likewise increased on account of the elasticity of the sides of the bony canal; which receiving the first and strongest impulses of the air, do reverberate them more strongly upon the auditory nerve.

It may be observed, that though the air be the usual matter of sounds; so that a bell rung in vacuo is not heard at all: yet will most other bodies, properly disposed, do the like office; only some more faintly than others.

Thus may a found be heard through water, or even through earth; of which we have various instances.

Add, that though the ear be the ordinary organ of hearing, yet Hagerup, a Danish physician, maintains, that one may hear with the teeth.—Thus, if one end of a knife, or the like, be applied on a harpsicord, and the other held between the teeth; the music thereof will be plainly heard, though the ears be ever so closely stopped.—But this, perhaps, may more properly be referred to the sense of feeling.

Such as want the sense of hearing are said to be *mutē* or *deaf*. See DEAFNESS.

‘The sense of hearing, says Cicero, is always open; for this we have need of even when asleep. The passage to it is full of turns, and meanders; that nothing hurtful may enter or find its way in. And if any little vermin does endeavor to pass; it must stick and be bemired in the *cerumen*, or ear-wax, laid for that purpose near the entrance.’ *De Nat. Deor. Lib. II. cap. 57.*

HEARING, is particularly used in civil and judicial concerns, for a cause being brought before the judge and jury, and the parties being heard as to the merits thereof. Such a cause was kept off eight months, before it was brought to a hearing.—We are to have our hearing the last day of the term.

The hearing of embassadors at the courts of princes is usually called *audience*.

HEARSE, among hunters, an hind in the second year of her age. See HUNTING.

HEART, *Cor*, in anatomy, a musculous part of the animal body, situate in the thorax; wherein the veins all terminate, and from which all the arteries arise; and which, by its alternate contraction and dilatation, is the chief instrument of the circulation of the blood, and the principle of life.—See *Tab. Anat. (Splanchn) fig. 12. lit. cc.*

This noble part is included in a capsula, or pouch, called the *pericardium*; whose structure and office will be explained under the article PERICARDIUM.

The figure of the heart is a cone, or pyramid reversed; the upper, and broader point whereof, is called the *basis*; and the lower the *apex*, or point; this is turned a little towards the left side.

The magnitude of the Heart is indeterminate, and different in several subjects, according to their respective dimensions.—Its ordinary length is about six inches, its breadth at the basis four or five; and the whole circumference, fourteen. Its place is in the middle of the thorax, between the two lobes of the lungs; and it is fastned to the mediastinum and pericardium, and supported by the great blood-vessels, to which alone it is immediately connected; being, for the convenience of its motion, disengaged from any other impediments.—It is covered with a thin membrane, which, about the basis, is guarded with fat; and which is no other than the common membrane of the muscles.

It has two great cavities called *ventricles*, somewhat unequal; the right being larger, capable of containing between two and three ounces of blood.—They are divided by a fleshy partition, consisting of the same muscular fibres with the parietes themselves, and called the *septum*; the figure whereof is concave towards the left ventricle, and convex towards the right.—There is no immediate communication between the

ventricles; but for the blood to pass out of one into the other, it must fetch a round through the lungs.

The parietes, or sides of these ventricles, are of a thickness and strength very unequal; the left much exceeding the right, because of its office, which is to force the blood through all the parts of the body; whereas the right drives it through the lungs only, and is therein greatly assisted by other parts.—The right ventricle, in effect, seems only intended with a view to the lungs; whence, in such animals as have no lungs, we only find one ventricle, which is the left.

In the ventricles are little muscles, called *columnæ carnae*, or *lacertuli*, these are derived from the parietes, and connected, by tendinous extremities, to the valves of the heart hereafter mentioned.

The ventricles are capped each with an auricle, or little muscle, consisting, like the ventricles themselves, of a double order of fleshy fibres.

The vessels, either arising from, or terminating in the heart, and its auricles, are two arteries, *viz.* the aorta, and the pulmonary artery, which have their origin from the two ventricles, *viz.* the aorta from the left, and the pulmonary from the right: and two veins, which terminate in the auricles, *viz.* the cava vein in the right, and the pulmonary vein in the left.

At the respective orifices of these vessels are placed valves. Particularly, at the orifice of the arteries, within each of them, are three semi-lunar valves, or membranes of a semi-lunar figure, which close the orifice of the artery, and hinder the relapse of the blood into the heart at the time of its dilatation.—At the mouth of the right ventricle, just at its juncture with the auricle, are three others called *tricuspidates*, from their three points being fastned by tendinous fibres to the columnæ carnae; so that upon the contraction, or systole of the heart, they close the orifice, and hinder the blood from recurring into the great vein.—The same office do the two mitral valves, at the exit of the left ventricle, stopping the return of the blood into the pulmonary vein.

The substance of the heart is entirely fleshy, or muscular.—The ancients, indeed, generally took it for what they call a parenchyma; but Hippocrates had a juster sentiment; and after him Steno and the moderns, have evidently found it to consist of a continued series of proper muscular fibres, variously contorted, or wound up, and ending at the orifices of the respective ventricles, where they form their tendons.

In dissecting the heart, after taking off the proper membrane, there appear, on the outer surface of the right ventricle, some slender straight fibres tending to and ending in the basis.—Immediately under these there is a double order of spiral fibres, the exterior whereof ascend obliquely from the septum to the basis, and form a sort of helix, or cochlea: The interior take a contrary course; winding obliquely from the right side towards the left, so as to encompass both ventricles, and ending in the basis on the left side, form likewise an helix of an inverse order.—Under these appear the fibres of the left ventricle; and first, a spiral series running to the left, under which, as in the other ventricle, lie another order running the contrary way, which not only extend to the outward paries, but encompassing the whole ventricle, make the septum more immediately appertain to, and be a part of, the left ventricle. Some of them, instead of terminating, as the rest do, in the tendons of the heart, run inwards, and form the columnæ carnae; while others reaching down to the cone, are wound about it, and form the circle called the *centre of the heart*.

The fibres of the heart appear to be the same with those of the other muscles; whence the part now generally passes for a real muscle; though some think that inference not over just, inasmuch as the aorta has the same claim to be reputed a muscle.

Some late authors, upon considering the structure and disposition of the spiral fibres, chuse rather to make the heart a double muscle, or two muscles tied together.—In effect, the two ventricles, with their respective auricles, are found two distinct bodies, two vessels or cavities, which may be separated, and yet remain vessels; the septum, which was supposed to belong only to the left, being now found to consist of fibres derived from them both.—To say no more, the two ventricles, according to M. Winslow, are two several muscles united together, not only by the septum, but by several plans of fibres arising from the exterior base of the heart, and meeting at the apex, which entering the left ventricle, lines the parietes, &c.

The heart has also its proper blood-vessels, *viz.* two arteries springing from the entrance of the aorta; and one larger vein, with one or two lesser, all which, from their encompassing the heart, are called *coronarie*.

The nerves of the heart and its auricles, come from a plexus of the par vagum, called by Willis, *plexus cardiacus*. It has also lymphæducts, which carry the lymph from the heart to the thoracic duct.

The use of the *heart* and its appendant auricles, is to circulate the blood through the whole body: in order to which, they have an alternate motion of contraction and dilatation.—By the dilatation, called the *diastole*, their cavity is opened, and their internal dimensions enlarged to receive the reflux blood from the veins; and by their contraction, called the *systole*, their cavity is shrunk, and their dimensions lessened, to expel the blood again into the arteries.

It must be added, that these alternate motions of the *heart* and auricles, are opposite in time to each other; the auricles being dilated whilst the *heart* is contracted again; and contracted whilst it is dilated, to drive the blood into it.

By means of the right ventricle, the blood is driven through the pulmonary vein, from which being received into the pulmonary artery, it is returned to the left ventricle; from which by the aorta, it is distributed all over the rest of the body, and thence returned to the right ventricle by the vena cava; so making an entire circulation through the whole body.

Schenchius gives an account of a man who had no *heart*; but Molinetti denies it: as also that there ever were two *hearts* found in any man, though the case be common in divers insects, which have often naturally several *hearts*; witness silk-worms, which have a chain of *hearts* running the whole length of their bodies. But we have in other authors instances of two *hearts*, even in the same man.—There have been *hearts* found all gnawed and devoured with worms: Muretus opened the *hearts* of some banditti, which were all hairy, or at least invested with a tomentum, or down.—And what is still more extraordinary, we have accounts of persons in whom the *heart* has been found inverted, or turned upside down; particularly in a woman hanged some time ago in Saxony, and a man hanged at Paris. *Journ. des Scav.*

Timorous animals, have always larger *hearts* than courageous ones; as we see in deer, hares, asses, &c.—There is a bone sometimes found in the basis of the *hearts* of certain animals, particularly deer, which seems to be no other than the tendons of the fibres of the *heart* indurated and ossified.

Historians relate, that Pope Urban VIII. being opened after his death, was found to have such a bone in his *heart*. The case is very usual in the trunk of the aorta, which springs from the *heart*.

Many amphibious creatures, as the frogs, &c. have but one ventricle in the *heart*.—The tortoise is said by the French academists to have three ventricles: M. Buffiere charges this on them as a mistake; and maintains it has but one. The point is scarce yet ascertained. *Mém. de l'Acad. an. 1703. and Philozoph. Transact. N° 328.*

Theory of the motion of the HEART.—The principle of motion in the *heart*, or the power from which its alternate contraction and dilatation arises, has been greatly controverted among the late physicians and anatomists.

The expulsion of the blood out of the ventricles, argues a very considerable motion in the part.—The motive power, it is certain, must surmount the resistance made to it; and according to Borell's computation, the resistance made to the motion of the blood through the arteries, is equal to 180000 pounds, which therefore are to be removed by the *heart*; or else the circulation must cease. Now, whence comes the machine of the *heart* to have such a power? And after the expulsion, what other power is it that surmounts the former, and restores its part to the dilatation, that is to produce a reciprocal actus? This whole affair remained in the utmost darkness and uncertainty, till Dr. Lower's excellent treatise *De Cordis*, where the mechanism, whereby the contraction, or systole, is effected, was admirably explained.—The cause of the dilatation, or diastole, which Dr. Lower had in great measure over-looked, has since also been happily supplied by Dr. Drake.

That the *heart* is a muscle, furnished and instructed for motion like other muscles, is abundantly demonstrated by Dr. Lower and others; and as it is a solitary muscle, without any proper antagonist, and not directly under the power of the will, nor exercising voluntary motion, it approaches nearest to the sphincter kind, all which have these conditions in common with it.

But in constant, and regular alternations of contraction and dilatation, the *heart* differs exceedingly from all the other muscles of the body.

This alternation has given the learned abundance of trouble, who finding nothing peculiar in the structure, which should necessarily occasion it; nor any antagonist, whose re-action should produce it; have been extremely perplexed to find out the cause.

That contraction is the proper action and state of all muscles, is evident both from reason and experience. For if any muscle be freed from the power of its antagonist, it immediately contracts and is not by any action of the will or spirits to be reduced to a state of dilatation.—Thus, if the flexors of any joint be divided; the extensors of that joint being by that means freed from the contrary action of their

antagonists, the joint is immediately extended, without any consent of the will, and in that state it remains; and so *vice versa*, if the extensors be divided.

Hence it appears, that the ordinary muscles have no restitutive motion, but what they derive from the action of their antagonists, by which they are balanced.—Thus the sphincters of the anus, vesica, &c. having no proper antagonists, are always in a state of contraction, and suffer nothing to pass them, but what is forced through them by the contrary action of some stronger muscles, which, though not properly called antagonists, yet on all necessary occasions, perform the office of such.

We have here, then, an adequate cause of the contraction of the *heart*, viz. the natural vis motrix of muscular fibres, whose proper nifus, or tendency, is to contract themselves.

It may be added, however, that though the muscular fibres of the *heart*, acted by the nerves, be the immediate instrument of its contraction, or systole, as is shewn by Dr. Lower, yet is there another cause which contributes not a little thereto, and which Dr. Lower overlooked, viz. the intercostal muscles and diaphragm, which aid and facilitate this contraction, by opening a passage for the blood through the lungs, which denied, would be an invincible obstacle.—Add, that the pulmonary artery and vein, spreading themselves throughout all the divisions and subdivisions of the bronchia of the lungs, and being as it were co-extended therewith, must suffer the like alteration of superficial dimensions, as the bronchia do in the elevation and depression of the costa. So that while the ribs are in a state of depression, whether before commerce with the external air, or after, the annular cartilages of the bronchia shrink one into another, and by that means their dimensions are exceedingly contracted: in conformity to which condition of the bronchia, the pulmonary artery and vein must likewise, either by means of their muscular coats, contract themselves to the same dimensions, or lie in folds or corrugations; which is less probable.—On the other hand, when the ribs are elevated, and the diaphragm bears downwards, the air rushing into the lungs, shoots out the cartilaginous rings, and divaricates the branches of the trachea, and by them extends the several divisions of the pulmonary artery and vein, and thereby lengthens and enlarges their cavities: and this their alternate action will be continued, and imparted to the *heart*; from which they arise.

This is a passage opened to the blood from the right ventricle of the *heart*, to the left, through the lungs, to which it could not otherwise pass; and the opposition which the blood, contained in that ventricle, must otherwise necessarily have made to its contraction, is taken off; and the systole thereby facilitated.

For the diastole, or dilatation of the *heart*, Dr. Lower contents himself to ascribe it to a motion of restitution of the over-strained fibres.—His words are, 'Since all its motion consists in its contraction; and the fibres of the *heart* are made for contraction only; it is evident, all the motion of the *heart* is in its systole; but, as the fibres are stretched beyond their tone in every contraction; for this reason, after that nifus is over, the *heart* relaxes again by a natural motion of restitution, and is distended by the influx of new blood from the veins. The diastole, then, is not effected by any further action of the *heart*, beside a remission of its former tension, and the influx of the blood.'

Now, if contraction be the sole action of those fibres, as it certainly is, and as the author here confesses; how can their distention, vulgarly, though improperly, called their relaxation, be a motion of restitution? for, from the nature of those fibres, and their disposition; the structure of the *heart* manifestly appears conical, and its dilatation a state of violence. So that the contraction is the true motion of restitution, and the only state to which it will spontaneously return when the force is taken off; and thus we are left still to seek for the true cause of the diastole, which appears the most difficult phenomenon relating to the *heart*.

Mr. Cowper, in his introduction to his anatomy, improves on the share Dr. Lower hints the blood to have in that action, and makes it the main instrument of the dilatation of the *heart*; in which he is followed by Dr. Drake; who, however, differs from him as to the manner, and reasons of its being so. 'The *heart* of an animal, says Mr. Cowper, bears a great analogy to the pendulums of those artificial automata, clocks and watches; while its motion is performed like that of other muscles, the blood doing the office of a pendulum.'—If he means that the blood, in its reflux, by gravitating on the auricles and ventricles, dilates and expands them; acting therein as a counterpoize to its contraction as a muscle; it is pity he had not given an explication at large of so abstruse and important a phenomenon: the specific gravity of the blood not seeming a cause adequate to the effect it is here supposed to produce.—For if the blood act only as a weight, by meer gravitation; so much of it only as descends from above the *heart*, can be employed in that action; which,

which, at the largest computation, does not amount to above five pound weight, and yet it must be able, according to the computation of Borelli, to overcome a resistance of 135,000 pound. Whatever, therefore, the force that dilates the heart, and is the cause of the diastole, be, it must be equal to that of the heart, the intercostal muscles and diaphragm; to all which it acts as an antagonist.

Such a power is hard, perhaps impossible to be found in the machine of an animal body; and yet without some such antagonist, it is as impossible the circulation of the blood should be maintained.---All the engines yet discovered within the body, conspire towards the constriction of the heart, which is the state of quiescence, to which it naturally tends; yet we find it alternately in a state of violence, or dilatation: and on this alternation does all animal life immediately depend.

Some external cause, therefore, must be found to produce this phenomenon; which cause must be either in some quality of the air, or the pressure of the atmosphere, because we have no constant and immediate commerce with any other media.

Some physicians observing this, and that, deprived by whatever means of communication with the external air, we become instantly extinct; have imagined, that in the act of inspiration, certain purer parts of the air were mixed with the blood in the lungs, and conveyed along with it to the heart, where they nourished a sort of vital flame, which was the cause of this reciprocal action of the heart.

Others, rejecting an actual flame, have fancied that these fine parts of air, mixing with the blood in the ventricles of the heart, produced an effervescence which dilated it.

But these notions have been long exploded, upon ample conviction; and it is a point yet undetermined, whether any air does mix with the blood at all in the lungs, or not.

But supposing that some air do insinuate itself into the pulmonary vein, it can no other way dilate the heart, than by an effervescence in the left ventricle, which would not dilate the right.---But even this opinion is contradicted by autopsy, and abundantly confuted by divers authors.

Upon the whole, the gross body of the atmosphere appears to be the true antagonist to all the muscles serving for ordinary inspiration, and the constriction of the heart; which is confirmed not only from its sufficient power, but from the necessity of its action upon animal bodies.

The heart, we have observed, is a solitary muscle, of very great strength; and the intercostal muscles and diaphragm, which likewise have no antagonists, are a vast additional force, which must be balanced by the contrary action of the intercostal muscles be voluntary, it does not exempt them from the condition of all other muscles serving for voluntary motion, which would be in a state of perpetual contraction, notwithstanding any influence of the will, were it not for the liberation of antagonist muscles. This liberation, between other muscles, is answered by the weight of the incumbent atmosphere, which presses upon the thorax, and other parts of the body. And as in all other voluntary motions, the influence of the will only gives a prevalence to one, of two powers before equilibrated; so here it serves to enable those muscles to lift a weight too ponderous for their strength not so assisted: so that as soon as that assistance is withdrawn, the ribs are again depressed by the mere gravitation of the atmosphere, which would otherwise remain elevated, through the natural tendency of those muscles to contraction.

---This is evidently proved from the Toricellian experiment, and those made upon animals in vacuo; where, as soon as the air is withdrawn, and the pressure thereby taken off, the intercostal muscles and diaphragm are contracted, and the ribs elevated in an instant, and cannot by any power of the will be made to subside, till the air is again let in to bear them forcibly down.

As in the elevation of the ribs, the blood, by the passage opened for it, is in a manner solicited into the lungs; so in their depression, by the subsidence of the lungs, and contraction of the blood-vessels consequent thereto, the blood is forcibly driven through the pulmonary vein into the left ventricle of the heart. And this, together with the general compression of the body by the weight of the atmosphere which surrounds and presses on its whole surface, is that power which causes the blood to mount in the veins, after the force impressed upon it by the heart is broken and spent, and which suffices to force the heart from its natural state to dilatation.

Upon computing the weight of a column of air equal to the surface of the body, it appears a power sufficient for the effects here ascribed to it: and considering that the bodies of animals are compressible machines, it appears that it must of necessity affect them in the manner here laid down.---And yet, though our bodies be entirely composed of tubuli, or vessels filled with fluids, this pressure, how great soever, being equal, every way, could not affect them, were it not that the superficial dimensions are equally variable: because, being compressed on all parts with the same degree of force, the contained fluids could not any where begin to recede, and make

way for the rest to follow, but would remain as fixed and immoveable, as if they were actually solid.

But, by the dilatation of the thorax, room is made for the fluids to move; and by the coaction of it, fresh motion is impressed; which is the great spring whereby the circulation is set and kept going.

This reciprocal dilatation and contraction of the superficial dimensions of the body, seems so necessary to animal life, that there is not any animal so imperfect as to want it, at least none to which our anatomical enquiries have yet reached.---For though most kinds of fish, and insects, want both moveable ribs and lungs, and consequently have no dilatatable thorax; yet that defect is supplied by an analogous mechanism, answering sufficiently the necessities of their life.---Thus, fishes, which have no lungs, have gills to do the office of lungs, receiving and expelling alternately the water, whereby the blood-vessels suffer the same alteration of dimensions, as in the lungs of more perfect animals.

Add, that the lungs, or air-vessels, of insects, are much more different from those of perfect animals, than those of fishes are; and yet in their action and use, they agree perfectly with both; that is, removing and expelling the air, and varying the dimensions and capacities of the blood-vessels. Having no thorax, or separate cavity for the heart and air-vessels, the latter are distributed through the whole trunk; by which they communicate with the external air through several spiracles or vent-holes, to which are fitted so many little tracheae or wind-pipes, which thence send their branches to all the muscles and viscera, and seem to accompany the blood-vessels all over the body, as they do in the lungs of perfect animals. By this disposition, in every inspiration, the whole body is inflated, and in every expiration compressed; and consequently the blood-vessels must suffer a vicissitude of extension and contraction, and a greater motion be thereby impressed on the contained fluids, than the heart, which in these creatures does not appear to be muscular, would be capable of giving.---The only animal, exempted from this necessary condition of receiving and expelling alternately some fluid in and out of the body, is a fetus: but this, while included in the womb, seems to have little more than a vegetative life; and ought scarce to be reckoned among the number of animals; and were it not for that small share of muscular motion which it exercises in the womb, it might, without absurdity, be accounted a graft upon, or branch of the mother.

One difficulty we must not here conceal, which will lie against the whole doctrine, viz. that the hearts of several animals have been found to beat regularly, and strongly, even in vacuo; not less so than in the air. Witness the hearts of frogs, tried by Mr. Boyle. *Philosoph. Transact.* No 62.

Effluvia of the force of the HEART.---The quantity of the force of the heart has been variously estimated, and on various principles; by various authors, particularly Borelli, Morland, Keill, Jurin, &c.

The force of the heart may be defined by the motion whereby the heart contracts; or by the motion of a weight which being opposed to the blood at its exit out of the heart, will just balance and stop the same.---This we have no way of coming at *a priori*; the internal structure of the part, and the nature and power of the contracting cause, being but imperfectly known: so that the only means remaining, is to estimate it by the effects.

All the action of the heart consists in the contraction of its ventricles: the ventricles contracting, strike or press upon the blood, and communicating part of their motion thereto, drive it out with vehemence where the passage is open.---The blood thus protruded into the aorta, and pulmonary artery, presses every way; partly against the coats of the arteries, which by the last diastole had been left in a collapsed, flaccid state; and partly against the anterior blood moving on too slowly before it. By such means the coats of the arteries are gradually distended, and the antecedent blood has its motions accelerated.---By the way it may be observed, that the more flaccid the arteries are, the less resistance will they make to dilatation; and the more they are dilated, the more strongly will they resist a further distraction; so that the force of the blood, at its egress out of the heart, is at first spent in distending the arteries, more than in protruding the antecedent blood; but afterwards more in protruding the blood, than in distending the arteries.

Borelli, we have already observed, in his *Oecon. Animal.* makes the obstacles to the motion of the blood through the arteries, equivalent to 180,000 pound; and the force of the heart itself, only equal to 3,000 pound, which is only $\frac{1}{60}$ of the opposition it has to overcome. Then, deducting 45,000 pound for the adventitious help of the muscular elastic coat of the arteries; he leaves the heart with a force of 3,000 pound to overcome a resistance of 135,000 pound; that is, with 1 to remove 45; which he supposes it enabled to do by virtue of percussion.

But had he proceeded in his calculation to the veins, which he allows

allows to contain quadruple the quantity of blood found in the arteries, and to which this energy of percussion either does not reach at all, or but very languidly; he would readily have seen the system of percussion to be insufficient.

But his calculus itself is also found to be faulty; the force ascribed by him to the heart being immensely too great.—D. Jurin shews, that had he not made a mistake in the computation, the resistance which the heart has to overcome, must have come out, on his own principles, much greater; and instead of 135,000 pound, would have been 1,076,000 pound, which transcends all probability.

The great faults in his solution consist, according to Dr. Jurin, in his estimating the motive force of the heart by a pondus at rest; in supposing the whole weight sustained by a muscle, in one of his experiments, to be sustained wholly by the contracting force thereof; in assuming muscles, equally heavy, to be of equal force: and in supposing the utmost force of the heart exerted at every systole.

Dr. Keill, in his *Essays of the Anim. Oecon.* first ventured to set aside Borelli's calculus; and substituted another, almost infinitely smaller, in its stead. His method of estimating the force of the heart is as follows:—Having the velocity wherewith a fluid flows out at an orifice, without meeting any resistance from an anterior fluid; the force which produces that motion is thus determined. Let the line AB be the height from which a falling body will acquire a velocity equal to that wherewith the fluid flows out at the orifice; then is the force which produces the motion of this fluid, equal to the weight of a cylinder of the same fluid, whose base is equal to the orifice, and weight equal to 2 AB. Coroll. 2. Prop. 36. Lib. II. Newton. *Princip.*

Now, the blood flowing out of the heart, is resisted in its motion by the anterior blood in the arteries and veins, and therefore cannot flow with all the velocity the force of the heart will give it; part of that force being spent in overcoming the resistance of the mass of blood. If therefore we knew how much the velocity of the blood is diminished by this resistance, or what proportion the velocity of the blood resisted, has to the blood driven out, and not resisted; having already determined the velocity of the blood as it is resisted, we might easily recollect the velocity by which the blood would flow were it not resisted; and from thence find the absolute force of the heart.

To find this, the author made the following experiment.—Having uncovered the iliac artery and vein in the thigh of a dog, near his body; and passed convenient ligatures under them; he opened the whole diameter of the vein, and received the blood which ran from it in the space of ten seconds: The same was afterwards done by the artery, for the same space of time; and both the quantities of the blood were exactly weighed. The experiment was repeated for the greater security: till, the quantity of blood from the artery, was found at a medium, to that from the vein in the same space of time, nearly as $7\frac{1}{2}$ to 3.

Now, the velocity of the blood in the iliac artery, so near the aorta, must be nearly the same with that in the aorta itself; and consequently the velocity with which it flows out of the iliac artery cut asunder, is the same with which it would flow out of the heart unresisted: or, the blood runs through a wound in the iliac artery, with all the velocity it received from the heart. Now all the blood which runs along the iliac artery, returns again by the iliac vein; and consequently, the quantities of blood which pass through both in the same space of time, are equal. The quantity of blood, therefore, which runs out of the iliac vein cut asunder, is the same which ran through the iliac artery, before it was cut, in that space of time. Having, therefore, the quantity which runs through the iliac artery when it is cut, and when it is not cut, we have their velocities; for the velocity of a fluid, running through the same canal, in equal spaces of time, is directly as their quantities: but the velocity of the blood, when the artery is cut, is equal to that it receives by the full force of the heart; and the velocity when it is not cut, is that velocity with which the blood moves through the aorta, resisted by the anterior blood: and therefore these two velocities are to one another, as $7\frac{1}{2}$ to 3.

If now the heart throw out two ounces of blood every systole, which is a probable assumption, then the blood moves through the aorta at the rate of 156 feet in a minute; and therefore the absolute velocity wherewith the blood would be forced into the aorta, did it find no resistance, is such as would make it move 390 feet in a minute, or $6\frac{1}{2}$ feet in a second.

We now proceed to enquire, what is the height from which a falling body will acquire this given velocity? for this height doubled, gives the length of the cylinder whose base is equal to the orifice of the aorta, and weight equal to the absolute force of the heart.

It is known by experiment, that the force of gravity will make a body move 30 feet in a second, which is the velocity it acquires in falling through 15 feet; and therefore this velocity is to the velocity of the blood flowing without resistance into the aorta, as 30 to 6.5: But because the heights from which bodies acquire given velocities, are as the squares of

the velocities, that is, as 900 to 42.25; therefore, as 900 to 42.25, so is 15 to 0.74. This height doubled, gives 1.48, or in inches 17.76; which is the height of a cylinder of blood, whose base is equal to the aorta, which we have supposed to be equal to 0.187; and therefore the solid content is 7.436112, the weight of which is equal to the absolute force of the heart.

This weight is five ounces, whence the force of the heart is found equal only to the weight of five ounces.

The same author, by another method of calculating from the laws of projectiles, finds the force of the heart almost equal to eight ounces, which though somewhat more than was before determined, yet the difference is of small moment in respect of Borelli's account; the great failing in whose calculation Dr. Keill takes to arise from his not distinguishing between the blood at rest, and the blood already in motion.—The force of the heart, it is certain, is not employed in giving motion to any quantity of blood at rest, but only to continue it in motion; how that motion first arose, seems out of the human capacity to determine. It is demonstrable, that if the resistance of the blood always bore the same proportion to the force of the heart it does now, the blood never could at first be put in motion by the heart. If the blood constantly moved forwards, with the motion first communicated to it, and did the coats of the vessels make no resistance; the posterior blood would not be retarded by the anterior, and the force of the blood would equal the entire force of the mover. But because of the resistance made by the coats of the blood-vessels, and the force which is spent in distending them, the blood is continually retarded in its motion as it circulates and would in a short time stop, were not the motion lost made up again by a fresh impulse from the heart; and therefore the force of the heart must be equal to the resistances the blood meets with in its motion: If it were more, the velocity of the blood would be continually increasing; if less, it would continually decrease; and at last stop: And hence it is evident, that if the circulation of the blood was once stopped, all the force of the heart could never set it moving again.

Thus much for Dr. Keill's system:—Dr. Jurin charges even this with its defects; and particularly in that it supposes the weight, whereby the motion of water running out at a vessel may be generated, to be what generates that motion: which this last author takes for a misapprehension of Sir Isaac Newton's corollary; urging, that the water falling by the power of gravity, acquires its motion of itself; and that the weight falling the same time, only receives a motion equal to that of the water out of the vessel.—There are some other points which he objects against, and of which the learned author has an express vindication in the *Philosophical Transactions*; to which his antagonist has since replied; but the author dying in the mean time, the dispute ceas'd.

Dr. Jurin, however, proceeds to give another computation, on more unexceptionable principles; though his adversary has found occasion therein for recrimination.

He considers one of the ventricles of the heart impelling the blood, as a given body impelling another at rest, with a given velocity; and after communicating part of its motion thereto, proceeding with the same common velocity. On which principle, the force of the heart will either be equal to the factum of the weight of the ventricle, and its initial velocity ere it impels the blood; or to the sum of the motions of the ventricle and the blood flowing out of the fame, and the motion communicated to the coats of the arteries and the antecedent blood.

Now it is demonstrable, 1^o. That the motion whereby a hollow machine, unequally contractile does act in contraction, is equal to the sum of the factums of the several particles of the machine multiplied into their respective velocities. Whence it follows, that the motion of the machine is equal to the factum of its weight into some mean velocity between the particles moved swiftest, and those moved slowest.—2^o. That if the water be expelled out of the orifice of such a machine, the motion of the water bursting out of the fame, will be equal to the sum of the facta of any transverse sections of all the threads of water, severally multiplied into their respective lengths and velocities: Whence it follows, that the motion of the water is equal to the factum of the water issuing out at the orifice into some mean length between that of the longest thread and the shortest. Hence, also, if there be several such machines full of water, and contracted alike, whether equally or unequally, the motion of the water, bursting out at the orifice of one of them, will be in a ratio compounded of the quadruple ratio of any homologous diameter of the machine, and the reciprocal ratio of the time wherein the contraction is effected.

From these data is drawn a solution of the problem, To find the force of the heart.—For, calling the weight of the left ventricle, or the quantity of blood equal to the fame, p ; the inner surface of the ventricle, S ; the mean length of the filaments, or threads of blood expelled from the fame, l ; a section of the aorta, s ; the quantity of blood contained in the

the left ventricle, q ; the time wherein the blood would be thrown out of the *heart*, were the resistance of the arteries and antecedent blood removed, t ; the variable velocity, where with the blood would flow through the aorta, if the resistance were taken away, v ; the variable length of the aorta, passed over by the blood, x ; and the time wherein the length x is run, z .—The mean variable velocity of the blood contiguous to the ventricle, or the mean velocity of the ventricle itself, will be $= \frac{sv}{\delta}$; the motion of the ventricle, $= p \times \frac{sv}{\delta}$; the motion of the blood issuing out, $= s v \times l + x$; and their sum, or the force of the ventricle, $= s v \times \frac{p}{\delta} + l + x$. But $v = \frac{x}{z}$; whence, by the inverse method of fluxions, the

force of the ventricle is found $= \frac{sv}{z} \times \frac{p}{\delta} + \frac{x}{z} + l$. But since $z = t$; $sv = q$. And hence, the force of the ventricle $= \frac{q}{t} \times \frac{p}{\delta} + l$. After the like manner, the force of the right ventricle (noting the same things by Greek letters, which in the left are denoted by Italic ones, is found, $= \frac{q}{t} \times \frac{p}{\delta} + \frac{q}{2\delta} + \lambda$. So that the whole force of the *heart*, is $= \frac{q}{t} \times \frac{p}{\delta} + \frac{q}{2\delta} + \frac{q}{2\delta} + l + \lambda$. Q. E. 7.

If now we suppose $p = 8$ ounces, and π to four ounces avoird. $\delta = 10$ square inches, and Σ to as much; $l = 2$, and $\lambda = 1$ inches; $q = 2$ ounces avoird. $s = 0, 4185$ square inches, $\sigma = 0, 583$; and $t = 0, 1$. The forces of the ventricles will be equal to the weights under-written, viz.

	lib.	oz.
Of the left ventricle	-	9 1
Of the right ventricle	-	6 3
Force of the whole heart	-	15 4

Which weights have a velocity, wherewith they would move an inch each second of a minute.

Coroll. Hence it is inferred, that when the pulse is quicker than ordinary, either the resistance is less than ordinary, or the force of the *heart* is increased, or a less quantity of blood than usual is expelled at each contraction of the *heart*; and vice versa.—As also, that if the resistance be either increased or diminished, either the pulse, or the quantity of blood expelled at each contraction, will be either increased or diminished respectively.—And that if the force of the *heart* be increased or diminished, either the pulse must be accelerated, or the resistance diminished.

On these principles Dr. Jurin proceeds to demonstrate the three following theorems.

1^o. That the whole motion of resistance made to the blood issuing out of the *heart* in the systole, or the whole motion communicated to the antecedent blood and the coats of the arteries, is equal to the whole force of the *heart*; *quam proxime*.

2^o. That the motion communicated to the antecedent blood in a systole, is to the motion communicated to the coats of the arteries, as the time of the systole is to the time of the diastole. Whence if, with Dr. Keill, we suppose the systole performed in one third of the interval between two pulses, the motion communicated to the antecedent blood will be one third of the whole motion of the *heart*; and that communicated to the arteries, two thirds.

3^o. In different animals, the force of the *heart* is in a ratio compounded of the quadruple ratio of the diameter of any homologous vessel, and the inverse ratio of the time wherein the *heart* is contracted; or a ratio compounded of the ratio of the weight either of the *heart*, or the whole animal, the subtriplicate ratio of the same weight, and the reciprocal ratio of the time.

HEART-BURN, a disease, among physicians usually called *cardialgia*.

The stercoraceous powders, as oyster-shells, crabs eyes, chalk, &c. are the usual remedies for the *heart-burn*.

HEART of a tree, the middle part thereof, taken longitudinally, is called so.

HEART, in the manage.—A horse that works in the manage with constraint and irresolution, and cannot be brought to consent to it, is said to be a horse of two hearts.

HEARTH, Focus. See the articles FIRE, CHIMNEY, &c.

HEARTH-MONEY. See the article CHIMNEY-MONEY.

HEARTH-STONES. See the article FIRE-STONE.

HEAT, Calor, one of the primary qualities of bodies; opposed to cold.

Heat may be defined a physical being, whose presence is known, and its degree measured by the expansion of the air, or spirit, in the thermometer.

Heat in us is properly a sensation, excited by the action of fire: or it is the effect of fire on our organs of feeling.

Hence it follows, that what we call *heat*, is a particular idea, or modification of our own mind; and not any thing existing in that form in the body that occasions it.—Heat is no more in the fire that burns the finger, than pain in the needle that pricks it.—In effect, *heat*, in the body that gives it, is only motion; and in the mind, only a particular idea or disposition of the soul.

Heat, with respect to our sensation, of the effect produced on us by a hot body, is estimated by its relation to the organ of feeling; no object appearing to be hot, unless its heat exceed that of our body: whence, the same thing to different persons, or at different times to the same person, shall appear both hot and cold.

Heat, as it exists in the hot body, or that which constitutes and denominates a body hot, and enables it to produce such effects on our organ; is variously considered by the philosophers.—Some will have it a quality, others a substance, and others only a mechanical affection, viz. motion.

Aristotle, and the Peripatetics define *heat* a quality, or accident, whereby homogeneous things, i. e. things of the same nature and kind, are collected or gathered together; and heterogeneous ones, or things of different natures, are severed or disunited.—Thus, says he, the same heat which associates and brings into a mass several particles of gold before separate, separates the particles of two metals before mixed together.

But, not only the doctrine, but the very instance he produces, is faulty: For *heat*, though continued to eternity, will never separate a mass, e. g. of gold, silver, and copper; and, on the contrary, if bodies of different qualities, as gold, silver, and copper, be put separately in a vessel over a fire; notwithstanding all their heterogeneity, they will be mixed and congregated into a mass thereby.

In effect, *heat* cannot be said to do either this thing or that universally; but all its effects depend on the circumstances of its application.—Thus, to do the same thing in different bodies, different degrees of *heat* are required; as, to mix gold and silver, the *heat* must be in one degree, and to mix mercury and sulphur, in another.

Add, that the same degree of *heat* shall have opposite effects:—Thus a vehement fire shall render water, oils, salts, &c. volatile; and yet the same fire shall imbody sand and fixed alkaline salt into glass.

The Epicureans, and other corpuscularians, define *heat* not as an accident of fire, but as an essential power or property thereof, the same, in reality with it, and only distinguished therefrom in the manner of our conception.

Heat, then, on their principles, is no other than the volatile substance of fire itself, reduced into atoms, and emitted in a continual stream from ignited bodies; so as not only to warm the objects within its reach, but also, if they be inflammable, to kindle them, turn them into fire, and conspire with them to make flame.

In effect, these corpuscles, say they, flying off from the ignited body, while yet contained within the sphere of its flame, by their motion constitute fire; but when fled, or got beyond the same, and dispersed every way, so as to escape the apprehension of the eye, and only to be perceivable by the feeling, they take the denomination of *heat*; inasmuch as they still excite in us that sensation.

The Cartesians, improving on this doctrine, assert *heat* to consist in a certain motion of the insensible particles of a body, resembling the motion whereby the several parts of our body are agitated by the motion of the heart and blood.

Our latest, and best writers of mechanical, experimental, and chemical philosophy, differ very considerably about *heat*.—The fundamental difference is, whether it be a peculiar property of one certain immutable body called *fire*; or whether it may be produced mechanically in other bodies, by inducing an alteration in the particles thereof.

The former tenet, which is as ancient as Democritus, and the system of atoms, had given way to that of the Cartesians and other mechanists; but is now with great address retrieved and improved on by some of the latest writers, particularly Homberg, the younger Lemery, Gravefande, and above all, by the learned and industrious Boerhaave, in a course of lectures expressly on *fire*; the result whereof we have already laid down under the article FIRE.

The thing we call *fire*, according to this author, is a body, sui generis, created such an origine, unalterable in its nature and properties, and not either producible de novo, from any other body, nor capable of being reduced into any other body, or of ceasing to be fire.

This fire, he contends, is diffused equably every where, and exists alike, or in equal quantity, in all the parts of space, whether void, or possessed by bodies; but that naturally, and in itself, it is perfectly latent and imperceptible; and is only discovered by certain effects which it produces, and which are cognizable by our senses.

These effects are *heat*, light, colour, rarefaction and burning; which are all indications of fire, as being none of them pro-

ducible by any other cause: So that wherever we observe any of these, we may safely infer the action and presence of fire.—But, though the effect cannot be without the cause, yet the fire may remain without any of these effects; any, we mean, gross enough to affect our senses, or become objects thereof: and this, he adds, is the ordinary case; there being a concurrence of other circumstances, which are often wanting, necessary to the production of such sensible effects. Hence, particularly, it is, that we sometimes find several, and sometimes all of these effects of fire together, and sometimes one unaccompanied with any others; according as the circumstances favour or dispose things for the same.—Thus we find light without heat; as in rotten wood, putrid fishes, or the mercurial phosphorus: nay, and one of them may be in the highest degree, and the other not sensible; as in the focus of a large burning-glass exposed to the moon; where, though the light, as Dr. Hooke found, was sufficient to have instantly blinded the best eye, yet no heat was perceivable, nor was there the least rarefaction occasioned in an exquisite thermometer.

On the other hand, there may be heat without light, as we find in the solid phosphorus; in fluids, which emit no light even when they boil, and not only heat and rarefy, but also burn or consume the parts; and in metals, stones, &c. which conceive a vehement heat before they shine, or become ignited.—Nay, and there may be the most intense heat in nature without any light: Thus in the focus of a large burning concave, where metals melt, and the hardest gems vitrify, the eye perceives no light; so that should the hand happen to be put there, it would be instantly turned into a coal, or even a calx. So also rarefactions are frequently observed by the thermometer, in the night time, without either heat or light, &c.

Thus it appears, that the effects of fire have a dependance on other concurring circumstances; some more, and others less.—One thing seems to be required in common to them all, viz. that the fire be collected or brought into less compass: without this, as fire is every where equally diffused, it could have no more effect in one place than another, but must either be disposed to warm, burn, and shine every where, or no where. Indeed, such every where does amount to no where; for to have the same heat, &c. in every place, would be to have no heat at all: It is only the changes that we perceive; those alone make the mind distinguish in its state, and become conscious of the things that diversify it. So our bodies being equally pressed on all sides by the ambient air, we feel no pressure at all; but if the pressure be only taken off in any one part, as by laying the hand over an exhausted receiver, we soon grow sensible of the loss.

This collection is performed two ways: the first, by directing and determining the fluctuating corpuscles of fire into lines, or trains, called rays; and thus driving infinite successions of the fiery atoms upon the same place or body, each to produce its several effect, and second that of the preceding ones, till by a series of augmentations, the effect is sensible.—This is the office of those bodies which we call luminaries; such as the sun, and other heavenly bodies; and also of our culinary fires, lamps, &c. on earth, which do not emit the fire from their own substance, as is commonly conceived, but only by their rotatory mutation direct the undetermined corpuscles into parallel rays. And the effect may be still further intended by a second collection of these parallel, into converging rays, by means of a concave speculum, or a convex glass, which at length brings them all into a point; whence those astonishing effects of our large burning-glasses.

The second way wherein the collection is made, is not by determining the vague fire, or giving it any new direction; but merely by assembling it; which is done by the attrition, or rubbing of two bodies swiftly against each other; so swiftly, in effect, as that nothing in the air, except the floating fire, has activity enough to move an equal pace, or succeeding fast enough into the places continually relinquished by it: by which means fire, the most agile body in nature, slipping in, becomes collected in the path of the moving body; so that the moveable has, as it were, a fiery atmosphere around it.—Thus it is the axes of chariot-wheels, mill-stones, the ropes of ships, cannon-balls, &c. conceive heat, and some of them kindle into flame.

Thus much for the circumstance in heat, common to all the effects of fire, viz. collection.—The particular circumstances are various: Thus, for it to warm, or to heat, i. e. to give the sensation of it, it is necessary that there be more fire in the hot body, or thing, than in the organ whereby it is to be felt; otherwise the mind will not be put into any new state upon its approach, nor have any new idea.—Whence, also, if the contrary to this obtains, v. g. if there be less fire in the external object than in the organ, it will raise an idea of cold, or chilliness.

Thus it is, that a man coming out of a hot bath, into a moderately warm air, seems as if he were got into an exceed-

five cold place; and another entering a room scarcely warm, in a very pinching day, will at first fancy himself in a stove.—Whence it appears, that the sense of heat does by no means determine the degree of fire; the heat being only the ratio, or difference between the internal and external fire.—As to the circumstances necessary to the fire's producing light, burning, rarefaction, &c. See LIGHT and BURNING.

The mechanical philosophers, particularly my lord Bacon, Mr. Boyle, and Sir Isaac Newton, look on heat in another light.—They do not conceive it as an original inherent property of any particular sort of body; but as mechanically producible in any body.

My lord Bacon, in an express treatise *De forma Calidi*, deduces, from a particular enumeration of the several phenomena and effects of heat:

1^o. That heat is motion; not, that motion generates heat, or heat motion; though in many cases, this be true: But, that the very thing heat is very motion, and nothing else.—But this motion, he shews, has several peculiar circumstances, which constitute it heat.

As, 2^o. That it is an expansive motion, whereby a body endeavours to dilate or stretch into a larger dimension than it had before.

3^o. That this expansive motion is directed towards the circumference, and at the same time upwards; which appears hence, that an iron rod being erected in the fire, will burn the hand that holds it, much sooner than if put in laterally.

4^o. That this expansive motion is not equable, and of the whole, but only of the smaller particles of the body; as appears from the alternate trepidation of the particles of hot liquors, ignited iron, &c. And lastly, that this motion is very rapid.

Hence, he defines heat an expansive, undulatory motion in the minute particles of the body; whereby they tend, with some rapidity, towards the circumference, and at the same time incline a little upwards.

Hence, again, he adds, that if in any natural body, you can excite a motion whereby it shall expand or dilate itself; and can so repress and direct this motion upon itself, as that the dilation shall not proceed uniformly, but obtain in some parts, and be checked in others, you will generate heat. This doctrine, Des Cartes and his sect adhere to with some little variation.—According to them, heat consists in a certain motion, or agitation of the parts of a body, like to that wherewith the several parts of our body are agitated by the motion of the heart and blood.

Mr. Boyle, in a treatise of the *Mechanical Origin of Heat and Cold*, strenuously supports the doctrine of the producibility of heat, with new observations and experiments: as a specimen, we shall here give one or two.

In the production, says he, of heat, there appears nothing, on the part either of the agent or patient, but motion and its natural effects.—When a smith briskly hammers a small piece of iron, the metal thereby becomes exceedingly hot; yet there is nothing to make it so, except the forcible motion of the hammer impressing a vehement and variously determined agitation on the small parts of the iron, which being a cold body before, grows, by that super-induced commotion of its small parts, hot: First, in a more loose acceptation of the word, with regard to some other bodies, compared with which it was cold before: and then sensibly hot, because this agitation surpasses that of the parts of our fingers; and in this instance oftentimes, the hammer and the anvil continue cold after the operation; which shews, that the heat acquired by the iron, was not communicated by either of those implements as heat, but produced in it by motion great enough strongly to agitate the parts of so small a body as the piece of iron, without being able to have the like effect upon so much greater masses of metal, as the hammer and the anvil. Though, if the percussions were often, and briskly renewed, and the hammer were small; this also might be heated.—Whence it is not necessary that a body itself should be hot to give heat.

If a large nail be driven by a hammer into a plank of wood, it will receive several strokes on its head, ere it grow hot; but when it is once driven to the head, a few strokes suffice to give it a considerable heat: for while, at every blow of the hammer, the nail enters farther into the wood, the motion produced is chiefly progressive, and is of the whole nail tending one way; but when the motion ceases, the impulse given by the stroke, being unable to drive the nail farther on, or to break it, must be spent in making a various, vehement, and intestine commotion of the parts among themselves, wherein the nature of heat consists. *Mech. Product. of Heat and Cold.*

That heat, says the same author, is mechanically producible, appears probable from a consideration of its nature, which seems principally to consist in that mechanical property of matter called motion; but which is here subject to three conditions, or modifications.

First, the agitation of the parts of the body must be vehement.—For this distinguishes the bodies said to be hot, from

those which are barely fluid.—Thus, the particles of water, in its natural state, move so calmly, that we do not feel it at all warm, though it could not be a liquor, unless they were in a restless motion; but when water becomes actually *hot*, the motion manifestly and proportionally appears vehement, since it does not only strike out organs of feeling briskly, but ordinarily produces numerous very small bubbles, melts coagulated oil cast upon it, and affords vapours, which by their agitation ascend into the air.—And if the Degree of *heat* be such as to make the water boil, the agitation becomes more manifest by the confused motions, waves, noise, bubbles, and other obvious effects, excited therein. Thus, in a *heated* iron, the vehement agitation of its parts, may be easily inferred from the motion, and the hissing noise it makes with the drops of water that fall from it.—But though the agitation be various, as well as vehement, yet there is a third condition required to make a body *hot*; which is, that the agitated particles, or at least the greatest number of them, be so minute, as to be singly insensible.—Were an heap of sand to be vehemently agitated by a whirlwind, the bulk of the corpuscles would keep their agitation from being properly *heat*, though by their numerous strokes upon a man's face, and the brisk commotion of the spirits, which would thence ensue, they might perhaps produce that quality.

The second condition is, that the determination be very various, and tend all manner of ways.—This variety of determinations appears to be in *hot* bodies, both by some of the instances already mentioned, and especially that of flame, which is a body; by the dilatation of metals when melted; and by the operations of *heat*, exercised by *hot* bodies upon others, in what posture or situation cover the body to be *heated* thereby, be applied to them: thus a coal, thoroughly kindled, will appear on all sides red, and melt wax, and kindle brimstone, whether the body be applied to the upper, the lower, or any other part of it.—Hence, if we duly attend to this notion of the nature of *heat*, it is easy to discern how it may be mechanically produced several ways; for, except in some few anomalous cases, by whatever means the insensible parts of a body can be put into a very confused and vehement agitation, *heat* will be introduced into that body: and as there are several agents and operations, by which the *heating* motion may be excited; so there must be several mechanical ways of producing *heat*: various experiments may be reduced to almost each of these heads; chance itself having, in the laboratories of chemists, afforded several phenomena referable thereto.

This system is further supported also by Sir Isaac Newton, who does not conceive *fire*, as any particular species of body, originally endued with such and such properties.—*Fire*, according to him, is only a body much ignited, *i. e.* *heated* hot, so as to emit light copiously: What else, says he, is red hot iron than fire? And what else is a burning coal than red hot wood? or flame itself than red hot smoke? It is certain, that flame is only the volatile part of the fuel *heated* red hot, *i. e.* so hot as to shine; and hence only such bodies as are volatile, *i. e.* such as emit a copious fume, will flame; nor will they flame longer than they have fume to burn.—In distilling hot spirits, if the head of the still be taken off, the ascending vapours will catch fire from a candle, and turn into flame. And in the same manner several bodies, much *heated* by motion, attrition, fermentation, or the like, will emit lucid fumes; which, if they be copious enough, and the *heat* sufficiently great, will be flame: and the reason why fused metals do not flame, is the smallness of their fume; this is evident, for, that spelter, which fumes most copiously, does likewise flame.—Add, that all flaming bodies, as oil, tallow, wax, wood, pitch, sulphur, &c. by flaming waste, and vanish into burning smoke.

And do not all fixed bodies, when *heated* beyond a certain degree, emit light and shine? and is not this emission performed by the vibrating motion of their parts? and do not all bodies, which abound with terrestrial and sulphureous parts, emit light as often as those parts are sufficiently agitated; whether that agitation be made by external fire, or by friction, or percussion, or putrefaction, or by any other cause?—Thus, sea-water, in a storm; quicksilver agitated in vacuo; the back of a cat, or the neck of a horse, obliquely rubbed in a dark place; wood, flesh and fish, while they putrify; vapours from putrifying waters, usually called *ignes fatui*; stacks of moist hay or corn; glow-worms, amber and diamonds by rubbing; fragments of steel struck off with a flint, &c. all emit light. *Id. ibid.*

Are not gross bodies and light convertible into one another? and may not bodies receive much of their activity from the particles of light, which enter their composition? I know no body less apt to shine than water; and yet water, by frequent distillations, changes into fixed earth; which, by a sufficient *heat*, may be brought to shine like other bodies. *Id. ibid.*

Add, that the sun and stars, according to Sir Isaac Newton's conjecture, are no other than great earths vehemently *heated*: for large bodies, he observes, preserve their *heat* the longest,

their parts *heating* one another; and why may not great, dense and fixed bodies, when *heated* beyond a certain degree, emit light so copiously, as by the emission and reflection thereof, and the reflections and refractions of the rays within the pores, to grow still hotter, till they arrive at such a period of *heat* as is that of the sun? Their parts also may be further preserved from fuming away, not only by their fixity, but by the vast weight and density of their atmospheres incumbent on them, and strongly compressing them, and condensing the vapours and exhalations arising from them. Thus, we see, warm water, in an exhausted receiver, shall boil as vehemently as the hottest water open to the air; the weight of the incumbent atmosphere, in this latter case, keeping down the vapours, and hindering the ebullition, till it has conceived its utmost degree of *heat*. So, also, a mixture of tin and lead, put on a red hot iron in vacuo, emits a fume and flame: but the same mixture, in the open air, by reason of the incumbent atmosphere, does not emit the least sensible flame.—Thus much for the *System of the Producibility of heat*.

On the other hand, M. Homberg, in his *Essai du Souffire Principe*, holds, that the chemical principle, or element, sulphur, which is supposed one of the simple, primary, pre-existent ingredients of all natural bodies, is real fire; and consequently that fire is co-eval with body. *Mem. de l'Acad. an. 1705.* See SULPHUR.

Dr. Gravefande goes on much the same principle: *fire*, according to him, enters the composition of all bodies, is contained in all bodies, and may be separated or procured from all bodies, by rubbing them against each other, and thus putting their fire in motion. But fire, he adds, is by no means generated by such motion. *Elem. Phys. T. II. c. 1.*

A body is then only sensibly *hot*, when the degree of its *heat* exceeds that of our organs of sense; so that there may be a lucid body, without any sensible *heat*; and consequently, as *heat* is only a sensible quantity, without any *heat* at all.

Heat, in the *hot* body, says the same author, is an agitation of the parts of the body, made by means of the fire contained in it; by such agitation a motion is produced in our bodies, which excites the idea of *heat* in our minds: so that *heat*, in respect of us, is nothing but that idea, and in the *hot* body nothing but motion.—If such motion expel the fire in right lines, it may give us the idea of light; if in a various and irregular motion, only of *heat*.

M. Lemery the younger, agrees with these two authors in asserting this absolute, and ingenerable nature of fire; but he extends it further.—Not contented to confine it as an element to bodies, he endeavours to shew that it is equally diffused through all space, that it is present in all places, even in the void spaces between bodies, as well as in the insensible interstices between their parts. *M. de l'Acad. an. 1713.* See ETHER.

This last sentiment falls in with that of Boerhaave above delivered:—It seems extravagant to talk of *heating* cold liquors with ice; yet Mr. Boyle assures us, he has easily done it, by taking out of a basin of cold water, wherein several fragments of ice were swimming, one piece or two which he perceived very well drenched with the liquor, and suddenly immersing them into a wide-mouthed glass of strong oil of vitriol: for the menstruum presently mixing with the water, which adhered to the ice, produced in it a brisk *heat*, sometimes with a manifest smoke, and that suddenly dissolving the contiguous parts of the ice, and those the next, the whole ice was soon reduced to water; and the corrosive menstruum being, by two or three shakes, well dispersed through it, the whole mixture would immediately grow so *hot*, that sometimes the containing vital could not be endured in ones hand. Boyle, *ubi supra*.

There is a great variety in the *heat* of different places, and seasons.—Naturalists commonly lay it down, that the nearer any Place is to the center of the earth, the *hotter* it is found; but this does not hold strictly true.—In digging mines, wells, &c. they find that at a little depth below the surface, it feels cool; a little lower, and it is yet colder, as being now beyond any reach, or influence, of the sun's rays, inasmuch that water will freeze almost instantaneously; and hence the use of ice-houses, &c. but when a little lower, *viz.* about 40 or 50 foot deep, it begins to grow warmer; so that no ice can bear it; and then the deeper they go, still the greater is the *heat*: till, at length, respiration grows difficult, and the candles go out.—Hence some have recourse to the notion of a fund of fire lodged in the centre of the earth; which they consider as a central sun, and the great principle of the generation, vegetation, nutrition, &c. of fossil and vegetable bodies.

But Mr. Boyle, who had been at the bottom of some mines himself, suspects that this degree of *heat*, at least in some of them, may arise from the peculiar nature of the minerals generated therein. To confirm this, he instances a mineral of a vitriolic kind, dug up in large quantities, in several

parts of England, which by the bare effusion of common water will grow so *hot*, as almost to take fire.

On the other hand, as you ascend high mountains, the air grows more and more piercing and cold: thus the tops of the Pico de Theide in Bohemia, the pike of Tenariff, and several others, even in the most sultry countries, are found eternally invested with snow and ice; the *heat* never being sufficient to thaw the same.

In some of the mountains of Peru there is no such thing as running water, but all ice: plants make a shift to grow about the feet of the mountains, but near the top no vegetable can live, and this is not for want of food, but through the intenseness of the cold.—This effect is attributed to the thinness of the air, and the little surface of earth there is to reflect the rays. The rays are here only determined into a parallelism; but the effect of direct parallel rays is found, by computation, to be very inconsiderable; this effect being really greater in winter than summer.

HEAT, in geography.—The diversity of the *heat* of climes and seasons, arises from the different angles under which the sun's rays strike upon the earth's surface.

It is shewn in mechanics, that a moving body, striking perpendicularly on another, acts on it with all its force, and that a body striking obliquely, acts with the less force, the more it deviates from the perpendicular.—Now fire, moving in right lines, must observe the same mechanical law as other bodies; and consequently its action must be measured by the sine of the angle of incidence: And hence fire, striking on any obstacle in a direction parallel thereto, has no sensible effect, by reason the ratio is almost infinite, *i. e.* it is nothing. Accordingly, the sun, radiating on the earth in the morning, scarce produces any warmth at all.

Hence, Dr. Halley gives a mathematical computation of the effect of the sun, under different seasons and climates; going on this principle, that the simple action of the sun, as all other impulses or strokes, is more or less forcible, according to the sines of the angles of incidence, or to the perpendicular let fall on the plane: whence, the vertical ray (which is of the greatest *heat*) being put for radius, the force of the sun on the horizontal surface of the earth will be to that, as the sine of the sun's altitude at any other time.

Hence it follows, that the time of the continuance of the sun's shining, being taken for a basis, and the sines of the sun's altitudes erected thereon as perpendiculars; and a curve drawn through the extremities of those perpendiculars: the area comprehended will be proportionate to the collection of the *heat* of all the sun's beams in that space of time.

Hence it will follow likewise, that under the pole the collection of all the *heat* of a tropical day, is proportionate to a rectangle of the sine of 23 degrees and an half, into 24 hours, or the circumference of a circle; that is, the sine of 23 degrees and an half, being nearly $\frac{3}{5}$ of radius, as $\frac{3}{5}$ into 12 hours. Or, the polar *heat* is equal to that of the sun continuing twelve hours above the horizon at 53 degrees height; than which the sun is not five hours more elevated under the equinoctial.

But whereas the nature of *heat* is to remain in the subject, after the luminary that occasioned its being *heated* is removed, and particularly in the air; under the equinoctial, the 12 hours absence of the sun does but little diminish the motion impressed by the past action of his rays, wherein *heat* consists, before he rises again; but under the pole, the long absence of the sun for six months, wherein the extremity of cold does obtain, hath so chilled the air, that it is, as it were, frozen, and cannot, before the sun has got far towards it, be any ways sensible of his presence, his beams being obstructed by thick clouds, and perpetual fogs and mists.

Add, that the different degrees of *heat* and cold in different places, depend in a very great measure, upon the accidents of situation, with regard to mountains or valleys, and the soil.—The first greatly help to chill the air by the winds, which come over them, and which blow in eddies through the levels beyond.

Mountains, sometimes, turning a concave side towards the sun, have the effect of a burning mirror on the subject plain; and the like effect is sometimes had from the concave or convex parts of clouds, either by refraction or reflection. And some even take these to be sufficient to kindle the exhalations lodged in the air, and to produce thunder, lightning, &c.

As to soils: a stony, sandy, or chalky earth, it is known, reflects most of the rays into the air again, and retains but few; by which means a considerable accession of *heat* is derived to the air; as, on the contrary, black loose soils absorb most of the rays, and return few into the air, so that the ground is much the *hotter*.

This the peasants, who inhabit the morafs de Veenen, where turf is dug, are very sensible of; walking there but a little while, the feet grow extremely *hot*, but the face not at all: on the contrary, in a sandy place, the feet are scarce warm, when the face is scorched by the great reflection.

The following table gives the *heat* to every tenth degree of

latitude to the equinoctial and tropical sun, by which an estimate may be made of the intermediate degrees.

Lat.	Sun in Y ☉	Sun in ☽	Sun in ♃
0	20000	18341	18341
11	19696	20290	15834
20	18797	21737	13166
30	17321	22651	10124
40	15321	23048	6944
50	12855	22991	3798
60	10000	22773	1075
70	6840	23543	000
80	3473	24973	000
90	0000	25055	000

Whence are deducible the following corollaries:

1^o. That in the equinoctial *heat*, when the sun becomes vertical, is as twice the square of the radius: which may be proposed as a standard to be compared with in all other cases.

2^o. That under the equinoctial, the *heat* is as the sine of the sun's declination.

3^o. That in the frigid zones, when the sun sets not, the *heat* is as the circumference of a circle into the sine of the altitude at 6. And, consequently, that in the same latitude, these aggregates of warmth, are as the sine of the sun's declination; and at the same declination of the sun, they are as the sines of the latitudes into the sines of the declination.

4^o. That the equinoctial day's *heat*, is every where as the cosine of the latitude.

5^o. In all places where the sun sets, the difference between the summer and winter *heats*, when the declinations are contrary, is equal to a circle into the sine of the altitude at 6, in the summer parallel; and consequently, those differences are as the sine of the latitude into, or multiplied by, the sines of declination.

6^o. From the foregoing table it appears, that the tropical sun, under the equinoctial, has of all others the least force; under the pole it is greater than any other day's *heat* whatever, being to that of the equinoctial as 5 to 4.

From the table, and these corollaries, a general idea may be conceived of the sum of all the actions of the sun in the whole year, and thus that part of *heat*, which ariseth simply from the presence of the sun, may be brought to a geometrical certainty.—The *heat* of the sun, for any small portion of time, is always as a rectangle, contained under the sine of the angle of incidence of the ray producing *heat* at that time.

HEAT, is usually divided, by the school philosophers, into *actual* and *potential*.

Actual HEAT, is that which we have been hitherto speaking of, and which is an effect of real, elementary fire.

Potential HEAT, is that which we find in pepper, wine and certain chemical preparations, as oil of turpentine, brandy, quick-lime, &c.

The Peripatetics account for the *heat* of quick-lime from an antiperistasis.

The Epicureans, and other corpufcularians, attribute even *potential heat*, to atoms or particles of fire detained and locked up in the pores of those bodies, and remaining at rest therein; which being excited to action again by the *heat* and moisture of the mouth, or by the effusion of cold water, or the like cause, then break their inclosures, and discover what they are.

This doctrine is well illustrated by M. Lemery the younger, in the instances of quick lime, regulus of antimony, tin, &c. in the calcination whereof he observes, 1^o. That the fire, which they imbibe in the operation, makes a sensible addition to the weight of the body, amounting sometimes to one tenth of the whole; and, that during this imprisonment, it still retains all the particular properties or characters of fire, as appears hence, that when once set at liberty again, it has all the effects of other fire.

Thus a stony, or saline body being calcined, and water poured thereon, that fluid is found sufficient, by its external impression, to break up the cells, and let the fire out; and upon this the water is rendered more or less warm, according to the quantity of fire lodged therein.—Hence, also, it is, that some of these bodies visibly contain a great deal of *actual fire*; and the slightest occasion is capable of disengaging it: and upon applying them to the skin, they burn and raise an eschar, not unlike the top of a live coal.

To this it is objected, that the particles of fire are only such in virtue of the rapid motion wherewith they are agitated; so that to suppose them fixed in the pores of a body, is to divert them at once of that which constituted them fire, and consequently, to disqualify them from producing the effects ascribed to them.—To which M. Lemery answers, that though the rapid motion of fire do contribute very greatly to its effects, yet the particular figure of its particles is to

to be considered withal. And though fire should be detained, and fixed in the substance of bodies, yet why should it fare worse than other fluids under the same circumstances? Water, for instance, is a fluid, whose fluidity depends, as already observed, on fire, and consequently it is less fluid than fire; and yet every day water is inclosed in bodies of all sorts without losing its fluidity, or any of the properties that characterize it as water.

Add, that when water is froze, the motion of its parts is, doubtless, discontinued; and yet the figure of the particles remaining the same, it is ready to commence a fluid, as before, upon the least warmth.

Lastly, though salt be allowed to be the matter of tastes, and that it has certain properties, arising chiefly from the figure of its parts, yet it only acts when dissolved; or, which amounts to the same, when it swims in a fluid proper to keep its parts in motion: yet it is not less salt, or less the matter of taste, when not in a state of dissolution: to despoil it of that quality, the figure of its parts must be altered.

As to what may be further objected of the impossibility of fixing so fine, subtle, penetrative, and active a matter as fire, within the spongy substance of a gross, porous body; it will be of no great weight, unless it can be proved, that the pores of the cells are bigger than the same.—If it be insisted, again, that a body which could find its way into a solid body, might get out again the same way; and that as it only penetrated the body, by reason its own corpuscles were smaller than the pores, the same consideration must let it out again: It is answered, that the pores are not now in the same condition as before; the fire in calcining, opened and dilated the pores; which, upon the fire's ceasing, must naturally close and contract again. *Ann. de l'Acad. an. 1713.*

Mr. Boyle endeavours to set aside this account, and substitute a mechanical property, viz. a peculiar texture of parts, in these cases, in lieu of fire.—Though a great likeness might be expected between the particles of fire adhering to the quick-lime, and those of highly rectified spirit of wine; yet he has not found that the effusion of the spirit upon quick-lime produced any sensible *beat*, or visible dissolution of the lime, though it seemed to be as greedily sucked in, as common water would have been. And further, he found, that if cold water were poured on the same lime so drenched, there would ensue no manifest *beat*; nor did the lump appear swelled or broken, till some hours after; which seems to argue, that the texture of the lime admitted some particles of the spirit of wine into some of its pores, which were either larger, or more fit for it, without admitting it into the most numerous, whereinto the liquor must be received, to be able suddenly to dissipate the corpuscles of lime into their minuter particles.

These phenomena, according to Mr. Boyle, seem to shew, that the disposition which lime has to grow hot with water, greatly depends on some peculiar texture; since the aqueous parts, which one would think capable of quenching most of the fiery atoms supposed to adhere to quick-lime, did not near so much weaken the disposition of it to *beat*, as that excess of the spiritous corpuscles, and their contexture with those of the lime, increased it.

Yet, in other places, this author appears rather to give into the corpuscular scheme: urging, that if instead of cold water, you quench the lime with *hot water*, the ebullition will be, oftentimes, far greater than if the liquor were cold; which indeed might well be expected, *hot water* being much fitter than cold, suddenly to pervade the body of the lime, and hastily to dissolve, and set at liberty, the fiery and saline parts wherewith it abounds. And what a greater interest salts may have in producing such *beats* than cold water, he has also tried, by pouring acid spirits, and particularly spirit of salt, upon good quick-lime: for by this means there was always a far greater degree of *heat* excited, than if he had used common water; and this, whether he employed the spirit cold or hot.

It is not easy, says the same author, to apprehend how such light and minute bodies should be so long detained, as must by this hypothesis be allowed, in quick-lime especially; since no great *beat* ensues the pouring of water upon minium, or crocus martis per se, though they have been calcined by a violent fire, the effluvia whereof seem to adhere to them, by the increase of the weight the lead and iron manifestly receive from the operation of it. *Mech. Orig. of Heat.*

HEAT, in the animal oeconomy, *Natural HEAT*, *Vital HEAT*. See *Innate HEAT*.

Innate HEAT, *calidum innatum*, is a term the ancients had many vague notions about: but geometrical reasoning has taught us to affix a more distinct idea hereto: for it is hence, says Dr. Quincy, we know, that this *innate heat* is no more than the attrition of the parts of the blood, occasioned by its circulatory motion, especially in the arteries; wherein, being propelled from a circular base, towards the apex of an hollow cone, with a force begun in the heart, it meets with a double resistance; viz. against the sides of the arteries, and against the preceding blood.

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For whereas the blood contains in it parts that are fitted to excite *beat* whenever they can get at liberty; that is, if the parts inclosing them can be got asunder; and whereas the parts inclosing such corpuscles cannot be got asunder, unless by some nifus of the parts of the blood among one another, whereby the attrition and abrasion of the cohering particles is produced; it follows, that the *beat* will be so much the greater, by how much such a nifus, and attrition of the parts among one another is increased.

And with the same resistances, (that is, the sections of the arteries, and the quantity of blood remaining the same) and an increased force of the heart, and circular motion of the blood, the nifus and attrition of the parts of the blood amongst one another, must necessarily be increased; both by the preceding blood being struck harder upon by the protrusion of a succeeding blood coming on with an increased velocity; and the occasioning thereby also more frequent strokes against the sides of the arteries; by which means, an increased velocity of blood increases the *beat*: and thus consequently does its *beat* depend upon its circulation.

From hence it appears, that at the same distances from the heart, the *beat* of equal quantities of blood will be as their velocities: and, that in the same velocities of blood, the *beat* will be reciprocally as the distances from the heart.—For since, in homogeneal and simple bodies, nothing else is required to disengage the particles exciting *beat*, but a nifus and attrition of parts, produced by the force of the heart; to which is always proportional the velocity of the blood; and the re-action, or resistance of the arteries and the antecedent blood; it follows, that if the resistance or re-action is not altered, which it will not be at the same distance from the heart; then the heat of the blood will not be altered, unless by an alteration of the impetus, or velocity impressed upon the blood from the heart: that is, as effects are proportional to their causes, the *beat* of the blood, at the same distances from the heart, will be proportional to its velocity.

In the same manner it appears, that if the velocities impressed by the heart be equal, there can be no change in the *beat* of the blood, but from a diversified resistance, or re-action of the arteries and antecedent blood. But the resistance of the preceding blood is proportional to its quantity; and its quantity is reciprocally proportional to the distance from the heart; (for the nearer the blood is to the heart, so much the greater will be its quantity between any given place and the extremity of the artery.) And therefore the resistance of the arteries will also be so much the greater, by how much nearer they are to the heart: for in this case, the resistance is proportional to the velocity; and the velocity of the blood is always greatest at the least distances from the heart.

Hence the *beat* of the blood may be considered as a rectangle, under the velocity and the distance: that is, if in two persons the velocity be as three, and the distances wherein we would determine the *beat*, be as much more in one as in another; that is, as two to one; the *beat* of one will be six, and the other three: that is, the *beat* of the first will be double that of the second. And if the distance of the first be as two, and the velocity as four; but the distance of the second as three, and the velocity as one; the *beat* of the first will be as eight, and of the second as three: and so the *beat* of the first, will be more than double the *beat* of the second.

HEAT, in chemistry. See the article FIRE.

HEAT, in smithery, &c. See the article IRON.

HEAT is also used in respect of race-horses, for the exercises to be given them by way of preparation, &c.

Two *beats* in a week are reckoned a just measure for any horse of what state or constitution soever.—The jockeys lay it down as a rule, that one of the *beats* be given on the same day of the week, whereon the horse is to run his match; and this to be the sharpest *beat*.

HEATHEN. See the article PAGAN.

HEAVE, at sea, signifies to throw away, or sling any thing over-board.

When a ship, being at anchor, rises and falls by the force of the waves, she is also said to *heave and set*.

To HEAVE at the *captain*, signifies to turn it about. See CAPTAIN.

To HEAVE a *flag aboard*, is to hang it out. See FLAG, and SIGNAL.

To HEAVE out the *top-sails*, is to put them abroad.

HEAVE-OFFERINGS, under the Jewish law, were things offered up to God by lifting them up on high.

HEAVEN, *Caelum*, an azure, transparent orb, investing our earth; wherein the celestial bodies perform their motions.

This is the popular notion of *heaven*; for the word, it must be observed, has various other ideas, in the language of philosophers, divines, and astronomers: agreeable to which, we may lay down divers *heavens*, as the *highest*, or *empyrean heaven*; the *aethereal*, or *fiery heaven*; the *planetary heaven*, &c.

HEAVEN, among divines, called also the *empyrean heaven*, is the abode of God, and blessed spirits: as angels, and the souls of the righteous deceased.

In this sense, *heaven* stands opposed to *hell*.

This is also frequently called in scripture the *kingdom of heaven*, the *heaven of heavens*; and by St. Paul the *third heaven*; sometimes *paradise*; the *new Jerusalem*, &c.

This *heaven* is conceived as a place in some remote part of infinite space, wherein the Deity is pleased to afford a nearer, and more immediate view of himself; and a more sensible manifestation of his glory; and a more adequate perception of his attributes, than in the other parts of the universe, where he is likewise present.

This makes what the divines also call the *beatific vision*.--Authors are much divided as to the reality of such *local Heaven*.

The inspired writers give us very magnificent descriptions of *heaven*, the structure, apparatus, and attendance thereof; particularly Isaiah, and St. John the divine.--The philosopher Plato, in his *Dial. de Anim.* speaks of *heaven* in terms that bear so near a resemblance to those of scripture; that Eusebius charges him with borrowing his account thence.

De Præpar. Evangel. L. XI. c. 37.

The ancient Romans had a kind of *heaven* in their system of theology, which they called *elysium*, or the *elysian fields*.

The Mahometan *heaven*, or *paradise*, is very gross, agreeable to the genius of their religion.

HEAVEN, among astronomers, called also the *ætherial* and *starry heaven*, is that immense region wherein the stars, planets and comets are disposed.

This is what Moses calls the *firmament*, speaking of it as the work of the second day's creation; at least it is thus the word עֲרֹמֶת is usually rendered by his interpreters; though this somewhat abulively, to countenance their own notion of the *heavens* being firm, or solid.--The word, it is certain, properly signifies no more than *expanse*, or *extension*; a term very well adapted by the prophet to the impression which the *heavens* make on our senses: whence in other parts of scripture, the *heaven* is compared to a curtain, or a tent stretched out to dwell in.--The LXX first added to this idea of expansion, that of *firm* or *solid*; rendering it by στερεωματα, according to the philosophy of those times; in which they have been followed by the modern translators.

The later philosophers, as des Cartes, Kircher, &c. have easily demonstrated this *heaven* not to be solid, but fluid; but they still suppose it full, or perfectly dense, without any vacuity, and cantoned out into many vortices.

But others carry the thing much further, and overturn not only the solidity, but the supposed plenitude of the *heavens*.

--Sir Isaac Newton has abundantly shewn the *heavens* void of almost all resistance, and consequently of almost all matter; this he proves from the phenomena of the celestial bodies; from the planets performing in their motions without any sensible diminution of their velocity; and the comets freely passing in all directions towards all parts of the *heavens*.

Heaven, taken in this general sense, for the whole expanse between our earth and the remotest regions of the fixed stars, may be divided into two very unequal parts, according to the matter found therein, viz. the atmosphere, or *aerial heaven*, possessed by air; and the *ætherial heaven*, possessed by a thin, unresisting medium, called *æther*.

HEAVEN, is more particularly used in astronomy, for an orb, or circular region of the *ætherial heaven*.

The ancient astronomers assumed as many different *heavens*, as they observed different motions therein.--These they supposed all to be solid, as thinking they could not otherwise sustain the bodies fixed in them; and spherical, that being the most proper form for motion.

Thus we had seven *heavens* for the seven planets, viz. The *heavens* of the Moon, Mercury, Venus, the Sun, Mars, Jupiter and Saturn.

The eighth was for the fixed stars, which they particularly called the *firmament*.

Ptolemy added a ninth *heaven*, which he called the *primum mobile*.

After him two *crystalline heavens* were added, by king Alphonsus, &c. to account for some irregularities in the motions of the other *heavens*: And lastly, an *empyrean heaven* was drawn over the whole, for the residence of the Deity; which made the number twelve.

The *crystalline heavens* were not supposed to have any stars fixed in them: they encompassed the inferior, stary and planetary *heavens*; and communicated their motion to them.--The first served to account for that slow motion of the fixed stars, whereby they advance a degree eastward in 70 years; whence the precession of the equinox. The second was to solve the motions of libration, or trepidation.

But others admitted many more *heavens*, according as their different views, and hypotheses required.--Eudoxus supposed

23, Calippus 30, Regiomontanus 33, Aristotle 47, and Fracastor no less than 70.

We may add, that the astronomers did not much concern themselves whether the *heavens* they thus allowed of were real or not, provided they served a purpose in accounting for any of the celestial motions, and agreed with the phenomena.

Among the other reveries of the Rabbins, contained in the Talmud, we find it asserted, that there is a place where the *heavens* and earth join together; that Rabbi Barchana going thither, laid his hat on the window of *heaven*; and that going to take it again immediately after, it was gone, the *heavens* having carried it off; so that he must wait for a revolution of the orbs to bring it to its place again.

HEAVINESS. See GRAVITY.

For the laws of the descent of *heavy* bodies; see DESCENT.

Heavy bodies do not tend precisely to the very centre of the earth, except at the poles and the equator; by reason of the spheroidal figure of the earth.----Their direction is every where perpendicular to the surface of the spheroid.

HEAULME, or HEAUME, in heraldry, an helmet, or head-piece. See HELMET.

HEWING of timber. See the article TIMBER.

HEBBERMAN, in ancient law-books, a poacher, or a fisherman below London-bridge; thus called, because he commonly fishes at ebb water. See LEB.

HEBBERTHEF, in ancient customs, a privilege of having the goods of a thief, and the trial of him, within a particular district.

HEBDOMADARY*, HEBDOMADARIUS, or HEBDOMADIUS, a member of a chapter, or convent, whose week it is to officiate in the choir; to rehearse the anthems, and prayers, and to perform the usual functions which the superiors perform at solemn feasts, and on other extraordinary occasions.

* The word is formed of the Greek, εβδομα, which signifies the number seven, of *εβδομα, seven*,

The *hebdomadary* generally collates to the benefices which become vacant during his week: though this is usually looked on as an abuse.

In cathedrals, the *hebdomadary* was a canon, or prebendary who had the peculiar care of the choir, and the inspection of the officers for his week.

In monasteries, the *hebdomadary* is he who waits at table for a week, or other stated period; directs and assists the cook, &c.

In church antiquity, we meet with accounts of nine different sorts of *hebdomadaries*, viz.--The *hebdomadarius cantor*, or *hebdomadary* chanter; *hebdomadarius chori*, *hebdomadary* of the choir; which two were really the same, viz. he who led or conducted the public service: *hebdomadary* of the kitchen, *hebdomadarius coquine*; *hebdomadary* of the defunct or the dead, *hebdomadarius defunctorum*, he who took care of the office and service of the dead; *hebdomadarius invitatorii*, he who sang the invitatory: *hebdomadarius lector ad mensam*, he who read at meal time; *hebdomadarius majoris missæ*, he who read mass: *hebdomadarius psalterii*, who probably was the same with the *hebdomadarius chori*: And *hebdomadarius sacri altaris*, who might be the same with *hebdomadary* of the high mass.

HEBRAÏSM, an idiomism or manner of speaking peculiar to the Hebrew tongue.

There is no understanding, even the versions of the Old Testament, without some acquaintance with the Hebrew; they are so full of *Hebraisms*.

We have abundance of *Hebraisms* borrowed from scripture, and naturalized in our own language; as, *Son of perdition*: *To sleep in the Lord*, &c.

HEBREW, something relating to the people of the Jews, i. e. the twelve tribes, descended from the twelve patriarchs, sons of Jacob. See JEWS.--Thus we say,

HEBREW Bible. See the article BIBLE.

HEBREW Character.

There are two kinds of *Hebrew* characters; the *ancient*, called also the *square*; and the *modern*, or *rabbinnical* characters.--The *square Hebrew*, takes its denomination from the figure of its characters, which stand more square, and have their angles more exact and precise than the other.

This character is used in the text of holy scripture, and their other principal and most important writings.--When both this, and the rabbinical character, are used in the same work, the former is for the text, or the fundamental part; and the latter, for the accessory part, as the glosses, notes, commentaries, &c.

The best and beautifullest characters of this kind, are those copied from the characters in the Spanish manuscripts; next, those from the Italian manuscripts; then those from the

the French; and lastly, those of the Germans, whose characters are much the same, with respect to the other genuine square Hebrew characters, that the Gothic or Dutch characters are with respect to the Roman.

Several authors contend, that the square character is not the real, ancient Hebrew character, wrote from the beginning of the language to the time of the Babylonish captivity; but that it is the Assyrian, or Chaldee character, which the Jews assumed, and accustomed themselves to, during the captivity, and retained afterwards.—These authors add, that what we call the Samaritan character, is the genuine ancient Hebrew.

The learned Jesuit Souciet maintains, with great address, that the ancient Hebrew character, is that found on the medals of Simon, and others, commonly called Samaritan medals; but which, he asserts, were really Hebrew medals, struck by the Jews, and not by the Samaritans.

Modern, or Rabbinical Hebrew character, is a good neat character, formed of the square Hebrew by rounding it, and retrenching most of the angles, or corners of the letters, to make it the more easy and flowing.—The Letters used by the Germans, are very different from the rabbinical character used every where else, though all formed alike from the square character, but the German in a more slovenly manner than the rest.

The Rabbins frequently make use either of their own, or the square Hebrew character, to write the modern languages in.—There are even books in the vulgar tongues, printed in Hebrew characters: instances whereof are seen in the French king's library.

HEBREW Language, called also absolutely HEBREW, is the language spoke by the Hebrews, and wherein all the books of the Old Testament are wrote; whence it is also called the holy, or sacred language.

There is no piece, in all antiquity, wrote in pure Hebrew, beside the books of the Old Testament; and even some parts of those are in Chaldee.

The Hebrew then, appears to be the most ancient of all the languages in the world; at least, it is so with regard to us, who know of no older. Some learned men will have it the language spoke by Adam in paradise; and that the faints will speak it in heaven.

Alberti, in his Hebrew Dictionary, endeavours to find in each word, in its root, in its letters, and the manner of pronouncing it, some natural reason of the signification of that word. But he has carried matters too far; and it has been shewn, in the *Mémoires de Trévoux*, that on his principles, words which signify quite different things, should signify the same.

Neuman, and Loecher, have prosecuted Alberti's scheme further, and with more address than he has done: The first, in his *Genesis Lingua Sanctæ*, and *Exodus Lingua Sanctæ*; and the latter, in his treatise *de Causis Lingue Hebrææ*.

Be that as it will, the Hebrew, such as we have it in the holy scripture, is a very regular, analogical language, and is particularly so in its conjugations. Properly speaking, there is but one, simple conjugation; but this is varied in each verb seven or eight different ways, which has the effect of so many different conjugations, and affords a great number of expressions, whereby to represent, under one single word, all the different modifications of a verb; and several ideas at once; which in the modern, and most of the ancient and learned languages, are expressible only by phrases.

The original, or primitive words in this language, which they call *radices*, roots, rarely consist of more than three letters, or of two syllables, which are expressed by two sounds, or by the same sound redoubled, which is indicated by a point.

There are twenty two letters in the Hebrew language, which grammarians divide into *guttural*, *palatal*, *dental*, *labial*, and *lingual*.—This division is taken from the several organs of speech; some whereof contribute more than others to the pronunciation of certain letters.

Usually, they only reckon five vowels in the Hebrew, which are the same with ours, *viz.* a, e, i, o, u; but then each vowel is divided into two, a long, and a breve, or short: the sound of the former is somewhat graver, and longer; and that of the latter shorter, and more acute.—It must be added, that the two last vowels have quite different sounds; different, we mean, in other respects besides quantity and degree of elevation.

To these ten or twelve vowels must be added some others called *semi-vowels*, which are only slight motions serving to connect the consonants, and make the easier transitions from one to another.

The number of accents is prodigious in the Hebrew.—There are near forty different ones; and of these there are several whose use is not well ascertained, notwithstanding all the enquiries of the learned into that matter.

In the general, we know these three things: 1^o. That they serve to distinguish the sentences, and the members thereof, like the points and comma's, &c. in English. 2^o. To de-

termine the quantity of the syllables; And 3^o. To mark the tone wherewith they are to be spoke or sung.

It is no wonder, then, that there should be more accents in the Hebrew than in other languages; as they do the office of three different things, which in other languages are called by different names.

As we have no Hebrew, but what is contained in the scriptures, that language to us wants a great many words; not only by reason, in those primitive times, the languages were not so copious as at present, but also on this account; that the inspired writers had no occasion to mention many of the terms that might be in the language.

The Chaldee, Syriac, Ethiopic, &c. languages, are by some held to be only dialects of the Hebrew; as the French, Italian, Spanish, &c. are dialects of the Latin.

Rabbinical HEBREW, or Modern HEBREW, is the language used by the Rabbins, in the writings they have composed.

The basis, or body hereof, is the Hebrew and Chaldee, with divers alterations in the words of those two languages, the meanings whereof they have considerably enlarged and extended. Abundance of things they have borrowed from the Arabic.—The rest is chiefly composed of words, and expressions chiefly from the Greek; some from the Latin; and others, from the other modern tongues; particularly that spoken in the place where each Rabbins lived or wrote.

The rabbinical Hebrew must be allowed a very copious language.—M. Simon, in his *Hist. Crit. du Vieux Testam.* L. III. c. 27. observes, that there is scarce any art, or science, but the Rabbins have treated thereof in it. They have translated most of the ancient philosophers, mathematicians, astronomers, and physicians; and have wrote themselves on most subjects: They do not want even orators and poets. Add, that this language, notwithstanding it is so crowded with foreign words, has its beauties visible enough in the works of those who have wrote well in it.

M. Simon says, it is impossible to reduce it into an art, or system of rules; but several learned men are of another sentiment; and it not only appears possible, but has actually been performed. Genebrard first attempted it in his *Ulogoge Rabbinica*, which yet goes no further than to the learning to read it. Buxtorf seconded him, at the end of his *Hebrew Grammar*; where we have an additional piece, under the title *Lectionis Hebræo-Germanicæ usus & exercitatio*. Others have gone yet further: Maius has lately given us a Rabbinical grammar, at Gießen, under the title of *Johannis Maii Grammatica Rabbinica*: And before him Sennet had done the same; *Rabbinismus*, h. e. *Præcepta Targumico-Talmudico Rabbinica*. Wirtemberg. an. 1656.

HECATOMB*, HECATOMBE, in antiquity, a sacrifice of an hundred beasts of the same kind, at an hundred altars, and performed by an hundred priests, or sacrificers.

* The word is formed of the Greek *ἑκατόμβη* which properly signifies a sumptuous, or magnificent sacrifice.—Others derive it from the Greek *ἑκατόν*, *centum*, a hundred, and *βου*, *bos*, bullock, &c. On which footing the *hecatomb* should be a sacrifice of an hundred bullocks.—Others derive the word from *ἑκατόν*, and *πέδι*, *pes*, foot; and on that principle hold, that the *hecatomb* might consist of only twenty five four footed beasts. There add, that it did not matter what kind of beasts were chose for victims, provided the quota of feet were but had.

Pythagoras is said to have sacrificed a *hecatomb* to the muses, of an hundred oxen, in joy and gratitude, for his discovering the demonstration of the 47th proposition of the first book of Euclid, *viz.* that in a rectangled triangle, the square of the hypotenuse is equal to the squares of the two other sides.

For the origin of *hecatombs*.—Strabo relates, that there were an hundred cities in Laconia; and that each city used to sacrifice a bullock every year, for the common safety of the country; whence the institution of the celebrated sacrifice of an hundred victims, called *hecatombs*. Others refer the origin of *hecatombs* to a plague; wherewith the hundred cities of Peloponnesus were afflicted; for the removal whereof, they jointly contributed to so splendid a sacrifice.

Julius Capitolinus relates, that for a *hecatomb* they erected a hundred altars of turf, and on these sacrificed a hundred sheep, and a hundred hogs. He adds, that when the emperors offered sacrifices of this kind, they sacrificed a hundred lions, a hundred eagles, and a hundred other beasts of the like kind.

HECATOMPHONIA*, ἑκατομφονία, an ancient sacrifice among the Messenians; offered by such as had slain an hundred enemies in battel.

* The word comes from *ἑκατόν*, an hundred, and *φονία*, to kill.

HECK, among husbandmen, a rack, at which horses are fed with hay.

It is also used as the name of an Engine, wherewithal to take fish in the river Ouse.—A salmon *beck*, is a grate for the catching that sort of fish. See SALMON FISHING.

Hence also HECKACIUM, or HECACIUM, which occurs

in antient records, for a rent paid the lord for the liberty to use such engines.

HECKLING of *Hemp*. See the article **HEMP**.
HECTIC*, or **HECTIC FEVER**, in medicine, a sort of slow habitual fever, seated in the solids, and gradually preying on and consuming the substance thereof.

* The word is Greek, *ἡκτικός*, formed of *ἥξις*, *habitus*, a quality hard to separate from its subject.

A *hectic* is an usual attendant of a consumption; and is reputed one of the diagnostic signs thereof.

The *hectic*, according to Dr. Quincy, is the reverse of those fevers which arise from a plethora, or too great a fulness. This being attended with too lax a state of the excretory passages, and particularly of those of the skin, whereby so much runs off, as leaves not resistance enough in the contractile vessels, to keep them sufficiently distended; so that they vibrate oftner, agitate the fluids more, and keep them thin and hot.

The remedy consists in giving a firmer tone to the solids, and laying more load upon the fluids, and thus bringing them to a better confidence; which is effected by means of balsamics, agglutinants, and foods of the best nourishment.—All evacuation herein is bad.

A milk diet is much recommended in *hectics*, and particularly asses milk, as being the least viscid and heavy of any kind. Dr. Baynard proposes butter-milk as a succedaneum to asses milk. According to him, it answers most of the indications in this case, as it cools, moistens, nourishes, &c. He adds, that he has known many persons cured of obstinate *hectics*, only by a continued use thereof.

HEDAGIUM*, antiently signified a toll, or custom, paid at the hyth, or wharf, &c. for landing merchandize, goods, &c.

* The word is formed from *beda*, a hyth, port, or wharf.

From such toll, or customary duty, exemptions were sometimes granted by the Sovereign to particular persons, and societies.

HEDGE*, in agriculture, &c. a fence, inclosing a field, garden, or the like; made of branches of trees interwoven.

* The word is formed of the German *bag*, or *baeg*, or the Anglo-Saxon *legge*, or *bege*; which signifies simply *inclosure*, *circumference*.

Quick-set **HEDGE**, is that made of quick or live trees, which have taken root; in contradistinction to that made of faggots, hurdles, or dry boughs, &c.

To plant a *quick hedge* of thorn, or the like, Mortimer directs, that the sets be about as big as the thumb, and cut within four or five inches of the ground; that if the *hedge* have a ditch, it be three foot wide atop, and one at bottom, and two deep: that if the *hedge* be without a bank, or ditch, the sets be in two rows, almost perpendicular, and at a foot distance; that the turf be laid with the grass side downwards: that at every thirty foot distance, a young oak, elm, crab, or the like, be placed: that stakes be driven into the loose earth, at about two foot and a half distance, so low as to reach the firm ground.

When the *hedge* is of eight or nine years growth, it may be splashed or laid down; by giving the shoots, or branches, a cut with a knife, or bill, half through; and then weaving them about the stakes, and trimming off the small superfluous branches.

Instead of building a garden-wall facing the north-east, Mr. Lawrence advises, that to save charge, &c. a crab-tree *hedge* of three rows be planted; which will be a good mound, and quickly grow up to be a better fence than a wall against the west and south-west winds, which make the greatest destruction in a garden, and which blow two parts in three of the whole year: beside the stock of fruit such a *hedge*, grafted with red-streak, or gennet moyl, will yield.

Esplanter **HEDGES**. See the article **ESPALIER**.

Transplanting of **HEDGE-ROWS**. See **TRANSPLANTING**.

HEEL, in anatomy, the hind part of the foot. See **FOOT**. In winter, the *heels* are liable to a kind of chilblains, called *kibes*, which sometimes tend to mortification.

The bone of the *heel* is called *calcaneum*. See the article **CALCANEUM**.

HEEL of a horse, is the lowest hind part of the foot, comprehended between the quarters, and opposite to the toe.

The *heel* should be high and large, and one side not rise higher on the pastern than the other.—The distempers incident to this part, are scabbiness and scratches. See **SCRATCHES**.

Some narrow *heeled* horses have high *heels*, but so weak and tender, that by pressing the two sides of the *heel* one against another, they will sensibly yield. See **HOOF**.

To open the **HEELS**, is to pare the foot, and cut the *heel* low, almost close to the frush; taking it down within a finger's breadth of the coronet, or top of the hoof, so as to separate the quarters, and by that means weaken and take away the substance of the foot, and make it close, and become narrow at the *heels*.

The **HEEL** of the horseman, being the part which is armed with a spur, the word is used for the spur itself: as, this horse understands the *heels* well.

To ride a horse from one **HEEL** to another, is to make him go sideways, sometimes towards one *heel*, and sometimes another.

HEEL, in the sea language:—If a ship lean on one side, whether aground or afloat, they say the *heels* a-star-board, or a-port, or the *heels* off-ward, or to the shore; that is, she inclines more to one side than to the other.

HEEL of a mast, is that part of the foot thereof, which is pared away slanting, that the mast may be stayed astward on it. See **MAST**.

HEELER, or *Bloody-HEEL Cock*, is a fighting cock which strikes, or wounds much with his spur.

The masters know such a cock, even while a chicken, by the striking of his two *heels* together in his going.

HEGIRA*, in chronology, a celebrated epocha, used by the Arabs and Mahometans, for the computation of time.

* The word is Arabic, formed of *هجرة* *hagrah*, flight; and *بني* to fly, quit one's country, family, friends, &c.

The event which gave occasion to this epocha, was Mahomet's flight from Mecca.—The magistrates of that city fearing his importunities might raise a sedition, resolved to expel him: this, accordingly, they effected in the year of our Lord 622, on the evening of the 12th or 16th of July.

To render this epocha more creditable, the Mahometans affect to use the word *hegira* in a peculiar sense, for an act of religion, whereby a man forsakes his country, and gives way to the violence of persecutors and enemies of the faith: They add, that the Corafites being then the strongest party in the city, obliged their prophet to fly, as not being able to endure his abolishing of idolatry.

This flight was not the first of Mahomet's, but it was the most famous. It happened in the 12th year from his assuming the character of prophet and apostle, and promulgating his new religion.

The Orientals do not agree with us, as to the time of the *hegira*. Among the Mahometans, Amassi fixes it to the year of Christ 630; and from the death of Moses, 2347, and Ben Castem, to the year of the world 5800, according to the Greek computation. Among the Christians, Said Ebn Batrik refers the *hegira* to the year of Christ 614, and of the creation 6114.

Khondemir relates, that it was Omar, the second caliph, that first established the *hegira* as an epocha, and appointed the years to be numbered from it: at the time he made this decree, there were already seven years elapsed. This establishment was made in imitation of the Christians; who, in those times, reckoned their years from the persecution of Dioclesian.

But there is another *hegira*, and the earlier too, though of less eminence:—Mahomet, in the 14th year of his mission, was obliged to relinquish Medina: the Corafites had all along opposed him very vigorously, as an innovator, and disturber of the publick peace; and many of his disciples, not enduring to be reputed followers of an impossor, desired leave of him to abandon the city, for fear of being obliged to renounce their religion. This retreat makes the first *hegira*.

—These two *hegira's* the Mahometans in their language call *hegiran*.

The years of the *hegira* consist only of 354 days. To reduce these years to the Julian calendar, *i. e.* to find what Julian year a given year of the *hegira* answers to, reduce the year of the *hegira* given, into days, by multiplying by 354; divide the product by 365, and from the quotient subtract the intercalations, *i. e.* as many days as there are four years in the quotient; and, lastly, to the remainder add 622. See **YEAR**.

HEIGHTH, the third dimension of a body, considered with regard to its elevation above the ground. See **DIMENSION**.

HEIGHTH, in astronomy, geography, &c. See **ALTITUDE**, and **ELEVATION**.

HEIGHTH, in the manage, &c. the stature of a horse, &c.

It is a reputed imperfection in a horse, when set too high on his legs, *i. e.* when the legs are too long in proportion to the body.

Some jockeys have determined a measure for them thus:—Take a string, and measure from the horse's withers to his elbow; and what length that is, the same should he have betwixt the elbow and the lower part of the heels.—Some measure their colts after this manner at a year old; being of opinion, that the legs of a colt at this age are as long as they ever will be.

The Duke of Newcastle, and Sir W. Hope, allow this to hold generally, but not universally.

HEIGHTS, in the military art, are the eminencies round a fortified place, whereon the armies usually post themselves.—The enemy had seized all the *heights*; appeared on the *heights*, &c.

HEIR *, **HÆRES**, in the civil law, he who succeeds to the whole estate and effects of another, whether by right of blood, or of testament.

* The word is formed of the Latin *heres*, of the verb *herere*, to stick, remain fast, be near, follow immediately, &c.

The institution of an *heir*, is a circumstance necessary to the validity of a testament.

There are two principal kinds of *heirs*, the *apparent* and *presumptive*.

HEIR Apparent, is he on whom the succession is so settled, that he cannot be set aside, without altering the laws of succession.

HEIR Presumptive. See the article **PRESUMPTIVE HEIR**.

HEIR, in common law, is he who succeeds, by right of blood, to any man's lands, or tenements in fee.

For, nothing passes in common law, *jure hereditatis*, by right of inheritance, but fee.

By common law, therefore, a man cannot be *heir* to goods or chattels; for, *heres dicitur ab hereditate*; it is the inheritance denominates the *heir*.

Every *heir*, having lands by descent, is bound by the acts of his ancestors, if he be named; it being a maxim, that *qui sentit commodum sentire debet et onus*.

Movables, or chattels immovable, are given by testament, to whom the testator thinketh fit; otherwise they lie at the disposition of the ordinary, to be distributed as he in conscience likes best.

LAST HEIR. See the article **LAST HEIR**.

HEIR-LOOM *, in our law-books, signify such household furniture, as is not inventoried after the owner's decease; but necessarily comes to the heir along with the house. See **HEIR**.

* *Confectudo hundredi de Streeford, in com. Oxon est quod heredes tenementorum infra hundredum predict. existen. post mortem antecessorum suorum habebunt, &c. principaliter, Anglice an heir-loome, viz. de quadam genere catalorum, utensilium, &c. Optimum plaustrum, optimum carucam, optimum ciphum, &c. Coke on Littleton.*

Heir-loom comprehends divers implements; as tables, presses, cupboards, bedsteads, furnaces, waincot, and such like; which, in some countries, have belonged to a house for certain descents, and are never inventoried after the decease of the owner, as chattels are; but accrue by custom, not by common law, to the *heir*, with the house itself.

HELCESAITES, or **ELCESAITES**. See **ELCESAITES**.

HELEPOLIS *, in antiquity, a military machine for battering down the walls of a place besieged.

* The word is Greek, *ἑλεπολις*; compounded of the words *ἔλας*, to take, and *πολις*, city.

The *helepolis*, as described by Diodorus Siculus, &c. appears to have been no more than the aries, or battering ram, with a roof, or covering over it, to prevent its being set on fire, as also to screen the men who worked it. See **ARIES**.

Some will have it a combination of two or three battering rams, moving on large strong wheels, roofed over, and covered with raw or wet skins. It had several iron points, or heads, wherewith the execution was done; formed much like the thunderbolts which painters represent. Within was a great number of soldiers, who drove it with force of arm and by means of ropes, violently against the wall where the breach was intended.

Others will have *helepolis* a general name, comprehending all the machines used by the ancients in besieging towns; as, among us, the name *artillery* includes all the sorts of large fire-arms.—But this opinion is chiefly founded on the origin of the name, and does by no means suit with those minute descriptions given of the *helepolis* in the ancient writers.

The invention of the *helepolis*, and divers other military machines, is ascribed to Demetrius; which, with the great number of cities he took thereby, gave him the denomination of *Polioretes*, or city taker.

HELICA *, in antiquity, sacrifices, and other solemnities, performed in honour of the sun.

* The word is formed from the Greek *ἥλιος*, sun.

HELICAL *, in astronomy:—**HELICAL Rising** of a star, planet, &c. is its issuing, or emerging out of the rays, and lustre of the sun, wherein it was before hid: whether this be owing to the recess of the sun from the star, or that of the star from the sun.

* The word is derived from the Greek, *ἥλιος*, *sol*, sun.

HELICAL Setting, is a star's entering or immersing into the sun's rays, and so becoming inconspicuous by the superior light of that luminary.

A star rises *helically*, when after it has been in conjunction with the sun, and on that account invisible, it gets at such a distance from him, as to be seen in the morning before the sun's rising.

The same is said to set *helically*, when it approaches so near the sun, as to be hid therein. So that, in strictness, the *helical*

ical rising and setting, are only an apparition and occultation.

The *helical rising* of the moon, happens when she arrives at the distance of 17 degrees from the sun; for the other planets, 20 degrees distance is required: and for the stars more or less, as they are greater or smaller.

To find the **HELICAL rising and setting by the globe**; see **GLOBE**.

The ancients computed that a star, between the tropics, would be forty days ere it got clear of the sun's rays, and become conspicuous again. Heliod first made this computation; and the rest followed him. The period comes very near to the computation of the moderns: for the sun advancing nearly a degree every day, it will be 20 days approaching thereto, from the *helical setting* of the star; and thirty days more withdrawing, till the *helical rising*.

HELIASTES * in antiquity, officers, or magistrates of Athens, who constituted a court of 500 persons, and were judges, for taking cognizance of civil matters.

* Ulpian gives us two etymologies of the word: some, says he, derive it from *ἥλιος*, *helios*, sun; and hold it thus called, by reason they sat in the open air, in sight of the sun. Ulpian himself chooses rather to derive *heliastes* from *ἡλιαια*, *Helicæa*, the place where this court or council was held; and that from *ἀνέλε*, I assemble, of *ἀλε*, *fatia*, enough.

The court of *heliastes* was one of the six civil jurisdictions of Athens, and that before which matters of the greatest moment were usually brought: so that it was held the first and most considerable of all the civil tribunals. The delinquencies of the military men were also brought before the *heliastes*.

HELICE, **ΕΛΙΚΗ**, in astronomy, the same with *ursa major*. See **URSA**.

HELICOID Parabola, or the *parabolic spiral*, a curve arising upon a supposition of the axis of the common Apollonian parabola's being bent round into the periphery of a circle. See **PARABOLA**.

The *helicoid parabola*, then, is a line passing through the extremities of the ordinate, which now converge towards the centre of the said circle.

Suppose, e. g. the axis of the common parabola to be bent into the periphery of the circle BDM. (See *Tab. Conics*, fig. 11.) then, the curve BFGNA, which passes through the extremities of the ordinates CP, and DG, which converge toward the centre of the circle A; constitutes what we call the *helicoid*, or *spiral parabola*.

If the arch BC, as an abscissa, be called *x*, and the part CF of the radius, as an ordinate to it, be called *y*; the nature of this curve will be expressed by the equation $ix = yy$. See **CURVE**, and **EQUATION**.

HELIOCENTRIC * *Place*, of a planet, is the place wherein the planet would appear to be, if viewed from the centre of the sun: Or the point of the ecliptic, wherein a planet viewed from the sun would appear to be.

* The word is compounded of *ἥλιος*, sun, and *κεντρος*, centre.

The *heliocentric place*, therefore, coincides with the longitude of a planet viewed from the sun.

HELIOCENTRIC Latitude of a Planet, is the inclination of the line drawn between the centre of the sun and the centre of a planet, to the plane of the ecliptic.

The *heliocentric latitude* of a planet is thus determined.—If the circle KLM, (See *Tab. Astron*, fig. 62.) represent the orbit of the earth round the sun, and the inner one ANBn, be placed so as to be inclined to the plane of the other (for which reason it appears in the form of an ellipse) when the planet is in N or n, (which points are called its *nodes*) it will appear in the ecliptic, and so have no latitude; if it move to P, then, being seen by the sun, it will appear to decline from the ecliptic, or to have latitude; and the inclination of the line RP, to the plane of the ecliptic, is called the planet's *heliocentric latitude*; and the measure of it is the angle P R Q, supposing the line P q to be perpendicular to the plane of the ecliptic.

This *heliocentric latitude* will be continually increasing, till it come to the point A, which they call the *limit*, or utmost extent of it; and then it will decrease again, till it come to nothing in N; after which it will increase again till it come to B; and lastly, it will be decreasing again, till the planet come to be in n, &c.

HELIOCOMETES, *Comet of the Sun*; a phenomenon sometimes observed at the setting of the sun; thus denominated by Sturmius and Pnylen, who had seen it, in regard it seems to make a comet of the sun, being a large tail, or column of light, fixed or hung to that luminary, and dragging after it at his setting, much in the manner of a tail of a comet. In that observed by M. Pnylen at Grypswald, March 15. 1702. at five of the clock in the afternoon, the end which touched the sun was only half the sun's diameter broad; but the other end, opposite to the sun, was much broader. Its length was above ten diameters of the sun; and it moved in the same track as the sun. Its colour was yellow next the sun and darker further off. It was only seen painted on the thinner, higher clouds; a little telescope easily discovered that there was nothing of it on the thicker, and lower clouds; though

the naked eye could not discover so much. It lasted, in its full vigour, the space of an hour, and then gradually diminished.

HELIOSCOPE *, in optics, a sort of telescope, peculiarly fitted for viewing and observing the sun, without doing prejudice to the eye.

* The word is compounded of ἥλιος, the sun, and σκοπέω, video, specto, I see, view, consider.

Helioscopes are necessary in viewing the phenomena of the sun, as his spots, eclipses, &c.

There are various apparatuses of this kind.—As coloured glasses are found to diminish the force of the sun's rays; to make a *heliocope*, it is enough that both the object-glass, and the eye-glass of the telescope, be of coloured glass; the first, *e. g.* of red, and the latter green.

But, as there is a necessity for the glasses to be very transparent, and equally coloured, which rarely happens; Hevelius chooses rather to use two plain coloured glasses, with a piece of paper between, either tied or cemented together, and applied before the eye-glass.

Dr. Hooke, in an express treatise on *helioscopes*, recommends four reflecting glasses placed in the tube; by these, he observes, the force of the rays will be so weakened, as only to strike the eye with a 256th part of their force: and this *heliocope* he prefers to all others.

M. Huygens's method is much easier:—He only blackens the inside of the eye-glass of the telescope, by holding it over the flame, or smoke of a lamp or candle: or, which is yet more commodious, blackens a piece of plain glass, and holds it between the eye and the object-glass: or, which is best of all, claps the smoked glass to another, with a rim of thick paper between, to keep the black from rubbing off; and fits the two into a cell, or frame, to be applied between the eye and the eye-glass.

HELIO-TROPE *, ἡλιότροπον, in natural history, the plant sun-flower, or turnsole; so called, by reason its flowers always turn towards the sun. See **TURNSOLE**.

* The word is compounded of the Greek, ἥλιος, sun, and τροπέω, verto, I turn. See *supplement*: article **HELIO-TROPION**.

HELIO-TROPE is also a precious stone, of a green colour, streaked with red veins.

Pliny says, it is thus called by reason when cast into a vessel of water, the sun's rays falling thereon, seem to be of a blood colour, and that when out of the water, it gives a faint reflection of the figure of the sun; and is proper to observe eclipses of the sun withal, as a heliocope.

The *heliotrope* is also called *oriental jasper*, on account of its ruddy spots.

It is found in the East-Indies; as also in Ethiopia, Germany, Bohemia, &c. Some have ascribed to it the faculty of rendering people invisible, like Gyges's ring. See *supplement*: articles **BLOODSTONE** and **HELIO-TROPE**.

HELISPHERICAL LINE, in navigation, denotes the rhumb line. See **RHUMB LINE**.

It is thus called, because, on the globe, it winds round the pole helically, *i. e.* spirally, and still comes nearer and nearer to it.

HELIX *, in geometry, a spiral line. See **SPIRAL**.

* The word is Greek, ἡλίξ, and literally signifies a wreath, or winding; of ἡλίσκος, involvo, I involve.

In architecture, some authors make a difference between the *helix* and the spiral.

A stair-case, according to Daviler, is in a *helix*, or is *helical*, when the stairs or steps wind round a cylindrical newel; whereas the spiral winds round a cone, and is continually approaching nearer and nearer its axis.

HELIX is also applied in architecture to the caulicoles, or little volutes, under the flowers of the Corinthian capital; called also *urille*.—See *Tab. Archit. fig. 26. lit. D*; see also **CAULICOLES**.

HELIX, in anatomy, is the whole circuit or extent of the auricle, outwards.

In opposition to which, the inner protuberance answering thereto is called *anhelix*. See **EAR**.

HELL, a place of punishment, wherein the wicked are to receive the reward of their evil deeds, after this life.

In this sense, *hell* stands opposed to *heaven*. See **HEAVEN**. Among the antients, *hell* was called Τάρταρος, Tartarus, Tartarus, Tartara; Ἅδης, Hades, Infernus, Inferna, Inferi, &c.—The Jews, wanting a proper name for it, called it *Gehenna*, or *Gehinnon*, from a valley near Jerusalem, wherein was a Tophet, or place where a fire was perpetually kept. Divines reduce the torments of *hell* to two kinds, *pœna damni*, the loss and privation of the beatific vision; and *pœna sensus*, the horrors of darkness, with the continual pains of fire inextinguishable.

Most nations and religions have their notions of a *hell*.—The *hell* of the poets is terrible enough: witness the punishment of Tityus, Prometheus, the Danaids, Lapithe, Phlegyas, &c. described by Ovid in his *Metamorphosis*.—Virgil, after a survey of *hell*, *Æneid*. Lib. VI. declares; that had he a hundred mouths

and tongues, they would not suffice to recount all the plagues of the tortured.—The New Testament represents *hell* as a lake of fire and brimstone; and a worm which dies not, &c. Rev. xx. 10, 14, &c. Mark ix. 43, &c. Luke xvi. 23, &c.

The Caffres are said to admit thirteen *hells*, and twenty-seven paradises; where every person finds a place of recompense suited to the degree of good or evil he has done.

There are two great points of controversy among writers touching *hell*: the first, Whether there really be any local *hell*, any proper and specific place of torment by fire? the second, Whether the torments of *hell* are to be eternal?

I. The locality of *hell*, and the reality of the fire thereof, have been controverted from the time of Origen.—That father, in his treatise Πηγάδιον, interpreting the scripture account metaphorically, makes *hell* to consist not in external punishments, but in the conscience of sinners, the sense of their guilt, and the remembrance of their past pleasures.—St. Augustine mentions several of the same opinion in his time; and Calvin, and many of his followers, have embraced it in ours.

The retainers to the contrary opinion, who are much the greater part of mankind, are divided as to the situation, and other circumstances of this horrible scene.—The Greeks, after Homer, Hesiod, &c. conceived *hell*, Τένος τῶν ὅσων τῶν γῆρας, &c. a large and dark place under the earth. Lucian, *De luctu*; and Eusebius, on *Homer*.

Some of the Romans lodged it in the subterranean regions directly under the lake Avernus, in Campania; which they were led to from the consideration of the poisonous vapours emitted by that lake.—Through a dark cave near this lake, Virgil makes Æneas descend to *hell*. See **AVERNUS**.

Others placed *hell* under Ténarus, a promontory of Laconia; as being a dark frightful place, beset with thick woods, out of which there was no finding a passage. This way, Ovid says, Orpheus descended to *hell*. Others fancied the river, or fountain of Styx, in Arcadia, the spring-head of *hell*, by reason the waters thereof were mortal.

But these are all to be considered as only fables of poets; who, according to the genius of their art, allegorizing and personifying every thing, from the certain death met withal in those places, took occasion to represent them as so many gates, or entering places into the other world.

The primitive Christians, conceiving the earth a large extended plain, and the heavens an arch drawn over the same; took *hell* to be a place in the earth, the furthest distant from the heavens; so that their *hell* was our antipodes.

Tertullian, *De anima*, represents the Christians of his time, as believing *hell* to be an abyss in the centre of the earth: which opinion was chiefly founded on the belief of Christ's descent into hades, *hell*, Matt. xii. 40. See the following article, **HELL**.

Mr. Whiston has lately advanced a new opinion.—According to him, the comets are to be conceived as so many *hells*, appointed, in the course of their trajectories, or orbits, alternately to carry the damned into the confines of the sun, there to be scorched by his flames; and then to return them to starve in the cold, dreary, dark regions, beyond the orb of Saturn.

The reverend and orthodox Mr. T. Swinden, in an express *Inquiry into the nature and place of Hell*, not contented with any of the places hitherto assigned; contends for a new one.—According to him, the sun itself is the *local hell*.

This does not seem to be his own discovery:—It is probable he was led into the opinion by that passage in *Rev. xvi. 8, 9*.—Though it must be added, that Pythagoras seems to have had the like view, in that he places *hell* in the sphere of fire; and that sphere in the middle of the universe.—Add, that Aristotle mentions some of the Italic, or Pythagoric school, who placed the sphere of fire in the sun, and even called it Jupiter's prison. *De Cælo*, L. II.

To make way for his own system, Mr. Swinden undertakes to remove *hell* out of the centre of the earth, from these two considerations:—1^o. That a fund of fuel or sulphur, sufficient to maintain so furious and constant a fire, cannot be there supposed: And, 2^o. That it must waste the nitrous particles in the air, to sustain and keep it alive.—And how, says he, can such fire be eternal, when by degrees the whole substance of the earth must be consumed thereby?

It must not be forgot, however, that Tertullian had long ago obviated the former of these difficulties, by making a difference between *arcanus*, and *publicus ignis*, secret and open fire: The nature of the first, according to him, is such, as that it not only consumes, but repairs what it preys upon.—The latter difficulty is solved by St. Augustine, who alleges, that God supplies the central fire with air, by a miracle.

Mr. Swinden, however, proceeds to shew, that the central parts of the earth are possessed by water rather than fire; which he confirms by what Moses says of water under the earth, *Exod. xx. from Psalm xxiv. 2. &c.*

As a further proof, he alleges, that there would want room in the centre of the earth, for such an infinite host of inhabitants, as the fallen angels, and wicked men.

Drezelius, we know, has fixed the dimensions of *hell* to a

German cubic mile, and the number of the damned to an hundred thousand millions: *De Damator. Carcer. & Rego.* But Mr. Swinden thinks he needed not have been so sparing in his number; for there might be found an hundred times as many; and that they must necessarily be unnumberably crowded in any space we could allow them in our earth.—It is impossible, he concludes, to flow such a multitude of spirits in such a scanty apartment, without a penetration of dimensions, which, he doubts, is not good philosophy, even in respect of spirits: If it be, he adds, 'he does not see why God should prepare, *i. e.* make a prison for them, when they might have been all crowded together into a baker's oven, p. 206.

His arguments for the sun's being the *local hell* are,

1. Its capacity;—No body will deny the sun spacious enough to receive all the damned conveniently; so that there will be no want of room. Nor will fire be wanting, if we admit of Mr. Swinden's argument against Aristotle, whereby he demonstrates that the sun is hot, p. 208, and *seq.*—The good man is 'filled with amazement to think what Pyrenean mountains of sulphur, how many Atlantic oceans of scalding bitumen, must go to maintain such mighty flames as those of the sun: to which our *Ætna* and *Vesuvius* are mere glow-worms,' p. 137.

2. Its distance and opposition to the empyreum, which has usually been looked upon as the local heaven: such opposition is perfectly answerable to that opposition in the nature and office of a place of angels and devils, of elect and reprobate, of glory and horror, of hallelujahs and cursings: And the distance quadrates well with Dives seeing Abraham afar off, and the great gulph between them; which this author takes to be the solar vortex.

3. That the empyreum is the highest, and the sun the lowest place of the creation; considering it as the centre of our system: And that the sun was the first part of the visible world created; which agrees with the notion of its being primarily intended or prepared to receive the angels, whose fall he supposes to have immediately preceded the creation.

4. The early and almost universal idolatry paid the sun; which suits well with the great subtilty of that spirit to entice mankind to worship his throne.

II. As to the eternity of *hell torments*, we have Origen, again at the head of those who deny it; it being the doctrine of that writer, that not only men, but devils themselves, after a suitable course of punishment, answerable to their respective crimes, shall be pardoned and restored to heaven. *Aug. de Civit. Dei*, L. XXI. c. 17.—The chief principle Origen went upon was this, that all punishments are emendatory; applied only as painful medicines, for the recovery of the patient's health. And other objections insisted on by modern authors, are the disproportion between temporary crimes, and eternal punishments, &c.

The scripture phrases for eternity, as is observed by archbishop Tillotson, do not always import an infinite duration: Thus, in the Old Testament, *for ever*, often signifies only a long time; particularly till the end of the Jewish dispensation: Thus in the epistle of *Jude*, ver. 7. the cities of Sodom and Gomorrah are said to be set forth for an example, suffering the vengeance of eternal fire; that is, of a fire that was not extinguished till those cities were utterly consumed.—So one generation is said to come, &c. but the earth endureth *for ever*.

In effect, M. le Clerc notes, that there is no Hebrew word which properly expresses eternity: *וְלָאָה* *holam*, only imports a time whose beginning or end is not known; and is accordingly used in a more or less extensive sense, according to the thing treated of.

Thus, when God says concerning the Jewish laws, that they must be observed *וְלָאָה* *lehalam*, for ever; we are to understand as long a space as he should think fit; or a space whose end was unknown to the Jews before the coming of the Messiah.—All general laws, and such as do not regard particular occasions, are made *for ever*, whether it be expressed in those laws or not: which yet is not to be understood in such a manner, as if the sovereign power could no way change them.

Archbishop Tillotson, however, argues very strenuously, that where *hell torments* are spoke of, the words are to be understood in the strict sense of infinite duration; and what he esteems a peremptory decision of the point is, that the duration of the punishment of the wicked, is in the very same sentence expressed by the very same word which is used for the duration of the happiness of the righteous, which all agree to be eternal. 'These, speaking of the wicked, shall go away, *οὐκ ἔσται ἡ ζωὴ αὐτῶν*, into eternal punishments; but the righteous, *οὐκ ἔσται ἡ θάνατος αὐτῶν*, into life eternal.

The same great author attempts to reconcile this eternity with the divine justice, which had not been satisfactorily done before.—Some had urged that all sin is infinite, in respect of the object it is committed against, *viz.* God; and therefore deserves infinite punishment: But,

that crimes should be heightened by the quality of the object, to such degree, is absurd: since the evil and demerit of all sin must then be equal, inasmuch as none can be more than infinite; and consequently there can be no foundation for degrees of punishment in the next life. Add, that for the same reason as the least sin against God is infinite, in respect of its object; the least punishment inflicted by God may be said to be infinite, because of its author; and thus all punishments from, as well as sins against God, would be equal.

Others have urged, that if the wicked were to live for ever, they would sin for ever: But this, says the author, is mere presumption. Who can say, that if a man lived ever so long, he would never repent? Besides, the justice of God only punishes sins which men have committed, not those they might possibly have committed.

Others therefore urge, that God gives men the choice of everlasting happiness and misery; and that the reward promised to obedience, is equal to the punishment threatened to disobedience.—To which it was answered, that though it be not contrary to justice to exceed in rewards, that being matter of mere favour; it may be so to exceed in punishments.

It may be added, that man in this case has nothing to complain of, since he has only his election.—But though this may suffice to silence the sinner, and make him acknowledge his destruction to be of himself, it does not satisfy the objection from the disproportion between the crime and the punishment.—All the considerations, therefore, hitherto alleged, proving ineffectual; our great author is left to solve the difficulty himself.

In order to this, he observes, that the measure of penalties, with respect to crimes, is not only, nor always taken from the quality and degree of the offence; much less from the duration and continuance of it; but from the reasons of government, which properly require such penalties as may secure the observation of the law, and deter men from the breach of it.—Among men it is not reckoned injustice to punish murder, and many other crimes, which perhaps are committed in a moment, with perpetual loss of estate, or liberty, or life. So that the objection of temporary crimes being punished with such long sufferings, is of no force.

In effect, what proportion crimes and penalties are to bear to each other, is not so properly a consideration of justice, as of wisdom and prudence in the law-giver, who may enforce his laws with what penalties he pleases, without any impeachment of his justice, which is out of the question.

The primary end of all threatening is not punishment, but the prevention of it: God does not threaten that men may sin and be punished; but that they may not sin, and so escape: And therefore the higher the threatening runs, the more goodness there is in it.

After all, it is to be considered, says the archbishop, that he who threatens, has still the power of execution in his own hands.—There is this difference between promises and threatenings; that he who promises, passes over a right to another, and thereby stands obliged to him in justice and faithfulness, to make good his word: but it is otherwise in threatenings; he that threatens, keeps the right of punishing still with him, and is not obliged to execute what he has threatened, any further than the reasons and ends of government require.—Thus, God absolutely threatened the destruction of Nineveh; and his peevish prophet understood the threatening to be absolute, and was angry for being employed in a message that was not made good: But God understood his own right, and did what he pleased, notwithstanding the threatening he had denounced, and notwithstanding Jonah was so touched in point of honour, that he had rather have perished, than Nineveh should have escaped.

HELL, *Hades*, is sometimes also used, in the scripture-style, for death, or burial; by reason the Hebrew and Greek names signify sometimes the place of the damned, and sometimes simply the grave.

Divines are divided about the sense of that article in the apostles creed, where our Saviour is said to have been crucified, dead and buried, and that he descended into hell, *Adnc.*—Some understand this descent into hell as no other than a descent into the tomb, or sepulchre; which others object against, in that his burial is expressly mentioned before; and maintain, that our Saviour's soul actually descended into the subterraneous, or local hell; where he triumphed over the devils, &c.

The Romanists add, that he there comforted the souls in purgatory; and brought away the spirits of the patriarchs, and other just persons, departed till that time; carrying them with him into paradise.

In the Romish church, that part of hell, wherein those were retained who died in the mercy and favour of God before our Saviour's suffering, is called *limbus*. See LIMBUS.

HELLEBORE, *ΕΛΛΕΒΟΡΟΣ*, or ELLEBORUS, a medicinal plant, reputed, among the ancients, a specific for the cure of melancholy and madness.

There are two sorts of *hellebore*, the *black* and *white*.
Black HELLEBORE, *Helleborus niger*, called also *melampodium*, and in English, the *christmas rose*, has a dark-coloured root, furnished with abundance of little fibres; its stem is green, its leaves are digitated, and its flowers are of a whitish colour, but in shape not unlike the rose.

White HELLEBORE, *Helleborus albus*, called also *veratrum*, in English, *nesewort*, has a whitish root, beset with fibres of the same colour, shooting out at a sort of bulb, not unlike the head of an onion. Its leaves are broad; at first green, afterwards of a yellowish red. From the middle of the leaves rises a stem, two or three feet high, which toward the upper part has several branches, each whereof bears a considerable number of little flowers like stars, disposed in manner of a spica, or ear.

It is only the roots that are used, in each kind; which are to be chosen large and fair, furnished with thick filaments: those of the *white* tan-coloured without, and *white* within; and those of the *black*, blackish without, and brownish within; dry, clean, and of a sharp, disagreeable taste.

The antients, as already observed, had a great opinion of their efficacy in diseases of the mind; whence various phrases and forms of speaking among writers: as *caput helleboro dignum*: Juvenal says, Misers need a double dose of *hellebore*: *Danda est hellebori multo pars maxima avaris*.—The island of Anticyra, situate against mount Oeta, was famous for the growth and use of this plant: it being here in its greatest perfection, and used with the best effect. Whence the proverb *Naviget Anticyras*, send him a voyage to Anticyra; spoken of a madman.

The *white* acts as a purgative, but so very violently, both upwards and downwards, as frequently to cause convulsions; whence the use of it internally is now out of doors: but it is still retained with success for the frenzy in horses, and the scab in sheep.

The chief use wherein the present practice acknowledges it, is in form of a sternutatory powder, to clear and open the head.

The *black hellebore* used among us, Dr. Quincy suggests to be much inferior in virtue to that of the antients; for that it will not operate much by stool; but is only a powerful alterative, getting far into the habit, and so promoting sweat.

He adds, that he has known it do wonders in the gout and rheumatism, and that it rarely fails in obstructions of the menfes. See *supplement*: article HELLEBORUS.

HELLENISM, a sort of Grecism; or a phrase peculiarly accommodated to the genius, and construction of the Greek tongue.

Hellenism, is distinguished from *Grecism*, in that the former is not applied to authors who have wrote in Greek: their language, it is evident, should be a continual *Hellenism*. But it is applied to authors, who writing in some other language, use terms and expressions peculiar to the Greek.

There are abundance of *Hellenisms* in the vulgate version of the scriptures.

HELLENISTIC, or *HELLENISTIC Language*, that used among the *Hellenists*. See HELLENISTS.

The critics are divided as to this language. — Several of them, and among the rest Drusius and Scaliger, take it to be the language used among the Grecian Jews. They add, that it is in this language the Greek translation of the Septuagint was wrote; and even the books of the New Testament composed.—M. Simon calls it the *language of the synagogue*.

It must not be imagined, that this was any peculiar language distinct from all others; or even any peculiar dialect of the Greek: It was thus denominated, to shew that it was Greek, mixed with Hebrews, and Syriacisms.

Salmatus rejects the common opinion of the learned touching the *Hellenistic* language; and has wrote two volumes on the subject, in which there is not a little *logomachia*.

HELLENISTS, *HELLENISTÆ*, a term occurring in the Greek text of the New Testament, and which in the English version is rendered *Grecians*.

The critics are divided as to the signification of the word.—Oecumenius, in his *Scolia* on *Actis* vi. 1. observes, that it is not to be understood as signifying those of the religion of the Greeks, but those who spoke Greek, τῶν Ἰδωντων ἐπισημασμεν. The authors of the vulgate version, indeed, render it, like ours, *Greci*; but Messieurs du Port Royal, more accurately, *Juifs Grecs*, Greek or Grecian Jews; it being the Jews who spoke Greek, that are here spoken of, and who are hereby distinguished from the Jews called *Hebrews*; that is, who spoke the Hebrew tongue of that time.

The *Hellenists*, or Grecian Jews, were those who lived in Egypt, and other parts, where the Greek tongue prevailed. It is to them we owe the Greek version of the Old Testament, commonly called the *Septuagint*, or that of the Seventy. See SEPTUAGINT.

Salmatus, and Vossius, are of a different sentiment with regard to the *Hellenists*. The latter will only have them to be those who adhered to the Grecian interests.

Scaliger is represented in the *Scaligerana*, as asserting the

Hellenists to be the Jews who lived in Greece, and who read the Greek Bible in their synagogues.

HELM, in navigation, a horizontal piece of timber, serving to move another fitted into it at right angles, called the *rudder*.

The *helm*, or tiller of a ship, is a beam, or piece of timber, fastned into the rudder, and so coming forward into the steerage; where he that stands at *helm* steers the ship.

A-lee the Helm, signifies to put the *helm* to the lee-side of the ship.

Bear up the Helm, is to let the ship go more large before the wind.

Port the Helm, is to put the *helm* on the left hand or side of the ship.

Right the helm, or *helm the midship*, is to keep it even with the middle of the ship.

Starboard the Helms, is to put it to the right side of the ship.

HELM, in chemistry, is the head of a still or alembic; thus called, because in figure it something resembles a *helm*, or helmet.

Hence, to bring a thing *over the helm*, is the same as to force it by fire up to the top of the vessel, that it may distil down into the receiver by the beak of the head.

And when they say, such a thing cannot be brought over the *helm*, they mean, that it is of too fixed a nature to be raised into vapour, by the force of fire.

HELMET, or *HELM*, an antient armour of defence, wore by the cavaliers, both in war and in tournaments, as a cover and defence of the head; and still used by way of crest or ornament, over the field or coat of arms.

The *helmet* is known by divers other names, as the *casque*, *head-piece*, *steel cap*, &c.

The *helmet* covered the head and face, only leaving an aperture about the eyes, secured by bars, which served as a visor.

The *helmet* is bore in armoury as a mark of nobility; and by the different circumstances of the bearing of the *helmet*, are the different degrees of nobility indicated. In France, whence all our heraldry originally came, the following rules obtain.

A person newly ennobled, or made a gentleman, bears over his escutcheon a *helmet* of bright iron or steel, in profile, or standing sideways; the visor quite close.

A gentleman of three descents bears it a little open, but still in profile, shewing three bars of the visor.

Antient knights, &c. have it in profile, but shewing five bars; the edges of silver.

A baron's *helmet* is of silver, the edges gold; with seven bars neither quite in profile, nor yet in front; with a coronet over it adorned with pearls.

Viscounts and earls formerly bore a silver *helmet*, with gold edges; its position like the former: but now they bear it quite fronting, with a coronet over it.

Marquises bear a silver *helmet*, damasked, fronting; with eleven bars, and their coronet.

Dukes and princes have their *helmet*, damasked, fronting, the visor almost open, and without bars; with their coronets over them.

Lastly, the *helmets* of kings and princes are all of gold, damasked, full fronting, and the visor quite open, and without bars.

The *helmets* of bastards are to be turned to the left, to denote their bastardy.

Among the English heralds, these laws are of late somewhat varied.—Leigh will have the *helmet* in profile, and close, to belong to knights: but all other authors give it to esquires and gentlemen.

To a knight they assign the *helmet* standing right forward, and the bearer a little open.

The *helmet* in profile or posited side-ways, and open, with bars, belongs to a nobleman under the condition of a duke.

The *helmet* right forward, and open, with many bars, is assigned to dukes, princes and kings.

Those turned side-ways are supposed to be giving ear to the command of their superiors; and those right forwards to be giving orders with absolute authority.

Commonly there is but one *helmet* in a field; but, sometimes, there are two or three; if there be two, they must be placed facing each other: if three, the two extremes must be looking towards that in the middle.

HELMONTIAN Laudanum. See LAUDANUM.

HELPS, in the manage.—To teach a horse his lessons, there are seven *helps*, or aids, to be known.—These are the *voice*, *rod*, *bit*, or *snaffle*; the *calves* of the legs, the *stirrups*, the *spur*, and the *goad*.

The *helps* are occasionally turned into corrections. See CORRECTION.

HELVETIC, something that has a relation to the Switzers, or inhabitants of the Swiss cantons, who were antiently called *Helvetii*.

The *Helvetic* body comprehends the republick of Switzerland, consisting of thirteen cantons, which make fo many particular commonwealths.

By the laws, and customs of the *Helvetic* body, all differences between the several itates and republics are to be decided within themselves, without the intervention of any foreign power.

HELVIDIANS, a sect of antient heretics, denominated from their leader *Helvidius*, a disciple of Auxentius the Arian, whose distinguishing principle was, that Mary the mother of Jesus did not continue a virgin; but had other children by Joseph.

The *Helvidians* are called by the Greeks, *Antidicomarianites*.

HEMEROBAPTISTS, a sect among the antient Jews, thus called from their washing and bathing every day, in all seasons. Epiphanius, who mentions this as the fourth herefy among the Jews, observes, that in other points these hereticks had much the same opinions as the Scribes and Pharisees; only that they denied the resurrection of the dead, in common with the Sadduces, and retained a few other of the impieties of these last.

D' Herbelot speaks of them as a sect still subsisting:—The disciples of St. John Baptist, says he, who in the first ages of the church were called *Hemerobaptists*, have constituted a sect, or rather a religion apart, under the name of *Mendai Jabia*. These people, whom our travellers call Christians from St. John Baptist, by reason their baptism is very different from ours, have been confounded with the Sabæans, from whom, however, they are very different.

HEMERODROMI *, among the antients, were centinels, or guards, appointed for the security, and preservation of cities, and other places.

* The word is Greek, *ἡμεροδρομοι*, compounded of *ἡμερα*, day, and *δρομη*, course, running about, &c.

They went out of the city every morning, as soon as the gates were opened, and kept all day patrolling round the place; sometimes also making excursions further into the country, to see that there were no enemies lying in wait to surprisè them.

HEMERODROMI, were also a sort of couriers among the antients, who only travelled one day, and then delivered their packets, or dispatches to a fresh man, who run his day; and so on, to the end of the journey.

The Greeks had of these sort of couriers, which they learnt from the Persians, who were the inventors thereof, as appears from Herodotus.—Augustus had the same: at least, he established couriers, who, if they did not relieve each other from day to day, yet did it from space to space, and that space was not very great.

H E M I, a word used in the composition of divers terms.—It signifies the same with *semi* or *deni*, viz. half; being an abbreviation of *ἡμισυς*, hemisys, which signifies the same.

The Greeks retrenched the last syllable of the word *ἡμισυς*, in the composition of words; and after their example we have done so too, in most of the compounds borrowed from them.

HEMICRANIA, *ἠμικρανία*, in medicine, a species of cephalalgia, or head-ach; wherein only one hemisphere, or half, or one side of the head is affected.

HEMICYCLE *. **HEMICYCLUM**, a femicircle. See **SEMICIRCLE**.

* The word is compounded of *ἡμισυς* *dimidius*, half, and *κικλος*, circle.

HEMICYCLE, is particularly applied in architecture, to vaults in the cradle form; and arches, or sweeps of vaults, constituting a perfect femicircle.

To construct an arch of hewn stone, they divide the *hemicycle* into so many vouffours; taking care to make them an uneven number, that there be no joint in the middle, where the key-stone should be. See **KEY**.

HEMICYCLUM was also a part of the orchestra in the antient theatre.—Scaliger, however, observes, it was no standing part of the orchestra; being only used in dramatic pieces, where some person was supposed to be arrived from sea, as in Plautus's *Rudens*.

The antients had also a sort of sun-dial, called *hemicyclium*.—It was a concave femicircle, the upper end or cusp whereof looked to the north.

There was a style or gnomon, issuing from the middle of the *hemicycle*, whereof that point corresponding to the centre of the *hemicycle*, represented the centre of the earth: and its shadow projected on the concavity of the *hemicycle*, which represented the space between one tropic and another, the sun's declination, the day of the month, hour of the day, &c.

HEMINA *, a vessel used as a measure among the antient Romans, containing half the sextary.

* The word is formed of the Greek, *ἡμισυς*, half.

The *hemina*, called also *cotyla* and *acetabulum*, contained eight ounces of liquor; and was the 12th part of the congius.

Several authors have wrote exprefs treatises on the Roman *hemina*; particularly Mess. Arnaud, and Pelletier.

S. Benedic't prescribes the *hemina*, as the portion or quantity of wine, to be allowed the religious of his order at each meal. F. Mabillon, who has wrote on the subject, shews, that this *hemina* was a measure peculiar to the Benedictines; as well as the pound of bread allowed the same religious, which only consisted of fifteen ounces. F. Lan-celot has a dissertation to prove that the *hemina* of wine, prescribed by S. Benedic't, only amounts to a demi-septier of Paris measure: But others make it two septiers; and others three.

HEMIOLIUS *, or **HEMIOLIA**, an antient mathematical term, occurring chiefly in musical writers.—It signifies the ratio of two things, whereof the one contains the other once and an half; as 3 : 2, or 15 : 10, otherwise called *sesquialterate*. See **RATIO**, and **SESQUIALTERATE**.

* The word is compounded of *ἡμισυς*, half, and *ὅλον*, whole.

Macrobius, on the *Somnium Scipionis*, L. II. c. 1. observes, that the concord, called in the antient music *diapente*, and in the modern, a *ffth*, arises from this proportion.

HEMIOPE * or **HEMIOPUS**, a musical instrument in use among the antients.

* The word is compounded of *ἡμισυς*, half and *οπη*, hole.

The *hemiopus* was a flute with only three small holes. See **FLUTE**.

HEMIPLEGIA * or **HEMIPLEXIA**, in medicine, a palsy of one whole side of the body. See **PALSY**.

* The word is Greek, *ἡμιπληγία*, compounded of *ἡμισυς*, half, and *πλησσω*, I strike, or seize.

HEMISPHERE *, **HEMISPHERIUM**, in geometry, is one half of a globe, or sphere, when divided into two by a plane, passing through its centre.

* The word is compounded of *ἡμισυς*, half, *σφαίρα*, sphere globe.

If the diameter of a sphere be equal to the distance of the two eyes; and a right line drawn from the centre of the sphere to the middle of that distance, be perpendicular to the line which joins the eyes: the eyes making a rotation on the axis, or middle point between them, will see the whole *hemisphere*.—If the distance of the eyes be either greater or lesser than the diameter of the sphere; in making such rotation they will view respectively more or less than a *hemisphere*. See **VISION**.

The writers in optics demonstrate, that a glass *hemisphere* unites parallel rays at the distance of a diameter, and one third of a diameter from the pole of the glass.

The centre of gravity of a *hemisphere* is five eighths of the radius distant from the vertex.

HEMISPHERE, in astronomy, is particularly used for one half of the mundane sphere. See **WORLD**.

The equator divides the sphere into two equal parts, called the *northern* and *southern hemispheres*.

The *northern hemisphere*, is that half in whose vertex is the north pole.—Such is that represented by *DPA*, (*Tab. Astronomy*, fig. 52.) terminated by the equator *DA*, and having the pole *P* in its zenith.

The *southern hemisphere*, is that other half *DQA*, terminated by the equator *DA*; and having the fourth pole *Q* in its zenith.

The horizon also divides the sphere into two *hemispheres*, the *upper* and the *lower*.

The *upper hemisphere* is that also of the mundane sphere *HZR*, terminated by the horizon *HR*, and having the zenith *Z* in its vertex.

The *lower hemisphere*, is that other half *HNR*, terminated by the horizon *HR*, and having the nadir *N* in its vertex.

HEMISPHERE is also used for a map, or projection, of half the terrestrial globe, or half the celestial sphere, on a plane.

Hemispheres are frequently called *planispheres*.

HEMISPHEROIDAL, in geometry, something that approaches to the figure of a *hemisphere*, but is not justly so.

The cacao opens when yellow and ripe, into two large *hemispheroids*, three foot in diameter.

HEMISTICH *, in poetry, a half verse. See **VERSE**.

* The word is compounded of *ἡμισυς*, half, and *τιχον*, verse.

Such, e. g. arc, *Cernit Deus omnia vindex—*
or *Medio tutissimus ibis*, &c.

It is disputed, whether or no the *hemistichs* in the *Æneid* were left with design; or whether they are owing to the work's being unfinished?

In English, &c. the common and Alexandrine verses, require a rest at the end of each *hemistich*: Common verses require it at the end of four syllables; and Alexandrine at the end of six.

LEONINE verses rhyme both at the end and at the *hemistich*. See LEONINE.

HEMINGTON, in the ancient music, was, what we now call an half note, or tone.

HEMITRITÆUS *, 'ΗΜΙΤΡΙΤΑΙΟΣ, in medicine, an irregular, intermitting fever, which returns twice every day; by which it is distinguished from the quotidian, which only returns once in the day.

* The word is compounded of ἡμις, half, and τριταίος, third: Modern Latin authors express it by *semiteriana*.

HEMLOCK, *Cicuta*, a narcotic plant; of some use in physic, in that intention.

There is a plaster denominated from it in the college dispensatory; consisting of the juice of the plant boiled up with gums, &c.

The common *hemlock* is however a poison; though not of the most violent sort.—We have instances of considerable quantities being taken without the least disorder. *Philosop. Transact.* N^o. 231.

The cicuta so much celebrated among the ancients, was the juice of a species of this plant, called *conanthe aquatica Cicuta facie*. See *supplement: article CICUTA*.

HEMP, a plant of great use in the arts and manufactories; furnishing thread, cloth, cordage, &c.

Hemp, by naturalists called *canabis*, bears a near analogy to flax, *linum*; both in respect of form, culture and use.

The plant is annual; that is, it must be sown afresh every year.—It rises quick, into a tall, slender sort of shrub, whose stem however is hollow, and big enough to be charred, and is often thus used in the composition of gunpowder.—Its leaves arise by fives or sixes from the same pedicle, and are a little jagged; yielding a strong smell which affects the head.—Its flowers grow in clusters, opposite to each other, in manner of a St. Andrew's cross; each consisting of five yellowish stamina, inclosed with a like number of petals, purple without, and white within.—Its fruit, or seed, is small and round, filled with a white solid pulp; and grows on the top of the stem; having its stalks distinct from those of the flowers.—Lastly, its bark is a tissue of fibres, joined together by a soft matter, which easily rots away.

Hemp is of two kinds; male, popularly called *karl*; and female, or *sunble*.—It is the female alone that produces seed, to perpetuate the kind: from the seed of this arise both male and female.

It does not appear, that the ancients were acquainted with the use of *hemp*, in respect of the thread it affords. Pliny, who speaks of the plant in his *Natural History*, Lib. XX. c. 23. says not a word of this; contenting himself with extolling the virtues of its stem, leaves and root. In effect, what some writers of the Roman antiquities remark, *viz.* that the *hemp* necessary for the use of war, was all stored up in two cities of the western empire, *viz.* at Ravenna and Vienne, under the direction of two procurators, called *procuratores linifarii*; must be understood of *linum*, or flax.

The seed of *hemp* is said to have the faculty of abating venereal desires; and its decoction in milk, is recommended against the jaundice.—The leaves are held good against burns, and the juice thereof against deafness.—The powder, or flower, mixed with any ordinary liquor, is said to turn those who drink thereof stupid.

The culture and management of *hemp*, makes a considerable article in agriculture; there being divers operations required therein, as *pulling*, *watering*, *beating*, *swinging*, &c.

The plant is to be sown in May, in a warm, sandy, rich soil; and is itself sufficient to destroy weeds on any ground.—About Lammas they begin to gather it; the light, or female, being first ripe. The marks of its maturity, are its leaves turning yellow, and the stalks white.

The way of gathering, is to *pull* it up by the roots; after which they bind it up in handfuls or bundles; the female they let stand eight or ten days in the air, that the seed may dry and ripen; after which they cut off the heads, and beat or thrash them to get out the seed.—They also beat the male, to get out a hurtful thick fetid sort of dust, contained therein.

This done, they proceed to *water* or *rate* it, by laying it five or six days in a pool, or other stagnant water, to rot the bark. A stream, or running water, would do the business much better, but that it infects the water, and gives it a quality very pernicious to the health; for which reason it is forbidden to rate it in any waters used for domestic purposes.

When rotted, and taken out again, they *dry* it; then *brake* or beat out the dry bun, or hex, which is the woody part of the stem, from the rind or bark which covers it, by crushing it in a toothed or nicked instrument called a *brake*, beginning with the root end.

When the bun is sufficiently broke, and hangs by small shivers, they *single* or beat it out with a piece of wood

edged for the purpose.—Note, the *karl hemp* they sometimes break with the fingers, and strip off the rind, without the help of the brake or swingle.

The next thing is to *beat* the *hemp*; which is done either on a block, or in a trough, with a hammer, or with beetles; till it feel sufficiently soft and pliable.—It remains now to be *beckled*, or passed through divers toothed instruments, not unlike the wool-dressers combs, of different fineness: This, separating the shorter tow from it, the rest is fit to be spun, wove, &c. for thread, cloth, cordage, or the like.

HENBANE, a poisonous plant. See *supplement: article HYOSCIAMUS*.

HENDECAGON, in geometry, a figure which has eleven sides, and as many angles.

* The word is Greek, ἑνδεκάγωνος, compounded of ἑνδεκα, eleven, and γωνία, angle.

HENDECAGON, in fortification is used for a place defended by eleven bastions.

HENDECASYLLABUM *, 'ΕΝΔΕΚΑΣΥΛΛΑΒΟΝ, in Greek and Latin poetry, a verse of eleven syllables. See VERSE.

* The word is Greek, compounded of ἑνδεκα, eleven, and συλλαβή, syllable, of ενδκαβήσασ, I comprehend.

Sapphic, and Phalæucic verses, are *hendecasyllaba*, or *hendecasyllabæ*, e. g.

Sap. Jam satis terris nivis atque diræ.

Phal. Falser mortuus est mea puella.

HENOTICUM *, in church history, a famous edict of the emperor Zeno, in the fifth century, intended to reconcile and reunite the Eutychemians with the Catholics.

* The word is Greek, ἑνωτικός, q. d. irenic, reconciliative; of ἑνω, I unite.

It was procured for the emperor, by means of Acacius, patriarch of Constantinople, with the assistance of the friends of Peter Mogus.

The ring of this edict lies here, that it does not admit the council of Chalcedon, like the other three, but rather seems to charge it with errors.—It is in form of a letter, addressed by Zeno to the bishops, priests, monks, and people of Egypt and Lybia. It was opposed by the Catholics, and condemned in form by pope Felix III.

HEPAR, in anatomy, the liver. See the article LIVER.

HEPAR Uterinum, the same with *placenta*. See PLACENTA.

HEPATIC, in medicine and anatomy, something that relates to the liver; by the Greeks called ἥπατ, hepar.

HEPATIC Ales, See the article ALOS.

HEPATIC Duës, is a vessel more usually called *porus biliaris*. See PORUS BILIARIUS.

HEPATIC Flux. See the article FLUX.

HEPATIC Plexus. See the article PLEXUS HEPATICUS.

HEPATIC Vein, is that otherwise called *basilica*. See BASILICA.

HEPATI-CYSTIC Duës. See CYST-HEPATIC Duës.

HEPATITES, liver stone, in natural history, a sort of stone, thus denominated from its liver-colour, or because it is generated in the liver.

HEPATITIS, 'ΗΠΑΤΙΤΙΣ, in medicine, an inflammation of the liver, with an abscess or imposthume thereof.

The *hepatitis* bears a near resemblance to the pleurisy; only that its symptoms are less intense.

It usually either kills the patient, or else disscusses, or suppurates gradually, or finally degenerates into a scirrhus.

HEPATOSCOPIA *, the art of divining, or discovering future, or hidden things, by inspecting the entrails of beasts.

* The word is compounded of the Greek, ἥπατος, the genitive of ἥπαρ, liver, and σκοπέω, I consider; the liver being a part principally regarded.

The Romans called it *extispicina*. See EXTISPICES.

HEPTACHORD *, in the ancient poetry.—*Heptachord* verses, were those sung or played on seven chords; that is, in seven different notes, or tones; and probably on an instrument with seven strings.

* The word is compounded of ἑπτα, septem, and χορδή, chord, string.

HEPTAGON *, in geometry, a figure consisting of seven sides, and seven angles.

* The word is compounded of ἑπτα, septem, seven, and γωνία, angle.

If the sides be all equal, it is called a *regular heptagon*. HEPTAGON, in fortification, a place strengthened with seven bastions for its defence. See BASTION.

HEPTAGONAL Numbers, are a sort of polygonal numbers, wherein the difference of the terms of the corresponding arithmetical progression is five.

One property, among others, of these numbers, is, that if they be multiplied by 40, and 9 be added to the product, the sum is always a square number. See NUMBER.

HEPTAMERIS literally signifies a *seventh part*; being formed of the Greek ἑπτα, seven, and μέρος, part, or portion.

The word is used by M. Saverus, in his *Principles of Acoustics*, for the seventh part of a meris; and in his system, for the forty third part of the octave.

HEPTAMERON, a term literally implying *seven days*: being compounded of *ἑπτά*, seven, and *ἡμέρα* day. It is chiefly used as a title of certain books, containing the transactions of seven days.

The *Heptameron* of Margaret de Valois, sister to Francis I. of France, and queen of Navarre, is a very ingenious piece, in the manner of Boccaccio's *Decameron*.

HEPTARCHY*, a government composed of seven persons: or a country governed by seven persons, or divided into seven kingdoms.

* The word is compounded of the Greek *ἑπτά*, seven, and *ἀρχή*, imperium, command, rule.

The Saxon *Heptarchy* included all the southern as well as northern parts of England, which were canted on into seven petty kingdoms, viz. those of Kent, the South-Saxons, West-Saxons, East-Saxons, Northumberland, the East-Angles, and Mercia.—The *heptarchy* was formed by degrees, from the year 457, when the first kingdom of Kent was erected; and it terminated in 805, when king Egbert re-united them into one; and made the *heptarchy* into a monarchy. See **MONARCHY**.

HEPTATEUCH*, in matters of literature, a volume, or work consisting of seven books.

* The word is composed of *ἑπτά*, seven, and *τευχός*, I do, I work; whence *τευχός* a work, book; and *ἑπτάτευχός* *Heptateuch*, a work of seven parts; or seven different works joined in one volume.

Heptateuch is chiefly applied to the first seven books of the Old Testament, viz. Genesis, Exodus, Leviticus, Numbers, Deuteronomy, Joshua, and Judges; that is, the five books of Moses called the *pentateuch*, and the two following ones, which are usually joined therewith.

HEPHTHEMIMERIS*, in the Greek and Latin poetry, a sort of verse consisting of three feet and a syllable; that is, of seven half feet.

* The word is Greek *ἑπθήμερις*; composed of *ἑπτά*, seven, *ἡμέρας*, half, and *μέρος*, part.

Such are most of the verses in Anacreon.

Θέλω	λαγύη	Ατρί	δάς
Θέλω	δι καδ	μοί α	δίσυ, &c.

And that of Aristophanes in his *Plutus*:

ἑπθήμερις χερσῶν.

They are also called *trimeri cataleptici*.

HEPHTHEMIMERIS, or **HEPHTHEMIMERES**, is also a cæura after the third foot, that is, on the seventh half foot.

It is a rule, that this syllable, though it be short in itself, must be made long, on account of the cæura, or to make it an *hephtthemimeris*: as in that verse of Virgil;

Et furvis agitated amor, & conscia virtus.

It may be added, that the cæura is not to be on the fifth foot, as it is in the verse which Dr. Harris gives us for an example,

Ille latus niveum mullu fultus Hyacintho.

This is not a *hephtthemimeris* cæura, but a *henneamimeris*, *i. e.* of nine half feet.

HERACLEONITES, ancient heretics of the sect of the Gnostics; thus called from their leader, Heracleon. S. Epiphanius, *Her.* 36. is very ample on this heresy.

He represents Heracleon as one who had reformed the theology of the Gnostics in many points; though, at bottom, he had retained the principal articles thereof. He refined on the ordinary interpretations of abundance of texts of scripture; and even altered the words of some, to make them consist with his own notions.

For example, he maintained that by those words of S. John, *all things were made by him*, is not to be understood the universe, and all that is good therein: But that the universe, which he calls *zoon*, was not made by the Word, but was made before him. And to support this construction, he added to those words of St. John, *without him nothing was made*, those other words, *of things in the world*.

He distinguished two kinds of worlds; the one divine, the other corruptible; and refrained the word *πάντα*, *all things* to this last. He held, that the Word did not create the world immediately, and of himself, but only that he gave occasion to the demiurgos to do it.

The *Heracleonites*, after the example of their master, annulled all the ancient prophecies; holding, that St. John was really the voice that proclaimed and pointed out the Messiah. but that the prophecies were only empty sounds, and signified nothing.—They held themselves superior in point of knowledge to the apostles; and on that footing dared to advance the most extravagant paradoxes, on pretence of explaining scripture in a sublime, elevated manner. They were so fond of these mystic interpretations, that Origen, though a stickler that way him-

self, was obliged to reproach Heracleon with his abusing scripture by that means.

HERACLIDÆ, in antiquity, the descendants of Hercules, whom the Greeks called, *Ἡρακλῆς*, *Heracles*.

The *Heracidae* were expelled from Peloponnesus, by Euristheus king of Mycenæ, after the death of Hercules.

Return of the HERACLIDÆ into Peloponnesus, is a celebrated epocha in the ancient chronology.

The time of this return is differently assigned; by reason that authors mistake the divers attempts which they made to return, for the return itself. The first attempt was twenty years before the taking of Troy: the second was 100 years later, or 80 years after the taking of Troy. This last is supposed to have succeeded; at least, according to Petavius, who mentions only these two. *Rat. Temp.* P. I. L. I. c. 12. and *Doctr. Temp.* L. IX. and c. 30.

Scaliger distinguishes three attempts; and fixes the first 50 years later than Petavius, viz. 30 years after the taking of Troy. He says nothing of the second, which was unfortunate like the first; but he places the third in the same year with Petavius.

As it occasioned a world of changes and revolutions in the affairs of Greece, inasmuch that scarce a state or people but were turned upside-down thereby; the return of the *Heracidae* is the epocha of the beginning of profane history; all the time that preceded it is reputed fabulous. Accordingly, Ephorus, Cumanus, Callisthenes, and Theopompus, only begin their histories from hence.

HERALD*, an officer of arms, antiently in great repute, and possessed of several considerable functions, rights, and privileges.

* The word *herald*, according to Du Cange, comes from the Saxon *herpe*, or German *her*, army, and *ald* servant; because chiefly serving in the army. Others will have the two words signify *champion of the army*; in allusion to their office of denouncing war, proclaiming peace, &c.—Du Cange adds, that they were called *clarigarii*, as well as *heraldi*. Borel derives the word from the Latin *herus*, master; *q. d.* one coming from his master. Others from *herbaut*, *q. d.* high lord: others from *herold*, which is the same with *dominus castellanus*: and others, lastly, from *her*, master, or army, and *held*, *q. d.* bound to his lord, or the army.

The origin of *heralds* is very antient.—Stentor is represented by Homer as *herald* of the Greeks, who had a voice louder than fifty men together. The Greeks called them *κρυεῖς*, and *εἰρηοφύλακες*; and the Romans, *feciales*.

The Romans had a college of *heralds*, appointed to decide whether a war were just or unjust; and to prevent its coming to open hostilities, till all means had been attempted for deciding the difference in a pacific way.

Heralds, or *heralds at arms*, have formerly been denominated *dukes at arms*, because properly belonging to dukes; as kings at arms, to kings.

In England we have six *heralds*, viz. 1^o. *Richmond*, 2^o. *Lancaster*, 3^o. *Chester*, 4^o. *Windsor*, 5^o. *Somerset*, 6^o. *York*.—To which may be added a seventh, or *Brumfistick herald*, erected by king George I.—Their office is to wait at court, to attend public solemnities, to proclaim war and peace, and to look to the regulation of the bearings of arms, and to search pedigrees, &c.

They were formerly created and christened by the king, who slowly pouring a gold cup of wine on their head, gave them their *herald's* name. Now it is done by the earl-marshal.—They could not arrive at the dignity of *herald*, without having been seven years pourfuiwant: nor could they quit the function of *herald*, but to be made king at arms. See **POURFUIWANT**, &c.

Their principal employment was to compose or make out coats of arms, genealogies, and titles of the nobility. They were the superintendants of military exploits, and the conservators of the honours of war. They had a right to take away the arms of such as for cowardice, treason, &c. deserved to be degraded. They had a commission to examine, and correct the vices and disorders of the nobles, and on such occasions to exclude them from jousts, tournaments, &c. To them belonged also the correcting of all usurpations, and abuses relating to crowns, coronets, cafts, crests, supporters, &c. They took cognizance of all differences among the nobles, with respect to their bearings, the antiquity of their families, precedencies, &c. They went into the several countries to search into the grounds and pretensions of nobility; and had a right to open all libraries, and to command all the antient charters and instruments in the archives to be shewn them. They had admission into all foreign courts, where they were commissioned to proclaim war and peace; and their persons were held sacred, as those of ambassadors. To them it belonged to make publication of jousts, and tournaments; to call the people to them; to signify the cartels; to mark the ground, list, or place of duel; to see fair play observed; and to divide the fun between the two parties. In the army, they advertised the cavaliers and captains of the day

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of battle, and assisted therein before the standard; retiring, after the first onset, to some place of eminence, there to observe who behaved best, and to give a faithful report thereof to the king. They also numbered the dead, relieved the engines, re-demanded prisoners, summoned places to surrender, and in capitulations walked before the governors of the place, to secure and warrant his person. They were the principal arbiters of the distribution of the spoils of the vanquished, and of military rewards. They published victories; and gave notifications thereof to foreign courts. They convened the estates of the kingdom, assisted at royal marriages, and frequently made the first demand; they also officiated at solemn feasts, &c.

The modern *heralds*, i. e. those we properly call *heralds*, have lost a good deal of the distinction and office of the ancient ones. What relates to the making out arms, the rectifying of abuses therein, &c. is chiefly committed to the kings at arms.

And in the army, drums and trumpets have succeeded to the function of *heralds*, being sent by the generals on the same errands; and on that account enjoying the same rights and privileges. Their persons are under the protection of the law of nations, when they bear the marks of their offices publickly, i. e. the trumpeter his trumpet, and the drummer his drum; in the same manner as the *herald* his coat.

The *heralds*, with the kings at arms, and the four pursuivants, are a college, or corporation; erected into such by charter of Richard III. who granted them divers privileges, as to be free from subsidies, tolls, and all troublesome offices. Clarenceux and Norroy king at arms, are also called *provincial heralds*.

HERALDRY, the art of armoury, and blazoning; or the knowledge of what relates to the bearing of arms, and the laws and regulations thereof.

Heraldry likewise comprehends what relates to the marshaling of solemn cavalcades, processions, and other ceremonies at coronations, instalments, creations of peers, funerals, nuptials, &c.

HERB*, a name common to all plants whose stalks, or stems, die away every year, after their seed is become ripe.

* The word is formed of the Latin *herba*; which some derive from *arvum*, field: others from the Greek *θερβω*, *potere*, to feed; of *τροφον*, *pabulum*. Of the Greek *σπερμα*, the Latins formed *spereba*; and of *ferba*, *herba*; after the manner of the Spaniards, who always change the *f* at the beginning of a word into *b*.

There are some *herbs* whose root perishes with the stem; and others, where the root survives the stem by several years.

Of the former, those which come to maturity the first year, and after they have cast their seed, die away, are called *annuals*: such are wheat, rye, &c.

Those which only bear flowers and fruit the second year, or even the third year, and then perish, are called *biennials* and *triennials*: such are the garden angelica, and some others.

Herbs whose root does not perish after they have shed their seed, are called *perennials*: such are mint, &c.

Of these, some keep their leaves all the year round, and are called *ever-greens*; as the asarabacca, &c. See EVER-GREENS.

The rest lose their leaves, and continue bare part of the year; as colts-foot, &c.

Herbs are also distinguished into *kitchen*, or *sallet herbs*, and *medicinal herbs*.

Sallet-HERBS, } See the articles { SALLET.
Medicinal-HERBS } SIMPLE.

HERBAGE, a collective name, comprehending all kinds of herbs.

The ancient hermits lived altogether on *herbage*.

What makes the principal difference in the goodness of butters and cheeses, is the difference of *herbage*.

HERBAGE, in law, signifies the green pasture, or fruits of the earth, provided by nature for the bite or food of cattle.

HERBAGE is also used for a liberty which a man hath to feed his cattle in another man's ground; as, in the forest.

HERBAL, a book which treats of plants; or describes the figure, genus, species, properties, virtues, &c. of herbs, trees, seeds, plants, &c.

Such are Gerard's *Herbal*, Parkinson's *Herbal*, &c.

HERBAL, is also used for a set or collection of specimens of the several kinds of plants, dried and preserved in the leaves of a book, called also a *HORTUS SICCUS*.

In the *Philosophical Transactions*, we have a method described for preserving specimens for such an *herbal*.—The flowers, leaves, &c. gathered perfectly ripe, and in their true colours, are to be spread on whitey-brown paper, with the parts all displayed as distinctly as may be. If the stem, or body of the flower, &c. be thick, one half is to be pared away to make it lie flat. Over these is to be spread another paper; and the whole is to be put between two iron plates, screwed tight together, and thus baked in an oven for two hours. When taken out, wash the plants over with a mixture of brandy and aqua fortis, and lay them on fresh paper to dry. Lastly, lick over the back sides with a brush dipped in a dissolution

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of gum Tragacanth, to make them stick; and lay them in the paper book, where they will lie fast, and always look fresh.

HERBALIST, or HERBORIST, a person skillful in plants; the same with *botanist*.


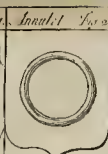


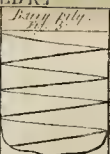


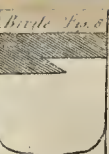
















































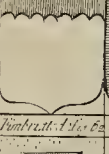

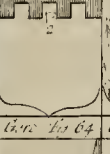






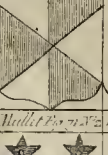


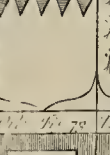

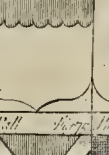



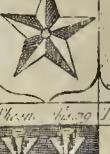










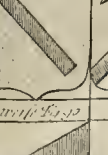





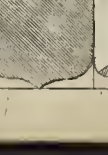

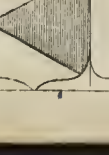

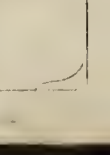
HERBE, in the academies, a reward or some good stuff given to a horse that has worked well in the manage.

HERBINGER, or HARBINGER. See HARBINGER.

HERCULES, EN IONAZIEN, in astronomy, one of the constellations of the northern hemisphere. See CONSTELLATION.

The stars in the constellation *hercules*, in Ptolemy's catalogue, are 29; in Tycho's, 28; in the Britanic catalogue, 95. The longitudes, latitudes, magnitudes, &c. whereof are as follows.

Names and Situations of the Stars.	Right Ascension	Longitude	Latitude North	Magnitude
In the extremity of the preceding foot	28 7 58	57 6 9	5	
Another following this, and contiguous	28 20 48	57 14 23	5 4	
In the preceding thigh	0 41 32	57 13 30	6	
	3 49 21	50 15 0	4	
	3 53 59	61 5 43	5 6	
5				
	4 41 24	60 38 53	6	
That preceding the ulna.	19 8 16	37 35 34	5	
	23 20 9	35 25 42	5 6	
	23 7 21	30 14 32	6	
North in the calf of the preceding leg	3 58 23	64 20 11	4	
10				
In the preced. ulna; according to Bayer [in the hand	21 18 33	37 14 20	4	
Another contig. to this to the fourth.	21 28 9	37 26 10	6	
	22 24 34	37 3 43	6	
	20 23 23	43 43 48	5	
In the preceding fourth. calf of leg	7 20 50	63 50 9	4	
15				
North of the preceding in the club	24 50 5	32 11 7	5 5	
Another contiguous to this	25 8 1	32 10 39	6	
	23 1 35	39 22 43	5 6	
In the preceding arm	24 51 32	40 2 12	3	
In the club, the middle of the preced.	28 27 13	28 10 49	6	
20				
Against the preceding knee	9 56 40	65 51 29	4	
	19 37 11	54 15 48	5	
	19 43 17	54 10 22	5	
	20 30 51	52 53 41	6	
North of the subsequent in the club	27 12 27	35 13 14	4 5	
25				
In the preced. shoulder, near the arm. [pit	18 52 35	57 53 20	5	
South. of the preceding, in the club	26 45 10	42 44 55	3	
Middle of the subsequent, in the club	1 3 32	27 9 23	6	
South. in the middle of the preceding	29 53 38	33 2 45	5	
30	17 6 16	62 19 46	5	
[thigh				
	24 53 26	51 41 38	6	
	11 12 55	69 0 0	6	
	1 55 58	28 53 42	6	
North. in the middle of preceding thigh	18 51 39	63 11 37	5	
Preceding in the extremity of the club	3 30 30	26 12 9	6	
35				
	2 4 16	34 16 30	6	
In the preceding side.	28 46 42	48 35 14	5	
	27 8 51	53 7 14	3 4	
South. of the subsequent in the club	4 12 55	30 41 30	5 6	
40				
[against the buttocks	2 46 35	37 45 47	6	
In the top of the preceding thigh	24 22 7	60 19 48	3	
Middle in the extremity of the club	5 18 31	27 27 57	5	
	4 25 27	33 17 27	6	
Subsequent in the extremity of the club	5 42 37	29 32 25	5 6	
45				
	4 29 34	35 27 56	6	
	0 24 26	51 54 1	6 5	
	4 52 18	37 14 19	6	
	0 55 30	51 48 33	5	
That between the shoulders.	2 44 56	46 47 8	5	
50				
	22 17 39	67 25 36	5 6	
	1 8 7	53 45 58	5	
In the neck	5 15 14	40 46 55	4 5	
	4 26 56	47 41 7	6	
	7 46 52	37 32 6	6	
55				
That in the following side	3 57 40	53 17 15	3	
More fourth. in the following buttock	3 37 33	55 56 10	6	
Preceding in the crown of the head	9 14 39	35 26 42	5 6	
In the rise of the following thigh	4 27 5	57 54 38	6	
	8 18 4	47 12 48	6	
60				
In the head	11 49 24	37 18 54	3	
In the following shoulder	10 24 2	47 44 13	3 4	
Subsequent in the crown of the head	15 24 13	33 55 38	5 6	
Foremost of three in the thigh	7 41 13	59 35 33	3 4	
Foremost of two in the belly	9 33 15	55 59 17	5	
65				
Middle on the following thigh	8 33 10	6 8 25	5	
That following the hind shoulder	12 25 7	47 31 53	5	
Subsequent and south against the belly	10 53 28	55 32 12	6	
	6 13 54	69 2 52	6	
Last of three in the thigh	10 59 0	60 10 3	4	
In				

 Merron No. 1	 Annot No. 2	 Lomic No. 3	 Londy No. 4	 Londy No. 5	 Paffen No. 6	 Pent No. 7	 Pente No. 8
 Palle No. 9	 Pardes No. 10	 Pottney No. 11	 Penton No. 12	 Poulton No. 13	 Pupper No. 14	 Pucky No. 15	 Purton No. 16
 Purton No. 17	 Purton No. 18	 Purton No. 19	 Purton No. 20	 Purton No. 21	 Purton No. 22	 Purton No. 23	 Purton No. 24
 Purton No. 25	 Purton No. 26	 Purton No. 27	 Purton No. 28	 Purton No. 29	 Purton No. 30	 Purton No. 31	 Purton No. 32
 Purton No. 33	 Purton No. 34	 Purton No. 35	 Purton No. 36	 Purton No. 37	 Purton No. 38	 Purton No. 39	 Purton No. 40
 Purton No. 41	 Purton No. 42	 Purton No. 43	 Purton No. 44	 Purton No. 45	 Purton No. 46	 Purton No. 47	 Purton No. 48
 Purton No. 49	 Purton No. 50	 Purton No. 51	 Purton No. 52	 Purton No. 53	 Purton No. 54	 Purton No. 55	 Purton No. 56
 Purton No. 57	 Purton No. 58	 Purton No. 59	 Purton No. 60	 Purton No. 61	 Purton No. 62	 Purton No. 63	 Purton No. 64
 Purton No. 65	 Purton No. 66	 Purton No. 67	 Purton No. 68	 Purton No. 69	 Purton No. 70	 Purton No. 71	 Purton No. 72
 Purton No. 73	 Purton No. 74	 Purton No. 75	 Purton No. 76	 Purton No. 77	 Purton No. 78	 Purton No. 79	 Purton No. 80
 Purton No. 81	 Purton No. 82	 Purton No. 83	 Purton No. 84	 Purton No. 85	 Purton No. 86	 Purton No. 87	 Purton No. 88
 Purton No. 89	 Purton No. 90	 Purton No. 91	 Purton No. 92	 Purton No. 93	 Purton No. 94	 Purton No. 95	 Purton No. 96

HER

HER

Names and Situations of the Stars.

Table with columns: Star Name, Longitude, Latitude North, Magnitude. Lists stars like 'In the hind arm', 'Precedent of three in the hind foot', etc.

right, i. e. of God's own appointment, and consequently indispensible, or, as they call it, *indisfajible*. On this account they stifle the obligation of *hereditary right*, in favour of the descendants of king James II.

HERESARCH*, *Arch-Heretic*; the founder or inventor of a heresy; or the chief and rind-leader of a sect of heretics.

* The word is Greek, ἀρεισιάρχης, compounded of ἀρεσις, heresis, heresy, and ἀρχή, princeps, prince, chief.

Thus Arius, and Socinus, are called *heresiarchs*; as being the founders and patriarchs of the Arians and Socinians. Simon Magus is recorded as the first *heresiarch* under the new law.

HERESY, an error in some essential point of Christian faith, maintained with obstinacy, and dissimulity.

It is properly the obstinacy that constitutes the character of heresy, not the error.—When a man is humble, and ingenuous, ready and desirous to receive further light and instruction, and when he gives every thing urged against him its due weight; he is not guilty of heresy.—Errare passim; haereticus esse nolo, is a celebrated maxim of St. Augustin.

Tertullian, in his treatise *Of Prescriptions*, defines heresy by choice; agreeably to the etymology of the word.—A heretic, in this sense, is one who of his own choice, on his own bottom, invents, proposes, or even embraces, any new dogma, or article of faith.

The word is formed of the Greek αἵρεσις, which, among the ancients, had nothing of that odious signification attached to it by ecclesiastical writers of later times. It only signified a peculiar opinion, dogma, or sect.

In this sense, they said, the heresy of the Stoics, of the Peripatetics, &c. meaning their sect, their system, &c.

HERESY is sometimes also used, by extension, for a proposition that is notoriously false, in some other science.

Thus, it is a heresy in morals, to say that a man must be ungrateful. It is a heresy in geometry, to say that two triangles, whose angles are similar, are not proportional.

HERETIC, a person who maintains, or adheres to a heresy, especially if convicted thereof.

A real heretic, is properly he who maintains a false opinion, out of a spirit of obstinacy, faction, or hypocrisy.—A heretic makes profession of Christianity; by which he is distinguished from an infidel, Jew, and idolater.

A man does not become an heretic by doing a thing condemned, or forbidden by the gospel, and, of consequence, repugnant to the Christian faith; but by a stiff dissenting adherence to an opinion opposite to some article of the Christian faith, whether it regard speculation or practice.

The facts of heretics who have at different Times disturbed the church, are innumerable.

The emperor Maximus, who usurped the throne from Gratian, was the first that decreed the pains of death to heretics. By our own law, heretics were anciently to be burnt. And there was a writ, *De haereticis comburendis*, which lay for that purpose; but it was taken away by Stat. Car. II.

HERIOT. See the article HARIOT.

HERISSON, in fortification, a beam armed with iron spikes, the points whereof are turned outward; supported in the middle by a stake, wherein is a pivot on which it turns; it serves as a barrier to block up a passage.

Herissons are frequently placed before gates; especially the posterns of a town or fortress, to secure those passages, which must of necessity be frequently opened and shut.

HERITAGE. See the article INHERITANCE.

HERMAPHRODITE*, ἑρμαφροδίτης, a person who has both the sexes, or the genital parts both of male and female.

* The word is formed of the Greek ἑρμαφροδίτη, a compound of ἑρμας, Mercury, and ἀφροδίτη, Venus; q. d. a mixture of Mercury and Venus, i. e. of male and female. For, it is to be observed, Hermaphroditus was originally a proper name, applied by the heathen mythologists to a fabulous deity, whom some represent as a son of Hermes, Mercury, and Aphrodite, Venus; and who being desperately in love with the nymph Salmasis, obtained of the gods to have his body and hers united into one. Others say, that the god Hermaphroditus was conceived as a composition of Mercury and Venus, to exhibit the union between eloquence, or rather commerce, whereof Mercury was god; with pleasure, whereof Venus was the proper deity. Lastly, others think this junction intended to shew that Venus, pleasure, was of both sexes; as, in effect, the poet Calvus calls Venus a god.

Pallentemque Deum Venerem. As also Virgil, Aeneid. Lib. II. Discedo ac ducente Deo flammam inter et flosces Expedit.

M. Spon observes, Hesy chius calls Venus Aphroditus; and Theophrastus affirms, that Aphroditos, or Venus, is Hermaphroditus; and that in the island of Cyprus she has a statue, which represents her with a beard like a man.—The Greeks also call hermaphroditos ἀνδρῶσπις, androgyni, q. d. men-women.

HERCULPUS Morbus, in medicine, the epilepsy; thus called from the terror of its attacks, and the difficulty of cure. See EPILEPSY.

HERD, among hunters, a company, or assemblage, of black or fallow beasts; in contradistinction to flock.

A herd of deer from such a forest.—The deer begin to herd in the month of December.

In the hunting language, there are various terms used for companies of the divers kinds of game.—We say a herd of hearts or bucks; a bevy of roes; a rout of wolves; a richness of martens, &c. See HUNTING.

HERDEWICH*, HERDEWIC, or HERDEWYCH, in our ancient law-books, a grange, or place for cattle and husbandry.

* Et unam herdewycham apud helthetum in peco, &c. Mon. Angl.

HEREBODE*, the king's edict, anciently issued to command his subjects into the field.

* The word is formed of the Saxon here, army, and bode, messenger.

HEREDITAMENTS, in law, are such things immoveable, as a man may have to himself and his heirs, by way of inheritance; or which, not being otherwise bequeathed, do naturally and of course descend to him who is next heir of blood; and fall not to the executor or administrator, as chattels do.

Hereditaments is a word of a large extent, and is much used in conveyances: for by the grant of hereditaments, uses, feignories, manors, houses, and lands of all sorts, charters, rents, services, advowsons, conveyances, and whatever may be inherited, will pass.

HEREDITARY, something appropriated to a family, or belonging thereto by right of succession, from heir to heir. Of monarchies, some are hereditary, others elective: of hereditary monarchies some descend only to the heirs male, as in France; others to the next of blood, whether male or female, as in England, Spain, &c.

The dominions of the emperor are distinguished into hereditary, which are those he derives from his ancestors by right of blood and inheritance; and those he enjoys in quality of emperor, by virtue of his election.

HEREDITARY is also applied to offices, and honours annexed to certain families.—Thus the offices of lord great chamberlain and earl marshal, are hereditary, in the families of the Howards, and Lindseys.

It is of no very long date, that the dignities of duke, count, &c. are hereditary. The canon law has taken all possible precautions to prevent benefices from becoming hereditary.

HEREDITARY is also applied figuratively to good or evil qualities, habitudes, &c. capable of being transmitted, by blood, from father to son.

The gout, kings-evil, madnes, &c. are hereditary diseases, i. e. they are sometimes transmitted from the parents in the semen, or first rudiments of the fetus. And such, probably, is the origin of numerous other chronic diseases.

HEREDITARY Right denotes a right, or privilege, in virtue whereof a person succeeds to the effects of his ancestors. The Nonjurors, &c. hold hereditary right to be a divine VOL. I

Naturalists distinguish four kinds of *hermaphrodites*: whereof one kind only are the perfect *hermaphrodites*, or those who have the pudenda of both kinds; but these are rarely if ever found. It is affirmed, however, that there were once two such *hermaphrodites* married to each other; and that each begot children upon the other. See various instances of *hermaphrodites* in a dissertation of M. Loffhagen, in the *Nov. Lit. Mar. Bath.* 1704. p. 105. Bauhine, *De Hermaphrod.* Ludov. Bonacoli. *Traçt. de Part. Form.* cap. 9. Aldrovand. *de Monstr.* cap. 1. Paul. Zacch. *Quæst. Med. Legal.* T. I. L. vii. § 8.

Others dispute all that has been said on the subject; maintaining, that the ill conformation of the parts of generation, the testicles being detained or concealed in men, and the clitoris longer than ordinary in women, have been the sole occasion of so erroneous a notion. To which may be added, scrotomatous tumors of the labia pudendi, which have sometimes passed for testicles.

Dr. Quincy thinks, that the frequent use of lascivious frictions, and titillations, may contribute greatly to the extension of the clitoris; and make it pass with the ignorant for a penis. This, he adds, was the case in the celebrated instance of the two nuns at Rome, who, after they had lived women for many years, were said to have become men.—But on what grounds he asserts this we do not know.

The extraordinary size of the clitoris, says Dr. Drake, and its propence, sometimes, out of the body in infants, makes the women mistake such children for that sort of monsters called *hermaphrodites*. Of this kind, I had one brought to me, the clitoris whereof hung out of the body so far, at about three years old, that it resembled very much a penis; but it wanted a perforation; and instead of that, just behind it, the urine issued at a hole, which was nothing else but the corner of the rima; the clitoris filling all the rest of the orifice: so that the parents mistook it for a boy, and as such christned it.—But the neighbours called it an *hermaphrodite*. Anthropol. p. 148.

But we have an authentick account, in the history of the Royal Academy of Sciences, of a real *hermaphrodite*; which may put the point out of question.—This person had all the external characters of a woman in the face, neck, breasts, hips, and pudendum; and accordingly had been baptized in that quality, and named *Margaret*; but had withal the real characters of a man, and a very able one.—The pudendum muliebri appeared very well, but was not above two fingers breadth deep; out of the middle of the rima, or aperture thereof, hung a pretty bulky penis, which in an erection came out eight inches. The penis was well formed, except that it had no prepuce, nor was accompanied with any apparent testicles. The urine and seed came out at it as in men; and, what was very extraordinary, the menes flowed through the same, and this very regularly once a month.

The person was brought sick to the hospital of St. James at Tholouse; and the account was given by M. Veay, surgeon of the same hospital; who adds, that having shewn the whole to several physicians, and the vicars general, they ordered the party to take the name and habit of a man; it being apparent that he could do the office of a man; but not that of a woman.

The interpreters, and commentators on the civil law, hold, that an *hermaphrodite* who has chose the male sex, as that which prevails most in him, may no longer do the office of a woman. And the French lawyers produce an arrest of the parliament of Paris, whereby a young *hermaphrodite* was condemned to be burnt on that very account.

At Athens, and Rome, they looked on *hermaphrodites* as ominous monsters, and precipitated them into the sea; as we are informed by Alexander ab Alexandro.

S. de Rennefort relates, that at Surat there are abundance of *hermaphrodites*; who, with womens clothes, wear mens turbans, to distinguish them, and let all the world know they have two sexes.

In 1376. Albert, bishop of Bremen, and brother of the duke of Brunswick, was accused by John de Cesterval, dean of his chapter, with being an *hermaphrodite*; but he cleared himself.

J. Frederic Mayer, a Lutheran divine, has an express dissertation, to prove that an *hermaphrodite* cannot be a priest: it was printed at Grypswald in 1705. And Willenberg, another Lutheran of Dantzick, has wrote to prove them excluded from all civil employments, like women.

HERMAPHRODITE is also applied, metaphorically, to divers other things besides the human species.

The latest botanists make a division of plants, which they call *hermaphrodites*; as having both the male and female parts of generation, viz. the stamina and pistil in the same flower.

Divers of the insect and reptile kind are also *hermaphrodites*; particularly worms, snails, &c.

In the *Memoirs of the French Academy*, we have an account of this very extraordinary kind of *hermaphrodites*, which not only have both sexes, but do the office of both at the same

time.—Such are earth-worms; the round tailed worms found in the intestines of men and horses; land-snails, and those of fresh waters; and all the sorts of leaches. And as all these are reptiles, and without bones, M. Poupert concludes it probable, that all other insects, which have those two characters, are also *hermaphrodites*.

The method of coupling, practised in this class of *hermaphrodites*, may be illustrated in the instance of earth-worms. Vid. Ray's *Hist. Insect.* p. 2. These little creatures creep, two by two, out of holes proper to receive them; where they dispose their bodies in such manner, as that the head of the one is turned to the tail of the other. Being thus stretched lengthwise, a little conical button, or papilla, is thrust forth by each, and received into an aperture of the other.

These animals, being male in one part of the body, and female in another; and the body flexible withal; M. Homberg does not think it impossible but that an earth-worm may couple with itself; and be both the father and mother of its young: an observation, which to some appears highly extravagant!

HERMATHENA*, ΕΡΜΑΘΗΝΗ, in antiquity, a statue representing Mercury and Minerva both in one.

* The word is a compound of *Hermes*, Mercury; and *Athena*, a Greek name of Minerva.

M. Spon gives divers figures of *hermathena*, in his *Rech. Cur. de l'Antiq.* p. 98. They are a sort of statues raised on square pedestals, after the manner of *Hermes*; only that the attributes of Minerva are added thereto.

HERMERCLES, in antiquity, a statue compounded of the figures of Mercury and Hercules.

M. Spon gives us a type of an *hermercles*, *Rech. Cur. de l'Antiq.* p. 96. fig. 13. The name, he observes, was given to a divinity, represented after the manner of *Hermes*, with the additional attributes of *Hercules*, viz. a lion's skin, and a club.—This he ascribes to the custom among the Greeks, of placing the statues of Mercury and Hercules in the academy, and gymnasia, as both the one and the other presided over the exercises of the youth.

HERMES, or HERMA, among antiquaries, a sort of square, or cubical figure of the god Mercury; usually made of marble, though sometimes of brass or other materials; without arms or legs; and planted by the Greeks and Romans in their cross-ways.

Servius gives us the origin hereof, in his comment on the eighth book of the *Æneid*. Some shepherds, says he, having one day caught Mercury, called by the Greeks *Hermes*, asleep, on a mountain; they cut off his hands: from which he, as well as the mountain where the action was done, became denominated *Cyllenius*, from κελύς, maimed: and thence, adds Servius, it is, that certain statues without arms are denominated *hermes's*, or *hermae*.—But this etymology of the epithet *Cyllenius* contradicts most of the other ancient authors, who derive it hence, that Mercury was born at Cyllene, a city of Elis, or even on the mountain Cyllene itself, which had been thus called before him.

Suidas gives a moral explication of this custom of making statues of Mercury without arms. The *hermes's*, says he, were statues of stone placed at the vestibles, or porches of the doors, and temples at Athens; for this reason, that as Mercury was held the god of speech and of truth, square and cubical statues were peculiarly proper; having this in common with truth, that on what side soever they are viewed, they always appear the same.

It must be observed, that Athens abounded more than any other place in *hermes's*: There were abundance of very singular ones in divers parts of the city; and they were indeed one of the principal ornaments of the place. They were also placed in the high roads, and cross-ways; by reason Mercury, who was the courier of the gods, presided over the highways: whence he had his surname of *Trivium*, from *trivium*, and that of *Viacus*, from *viva*.

From Suidas's account above cited, it appears, that the terms, *termini*, used among us in the door-cases, balconies, &c. of our buildings, take their origin from these Athenian *hermes's*; and that it were more proper to call them *hermetes* than *termini*; for that though the Roman *termini* were square stones, whereas a head was frequently placed, yet they were rather used as land-marks, and mere-stones, than as ornaments of building.

HERMETIC, or HERMETICAL *Art*, a name given to chemistry, on a supposition that Hermes Trifinegustus was the inventor thereof, or that he excelled therein. See *CHEMISTRY*. We know but little of this Hermes, only that he was an ancient king of Egypt, a thousand years prior to *Æsculapius*.—Zosimus Panopolita mentions him as having wrote of natural things; and there are several pieces still extant under his name, but they are all supposititious.

HERMETICAL *Philosophy*, is that which undertakes to solve and explain all the phenomena of nature, from the three chemical principles, salt, sulphur, and mercury.

A considerable augmentation was made to the ancient *hermetical philosophy*, by the modern doctrine of alkali and acid.

HERMETICAL *Physic*, or *Medicine*, is that system, or hypothesis, in the art of healing, which explains the causes of diseases, and the operations of medicines, on the principles of the *hermetical* philosophy; and particularly on the system of alcahi and acid.

HERMETICAL Seal, a manner of stopping or closing glass vessels, for chemical operations, so very accurately, that nothing can exhale, or escape; not even the most subtle spirits.

It is performed by heating the neck of the vessel, in the flame of a lamp, till it be ready to melt; and then with a pair of pincers twisting it close together.— This they call putting on *Hermes's seal*.

Though there are other ways of *sealing* vessels *hermetically*, viz. by stopping them with a plug, or stopple of glass, well luted into the neck of the vessel.— Or, by turning another ovum philosophicum upon that wherein the matter is contained.

HERMHARPOCRATES, or **HERMARPOCRATES**, in antiquity, a deity, or figure of a deity, composed of Mercury, and Harpocrates, the god of silence.

M. Spon gives us an *hermharpocrates* in his *Rech. Cur. de P. Antiquit.* p. 98. fig. 15. having wings on his feet, like Mercury; and laying his finger on his mouth, like Harpocrates. It is probable, they might mean by this combination, that silence is sometimes eloquent.

HERMIANI, or **HERMIATITÆ**, a sect of heretics, in the second century; thus called from their leader Hermias.— They were also denominated *Seleuciani*.

One of their distinguishing tenets was, that God is corporeal.—Another, that Jesus Christ did not ascend into heaven with his body, but left it in the sun.

HERMIT*, or **EREMIT**, **EREMITA**, a devout person, retired into a solitude, to be more at leisure for prayer and contemplation, and to disencumber himself of the affairs of the world.

* The word is formed from the Greek, *ερεμιτης*, *eremus*, wilderness; and, according to the etymology, should rather be wrote *eremit*, the spirit being lost.

A *hermit* is not reputed a religious, unless he have made the vows.

Paul, surnamed the *hermit*, *Paulus Eremitanus*, is usually reckoned the first *hermit*; though S. Jerom, at the beginning of the life of that saint, says, it is not known who was the first.—Some go back to S. John the Baptist, and others to Elias.

Others make S. Anthony the founder of the *hermetical* life: but others take him to have only rekindled and heightened the fervour thereof; and hold, that the disciples of that saint owned S. Paul of Thebes for the first person that practised it.—The persecutions of Decius and Valerian are supposed to have been the occasion.

Several of the antient *hermits*, as S. Anthony, &c. though they lived in deserts; had yet numbers of religious accompanying them.

There are also divers orders and congregations of religious, distinguished by the title of *hermits*; as, *hermits* of S. Augustin, of S. John Baptist, of S. Jerom, of S. Paul, &c.

HERMITS of S. Augustin, is a religious order, more frequently called *Augustines*, or *Augustin* friars.

It is commonly pretended to have been instituted by that father; but without much ground. This is pretty certain, he laid the foundations of a monastic order about the year 388, and retired to his father's estate near Tagasta, to lead a religious life, with some companions: but it does not at all appear, that this order has subsisted ever since; nor that the *hermits* of S. Augustin are descended, without interruption, from them.

This order, in reality, only commenced under pope Alexander IV, in the middle of the thirteenth century; and was formed gradually by the union of divers congregations, which had no rule, or at least had not that of S. Augustin.—These congregations were that of John Bonites, the most antient of all; that of the *hermits* of Tuscany; that of the Sack, or Bag; those of Vallerfitta; of S. Blaife; of S. Benedict de Monte Fabalo; of the Tower of Palmes; Sancta Maria de Murcetta; of S. James de Molino, and de Loupavo near Lucca.

This coalition was not made by Innocent IV. as most historians of the order contend: all that pontiff did, was to unite some *hermits* in Tuscany, to whom he gave the rule of S. Augustin: but these were a distinct body from those just mentioned.—It was Alexander IV. that made the grand union; as appears from his bull, published in the *Mare magnum* of the Augustines.

That pontiff undertook this union from the first year of his pontificate, viz. the year 1254. It was the year 1256, before the superiors of all the congregations could be got together. In the general chapter the union was effected; Lanfranc Septala, a Milanese, was chosen general: and the order divided into four provinces, viz. those of France, Germany, Spain and Italy.

Since that, other orders have been united to the *hermits* of S. Augustin; as, the Poor Catholics, &c. and the order now consists of 42 provinces.

After so many unions, the order began to divide again into separate congregations, according to the relaxations, and reformations that afterwards got footing.—Such, are the *Bare-footed hermits* of S. Augustin; the congregation of *Centorbi*, or the *Sicilian Reform*; the congregation of the *Colorites* in Calabria, &c.

There are also several congregations of nuns, under the appellation of *hermits* of S. Augustin.

There is also a Third order of *hermits* of S. Augustin. See **THIRD Order**.

HERMITS of Britini, was a congregation formed under pope Gregory IX, who gave them the rule of S. Augustin.

Their first *hermitage*, or abode, was in a solitary place called *Britini*, in the marquise of Ancona; whence the name. They led a very austere life; they never eat any meat; and fasted much.

HERMITS of Camalduli. See the article **CAMALDULIAN**.

HERMITS of S. Jerom. See the article **JERONYMITES**.

HERMITS of S. John Baptist, was a religious order in Navarre; whose principal convent, or *hermitage*, was seven leagues from Pampelona.

Till the time of Gregory XIII. they lived under the obedience of the bishop of that city; but the pope confirmed them a religious order, approved their constitutions, and admitted them to make the vows.—Their way of living was exceedingly austere, they went bare-footed, wore no linen, lay on boards, with a large stone for a pillow, and bore a large wooden cross on their breasts.

Their house was a kind of laura, rather than a convent; cantoned out into cells, in which they lived solitary, in the middle of a wood.

HERMITS of S. Paul the first *hermit*, is an order formed in the thirteenth century, by the union of two bodies of *hermits* in Hungary; viz. those of S. James de Patach, and those of Piffila near Zante.

Upon their being incorporated, they chose S. Paul the first *hermit*, for the common patron, and protector of their order; and assumed his name.—They multiplied very considerably in Hungary, Germany, Poland, and other provinces; and at length came to have seventy monasteries in Hungary alone; but the revolutions and wars in that kingdom reduced them again.

HERMITAGE, properly signifies a little hut, or habitation, in some desert place, where a hermit dwells.

HERMITAGE is also popularly attributed to any religious cell, built and endowed in a private and reclusive place; and thus annexed to some large abbey, of which the superior was called *hermita*.

HERMODACTYLS, in medicine, a drug used as a gentle purgative, &c.

Naturalists for a long time were not agreed as to the origin of this drug.—Some would have it the root, and others the fruit of a plant.—To reconcile them, some allowed two kinds of *hermodactyls*: the one a root, the other a fruit.

The *hermodactyl* is a root about the size of a little chestnut, in figure resembling a heart; ruddy without, very white within; of a light, fungous substance; without fibres; easily broke, and reducible into a powder like flour, of a sweetish taste, but somewhat viscid. It is brought to us dried, from Egypt and Syria.

Authors differ as to the plant which produces it. The most judicious allow it to be the root of a sort of colchicum; tho' others take it for a tuberous iris.

Hermodactyls are chiefly used to purge pituitous humours of the brain and joints.—They are so efficacious in scouring the mucilaginous glands, and preventing them from the lodgments of gritty matters, which occasion the gout and arthritic complaints; that they are denominated, by some writers, *anima articulorum*.—They also promote sweat. See **Supplement: article HERMODACTYLS**.

HERMOGENIANS, a sect of antient heretics, denominated from their leader *Hermogenes*; who lived towards the close of the second century.

Hermogenes established matter as his first principle; and made idea the mother of all the elements.

The *Hermogenians* were divided into several branches, under their respective chieftains, viz. *Hermiani*, *Seleucians*, *Matevriari*, &c.

Some will have the Manichees also to have sprung from the *Hermogenians*.

HERNIA*, in medicine, a descent of the intestines, or omentum, out of their natural place; or, rather, the tumor formed by that descent; popularly called a *rupture*.

* The word is Latin, *hernia*, and originally signifies the same with *tumor scroti*; called also, *varicex*. Priscian observes, that the ancient Marji gave the appellation *berna* to rocks; whence, some will have *hernia*'s thus called *propter duritiam*, on account of their hardness.—Scaliger chuses rather to derive the word from the Greek, *ἕρως*, *varicus*, branch.

When the peritonæum happens to be broken, or extraordinarily dilated; the viscera, and particularly the caul and small guts,

are apt to fall out of their place, and to form these sorts of tumors, called *hernia's*.

They happen most usually in the inguen or groin, or in the scrotum, and navel; though, sometimes, in other places; as above or below the navel; in the side, far above the inguen, in the upper part of the thigh, near the spine, &c.

Hernia's are often occasioned by blows, violent concussions, over-stretching in vomiting, and hard labour, or wind; from which last cause it is, that they are so frequent in children, and so easily helped by timely care: in adults they are generally incurable. From *hernia's* frequently arise the iliac passion, and sometimes inflammations, and even gangreens of the intestines.

Hernia's are variously denominated, both according to the parts displaced, and to those whereon they fall.

A descent of the intestines into the scrotum, which is the most usual kind of rupture, is called *enterocoele*.

If, instead of the intestines, the omentum be fallen; it is called *epiplocele*.

A descent of both, is called *entero-epiplocele*.

If the intestines fall on the navel, it is called *amphalocoele*.

If they fall through the perforation of the oblique descendent into the groin; it is called *bubonocoele*, or *inguinalis*.

There are also a spurious sort of *hernia's* or tumors of the testes, &c. occasioned, not by the descent of any of the solid parts, but by a coagmentation of some of the fluids.

When the testicles are swelled, and diffused with a watry humour, it is called an *hydrocele*, or *hernia aquosa*. See **H Y D R O C E L E**.

When with winds *pneumatocoele*, or *hernia ventosa*. See **P N E U M A T O C E L E**.

When the tumor is owing to a mole, or excrescence of flesh, it is called *sarcocoele*, or *hernia carnofa*. See **S A R C O C E L E**.

When to a dilatation of the vessels, in manner of a varix, *circoscete*, or *hernia varicosa*.

A kind of prominent tumor in the throat, is frequently also called *bronchocoele*, or *hernia gutturalis*.

Some late authors also speak of *hernia's*, or descents of the bladder into the scrotum; but these are very rare.—M. Mery concludes, that they never arise from mere accident; but when they do happen, it must be the effect of an original ill conformation.—His reason is, that the bladder of urine is too big to pass through the annuli or rings which the intestines pass through; besides that it is fastened too strongly on all sides to admit of a descent.

M. Petit, however, is of a different opinion; and maintains, that *hernia's* of the bladder may be produced after the ordinary manner of others. See the *Memoires de l'Acad. an. 1717*.

HERO*, in the antient theology and mythology, a great and illustrious person, of mortal nature; though, by the populace, supposed to partake of immortality; and, after his death, placed by them in the number of the gods.

* The word is formed of the Latin, *heros*, and that of the Greek, *ἥρως*, *semi-deus*, demi-god. S. Augustin, *De Civit. Dei*, Lib. X. observes, that it is highly probable, that some one of Juno's sons was originally called by this name; that goddess being called in Greek *ἥρως*. Or, it may be, that great men were distinguished by this appellation, in allusion to the opinion of the antients, that virtuous persons, after their deaths, inhabit the wide expanse of the air, which is Juno's province.—Isidore inclines to think, that *heros's* were thus called *quasi aeres, aeri*, persons of superior merit, and worthy of heaven.—Plato derives the word from the Greek *ἔρως*, love, as intimating the *heros's* to have risen from the copulation of a god with a mortal woman; or of a goddess with a man.—Others derive the name from the Greek, *ἔρω, dicere*, to speak; the *heros's* being persons who by their eloquence led the people at their pleasure: Others, lastly, derive it from the Greek, *ἡρα, terra*, earth; the *heros's*, on their principle, being the *dii terrestres*, or gods of the earth.

Hero's were, properly, persons partly of divine, and partly of human extraction; being begot between a deity and a mortal: as Achilles, who was the son of the goddess Thetis, by Peleus; and Hercules, who was the son of Jupiter by Alcmena.

A *hero*, then, coincides with what we otherwise call a *demi-god*: accordingly, Lucian defines a *hero* to be a medium between a god and a man; or, rather, a composition of both.

HERO, is also used in a more extensive sense, for a great, illustrious, and extraordinary personage; particularly, in respect of valour, courage, intrepidity, and other military virtues.

F. Bouhours makes this distinction between a great man and a *hero*, that the latter is more daring, fierce, and enterprising; and the former more prudent, thoughtful, and reserved.—in this sense we properly say, Alexander was a *hero*, Julius Cæsar a great man.

HERO of a *Poem*, or *Romance*, is the principal personage, or he who has the top part therein.

thus the *hero* of the *Iliad*, is Achilles; of the *Odyssey*, Ulysses; of the *Æneid*, Æneas; of *Tasso's Jerusalem*, Godfrey of Bulloign; of Milton's *Paradise Lost*, Adam; though Mr. Dryden will have the Devil to be Milton's *hero*; in regard he gets the better of Adam, and drives him out of paradise.

The character of Achilles, is the inexorable wrath of a haughty, valiant, unjust, and revengeful prince: that of Ulysses, is the wise and prudent dissimulation of a courageous king, whose constancy nothing could shake: that of Æneas, is piety, goodness, gentleness, good-nature and humanity; sustained, like the others, with an invincible courage.

Many of the critics find fault with the *hero* of the *Æneid*.—They say he is too sensible and delicate; and wants of the fire, firmness, and uncontrollable spirit, remarkable in the *hero* of the *Iliad*.—Piety, tenderness, and submission to the gods, are the virtues of the middle class of mankind: they do not strike and command enough for a *hero*, who is to be the instrument of such notable exploits.—S. Evermond looks on Æneas as fitter to have been the founder of a religious order, than of an empire. F. Boffu defends Virgil's *hero*, or at least Virgil, with admirable address.—Æneas's character, he observes, was not to be formed on the model, either of Achilles, or Ulysses; nor to be of the same kind with them; as the fable, and the design of the *Æneid*, was very different from those of the *Iliad* and *Odyssey*.

What Virgil had in view, was to make the Romans receive a new kind of government; and a new master: this master, then, must have all the qualities requisite for the founder of a state, and all the virtues which make a prince beloved.—The violence of Achilles was of consequence precluded; and so was the dissimulation Ulysses: that being a quality which renders a man suspected, not beloved.

Virgil was restrained in his choice; his *hero* was to be of the genius of Augustus: and the poet was in the condition of a painter, who is obliged to accommodate a piece of history to the model of a face that is given him.—The character of Homer's two *heroes*, as being directly opposite to his design, he has thrown upon Turnus and Mezentius, who are the counterparts to his *hero*.

It is disputed among the critics, whether it be necessarily required, that the *hero* of an epic poem be a good and virtuous man?—F. Boffu maintains the negative: between a *hero* in morality, and a *hero* in poetry, the same distinction is to be made, as between moral, and poetical goodness.—Hence, as the manners of Achilles, and Mezentius, are poetically as good as those of Ulysses, and Æneas; so those two cruel and unjust men are as regular poetical *heroes*, as these two just, wise, and good men.

Aristotle, indeed, represents the *heroic* virtue, as a virtue more than human; and, of consequence, *heroes*, as divine persons, whom the excellency of their nature raises above our class: but this, he says only in his books of Morality; in his Poetics he speaks another language.—The prime person of a poem, whom we call the *hero*, he there observes, must neither be good nor bad, but between both: He must not either be superior to the generality of mankind by his virtue and justice; nor inferior to them by his crimes and wickedness. The moral, and epic *heroes*, therefore, even on Aristotle's principles, have nothing in common with each other: the one must be raised above mankind; and the other must not be on a level with the most perfect of men.

In effect, reason, the nature of the poem, which is to be a fable, the practice of Homer, and the rules of Aristotle and Horace all agree, that so far is it from being necessary that the *hero* of an epopea be a perfect, faultless man; that it is not necessary he be an honest man: and that it is no ways irregular to make him as perfidious as Ixion; as unnatural as Medea; or as brutal as Achilles.

It is another subject of controversy among the critics, whether the catastrophe, or conclusion of the action, is necessarily to leave the *hero* happy, and at ease; or whether it be allowable to leave him unhappy?

The general practice of the *heroic* poets stands for the first. We have scarce one example of a *hero* who is overcome, and remains unhappy; excepting Adam in Milton.

In tragedy, the case is different: unhappy catastrophes, according to Aristotle, are preferable to happy ones; and were always much better received among the antients. Indeed, one reason may be, that in the popular states of Greece, monarchs being odious, nothing pleased them better than to see the misfortunes of kings: and even among us, where that consideration does not hold, yet the unhappy conclusion has its advantage.—The tragic scene is the throne of the passions; and terror and pity are there to rule in a peculiar manner: Now those passions arise the most naturally from unhappy events; and the audience, quitting the theatre full of the misfortunes wherewith the piece was closed, preserve their concern much longer, and feel more forcible effects from it, than if their tears had been wiped away, and their sighs smothered in the satisfaction of a more happy peripetia.

But these reasons have no place in the epopea; which is not intended

intended so much to affect the passions, as to remove ill habits.—But it is true withal, that the epoea does not exclude all unhappy conclusions: The nature of epic fable is such as admits equally of good and bad persons for the prime parts; the unhappy adventure of a lamb unjustly devoured by a wolf, is a subject every way as instructive, and as regular, as the generosity of a lion, who lets himself be disarmed of his rage by the innocence of the same lamb.

It is true, if the poet propoſed his *hero* as a pattern of perfection for imitation, the misfortunes falling on him would ſuit very ill with the deſign: but this was doubtleſs the fartheſt thing from the intentions of the great maſters of the epoea abovementioned.—The only reaſon, perhaps, that can be given for the uniform practice of the poets in this reſpect, is, that an epic poem, containing an action of much more extent than that of a tragic poem, the reader would not be ſo well ſatisfied, if, after ſo many labours and difficulties as the *hero* is brought to ſtruggle withal, he ſhould not, at laſt, be brought off; but periſh miſerably. There is ſomething, no doubt, great and good in the *hero*, which, in the courſe of the poem, makes us concerned for him; ſo that, after ſo long an acquaintance, we cannot leave him miſerable, without ſome anxiety; which it is not the final buſineſs of the poet to raiſe.

HEROIC, ſomething belonging to a hero, or heroine.

Thus we ſay, *heroic* actions, *heroic* virtue, *heroic* ſtyle, *heroic* virtue, *heroic* poet, *heroic* age, &c.

HEROIC AGE, is that age, or period of the world, wherein the heroes, or thoſe called by the poets the children of the gods, are ſuppoſed to have lived.

The *heroic age* coincides with the fabulous age. See FABULOUS.

HEROIC POEM, is that which undertakes to deſcribe ſome extraordinary action, or enterpriſe.

Homer, Virgil, Statius, Lucan, Taſſo, and Milton have compoſed *heroic poems*.

In this ſenſe, *heroic poem* coincides with epic poem. See EPIC.

HEROIC POETRY. See the article EPIC POETRY.

HEROIC VERSE, is that wherein *heroic poems* are uſually compoſed; or, it is that proper for ſuch poems.

In the Greek and Latin, hexameter verſes are peculiarly denominated *heroic verſes*, as being alone uſed by Homer, Virgil, &c.

Alexandrine verſes of twelve ſyllables, were formerly called *heroic verſes*, as being ſuppoſed the only verſe proper for *heroic poetry*; but the later writers uſe verſes of ten ſyllables.

HEROIN, HEROINA, OR HEROIS, a woman, that has the qualities, and virtues of a *hero*; or, that has done ſome heroic action. See HERO.

HERODIANS, a ſect among the Jews, at the time of Jeſus Chriſt; mentioned by S. Matthew xxii. 16. and S. Mark iii. 6.

The critics, and commentators on the New Teſtament, are very much divided with regard to the *Herodians*.

S. Jerom, in his dialogue againſt the Luciferians, takes the name to have been given to ſuch as owned Herod for the Meſſiah: And Tertullian and S. Epiphanius are of the ſame ſentiment.—But the ſame St. Jerom, in his comment on S. Matthew, treats the ſame opinion as ridiculous; and maintains, that the Pharifees gave this appellation, by way of deriſion to Herod's ſoldiers, who paid tribute to the Romans: agreeably to which, the Syriac interpreters render the word by the *domiſtics of Herod*, i. e. his courtiers.

M. Simon, in his notes on the 22d chapter of Matthew, advances a more probable opinion.—The name *Herodian*, he imagines to have been given to ſuch as adhered to Herod's party and intereſt, and were for preſerving the government in his family; about which there were at that time great diviſions among the Jews.

F. Hardouin will have the *Herodians* and Sadduces to have been the ſame.

HERPES, *, 'EPIHE, in medicine, a cutaneous heat, or inflammation, attended with a roughneſs of the ſkin, and the eruption of a number of little puſtules ſpreading every way.

* The word is formed of the Greek. *ἕρπω*, paulatim gradior, rept, by reaſon the eruptions creep from place to place.

There are divers kinds of this diſeaſe: as, *Miliary HERPES*, this is an aſſemblage of innumerable little puſtules, under the cuticle, of the ſize of millet ſeeds: popularly called the *ſhingles*.

The *herpes miliaris*, according to Wiſeman, approaches very nearly to the nature of the pox; and therefore is to be cured with mercurial cathartics, &c.

Simple HERPES, is a ſingle puſtule or two, riſing chiefly on the face, of a whitish or yellowiſh colour, pointed, and with an inflamed baſe.—Theſe dry away of their own accord, upon letting out the little drop of pus contained in them.

A third ſpecies of *herpes*, is what we otherwiſe call *fer-*

pigo; and, in Engliſh, a *letter*, or *ring-worm*. See SERPIGO.

HERPES Exedens, is of a more corroſive kind; the puſtules are ruddy, and attended with an itching; and ulcerate the parts they riſe on.

HERRING. See the articles FISH, and FISHERY.

There are divers names given to preſerved herrings, according to the different manners wherein they are ordered, as,

1°. *Sea-fiſks*, theſe are ſuch as are caught all the fiſhing ſeaſon, and are but once packed.—A barrel of theſe holds fix or eight hundred; eight barrels go to the tun, by law: A hundred of herrings, is to be a hundred and twenty; a laſt, is ten thouſand; and they commonly reckon fourteen barrels to the laſt.

There are others repacked on ſhore, called *repacked herrings*: Seventeen barrels of ſea-fiſks, commonly make from twelve to fourteen of repacked herrings.

The manner of repacking them, is to take out the herrings, waſh them out in their own pickle, and lay them orderly in a freſh barrel. Theſe have no falt put to them, but are cloſe packed, and headed up by a tworn cooper, with pickle, when the barrel is half full; the pickle is brine, ſo long as that the *herring* will ſwim in it.

2°. *Summers*, theſe are ſuch as the Dutch chaſers, or divers, catch from June to the 15th of July.—Theſe are ſold away in ſea-fiſks, to be ſpent preſently, in regard of their ſtink; for that they will not endure repacking: they go one with another, full and ſhotten; but the repacked herrings are ſorted, the full herrings by themſelves.

3°. The *ſhotten* and *ſick herrings* by themſelves; the barrel whereof is to be marked diſtinctly.

4°. *Crux herrings*, which are ſuch as are caught after the 14th of September.—Theſe are cured with that kind of ſalt called ſalt upon ſalt, and are carefully ſorted out, all full herrings, and uſed in the repacking.

5°. *Curved herrings*, theſe ſerve to make red herrings, being ſuch as are taken in the Yarmouth ſeas, from the end of Auguſt to the middle of October; provided they can be carried aſhore within a week, more or leſs, after their taking.—Theſe are never gipped, but rowed in ſalt, for the better preſerving of them, till they can be brought on ſhore; and ſuch as are kept to make red herrings, are waſhed in great vats in freſh water before they are hangd up in the *herring hangs*, or red-herring houſes.

As for the manner of ſalting herrings.—The nets being haled on board, the fiſhes are taken out, and put into the war-backs, which ſtand on one ſide of the veſſels:—When all the nets are thus unloaded, one fills the gippers baſkets.—The gippers cut their throats, take out their guts, and ſling out the full herrings into one baſket, and the ſhotten into another:—One man takes the full baſket when they are gipt, and carries them to the rower-back, wherein there is ſalt.—One boy rows and ſtirs them about in the ſalt; and another takes them thus rowed, and carries them in baſkets to the packers.—Four men pack the herrings into one barrel, and lay them, one by one, ſtraight and even; and another man, when the barrel is full, takes it from the packers.—It is let ſtand a day or more open to ſettle, that the ſalt may melt and diſſolve to pickle; after which it is filled up, and the barrel headed.—The pickle is to be ſtrong enough to ſuſtain a *herring*; otherwiſe the fiſh decay in it.

Pickled HERRING. } See the article HERRING FISHERY.

Red HERRING. }
Herrings are ſometimes preſcribed in medicine, by way of cataplaſms, to the feet, in fevers; as being ſuppoſed to draw the febrile matter downwards. Though, it is more probable, this effect ſhould be owing to the ſalt uſed in the pickle, than to the fiſh.

HERRING BUS, a veſſel uſed in the *herring* fiſhery. See FISHERY.

HERRING COB, is a young *herring*. See HERRING FISHERY.

HERRING FISHERY. See the article HERRING FISHERY.

HERRING SILVER, a compoſition in money, formerly paid in lieu of a certain quantity of herrings for the proviſion of a religious houſe.

HERSE *, in fortification, a lattice, or port-cullice, in form of an harrow; beſet with iron ſpikes.

* The word *herſe* is French, and literally ſignifies harrow; being formed of the Latin *herpes* or *irpes*; which denote the ſame.

It is uſually hung by a rope faſtened to a moulinet; to be cut, in caſe of ſurprize, or when the firſt gate is broken with a petard; that the *herſe* may fall, and ſtop up the paſſage of the gate, or other entrance of the fortrefs.

The *herſe* is otherwiſe called a *ſarrazin*, or *catarael*; and when it conſiſts of ſtraight ſtakes, without any cross-pieces, it is called *ergues*.

HERSE, is alſo a harrow, which the beſieged, for want of chevaux de frife, lay either in the way, or in breaches, with the points up, to incommode the march as well of the horſe, as the infantry.

HERSILLON*, in the military art, a fort of plank, or beam, ten or twelve foot long, whose two sides are drove full of spikes, or nails, to incommode the march of the infantry or cavalry.

* The word is a diminutive of *herse*, the *hersillon* being the office of a little *herse*. See **HERSE**.

HESPER*, **HESPERUS**, in astronomy, the *evening-star*; an appellation given to Venus when she follows, or sets after the sun.

* The word is formed of the Greek, *ἠσπερος*, and is supposed to have been originally the proper name of a man, brother of Atlas, and father of the Hesperides. See **HESPERIDES**.—Diodorus, L. III. relates, that *Hesperus* having ascended to the top of mount Atlas, the better to observe and contemplate the stars, never returned more; and that hence he was fabled to have been changed into this star.

HESPERIDES, **ἠσπεριαιε**, in the ancient mythology, were the daughters of Hesper, or Hesperus, the brother of Atlas. The *Hesperides* were three in number, *Ægle*, *Arethusa*, and *Hesperthusa*.—Hesiod, in his *Theogony*, makes them the daughters of *Nox*, night; and seats them in the same place with the Gorgons, *viz.* at the extremities of the west, near mount Atlas: It is on that account he makes them the daughters of Night, by reason the sun sets there.

The *Hesperides* are represented by the antients, as having the keeping of certain golden apples, on t'other side the ocean. And the poets give them a dragon to watch the garden where the fruit grows: this dragon they tell us Hercules slew, and carried off the apples.

Pliny and Solinus will have the dragon to be no other than an arm of the sea, wherewith the garden was encompassed; and which defended the entrance thereof. And Varro supposes that the golden apples were nothing but sheep. Others, with more probability, say they were oranges.

The gardens of the **HESPERIDES**, *Hesperidum horti*, or *horti Hesperidum*, are placed by some authors at Larach, a city of Fœz; by others, at Bernick, a city of Barca, which tallies better with the fable. Others, take the province of Susa in Morocco, for the island wherein the garden was seated. And lastly, Rudbecks places the fortunate islands, and the gardens of the *Hesperides*, in Sweden.

HESYCHASTES*, **HESYCHASTA**, a person who keeps himself vacant and at leisure, to attend the better, and with the less interruption, to the contemplation of divine things.

* The word is Greek, *ἠσυχαστης*, formed of *ἠσυχαιω*, *quiesco*, quasi *indulgeo*, a derivative of *ἠσυχω*, *quietus*, quiet. So that *hesychastes* in Greek, answers to the literal sense of *Quietist* in English.

The name was chiefly used by the antients for such among the monks as did not employ themselves in any labour of the hands, but renounced all bodily action, to resign themselves wholly to prayer, and meditation.

HETERIARCH*, **HETARIARCHA**, in antiquity, an officer in the Greek empire; whereof there were two species: the one called simply *heteriarch*; and the other, *great heteriarch*, who had the direction of the former.

* The word is Greek, *ἠτειαρχα*; formed of the Greek *ἠτειαρχω*, *facio*, companion, ally, and *αρχη*, *imperium*, command.

Their principal function was to command the troops of the allies; besides which, they had some other duties in the emperor's court, described by Codin, *De Officiis*, c. 5. n. 30, 31, 32, 37.

HETEROCLITE*, **HETEROCLITON**, in grammar, an irregular, or anomalous word, which either in declension, conjugation, or regimen, deviates from the ordinary rules of grammar. See **ANOMALOUS**, **IRREGULAR**, &c.

* The word is Greek, *ἠτεροκλιτος*, formed of *ἠτερο*, *alter*, another, different, and *κλιω*, I decline.

Heteroclitite is more peculiarly applied to nouns, which vary, or are irregular, in point of declension; having fewer cases, numbers, &c. than ordinary: or that are of one declension in one number, and another in another.

We have various sorts of *heteroclitites*, as defective, and redundant *heteroclitites*, &c.—Under the class of *heteroclitites*, come aptotes, diptotes, monaptotes, triptotes, tetrapototes, pentaptotes, &c. See **APTOTE**, **DIPTOTE**, &c.

HETERODOX*, in polemical theology, something that is contrary to the faith or doctrine established in the true church.

* The word is formed of the Greek, *ἠτεροδοξος*, a compound of *ἠτερος*, *alter*, and *δοξα*, opinion.

Thus, we say, a *heterodox* opinion, a *heterodox* divine, &c. The word stands in opposition to *orthodox*.

HETERODROMUS *Velites*, in mechanics, a lever wherein the fulcrum, or point of suspension, is between the weight and the power.

This is what we otherwise call a *lever of the first kind*.—Such is that represented *Tab. Mechanics*, fig. 1.

If either the weight be in the middle between the power and the fulcrum; or the power between the weight and the fulcrum, the lever is denominatèd *homodromus*.—Such are those represented *fig. 2.* and *3.*

HETEROGENEITY, in physics, the quality, or disposition which denominates a thing *heterogeneous*.

The word is also used for the *heterogeneous* parts themselves.—In which sense, the *heterogeneities* of a body are the same thing with the *impurities* thereof.

Heterogenity, is a term of a very lax signification, and is brought by the chemists to serve almost for any thing they do not understand; so that all disagreement, or inaptitude to mixture between any bodies, is imputed to the *heterogenity* of their parts.

But, so far as the term may be made use of, to convey any distinct signification, it must be by considering natural bodies under different fortments, according as they are diversified by figure, bulk, motion, and their more sensible properties: so that those of different fortments are *heterogeneous* to one another, and the parts of the same fortment, are homogeneous.

Thus the division chemistry makes of bodies into oils, salts, spirits, &c. may be reckoned, with respect to one another, *heterogeneous*; though the parts of each division are among themselves homogeneous.

In effect, they are two terms, which serve frequently for a refuge to ignorance; otherwise the common terms of *like* and *unlike* might serve every whit as well. *Quincy*.

HETEROGENEOUS*, or **HETEROGENEAL**, literally imports something of a different nature, or that consists of parts of different, or dissimilar kinds: in opposition to *homogeneous*. See **HOMOGENEOUS**.

* The word is Greek, formed of *ἠτερος*, *alter*, different, and *γενος*, *genus*, kind; *q. d.* composed of different kinds of parts.

Thus, we say, milk is a *heterogeneous* body; composed of, or containing butter, cheese, and whey.

The refining of a metal, is the purging it of all its *heterogeneous* parts.

HETEROGENEOUS, is particularly applied, in mechanics, to those bodies whose density is unequal in different parts of their bulk.

Or, *heterogeneous* bodies are such, whose gravities in different parts are not proportionable to the bulks thereof.

Bodies equally dense, or solid in every part, or whose gravity is proportionable to their bulk, are said to be homogeneous.

HETEROGENEOUS Light, is that which consists of parts or rays of different refrangibility, reflexibility, and colour.

HETEROGENEOUS Nouns, in grammar, are such as are of one gender in the singular number, and another in the plural. See **NOUN**, **GENDER**, &c.

HETEROGENEOUS Numbers, are those which are referred to different unics, or integers.

HETEROGENEOUS Quantities, are those which are of such different kind and consideration, as that one of them taken any number of times, never equals or exceeds the other.

HETEROGENEOUS Sards, are such as have different radical signs; as, $\sqrt[2]{aa}$, and $\sqrt[3]{bb}$: $\sqrt[5]{9}$, and $\sqrt[7]{19}$.

How to reduce the *heterogeneous* *Sards* to homogeneous ones; see under the article **SARDS**.

HETERORHITHMUS*, a term used by some fanciful writers, for a course of life unsuitable to the age of those who live in it.

* The word is compounded of the Greek, *ἠτερος*, and *ῥιθμος*, measure.

The same is also applied to pulses, when they beat variously or irregularly in diseases; or rather, when a pulse belonging to one age, is found in a patient of another.

HETEROSCIUM*, in geography, a term vulgarly applied to those inhabitants of the earth, whose shadow at noon-time is always projected the same way, either northward, or southward.

* The word is Greek, formed of *ἠτερος*, other, different, and *σκια*, shadow.

In this sense, the inhabitants of the temperate zones, are denominatèd *heteroscii*. See **ZONE**.

HETEROSCH, however, in strictness, and according to the origin and reason of the word, is a term of relation; and denotes those inhabitants, which, during the whole year, have their noon-tide shadows projected different ways from each other. Thus, we who inhabit the northern temperate zone, are *heteroscii* with regard to those who inhabit the southern temperate zone: and they are *heteroscii* with respect to us. From this definition it follows, that only the inhabitants of the two temperate zones are *heteroscii*; nor is the word ordinarily applied to any other. Though, in reality, there is always one part of the torrid zone, whose inhabitants are *heteroscii* with regard to those of the rest, and with regard to those of one of the temperate zones, except at the time of the solstices. And even at that time, all of the torrid zone are *heteroscii* with regard to those of one of the temperate zones.

But as this is variable, and the people of the torrid zone have their shadow now on this, and then on that side; the custom is to call them *ambioscii*, and not *heteroscii*.

HETEROUSII*, **HETEROUSIANS**, a sect, or branch of Arians, the followers of Aetius, and from him also denominatèd *Aetians*.

* The word is Greek, compounded of *ἠτερος*, *alter*, and *ουσια*, substance.

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They were called *Heteroufi*, by reason they held, not that the Son of God was of a substance like, similar to that of the Father; which was the doctrine of another branch of Arians, thence called *Homonofians*, *Homonoufi*: but that he was of another substance different from that of the Father. See **ARIAN**, and **HOMOUSIAN**.

HEXACHORD *, in the ancient music, a concord commonly called, by the moderns, a *sixth*.

* The word is Greek, compounded of ἕξ, *sex*, six; and χορδή, *chorde*, chord, or string.

The *hexachord* is two-fold, the *greater* and *lesser*.—The *greater hexachord*, is composed of two greater tones, two lesser tones, and one greater semitone; which make five intervals.

The *lesser hexachord* consists only of two greater tones, one lesser tone, and two greater semitones.

The proportion of the former, in numbers, is as 3 to 5; and that of the other, as 5 to 8.

HEXAEDRON *, or **HEXAEDRON**, in geometry, one of the five regular bodies, popularly called a *cube*. See **CUBE**.

* The word is Greek, formed of ἕξ, *sex*, six, and ἕδρα, *sedes*, seat.

The figure of the side of a *hexaedron*, is in a sub-triple ratio to the square of the diameter of the circumscribed sphere.—Hence, the side of the *hexaedron* is to the side of the sphere it is inscribed in, as one to the $\sqrt{3}$; and consequently it is incommensurable thereto.

HEXAGON *, in geometry, a figure of six sides, and as many angles.

* The word is Greek, formed of ἕξ, *sex*, six, and γωνία, *angulus*, angle.

If these sides and angles be equal, it is called a *regular hexagon*.

The side of a *hexagon* is demonstrated to be equal to the radius of a circle circumscribed about the same.

Hence, a *regular hexagon* is inscribed in a circle, by setting the radius off six times upon the periphery.

To describe a *hexagon* on a given line A B, (*Tab. Geometry*, fig. 84.) draw an equilateral triangle A C B; the vertex C will be the centre of a circle, which will circumscribe the *hexagon* required.

HEXAGON, in fortification, is a fortress with six bastions.

HEXAMERON *, or **HEXAMERON**, a name given to divers writings both of ancient and modern authors, containing commentaries, or discourses on the first chapter of Genesis; wherein is delivered the history of the creation, or the first six days of the world.

* The word is Greek, formed of ἕξαμερον, or ἕξαμερον, compounded of ἕξ, *sex*, six, and ἡμέρα, which in the Doric dialect is wrote ἡμερα, *day*.

S. Bassi, S. Ambrose, &c. have wrote *hexamerons*.

HEXAMETER *, in the ancient poetry, a verse used by Greek and Latin writers, consisting of six feet.

* The word is Greek, ἕξαμετρον, compounded of ἕξ, *sex*, six, and μετρον, *measure*, foot.

The first four feet of a *hexameter*, may be indifferently either dactyls, or spondees; but the last foot, in strictness, is always to be a spondee; and the last but one a dactyl.—Such is that of Homer,

Εἰς ἵδωρ μὲ ῥέψῃσθαί, ἔχρηθ' ὄνος ἀνδρῶν ἄμωμ.

And that of Virgil,

Disiote iustitiam maniti & non temerere divos.

Hexameter verses are divided into *heroic*; which are to be grave and majestic, suitable to the dignity of heroic poetry; and *satyrical*, which may be more loose and negligent as those of the epistles of Horace.

Epic poems, as the *Iliad*, *Odysses*, *Aeneid*, &c. consist of *hexameter* verses alone: elegies and epistles ordinarily consist, alternately of *hexameters* and *pentameters*.

Some of the French and English poets have attempted to compose in *hexameter* verses, but without success. Jodelle made the first essay in 1553, with a distich in praise of Olivier de Magny, which Pasquier represents as a master-piece. It is this,

*Phobus, amor, cypris, vent favor, navirris & orner
Ton vers, & ton chef, d'ombre, de flamme, de fleurs.*

But this kind of poetry pleases no body. The modern languages are not at all fit for a kind of verse whose cadence depends altogether on long and short syllables.

HEXAMILION *, **HEXAMILLI**, or **HEXAMILUM**, in antiquity, a celebrated wall built by the emperor Emanuel, over the isthmus of Corinth.

* It took its name from ἕξ, *sex*, and μίλιον, which in the vulgar Greek signifies *amile*: as being six miles long.

The design of the *hexamilion*, was to defend Peloponnesus from the incursions of the barbarians.—Amurath II. having raised the siege of Constantinople, in the year 1424, dissolved the *hexamilion*, though he had before concluded: peace with the Greek emperor.

The Venetians restored it in the year 1463, by thirty thousand

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workmen, employed for fifteen days, and covered by an army commanded by Bertoldo d'Este, general of the land forces, and Louis Lorezano, general of the sea.

The infidels made several attempts upon it, but were repulsed, and obliged to retire from the neighbourhood thereof. But Bertoldo being killed at the siege of Corinth, which was attempted soon after; Bertino Calcinato, who took on him the command of the army, abandoned, upon the approach of the beglerbeg, both the siege and the defence of the wall, which had cost them so dear: upon which it was finally demolished.

HEXAPLA *, in church history, a Bible disposed in six columns; containing the text, and divers versions thereof; compiled, and published by Origen.

* The word is formed of ἕξ, *sex*, six, and ἀπλοῦ, *plano*, I open, I unfold.

Eusebius, *Hist. Ecl.* L. VI. c. 16. relates that Origen, after his return from Rome under Caracalla, applied himself to learn Hebrew; and began to collect the several versions that had been made of the sacred writings, and of these to compose his *Tetrapla*, and *Hexapla*: others, however, will not allow him to have begun till the time of Alexander, after he had retired into Palestine, about the year 231.

To conceive what this *Hexapla* was, it must be observed, that besides the translation of the sacred writings, called the *Septuagint*, made under Ptolemy Philadelphus, above 270 years before Christ; the scripture had been since translated into Greek by other interpreters. The first of those versions, (or, reckoning the Septuagint,) the second was that of Aquila, done about the year of Christ 140: the third was that of Symmachus, published, as is commonly supposed, under Marcus Aurelius: The fourth was that of Theodotio, under Commodus: the fifth was found at Jericho, in the reign of Caracalla, about the year 217; and the sixth was discovered at Nicopolis, about the year 228. Lastly, Origen himself recovered part of a seventh, containing only the Psalms.

Now Origen, who had held frequent disputations with the Jews in Egypt and Palestine; observing that they always objected against those passages of scripture quoted against them, and appealed to the Hebrew text; the better to vindicate those passages, and comfort the Jews, by shewing that the Seventy had given the sense of the Hebrew; or rather to shew, by a number of different versions, what the real sense of the Hebrew was: undertook to reduce all these several versions into a body, along with the Hebrew text; so as they might be easily confronted, and afford a mutual light to each other.

In order to this, he made choice of eight columns: in the first he gave the Hebrew text in Hebrew characters: in the second, the same text in Greek characters. The rest were filled with the several versions abovementioned; all the columns answering verse for verse, and phrase for phrase. And in the Psalms there was a ninth column for the seventh version. This work Origen called ἑξαπλά, *hexapla*, q. d. *sexuple*, or a work of six columns; as only regarding the first six Greek versions.

Indeed, S. Epiphanius, taking in likewise the two columns of the text, calls the work *Otiapla*, as consisting of eight columns.

This celebrated work perished long ago: though several of the ancient writers have preserved us pieces thereof; particularly S. Chrysostom on the *Psalms*, Philoponus in his *Hexameron*, &c.—Some modern writers have earnestly endeavoured to collect fragments of the *Hexapla*, particularly Drusus, and F. Montfaucou.

HEXASTYLE *, **HEXASTYLOS**, in the ancient architecture, a building with six columns in front.

* The word is compounded of ἕξ, *sex*, and ὑλός, *column*.

The temple of Honour and Virtue at Rome, built by Mutius, was a *hexastyle*.

HEYRS, in husbandry, young timber trees, usually left for standards in felling of woods, or copes.

HIA TUS, a Latin term, properly signifying the aperture of the mouth; from the verb *hiare*, to gape.

It is variously used in works of literature, &c. to denote a *chasm* or *gap*; particularly in verses, where there is a clashing of vowels, by one word ending with a vowel, and the following one beginning with another.

As in — Tho' oft the ear the open vowels tire.

This clashing of vowels, so disagreeable to the ear, is called a *hiatus* in prose as well as verse.—The Romans were so very careful to avoid it, that they always suppressed the preceding vowel even in prose; as is observed by Cicero in his *Orator*.—In writing, to avoid it, they used to infer the letter *d*; as in *redco redamo, mederga*, &c. Hence on the base of the Duilian column, we meet with *prædada. altd. marid. &c. Voff.*

HIATUS is also used for a defect in a manuscript copy; where something is lost, or effaced, by the injuries of time, or otherwise.

In a theatrical piece, there is said to be a **HIATUS**, when a scene

scene is not well connected to the next, but leaves the action interrupted, and the stage empty.

In matters of genealogy, **HIATUS** is an interruption in a line or series of descendants.—Those proofs of eight hundred years are impossible, by reason of the frequent *hiatus*'s occasioned by civil wars, Gothic inundations, &c.

HICKUP*, **HIKOKK**, **HICCOUGH**, or **HICKET**, *singultus*, in medicine, a sudden irregular inspiration; wherein the stomach, and the parts contained in the lower venter, are impelled downwards.

* The word seems formed of the Fleming, *hieck*, which signifies the same thing: others derive it *ab hiscendo*; others, a *difficili anhelitu*: but others think the most natural derivation to be from the sound yielded in this action.

The *hickup* is not immediately a disorder of the stomach, as is usually imagined; but a convulsive motion of the diaphragm; whereby that muscle retiring impetuously downwards, impels the parts beneath it.

It is occasioned by sharp humours; a too great plenitude of the stomach; a bit of any thing stopped at its upper orifice: or, in the general, by any thing capable of irritating the nerves of the diaphragm.

The Remedy for the *hickup*, according to Hippocrates, is to fetch the breath very long, or even to stop the breath for some time. A sneezing happening upon a *hickup*, generally cures it; the diaphragm, shook by the violent expiration, being apt to throw off what before irritated it.

HIDAGE*, or **HYDGE**, an extraordinary tax; antiently payable to the king for every hide of land. See **HIDE**.

* *Sunt etiam quedam communes prestationes, quae servitia non dicuntur, nec de consuetudine oriuntur, nisi cum necessitas intervenit, vel cum rex venerit; sicut sunt hidagia, coragia, & carvagia, & alia plura de necessitate: Et ex consensu communi totius regni introducta, & quae ad dominum non pertinent, &c.* Bracton, Lib. II. cap. 6.

King Ethelred, in the year of Christ 994, upon the landing of the Danes at Sandwich, taxed all his lands by *hides*. Every three hundred and ten *hides* of land on this occasion found one ship furnished; and every *eight hides* found one jack, and one saddle for the defence of the realm.—William the conqueror took six shillings for every *hide* of land in England. *Flor. Wigorn.* an. 1084.

HIDAGE, is also used for being quit of that tax; otherwise called *hide-gild*.

HIDE, the skin of a beast; particularly that of a bullock, or cow. See **SKIN**, and **TANNING**.

We have *hides* of divers denominations, according to their state, quality, &c.

Curried HIDE, is that which after tanning, has passed through the currier's hands, and has thus received its last preparation, and is fitted for use.

Raw HIDE, or *Green HIDE*, is that which has not undergone any preparation; being in the same condition as when taken off the carcass.

Salted HIDE, is a green *hide*, seasoned with sea-salt and alum, or salt-petre; to prevent its spoiling and corrupting, either by keeping it too long in cellars, or in transporting it too far in a hot season.

There are also *hides dried in the hair*, sent from America; particularly those of Buffalo's.

Tanned HIDE, is a *hide* either green, salted, or dried, further dressed and prepared by the tanner, by paring off the hair, and steeping it in pits of lime and tan. See **TANNING**.

HIDE, or **HYDE**, **HYDA**, in our antient customs, denoted a measure or quantity of land, containing so much as could be yearly tilled with a single plough.

Beda calls the *hide* of land, *familla*, and defines it to be so much as was sufficient for the ordinary maintenance of one family.—In other authors it is called *mansum*, *mansus*, *carucata*, &c.

Crompton, in his *Jurisdict.* fol. 222. says, a *hide* of land contains one hundred acres: He adds, that eight *hides* make a knight's fee. In an antient manuscript the *hide* is fixed at one hundred and twenty acres.

But Sir Edward Coke notes, that a knight's fee, a *hide*, or plough-land, a yard-land, and an oxgang of land, do not contain any certain determinate number of acres.

The distribution of England into *hides* of land is very antient; there being mention made of it in the laws of king John, cap. 14. *Henricus I. Maritima, filiae suae gratia imperatori, cepit ab unaquaque hida Angliæ tres fol.* SPELMAN.

HIDE-BOUND, a disorder of a horse, or other beast, wherein his skin sticks so tight to his ribs and back, as not to be loosened from it with the hand.

The disorder is sometimes owing to poverty, and bad keeping; at other times to over-riding, or a surfeit, the horse being suffered, when he is hot, to stand long in the wet; or to a morbid drinck of the blood, which not having its natural course, causes the skin to shrink up, and cleave to the bones.—Among husbandmen, trees also are said to be *hide-bound*, when the bark sticks too close.

HIDEL, in our antient statutes, signifies a place of protection, or sanctuary.

HIDGILD*, or **HIDEGILD**, in the laws of king Canute, is explained by *pretium redemptionis servi*; the price by which a servant was to redeem his skin from being whipped.

* The word is formed from the Saxon, *hinc*, skin, and *gild*, payment.—*Si liber sextis diebus operetur, perdat libertatem; si servus, corium perdat, vel hidgildum, i. e.* let him be whipped, (which was the punishment for servants) or let him pay for his skin; by which payment he is to be excused from whipping.

HIDROTICS*, or **HYDROTICS**, in medicine, the same with *sudorifics*.

* The word is composed of the Greek, ἵδρω, sweat.

Contraeryva, zedoary, guaiacum, angelica, &c. are of the number of *hidrotics*, or *hidatic* medicines.

HIERACITES, **HIERACITÆ**, a sect of antient heretics; denominated from their leader, Hierax.

This heresiarch was by nation an Egyptian; and, besides his mother-tongue, was a master of the Greek, and well skilled in all the polite parts of learning. Being born a Christian, he had been brought up to the study of the holy scriptures, which he had a more than ordinary acquaintance; so that he wrote commentaries on some of them; but, by an ill use of his knowledge, he fell into divers errors, in which his interest and authority among the monks of Egypt, procured him abundance of followers.

He absolutely denied the resurrection of the body; maintaining, that the soul alone rose again; and that the resurrection was altogether spiritual.—Epiphanius informs that he might have imbibed this error from Origen.

The same Hierax, and his followers, likewise condemned marriage; being of opinion that it was only allowed under the Old Testament; and till the coming of Jesus Christ; but that under the new law, all marriage was prohibited, as incompatible with the Kingdom of God.

S. Epiphanius produces the passages of scripture whereon he founded this doctrine. He adds, that Hierax did not give into Origen's error with regard to the Mystery of the Trinity, but allowed the Son to be really and truly begotten of the Father: He was also orthodox with respect to the Holy Ghost; excepting for some peculiarities received from the Melchisedecians, on which he had refined. He lived a very austere life, and promoted the same among his followers: but after his death they degenerated very fast.

HIERA PICRA*, in pharmacy, originally a kind of electuary, first described by Galen; composed of aloes, cinnamon, asarabacca, spica-nardi, saffron, and mastic, made up with honey, or syrup of violets and honey.

* It is denominated from the Greek ἱερα, sacer, holy, by reason of its rare virtues; and πικρα, amarus, bitter; aloes, which is the base thereof, rendering it extremely bitter.

It was used to purge, and cleanse the stomach; remove obstructions, promote the menes and hæmorrhoids, and sweeten the blood: but its chief use among us, is in Powder for making the tinctura sacra.

Besides this *simple hiera picra*, there is a *compound* sort, called *dialococynthidos pachii*, by reason colocynthis is the base thereof, and that it was first used, with good success, by Pachusius of Antioch, in divers obstinate diseases.—It is composed of colocynth, opponax, aristolochia rotunda, agaric, and other ingredients. It is used in epilepsies, apoplexies, palfies, and lethargies; and to excite the menes, and promote the expulsion of the after-birth.

There is also a third sort of *hiera*, called *liberans*; but rarely used.—Dr. Quincy says, it is one of the most ridiculous medleys ever contrived. It passes for a cordial, &c.

HIERARCHY*, **HIERARCHIA**, in theology, the order, or subordination, among the several choirs, or ranks of angels.

* The word is Greek, ἱεραρχία; formed of ἱερα, sacer, holy, and αρχη, principatus, rule, & d. ἱερα αρχη, holy command, or rule in holy things.

S. Dionysius, and other of the antient writers, establish nine choirs, or orders of celestial spirits; viz. seraphims, cherubims, thrones, dominions, principalities, powers, virtues, angels, and archangels: and these they divide into three hierarchies.

HIERARCHY, is also used on earth, for the subordination between prelates, and other ecclesiastics. See **ECCLESIASTICAL ORDER**, **PRIEST**, &c.

Archbishops, bishops, priests, and deacons, compose the *hierarchy* of the church of England.—In that of Rome, the pope has likewise a place at the head of the *hierarchy*.

F. Cellot, a Jesuit of Paris, has published a volume expressive, (*De Hierarchia & Hierarchis*), on the *hierarchy*, and those who compose it. He there distinguishes a created, and an uncreated *hierarchy*; a divine, and a human, or ecclesiastical *hierarchy*; and in this, a *hierarchy* of jurisdiction, a *hie-*

archy of order, and a hierarchy of graces, the most sublime of all.

He defines hierarchy in the general, a command, or sovereignty, in holy things: principatus, sive imperium in rebus sacris; on which footing he holds, that hierarchy excludes all below bishops; and that neither priests nor deacons can be reckoned among the number of hierarchists. Bellarmin, Haller, Aurelius, &c. he holds, were all mistaken, and did not distinguish between being of the hierarchy, and being under it.

According to him, to be of, or in the hierarchy, are the same thing; and are only applicable to those who govern the church, or have some part in the administration of the government thereof: On the contrary, to be under the hierarchy, is to be ruled or governed by the hierarchy.—Cellet will not admit of any difference between these three expressions. To prove that they all denote the same thing, he instances in the case of monarchy, alledged for the same purpose by P. Aurelius: arguing, that in a monarchy, all, even the subjects, are in the monarchy, of the monarchy, or under the monarchy; and that none are excluded but foreigners, and that the case is the same in the hierarchy.

HIERATIC Paper, among the ancients, was the finest sort of paper; which was set apart only for sacred or religious uses. See PAPER.

HIEROGLYPHIC*, Ἱερογλυφικά, a symbol, or mystic figure, used among the ancient Egyptians, to cover, or conceal the secrets of their theology.

* The word is composed of ἱερός, sacer, holy, and γλυφίζω, sculptare, to engrave; it being the custom to have the walls, doors, &c. of their temples, obelisks, &c. engraven with such figures.

Hieroglyphics are properly emblems, or signs of divine, sacred, or supernatural things; by which they are distinguished from common symbols, which are signs of sensible and natural things.

Hermes Trismegistus, is commonly esteemed the inventor of hieroglyphics: He first introduced them into the Heathen theology; from whence they have been transplanted into the Jewish and Christian.

Sacred things, says Hippocrates, should only be communicated to sacred persons.—Hence it was, that the ancient Egyptians communicated to none but their kings and priests, and those who were to succeed to the priesthood and the crown, the secrets of nature, and the mysteries of their morality and history; and this they did by a kind of cabbala, which at the same time that it instructed them, only amused the rest of the people.—Hence the use of hieroglyphics, or mystic figures, to veil their inorality, politics, &c. from profane eyes. Span.—This author, it may be observed, and many others, do not keep to the precise character of a hieroglyphic, but apply it to profane as well as divine things.

Hieroglyphics are a kind of real characters, which do not only denote, but in some measure express the things.—Thus, according to Clemens Alexandrinus, Strom. 5, a lion is the hieroglyphic of strength and fortitude; a bullock, of agriculture; a horse, of liberty; a sphinx of subtilty, &c.

HIEROGLYPHICAL, something containing a hieroglyphic. See HIEROGLYPHIC.

In Egypt are still found divers obelisks, figures, &c. full of hieroglyphical figures or characters.

From the inmost recesses of the dome, says Apuleius, he brings forth certain books wrote in mystic, unintelligible characters; consisting partly of figures of animals, apparently suggesting some compendious sayings; and partly of knots, and flourishes; all abundantly secured from the too curious eyes of profane readers. The religious rites of the Egyptians, are mostly involved in such figures of animals, which are hence called ἱερογλυφικὰ γράμματα, hieroglyphical letters.

HIEROGRAMMATEI, Ἱερογραμματοῖς, among the ancient Egyptians, were the priests appointed to explain the mysteries of religion, and to direct the performance of the ceremonies thereof.

The hierogrammati invented and wrote hieroglyphics and hieroglyphical books, and occasionally explained them, together with other matters relating to the doctrines of religion. If we may believe Suidas, they were also prophets; at least, he relates, that a hierogrammatist foretold to an ancient king of Egypt, that there would be an Israelite of great wisdom, virtue and renown, who should humble Egypt.

The hierogrammati were always near the king, to assist him with their informations and counsels: the better to fit them for this, they made use of the skill and knowledge they had acquired in the stars, and the motions of the heavenly lights; and even of the writings of their predecessors, wherein their functions and duties were delivered. They were exempted from all civil employments; were reputed the first persons in dignity next the king; and bore a kind of scepter in form of a ploughshare.

After Egypt became a province of the Roman empire, the hierogrammati sunk into neglect.

HIEROMNENON*, an officer in the ancient Greek church; whose principal function was to stand behind the patriarch at the sacraments, ceremonies, &c. and then him the prayers, psalms, &c. which he was to rehearse.

* The word is composed of the Greek ἱερός, sacred, and μνησκω, one who advertises, or puts in mind of.

He also clothed the patriarch in his pontifical robes; and assigned the places of all those who had a right to be around him, when seated on his throne; as the master of the ceremonies now does to the pope.

The hierommene was commonly a deacon; when he was in priest's orders, as it sometimes happened, he was excused from dressing the patriarch in his pontifical habits. Whether he were deacon, or priest, he had always under him an officer named *cestrifus*. He had also the keeping of the book entitled *Contaction*, or book of ordination; and that called the *Enthronisationis*, which was a sort of ritual.

HIERONYMITES*, or Hermits of St. Jerom. See JERONYMITES.

* The word is compounded of ἱερός, holy, and μοναχ, name.

HIEROPHANTES*, or HIEROPHANTA, in antiquity, a priest among the Athenians.

* The word comes from ἱερός, holy, sacred, and φανω, I appear.

The hierophantes was properly the chief person that officiated in the Eleuthia, that great solemnity, sacred to Ceres and Proserpine. See ELEUSINIA.

St. Jerom says, that the hierophantes extinguished the fire of lust, by drinking cicuta, or the juice of henbane; or even by making themselves eunuchs.—Athenodorus observes, that it was the hierophantes who instructed persons initiated into their religion, in the mysteries and duties thereof; and that it was hence he derived his name.—For the same reason he was also called *prophetes*, the prophet.—He had officers under him to do the same thing, or to assist him therein, who were also called *prophetes*, and *exegetes*, i. e. explainers of divine things.

To the hierophantes it belonged to dress and adorn the statues of the gods, and to bear them in processions and solemn ceremonies.

HIEROPHYLAX*, an officer in the Greek church.—His function is that of guardian, or keeper of the holy things, utensils, vestments, &c. answering to our *sacrista*, or sexton.

* The word is composed of ἱερός, sacer, and φυλάξω, I keep.

HIEROSCOPY*, HIEROSCOPIA, a kind of divination, performed by considering the victim, and observing every thing that occurs during the course of the sacrifice.

* The word is formed of ἱερός, sacer, and σκοπέω, I view, or consider.

HIGH, *altus*, a term of relation, applied to a body, considered according to its third dimension, or its elevation above the horizon, or even above the ground.

The pike of Tenariff is reputed the highest mountain in the world.—The Monument is two hundred and twenty foot high from the ground. See MONUMENT.

The tower of St. Paul's, before its first burning down in 1086, was five hundred and twenty foot high, exclusive of a pole of copper, whereon was a cross fifteen foot and a half high.—The towers of Notre Dame at Paris, so much talked of, are but two hundred and twelve foot high, &c.

HIGH, is also used to denote a person in power, dignity, &c.

Thus God is frequently called in scripture the *Most High*. So on earth we say, high and puissant lord, prince, &c.—The states general of the united provinces, are called their *high mightinesses*. See STATES, &c.

So in England we say, high court of parliament.
Lord high chancellor, } See } CHANCELLOR.
Lord high treasurer, } } TREASURER.

HIGH, in music, is sometimes used in the same sense with *loud*, in opposition to *low*: and sometimes in the same sense with *acute*, in opposition to *grave*.

HIGH bearing-cock, is a term used with respect to fighting cocks; denoting one larger than the cock he fights withal. ---As a low bearing-cock is one overmatched for height.

HIGH DUTCH, is the German tongue in its greatest purity, as spoken in Misnia, &c. See TEUTONIC, &c.

HIGH Operation, in chirurgery, is a method of extracting the stone; thus called, by reason the stone is taken out at the upper part of the bladder.

For the method of performing the high operation. See LITHOTOMY.

The high operation is said to have been first practised by Rossitus, others say by Franco, a chirurgeon of Laufanne. It

has been lately retrieved by Mr. Douglas, and practised with good success by Mr. Chetelden, and others.

HIGH Relief. See the article **RELIEVO**.

HIGH Sea, or ocean, is that far from land. See **SEA**.

HIGH Water, is that state of the tides when they cease to flow up.

HIGHNESS, a quality, or title of honour given to princes. The kings of England and Spain had formerly no other title but that of *highness*; the first, till the time of James I. and the second, till that of Charles V.

The petty princes of Italy began first to be complimented with the title of *highness* in the year 1630.---And the duke of Orleans assumed the title of *royal highness* in the year 1631, to distinguish himself from the other princes of France.

The duke of Savoy, after king of Sardinia, bore the title of *royal highness*, on account of his pretensions to the kingdom of Cyprus.---It is said that duke only took the title of *royal highness*, to put himself above the duke of Florence, who was called *great duke*; but the great duke has since assumed the title of *royal highness*, to put himself on a level with the duke of Savoy.

The prince of Conde first took the title of *most serene highness*, leaving that of simple *highness* to the natural princes.

HIIS testibus, q. d. *these witnesses*; a phrase anciently added in the end of a deed, written in the same hand with the deed; upon which the witnesses were called, the deed read, and then their names entered. See **WITNESS**.

This clause of *hiis testibus*, in subjects deeds, continued till, and in, the reign of Henry VIII. but it is now omitted. *Cok. on Littlel.*

HILARIA, in antiquity, feasts celebrated every year, by the Romans, on the eighth of the calends of April, in honour of Cybele, the mother of the gods.

The *hilaria* were solemnized with great pomp, and rejoicing. Every person dressed himself as he pleased, and took the marks, or badges, of whatever dignity, or quality, he had a fancy for.

The Romans took this feast originally from the Greeks, who called it **ANABASIS**, q. d. *ad ascensum*: the eve of that day they spent tears in and lamentations, and thence denominated it **KATABASIS**, *descensus*.

Afterwards, the Greeks took the name **ΙΑΡΙΑ**, from the Romans; as appears from Photius, in his extract of the life of the philosopher Siodore.

Casaubon maintains, that beside this particular signification, the word *hilaria* was also a general name for any joyful or festival day, whether public, or private and domestic. But Salmassius does not allow of this.

Tristan, T. I. p. 482. distinguishes between *hilaria* and *hilaria*. The former, according to him, were public rejoicings; and the latter, prayers made in consequence thereof; or even of any private feast, or rejoicing, as a marriage, &c. The public lasted several days; during which, all mourning, and funeral ceremonies, were suspended.

The *hilaria* were first instituted in honour of the mother of the gods, as is observed by Macrobius, L. I. c. 10. and Lampadius, in his life of Alexander Severus; being apparently intended to express the joy conceived at the birth of the gods.

HILARODI*, in the ancient music and poetry, a sort of poets among the Greeks, who went about singing little merry diverting poems or songs; though somewhat graver than the Ionic pieces.

* The word is Greek, *ἡλαροδοί*, compounded of *ἡλαρος*, joyful, and *ᾠδή*, singing, song.

The *hilarodi* appeared dressed in white, and were crowned with gold. At first they wore shoes; but afterwards they assumed the crepida, which was only a shoal, tied over the foot with straps.

They did not sing alone; but had always a little boy, or girl, to attend them, playing on some instrument.

From the streets, they were at length introduced into the tragedy, as the magodi were into comedy.

The *hilarodi* were afterwards called *simodi*, from a poet named Simus, who excelled in this kind of poetry.

HILARODIA, a poem, or composition in verse, made, or sung by a sort of rhapsodists called *hilarodi*. See **HILARODI**.

Scaliger holds *hilarodia*, *hilaro-tragedia*, *phylacography*, and the *rhintonic fable*, to be all names for the same thing.

HILARO-TRAGEDIA, a dramatic performance, partly tragic, or serious; and partly comic, or merry.

Scaliger holds, the *hilaro-tragedia* and *hilarodia* to be one and the same thing. Others, rather take the *hilaro-tragedia* to have been pretty nearly what we call a *tragi-comedy*. Others, again, will have it to have been a pure tragedy, only terminating with a happy catastrophe, which brings the

hero out of a wretched into a fortunate state.---But the first opinion seems the most probable, and the best warranted.

Suidas mentions one Rhinton, a comic poet of Tarentum, as the inventor of this kind of poem: whence it was also called *Rhintonica fabula*.

HILARY Term. See the article **TERM**.

HILL. See the article **MOUNTAIN**.

HILLOCK. See the article **MOUNT**.

HIN, a Hebrew measure, containing the sixth part of an epha; or one wine gallon and two pints.

HIND, a female stag of the third year. See **HUNTING**.

HIND Calf, a hart of the first year. See **HUNTING**.

HIND Hand, in the manage. See the article **HAND**.

HINDENI Homines*, anciently signified a society, or class of men.

* The word is formed from the Saxon, *hindene*, a society, or company.

In the time of our Saxon ancestors, all men were ranked into three classes, or *hindenes*; the *lowest*, the *middle*, and the *highest*; and they were valued according to the class they were in; that in case an injury were done by any one, satisfaction might be made according to the value, or worth of the man it was done to. See **SYXHYNDEMEN**.

The *lowest* were those who were worth ten pounds, or two hundred shillings; called *virgi ducentini*, or *twybyndmen*, and their wives, *twybyndas*.

The *middle* were valued at six hundred shillings; and were called *sixbyndmen*, and their wives *sixbyndas*.

The *highest* were valued at twelve hundred shillings, and were called *twelveybyndmen*, and their wives the *twelveybyndas*.

HINE, or **HIND,** in the Saxon language, signifies a servant, or one of the family; but it is now taken in a mere restrictive sense, for a servant at husbandry: and the *master-hine*, is he that oversees the rest.

HINGES, in building, those necessary iron ligaments, by means whereof doors, lids, folds of tables, &c. make their motion, whether of opening, shutting, or folding.

The species of *hinges* are many, *viz.* bed, box, butts, case-ment; Lancashire, and smooth-filed; casting, chest-black, Lancashire, smooth-filed, coach, desk, dovetails, effes, folding, garnets, dozen-ware-long, dozen-ware-short, weighty-long, weighty-short, lamb-heads, port, side Lancashire, side-smooth-filed, side with rising joints; Lancashire, and smooth-filed, side with squares, screw, scuttle, flutter; Lancashire, and smooth-filed, stall, trunk of sundry sorts, joints; Lancashire, dozen-ware with hooks, dozen-ware long, dozen-ware short, weighty-long, weighty-short.

HIP. See the article **HAYRICH**.

HIP-SHOT, a disorder of a horse, when he has wrung or sprained his haunches, or *hips*, so as to relax the ligaments that are to keep the bone in its due place.

The signs are, that the horse will halt much, and go aside-long, trailing his leg after him; and the *hip* which is hurt will be lower than the other; the flesh falling away on the side of his buttock.

HIPS, in building, are those pieces of timber, placed at the corners of a roof.

The *hips* are much longer than the rafters, by reason of their oblique position, and are placed not with a right or square angle, but a very oblique one; and by consequence are not, at least ought not to be, square at any angle (as rafters are at all) but bevel at every one of them; and which is yet more, as rafters have but four planes, these commonly have five.

They are commonly, by country workmen, called *corners*: some call them *principal rafters*, and others *sleepers*. Indeed, *hips* and *sleepers* are much the same; only the *sleepers* lie in the valleys, and join at top with the *hips*; but those *surfaces* or *plains*, which make the back of the *hip*, are the under sides of the *sleepers*.

The *backs of a Hip*, are those two superficieses, or planes, on the outside of the *hip*, which lie parallel, both in respect of their length and breadth, with the superficieses of the adjoining side, and end of the roof.

HIP-MOULD, is by some used for the back of the *hip*---Others understand it as a prototype, or pattern, commonly made of a piece of thin waifcot; by which the back, and the sides of the *hip* are set out.

HIP-ROOF, among builders, called also *Italian-roof*, is a roof which has neither gable head, nor spread head, nor jirkin head; which last, are both gable and *hip* at the same end. A *hip-roof* has rafters as long, and with the angles at the foot, &c. at the ends of buildings, as it has at the sides; and the feet of the rafters on the ends of such buildings as have *hip-roofs*, stand on the same plane, *viz.* parallel with the horizon, and at the same height from the foundation, with rafters on the sides of the roof.

HIP

HIP-TYLES. See the article **TYLE**.
HIPPEUS, or **EQUINUS**, in physiology, a sort of comet which some writers suppose to bear a resemblance in its tail to a horse. But the shape of this kind of comet is not always alike; being sometimes oval, and sometimes imitating a rhomboides. Its train also is sometimes spread from the front, or forepart, and sometimes from the hind part.

Hence, this class of comets is distinguished into *equinus barbatus*, *equinus quadrangularis*, and *equinus ellipticus*. See **COMET**.

HIPPIATRICE*, the art of curing the diseases of brutes, and particularly horses.

The word is composed of *ἵππος*, horse, and *ιατρικη*, physician.

This makes what we rather call the *farrier's art*. See **FARRIER**.

HIPPOCENTAUR*, in antiquity, a fabulous monster, supposed to be half horse, and half man.

The word is pure Greek, formed of *ἵππος*, equus, horse, *κέντρον*, pugio, I prick, spur, and *ταύρος*, taurus, bull.

What gave occasion to the fable, was, that a people of Thessaly, inhabiting near mount Pelion, became thus denominated, by reason they were the first that taught the art of mounting on horseback; which occasioned some of their neighbours to imagine that the horse and man made but one animal.

The *hippocentaur* should seem to have differed from the centaurs, in this, that the latter only rode bullocks, and the former on horses, as the names themselves intimate. See **CENTAUR**.

Pliny affirms, he had seen a real *hippocentaur* at Rome, which was brought out of Egypt, embalmed in honey: But this we may well suspect to have been a cheat. V. *Plin. Hist. Nat. l. 7. c. 2.*—On the medals of Gallienus, is represented a centaur drawing a bow, or holding a globe in the right hand, and the helm of a ship in the left; with this inscription, **A-POLLINI CONS. AUG.** To Apollo the conservator of Augustus.—Trifan considers both the one and the other, as a symbol of the protection Gallienus received from Apollo in his wars against the Persians.

HIPPOCRAS*, *Vinum Hippocraticum*, a kind of medicated wine. See the article **WINE**.

* Menage approves the conjecture of those who derive *hippocras* from *Hippocrates*, as supposing him the inventor hereof: but we may better deduce it from the *manica Hippocrates*, or *Hippocrates's sleeve*, used in the filtration of it.

Hippocras is a drink composed of wine, with spices and other ingredients infused therein; much used among the French by way of a Cordial dram after meals.

There are various kinds of *hippocras*, according to the kind of wine, and the other additional ingredients made use of; as white *hippocras*, red *hippocras*, claret *hippocras*, strawberry *hippocras*, *hippocras* without wine, cyder *hippocras*, &c.

That directed in our late college dispensatory, is to be made of cloves, ginger, cinnamon, and nutmegs, beat, infused in canary, with figar; to the infusion, milk, a lemon, and some slips of rosemary are to be put, and the whole strained through a flannel. It is recommended as a cordial, and as good in paralytic, and all nervous cases.

HIPPOCRATES'S Sleeve, *Manica Hippocratica*, a kind of filter, or straining-bag, formed by joining the opposite angles of a square piece of flannel, in form of a pyramid; and used to percolate, or strain syrups, decoctions, &c. for clarification.

HIPPOCRATICA Facies. See **FACIES Hippocratica**.

HIPPODROME*, **HIPPODROMUS**, in antiquity, a list, or course, wherein horse-races are performed; and horses exercised.

* The word is Greek, *ἵπποδρομος*, composed of *ἵππος*, equus, horse, and *δρομος*, cursus, of the verb *δρομαι*, curro, I run.

HIPPOLAPATHUM, in natural history, a species of lapathum, called also *monk's rhubarb*.

HIPPOMANES*, a sort of poison, famous among the ancients as an ingredient in amorous philters, or charms.

* The word is Greek, *ἵππομανης*, compounded of *ἵππος*, equus, horse, and *μανια*, furor, fury, madness.

Naturalists are not agreed about the nature of the *hippomanes*.

—Pliny describes it as a blackish caruncle, found on the head of a new born colt; which the dam bites off, and eats, as soon as she is delivered. He adds, that if she be prevented herein by any other's cutting it off before, she will not take to, nor bring up, the young.

Virgil, and after him Servius and Columella, describe it as a poisonous matter, trickling from the pudendum of a mare, when proud, or longing for the horse.

At the end of M. Bayle's Dictionary is a very learned dissertation on the *hippomanes*; and all its virtues, both real, and pretended.

HIPPOPEDES*, or **HIPPOPEDES**, in the ancient geography, an appellation given to certain people, situated on the banks of the Scythian sea; as being supposed to have horse's feet.

* The word is Greek, composed of *ἵππος*, horse, and *πέδιον*, pes, foot.

HIS

The *hippopedes* are mentioned by Dionysius, *Geogr. v. 310.* Mela, *L. III. c. 6.* Pliny, *L. IV. c. 13.* and S. Augustin, *De Civit. L. XVI. c. 8.*—But the truth is, that they had this appellation given them on account of their swiftness, or lightness of foot.

HIPPUS*, in medicine, a disorder of the eyes, wherein they continually shake, and tremble; and thus represent objects as if continually fluctuating.

* It is thus called from the Greek, *ἵππος*, horse; in regard according to Blancard, objects appear to fluit in it, as much as when we are riding.

HIRCUS*, *Tragus*, or *Goat*, in anatomy, a part of the auricle, or outer ear; being that eminence next the temples. See **EAR**.

* The word is Latin, and literally signifies *goat*.

HIRCUS, in astronomy, a fixed star of the first magnitude, the same with *capella*. See **CAPELLA**.

HIRCUS is also a denomination given to the rank smell exhaling from the arm-pits; and which has its source in the axillary glands.

HIRCUS, is also used by some writers for a comet, encompassed as it were with a main, seemingly rough and hairy. See **COMET**.

HISSING, an appellation given by grammarians to the three consonants, *s*, *x*, and *z*. See **S**, **X**, and **Z**.

HISTIODROMIA*, the art of sailing, or of conducting vessels on the sea.

* The word is Greek, composed of *ἵστος*, sail, of *ἵσται*, the mast of a ship, which comes from *ἵσταν*, *sto*, I stand; and *δρομος*, cursus, of *δρομαι*, I run.

Histiiodromia is the same with what we otherwise call *navigation*.

Histiiodromia turns on four points, any two whereof being given, the other two are easily found from them, by the loxodromic tables, sines, tangents, secants, mercator's chart, &c. These four things are, the difference of latitude, difference of longitude, the course, and the distance run.

HISTORICAL, something that relates to history. See **HISTORY**.

Thus we say, *historical truth*, *historical style*, &c.

The donation of Constantine, the reality of a pope Joan, &c. are *historical points*, very much controverted.

Henry Stevens has published a *historical* and poetical dictionary, since improved and augmented by Lloyd, Morery, Hoffman, &c. Mr. Bayle has given us an *historical* and critical dictionary: Diodorus Siculus, Vignier, and bishop Nicholson, *historical libraries*.

The *historical art* consists chiefly in the arranging and disposing the various incidents, so as to constitute one uniform, well connected whole. *F. Daniel*.

The principal qualities of the *historical style*, are perspicuity and brevity.

HISTORICAL Column, is that whose shaft is adorned with basso-relievo's carved all around from bottom to top, representing the history and actions of some illustrious person.

In *historical column*, the figures may be either disposed in a spiral line, continued from one end to the other; as in the Trajan column at Rome: or in distinct bands, or circles, containing so many different subjects.

HISTORIOGRAPHER*, a professed historian, or writer of history; or a person who applies himself peculiarly thereto.

* The word is composed of the Greek, *ἱστορια*, history, and *γραφω*, scribo, I write.

The term is chiefly used for a person who has a peculiar charge and commission to write the history of his time.—The *historiographer* to his majesty, is an officer under the lord chamberlain: his salary 200 *l. per ann.*

HISTORY*, a recital, or description of things as they are, or have been; in a continued, orderly narration of the principal facts, and circumstances thereof. See **ANNALS**.

* The word is Greek, *ἱστορια*, *historia*, and literally denotes a search of curious things, or a desire of knowing, or even a rehearsal of things we have seen; being formed of the verb *ἵσταν*, which properly signifies to know a thing by having seen it. Though the idea appropriated to the term *history*, is now much more extensive; and we apply it to a narration of divers memorable things, even though the relator only takes them from the report of others. The origin of the word is from the verb *ἵσταν*, I know; and hence it is, that among the ancients several of their great men were called *polyhistores*, q. d. persons of various, and general knowledge.

History is divided, with regard to its subject, into the *history of nature*, and the *history of actions*.

HISTORY of Nature, or **Natural HISTORY**, is a description of natural bodies; whether terrestrial, as animals, vegetables, fossils, fire, water, air, meteors, &c. or celestial, as the stars, planets, comets, &c.

Such are Aristotle's, Dioscorides's, Aldrovandus's, &c. *histories*: such also are Ray's and Gelfer's *history* of quadrupeds; Willughby's *histories* of birds, fishes, &c. Such, lastly, are

Mr. Flainthead's *Historia celestis*, or *history* of the heavenly bodies.

Natural history is much the same with what we otherwise call *physiology*.

HISTORY, with regard to actions, is a continued relation of a series of memorable events, in the affairs, either of a single person, a nation, or several persons and nations; and whether included in a great, or little space of time.

Thus, Thucydides has wrote the *history* of Greece; Livy, that of Rome; Mezeray, and F. Daniel, of France; Tyrrel, and Echard, the *history* of England; Buchanan, of Scotland; Clarendon, the *history* of the rebellion; and Thuanus, bishop Burnet, &c. the *history* of their own lives and times.

Eusebius, Baronius, &c. have wrote the *history* of the church; bishop Burnet that of the Reformation, &c.

Several authors have wrote on the method of reading, and studying *history*; among the rest Lucian, Bodin, Vossius the elder, Whear, Patrici, Beni, Mascardi, De Silhon, F. le Moine, F. Rapin, the abbot de S. Real, F. Thomassin, Fresnoy, &c.

History is divided into *antient* and *modern*, *universal* and *particular*, *sacred* and *profane*.

F. Menestrier gives us the proper characters of the divers kinds of *history*, with great accuracy.—He distinguishes *history*, with regard to both its matter, and its form; and gives curious instances of each particular.

History, with regard to its matter, is either *sacred*, or *natural*, or *civil*, or *personal*, or *singular*.

SACRED HISTORY, is that which lays before us the mysteries and ceremonies of religion, visions or appearances of the Deity, &c. miracles, and other supernatural things, whereof God alone is the author.—Such are the book of Genesis, the Gospels, Apocalyptic, &c. See **MIRACLE**, **PROPHECY**, **REVELATION**, &c.

NATURAL HISTORY, is a description of the singularities of nature; its irregularities and prodigies; and the alterations it undergoes in the birth, progress, end, and use of things.—Such is Aristotle's *history* of animals; Theophrastus's *history* of plants; and the entire body of *natural history*, by Pliny: Such also are Acosta's *natural history* of the Indies; Plott's *history* of Staffordshire, &c.

CIVIL HISTORY, is that of people, states, republics, communities, cities, &c.—Such are those of Thucydides, Halicarnassus, Livy, Polybius, Mezeray, F. Daniel, Milton, Buchanan, &c.

PERSONAL HISTORY, is that which gives the portrait, or life of some single person.—Such are the Lives of Plutarch, Cornelius Nepos, Suetonius, &c. And the lives of the painters, poets, philosophers, saints, &c.

Personal history, is the same with what we otherwise call *biography*. See **BIOGRAPHY**.

SINGULAR HISTORY, is that which describes a single action, siege, battle, or even a war, or expedition, &c. *History*, with regard to its form, is either *simple*, or *figurate*, or *mixed*.

SIMPLE HISTORY, is that delivered without any art of foreign ornament; being only a naked, and faithful recital of things, just in the manner, and order wherein they passed.—Such are the chronicles of the eastern empire; the fasti; chronological tables, journals, &c.

FIGURATE HISTORY, is that which is further enriched with ornaments, by the wit, ingenuity, and address of the historian.—Such are the political, and moral *histories* of the Greeks, Romans, and most of the moderns.

This latter is a kind of *rational history*; which, without stopping at the shell or outside, the appearances of things, discovers the secret springs and movements of the several events; it enters into the thoughts, the breaths of the persons concerned therein; discovers their intentions and views; and by the result of enterprises, and undertakings, discovers the prudence or weakness, wherewith they were laid, conducted, &c.

These are much the most useful, and entertaining *histories*.

—To this class, may be peculiarly referred the *histories* and Annals of Tacitus, among the antients; and those of Guiccardin, Thuanus, and bishop Burnet, among the moderns.

MIXED HISTORY, is that which, beside the ornaments of figured *history*, calls in the proofs and authorities of simple *history*, furnishing authentic memoirs, or original letters, manifestos, declarations, &c. to vouch the truth of what is said.—Such are the *histories*, or collections of Rushworth; M. Rapin, Thoyras's *history* of England; the genealogical *histories* of Duchesne; M. de Marca's *history* of Bearn, &c.

HISTORY, is also used for a romance; or a fabulous, but probable relation, of a series of actions, or adventures feigned, or invented by the writer. See **ROMANCE**.

Such is the *history* of the civil wars of Granada; the *history* of Don Quixote; the Ethiopic *history* of Heliodorus, &c.

HISTORY, in painting, denotes a picture composed of divers figures, or persons, representing some transaction, or piece of *history*, either real or feigned.

Painters are distinguished into portrait painters, flower and fruit painters, painters of beasts and land-scapes, and *history* painters.—The first place is universally allowed to *history*

painters, as the most difficult, masterly, and sublime province. **HISTRIO**, in the antient drama, signified an actor, or comedian; but more especially a pantomime, who exhibited his part by gestures, and dancing.

HOAR-FROST, *Pruina*. See **FROST**.

HOARSENESS, *Raucedo*, a diminution of the voice; sometimes attended with a preternatural asperity, or roughness thereof.

The part here affected is the aspera arteria, and particularly its head, or the larynx. See **ASPERA**, and **LARYNX**.

The proximate cause of *hoarseness* is a too copious effusion of thin lymph upon the part.

Hoarseness is a sort of catarrhus indispotion, arising from a too great acrimony or saltiness of the lymph.

Sperma ceti, decoct. rapar. & rob. paffular. are approved remedies herein.—Where the disorder is inveterate, incidents and expectorants are frequently of service.

HOBBY, a sort of hawk that preys upon small game, as pigeons, larks, &c. See **HAWK**.

HOBITS, a sort of small mortars, from six to eight inches diameter, mounted on carriages, made after the gun fashion; used for annoying the enemy at a distance with small bombs.

HOBLERS, or **HOBLERS**, **HOBELARI**, in our antient customs, were men, who by their tenure, were obliged to maintain a light horse, or hobby, for the certifying any invasion towards the sea-side.

The name was also used for certain Irish knights, who used to serve as light horsemen upon hobbies.

HOCK-TUESDAY MONEY. See the article **HOCK-DAY**.

HOD, a sort of tray for carrying mortar; in use among bricklayers.

HODEGOS, a term purely Greek, *ἡδύγος*, signifying *guide*. The word is chiefly used as the title of a book compiled by Anastasius the Sinite, towards the close of the sixth century; being a method of disputing against the heretics, particularly the Acephali.

Mr. Toland has also published a dissertation under the same title. Its subject is the pillar of fire, &c. which went before the Israelites, as a guide in the desert.

HODGE-PODGE. See the article **HΟΤΧ-ΡΟΤ**.

HODMAN, a young scholar admitted from Westminster school to be student in Christ's College in Oxford.

HOE, or **HOW**, a Husbandman's tool, made like a cooper's adz, to cut up weeds in gardens, fields, &c.

This instrument is of great use, and ought to be much more employed than it is, in hacking and clearing the several corners, creeks, and patches of land, in spare times of the year, which would be no small advantage thereto. See **Supplement: article HOING**.

HOG STEER, among hunters, a wild boar of three years old, See **HUNTING**.

HOGGET, or **HOGREL**, is a young boar of the second year.

HOGENHINE, **HOGHENHEYNE**, or rather **AGENHINE**, *q. d. own servant*; he that comes guestwise to an inn, or house, and lies there the third night: for thus he was accounted of that family; and if he offended the king's peace, his host was answerable for him. See **THIRD NIGHT OWN BIND**.

HOGUE, properly, **HAUT-GOUT**, a mess in cookery, fo denominated from its high favour, or relish.

Its preparations, ingredients, &c. are various.—Its basis is usually some flesh, *e. g.* leg of mutton, minced with suet, and favoury herbs, as shallot, thyme, spinage, &c. added thereto, with seasoning of salt and pepper, and yolks of eggs: the whole worked up into a ball, and thus hoiled; frequently, in the body of a cabbage, first fashioned like a duck, or other fowl, with a head stuck on.—It remains to be served up with a proper sauce, as butter, yolks of eggs, anchovies, &c.

HOGSHEAD, a measure, or vessel of wine, or oil; containing the fourth part of a tun; or 63 gallons.

Two of these *hogheads* make a pipe or butt.

The distillers weigh their vessels when full, and for a *hog-head* allow four hundred weight, two quarters, and twenty two pound, cask and liquor.

HOKEDAY, **HOCK-DAY** or **HOCK-TUESDAY**, in our antient customs, (*Dies mortis quem quindenam pasche vocant*) the second tuesday after Easter week.

This day was very remarkable in former times, inasmuch as to be used on the same footing with Michaelmas, for a general term or time of account.—We find leases without date referring so much rent payable *ad duas anni terminos, scil. ad le hoke-day, & ad festum sancti Michaelis*. See the article **QUARTER**.

In the accounts of Magdalen college, Oxford, there is yearly an allowance, *pro mulieribus hockantibus*, of some manors of an allowance, where the men *hock* the women on Monday

days, and the women hock them on Tuesdays.—The meaning of it is, that on that day the women in meritment stoyd the ways with ropes, and pull'd passengers to them, desiring something to be laid out in pious uses.

HOKÉ-DAY Money, or **HOKÉ-TUESDAY Money**, a tribute antiently paid the landlord, for giving his tenants and bondmen leave to celebrate *hoké-day*, or *hoké-day*; in memory of the expulsion of the domineering Danes.

HOLD of a Ship, the lowest part of the ship; including all that part lying between the keelson and the lower-deck.—See *Tab. Ship, fig. 2. lit. G. fig. 2. n. 116.*

In the hold are the steward's room, the powder room, the bread room, and the boatwain's room; divided from each other by bulk-heads.

The hold is the store room in a merchant ship, or the place wherein the goods, at least all the heavier and more cumbersome, are stowed. The rest are disposed between the two decks; at least in Dutch ships, which have their holds very shallow, and the space between the decks, very high.

To find the burden of a ship, the hold is to be measured.

HOLD-FAST, an iron hook in shape of the letter S, fixed in a wall to retain and support it.

HOLLAND, in the linnen drapery, a fine, white, even, close kind of linnen cloth, chiefly used for shirts, sheets, &c.

It is principally wrought in the provinces of Holland, Friesland, and other parts of the united provinces; whence the appellation.

The principal mart or staple of this cloth is at Haerlem, whither it is sent from most other parts as soon as wove, there to be whitened in the ensuing spring.

That manufactured in Friesland is the most esteemed, and called *frize holland*. It is the strongest, and the best coloured of any of that fineness.—It is never calendered, nor thickened as the rest; but is imported just as it comes from the whittier.—It is distinguished by its being yard, quarter and half wide; which is half a quarter more than those commonly called *frize holland*s, which are not right.

Gulix HOLLAND is very white and fine, and is chiefly used for shirts; being the strongest of any for its fineness, except true frize. It is just yard wide.

Almacor HOLLAND, is a very strong cloth, and wears exceedingly well. It is about yard, quarter and half wide.

HOLLOW, in architecture, a concave moulding, about a quadrant of a circle; by some called a *casement*; by others an *obscure*. See **CASEMENT**.

HOLLOW Square, is a body of foot drawn up with an empty space in the middle, for the colours, drums, and baggage; facing, and covered by the pikes every way to oppose the horse.

HOLLOW Tower, in fortification, is a rounding made of the remainder of two breaches, to join the curtain to the orillon: where the small shot are played, that they may not be so much exposed to the view of the enemy. *Harris*.

HOLM *, **HULMUS**, signifies as much as *insula amica*, a river-island, according to Bede; or a plain grassy ground upon the water-side, or in the water, according to Camden.

* Where any place is called by the name *holm*, or where this syllable is joined with any other in the name of a place, it signifies it to be surrounded with waters.—As the *statbolmes*, the *step-bolmes*, near Bristol.—If the situation of the place be not near the water, it may signify a hilly place; for *holm*, in Saxon, does also signify *a hill*, or *cliff*.

HOLOCAUST *, a kind of sacrifice, wherein the whole offering is burnt, or consumed by fire; called also, in scripture, a *burnt-offering*. See **SACRIFICE**, and **OBULATION**.

* The word is Greek, ὁλοκαυτω, formed from ὅλος, totus, whole; and καίω, urō, igne absumo, I consume with fire.

HOLOGRAPHUM *, in the civil law, something written wholly in the hand-writing of the person who signs it.

* The word is Greek, composed of ὅλος, all, and γραφή, I write.

The word is chiefly used in speaking of a testament, written wholly in the testator's own hand. See **TESTAMENT**.

The Romans did not approve of *holographic* testaments; and though Valentinian authorized them by a novel, they are not used where the civil law is in full force.

HOLMETER *, a mathematical instrument, serving universally for the taking of all sorts of measures, both on the earth, and in the heavens.

* The word is Greek, composed of ὅλος, all, and μέτρον, I measure.

The *holometer* is the same with what is otherwise denominated *pantometer*.

HOLSOM.—A ship is said to be *holsom* at sea, when she will hull, try, and ride well, without rolling or labouring.

HOLYNNESS, or **HOLINESS**, sanctity; the quality which constitutes or denominates a person, or thing *holy*; i. e. pure, or exempt of sin.

HOLYNNESS is also used in respect of persons and things that are sacred, i. e. set apart to the service of God, and the uses of religion.

In this sense we say, *holy days*, *holy ordinances*, the *holy Bible*, *holy gospels*, *holy war*, &c.—The Roman catholics call the Inquisition, the *holy tribunal*; the see of Rome, the *holy see*, &c.

Holy oil, *holy water*, &c. See **UNCTION**, **WATER**, &c.

Palestine is particularly called the *holy land*, and Jerusalem the *holy city*.—Princes formerly made a practice of going to signify their religion, in the *holy land*; who, if they had any real religion, would have staid at home. See **CROISADE**.

In Romish countries, one third part of the year is taken up in *holy days*, *saints days*, &c. In Scotland, they observe no stated *holy days*, besides Sundays.

HOLY Thursday, is what we otherwise call *ascension day*; being ten days before Whitunday. See **ASCENSION**.

HOLY Week, is the last week of Lent, called also *passion week*.

HOLY Year, is sometimes used for the year of Jubilee. See **JUBILEE**.

In the Jewish tabernacle, and afterwards in the temple, there were two places; the one called the *holy*, *sanctum*; and the other, which was more retired, the *holy of holies*, *sanctum sanctorum*, or the sanctuary.

The *holy* was separated from the *holy of holies* by a veil.—In this latter place was the ark of the covenant kept. See **SANCTUM SANCTORUM**.

HOLYNNESS is also a title or quality attributed to the pope; as that of majesty is to kings.

Even kings, writing to the pope, address him under the venerable appellation of your *holyness*, or *holy father*; in Latin, *sanctissime*, or *beatissime pater*. See **POPE**.

Antiently the same title, *holyness*, was given to all bishops; as appears in S. Augustin, Fortunatus, Nicholas I. Caffiodore, &c.—S. Gregory compliments some of his contemporary bishops with, your beatitude, and your *holyness*.

The Greek emperors of Constantinople were also addressed under the title of *holyness*, in regard of their being anointed with *holy oil* at their coronation.—Du Cange adds, that some of the kings of England have had the same attribute; and that the Orientals have frequently refused it to the pope.

Order of the HOLY GHOST, is a military order in France, the principal, in point of dignity, in that kingdom.

It was instituted by king Henry III. in 1569, in memory of three great events happening on the same day, viz. his birth, accession to the crown of France, and election to that of Poland; the order is to consist of 100 knights only; who, to be admitted, are to make proof of their nobility for three descents.

The king is the grand master or sovereign, and takes the oath as such on his coronation day; whereby he solemnly vows to maintain for ever the order of the *holy Ghost*, and not to suffer it to shrink, fall, or diminish, so long as it is in his power to hinder it; nor ever to attempt to alter or dispense with any of the irrevocable statutes of the order.

The knights are all to wear a gold cross, hung about the neck by a blue silk ribbon or collar; and the officers and commanders are also to wear a cross sewed on the left side of their cloaks, robes, and other upper garments.

Before they receive the order of the *holy Ghost*, that of S. Michael is conferred, as a necessary step; for which reason their arms are always surrounded with a double collar.

HOLY GHOST, in heraldry.—*Cross of the HOLY GHOST*, consists of a circle in the middle of a cross, and on it the *holy Ghost* in figure of a dove: the four arms are drawn narrow from the centre, and widening to the ends, where the returning lines divide each of them into two sharp points, upon each of which is a pearl.

From the intervals of the circle between the arms, issue four flower-de-luces.—This is the cross worn by the knights of the order of the *holy Ghost* in France.

HOLY-Rood Day, a festival observed by the Roman catholics, in memory of the exaltation of our Saviour's cross. See **EXALTATION of the cross**.

HOLY-WATER Sprinkle, among hunters, signifies the tail of a fox. See **TAIL**.

HOMAGE *, in its general sense, denotes the reverence, respect, and submission which a person yields his master, lord, prince, or other superior.

* The word is formed of the Latin, *homo*, man; by reason when the tenant takes this oath, he says, *Ego devenio homo vester*, I become your man: for the same reason, *homage* is also called *manhood*: so, the *homage* of his tenant, and the manhood of his tenant, is all one. *Coke on Littl. fol. 64.*

HOMAGE, **HOMAGIUM**, **HOMINIUM**, in law, is an engagement or promise of fidelity, which the vassal or tenant who holds a fee, renders to the lord when admitted thereto. See **FREE**, **VASSAL**, **LORD**, &c.

In the original grants of lands and tenements by way of fee, the lord did not only tie his tenants in certain services; but also took a submission, with promise and oath to be true and loyal to him as their lord and benefactor.

This submission, &c. is called *homage*, the form whereof, as appointed by stat. 17 Edward II. is in these words: When a free-man shall do *homage* to his lord, of whom he holdeth

in chief, he shall hold his hands together between the hands of his lord, and shall say thus: 'I become your man from this day forth for my life, for member, and for worldly honour; and shall owe you my faith for the land I hold of you; saving the faith that I owe unto our sovereign lord the king, and to mine other lords.'

In this manner the lord of the fee, for which *homage* is due, takes *homage* of every tenant as he comes to the land or fee. Glanvil, indeed, excepts women; who only perform *homage* by their husbands; in regard *homage* is supposed to have a more immediate relation to service in war; but Fitzherbert denies this exception. *Nat. Brev.* fol. 157.

It is added, that bishops do no *homage*, but only fealty, and, probably, for the same reason as women. Yet do we read, that the archbishop of Canterbury does *homage* on his knees to our kings at their coronation; and that the bishop of Man is *homager* to the earl of Derby.

Fulbeck reconciles this: By our law, says he, a religious man may do *homage*; but may not say to the lord, *Ego devotio homo vestri*; because he has already professed himself to be only God's man; but he may say to him, 'I do unto you *homage*, and to you shall be faithful and loyal.'

Homage and fealty, or faith, are two distinct things, and different duties.

Originally, *homage* was performed by the gentleman, and fealty by the peasant. Others say, that *homage* was that performed to the lord himself; and fealty to his seneschal or steward, for his lord.—It is added, that he who holds lauds for term of life, owes *homage*, but not fealty.

Bishops take the oath of fealty and loyalty to the king for the temporalities they hold of him; but without *homage* or vassalage.

HOMAGE-LIEGE, a more extensive kind of *homage*, whereby the vassal held of the lord, not only for his land, but for his person.—So that the lord might use him against all mankind, whether within or without the kingdom, excepting against the king.

This kind of *homage* was rendered bare-headed, with the hands joined on the gospels, one knee on the ground, and without sword, girdle, or spurs.—By which it was distinguished from *frank homage*.

There are also other distinctions of *homage*; as, **Plain HOMAGE**, or *homage* of a fee, where no oath of fidelity is taken.

HOMAGE of Devotion, which is a donation made to the church, and does not import any duty or service at all.

HOMAGE of Peace, which a person makes to another after a reconciliation, as an assurance that he will no longer disturb his peace, &c.

HOMAGE, again, is divided into *new*, or that performed upon the grant of the fee; and *ancestral*.

HOMAGE Ancestral, is where a man, and his ancestors, time out of mind, have held their land of the lord and his ancestors by *homage*.

If such lord have received *homage*, he is bound to acquit the tenant against all other lords above him, of every manner of service; and if the tenant has done *homage* to his lord, and is impleaded, and vouches the lord to warranty, the lord is bound to warrant him; and if the tenant lose, he shall recover in value against the lord, so much of the lands as he had at the time of the voucher, or any time after.

HOMAGE is also used for the jury in a court-baron; because commonly consisting of such as pay *homage* to the lord of the fee. See **JURY**, and **COURT-BARON**.

HOMAGE is also taken, in some cases, for the particular place or district where the services are to be performed.

HOMAGER, a person that does, or is bound to do, *homage* to another. See **HOMAGE**.

This lordship is so extensive, that there are above an hundred and twenty tenants or *homagers* therein.

HOMAGIO respectuando, a writ issued out to the escheator, commanding him to deliver seisin of lands to the heir that is at full age, notwithstanding his *homage* not being done.

HOMESOKEN*, or rather **HAMSOKEN**, sometimes also written **HAMSACA**, and **HAMSOCNA**, the privilege or protection which every man enjoys in his own house.

* *Hamsoken, hoc est quietus esse de amerciamenti pro ingressu hospitii avicenter & sine licentia contra pacem regis, & quod te noverit placita de hujusmodi transgressione in curia vestra.* W. Thorn, 2030.

Hence, he who invades that freedom, is properly said, *frangere hamsocam*, or *hamsocnam*.

This crime seems to amount to what we now call *burglary*, which is a crime of a heinous nature, as being not only a breach of the king's peace, but a breach of that liberty which a man hath in his house, which, as we commonly say, should be his castle, and therefore ought not to be invaded. *Bracton*, lib. III. See **BURGLARY**.

HOME-STALL, a mansion-house, or seat in the country. *Rust.*

HOMER, or **GOMOR**, a Jewish measure, containing the tenth part of the epha. See **EPHA**.

HOMICIDE, in common law, the killing of a man.

Homicide is divided into *voluntary* and *casual*. **Casual HOMICIDE**, is either *merely casual*, or *mixed*.—*Merely casual*, is when a person kills another by pure mischance, being about his lawful occasions; as in the case of an ax slipping out of a man's hand, or falling off the helve while he is felling a tree.

It is accounted *mixed*, when there is negligence, or some other unwarrantable circumstance attending the action. See **MANSLAUGHTER**.

Voluntary HOMICIDE, is that which is deliberate, and committed with a set purpose, and mind to kill; and is either with a precedent malice, or without.—The former is murder, which is a felonious killing, with malice prepense, any person in the realm, living under the king's protection. See **MURDER**.

HOMILY*, originally signifies a conference or conversation; but the word has since been applied to an exhortation, or sermon delivered to the people.

* The word is Greek, *ὁμιλία*; formed of *ὁμιλος*, *catus*, affably, council.

The Greek *homilia*, says M. Fleury, signifies a familiar discourse; like the Latin *sermo*: and discourses delivered in the church took these denominations, to intimate that they were not harangues, or matters of ostentation and flourish, like those of profane orators; but familiar and useful discourses, as of a master to his disciples, or a father to his children.

All the *homilies* of the Greek and Latin fathers are composed by bishops.—We have none of Tertullian, Clemens Alexandrinus, and many other learned persons; by reason, in the first ages, none but bishops were admitted to preach.

The privilege was not ordinarily allowed to priests, till toward the fifth century.—S. Chryostom was the first presbyter that preached stately: Origen and S. Augustin also preached, but it was by a peculiar licence or privilege.

Photius distinguishes *homily* from sermon; in that the *homily* was performed in a more familiar manner; the prelate interrogating and talking to the people; and they, in their turn, answering and interrogating him: so that it was properly a conversation; whereas the sermon was delivered with more form, and in the pulpit, after the manner of the orators.

There are several fine *homilies* of the fathers still extant; and particularly of S. Chryostom, St. Gregory, &c.

HOMINE capti in withernamium, a writ for apprehending him that has taken any bondman or woman, and led him or her out of the country; so that he or she cannot be relieved according to law. See **WITHERNAM**.

HOMINE replegiando, a writ for the bailing of a man out of prison. See **BAIL**.

HOMINICOLÆ*, in antiquity, a name which the Apollinarists gave to the orthodox, to denote them worshippers of man. See **APOLLINARISTS**.

* The word is formed of the Latin, *homo*, *hominis*, man, and *cola*, I worship.

As the orthodox maintained that Jesus Christ was God-man; the Apollinarists accused them of adoring a man, and therefore called them *hominicole*.

HOMOGENERIC*, in astronomy, a term of the same import with *concentric*. See **CONCENTRIC**.

* The word is Greek, composed of *ὁμος*, alike, similar, and *κεντρον*, centre.

The hypothesis of Ptolemy is explained by means of divers *homocentric* and *excentric* circles.

HOMOEOPOTON, ὁμοιοπότητον, a figure in rhetoric, whereby several nouns end in like cases: e. g. *maerentes, flentes, lacrymantes, & miserantes*.

HOMOEOTELEUTON, ὁμοιοτελευτόν, a figure in rhetoric, whereby several verbs in a sentence are made to end alike: as, *eos deduci, evubi quam desiri malui*.—Or, *ut civis invidiosus, delinquis studiosus, laqueris odioso*.

HOMOGENEOUS*, ὁμογενής, or **HOMOGENEAL**, is a term applied to various subjects, to denote, that they consist of similar parts, or of parts of the same nature and kind.—In contradistinction to *heterogeneous*, where the parts are of different natures, &c.

* The word is composed of the Greek, *ὁμος*, like, similar, and *γενος*, genus, kind.

Natural bodies, for the generality, are composed of *homogeneous* parts; as a diamond, a metal, &c.—Artificial bodies, on the contrary, are assemblages of heterogeneous parts, or parts of different qualities; as a building, of stone, wood, &c.

HOMOGENEAL Light, is that whose rays are all of one and the same colour, degree of refrangibility, and reflexivity. See **LIGHT**.

HOMOGENEAL Numbers, are those of the same kind and nature.

HOMOGENEAL Surds, are such as have one common radical sign; as $\sqrt[3]{27}$, and $\sqrt[3]{3}$. See **SURD**.

HOMOGENEUM Comparationis, in algebra, the known quantity

quantity in an equation; called also *absolute number*. See EQUATION.

It is called *homogeneous comparison*, of *comparison*, to distinguish it from the other terms; which, though *homogeneous* as well as this, *i. e.* always raised to the same degree of power, are not the quantities to which things are here compared or referred.

HOMOIOMERICAL Principles, a peculiar kind of principles, supposed by Anaxagoras to be in mixed bodies; being determinate numbers of such similar principles, as, when they came to be parts, *e. g.* of an animal body, would there make such masses and combinations as their nature required, *viz.* the sanguinary particles would then meet all together and make blood, the urinous particles constitute urine, the officious ones bones, the carnosous flesh, &c. See PRINCIPLE.

HOMOLOGATION*, in the civil law, the act of confirming or rendering a thing more valid and solemn, by a publication, repetition, or recognition thereof.

* The word comes from the Greek, *ὁμολογία*, consent, assent, *ὁμολογία*, similar, alike, and *λογος*, of *λογος*, *dicere*, to say, *q. d.* to say the same thing, to consent, agree.

The creditors have signed the contract; there remains nothing but to get it *homologated*.

HOMOLOGOUS*, in geometry, is applied to the corresponding sides of similar figures; which are said to be *homologous*, or in proportion to each other.

* The word is Greek, composed of *ὁμολογία*, similar, and *λογος*, ratio, reason, *q. d.* quantities alike to each other in ratio.—So if the ratio of A to B, be the same as of C to D; here A is *homologous* to C, as B to D; by reason of the similitude between the antecedents and consequents. The two antecedents, and the two consequents, then, in any continued geometrical proportion, are *homologous* terms.

Thus, the base of one triangle, is *homologous* to the base of another similar triangle: so, in similar triangles, the sides opposite to equal angles, are said to be *homologous*. Equiangular, or similar triangles, have their *homologous* sides proportional.

All similar rectangles are to each other, as the squares of their *homologous* sides.

HOMOLOGOUS Things, in logic, are such as agree in name, but are of different natures.—These coincide with what we otherwise call *equivocal* and *homonymous terms*.

HOMONYMIA, in logic, an equivocation. See HOMONYMON, &c.

HOMONYMON*, *ὁμωνυμον*, in logic, a word which has different meanings; or which is used to express things of different nature, and quality.

* The word is composed of *ὁμολογία*, similar, and the Ionic *ὁμωμα* for *ομοια*, name.

Homonymia are the same with what are otherwise called *polysemia*, *synonymia*, and *equivocalis*.

HOMOUSIOS, *ὁμοουσιος*, among divines, a being of the same substance, or essence with another.

The divinity of Christ having been denied by the Ebionites and Cerinthians in the first century: by the Theodotians in the second; by the Artemonians at the beginning of the third; and by the Samosatarians, or Paulians, towards the close of the same: A council was assembled at Antioch in 272, wherein Paulus Samosatenus, head of this last sect, and bishop of Antioch, was condemned and deposed; and a decree published wherein Christ is asserted to be God of God, and *ὁμοουσιος*, *i. e.* consubstantial with the Father.

HOMOUSIANS*, *ὁμοουσιαν*, **HOMOUSIANISTS**, *ὁμοουσιανισται*, are names which the Arians antiently gave to the orthodox; by reason they held that God the Son is *homousios*, *i. e.* consubstantial with the Father.

* The word is formed of the Greek, *ὁμοουσιος*, or *ὁμοουσιος*, signifying of the same substance.

Huneric, king of the Vandals, who was an Arian, published a rescript, directed to all the *homousian* bishops. See PERSON, &c.

HOMOPHAGI. See the article OMOPHAGI.

HOMUNCIONISTS*, *ὁμουνκιονισται*, a sect of heretics, the followers of Photinus; and from him also called *Photinians*. See PHOTINIANS.

* The word is formed of the Latin, *homuncio*, a diminutive of *homo*, man; *q. d.* little man.

They had this appellation in respect of their denying the two natures in Jesus Christ, and holding that he was only mere man.

HOMUNCIONITES, *ὁμουνκιονισται*, were a sect of antient heretics, whose distinguishing dogma it was, that the image of God was impressed on the body, not on the soul, or mind of man.

HOND-HABEND. See the article HAND-HABEND.

HONE, a fine sort of whet-stone, whereon to set a razor, or penknife.

It is of a yellowish colour, and is vulgarly, but erroneously, supposed to be holly-wood petrified or changed into stone, by lying in a petrifying water for a certain season.

Of these waters there are said to be some in Oxfordshire, that will thus petrify in a very short time. See Supplement: article PETRIFICATION.

HONEY, *Μελ*, a sweet sort of juice sucked from vegetables by the bees, and deposited in their combs.

Honey is properly one of the juices afforded by the flowers, and is found to exude from all sorts thereof; the very bitterest, as those of aloe and colocynth, not excepted.

In all those flowers that have utricles at the bottom of the petals, there is found a viscid, ruddy, sweet juice in good plenty; whence it is, that we see the children gather cowslips, foxgloves, *honey-suckles*, &c. and suck the honey from them.—

The bees also visit these flowers; and putting in their proboscides, or trunks, suck out the *honey* juice, and load their stomachs therewith; this is to be afterwards discharged and laid up in their combs:—So that *honey* is evidently a vegetable substance.

In the belly of the bee is a small transparent bladder, which is the proper receptacle of the *honey*: when the animal finds this full, it returns, enters one of the cells, and discharges it there by that part of the head situate between the two jaws, which it extends wider than ordinary, moving its head at the same time this way and that.—If a drop happen to be ill placed, it sucks it up again by its proboscis, and discharges it anew.—When a cell is filled with *honey*, they stop it up with wax for winter store.

Honey was antiently taken for a dew that fell or descended on the flowers; but what proves this a mistake, is, that the bees only gather it after the sun is up, when there is no dew left: it must therefore be a liquor prepared in the flower, and excreted by its proper vessel, like manna.

It has been supposed by many, but erroneously, to be the fire dust, or farina secundans of the apices.—According to the observations of M. du Vernay, the bees, when in search of their stores, fix on no other parts but the stamina and apices, and not on such as yield any other liquor: But it is in reality the wax not the honey, which they collect there.

What is very remarkable, is, that *honey*, in virtue of its vegetable nature, is discovered by M. Lemery to contain iron, which discovery may serve as an answer to M. Geoffroy's chemical question, *viz.* Whether there is any part of a plant without iron? For if so delicate an extract from the finest part of the flower, and this further elaborated in the little viscera of the insect, be not void of iron, we may despair of seeing any part so.

We have two kinds of *honey*, *white* and *yellow*.—The *white*, *mel album*, called also *virgin honey*, trickles out spontaneously from the comb, by turning it up, or breaking it.

The second kind, or *mel flavum*, is squeezed from the combs in a press, after having first softened them with a little water over the fire.—There is also an intermediate sort, of a yellowish white colour, drawn by expression, without fire.

Honey left to stand two or three days, purges itself; throwing up a scum of wax and other dross, which is to be taken off.

Some naturalists will have *honey* to be of a different quality, according to the difference of the flowers or plants the bees suck it from.—Accordingly, Strabo relates, that there is a kind of *honey* in Pontus, which is a strong poison; being procured by bees which feed upon aconite and hemlock.

F. Lamberti, in his account of Mingrelia, assures us of the contrary; and affirms it the best *honey* in the world, by reason of the great quantity of bawm growing there.—He adds, that there is another very white kind of *honey*, hard as sugar, and which does not stick to the hands.

The antients ranked sugar and manna among the species of *honey*.

Honey has considerable medicinal virtues; being reputed a good detergent and cleanser; and in that quality it is used both internally and externally, for the viscera, wounds, ulcers, &c. *Honey* is the basis of several compositions in pharmacy.—Of *honey*, with the addition of roses or violets, mercurialis, &c. is made *mel rosatum*, *mercuriale*, *belleboratum*, &c.

There is also a *mel scilliticum*, or a preparation of squills: *mel passulatum*, made with raisins boiled in hot water: and *mel anthosatum*, made with rosemary flowers.

The chemists also draw a water, a spirit, an oil, &c. from *honey*.

Honey is also an ingredient in several drinks, as mum, metheglin, &c. See MUM, and METHEGLIN. See Supplement: article MEL.

Wild HONEY.—S. Adaman, abbot of Hii, in his description of the holy places, observes, that in the place where S. John Baptist lived in the desert, there are locusts which the poor people boil with oil, and a sort of herbs with large long leaves of a milk colour, and a taste like that of *honey*; and that this is what in scripture is called *wild honey*. See ACRIDOPHAGI.

HONEY-COMB, a waxen structure, full of cells, framed by the bees to deposit their honey, eggs, &c. in. See CELL, WAX, HONEY, &c.

The great fragility and contrivance of the bees in making their combs, have often been admired.—The labour is distributed regularly among them; sometimes those bees that carry the wax in their jaws and chaps, moisten and mollify it with some liquor that they distil upon it; the same sometimes build the walls of their hexagonal cells; but sometimes others do it; but those that form the cells never polish them.—Others come and make the angles more exact, and close and smooth the superficies.—And as in the doing of this, some small bits of wax are scraped off, there are some whose business is to pick up these, that they may not be lost.

M. Maraldi has also observed, that those bees that polish the walls, work longer than those that build them; as if polishing were known to be not so laborious as building.

They begin their work at the top of the hive, fastening it to the most solid part thereof: thence it descends downwards, being continued from top to bottom, and from one side to another; and to make it the more solid, they use a sort of tempered wax that is pretty much like glue. The form of the cells of which the honey-comb is made, is hexagonal; a figure that, besides what is common with a square and equilateral triangle, has the advantage of including a greater space within the same surface. See Supplement: article COMB.

HONEY-COMB, in gunnery, is a flaw in the metal of a piece of ordnance, when it is ill cast, and spongy.

HONEY-DEW, is a sweet tasted dew, found early in the morning on the leaves of divers sorts of plants.

Honey-dews, are of a very different nature from blawings, being caused by the condensing of a fat moist exhalation, raised in a hot dry summer, from plants and blossoms; as also from the earth; which, by the coolness and serenity of the air in the night, or in the upper clear region of the air, is thickened into a fat gluey matter, and then falls to the earth again; part whereof rests upon oak leaves, and those of some other trees, whose leaves are smooth, and do not easily admit the moisture into them.

Gassendus holds, that a viscid juice transpiring out of the leaves, helps to compose this honey, or to convert the dew falling on them into a honey substance, which ore had nothing of it: And hence he accounts for the reason why we find it on some trees, and not on others.

This honey-dew falling on the ears and stalks of wheat, besmears them with a different colour from the natural; and being of a clammy substance, so binds up the young, tender and close ears of the wheat, by the heat of the sun, that it prevents the growth and completing of the perfect grain therein.

A shower of rain succeeding presently after the fall thereof, or the wind blowing stiffly, are the only natural remedies against it. See Supplement: article MILDEW.

HONI *soit qui mal y pense*, q. d. evil to him that thinks evil; the motto of the most noble order of the knights of the garter. See GARTER, and MOTTO.

HONOR.
HONORABLE. } See the article { **HONOUR.**
HONORARY. } **HONOURABLE.**
HONORARY. } **HONOURARY.**

HONORIANI, in antiquity, a species or order of soldiery under the eastern empire; who introduced the Goths, Vandals, Alani, Suevi, &c. into Spain.

Didymus and Verimianus, two brothers, had, with great vigilance and valour, defended the passages of the Pyreneans against the Barbarians for some time, at their own expence; but being at length killed, the emperor Constantius appointed the *honoriani* to defend those passages, who, not contented to lay them open to all the nations of the North then ravaging the Gauls, joined themselves to them.

HONOUR, **HONOR**.—Beside its literal sense, wherein it denotes a testimony, or token of esteem and submission; *honour* is particularly applied in our customs to the more noble kind of signories, or lordships; whereof other inferior lordships, or manors hold, or depend.

As a manor consists of several tenements, services, customs, &c. (See SERVICE, &c.) so an honour contains divers manors, knights-fees, &c.

It was also formerly called *beneficium* or *royal fee*; being always held of the king in capite. *Spelman*.—Antiently, *honour* signified the same as *baronia*.

By stat. 37 Hen. VIII. c. 18. the king is empowered by letters patent to erect four several honours, viz. Westminster, Kingston upon Hull, S. Olythe, and Donnington; and as many other honours as he will.—The manner of creating these honours, may be gathered from the stat. 33 Hen. VIII. cap. 37, &c.

Counsellors of HONOUR, or *honorary counsellors*, are such as have a right to enter or sit in assemblies, courts, &c. to deliberate or give judgment in the same, though they do not regularly and properly belong thereto.

The French call *chevaliers de HONNEUR*, knights or gentlemen of HONOUR, the gentlemen ushers of queens and

princesses, who attend them, give them their hand, &c. See USHER.

Maid of HONOUR, are young ladies in the queen's household, whose office is to attend the queen, when she goes abroad, &c. In England they are six in number, and their salary 300*l.* per annum each.

HONOURS of the Louvre, among the French, are certain privileges annexed to divers dignities or offices, particularly those of duke, peer, chancellor, &c. as to enter the Louvre in a coach; to have the tabouret or stool in the queen's presence, &c.

HONOURS of the House, are certain ceremonies observed in receiving visits, making entertainments, &c. performed either by the master himself, or by some person appointed for that purpose; as, to go and receive the guests, to conduct them out again, to see they be well seated, to help them to the choice hits, &c. And all this in a polite, agreeable manner.

HONOURS of the City, are the public offices or employments thereof.—He who has been constable, overseer of the poor, and churchwarden of his parish; common-council-man, alderman, and lastly mayor: has passed all the honours of the city.

HONOURS of the Church, are the rights belonging to the patron, &c. As a seat and sepulchre in the church, to be first served with the consecrated bread and wine, &c.

HONOURS are also applied to the principal parts of the apparatus of great ceremonies; as coronations, consecrations, christenings, &c. Such are the oil, tapers, &c.

Such lords or ladies bore the honours at such a ceremony.

In obsequies, they antiently presented the honours, that is, the shield, crest, sword, gantlets, spurs, banner, horse, &c.

Funeral HONOURS, are the ceremonies performed at the interments of great men; as hangings, hearies, funeral harangues, &c.

HONOUR Courts, are courts held within the honours, or feignories abovementioned.

HONOUR Point, in heraldry, is that next above the centre of the escutcheon; dividing the upper part into two equal portions. See POINT, and ESCUTCHEON.

HONOURABLE Amends, *Amende honorable*. See the article AMENDS.

HONOURABLE, or **HONORABLE Ordinaries**, in heraldry, are the principal ordinaries or bearings, which, when in their full extent, may possess one third of the field.

Some only allow of nine, viz. the cross, chief, pale, bend, fesse, chevron, saltire, giron, and escutcheon; others add more, viz. the bar, bordure, &c. See each under its proper article, CROSS, CHIEF, PALE, &c.

HONOURARY, or **HONORARY**, is understood of a person who bears or possesses some quality or title, only for the name's sake, without doing any of the functions thereto belonging, or receiving any of the advantages thereof.

Thus we say, *honorary counsellors*. See *Counsellors of HONOUR*.

In the college of Physicians, London, are *honorary fellows*. The royal academy of sciences at Paris, consists of four classes of members, viz. *honorary*, pensionary, associates, and adjuncts. See ACADEMY.

Among these the *honorary* are to be twelve in number, and all inhabitants of the kingdom.

HONOURARY Services, are those incident to the tenure of grand serjeanty, and commonly annexed to honours.

HONOURARY Tutor, is a person of quality appointed to have an eye over the administration of the affairs of a minor; while the onerary tutors have the real effective management thereof.

HONOURARY, **HONORARIUM**, is also used substantively, for a lawyer's fee; or a salary given to public professors of any art or science.

HONT FONGENETHEF, a thief taken hond-habend, i. e. having the thing stolen in his hand.

HOOD. See CHAPERON, and CUCULLUS.

HOOP, in falconry, is a piece of leather, wherewith the head of a hawk, falcon, or the like, is covered.

After feeling or sewing up the eyelids of a young hawk, she is to be fitted with a large easy hood, which is to be taken off and put on very often, watching her two nights; and handling her frequently and gently about the head. When you perceive she has no aversion to the hood, unlace her in an evening by candle-light, continuing to handle, hood and unhood her, as before, till at last she takes no offence, but will patiently endure handling.

After unlacing, anoint with the finger and spittle the place where the feeling thread was drawn through; then hood her, and hold her on your fist.

As soon as she is well reclaimed, let her sit upon a perch; but every night keep her on the fist three or four hours, stroaking, hooding, and unhooding, &c. And thus you may do in the day-time, when she hath learned to feed eagerly, and without fear.

HOOF, *Ungula*, the horny part which covers the feet of divers animals, as horses, bullocks, &c.

The hoof serves much the same purposes as the nails of some animals, and the claws of others.

The *hoof* of a horse surrounds the sole, and the coffin bone.—To be good, it should be of a dark colour, somewhat shining, high, smooth, of a round shape, but a little larger below than above; short, that the horse may tread more on the toe than on the heel; and somewhat hollow within, having a narrow frush, and broad heels.

The *hoof* should not have circles, which are a sign of its being brittle, and that the horse having been shod, has had his feet spoiled by the many pieces broke out of it.—A white *hoof* also is commonly brittle.

To judge whether the *hoof* be good and stanch, lift up the foot, and consider if it have a shoe forged purposely for it, and be very much pierced, and the holes made in unusual parts, as wanting horn enough to take hold by in those places where the nails are commonly driven.

Sometimes they are forced to pierce the shoes nigh the heels, because the fore-part is bad; it being unusual to drive the nails near the heels, except the toe be so much split and broke as not to bear nails.

If the *hoof* be not round, but broad, and spreading out at the sides and quarters, the horse commonly has narrow heels, and, in time, will be flat-footed; which sort of foot is weak, and will not long carry a shoe, nor travel far, but forbate; add, that treading more on his heels than toes, will cause him to go low on his pasterns.

If the *hoof* be long, it will make him tread altogether on his heels.—If crooked, *viz.* broad without and narrow within, so that the horse is splay-footed, it will cause him to tread too much inward, and cut or interfere.—If the frush be broad, the heels will be weak and soft.—If the heel be narrow and tender, the horse will in time grow *hoof-bound*.

—The infirmities to which *hoofs* are liable, are, the casting of the *hoof*, *hoof-bound*, *hoof-hard*, *hoof-hurt*, loose *hoof*, false quarters, &c.

Casting of the Hoof.—A horse is said to cast his *hoof*, when the whole coffin of the *hoof* becomes loosened, and falls off from the bone.—This may be remedied by care and proper application; a new *hoof* being procurable, if the coffin bone, &c. be not hurt.

Horses sometimes cast their *hoofs* by reason of some prick, stub, foundering, furbating or other accident, that causes an impoisonment in the foot; so that the *hoof*, and sometimes the coffin bone, being fungy and easily broken, fall off in large pieces. The last when it happens is a desperate Case.

HOOF-BOUND, is a shrinking in of an horse's *hoof* on the top, and at the heel; which makes the skin stare above the *hoof*, and grow over the same.

It befalls an horse divers ways, either by keeping him too dry in the stable, by direct froeing, or by some unnatural heat after foundering.

HOOF-HURT.—In labouring beasts, especially oxen, if the *hoof* be hurt with a coulter or share, it may be cured by a salve of pitch and grease mixed with powder of brimstone, dissolved together, and with an hot iron melted in the cleft of the *hoof*.

HOOF-LOOSENED, is a dissolution or dividing of the horn or coffin of a horse's *hoof* from the flesh, at the setting on of the coronet.

If the parting be round about the coronet, it comes by means of foundering; if in part, then by a prick of some channel nail, quitter-bone, retreat, graveling, cloying, or the like.

The signs of being loosened by foundering, is its breaking first in the fore part of the coronet, right against the toes; because the humour always descends towards the toe.—If it proceeds from pricking, graveling or the like, the *hoof* will loosen round about equally, even at first.—If occasioned by a quitter-bone, or hurt on the coronet, it will break right above the grieved part, and rarely be seen to go any farther.

HOOF-SWELLED, is an infirmity that sometimes befalls young horses, when they are over-rid, or wrought hard, which makes them swell in that part, by reason of the blood falling down and settling there; which, if not speedily removed, will usually beget a wet spavin.

HOOK, in angling, &c. See FISHING-HOOK.

HOOKS, in building, &c. are of various sorts; some of iron, and others of brass, *viz.*

1^o. *Armour hooks*, which are generally of brass, and are to lay up arms upon, as guns, muskets, half pikes, pikes, javelins, &c. 2^o. *Cement hooks*. 3^o. *Chimney hooks*, which are made both of brass and iron, and of different fashions: their use is to set the tongs and fire-shovel against. 4^o. *Curtain-hooks*. 5^o. *Hooks for doors, gates*, &c. 6^o. *Double line hooks*, large and small. 7^o. *Stigle-line hooks*, large and small. 8^o. *Tenter hooks* of various sorts. See TENTER.

HOOK-PINS, in architecture, are taper iron pins, only with a *hook-head*, to pin the frame of a roof or floor together.

HOP, *Lupulus*, a plant of the reptile kind, whose flower is a principal ingredient in beer, and other malt-liquors. See BREWING.

The *hop* creeps like bind weed, unless it find pales or

shrubs to hang to; or unless they who cultivate it, plant poles for the purpose.—Its stem is long, flexible, rough, and hairy.—Its leaf is indented like that of the vine, and covered with a kind of prickly down like that of the cucumber. Its flowers are of a greenish yellow, resembling, both as to form and size, those of the female elm; and they grow in a kind of bunch or cluster. In this flower is a blackish bitter grain contained, which is the seed of the *hop*.

In the spring time, while the bud is yet tender, the tops of the plant being cut off, and boiled, are eat like asparagus; and found very wholesome and effectual to loosen the body; the heads and tendrils are good to purify the blood in the scurvy and most cutaneous diseases: decoctions of the flowers, and syrups thereof, are of use against pestilential fevers; and apozems are also prepared with *hops*; for hypochondriacal and hysterical affections, and to promote the mensis.

The propagation and culture of *hops*, being a point of some nicety, as well as great advantage, we shall lay down a little system thereof.—It is certain there is nothing in all the rural employments, that, under prudent management, turns to more account; very large estates having been raised by this commodity in a few years—Switzer tells us, he has known ground yield 30 l. per annum per acre, planted therewith: To say nothing of the great number of poor that are employed therein, *viz.* in the planting, sowing, digging, houghing, poles, tying, picking, &c.

Culture of Hops, and Hop Gardens.—*Hops* are of divers kinds: Mortimer reckons four, *viz.* the wild garlick *hop*, which is not worth propagating; the long and square garlick *hop*, which, though valuable, yet on account of the redness towards the stalk, do not bear the best price; the long white *hop*, which is the most beautiful and fertile; and the oval *hop*.—Another author distinguishes the *hops* to be cultivated into the white and grey kinds; the latter being a large square *hop*, more hard, and bearing a plentiful crop than the former; though it does not ripen so early.

For the soil of Hops.—There are scarce any but may serve, except stoney, rocky, and stiff clay ground: the best, however, is that which is light, deep, and rich; which will be the better if sand be mixed with it: a black garden mould is also excellent. If the ground be cold, stiff, and sour, the best means of improvement is to burn-beat it. Mortimer adds, that in Kent, where they esteem new land best for *hops*, they plant their *hop* gardens with cherry trees and apple trees, at a good distance; that when the land is past the best for *hops*, (which happens in about ten years) the cherry trees may begin to bear; and thirty years after, when the cherry trees are spent, the apple trees will be in perfection.

For the planting of Hops.—The ground is first to be prepared by tilling it the beginning of the winter, either with the plough or spade. In October, (and sometimes, though rarely, in March) they proceed to plant; marking out the places where each hillock or little plantation is to be. Some plant in squares, checker-wise, which is the most convenient form, where they intend, in the course of the tillage, to plough with horses between the hills: but the best form for the *hops*, as well as the most pleasing to the eye, is the quincunx. See QUINCUNX.

If the ground be poor, or stiff, it is necessary some good mould, or else a compost of manure and earth, be laid in holes a foot square, in the several places where the hills are to be.—The distance of the hills in dry hot ground may be six foot; but in moist and rich ground, subject to bear large *hops*, it should be eight or nine.

For planting, the largest sets are to be chosen, eight or ten inches long, having each three or four joints. These are to be set in holes, made for the purpose, one at each corner of a hole, and a fifth in the middle, raising the earth two or three inches about.

For the dressing of Hops.—If the *hop-ground* be old, and wore out of heart, they find it convenient to dig about the plants, toward the beginning of each winter, and take away a quantity of the old earth; its place is then to be supplied with what is fatter and fresher.—If the *hops* be in good heart, manuring and pruning is most advisable. In order to this, they pull down the hills, and undermine all about, till they come near the principal roots. This done, taking off the earth from the roots, they find by the colour, &c. which are new shoots, and which old ones; and cut off all the new ones.—When the roots are thus dressed, the new mould or manure is to be applied.

For the poles.—The time is when the *hops* begin to appear above ground: the number and dimensions of the poles is to be adjusted to the distance of the hills, the nature of the soil, and strength of the *hop*.—To prevent *berysing*, the poles are to be made to lean outwards; and particularly toward the south, to receive more of the sun's beams; it being matter of observation, that a leaning pole always bears more *hops* than an upright one.

As to tying.—When the *hops* are got two or three foot above ground, the next business is to conduct and tie them to such

poles as are empty, and at a proper distance from them.—They are to be tied with withered rushes, or woollen yarn; but not so close as to hinder their climbing up the poles: two or three strings may suffice for a pole. This operation is to be attended to in April and May.

About Midsummer, when they cease to run in length, and begin to branch, such of them as are not yet got up to the tops of the poles, should have their heads nipped off, or else they should be diverted from the pole, that they may branch the better; which is more for the increase of the *hop*, than its extending in length.

Some time in May, after rain, the hills are to be made up with a hoe, or spade, or by ploughing; which will be a means to destroy the weeds: and it is necessary, if the spring or summer prove dry, to water them twice or thrice in a season.

Hops blow towards the latter end of July: and the forward ones are ripe by the close of August.—Their ripeness is discovered by their fragrant scent, their changing of colour, their being easily pulled, and by the brownish colour of the seed.

Hops are to be gathered when they look a little brownish, and that without delay: the most expeditious way is, to make a frame with four short poles or sticks, laid on four forks driven into the ground, of such breadth, as to contain either the hair-cloth of the kiln, or a blanket tacked round it about the edges.—On this device, the poles, with the *hops* on them, may be laid, being either supported by forks, or by the edges of the frame; at each side whereof, the pickers may stand and pick the *hops* into it.—When the blanket or hair-cloth is full, untack it, carry it away, and place another, or the same emptied, in the same frame again; and this frame may be daily removed, with little trouble, to some new place of the garden near the work.

Hops must not be gathered while wet; but if the dew be on them, or a shower of rain has taken them, the pole may be shaken, and they will dry the sooner: If they be over-ripe, they will be apt to shed their seed, wherein consists their chief strength; neither will they look so green, but somewhat brown, which much lessens their value; though some let them stand as long as they can, because they waste less in the drying; for four pounds of undried *hops*, thorough ripe, will make one of the dry; whereas five pounds of those scarcely ripe, yet in their prime, make but one; so that it is judged the proprietors get more in the thorough ripe *hop* by the weight, than they lose in the colour.

As fast as the *hops* are picked, they must be dried: some, especially the Flemmings and Hollanders, make use of an oost or kiln for this purpose: others dry them on the ordinary malt kiln in an hair-cloth: but the best way, is to make a bed of flat ledges, about an inch thick, and two or three inches broad, fawn, and laid one across the other, checker-wise, the flat way; the distances are to be about three inches, or the like; the ledges so entered, are put into another, that the floor may be even and smooth: this bed may rest on two or three joists set edgewise, to support it from sinking; then cover it with large double tin plates folded together at each joint; and so order the ledges before they are laid, that the joints of the tin may always lie over the middle of a ledge; and when the bed is wholly covered with tin, fit boards about the edges of the kiln to keep up the *hops*, only let the one side be to remove, that the *hops* may be shovelled off as before. The *hops* may be turned on this tin-bed or floor with great safety and small expence of fuel; besides, that any manner of fuel will serve for this purpose as well as charcoal, the smoke not passing through the *hops*: but it must not be forgot, to make conveyances for it at the several corners and sides of the kiln.

The turning of *hops* after the easiest and most secure manner, is found to be not only a waste and injury to the *hop*, but also an expence of fuel and time; yet it may be prevented, in case the upper bed, whereon the *hops* lie, have a cover that may be let down and raised at pleasure; which cover may be tinned over, by nailing single tin plates to the face of it, that when the *hops* begin to dry, you may let down this cover within a foot and less of the *hops*, which will so reflect the heat upon them, that the uppermost *hop* will be as soon dry as the lower, and every *hop* equally dried.

The method of bagging *hops* (after they have lain a month more to cool and toughen) is to make a round or square hole in an upper floor, big enough for a man with ease to go up and down, and turn and wind in it; then tack a hoop about the mouth of the bag fast with packthread, that it may bear the weight of the *hops* when full, and of the man that treads them: that done, let the bag down through the hole, and the hoop will rest above, so as to keep the bag from sliding wholly through; into this bag cast a few *hops*, and before you go into tread, let an handful of *hops* be tied at each lower corner with a piece of packthread, to make, as it were, a tassel, wherby the bag, when full, may be conveniently lifted or removed; then go into the bag, and tread the *hops* on every side, another still casting in as fast as you require, till it be full; when it is well trodden and filled, let

the bag down by unripping the hoop, and close the mouth of the bag, filling the two upper corners as you did the lower: This bag, if well packed and dried, will keep several years in a dry place; only care must be taken, that mice do not spoil or waste the *hops*; nor that they will eat them, but they love to make their nests therein.

HOPLITES, * **HOPLITÆ**, in antiquity, were such of the candidates at the Olymic and other sacred games, as ran races in armour.

* The word is Greek, ὀπλίτης, formed of ὀπλον armour.

One of the finest pieces of the famous Parrhasius, was a painting which represented two *hoplites*; the one running, and seeming to sweat large drops; and the other laying his arms down, as quite spent and out of breath. *Pliny*, L. XXXV. c. 10. and *Paschas*, De *Coronis*, L. VI. c. 14.

HOPLOMACHI*, ὀπλομαχοί, in antiquity, were a species of gladiators, who fought in armour; either completely armed from head to foot, or only with a cask and cuirass.

* The word is composed of the Greek ὀπλον, armour, and μάχημα, I fight.

HOPPER, a vessel wherein feed-corn is carried at the time of sowing.

The word is also used for that wooden trough in a mill, into which the corn is put to be ground.

HORARY, something relating to *horæ*, hours. See **HOUR**.

HORARY Circles of the globe.

HORARY Circles, or *Lines*, in dialling, are the lines or circles which mark the hours on sun-dials.

HORARY Motion of the Earth, is the arch it describes in the space of an hour.

This is 15 degrees; though not accurately so, (for the earth moves with different velocity, according to its greater or lesser distance from the sun) but it is near enough for ordinary computations.

HORD*, **HORDA**, in geography, is used for a company or tribe of wandering people, which have no settled abode or habitation, but strolc about, dwelling in chariots, or under tents, to be ready to shift as soon as herbage, fruits, and the present province is eaten bare.

* The term is Tartarian, and literally denotes a multitude.

HORD, is more properly the name which the Tartars, who inhabit beyond the Wolga, in the kingdoms of Astracan and Bulgaria, give to their villages.

A *hord* consists of fifty or sixty tents ranged in a circle, leaving an open place in the middle.—The inhabitants of each *hord* usually form a military company or troop; the eldest whereof is commonly the captain, and depends on the general or prince of the whole nation.

HORDEATUM, a liquid medicine, made of barley, boiled till it burst.

Sometimes other ingredients are added, as the cold seeds, almonds, and the like.

HORDEOLUM*, in medicine, a small tubercle arising on the outer verge of the palpebre, or eye-lids.

* It is thus called from the Latin *hordeum*, barley, as resembling a barley corn.

The cure of the *hordeolum* and *grando*, is by discutients and suppuratives.

HORDICALIA*, or **HORDICIDIA**, in antiquity, a religious feast held among the Romans, wherein they sacrificed cattle big with young.

* The word *hordicidia* is formed of *horda*; which Festus explains by *pregnans*, pregnant; and *caedo*, I sacrifice. Ovid, in his *Fasts*, L. IV. v. 631. describes *horda*, or *forda*, to be *hor* pregnant; of *φύση*, *grovidea*.

This feast fell on the 15th of April; on which day they sacrificed thirty cows big with calf to the goddess *Tellus*, or *Terra*, Earth: part of them were sacrificed in the temple of Jupiter.—The calves taken out of their bellies were burnt to ashes, at first, by the pontifices; afterwards, by the eldest of the vestal virgins.

Alexander ab Alexandro, *Genial. Dier.* writes *hordalis dies*; and from him, some of the moderns call the feast *hordalia*; but Varro writes it *hordicalia*, and Festus, *hordicidia*.

HORIZON*, or **HORISON**, in astronomy, a great circle of the sphere, dividing the world into two parts, or hemispheres; the one upper, and visible; the other lower, and hid.

* The word is pure Greek, ὁρίζων, which literally signifies bounding or terminating the sight; being formed of ὁρίζω, termino, definio, I bound, I limit; whence it is also called *finitor*, finisher.

The *horizon* is either *rational* or *sensible*.

Rational, true, or astronomical Horizon, which is also called simply and absolutely, the *horizon*, is a great circle, whose plane passes through the centre of the earth, and whose poles are the zenith and nadir. It divides the sphere into two equal parts, or hemispheres.

Such is the circle HR (*Tab. Astronom. fig. 52.*) whose poles are the zenith and nadir; whence it follows, that the several points of the *horizon* are a quadrant distant from the zenith and nadir.

HOR

The meridian and vertical circles, all cut the rational horizon at right angles, and into two equal parts.

Sensible, visible, or apparent HORIZON, is a lesser circle of the sphere, as *h r*, which divides the visible part of the sphere from the invisible.

Its poles, too, are the zenith and nadir; and consequently the *sensible horizon* is parallel to the *rational*; and it is cut at right angles, and into two equal parts by the verticals.

The *sensible horizon* is divided into *eastern* and *western*.

The *eastern* or *orient* HORIZON, is that part of the horizon wherein the heavenly bodies rise.

The *western* or *occidental* HORIZON, is that wherein the stars set.

HORIZON, in geography, is a circle passing over the earth, and dividing the visible part of the earth and heavens from that which is invisible.

The altitude or elevation of any point of the sphere, is an arch of a vertical circle, intercepted between it and the *sensible horizon*.

This is peculiarly denominated *sensible horizon*, to distinguish it from the *rational* or *true*, which passes through the centre of the earth; as already observed.

By *sensible horizon* is also frequently meant a circle, which determines the segment of the surface of the earth, over which the eye can reach, called also the *physical horizon*.

In this sense we say, a spacious horizon, a narrow scanty horizon.—To find the extent of the horizon, or how far a man's prospect reaches, by means of the height of his eye, supposing the earth an uninterrupted globe, is a common case of right-angled plane triangles, where two sides and an opposite angle are given.—Thus, suppose *A H B* (*Tab. Geography, fig. 8.*) a great circle of the terraqueous globe, *C* the centre, *H C* its semi-diameter, and *E* the height of the eye; since *HE* is a tangent, the angle at *H* is a right angle; so that there are given *H C*, 398,386 miles, or 21,934,781 English feet, *C E*, the same length and the height of the eye on the mast of a ship, or at only a man's height, &c. added to it, and *E H C* the opposite right angle.

By these three parts given, it is easy to find all the other parts of the triangle.—And first, for the angle at *C*, in order to find the side *H E*; the proportion is, as the side *C E* to the angle at *H*, so is the side *H C* to the angle at *E*; which being subtracted from 90 degrees, the remainder is the angle at *C*. Then as the angle at *E*, is to its opposite side *H C*; or else, as the angle at *H* is to its opposite side *C E*; so is the angle at *C* to its opposite side *E H*, the visible horizon.

Or the labour may be shortened by adding together the logarithm of the sum of two given sides, and the logarithm of their difference; the half of which two logarithms, is the logarithm of the side required, nearly. For an example, we will take the two sides in yards, by reason scarce any table of logarithms will serve us any farther: the semi-diameter of the earth is 7,011,594 yards; the height of the eye is two yards more, the sum of both sides is 14,023,190.

Logar. of which sum is	-----	7,1468468
Logar. of two yards, the differ.	is	0,3010300
Sum of both logar.	-----	7,4478768
The half sum	-----	3,7239384

is the logarithm of 5296 yards=three miles, which is the length of the line *E H*, or distance the eye can reach at six feet height.

This, at least, would be the distance on a perfect globe, did the visual rays come to the eye in a straight line; but by means of the refraction of the atmosphere, distant objects on the horizon appear higher than really they are, and may be seen at a greater distance, especially on the sea, which is a matter of great use, especially to discover the land, rocks, &c.

Father Laval, professor of hydrography at Marseilles, found that the horizon of his observatory to the sea-ward was never more than 15 minutes, nor less than 13½; that is, the arch of the circumference of the earth, intercepted between the observatory and the horizon, fluctuated between those two quantities; whence M. Cassini deduces, that the extent of the horizon is seven French leagues of three miles each; and that the observatory is 175 foot high.

The height of the horizon, at the same place, and the same elevation above it, is very subject to vary, by means of differences in the atmosphere, which occasion others in the refractions.

When the sea was full, or the north-west or south-east wind blew, and the air hazy about the horizon, F. Laval always found his horizon depressed, or lower; *i. e.* the refraction which should raise it in that case was less than ordinary.—And yet on the common principles, the air being now much charged with vapours, the very contrary was rather to be expected.—This makes M. Cassini suspect, that there is some other refractive matter in the atmosphere, beside the air itself.

The same author observes, that at a height ten times greater than that of F. Laval's observatory, he found the arch ter-

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minated by the horizon to the seaward, 42', without any sensible variation; whence he concludes, that the variations are the greater, as the height is the less; which may seem contrary to what he had asserted in another place, *viz.* that the variations in the apparent altitudes of bodies are greater, as these objects are more remote, by reason they are seen through the larger quantity of air, which is all liable to be varied.—But the contradiction may be solved.

Another depression of the visible horizon, is caused by the height of the observer's eye above the surface of the sea.

HORIZON of the Globe. See the article GLOBE.

HORIZONTAL, something that relates to the horizon, or that is taken in the horizon, or on a level with the horizon. We say, a horizontal plane, horizontal line, horizontal distance, &c.

HORIZONTAL Dial, is that drawn on a plane parallel to the horizon; having its gnomon, or style, elevated according to the altitude of the pole of the place it is designed for.

Horizontal dials are, of all others, the most simple and easy.—The manner of describing them, see under the article DIAL.

HORIZONTAL Distance. See the article DISTANCE.

HORIZONTAL Line, in perspective, is a right line drawn through the principal point, parallel to the horizon: or, it is the intersection of the horizontal and perspective planes.

Such is the line *P Q* (*Tab. Perspective, fig. 12.*) passing through the principal point *F*.

HORIZONTAL Parallax. See the article PARALLAX.

HORIZONTAL Plane, is that which is parallel to the horizon of the place; or nothing inclined thereto.

The business of levelling, is to find whether two points be in the horizontal plane; or how much the deviation is.

HORIZONTAL Plane, in perspective, is a plane parallel to the horizon, passing through the eye, and cutting the perspective plane at right angles.

HORIZONTAL Projection. See the article MAP.

HORIZONTAL Range, or Level Range of a piece of ordnance, is the line it describes, when directed parallel to the horizon, or horizontal line.

Dr. Halley gives two very ready theorems, the one, to find the greatest horizontal range at 45 degrees elevation, in any spot made upon any inclined plane, with any elevation of the piece whatsoever; and the other, to find elevations proper to strike a given object with any force, greater than what is sufficient to reach it with the middle elevation.

1°. A shot being made on an inclined plane: having the horizontal distance of the object it strikes, with the elevation of the piece, and the angle at the gun between the object and the perpendicular; to find the greatest horizontal range of that piece laden with the same charge; that is, half the latus rectum of all the parabolas made with the same impetus.—Take half the distance of the object from the nadir, and the difference of the given elevation from that half; subtract the versed sine of that difference from the versed sine of the distance of the object from the zenith: The difference of those versed sines, will be to the sine of the distance of the object struck, to the greatest range at 45 degrees.

2°. Having the greatest horizontal range of a gun, the horizontal distance and angle of inclination of an object to the perpendicular; to find the two elevations necessary to strike that object.—Halve the distance of the object from the nadir; this half is equal to the half sum of the two elevations sought: then say, as the greatest horizontal range is to the horizontal distance of the object, so is the sine of the angle of inclination, or distance of the object from the perpendicular, to a fourth proportional; which fourth being subtracted from the versed sine of the distance of the object from the zenith, leaves the versed sine of half the difference of the elevations sought; which elevations are therefore had, by adding and subtracting that half of the difference to and from the aforesaid half sum.

HORIZONTAL Refraction. See the article REFRACTION.

HORIZONTAL shelters, among gardeners, are defences, disposed parallel to the horizon, for tender plants, blossoms, and fruits in the spring, to defend them against blasts and pinching nights.

The usual shelters that have obtained, are bass-mats, and other warm coverings, which are rolled up in the day-time, and let down in the night.—It was the reverend Mr. Lawrence who first proposed horizontal shelters, chiefly on this principle, that most of our frosts and blasts fall perpendicularly; *i. e.* the condensed vapours falling from the upper region, do, at night, form themselves toward the surface of the earth, into drops of dew, subject to be frozen by the coldness of the air.

Horizontal shelters are to be made by laying rows of tyles, at certain distances one above another, in the fracture of the wall, so as to project or hang over the plane of the wall, to carry off the dew, wet, &c.—It is an inconvenience objected

to this method, that it is difficult to lead a tree rightly among the tyles, or to keep its figure duly filled up.

HORN, Cornu, a hard callous substance growing on the head of divers animals.

It is laid down as a rule by some naturalists, that no animals have horns, but those that are cloven-footed.

The horns are usually a double part; inasmuch that there is but one exception, which is in the rhinoceros.

The horns of a deer are by hunters called his head. See **HEAD**.—In the history of the French academy of sciences, we have an account of a bullock's horn dug out of the ground in ploughing, which had shot forth fibrous roots, and appeared to have grown or vegetated after the manner of a plant.

Horns make a considerable article in the arts and manufactures.—Bullocks horns softened by the fire, serve to make lantern-horns, combs, inkhorns, tobacco-boxes, &c.

HORN is sometimes also used for the hoof of a horse, &c. **Ammon's HORN**. See the article **CORNU AMMONIS**.

Horn's HORN, Cornu Cervi.—The scrapings or rasings of the horn of this animal are medicinal, and used decoction pitians, &c.

It yields by distillation a very penetrative volatile spirit.

HORN is also a sort of musical instrument, of the wind kind; chiefly used in hunting, to animate and bring together the dogs, and the hunters.

The horn may have all the extent of the trumpet. The term for sounding antiently was, wind a horn; all horns being in those times compassed: but since straight horns are come in fashion, they say, blow a horn, and sometimes plainly, found a horn.

There are various lessons on a horn; as the recheat, double recheat, royal recheat, running or farewell recheat, &c. See **RECHEAT**.

The Hebrews made use of horns formed of rams horns, to proclaim the jubilee; whence the name jubilee.

HORN is also the name of two processes arising from the sides of the fund. See **CORNUA-UTERI**.

HORN, in architecture, is sometimes used for **volute**. See **VOLUTE**.

HORN of plenty. See the article **CORNU-COPIA**.

HORN with horn, or **HORN** under horn, (*cornutum cum cornuto*) is when there is common *per cause de vicinage*, intercommoning of horned beasts. See **COMMON**, and **INTERCOMMON**.

HORN-WORK, in fortification, a sort of out-work, advancing toward the field, to cover and defend a curtain, bastion, or other place suspected to be weaker than the rest: as also to possess a height, &c.—See **Tab. Fort. fig. 21. lit. f.**

It consists of two demi-bastions, as LMN and OPQ, **Tab. Fort. fig. 9.** joined by a curtain NO.—Its sides or flanks are usually parallel; though sometimes they approach or contract towards the place, forming what they call a *queue d'aronde*, or *swallowtail*. See **QUEUE D'ARONDE**.

When the flanks are too long, they sometimes make epaulements to flank them.—The parts of the horn-work next the country, are to be defended by a parapet.

Two horn-works joined together, make a crown-work. See **CROWN-WORK**.

HORN-BEAM *Pallengers*, a denomination given by some to trees of this species which have been lopped, and are of about twenty years growth. See **TREE**.

HORN-GELD*, signifies a tax within the forest, to be paid for the feeding of horned beasts. See **GELD**.

* *Quitum esse omni collectione in foresta de bestis cornutis, &c. Et sint quieti de omnibus geldis, & danzgelis, & woldgelis, & sengeldis, & hongeldis, &c.*

To be free of horn-geld, is a privilege granted by the king to such as he thinks good.

A horse is said to be **HORN-tipped**, when the tops of the two haunch bones appear too high.

HORNAGIUM, HORNAGE, in our antient law books, seems to import the same with *horngeld*.

HORODICTIC *Quadrant*. See the article **QUADRANT**.

HOROGRAPHY*, the art of making or constructing dials; called also *horologiography, gnomonica, sciatberica, photicaltherica, &c.* See **DIALING**.

* The word is compounded of *hora, hora, time, hour, an. ηωρα, scribo, I write.*

HOROLOGIOGRAPHY, the art of making or constructing dials. See **DIALING**.

HOROLOGIUM*, *ῥολογιον*, a common name among antient writers, for any instrument, or machine to measure the hours withal. See **CHRONOMETER**.

* The word is originally Greek, composed of *hora, hora, time, hour, and λος, speech, discourse.*

Such are our clocks, watches, sun-dials, &c. See **CLOCK**, **WATCH**, **DIAL**, &c. see also **CLEPSYDRA**.

HOROLOGIUM*, **HOROLOGION**, is also a name the Greeks give to their liturgy, or breviary; by reason it contains th-

daily hours, or the several offices to be rehearsed each day.

* The Greeks call it *ἡμερολόγιον*, which answers to what in Latin and English we call *diurnal*, or diurnal.

The *ἡμερολόγιον* is the breviary of the Greeks. **HOROPTER**, in optics, is a right line, drawn through the point where the two optic axes meet, parallel to that which joins the centres of the two eyes, or the two pupils.

Such is the line AB (**Tab. Optics. fig. 67.**) drawn through the point of concurrence C, of the optic axes of the eyes D and E, parallel to HI, which joins the centres of the eyes H and I.

It is called *horopter*, as being found by experience to be the limit of distinct vision.

Plane of the HOROPTER. See **PLANE of the Horopter**.

HOROSCOPE*, in astrology, the degree or point of the heavens, rising above the eastern point of the horizon, at any given time when a prediction is to be made of a future event; as, the fortune of a person then born, the success of a design then laid, the weather, &c.

* The word is Greek composed of *hora, hora, hour, and the verb σκοπεω, σκοπεω, consider, I consider.*—The Latins call it *causid orientalis*: sometimes, *ascendens*.

Mercury and Venus were in the *horoscope*, &c. They were formerly so infatuated with *horoscopes*, that Albertus Magnus, Cardan, and others, are said to have had the temerity to draw that of Jesus Christ.

HOROSCOPE is also used for a scheme or figure of the twelve houses, i. e. the twelve signs of the zodiac, wherein is marked the disposition of the heavens for any given time.

Thus we say, to draw a *horoscope*, construct a *horoscope*, &c. We call it more peculiarly *calculating* a nativity, when the life and fortune of a person are the subject of the prediction: for they draw *horoscopes* of cities, great enterprises, &c.

Lunar HOROSCOPE, is the point which the moon issues out of, when the sun is in the ascending point of the east. This is also called the *part of fortune*.

HOROSCOPE, is also a mathematical instrument, in manner of a planisphere; but now disused.

It was invented by J. Paduanus, who composed a special treatise thereon.

HORROR, **HORROR**, strictly signifies such an excess of fear, as makes a person tremble.—In physic it denotes such a shuddering or quivering as precedes an ague fit; and is often joined with rigors, and lumbagines. See **AGUE**, **FEVER**, &c.

Through ignorance of this acceptation, some have understood fear to be accounted by authors among the antecedent symptoms of those distempers.

HORS *de son fee, q. d.* out of his fee, is an exception to avoid an action brought for rent or other service, issuing out of certain lands, by him that pretends to be the lord.—For if the defendant can prove the land to be without the compass of his fee, the action fails.

HORSE, a domestic quadruped, of great use in the affairs of agriculture, commerce, war, sporting, &c.

The horse makes the subject of a very extensive art, called *horsemanship*, consisting of divers subordinate arts or branches. See **HORSEMANSHIP**.

From the same beast also arise the professions of chivalry, knight-hood, &c.

Authors are divided as to the time when men first began to mount horses.—The scholiast of Euripides, and Eustathius on the second book of the *Iliad*, speak as if the antients had been unacquainted with the use of saddle horses, and had only used them to draw chariots, &c. They add, that courses on horse-back were not introduced at the Olympic games, before the 85th Olympiad.—But this can scarce be; in regard the centaurs, to whom the invention is attributed, lived long before that time.

It appears likewise from Pausanias, that there were horse-courses even in the time of Hercules, the institutor of the Olympic games.

It was the custom among the antients to impress some mark on their horses; the most common were a *Σ*, *sigma*, a *Κ*, *kappa*, and a bullock's head. Hence those marked with *Σ*'s, were called *Συδαοται*; those with a *Κ*, *Κωννιδαι*; and those with a bull's head, *Βουφάλοι*, *lucophali*.—This mark was stamped on the horse's buttocks, and his harness: as appears from the scholiast on Aristophanes's *Clouds*, Helychius, &c.

The parts of a horse's body furnish a great variety of terms, by no means to be overlooked.—The skin and coat are called the *hair*; the long hair on the neck, the *mane*; the forehead, the *topping*, or *tuft*; the hair behind, on the feet, the *st-lock*, or *fetter-lock*; that growing over the top of the hoof, the *cornet*, or *crown*; that on the eye-lids, the *brills*.—The ridge whereon the mane grows, is called the *crist*, or *crest*; the fore part, from the neck to the fore legs, the *brisket*, or *cheff*; the mark frequently running down his face, the *rache*; and

and that in the forehead, the *star*.—The top of the shoulder blades, at the setting on of the neck, is called the *withers*; the place where the saddle is set, the *dock*; and a bruise or hurt thereon, a *navel-gall*; the middle of the back, from the mane to the hips, the *reins*; the extremity of the reins above the hips, the *couple*; the tail, the *dock* or *runt*; the hollow or sinking of the back-bone, the *sway*; the hind part of the belly, next the genital, the *flank*; that nearer the thighs, the *grain*; the loose skin wherein the yard is, the *sheath*; and the fore parts of the shoulders, next the breasts, the *fillets*.—The uppermost part of the hind leg, next the buttock, is called the *stifle* or *stiffle joint*; the asier joint, or bending of the hind leg, the *clambrel* or *elbow*; the inner, the *ham* or *hough*; the joint at the fetlock, the *pastern ankle*, or *setlock joint*; the foot, above the hoof of the ankle joint, the *coronet*.—The part from the withers to the top joint of the thigh, is called the *shoulder*; the middle joint of the fore leg, the *knee*; the right leg before, the *farther leg*; and the left, the *nearer*.—The hoof is called the *horn*; the hollow of the hoof, the *coffin*; the tender part of the hoof, next the heel, the *frill*; the ball of the foot, the *frog*; the part to be pared or cut off the hoof when overgrown, the *rif*; the fore part of the hoof, the *toes*; the hind part, where there is a sifting in the middle of the sole, the *heel*; and the infides meeting on the heel, the *quarters*.—Of most of these a further account will be found under the respective articles.

The masters in this art lay it down, that a *horse* to be good, and well made, must have three parts like those of a woman, *viz.* the breast, which is to be broad, the hips round, and the mane long; three of a lion, *viz.* countenance, intrepidity, and fire; three of a bullock, *viz.* the eye, nostril, and joint; three of a sheep, *viz.* the nose, gentleness, and patience; three of a mule, strength, constancy, and foot; three of a deer, head, leg, and hair short; three of a wolf, throat, neck, and hearing; three of a fox, ear, tail, and trot; three of a serpent, memory, fight, and turning; three of a hare or cat, running, walking, and suppleness.

Horses are distinguished into divers kinds, and are differently denominated, with regard to their strain or country.—As, the *Neapolitan*, known by his hawk nose.—The *Spanish genet*, by his small limbs.—The *Barb*, by his fine head and deep hoof.—The *Dutch*, by the roughness of his legs.—The *English*, by his strong knitting together, &c.—The *Flanardin*, &c.

Horses are also distinguished with regard to the uses or offices they are reserved for; as, the *coach-horse*, *war-horse*, *hunting-horse*, *running-horse*, *pack-horse*, &c.

Horses are also distinguished with regard to their colours; as—A *bay*, which admits of divers shades or casts, *viz.* a black bay, brown bay, dapple bay; all which have constantly black manes and tails.—*Dun* and *mouse-dun*, having frequently a black list along the back, which denominates them *flax-backed*.—*Flea-bitten*, which is white spotted with red.—*Grey*, dapple grey, silver-grey, fad or powdered grey, black grey, sandy grey, and iron grey.—*Griffel* or *raunt*, a light flesh colour intermixed with white.—*Peach colour* or *blissom colour*.—*Piebald*, which consists of two colours, one of them white.—*Road*, a bay, black, or forel intermixed with white hairs.—*Rubican*, black or forel, with a few white hairs scattered about his body.—*Sorrel*, common sorrel, red or cow-coloured forel, bright or light-coloured forel, burnt forel; all chiefly distinguished by the colour of their manes.—*Starling colour*, resembling a brownish or blackish grey, only more freckled, or intermixed with white.—*Tiger colour*, much the same with the branded grey, only the spots smaller.—*Wolf colour*.—*Deer colour*.—*Black*.—*White*, &c.

These colours are generally considered as symbolical of the nature, qualities, &c. of the beasts; and accordingly their value is much influenced hereby.—The dapple grey is prized for beauty; the brown bay for service; the black with silver hair for courage; the roan for countenance; the forel, black without white, and iron grey, are reputed hot and fiery; the bright grey, flea bitten, and black with white spots, are sanguine; the white, dun, and pve-bald, phlegmatic and heavy; the mouse-dun, red bay, and bluegrey, are dull; the peach colour rarely prove obedient to the spur; the forel seldom fail of being good, especially if their legs, tails, and manes be black; and the fame may be said of the flea-bitten, at least those fo marked in the fore parts, or over the whole body; for when only behind, it is an ill sign.

Indeed it is hard laying down any universal rules in this case.—The white, which promise the least often prove good when black about the eyes and nostrils. And there are excellent iron greys, though that is not reputed a good colour.

For the age, teeth, mark, &c. of *horses*. See AGE, TOOTH, MARK, &c.

For the furniture, &c. of a *horse*. See SADDLE, BRIDLE, BIT, &c.

Horse is also used, in the military language, to express the

cavalry; or the body of soldiers who serve on horseback. See CAVALRY.

The army consisted of 30000 foot, and 10000 *horses*.

The *horse*, includes *horse* guards, *horse* grenadiers, and troopers.—Dragoons are also frequently comprehended under this name, though they fight on foot. See GRENADEIER and DRAGOON.

Horse guards, by the Spaniards called *guardas a cavallo*; by the French, *gardes de corps*; by the English usually *life-guards*; are the guards of the king's person and body, consisting with us of 800 men, well armed and equipped.

They are divided into four troops; to which are now added, by establishment, two troops of grenadiers, consisting of eighty men, under the command of a captain.

Each troop of *horse* guards is divided into four divisions or squadrons; two of which consisting of a hundred men, commanded by a principal commissioned officer, two brigadiers, and two sub-brigadiers, with two trumpets, mount the guard, one day in six, and are relieved in their turns.

Their duty is, by parties from the guard, to attend the king's person when he goes out near home.—When he goes out of town, he is attended by detachments out of all the three troops.

One of three captains of the *horse* guards attends on the king when he walks on foot, immediately next his person; carrying in his hand an ebony staff, or truncheon, with a gold head.

One division of grenadiers mounts with a division of the troop to which they belong; and these go out on small parties from the guard, perform sentinel duty on foot, attend the king also on foot, &c.

Master of the Horse. See MASTER of the horse.

Light Horse, includes all the *horse* except those of the life-guard.

The term *light horse* is sometimes also applied to an independent troop; or a troop not embodied into a regiment.

The denomination arose hence, that antiently they were lightly armed, in comparison of the royal guards, which were armed at all points.

Horse is also a term used in various arts and manufactories, for something that helps to sustain their work from the ground, for the more commodious working at it.

The *horse* used by tanners and skimmers, called also the *leg*, is a piece of wood cut hollow and roundish, four or five foot long, and placed alope; upon which they pare their skins to get off the dirt, hair, flesh, &c.

Horse is also used in carpentry for a piece of wood jointed across two other perpendicular ones, to sustain the boards, planks, &c. which make bridges over small rivers; and on divers other occasions.

Little Horse. See the article EQUULEUS.

Horse is also a rope in a ship, made fast to one of the fore-mast shrouds; having a dead man's eye at its end, through which the pennant of the sprit-fail sheets is reeved.—See *Tab. Ships*, fig. 1. n. 125.

Horse is also a cant name lately introduced into the affair of lotteries, for the chance, or benefit of a ticket, or number for one or more days, upon condition, if it be drawn a prize within the time covenanted for, of returning to the seller an undrawn ticket.

To determine the value of a *horse*.—Multiply the amount of the prizes in the lottery by the time the *horse* is hired for; and from the product subtract the amount of the number of prizes by the value of an undrawn ticket into the time of the *horse*: the remainder being divided by the number of tickets into the whole time of drawing, the quotient is the value of the *horse*.

HORSEMANSHIP, the art of breaking, disciplining, and managing horses.

Horsemanship, in its latitude, includes what relates to the knowledge of the make, colour, age, temper, and qualities of *horses*; their respective countries and climates with the manner of breeding, propagating, &c. the discovery of the uses or services they are fitted for; whether the wars, the race, the fiddle, or labour; and forwarding and accommodating them thereto.

In this general sense, it also includes the knowledge of the defects and diseases of *horses*, and the remedies proper for the same; with the several operations requisite thereto, as *docking*, *gelding*, *shoeing*, &c. and thus takes in the farrier's province.

But the word is in a more peculiar manner understood of the art of riding; or of directing a horse to advantage, not only in the ordinary motions, but more especially in the managing, or making him work, upon volts, airs, &c. See MANAGE.

HORSE-SHOE, a cover or defence for the sole of a horse's foot.

Of these there are several sorts; as, the *Planch SHOE*, or *Pancelet*, which is said to make a good foot, and a bad leg; as causing the foot to grow beyond the measure of the leg. It is chose for a weak heel, and will last longer than any other shoe; being borrowed from the moul, which has weak heels; and trulkes to keep the feet from stones and gravel.

SHOES with Calkins, which, though intended to secure the horse from sliding, yet are reputed by many to do him more harm than good, in that he cannot tread evenly upon the ground, whereby, many times, he wrenches his foot, or strains some sinew, especially upon stoney ways, where stones will not suffer the calkins to enter.—*Double calkins* are less hurtful, as he treads even with them than on the single calkins; but then they must not be over long, or sharp pointed, but rather short and flat.

SHOES with Rings, these were first invented to make the horse lift his feet up high; though such shoes are more painful than helpful, beside the unhandiness of the sight.—The fault of not lifting the feet high enough is most incident to horses that have not found hoofs; for tender feet fear to touch the ground hard; but what is intended for remedy, proves a prejudice to the horse, by adding high calkins, or rings to his shoes, as by that means his heels are made weaker than before.

SHOES with swelling welts or borders round about them, are used in Germany, &c. which being higher than the heads of the nails, save them from wearing.—These are the best sort of lasting shoes, if made of well tempered stuff, as they wear equally in all parts, and the horse treads evenly upon them. Others, who use to pass mountains and places where smiths are not so easily met with, carry shoes about them, with vices, whereby they fasten them to the horse's hoofs without the help of the hammer or nail; yet is this more for show than service; for though such shoe may save a horse's feet from stones, yet it so pinches his hoof that he goes with pain, and perhaps injures it more than the stones do.—On such emergent occasions, therefore, it were better to make use of the

Joint SHOE, which is made of two pieces, with a flat rivet nail joining them together in the toe, so that it may be taken both wide or narrow, to serve any foot.

Panton, or Pantable SHOE, which opens the heels, and helps hoof-binding.—To which may be added, the *half panton shoe*.

Patten SHOE, is used for a horse that is burnt in the hip, stiffler, or shoulder, as it caufes him to bear upon that leg the grief is on, and consequently makes him use it the better.

HORSE-SHOE, in fortification, is a work sometimes of a round, sometimes of an oval figure, inclosed with a parapet, raised in the ditch of a marshy place, or in low grounds; sometimes also to cover a gate; or to serve as a lodgment for soldiers, to prevent surprizes, or relieve an over-tedious defence.

HORSE-SHOE HEAD, a disease in infants, wherein the sutures of the skull are too open, or too great a vacuity is left between them; so that the aperture shall not be totally closed up, or the cranium in that part be so hard as the rest for some years after.

This openness is found to be increased upon the child's catching cold. When the disease continues long, it is reputed a sign of weakness and short life. In this case, it is usual to rub the head every now and then with warm rum, or brandy, mixed with the white of an egg, and palm oil. Sometimes the disorder arises from a collection of waters in the head, called a *hydrocephalus*.

HORSE Measures, is a rod of box, to slide out of a cane, with a square at the end, being divided into hands and inches, to measure the height of horses.

HORSHAM Stone, is a kind of thin broad slate, of a greyish colour; formerly much used, especially in Suffex, to heal or cover churches and chancels, great houses, &c.

It is called *Horsbam stone*, because chiefly brought from the town of Horsham in Suffex.

HORTAGILERS, in the grand seignior's court, are upholsters, or tapestry-hangers.

There is no city better or more orderly regulated than the grand seignior's camp; and to have a notion of the magnificence of that prince, he must be seen in that equipage; he being much better lodged and accommodated there, than at Constantinople, or in any other city of his dominions.

He has always two tents or pavilions, and two sets of furniture entire; that while he is in one, they may pitch or spread the other.

In order to this, he has constantly four hundred *hortagilers*, or upholsters, in his retinue, who go a day's journey before him, to fix on a proper place. They first prepare the Sultan's tent, and then those of the officers of the port, and the beglerbegs, according to their rank.

HORTICULTURE*, the art of gardening. See GARDENING.

* The word is compounded of *hortus*, garden, and *colo*, I till, dress, &c.

HOSANNA*, in the Hebrew ceremonies, a prayer which they rehearsed on the several days of their feast of tabernacles.

* It was thus called, by reason there was a frequent repetition therein of the word הושיענו יהוה הושיענו, or *hosua precor*, i. e. save us now; or, save us, we pray.

There are divers of these *hosannas*.—The Jews call them *hosannoth*, i. e. the *hosannas*.—Some are rehearsed on the fifth day, others on the second, &c. which they call *hosanna* of the first day, *hosanna* of the second day, &c.

HOSANNA Rabba, or *Grand HOSANNA*, is a name they give to their feast of tabernacles, which lasts eight days; by reason, during the course thereof, they are frequently calling for the assistance of God, the forgiveness of their sins, and his blessing on the new year; and to that purpose they make great use of the *hosannoth*, or prayers abovementioned.

The Jews, also, apply the term *hosanna rabba*, in a more peculiar manner, to the seventh day of the feast of tabernacles; by reason they apply themselves more immediately on that day to invoke the divine blessing, &c.

HOSE, from the Saxon *hosa*, a flocking. See STOCKING.

HOSE IN HOSE, among botanists, signifies one long husk of a flower within another; as in the polyanthos.

HOSE-HUSK, in botany, a long round husk; as in pinks, july-flowers, &c.

HOSPITAL*, popularly *SPITAL*, a place or building erected out of charity, for the reception and support of the poor, aged, infirm, sick, and otherwise helpless.

* The word is formed of the Latin *hospes*, host, or stranger.

In the first ages of the church, the bishop had the immediate charge of all the poor, both found and diseased, as also of widows orphans, strangers, &c.—When the churches came to have fixed revenues allotted them, it was decreed, that, at least, one fourth part thereof should go to the relief of the poor; and to provide for them the more commodiously, divers houses of charity were built, which are since denominated *hospitals*.

They were governed wholly by the priests and deacons, under the inspection of the bishop.

In course of time, separate revenues were assigned for the *hospitals*; and particular persons, out of motives of piety and charity, gave lands, and money for erecting of *hospitals*.

When the church discipline began to relax, the priests, who, till then, had been the administrators of *hospitals*, converted them into a sort of benefices, which they held at pleasure, without giving account thereof to any body; reserving the greatest part of the income to their own use; so that the intentions of the founders were frustrated.—To remove this abuse, the council of Vienne expressly prohibited the giving any *hospital* to secular priests in the way of a benefice; and directed the administration thereof to be given to sufficient and responsible laymen, who should take an oath, like that of tutors, for the faithful discharge thereof; and be accountable to the ordinaries.—This decree was executed, and confirmed by the council of Trent.

In England, *hospitals* founded for the mere relief of the indigent and necessitous, are peculiarly called *alms-houses*; the name *hospital* being reserved to those destined for the sick, aged, young, &c.—The principal of these are, the

Royal HOSPITAL, for disabled soldiers, commonly called *Chelsea-College*.

It was founded by king Charles II. carried on by king James II. and finished by king William and queen Mary.

The building is very spacious and magnificent: Its figure is a Π ; the middle or front part whereof consists of a chapel and hall; the other two lines being four stories high, are divided into wards or galleries, two in each story containing each twenty-six distinct apartments for the foot-soldiers. At each of the four corners of the main building, there is a pavilion, in one whereof is the governor's lodging and the council chamber; the other being lodgings for several of the officers of the house. Beside the main building, there are four wings or out-buildings; one for the infirmary, another for several officers of the house, another for old maimed officers of horse and foot; and the fourth for the baker, laundress, &c.

The number of ordinary pensioners is 476; beside the officers and servants of the house: The out, or extraordinary pensioners, are also very numerous; and these, upon occasion, do duty in the several garrisons, from whence draughts are made for the army, &c.

The pensioners are all provided with clothes, diet, washing, lodging firing, and have one day's pay in every week for spending money.

The qualifications required to be admitted of this body, are, That the candidate bring a certificate from his superior officer, that he has been maimed or disabled in the service of the crown; or that he has served the crown twenty years, which must be made appear by muster-rolls.

To defray the charges of this *hospital*, there is a considerable sum paid yearly out of the poundage of the army; beside one day's pay of each officer, and each common soldier, every year; which, in time of war, amounts to 13 or 14000*l*.

For the administration of this *hospital*, there is a governor, lieutenant-governor, major, treasurer, &c.

Greenwich HOSPITAL, is a retreat for seamen, who, by age wounds, or other accidents, are disabled from service; and for the widows and children of such as are slain in the service.

This, in point of magnificence and spaciousness, greatly excels even Chelsea *hospital*. A good part of it was built in king Charles the second's time, at the expence of 36000*l*. It was much promoted by king William; and finished under queen Anne, and king George the first and second.

The number of penitons entertained in this *hospital* is 300. To each hundred men are allowed six nurses, being the widows of seamen.

The victualling is according to the allowance of Chelsea, *hospital*, viz. four men to a mess; each mess to contain four pound of flesh, a gallon of beer, &c.

It is administered by a governor, lieutenant-governor, captain, lieutenant, chaplain, steward, physician, &c.

Christ's HOSPITAL, popularly called the *Blue-coat Hospital*, was antiently a monastery of grey friars, founded by Rahere, the first prior thereof, in the time of Henry I. It was dissolved by Henry VIII. and converted by Edward VI. into an *hospital* for poor children, who are supplied with all necessaries and conveniences, cloathed, dieted, and taught.

Since its first endowment it has received abundance of new donations. A great part of it was burnt down by the great fire; but is again rebuilt by the care of the governors, though not without incurring a great debt, and anticipating the revenues of the *hospital*.

Formerly, a thousand poor children, most of them orphans, were maintained on this foundation; and six or seven score yearly put out apprentices, and the girls to service; but the number, through the deficiency of the funds, grew afterwards much less.

Here were two mathematical schools; the first founded by king Charles II; but they are now united. Youths are there taught several parts of practical mathematics, particularly navigation, to fit them for apprentices to masters of ships: To say nothing of the grammar school, (whence the most improved boys are yearly sent to the university) the writing school, drawing school, &c.

The officers of this *hospital* are a president, treasurer, governors, &c.

S. Bartholemew's HOSPITAL adjoins to Christ's *hospital*, and formerly belonged to the same grey friars.

At the dissolution of monasteries, Henry VIII. left five hundred marks a year to it for the relief of poor people; but it was more largely endowed for the use of sick and lame persons only, by Edward VI.

It is governed by a president, treasurer, &c. with three officers. It is furnished with two physicians, and three master surgeons, besides as many assistant surgeons.

In this *hospital*, with two others depending on it, the one at Kingland, called the *Lark*, the other in Southwark, are usually about three hundred patients, provided with lodging, diet, physic, chirurgery, &c.

S. Thomas's HOSPITAL, in Southwark, is for the same purposes as that of S. Bartholemew.

It was originally founded an *hospital*, by Richard, prior of Bermondsey, in 1213; surrendered to King Henry VIII; and given by Edward VI. to the citizens of London, for an *hospital* for infirm and lame people.

It consists of four quadrangular courts: In the first are six wards for women: in the second, two chapels, the lesser for the private use of the *hospital*, and the larger parochial: in the same court are the houses of the treasurer, and other officers: in the third court are six or seven wards for men. The fourth hath also three wards, baths hot and cold, a chirurgery, apothecary's shop, &c.

There are about three thousand persons taken in and discharged out of this *hospital* yearly.

The governors of this *hospital* are the lord mayor and court of aldermen, with about two hundred an' sixty other citizens. Among which are a president, treasurer, &c. two physicians, and three surgeons.

Guy's HOSPITAL, or the *HOSPITAL of Incurables*, is the foundation of a wealthy citizen, and bookseller, Thomas Guy, Esq;

It is chiefly intended for reputed incurable persons; and is even to take in yearly a certain number of patients turned out of the other *hospitals*, particularly Bethlehem as incurable.

The founder bestowed 50,000*l*. on the building in his lifetime, and, by will, endowed it with 200,000*l*. at his death, in 1224: the greatest benefaction, without dispute, that ever was left by any one private man.

Its officers are a president and governors, most of whom are the same with those of S. Thomas's *hospital*, which is in the neighbourhood thereof; with a treasurer, two physicians, two chirurgeons, &c.

Bridewell HOSPITAL

Sutton's HOSPITAL.

HOSPITAL of Jerusalem

HOSPITALEK, one that entertains and provides for poor people, travellers, &c.

The appellation is chiefly given to certain communities of religious; as, the *hospitalers* of Elfsfort in Essex, instituted to take care of lepers; *hospitalers* of S. John Baptist of Coventry; *hospitalers* of S. Julian; *hospitalers* of S. Leonard at York, &c.

The religious *hospitalers* generally follow the rule of S. Augustine. Most of them pretend that S. Martha was their first foundress, and chose her for their patron, by reason the entertained Jesus Christ at her house. Some of them go back to the patriarch Abraham for their founder.

There are also *hospitalers* among the military orders, such are the knights of S. Lazarus, and S. John of Jerusalem.

HOSPITALERS, HOSPITALARII, more particularly denote an order of religious knights, who built an *hospital* at Jerusalem, wherein pilgrims were received.—To these pope Clement V. transferred the effects and revenues of the Templars; whom, by a council held at Vienne, he suppressed, for their many and great misdemeanors.

These *hospitalers* were otherwise called *knights of St. John of Jerusalem*, and are the same with those whom we now call *knights of Malta*.

HOSPITIUM, Inn, a term peculiarly used in our law-books for an inn of Court.

HOSPITIUM is also used for a little convent, which the religious built for the reception of strangers and travellers of the same order, who had occasion to stay with them some time.

Most of these *hospitia*, or inns, in time became fixed convents.

HOSPODAR, the title born by the prince of Walachia and Moldavia.

The *hospodars* of Walachia and Moldavia receive the investiture of those principalities from the grand seignior, by a vest and a standard which he gives them.

They are sometimes deposed by him; though in other respects they have the sovereign power within their states.

HOST*, HOSPIES, a term of mutual relations, applied both to a person who lodges and entertains another, and to the person thus lodged, &c.

* The word is formed of the Latin *hospes*, which some will have thus called, *quasi hospitium*, or *ostium patens*; but *ostium* was antiently wrote with an aspirate.

Thus the innkeeper says, he has a good *host*, in speaking of the traveller who lodges with him; and the traveller, again, says, he has a kind *host*, in speaking of his landlord.

It must be observed then, that it was the custom among the antients, when any stranger asked for lodging, for the master of the house, and the stranger, each of them to set a foot on each side of the threshold, and swear they would neither of them do any harm to the other.—It was this ceremony that raised so much horror against those who violated the law, or right of hospitality on either side: inasmuch as they were looked on as perjured.

Instead of *hospes*, the antient Latins called it *hospis*; as Cicero himself informs us: though in course of time, *hospis* came to signify an enemy; so much was the notion of hospitality altered.

HOST is also used by way of abbreviation for *hospis*, a victim, or sacrifice offered to the Deity. See **HOSTIA**.

In this sense, *host* is more immediately understood of the person of the Word incarnate, who was offered up a *host*, or *hospis*, to the Father, on the cross; for the sins of mankind.

HOST, or **HOAST**, is chiefly used in the Romish church for the body of Jesus Christ, contained under the species of bread and wine, which is offered up every day, a new *host*, or sacrifice, in the mass.

Pope Gregory IX. first decreed a bell to be rung, as the signal for the people to betake themselves to the adoration of the *host*.

The vessel wherein the *hosts* are kept, is called the *cibory*; being a large kind of covered chalice.

HOSTAGE*, a person left as surety for the performance of the articles of a treaty.

* The word is formed of *host*, and that of *hospes*.

When two enemies are on the point of concluding a treaty or capitulation, it is frequent for them to give *hostages* on each side, as sureties for the execution of what is contained therein.

The garrison of such a place has capitulated, and given *hostages*. Such an officer was given as an *hostage*.

A *hostage* is either a principal or an accessory, according to the state of the case. He is only an accessory, when, for instance a prince promises fidelity to another, and gives up his son, or some other great lord, to assure his engagement, without any further stipulation. For here if the prince fail of his word, the *hostage* is no ways accountable for it. But the *hostage* becomes a principal, when it is expressly stipulated,

lated, that he shall be answerable for the event: for instance, if a city engage to surrender, in case it be not relieved in so many days; and, to secure the engagement, give hostages; these hostages are what a surety is to a creditor for the debt of his principal. So that, if the relief do not come, and yet the citizens refuse to surrender, the hostages stand in their place, become principals, and are liable to be punished for the prevarication of those they have become surety for.

A *hostage* given for another person, becomes free when that person dies.

HOSTEL, or **HOTEL**, a French term, antiently signifying a house, or dwelling-place.

It is now more commonly used for the palaces, or houses of the king, princes, and great lords.

In this sense they say, the *hotel del Conde*, *hotel de Conti*, *hotel de Louvre*, &c.

The grand prevot de l'*hotel*, is the first judge of the officers of the king's household. His jurisdiction is much like that of lord-steward of the household of the king of England.

The *hotel de ville* is what we call a *town-house*, or *town-hall*.

HOTEL-DIEU, is a common name for the chief hospital for the reception of sick persons in most of the cities of France.

The *HOTEL de Mars*, is an hospital near Paris, of the same nature with Chelsea hospital.

HOSTIA *, **HOST**, in antiquity, a victim offered in sacrifice to a deity.

* The word is formed from *hostis*, enemy, it being the custom to offer up a sacrifice before they joined battle, to render the gods propitious; or after the battle was over, to give them thanks.—Some chuse to derive the word from *hostis*, q. d. *ferio*, I strike.—Isidore, on this word, remarks, that the name *hostia* was given to those sacrifices which they offered before they marched to attack the enemy; *Ante quam*, says he, *ad hostem pergerent*; in contradistinction from *victima*, which were properly those offered after the victory: Ovid seems to distinguish otherwise when he says,

*Victima que cecidit dextrâ victricæ vocatur;
Hostibus a domitis hostia nomen habet.*

As if the *hostia* might be slain by any priest, but the victim only by the hands of the victor: Fronton makes another distinction: According to him, *victima* was a grand oblation, and *hostia* a smaller and less considerable one.

HOSTILITY *, the action of an enemy.—During a truce, all *hostilities* are to cease on both sides: such a city stands neutral, and commits no *hostilities* on either side.

* The word is Latin, *hostilitas*, formed of the primitive *hostis*, which signifies *enemy*; and which antiently signified *stranger*, *hostis*.

HOT-BATH. See the articles **BATH**, and **THERMÆ**.

HOT-BED, a piece of earth or soil plentifully enriched with manure, and defended from cold winds, &c. to forward the growth of plants, and force vegetation, when the season or the climate of itself is not warm enough.

By means of *hot-beds* skilfully managed, we can so nearly imitate the temperature of other climates, that seeds of plants brought from any country between the tropics, may be made to flourish even under the poles.

Heat and humidity being the great instruments of vegetation; to promote the growth of any plants, these must be duly proportioned, so as neither to exceed nor come short of the bounds nature has allotted for it.—Too much heat we find rather scorches a plant than makes it grow; and too much moisture frequently chills it, unless quickly exhaled from the roots.—With us, a moderate heat is found the most eligible; such as is raised by the ferment of wet straw and horse-litter, which, from the earth lying thereon, will send forth, for some time, a gentle steam, richly impregnated with vegetative salts.

The usual way of making *hot beds*, is of horse-litter and grass mixed together, and left on an heap for eight or ten days to putrefy; and then removed into a bed, and covered up with glasses, or frames.—Others chuse to take horse-dung a month or six weeks old, and make a feed-bed of it about four foot high, and cover it up with straw a foot thick, which is to be removed in three or four days, and its place supplied either with cows dung, or with the last year's ridges. The process of ordering a good serviceable *hot bed*, for the customary raising of colliflowers, cucumbers, melons, radishes, and other tender plants and flowers, in January or February, is directed by Mr. Mortimer in manner following: Provide a warm place defended from all the winds, by being inclosed with a pale or hedge made of reeds or straw, about six or seven foot high, of such dimensions or capacity as occasion requires.—Within this inclosure raise a bed two or three foot high, and three foot over, of fresh horse-dung, about six or eight days old; then tread it down very hard on the top, make it level, and if you think fit, edge it round with boards or brick, laying fine rich mould about three or four

inches thick on it: When the extreme heat of the bed is over, which you may perceive by thrusting in your finger; plant your seeds at pleasure, and set up some forks four or five inches above the bed, to support a frame made of sticks, and covered with straw or bafs-mat, in order to secure the seeds and plants from cold and wet; only the covering may be opened in a warm day, for an hour before noon, and an hour after.—But take care to earth up your plants as they shoot in height; and when able to bear the cold, they may be transplanted.

In Holland they make use of *hot beds* made of sand; which are not so apt to raise unwholesome damps as those of horse dung.—The Dutch likewise made *hot beds* of tanner's bark, which, when once rightly prepared, will maintain an equable heat for six months.

Bradley, with very good reason, proposes a thermometer to be used to regulate the heat of *hot beds*.—For plants that are either to be brought up in a colder season, or a colder climate than what they naturally require; you are to take the height at which the thermometer stands in their proper season or clime, as a standard; and by applying a thermometer to the *hot bed*, judge whether the heat is to be increased or remitted.—I thus a *hot bed* for cucumbers must be kept, to raise the spirit in the glass, to the same height as the natural temperature of the weather will raise it to about the latter end of May and June, when cucumbers will grow abroad without any artificial heat or shelter. See Supplement: article **HOT BED**.

HOT-HOUSE. See **STOVE**, and **HYPOCAUSTUM**.

HOT-SHOOTS, or **HOTVISES**, a sort of factitious or compound fuel, made of a third part of any coal, pit, sea, or charcoal, mixed with two thirds of loam.

These ingredients are to be made up into balls, moistened with a little urine, round or in any other form at pleasure; and exposed to the air till thoroughly dry.—Then may they be built into the most orderly fire imaginable, affording a glowing, regular and constant heat for seven or eight hours, without stirring. This mixture is also used in some parts to slacken the impetuous devouring of the fire, and keep coals from consuming too fast.

HOTCH-POT, or **HODG-PODG**, primarily denotes a Flemish medley dish, made of flesh cut in pieces, and sodden with herbs, roots, &c.

HOTCH-POT, in law, signifies a mixture or blending of lands given in marriage, with other lands in fee accruing by descent.—A man seized of thirty acres of land in fee, hath two daughters, and gives with one of them ten acres in frank-marriage, and dies seized of the other twenty. If now she that is thus married will have any part of the twenty acres, she must put her lands given in frank-marriage in *hatch-pot*; that is, she must refuse to take the sole profits of the ten acres, but suffer them to be mingled with the other twenty, to the end an equal division may be made of the whole thirty between her and her sister.—Thus for her ten acres she will be entitled to fifteen. *Coke on Littl.*

HOTTS, or **HUTTS**, pounces and round balls of leather, stuffed, or tied on the sharp end of fighting cocks spurs; to keep them from hurting one another in sparring or breathing themselves.

HOUGH, *Ham*, the joint of the hind leg of a beast, which connects the thigh to the leg. See **HAM**.

To HOUGH, or *cut the Houghs*, is to ham-string. See **HAM-STRING**.

HOUGH *bony*, is a hard round swelling, or tumor growing upon the tip or elbow of the *hough*.

It generally proceeds from some stroke or bruise; and if neglected till the substance of the swelling becomes hard like glue, it proves difficult to cure.

HOUND, *Canis venaticus*, a hunting dog.

Hounds may be distinguished, with regard to the manner of their hunting, into such as find out and pursue the game by sight, and the quickness and swiftness of their motion; of which kind are the *gaze hound*, *agajcus*; and *grey-hound*, *canis gravius*; the *terrier*, &c.—And those which find and pursue the game by the goodness of their smell.

The species of scenting dogs may be divided farther into *bounds* simply so called, and *blood bounds*, each whereof admits of some diversities.

1°. As to *bounds* simply thus called, those which are all of one colour, as white, black, &c. are the most valued; then those spotted with red: Those spotted with dun are less prized, as usually wanting courage and boldness.—Fallow *bounds* are of good scent, and hardly not fearing the water: they keep the chase well without change; but are not so swift as the white: they love the hart above any other chase, having little stomach for the hare, &c. whence they are not so fit for private gentlemen; beside, that they are apt to run at tame beasts.

The *dun bounds* are of a more general use, being fit for all chases.—Their sagacity and fidelity in knowing and sticking to their master's voice and horn, and to none else, are much admired: They also understand each other, and know which are babblers, which liars, &c. They are of different sizes, and

and qualities in the several countries, &c. Mountainous and woodland parts breed a tall heavy fort, called *slow bounds*: moderate foils, where the champion and covert hare pretty equally, produce a middle-sized *bound* of a nimble make.

The marks of a good and fair *bound* are, to be of a middle proportion, rather long than round; the nostrils wide; back bowed; fillets, great; haunches, large; ham, straight; tail, big near the reins, and the rest slender to the end; the legs, big; the sole, dry; and claws, large.

For the terms used in respect of *bounds*, their noises, &c. See HUNTING.

To enter a young *bound*; after having taught him to know the halloo and the found of the horn, at about eighteen months old he may be taken into the field. The best method to initiate him, is to take a live hare, and trail her upon the ground, this way, then that; and, at length, hide her at a proper distance. Then setting the *bound* near the trail, he will take wind, and run to and fro about the fields, woods, paths, &c. till he find which way she has gone: as he approaches nearer the lodged hare, he will mend his pace, and at last leap on his prey, which he must be suffered to kill, and bringing it to his master with triumph, he must be rewarded and encouraged.—This done, he may be let run in a pack of old *bounds* to confirm and perfect him.

It ought to be noted, that whatever young *bounds* are first entered at and rewarded with, they will ever after covet most; so that if they be intended, e. g. for the hart, they must not be entered at the hare.

2°. The *grey-bound* might deserve the first place, by reason of his swiftness, strength, and sagacity in pursuing his game; such being the nature of this dog, that he is speedy and quick of foot to follow, fierce and strong to overcome, yet silent, coming upon his prey unawares.

The make and proportions required in a good *grey-bound*, are, that he have a long body, strong, and pretty large, a neat sharp head, sparkling eyes, a long mouth, and sharp teeth, little ears, with thin gristles in them, a straight, broad, and strong breast, his fore legs straight and short, his hind legs long and straight, broad shoulders, round ribs, fleshy buttocks, but not fat, and a long tail, strong and full of veins.

Of this kind, those are always fittest to be chosen among the whelps that weigh lightest; for they will be sooner at the game, and so hang upon it, hindering its swiftness, till the heavier and strong *bounds* come in to offer their assistance; whence, besides what has been already said, it is requisite for a *grey-bound* to have large sides, and a broad midriff, that he may take his breath in and out the more easily; his belly should also be small, which otherwise would obstruct the swiftness of his course; and his hairs thin and soft.

The huntsman is to lead these *bounds* on his left hand, if he be on foot, and on the right if on horseback.—The best time to try and train them to the game, is at twelve months old, though some begin sooner, with the males at ten, and the females at eight months old, which last are generally more swift than the dogs: They should be kept in a slip, while abroad, till they see their course; neither should you loosen a young dog till the game has been a considerable time on foot, he being apt, by over eagerness at the prey, to strain his limbs.

3°. The *gaze-bound*, or *beagle*, is a dog more beholden to the sharpness of his sight, than his nose or smelling; by virtue whereof he makes excellent sport with the deer and hare.—He is also noted as exquisite in chusing of one that is not lank or lean, but full, fat and round, which, if it happen to return, and be mingled again with the residue of the herd, he will soon spy out, and leave the rest untouched, never ceasing, after he has separated it from its company, and till he has wearied it to death.

These dogs are much used in the north of England, and on champion ground, rather than bushy and woody places, and by horsemen, more than footmen.—If at any time he happen to take a wrong way, upon the usual sign made by his master, he immediately returns, takes the right and ready course, beginning his chase afresh, with a clear voice and swift foot, following the game with as much courage as at first.

4°. The *blood-bound* differs nothing in quality from the *Scottish flux bound*, saving that it is longer shap'd and not always of the same colour; but sometimes red, fanded, black, white spotted, &c. though most commonly either brown or red.

Their nature is, that being set on by the voice and words of their leader, to cast about for the sitting of the present game, and having found it, they will never cease pursuing it with full cry till it be tired, without changing for any other.

They seldom bark, except in their chase, and are very obedient and attentive to the voice of their leader.—Those that are really good, when they have found the hare, make show thereof to the huntsman by running more speedily, and with gesture of head, eyes, ears, and tail, winding to the

form or hare's muse, never giving over prosecution, and running with a gallant noise.

They have good and hard feet, and flatly stomachs; and are very properly denominated *Janginary* or *blood-hounds*, by reason of their extraordinary scent; for if their game be only wounded, so that it escapes the huntman's hands, or if it be killed, and never so cleanly carried away, these dogs, by their exquisite smell, will discover it, and not be wanting, either by nimbleness or greediness, to come at it, provided there be any stains of blood.—Nay, though by all the cunning and foresight imaginable, a beast be conveyed away without spot or blood, yet through the roughest and most crooked ways and meanders, will this dog find out the deer-stealer, and even in the thickest throng, will, by his smell, separate and pick him out.

5°. The *terrier*, or *terrier*, only hunts the fox or badger; being thus called, because, after the manner of a ferret in searching for coney, he leaps into the ground, and affrights or attacks the beasts, either tearing them in pieces, or halting them out by force; or, at least, driving them out of their harbours to be taken in a net, or otherwise.

The huntmen have commonly a couple of *terriers*, that they may put in a fresh one, as occasion serves, to relieve the other.

The time of entering the *terrier*, is when he is near a twelve-month old: if it be not done within that time, he will hardly be brought to take the earth. This entering and fleshing of them may be performed several ways.—First, when the foxes and badgers have young cubs, take an old *terrier*, set him into the ground, and when he begins to bay, hold the young one at the hole or mouth of the earth, that he may listen and hear the old one's bay.

The old fox or badger being taken, so that nothing remains within but the cubs, couple up the old ones, and put in the young in their steads, encouraging them by crying, To him, To him.—If they take any cub within, let them do with it what they list; not forgetting to give the old *terriers* their reward, which is blood and livers, fried with cheefe and some of their grease; shewing them all heads and skins to encourage them.

HOURLY, *ORA, Hora*, an aliquot part of a natural day, usually a 24th, sometimes a 12th.

* The origin of the word *hora*, or *age*, comes according to some authors, from a surname of the sun, the father of *hours* whom the Egyptians call *horus*. Others derive it from the Greek *ἡσθη*, to terminate, distinguish, &c. Others, from the word *horis*, urine; pretending that Trimegistus was the first that settled the division of *hours*, which he did from observation of an animal consecrated to Serapis, named the *syncephalus*, which makes water twelve times a day, and as often in the night, at equal intervals.

An *hour*, with us, is a measure or quantity of time, equal to a 24th part of the natural day, or nycthemeron or it is the duration of the 24th part of the earth's diurnal rotation. Fifteen degrees of the equator answer to an *hour*; though not precisely, but near enough for common use.

The hour is divided into 60 minutes; the minute into 60 seconds, &c.

The division of the day into *hours* is very ancient; as is shown by Kircher, *Oedip. Egypt.* Tom. II. P. II. class VII. c. 8. Though the passages he quotes from scripture do not prove it.—The most ancient *hour* is that of the 12th part of the day. Herodotus, Lib. II. observes, that the Greeks learnt from the Egyptians, among other things, the method of dividing the day into twelve parts.

The astronomers of Cathaya, &c. bishop Beveridge observes, still retain this division. They call the *hour chog*; and to each *chog* they give a peculiar name, taken from some animal: The first is called *zeth*, mouse; the second *chin*, bullock; the third *zen*, leopard; the fourth *man*, hare; the fifth *chin*, the crocodile, &c.

The division of the day into twenty four *hours*, was not known to the Romans before the first Punic war.—Till that time they only regulated their days by the rising and setting of the sun.

They divided the twelve *hours* of their day into four, *viz. prime*, which commenced at six o'clock; *third* at nine, *sixth* at twelve, and *nine* at three. They also divided the night into four watches, each containing three *hours*.

There are divers kinds of *hours*, used by chronologers, astronomers, dialists, &c.—Sometimes, *Hours* are divided into *equal* and *unequal*.

Equal Hours, are the 24th part of a day and night precisely; that is, the time wherein fifteen degrees of the equator mount above the horizon.

These are also called *equinoctial hours*, because measured on the equinoctial; and *astronomical*, because used by astronomers.

They are also differently denominated, according to the manner of accounting them in different countries.

Astronomical Hours are equal *hours*, reckoned from noon, or mid-day, in a continued series of twenty four.

Babylonish Hours are equal *hours*, reckoned from sun-rise in a continued series of twenty-four.

European Hours are equal *hours*, reckoned from mid-night; twelve from thence to noon, and from noon to mid-night twelve more.

Jewish, or *planetary* or *ancient Hours*, are twelfth parts of the artificial day and night.

Hence, as it is only in the time of the equinoxes that the artificial day is equal to the night, it is then only that the *hours* of the day are equal to those of the night: At other times they will be always either increasing or decreasing.

They are called *ancient* or *Jewish hours*, because used by the ancients, and still among the Jews. They are called *planetary hours*, by reason the astrologers pretend, that a new planet comes to predominate every *hour*; and that the day takes its denomination from that which predominates the first *hour* thereof: as, Monday from the moon, &c.

Italian Hours are equal *hours*, reckoned from sun-set, in a continued series of twenty-four.

Unequal or *temporary Hours*, are 12th parts of the artificial day and night.—The obliquity of the sphere renders these more or less unequal at different times; so that they only agree with the equal *hours* at the times of the equinoxes.

HOURS, HORÆ, in the ancient mythology, were certain goddesses, the daughters of Jupiter and Themis; at first only three in number, *Eunomia*, *Dice*, and *Irene*: to which were afterwards added two more, *Carpo* and *Thalote*.

Homer makes them the door-keepers of heaven. Ovid allots them the employment of harnessing the horses of the sun: *Jungere equos Titan velocibus imperat Horis.*

Hours, Horæ, in the Romish church, are certain prayers performed at stated times of the day; as *matins*, *vespers*, *lauds*, &c.

The lesser *hours*, are *prime*, *terce* *sixth*, and *nona*.—They are called *hours*, or *canonical hours*, as being to be rehearsed at certain *hours* prescribed by the canons of that church, in commemoration of the mysteries accomplished at those *hours*. These *hours* were anciently also called *curse cursus*; F. Maillon has a dissertation on them, entitled, *De Cursu Galliano*.

The first constitution enjoining the observation of the canonical *hours*, is of the ninth century, being found in a capitular of Heito, bishop of Basil, directed to his curates, importing, that the priests shall never be absent at the canonical *hours* either by day, or night.

Prayers of forty Hours, are public prayers continued for the space of three days successively, and without intermission, before the holy sacrament, to obtain the assistance of heaven on some important occasion.

In these days, care is taken, that the holy sacrament be exposed forty *hours* viz. thirteen or fourteen *hours* each day.

HOUR-CIRCLES, or HORARY Circles, in astronomy, &c. are great circles, meeting in the poles of the world, and crossing the equinoctial at right angles; the same as *meridians*.

They are supposed to be drawn through every 15th degree of the equinoctial and equator, and on both globes are supplied by the meridian, *hour-circle*, and index. See **GLOBE**.

The planes of the *hour-circles* are perpendicular to the plane of the equinoctial, which they divide into 24 equal parts.

HOUR-GLASS, a popular kind of chronometer or clepsydra, serving to measure the flux of time, by the descent or running of sand out of one glass vessel into another.

The best *hour-glasses* are those, which, instead of sand, have egg-shells well dried in the oven, then beaten fine and sifted.

Hour-glasses are much used at sea for reckoning, &c.

There are also a sort of *hour-glasses*, which depend on the flux of water or some other liquid, more properly called *clepsydra*. See **CLEPSYDRA**.

HOUR-LINES, on a dial, are lines which arise from the intersections of the plane of the dial, with the several planes of the *hour-circles* of the sphere, and therefore must be all right lines. See **DIAL**.

HOUUSAGE, a fee which a carrier, or other person pays for laying up goods in a house.

HOUSE, Habitation; a place built with conveniencies to live in; or a building wherein to shelter a man's person and goods from the inclemencies of the weather, and the injuries of ill-disposed persons.

We say a brick *house*, a stone *house* a *house* of two stories, of three stories, a manor *house*, a farm *house*, &c. Ancient Rome consisted of 48000 *houses* all insulated or detached from one another.

A pleasure *house* or country *house*, is that built for a person to enjoy and divert himself occasionally in. This is the *villa* of the ancient Romans; and what in Spain and Portugal they

call *quinta*; in Provence, *caffine*; in some other parts of France, *chferie*; in Italy, *vigna*.

The word *vigna* is itself sometimes used in English to denote the country seats of the noble Romans; as the *vigna Farnese*, *vigna Borghese*, &c.

The citizens of Paris have also their *maisons de bouteilles*, *bottle-houses*, to retire to, and entertain their friends; which, in Latin, might be called *micæ*: the emperor Domitian having a *house* built for the like purpose, mentioned under this name by Martial, Lib. II. Epig. 59.

It is a thing principally to be aimed at, in the site or situation of a country *house* or seat, that it have wood and water near it: If it cannot be conveniently built among trees, yet there are few places where trees may not be speedily raised about it.

It is far better to have a *house* defended by trees than hills; for trees yield a cooling, refreshing, sweet, and healthy air, and shade, during the heat of the summer, and very much break the cold winds and tempests, from every Point in the winter.—The hills, according as they are situated, defend only from some certain winds; and if they are on the north side of the *house*, as they defend from the cold air in the winter, so they also deprive you of the cool refreshing breezes, which are commonly blown from thence in the summer.—And if the bills are situated on the south side, it then proves also very inconvenient.

A *house* should not be too low seated, since this precludes the convenience of cellars.—If you cannot avoid building on low grounds, set the first floor above the ground the higher, to supply what you want to sink in your cellar in the ground; for in such low and moist grounds, it conduces much to the driness and healthiness of the air, to have cellars under the *house*, so that the floors be good and celled underneath. *Houses* built too high, in places obvious to the winds, and not well defended by hills or trees, require more materials to build them, and more also of reparations to maintain them; and they are not so commodious to the inhabitants as the lower built *houses*, which may be built at a much easier rate, and also as compleat and beautiful as the other.

In buildings or *houses* not above two stories with the ground room, and not exceeding twenty foot to the raison-place, and upon a good foundation; the length of two bricks, or eighteen inches for the heading course, will be sufficient for the ground work of any common structure, and six or seven courses above the earth to a water-table, where the thickness of the walls is abated, or taken in, on either side the thickness of a brick, namely two inches and a quarter.

For large and high *houses*, or buildings of three, four, or five stories with the garrets, the walls of such edifices ought to be from the foundation to the first water-table, three heading courses of brick, or twenty eight inches at least; and at every story a water-table, or taking in on the inside for the summers, girders, and joints to rest upon, laid into the middle, or one quarter of the wall at least, for the better bond.—But as for the innermost or partition wall, a half brick will be sufficiently thick; and for the upper stories, nine inches, or a brick length, will suffice.

The parts, proportions, &c. of the *houses* in London, are regulated by a statute made for rebuilding the city after the fire.—By this it is enacted, That the *houses* of the first and least sort of building, fronting bye-streets or lanes, shall be two stories high besides cellars and garrets; the cellars six foot and an half high, if the springs of water hinder not; and the first story nine foot from the floor to the ceiling, and the second story as much: That all the walls in front and rear be, as high as the first story, full the thickness of the length of two bricks: and thence upwards to the garrets, of the thickness of one brick and an half; and that the thickness of the garret walls on the back part, be left to the discretion of the builder, so that the same be not less than one brick length; and that the thickness of the party wall in the garret, be of the thickness of the length of one brick at least.

—That the *houses* of the second sort of buildings, fronting freets, and lanes of note, and the river of Thames, consist of three stories high, besides cellars and garrets; that the cellars thereof be six foot and an half high, if the springs hinder not; that the first story contain full ten foot in height from the floor to the ceiling; the second ten foot, the third nine foot; that all the said walls in the front and rear, as high as the first story, be two bricks and a half thick, and from thence upward to the garret floor of one brick and an half thick; and the thickness of the garret walls on the back part, be left to the discretion of the builder, so that the same may not be less than one brick thick: And also that the thickness of the party walls between every *house* of this second and larger sort of building, be two bricks thick as high as the first story, and thence upward to the garrets of the thickness of one brick and an half.

Also, that the *houses* of the third sort of buildings, fronting the high and principal freets shall consist of four stories high, besides cellars and garrets; that the first story contain full ten

foot in height from the floor to the ceiling, the second ten foot and an half, and the third nine foot, the fourth eight foot and an half; that all the said walls in front and rear, as high as the first story, be two bricks and an half in thickness, and from thence upwards to the garret floor, of the thickness of one brick and an half; and that the thickness of the garret walls on the back part, be not less than one brick; and also that the party walls between every house of this third and larger sort of building, be two bricks thick as high as the first floor, and thence upwards to the garret floor one brick and an half.

Also, that in all houses of the fourth sort of buildings, being mansion houses, and of the greatest bigness, not fronting any streets or lanes as aforesaid, the number of stories, and the height thereof, shall be left to the discretion of the builder, so as he exceed not five stories.

The same act also enjoins, that no timber be laid within twelve inches of the fore side of the chimney jambs; and that all joists on the back of any chimney, be laid with a trimmer, at six inches distance from the back; as also, that no timber be laid within the tunnel of any chimney, upon penalty to the workman for every day's default, of 10 s. and 10 s. every week it continues unreformed.

Add, That as the buildings of London join one upon another, and almost every several house hath a distinct proprietor; the parliament hath decreed, that the wall dividing the proprietors grounds, should be built at the equal charge of both the owners: whence it may not be impertinent to shew how these party walls are valued.

All brick-works, whether one, two, three, four, or any other number of brick lengths in thickness, are to be reduced to the thickness of a brick and a half.

It hath been observed, that about 4500 bricks, of about 16 s. per thousand a hundred and a quarter of lime, at 10 s. per hundred; and two loads and a half of sand, at 3 s. per load, will completely raise one rod of brick-work of a brick and a half thickness.

And thus much will a rod of party wall, the materials only, reduced to a brick and half thick, amount to, at the former supposed rates; to which may be added, for workmanship, 1 l. 8 s.

So that for every rod of party wall, they allow 3 l. apiece; whence, if a party wall be measured, and the measure when reduced to a brick and a half, be found to contain sixteen rods; that sixteen multiplied by 3 l. giveth 48 l. and so much is the one proprietor to allow the other.

Town-House, or Hall, is a place where the officers and magistrates of a town or city hold their meetings, for the due administration of their laws and policy. See **HALL,** and **GUILD.**

Work-House. See **WORK-HOUSE;** see also the article **RASPHUSES.**

HOUSE is also used for a convent or monastery.

The chief abby of such an order has so many houses dependent on it.—There have been reforms made of several religious houses.

Regular priests give the name *houses* to the places they reside in, and not that of convents or monasteries, which properly belong to simple friars.—Thus we say, the *Jesuits house*, and the *Barnabites or Theatins house*.

The Jesuits have both professed houses, and colleges for novices, which they call *houses of probation*.

They have also houses of retreat for spiritual exercises, where they receive secular persons and ecclesiastics, disposed to practise the same with them, for eight or ten days.

HOUSE is also used for one of the estates of the kingdom assembled in parliament.

Thus we say, the *house of lords*, the *house of commons*, &c. See **PEERS,** and **COMMONS.**

HOUSE is also used for a noble family; or a race of illustrious persons issued from the same stock. See **GENEALOGY.**

In this sense we say, the *house* or family of the Stuarts, the Bourbons, the *house* of Hanover, of Austria, of Lorain, of Savoy, &c.

HOUSE, in astrology, a *dodecatemery*, or twelfth part of the heavens. See **DODECATEMERY.**

The division of the heavens into *houses* is founded on this, that the stars and planets when found herein are supposed to have certain influences, either good or evil, upon sublunary bodies; and to each *house* is assigned its particular virtue or influence; upon the consideration whereof they draw horoscopes. See **HOROSCOPE.**

This division is made by six great circles, called *circles of position*, which cut each other in the common intersection of the meridian and horizon, in the ordinary way of domifying, which is that of Regiomontanus: for the antients had three other ways.

These circles divide the equator into twelve equal parts, of

30 degrees each, without any regard to the zodiac.—The horizon and meridian are two circles of the celestial *houses*, which divide the heavens into four equal parts, each whereof comprehends three *houses*.—There are six above the horizon, and as many below it; and six eastern and six western *houses*.

The scheme or figure of the heavens consists of twelve triangles, which are likewise called *houses*; wherein are laid down the stars, signs, and planets, comprized within the respective spaces of the circles of position.

Each planet has two certain *houses*, wherein they say it exerts itself with peculiar vigour; Leo is the Sun's *house*, and Cancer that of the Moon; Capricorn is Saturn's, &c.

Some call the *houses, dodecatemeries*; but that name is more immediately appropriated to the twelve signs or divisions of the zodiac. See **DODECATEMERY.**

The astrological *houses* have their particular names according to their qualities.—The first is the *house of life*; being the ascendant, and containing five degrees above the horizon, the rest beneath it. The second is the *house of riches*. The third, is the *house of brothers*. The fourth, in the lowest part of heaven, the *house of relations*, and angle of the earth. The fifth, the *house of children*. The sixth, the *house of health*. The seventh, the *house of marriage*, and the angle of the west. The eighth, the *house of death*, and upper gate. The ninth, the *house of piety*. The tenth, the *house of offices*. The eleventh, the *house of friends*. And the twelfth, the *house of enemies*.

It is popularly, and, as it were, poetically said, that the sun has twelve *houses*; by which are meant the twelve signs; though, in reality, it has only one sign; viz. Leo: beside, the division of *houses* is accommodated to the equator, and not the zodiac.

They begin numbering the *houses* with the ascendant, and pass thence to the imum cœli; so that the vertical point makes the beginning of the tenth.

HOUSE-BOAT, Estovers; or an allowance of timber out of the lord's wood, for the repair, and upholding a *house*, or tenement.

Some make *house-bote* twofold, viz. *Estoverium ad faciendum & arandum*. See **ESTOVERS.**

HOUSE-ROBBERING, or **HOUSE-BREAKING,** the robbing or plundering a man in some part of his *house*, or his booth, or stall in a fair or market; the owner, or his wife, children, or servants, being within the same.

This was made felony by stat. 23 Hen. VIII. and 3 Ed. VI. but it is since also made felony, though none be within the *house*, 26 Eliz. See **BURGLARY.**

HOUSE-WIFE'S CLOTH, is a middle sort of linnen cloth between fine and coarse, fit for family uses.

HOUSHOLD, the family or domestics of a prince or private person.

The civil government of the king's court belongs chiefly to the lord steward of the *household*. He has authority over all officers and servants of the king's house, except those of the chapel, chamber, and stable, who are under the jurisdiction of the lord chamberlain, master of the horse, and dean of the chapel.

Under the lord steward are a treasurer of the *household*, comptroller, cofferer, master of the *household*, clerks of the green cloth, &c.

The troops of the *household* are the horse guards, horse grenadiers, and foot guards.—The *household* troops of France are called the *gendarmerie*.

HOUSEHOLD DAYS, are four solemn festivals in the year, when the king after divine service offers a bequest of gold to God on the altar. See **BESANT.**

These *household days* are *Christmas, Easter, Whitfunday,* and *All-Saints.*

The *household days* are a part of the twelve collar and offering days.

HOUSING*, or **HOUSSE,** a cover laid over the saddle of a horse in order to save it from the weather, dirt, &c.

* The word is formed of the French *housser*, which signifies the same thing; though it antiently denoted a kind of hood, wore by country people.

The cavaliers appeared with their embroidered *houssings*.

BOOT HOUSING, is a piece of stuff fastened to the hinder part of the saddle, that covers a horse's croupe; either for the sake of ornament, to hide the horse's leanness, or to save the clothes of the rider from being daubed and soiled by the sweat of the horse.

SHOE HOUSING, a piece of cloth bordered with a fringe, oftentimes put round the saddle, to cover the croupe, and hang down to the lower part of the belly, to save the stockings of those that ride without boots.

HOW, among gardeners. See the article **HOE.**

HOWKER, or **HOOKER,** vessel much used by the Dutch; bulk,

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built something like a pink, but rigged and masted like a hoy. *Howkers* carry from fifty to two hundred tun; and with a small number of hands will go to the East-Indies.

They tack soon and short, will sail well, and lie near the wind; and live almost in any sea.

HOY, a small vessel or bark, whose yards are not across, nor the sails square, like those of ships, but the sails like a misen, so that the can sail nearer the wind than a vessel with cross sails can do.

HOYSE, or **HOISE**, the sea word for haling up any thing into the ship; or getting up a yard, &c.

Thus they say *hoise* up the yard, *hoise* the water in, &c.

HOZING of *Dogs*, the cutting out the balls of their feet. See **EXPEDITATING**.

HUCKLE Bone, the hip bone. See **COXE** Os.

HUCKSTER, one that sells provisions or small wares by retail.

HUDSON'S-BAY Company. See the article **COMPANY**.

HUE and **CRY**, the pursuit of one who has committed felony, &c. on the highway.

If a party robbed, or any in the company of one murdered or robbed, come to the constable of the next town, and require him to raise *hue and cry*, or to pursue the offender, describing him, and shewing, as near as he can, which way he is gone: the constable is forthwith to call for aid from the parish to seek the felon: and if he is not found there, he is to give the next constable warning; till he be apprehended, or at least pursued to the sea-side.

The Normans had a pursuit with a cry after offenders, not unlike this; which they called *clamor de baro*. See **CLAMOR** de baro.

Hue is also used alone, ann. 1 Edw. I. stat. 2.—In ancient records it is called *hutesum* & *clamor*.

HUERS. See the article **CONDERS**.

HUG, or *Cornish* **HUG**, a term used in wrestling, when one has an adversary on his breast, and holds him fast there.

HUGUENOTS, an appellation given by way of contempt to the Reformed, or Calvinists of France.

The name had its first rise in 1560; but authors are not agreed as to the origin and occasion thereof. Pasquier, Menage, &c. give us divers etymologies, but none of them are stuck to.

Du Verdier derives it from John Hus, whose opinions the *huguenots* chiefly receive, and *guenon*, ape, q. d. Hus's apes. See **HUSSITES**.

Coquelle deduces the name from *Hugues Capet*, whose right of succession to the crown, the Calvinists maintained against those of the house of Guise, who pretended to be the successors of Charlemaign.

Others derive it from one *Hughes*, or *Hugh*, a Sacramentarian, who had asserted much the same doctrines as the *huguenots*, under Charles VI.

Others fetch it from the Swiss word *hensquenaux*, i. e. felicitous people; or from *cidgnossen*, i. e. allies, or associates in faith, which is the opinion Maimbourg most inclines to; who hence concludes, that *huguenot* is originally no term of reproach.

Castelnau Maurissiere, in his *Memoirs*, will have the *huguenots* to have been thus called by the populace, to denote them of less value than a little piece of money of the same name, being a maille, or farthing; which, in the time of Hugh Capet, was called *huguenot*, q. d. not worth more than a farthing.

Others take the name to have been first given by way of derision to a certain German Protestant, who being taken and examined as to the conspiracy of Amboise, before the cardinal de Lorraine, was confounded and stopped short in the beginning of his harangue, which began with *Huc nos venimus*. But the most plausible opinion is that of Pasquier, who observes, that at Tours the people have a notion of a sprite or goblin, called *king Hugon*, who strols about in the night time; whence, as those of the religion met chiefly in the night time to pray, &c. they call them *huguenots*; q. d. disciples of king Hugon: for it was at Tours that they were first thus denominated.—This opinion F. Daniel assents to.

HUISSIER, a French name for an *usher*, *serjeant*, or *beadle*.

HULKS, are large vessels, having their gun-decks from 113 to 150 feet long, and from 31 to 40 feet broad.—They will carry from 400 to 1000 tuns.

Their chief use is for setting masts into ships, and the like.

Antiently, the word *bulka* seems to have signified a *small vessel*.

HULL of a Ship, is her main body, without any masts, yards, sails, or rigging.—See *Tab. ship. fig. 1. lit. A to R*.

To **HULL**, or *lie a HULL*, is understood of a ship, when, either in a dead calm, or in a storm, she cannot carry all her sails, but they are taken in to preserve them; so that nothing but her masts, yards, and riggings are abroad, and her helm tied down to the lee-side of the ship.—In this state she will lie easily under the sea, if she be a good sailor; and make her way one point before the beam.

HUM

To **strike a HULL**, is to lie closely or obscurely in the sea in a storm, or to tarry for some comfort, bearing no sail, with the helm lashed a-lee.

HUMAN, something that relates to man, or the nature of man. See **NATURE**.

The *human* body is the subject of medicine.

Epicurus and his followers deny that the gods concern themselves with *human* affairs.

Faith is distinguished into divine and *human*.

HUMANITY, the nature of man, or that which denominates him *human*.

Nestorius would not allow the infirmities of *humanity* to be attributed to the Deity; nor the attributes of the Deity to *humanity*.

HUMANITIES is used plurally, for the *humaniores literæ*, i. e. the study of the Greek and Latin tongues, grammar, rhetoric, poetry, and the antient poets, orators, and historians. Such a student has gone through his *humanities* with applause.—Calvin performed his *humanities* in the college de la Marche at Paris.

HUMECTATION*, *Moisistening*, in pharmacy; the preparing of a medicine, by steeping it awhile in water, in order to soften and moisten it when too dry; or to cleanse it, or to prevent its subtle parts from being dissipated in grinding or the like.

* The word is Latin, *humectatio*, formed of *humor*, moisture.

HUMECTATION is also used for the application of moistening or suppling remedies.

In this sense we say, embrocations, emplaisters, unctions, *humectations*, fomentations, &c.

HUMERUS, or *Os HUMERI*, in anatomy, the uppermost bone of the arm, popularly called the *shoulder bone*; extending from the scapula, or shoulder-blade, to the upper end of the cubitus, or elbow.—See *Tab. Anat. (Ofseol.) fig. 3. n. 6. fig. 7. n. 8. fig. 3*.

The *humerus* is a large, long, round fistular bone, of a pretty hard, compact substance; and its inward cavity, which contains the marrow, is considerably long and large.

At its upper end it has a large round head, which is covered with a very smooth cartilage and is received into the cavity of the scapula, which makes a juncture per Arthrodiam.—This head of the bone being much larger than the socket into which it is received, the part extant is strictly embraced by a ligament, one edge of which is fastened to the margin of the cartilaginous socket of the scapula, and the other to the lower part of the head of this bone, hereby uniting them firmly together; yet so as to leave the motion the freest of all the articulations of the body, and therefore the bone very liable to dislocations.

At the lower end of the *humerus* are two processes, covered each with a cartilage; the external and left receiving the extremity of the radius; and the internal, the head of the cubitus.

On the outside of each of these processes is a small eminence, to which are fastened the ligaments and heads of the muscles that move the carpus and fingers.

In this bone are also three funis's; one on the fore side of the large process, receiving a process of the cubitus; another on the back part which receives the olecranon; and the third, a small femilar one between the two processes, answering to the eminence of the finus of the cubitus.

The later anatomists allow this bone five different motions, *viz.* upwards, downwards, forwards, backwards, and rotatory; and five pair of muscles for performance of the same, *viz.* the deltoides, teres, pectoralis, infra-spinatus, subscapularis, &c. See each under its proper article.

HUMID, **HUMIDUM**, *Moist*.

The school philosophers make water the *primum humidum*, the first of *humid* bodies, and the cause or principle of humidity in others, which are more or less moist, as they partake more or less of this element.

HUMIDITY, *Moisture*; the quality or power of wetting, or moistening other bodies.

Aristotle defines *humidity*, by a passive quality which indispotes a body from being retained within its own bounds, but makes it easily retained in those of another: which amounts to the same as his definition of fluidity.

Others of the peripatetic school, define *humidity* a quality whereby a body becomes humid, i. e. disposed to moisten other bodies, and in moistening, to soften and dispose them to receive any figure, or impression.

Modern writers consider *humidity* as a particular species of fluidity; and define it a fluid, which being applied to a solid body, adheres thereto, and communicates the quality to other bodies. Others, somewhat more accurately, call *humidity* the power whereby a body moistens another: but what that power is, they do not shew.

But

But of this we are certain, *humidit* is only a fort of relative mode.—So far as the component particles of a fluid, compared with respect to the pores and particles of other bodies, or the texture thereof, are apt and disposed to enter those pores, or stick to those particles; so far is that fluid humid: on the contrary, so far as there is a repugnance or incongruity between the particles, &c. in respect of such bodies, the fluid is not humid.

Thus quicksilver is not moist in respect to our hands or clothes, and other things, which it will not stick to; but it may be called *humid*, in reference to gold, tin, or lead, to whose surfaces it will presently adhere, and render them soft and moist.—Even water itself, which wets almost every thing and is the great standard of moisture and *humidit*, is not capable of wetting all things; for it stands, or runs off in globular drops from the leaves of cabbages, and many other plants; and it will not wet the feathers of ducks, swans and other water fowl.

Add, that the texture alone may cause the fluid to be humid, as is plain, in that neither quicksilver, lead, or bismuth alone will stick upon glass; yet being mixed together, they will form a mass that will do so; as appears from such a composition being frequently used in foliating looking-glasses.

HUMIDUM Radicale, or Radical Moisture.

This, in reality, seems to amount to no more than the purest and most defecate part of the nutritious matter, in a condition ready to be assimilated.

By too much heat, as in fevers, hectic, &c. this *humidit* is too hastily exhausted and spent.

HUMILIATION, the act of humbling, i. e. of abating a person's pride, and bringing him lower in his opinion.

In this sense, *humiliation* stands distinguished from mortification: *humiliation* brings down the mind; mortification subdues the flesh.

HUMILIS Musculus. See the article EYE.

HUMOR, or HUMOUR. See the article HUMOUR.

HUMORISTS, or *Humoristi*, the title of a celebrated academy of learned men at Rome.

The academy of *humorists* was established by Paul Mancini, who made use of Gaspar Salviani to assemble together all the men eminent for learning about Rome, and form them into a society; as is observed by Janus Nicius, in his elogy of Salvinius, Part I. p. 32.

The device of this academy is a cloud, which being raised from the salt water of the sea, returns again in fresh water; with this hemistic of Lucretius, Lib. VI. *Redit agmine dulci.* Jerom Alexander, a *humorist*, has three express discourses on this device.

The obsequies of M. Peiresc were celebrated in the academy of the *humorists*, whereof he was a member, in above forty different languages. Gassend. *Vita Peiresk.* L. VI. p. 399.

HUMOROSI, the name of an academy established at Cortona in Italy.

The *humorosi* of Cortona must not be confounded with the humoristi of Rome. See HUMORISTS.

HUMOUR, or HUMOR, in its general sense, signifies the same as *liquor*, or *liquid*. See LIQUID.

HUMOUR, in medicine, is applied to any juice, or fluid part of the body, as the chyle, blood, milk, fat, serum, lymph, spirits, bile, feces, salivary and pancreatic juices, &c. See each of these under its proper head, CHYLE, BLOOD, BILE, &c.

The four *humours*, so much talked of by the ancient physicians, are four liquid substances which they suppose to moisten the whole body of all animals, and to be the cause of the divers temperaments thereof.

These are *phlegm*, *blood*, *bile*, and *melancholy*. But the moderns do not allow of these divisions. The *humours* they rather chuse to distinguish into *nutritious*, called also *elementary*, as chyle and blood; those separated from the blood, as bile, saliva, urine, &c. and those returned into the blood.

Humours, again, are distinguished into *natural* or salutary, and *morbid*, or corrupted.—To the former class belong all the juices ordinarily secreted for the uses of the body.

To the latter belong those compound *humours*, which thickening and growing putrid, cause tumors, abscesses, obstructions, and most diseases.

These are distinguished by various names, *malignant*, *adust*, *acrimonious*, *corrosive*, *crude*, *peccant*, &c.

HUMOUR is also used for the particular temperament or constitution of a person, considered as arising from the prevalence of this or that *humour*, or juice of the body.

Thus we say, a bilious, choleric *humour*; a phlegmatic *humour*; a melancholic, hypochondriac *humour*; a sanguine, gay, sprightly *humour*, &c.

HUMOURS of the Eye.—Anatomists and opticians distinguish three particular *humours* of the eye, which they call the *aqueous*, *crystalline*, and *vitreous*.

The *aqueous*, or watry *humour*, is placed in the anterior or fore part of the eye, which it possesses; and is thus called, because clear and fluid like water.

The *crystalline humour* is placed between the other two; and is thus called from its solidity and transparency, resembling that of a crystal.

The *vitreous*, or glassy *humour*, fills the posterior part of the eye; and is denominated from its resemblance of melted glass.

These three *humours* have each their share in the refraction of the rays of light necessary to vision.

Authors, both ancient and modern, speak of the regeneration of the *humours* of the eye; and give us instances of their reproduction, when by any accident they had been let out. But their instances strictly considered generally go no farther than to the aqueous and vitreous *humours*.

Borri only, in a letter to Bartholine, says as much of the crystalline.—He affirms, that he has lit the pupil of the eye of divers animals, and squeezed out all the *humours*, even the crystalline, and has afterwards perfectly restored them again to sight; and that the eyes of the birds, whereon the operation had been performed, instead of being damaged thereby, were rendered more lively and vigorous than usual. He adds, that he had performed the same experiment on divers persons, with so much success, that there remained not the smallest appearance of a cicatrix in the eye. See CATABACT.

HUMOUR is also used in dramatic poetry, for a subordinate or weaker species of what the critics call *manners*.

Humour is usually looked on as peculiar to the English drama; at least, our comic poets have excelled therein, and carried it beyond those of any other nation: and ours is perhaps the only language that has a name for it.

Humour is usually considered by critics, as a fainter or weaker habitual passion peculiar to comic characters, as being chiefly found in persons of a lower degree than those proper for tragedy.

Every passion may be said to have two different faces, one that is serious, great, formidable, and solemn, which is for tragedy; and another that is low, ridiculous, and fit for comedy; which last is what we call its *humour*.

Wit only becomes few characters: it is a breach of character to make one half the persons in a comedy, or indeed in any comedy, talk wittily and finely; at least at all times, and on all occasions.—To entertain the audience, therefore, and keep the dramatic persons from going into the common, beaten, familiar ways and forms of speaking and thinking, recourse is had to something to supply the place of wit, and divert the audience, without going out of character: and this does *humour*; which therefore is to be looked on as the true wit in comedy.

A very good judge, the duke of Buckingham, makes *humour* to be all in all: wit, according to him, should never be used, but to add an agreeableness to some proper and just sentiment, which, without some such turn, might pass without its effect.

HUNDRED, *Centum*, *Cent*, the number of ten times ten, or the square of ten.

The place of *hundreds* makes the third in order in the Arabic numeration.

We usually express the quantity or proportion of the profits made in the way of commerce, &c. by the *hundred*.—They ask two and a half *per cent.* or in the *hundred*, for remitting money to such a city. The legal interest of money is *five per cent.* or five pounds in the *hundred*.

HUNDRED is also used as a measure, to express a certain quantity, or number of things.—A *hundred* of salt at Amsterdam, is fourteen tuns.

Deal boards are sold at six score to the *hundred*, called the *long hundred*.—Pales and laths are counted at five score to the *hundred*, if five foot long, and six score if three foot long.

HUNDRED Weight, or the great hundred. See QUINTAL.

HUNDRED, HUNDREDUM, *Centuria*, is also a part or division of a shire, or county. See SHIRE, and COUNTY. It was so called, according to some, because of old each *hundred* found 100 fidejussors or sureties of the king's peace, or 100 able men for his war.

Others rather think it to have been so called, because originally composed of an *hundred* families.—It is true, Brompton tells us, that an *hundred* contains *centum villas*; but then Giraldus Cambrensis writes that the Isle of Man hath 343 *villas*. In both these places the word *villa* must be taken for a country family; for it cannot mean a village, because there are not above forty villages in that island.

So, where Lambard tells us that an *hundred* is so called, a *numerus centum hominum*, it must be understood of an *hundred* men, who are heads and chiefs of so many families.

Hundreds were first ordained by king Alfred, the 29th king of the West Saxons: *Alfredus rex* (says Lambard, *verbo centuria*)

(*uria*) ubi cum Gutbruno Dano factus inerat, prudentissimum olim a Fetrone Moysi datum secutus consilium, Angliam, primum in satrapias, centurias, & decurias partitius est.---Satrapiam, sive, a Scyrian, (quod partiri significat) nominavit, centuriam hundred; & decuriam, ut sibi sicut tennantale, i. e. decemvirale collegium, appellavit; atque isdem nomen vel hodie vocantur, &c. See COUNTY, and TITHING. This dividing of counties into hundreds, for the better government, king Alfred borrowed from Germany, where *centa* or *centina* is a jurisdiction over an hundred town.

Such is the original of *hundreds*, which still retain the name; though their jurisdiction be devolved to the county-court, some few excepted, which have been by privilege annexed to the crown, or granted to some great subject, and so remain still in the nature of a franchise.

This has been ever since the stat. 14 Edw. III. whereby these *hundred* courts, formerly farmed out by the sheriff to other men, were all, or most part, reduced to the county-court, and so remain at present: so that where we read now of *hundred* courts, they are to be understood of several franchises, wherein the sheriff has nothing to do by his ordinary authority, except they of the *hundred* refuse to do their office.

HUNDRED, or **HUNDREDUM**, is sometimes also used for an immunity or privilege, whereby a man is quit of the *hundred*-penny, or custom due to the *hundred*.

HUNDRED-LASH, signifies the *hundred* court; from which all the officers of the king's forest were freed by the charter of Canutus.

HUNDRED SUIT, the payment of personal attendance, ordering suit, and service at the *hundred* court.

HUNDREDERS, or **HUNDREDORS**, **HUNDREDARII**, are men impanelled, or fit to be impanelled, of a jury, upon any controversy, dwelling within the *hundred* where the land in question lies.

HUNDREDER is also used for him who hath the jurisdiction of an *hundred*, and holds the *hundred* court. See **HEADBOROUGH**. Sometimes it is also used for the bailiff of an *hundred*. See **BAILIFF**.

HUNGARY Water, *Aqua HUNGARICA*, a distilled water, so denominated from a queen of Hungary, for whose use it was first prepared.

Hungary water is one of the distilled waters of the shops; and is directed in the college dispensatory, to be made of rosemary flowers infused some days in rectified spirit of wine, and the spirit then distilled.

It is an agreeable perfume, and its virtues are much the same as those of the simple it is drawn from. See **ROSEMARY**.

HUNGER, *Fames*, a natural appetite or desire of food. *Hunger* is properly distinguished into *natural* and *animal*: *natural hunger* is an irritation of the stomach, occasioned by fasting; *animal hunger* is the sensation or perception of that irritation, and the desire of food consequent thereon.

These are various opinions as to the nature, cause and definition of *hunger*; the point having been controverted from Aristotle to our time.---Galen defines it a painful sensation, arising from a divulsion of the stomach; the other Peripatetics call it an appetite or desire of hot and dry: which two systems some authors have endeavoured to reconcile by taking them both in; and accordingly define *hunger* a natural appetite of hot and dry, occasioned by a painful divulsion of the membranes of the stomach, arising from an emptiness thereof.

The modern philosophers speak much more accurately and intelligibly on the point.---*Hunger* is generally considered by them as owing to the sharpness or acrimony of the liquor contained in the stomach, which vellicating the fibres thereof, occasions this uneasy sensation.---They add, that the occasional cause of this vellication, is the emptiness of the stomach, which not furnishing food for the stomach-liquor to be employed on, exposes its inner membrane to the action thereof.

In effect, it is generally agreed, that there is some menstruous juice or humour continually discharged from the excretory ducts of the neighbouring glands into the stomach, to assist in the dissolution and digestion of the food; and that this liquor, after the food is gone, falls upon the stomach itself, and irritates its nerves so strongly, as to propagate the impression to the brain, and thus produce the perception of *hunger*.

This juice some will have to be acid, by reason bodies of that class are used to whet the appetite and excite *hunger*; and that fatty bodies more readily remove it than others, by their adhering to the acid spicula, and blunting the points thereof.

Others, denying the existence of any such stomach-liquor, and accounting for digestion without it; consequently deny *hunger* to have any dependence thereon.---The dry attrition of the coats of the stomach, according to them, is the only cause of it.

On both these principles they say it is that the Indians elude their *hunger*, by swallowing pills made of tobacco leaves and

calcined shells: These pills take away the appetite, both as the tobacco leaves gradually diminish the sensibility of the stomach, and as the calcined shells absorb the salino-acid menstruum. Thus also it is, that poor people frequently smoke tobacco to deceive their *hunger*, not to satisfy it; for tobacco affords no nutriment; but it occasions a plentiful spitting, and by this means discharges the body of the acrid humour which causes *hunger*.

The latter system Dr. Drake thus lays down:---When all the chyme and chyle is pressed out of the stomach, it follows the motions of its contents, and is again, by means of its muscular coat, reduced to a state of contraction, and by that means the inner coat is brought to lay in folds, which touching, and by means of the peristaltic motion, rubbing lightly, upon one another, produce that gentle sense of fretting or vellication, which we call *hunger*, which being felt first in the upper orifice, which is first evacuated, begins there to prompt us to replenish: but as by degrees the remainder of the contents are expelled, this friction or rubbing of the membranes upon each other, spreads gradually over the whole stomach, and renders our *hunger* more urgent and impatient, till, by a new repletion, we take away the cause.

Others think the blood, derived from the adjacent ramifications of the arteries into the stomach, sufficient to account for *hunger*, without the mediation either of the attrition or the menstruum.---The mass of blood itself, they observe, is rendered acid through abstinence from food; its soft balsamic parts having been carried into all parts of the body, and lodged therein as nutriment, to supply the absence of those wore off and exhaled: To which it may be added, that the velocity of the blood is considerably augmented a good while after eating, beyond what it was during the action of digestion.

Hence it is, that persons of a bilious constitution, young people, and those who labour hard, must sooner find themselves *hungry* than others. 2^o. That *hunger*, if it hold long, occasions a violent heat, and even sometimes a fever. 3^o. That those whose humours are crass and viscid, are less incommoded with *hunger* than others.

In effect, we observe, that some animals, whose humours are found to have those conditions, as tortoises, &c. will live a long time without food.---For man, six or seven days are commonly supposed the limit within which, if he take no solid food, he dies; though we have instances of abstinence which far surpasses this. See **ABSTINENCE**, and **FASTING**.

HUNGRY Evil, is an unnatural and over-hasty greediness in a horse, to devour his meat faster than he can chew it; and may be known by his snatching at it as if he would devour it whole.

HUNTING, the art or act of pursuing, and chasing beasts of game. See **GAME**.

In its general sense, *hunting* includes the pursuit both of hairy and feathered game; but in its more proper and restrained signification, it is only applicable to beasts of venery and chase.

F. de Launay, professor of the French laws, has an express treatise of *hunting*.---From those words of God to Adam, Gen. i. 26, and 28. and to Noah, Gen. ix. 2, 3. *hunting* was considered as a right devolved, or made over to man; and the following ages appear to have been of the same opinion. Accordingly we find that among the more civilized nations, as the Persians, Greeks, and Romans, it always made one of their genteeler diversions; and as to the wilder and more barbarous, it served them with food and necessaries.---The Roman jurisprudence, which was formed on the manners of the first ages, made a law of it; and established it as a maxim, that as the natural right of things which have no master, belongs to the first possessor, wild beasts, birds, and fishes, are the property of whoever can take them first.

But the northern nations of Barbarians who over-run the Roman empire, bringing with them a stronger taste for the diversion; and the people being now possessed of other, and more easy means of subsistence from the lands and possessions of those they had vanquished: their chiefs and leaders began to appropriate the right of *hunting*, and, instead of a natural right, to make it a royal one.---Thus it continues to this day; the right of *hunting*, among us, belonging only to the king, and those who derive it from him.

And hence have arisen all our laws and charters of the forest, laws and regulations for preservation of the game. &c. See **FOREST**.

Hunting is practised in a different manner, and with a different apparatus, according to the nature, genius, and address of the particular beast which is the object thereof.---These beasts are the hart, hind, hare, boar, wolf, buck, doe, fox, marten, and roe; the five first whereof are denominated beasts of the forest, or venery, *yssofres*; and the five latter, beasts of the field, or of chase, *campofres*.

The gentlemen and masters of the sport have framed a new set of terms, which may be called the *hunting language*; a little

little view or vocabulary whereof we shall here give the reader.

The terms, then, used for beasts of venery and chase, as they are in company, are these.—They say, *a herd of harts*, and all manner of deer.—*A bevy of roes*.—*A fountainer of swine*.—*A rout of wolves*.—*A riches of martens*.—*A brace or leash of bucks, foxes, or hares*.—*A couple of rabbits or conies*.

There are also terms for their lodging.—*A hart is said to harbour*.—*A buck lodges*.—*A roe beds*.—*A hare seats or forms*.—*A coney fits*.—*A fox kennels*.—*A marten trees*.—*An otter watches*.—*A badger earths*.—*A boar couches*.

Hence, to express their dislodging, they say, *unbarbour the hart*.—*Rouss the buck*.—*Start the hare*.—*Bolt the coney*.—*Unkennel the fox*.—*Trees the marten*.—*Vent the otter*.—*Dig the badger*.—*Rear the boar*.

The terms for their noise at rutting time are as follows:

A hart belletts.—*A buck growns or treats*.—*A roe bellows*.—*A hare beats or taps*.—*An otter whines*.—*A boar screams*.—*A fox barks*.—*A badger shrieks*.—*A wolf howls*.—*A goat rattles*.

Terms for their copulation.—*A hart or buck goes to rut*.—*A roe goes to turn*.—*A bear goes to brim*.—*A hare or coney goes to buck*.—*A fox goes to clicketting*.—*A wolf goes to match or make*.—*An otter hunteth for his kind*.

Terms for the footing and treading.—*Of a hart, we say the ston*.—*Of a buck, and all fallow deer, the view*.—*Of all deer, if on the grafs, and scarce visible, the falling*.—*Of a fox, the prints*; and of other the like vermin, the *footing*.

—*Of an otter, the marks*.—*Of a boar, the track*.—*The hare, when in open field, is said to fore*; when the winds about to deceive the hounds, the *dobles*; when the beats on the hard highway, and her footing comes to be perceived, the *pricketh*: in snow, it is called the *trace of the hare*.

The tail of a hart, buck, or other deer, is called the *single*.—*That of a boar, the wreath*.—*Of a fox, the brush or drag*; and the tip at the end, the *chape*.—*Of a wolf, the stern*.—*Of a hare and coney, the scat*.

The ordure or excrement of a hart, and all deer, is called *sewmet* or *sewishing*.—*Of a hare, craviles or crotching*.—*Of a boar, lesles*.—*Of a fox, the billiting*; and of other the like vermin, the *spants*.—*Of an otter, the spaints*.—*As to the heads of deer, something has already been spoken under the article H E A D*.

For the attire, or parts thereof, those of a stag, if perfect, are the *bar*, the *pearls*, the *little knobs on it*, the *beam*, the *gutters*, the *antler*, the *sur-antler*, *royal*, *sur-royal*, and all at top, the *croches*.—*Of the buck, the bar, beam, brow-antler*, *black-antler*, *advancer*, *palm*, and *spellers*.

If the croches grow in the form of a man's hand, it is called a *palmed head*.—*Heads bearing not above three or four, and the croches placed aloft, all of one height, are called crown-ed heads*.—*Heads having double croches, are called forked heads*, because the croches are planted on the top of the beam like forks.

They say, *a litter of cubs*, *a nest of rabbits*, *a squirrel's dray*.

The terms used in respect of the dogs, &c. are as follow. —*Of greyhounds, two make a brace*; of hounds, a *couple*.—*Of greyhounds, three make a leash*; of hounds, a *couple and half*.—*They say, let slip a greyhound; and cast-off a hound*.—*The string wherein a greyhound is led, is called a leash*; and that of a hound, a *lyme*.—*The greyhound has his collar*, and the hound his *coupler*.—*We say a kennel of hounds, and a pack of beagles*.

Styles or manners of HUNTING, are various, according to the country, the beast, and the means whereby he is to be caught.

The *hunting* used by the antients, was much like that now practised for the rein deer; which is seldom hunted at force, or with hounds; but only drawn with a blood-hound, and forestalled with nets and engines. —*Thus did they with all beasts*; whence a dog is never commended by them for opening, before he has discovered where the beast lies: Hence, they were not in any manner curious as to the music of their hounds, or the composition of their kennel or pack, either for deepness, loudness, or sweetness of cry, which is become a principal point in the *hunting of our days*.

Their huntmen, indeed, were accustomed to shout and make a great noise, as Virgil observes in the third of his *Georgics*: *ingentem clamore preme ad retia ceruom*. But that clamour was only to bring the deer to the nets laid for him.

The Sicilian way of *hunting* had something in it very extraordinary. —*The nobles or gentry being informed which way a herd of deer passed, gave notice to one another, and appointed a meeting; every one bringing with him a cross-bow or long-bow, and a bundle of staves shod with iron, the heads bored, with a cord passing through them all: Thus provided, they came to the herd, and casting themselves about in a large ring, surrounded the deer. —*Then, each**

taking his stand, unbound his faggot, set up his stake, and tied the end of the cord to that of his next neighbour, at the distance of ten foot from one another. —*Then taking feathers, died in crimson, and fastened on a thread, they tied them to the cord; so that with the least breath of wind, they would whirl round. —*Which done, the persons who kept the stands withdrew, and hid themselves in the next covert.**

Then the chief ranger entering within the line with hounds to draw after the herd, roused the game with their cry; which flying towards the line, were turned off, and still gazing on the flaking and shining feathers, wandered about as if kept in with a real wall or pale.

The ranger still pursued, and calling every person by name, as he passed by their stand, commanded him to shoot the first, third, or sixth, as he pleased; and if any of them missed, or singled out another than that assigned him, it was counted a grievous disgrace.

By such means, as they passed by the several stations, the whole herd was killed by the several bands. *Pier. Hieroglyphic. Lib. VII. cap. 6.*

Hunting, as practised among us, is chiefly performed with dogs; of which we have various kinds, accommodated to the various kinds of game; as *hounds, grey-hounds, staunch-hounds, blood-hounds, terriers*, &c. See HOUND.

In the kennels or packs they generally rank them under the heads of *enterers, drivers, flyers, tyers*, &c.

On some occasions, nets, spears, and instruments for digging the ground, are also required: nor is the *hunting-horn* to be omitted.

The usual chafes among us, are the *hart, buck, roe, hare, fox, badger, and otter*. —*We shall here give something of what relates to each thereof.*

By the way let it be observed, with regard to the seasons of beasts, that hart and buck *hunting* begins at the end of fence month, which is a fortnight after Midsummer, and lasts till Holy-Rood-Day. —*The hind and doe come in course on Holy-Rood-Day, and last till Candlemas*. —*Fox hunting comes in at Christmas, and holds till the Annunciation.*

Roe *hunting* begins at Michaelmas, and ends at Candlemas. —*Hare hunting commences at Michaelmas, and goes out at the end of February*. —*Where the wolf and boar are hunted, the season for each begins at Christmas; the first ending at the Annunciation, the second at the Purification.*

Here, too, is the place for some general terms and phrases, more immediately used in the progress of the sport itself: what belongs to the several sorts of game, in particular, being reserved for the respective articles.

When the hounds then, being cast off, and finding the scent of some game, begin to open and cry; they are said to *challenge*. —*When they are too busy, before the scent be good, they are said to babble*. —*When too busy, where the scent is good, to bawl*. —*When they run it end-ways orderly, holding in together merrily, and making it good, they are said to be in full cry*. —*When they run along without opening at all, it is called running mute.*

When spaniels open in the string, or a grey-hound in the course, they are said to *lapse*.

When beagles bark and cry at their prey, they are said to *yearn*.

When the dogs hit the scent the contrary way, they are said to *draw amiss*.

When they take fresh scent, and quit the former chafe for a new one, it is called *hunting change*.

When they hunt the game by the heel or track, they are said to *hunt counter*.

When the chafe goes off, and returns again, traversing the same ground, it is called *hunting the soil*.

When the dogs run at a whole herd of deer, instead of a single one, it is called *running riot*.

Dogs set in readiness where the game is expected to come by, and cast off after the other hounds are passed, are called a *relay*. —*If they be cast off ere the other dogs be come up, it is called a vacantlay*.

When finding where the chafe has been, they make a proffer to enter, but return, it is called a *blimish*.

A lesson on the horn to encourage the hounds, is named a *call*, or a *reheat*. —*That blown at the death of a deer, is called the mort*. —*The part belonging to the dogs of any chafe they have killed, is the reward*. —*They say, take off a deer's skin; strip or chase a hare, fox, and all sorts of vermin; which is done by beginning at the snout, and turning the skin over the ears, down the tail.*

Badger HUNTING. —*A badger is called by several names, viz. a gray brock, boreson, or bayson*. —*The male is called a badger or bore-pig, and the female a fox.*

This beast is very frequent in Italy, Sicily, the Alpine, and Helvetian coasts; and is not uncommon in France and England.

There are two kinds, the one resembling a dog, and the other a hog; they differ in their snout and colour, the one resembling that of a dog, the other of a swine: The first has a greyer or whiter coat than the other, and goes farther out to prey:

They sfer also in their meat, the one eating flesh and carrion, like a dog, the other roots and fruit, like a hog.

Tuberville mentions two sorts of badgers, but in a somewhat different manner; the one, according to him, casting his fi-aunts long, like a fox, having his residence in rocks, and making his burrow very deep; whereas the burrows of the other are made in light ground, and have more variety of cells and chambers: The one is called the *badger-pig*, and the other the *badger-whelp*; or the one may be called *canine*, and the other *swinish-badger*: The first has his nose, throat and ears yellowish, and is in other parts much blacker and higher legged than the latter. He says both live on flesh, hunting greedily after carrion; and are pernicious to warrens, especially when big with young. When the badgers earth, after they have dug a good depth, they make use of an expedient to carry off the earth.—In order to which, one of them lies down on his back, and upon his belly the rest lay the earth; thus taking his hind feet in their mouth, they draw the belly-laden badger out of the hole or cave, and having disburdened him, he re-enters, and repeats the labour till the work be completed.

The badger is a very sleepy beast, especially in the day time, seldom stirring abroad but in the night, whence the denomination *lucifuga*, *q. d.* avoider of the light.

The badger is a deep biting beast, having very sharp teeth: to guard against the effects whereof, it is usual to put great broad collars about the dogs necks. His back is broad, and his legs are longer on the right side than the left, whence he runs best on the side of a hill or cart-road way. He fights on his back, and by this means is at liberty to use both his teeth and nails: He has a faculty of blowing up his skin after a strange manner, by which he defends himself against any blow or bite of the dogs; so that you may thrash your heart out on his back to no purpose; but a small stroke on the nose dispatches him presently. In Italy and Germany they eat the flesh of badgers, boiling it with pears; but in England it is not liked, being of a sweetish and rankish taste. It is best in September; and of the two kinds, the *swinish-badger* is the best meat.

They are long livers, and generally grow blind by mere age; from which time they never stir out of their holes, but are fed by the rest.

The method of *hunting* the badger is thus:—Seek the earth and burrows where he lies, and in a clear moon-shine night go and stop all the holes but one or two, and therein place sacks, fastened with drawing strings, which may shut him in as soon as he strains the bag.—The bags thus set, cast off your hounds, and beat all the groves, hedges, or tufts within a mile or two. What badgers are abroad, being alarmed by the dogs, will strain repair to their earths, and so be taken.

He that stays to watch the sacks, must stand close, and upon a clear wind; else the badger will find him, and fly some other way for safety. If the hounds either encounter him, or undertake the chase before he can get into his earth, he will stand at bay like a bear, and make excellent sport.

If the badger be attacked in his earth; as soon as he perceives the terriers yearn him, he will stop the hole between the dogs and himself; and if the dogs continue baying, he removes his baggage with him, and goes into another apartment or chamber, of which he usually has half a dozen in the burrow; thus retreating from one to the other, till he can go no farther, and barricading the way as he goes.

Buck HUNTING, or HUNTING of fallow deer.—The buck the first year, is called a *faun*.—The second year, a *pricket*.

—The third, a *fovel*.—The fourth, a *fore*.—The fifth, a *buck of the first head*.—The sixth year, a *great buck*.

The female is called *doe* or *doe*.—The first year, a *faun*—The second a *tegg*.—The third, a *doe*.

This beast is common in most countries, being as corpulent as a hart, but in most things resembling more a roe, except in colour; which is various, but most commonly branded or sandy on the back, having a black list all along on the ridge, and the belly and sides spotted with white.

The male has horns not much differing from a hart, except in largeness, and they grow out of the head like fingers out of the hand; whence it is called *cervus palmatus*. The female is without horns.

Less art and skill are required in lodging a buck, than in harbouring a hart; nor does there need so much drawing after: It is sufficient that you judge by the view, and mark what grove or covert he enters; for he does not wander and rove so often as a hart, nor so frequently change his layer. When hard hunted, he usually takes to some strong hold or covert he is acquainted with; not flying far before the hounds, nor crossing nor doubling, nor using any of the subtleties the hart is accustomed to.

The buck will beat a brook, but seldom a great river, as the hart; nor can he stay so long at foil.

The greatest subtlety a huntsman need use in *hunting* the buck, is to beware of *hunting* counter or change, because of the plenty of fallow deer, which use to come more directly upon the hounds than the red deer do.

The buck herds more than the hart, and lieth in the driest places: but if he be at large, unconfined in a park, he herds but little from May to August, because the flies trouble him. He takes delight in hilly places, but chuses the dales to feed in.

FOX HUNTING.—This animal, the first year, is called a *cub*.—The second, a *fox*.—The third, an *old fox*.

His nature, in many respects, is like that of a wolf; and both bring the same number of cubs at a litter; but the fox litters deep under ground, which the wolf does not.

A bitch fox is hard to take, when bragged, and with cub, in regard she lies near her burrow, into which she runs upon hearing the least noise; indeed it is no easy matter to take her at any time, as being a beast of exceeding subtlety. What makes *fox-hunting* the more entertaining, is, the strong hot scent this creature affords, which keeps up an excellent cry; but as his scent is hotter at hand, so it dies sooner than that of a hare, &c. Add, that he never flies far before the hounds, as not trusting to his legs, or the champion ground, but has recourse to the strongest covers.—When he can no longer stand up before the hounds, he takes earth, and must be dug out.—When coursed by grey-hounds on a plain, his last refuge is usually to piss on his tail, and flap it in their faces as they come near him; sometimes squirting also his thicker excrement upon them, to make them give over their course.

When a bitch fox goes a clicketing, and seeks the dog, she cries with a hollow voice, not unlike the howling of a mad dog; and the like noise she makes when the milles any of her cubs; but the never cries at all when she is killing, but defends herself in silence to the last gasp.

The fox is taken with hounds, grey-hounds, terriers, nets, and gins.—Of terriers there are two sorts, the one crook-legged, and commonly short-haired, which take earth well, and lie long at fox or badger; the other is shagged and straight-legged, which will not only *hunt* above ground as others, but also enter the earth with great fury, though these cannot stay in so long, by reason of their vehemence.

The fox chuses to earth in ground hard to dig, as in clay or stony ground, or amongst the roots of trees; and his earth has commonly but one hole, which goes straight along in, before it come at their couch. He sometimes by craft possesseth himself of a badger's old borrow, which has variety of chambers, holes, and angles. Gesner relates, that he frequently cheats the badger of his habitation, by laying his excrement at the mouth of the other's burrow: Some pretend, that the wolf being an enemy to the fox, this latter secures his earth, by laying an herb called *sea-otum* in the mouth thereof, which the wolf has a natural aversion to, so that he never comes near the place where it either lies or grows.

Hare HUNTING.—A hare, the first year, is called a *leveret*.—The second year, a *bare*.—The third, a *great hare*.

A hare is called in Hebrew, *arnebet*; which being feminine, possessed a great many with the notion that all hares were females.—He is called *lag-s*, by the Greeks, for his immoderate lust, and by the same nation *ptox*, for his fear; and by the Latins, *lepus*, quasi *levi-pes*, to denote his swiftness of feet. There are four sorts of hares.—Some live in the mountains, some in the fields, some in the marshes, and some any where indifferently.

Those of the mountains are the most swift, and those of the marshes the slowest: The wandering hares are the most difficult and dangerous to follow.

Each part and member of the hare is formed for celerity; the head is round and short, of a convenient length; the ears long and lofty, to hear the enemy at a distance, and save itself in time; the lips continually move, sleeping and waking; and the eye is too big and round for the lid to cover it, even when asleep, so that the creature sleeps as it were on the watch. The breast is capacious, and fitted to take more breath than that of any other beast.

They feed abroad to conceal their forms; and never drink, but content themselves with the dew. The hare's ears lead the way in her chase; for with one of them she hearkeneth to the cry of the dogs, the other being stretched forth like a sail to promote her course.

The hares of the mountains often exercise themselves in valleys and plains, and through practice grow acquainted with the nearest way to their forms. Those which frequent bushes and brakes, are not able to endure labour, nor are very swift, being tender footed, and growing fat through discontinuance of exercise.

When the hare has left the dogs far behind, she goes to some hill or rising ground, where, rearing on her hinder legs, she observes at what distance her pursuers are.

The scent is naturally stronger in wood hares than field hares; but in all sorts it is strongest when they feed on green corn.—In winter mornings, the scent does not lie till the frost be a little thawed: and it may be added, that a hare always leaves more scent when she goes to relief, than when she goes to form.

Her footsteps are more seen in winter than summer, because as the nights are longer, they travel farther.—Their prints are

are very uncertain at the full moon; at which time they leap and play together. The young, it is to be observed, tread heavier than the old, by reason their limbs are weaker. A buck, or male hare, is known by his beating the hard high-ways, feeding farther out in the plains, and making his doublings of a greater compass than the female, who keeps close by some covert side, turning, winding and crossing in the bushes like a coney, and rarely running out an end; whereas the buck, having once made a turn or two about his form, then farewell turns, for he will frequently lead them five or six miles without once turning his head: Add, that the buck is known at his rising out of form, by his hinder parts, which are more white, and his shoulder which is redder than the does.

The hare regulates its conduct according to the weather.—In a moist day she holds the highways more than at any other time, by reason the fent is then most apt to lie; and if she come at the side of any young grove or spring, she forbears to enter, but squats down aside thereof, till the hounds have over-shot her; upon which she returns the same way she came without turning into any covert, for fear of the wet and dew hanging on the boughs.

Regard is also to be had to the place where the hare sits, and upon what wind; for if her form be either upon the north or south wind, she will not willingly run into the wind, but aside, or down the wind: On the contrary, if the form in the water, it is a sign she is foul and miscal, and in the court will make all her doubling and crossing about brook-sides, and near plashe; for her scent, under this condition, being very strong, she needs a place that will take but little. Sometimes, when hunted down, she will start a fresh hare, and squat in the same form: At other times she will creep under the door of a sheep coat, and hide among the sheep, or run among a flock of sheep; and will not without the utmost difficulty be taken from among them.—Add, that some will take the ground like a coney; this is called going to *vaunt*.

Some hares will go up one side of the hedge, and come down the other; and we have known a hare, that being sorely hunted, has got upon a quick-set hedge, and ran a good way on the top thereof, and then leaped off upon the ground: And it is no unusual thing for them to take themselves to furz-bushes, and leap from one to another, whereby the hounds are frequently in default.

A hare it is said does not live above seven years, at most, especially the buck: And if he and the doe keep one quarter, they will not suffer any strange hare to fit by them; whence the proverb, 'The more you hunt, the more hares you shall have;' since, having killed one hare, another comes and possesses his form. By the way it is to be observed, that to enter a young kennel of hounds, regard must be had to the nature of the country, and of the quarry; for, according to the place wherein they are entered, and the game first given them, will they afterwards prove. Thus, if they be entered in a champion country, they will ever after more delight to hunt there than on any other ground.

Having found where a hare hath relieved in some pasture or corn-field; to find her form, the season of the year, and the state of the weather, are to be considered.—In the spring or summer, a hare will not fit in the bushes, because frequently offended with pismires, snakes, and adders; but will fit in cornfields and open places.—In winter they choose to fit near towns and villages, in tufts of thorns and brambles, especially when the wind is northerly or southerly.—According to the season and nature of the place where the hare is accustomed to fit, there beat with your hounds and start her; which is better sport than trailing of her from her relief to her form.—Having started her, step in; and halloo in the hounds till they have undertaken it, crying, That, That or There, There, and go on with full cry; then recheat them, and follow at a distance, taking care not to forward them too much at first, as being apt, in the first heat to overthrow the game.—Above all things mind the first doubling the hare makes, which is to be a key or direction for the whole day; all the other doublings the afterwards makes being like the first.—According to the policies you see her use, and the place where you hunt, make your compass, to help the defaults, great or little, long or short; always seeking the moiftest and most commodious places for the hounds to scent in.

Hart HUNTING, or HUNTING of red deer.—This animal, the first year is called a *calf*, or *bind calf*.—The second year, a *knobber*.—The third, a *brock*.—The fourth, a *flag-gard*.—The fifth, a *flag*.—The sixth, a *hart*. The female is called a *hind*.—The first year she is a *calf*.—The second, a *beafse*, and sometimes a *bracket's ffler*.—The third, a *bind*.

Terms occurring more especially in hunting the hart, and not yet explained, are as follow.—The print or impression where a deer has lain, is called a *layer*: if it be in covert, or a thicket, it is called his *harbour*.—Where a deer has passed into a thicket, leaving marks whereby his bulk may be guessed at, it is called an *entry*.—When they cast their heads,

they are said to *mew*.—When they rub their heads against trees, to bring off the peels of their horns, they are said to *fray*.—When a deer hard hunted takes to swimming in the water, she is said to go to *foit*.—When they turn head against the hounds, they are said to *bay*.—When the hounds touch the fent, and draw on till they put up the hart, they are said to *draw on the flat*.

As to the nature and qualities of the hart, it is to be observed that he is an excellent swimmer; there being instances, when fore hunted, of his plunging in the sea, and being killed by fishermen twelve miles from land.—When in going to rut, they have occasion to cross a great river, or arm of the sea, it is said they assemble in great herds; the strongest goes in first, and the next of strength follows; and so one after the other, relieving themselves by staying their heads on the buttocks of each other.

The hind commonly carries her calf eight or nine months, which usually falls in May: Some have two at once; and they always eat up the skin wherein the calf laid.—As the young grows up, the old one teaches it to run, and leap, and how to defend itself from the hounds.

The hart is amazed at hearing any one call or whistle in his fit: If you cry ware, ware, or take heed, you will see him instantly turn back, and make some little stand.—His sense of hearing is very perfect when his head and ears are erected; but very imperfect when he holds them down: Hence, when he pricks up his ears, he is known to be apprehensive of danger. When he is on foot, and not afraid, he wonders, and takes pleasure to gaze at every thing he sees.

The hart is very long lived, commonly reaching to an hundred years, or upwards.—The principal marks of his age are taken from his head; yet is this somewhat precarious, some having more croches thereon at the same age than others.—Those are accounted to excel in beauty of horns, which bear them high.

The horns do not grow to the bone or scalp of the head, but only to the skin, branching into many spears, and falling off once a year, in the spring.—Though solid throughout as stones, yet if they remain a while in the air, they grow very light and friable, discovering themselves to no other than an earthy substance, concrete and hardened with a strong juice into the form of bones.

The horns being fallen, they retire and hide themselves in the shades to avoid the annoyance of flies; and only come out to feed in the night.—Their new horns appear at first like bunches, very soft and tender; but by the increase of the sun's heat, they at length grow harder, and are covered with a rough skin called a *velvet head*.—As that skin dries, they daily try the strength of their new heads upon trees, which not only burnishes and scrapes off the roughness, but, by the pain they feel hereby, admonishes them how long to forbear the company of their fellows; for when the horn grows inflexible, they return to their former condition.

The taking of this beast requires a deal of art and attention.—The deceitful and subtle hart, says Gessner, by windings and turnings deceives its hunters, no less than the harts of Mæandros, flying from the terrible cry of Diana's hounds. The prudent hunter, therefore, must frame his dogs, as Pythagoras did his scholars, with words of art, to fit them on, and take them off at pleasure.

When he goes for sport, he is first to encompass the beast on son gifts, in her own layer; and thus unharbour her in the view of the dogs, that so they may never lose her slot or footing.—But note, a deal of choice and discretion is here required; for he may not set off upon every one, either of the herd, or those which wander solitary: The young, the small, &c. are to be passed over; and partly by sight, and partly by the footings, fewmets, the largeness of the layer, &c. he must make judgment of the game, singling out for that purpose the largest head in the whole herd.

There are divers means for knowing an old hart, viz. by the *flat*, the *entries*, the *abatures*, and *foils*, the *fewmets*, *gate* and *walks*, *fraying-stocks*, and the *head* and *branches*.

1°. As to the *flat*.—The treadings of the hart's foot are to be carefully noted: If you find the treadings of two, the one long, and the other round, yet equally big, the longest flat declares the largest hart: Add, that the old hart's hind foot never over-reaches the fore foot, as that of the young one does.—2°. The fewmishing is chiefly to be judged of in April or May: If it be large and thick, it signifies the hart to be old.—3°. To know the height and thickness of the hart, observe his entries and galleries into the thickets, and what boughs he hath over-stridden; and mark from thence the height of his belly from the ground; for a young deer usually creeps low, as he passes to his harbour, and goes through places, which the old one, being stiff and flatly, will not stoop to.—4°. By his gate it may be known whether the hart be large, and whether he will stand long before the hounds: If he have a long step, he will stand long; being swift, light, and well breathed: If he have a great slot, which is the sign of an old deer, he will be a laffer.—As to his fraying post, note, that the older the hart is, the sooner he goeth to fray, and the greater is the tree he chuses to

fray upon; it being necessary it be such as may not bend.—Now, to seek or find out a hart in his haunt, or feeding-place, it is to be observed, that he changes his manner of feeding every month.—From the conclusion of the rutting time, which is in November, they feed in heaths and broomy places.—In December they herd together, and withdraw into the strength of the forests, to shelter themselves from the feverer weather, feeding on holm trees, elder trees, brambles, &c. The three following months they leave herding, but keep four or five in a company, and in the corners of the forest, will feed on the winter pasture, sometimes making their excursions into the neighbouring corn fields, if they can perceive the blades of wheat, rye, &c. appear above ground.—In April and May they rest in thickets and shady places, stirring very little till rutting time, unless disturbed.—The three succeeding months they are in their pride of grease, and resort to springs copes and corn fields.—In September and October they leave the thickets, and go to rut; during which season, they have no certain place either for food or harbour.

Having found out the game, the *hunters* discouple and cast off the dogs; and, some on horseback, others on foot, follow the cry with the utmost art, observation, and speed; remembering and preventing the subtle turning an headings of the hart; standing with dexterity and intrepidity to leap hedge, pales, ditch, &c.

The utmost address and circumspection is to be used to keep to the beast first attempted, and to prevent the dogs from pursuing any other: This, in effect, makes one of the principal difficulties and glories of the chase; the beast having a hundred devices to put off some other head for his own: Sometimes he will fend forth some other little deer in his stead into the dogs way, lying close the while himself; on which occasion the huntsman is to found a retreat, and break off the dogs, and take in leam, till the game be recovered.

Sometimes he will purposely seek out for other deer at layer, and route them, to make the *hounds* hunt change, himself lying down flat in some of their layers upon his belly, to make the hounds over-shoot him: Add, that they may neither scent nor vent him, he will gather up his fore feet under his belly, and blow or breathe on some moist place of the ground, so that the hounds shall pass within a yard, without apprehending him.—He will break into one thicket after another, to find deer, rousing, gathering them together, and herding with them; and even beating some of them into his treads, that he may the more easily escape.—Finding himself spent, he will break herd, and fall to doubling and crossing in some hard beaten high way; always running against the wind, not only to cool himself, but the better to hear the voice of his pursuers.

The last refuge of a hart *forely hunted*, is the foil; keeping the middle, for fear, lest by touching a bough, or the like, he may give scent to the hounds. He always swims against the stream, whence the old rule, 'He that will his chafe find let him try up the river, and down the wind.' In taking foil, he will sometimes cover himself under water, so as to shew nothing but his nose.

Where opportunity of water fails, he will fly into herds of cattle, as cows, sheep, &c. and will sometimes leap on an ox, cow, or the like, laying the fore part of his body thereon, so that touching the earth only with his hinder feet, he may leave a small, or no scent behind.—What is further still, the chief huntsman to Lewis XII. relates, that a hart which they were in hard chase of, leaped into a great tall white thorn, which grew in a shadowy place, and there stood aloft till he was thrust through by a huntsman, rather than he would stir.

The hart being killed, the huntsman with his horn windeth the fall of the beast; upon which every one approaches, the skilfullest opens the beast, rewarding the hounds with what properly belongs to them; the huntsman, at the same time, dipping bread in the skin and blood of the beast to give the hounds their full satisfaction.

The hart is known to be spent by his running stiff, high, and lampering; by his mouth being black and dry, without foam on it, and his tongue hanging out; though he will sometimes close his mouth to deceive the spectators: And by his flut; for he will sometimes close his claws together, as if he went at leisure, and frait again open them wide, making great glidings, and hitting his dew-laps upon the ground, &c. When quite spent, and close beset, or intercepted on all sides, the hart usually takes to bay, and makes force with his head against the first man or dog that closes in upon him, unless prevented with a spear, sword, or the like.—Hence it is very dangerous going into a hart at bay, especially at rutting time, for then they are more than ordinarily fierce.

The hart being killed, his death is solemnized with great ceremony.—The first thing, when the huntmen come in, is to cry, *Ware haunch*, that the hounds may not break into the deer: Having secured this, they cut his throat, and blood the younger hounds, to make them love a deer, and learn to leap at his throat. Then having blown the mort, and all the

company being come in, the most distinguished person, who has not taken *jay* before, takes up the knife, and lays it cross the belly of the deer (some of the assistants holding by the fore legs, and at the same time the huntsman drawing down the pizzle) and thus he draws the knife along the middle of the belly, beginning near the brisket, cutting deep enough to discover how fat he is. Then the most skilful person breaks up the deer, by first fitting the skin from the cutting of the throat downward, making the arter, that the ordure may not break forth, and then paunching him, and rewarding the hounds therewith.

Lastly, the person that took the *jay*, being presented with a drawn hanger, he is to cut off the head; which done, and the hounds rewarded therewith, the concluding ceremony, if a buck, is a double, if a stag, a treble most blown by one, and a reheat in comfort by all that have horns: the whole is then concluded with a general whoop.

Otter HUNTING.—The otter is supposed to come, to be of the castor or beaver kind, being, like it, an amphibious creature, and living both in the water, and on land; beside that the resemblance in point of shape is such, as, were his tail off, he were in all respects like the beaver; differing in nothing but habitation, the beaver frequenting both the salt water and the fresh, but the otter only the fresh.

Though the otter lives much in the water, he does not breathe like fishes, but after the manner of quadrupeds.—He is web-footed, like our water-fowl, and can endure to be under water a long time without respiration; and yet in fishing he is frequently found to pop up his nose for breath.—He has an admirable finel, whereby some say he will directly wind a fish in the water a mile or two off; and is a most pernicious beast to a fish-pond, his dexterity at diving, and hunting under water, being such, that scarce any fish can escape him: if by painful *hunting* ashore he cannot fill his belly, he will feed on herbs, snails, or frogs: He will swim a fishing two miles together, always against the stream, that when his belly is full, the current may carry him down again to his lodging, which is always near the water, and artificially built with boughs, sprigs, and sticks, couched together in fine order.

The flesh of this beast is cold and fishy, as often feeding on stinking fish: for which reason it is not eaten among us: Though among the Germans it is a pretty common food; and the Carthusian friers, who are forbidden to eat all manner of flesh beside, are allowed this. Some in England also have, of late, said much in praise of otter pyc.

The otter is to be hunted by particular dogs, called *otter hounds*; and also with special instruments, called, *otter spears*.—To find him out, some are to go on one side of the river, and some on the other; beating all the way on the banks, with the dogs following.—Thus it is soon found if there be an otter in that quarter; for the otter cannot endure long in the water, but must come forth to make his spraints, and in the night sometimes to feed on grass and other herbs. If the hounds find an otter, look in the soft and moist places, to learn by the prints, which way he bent his head: If these make no discovery, it may be partly perceived by the spraints.—This done, follow the hounds and lodge him as a hart or deer.

The otter always endeavours to keep to the water, where he is master.—In *hunting* him therefore, you are to be ready with your spears, to watch his vents, for that is the chief advantage: If you perceive where he swims under water, strive to set a stand before him, where you expect he will vent, and there endeavour to strike him with the spear: If you miss, pursue him with the hounds; which, if they be good, and well entered, will come chaunting and trailing along the river side, and beat every tree root, every osier bed, and tuft of bulrushes; nay, sometimes, they will take the water, and beat it like a spaniel; by which means the otter can hardly escape.

If the beast find himself wounded with a spear, he usually makes to land, where he will maintain a furious battle with the dogs.

Roe-buck HUNTING.—The *roe-buck*, the first year, is called a *hind*.—The second, a *gyrle*.—The third, a *hemise*.—The fourth, a *roe-buck of the first head*.—The fifth year, a *fair roe-buck*.

We have no *roe* deer in England; but they abound in Scotland, Germany, Africa, &c. And it should seem they had been more common among us, our huntmen still retaining the proper terms for the chase.

They make good chase, stand long, and *fly* end-way.—When a *roe* crosses and doubles, it is called *trapping*.

Their swiftness appears not only on earth, but in waters, through which they cut their way as with oars; whence they love lakes and streams, breaking the floods to come at fresh pasture, feeding on rushes, &c.

Horns grow only on the male; being set with six or seven branches, not palmed, but branchy, yet shorter than fallow deer. After rutting he casts his head.

They

HUR

They are said never to wink, nor even when asleep; for which conceit their blood is by some fanciful people prescribed to persons dim-sighted or pur-blind.—The tail of this beast is less and shorter than that of a fallow deer, inasmuch, that it is questioned whether it ought to have that denomination.

They keep most in mountains among the rocks; and when *hunted*, Martial tells us, will hang thereon with their horns, to delude the dogs.—They are often taken by counterfeiting their voice, which the huntsman does by the assistance of a leaf in his mouth.

When *hunted*, they turn much, and often, and will come back on the dogs directly, when they can no longer endure.

They also take soil, as the hart; and will sometimes hang by a bough in such a manner, as that nothing shall appear but their snout.

HURDLES, in fortification, twigs of willows or osiers, interwoven close together, sustained by strong stakes, and usually laden with earth.

Hurdles, called also *clayes*, serve to render batteries firm, to consolidate the passage over muddy ditches, and to cover traverses, and lodgments for the defence of the workmen against the artificial fires or stones that may be cast upon them. See **CLAYES**.

HURDLES, in husbandry, are frames made either of split timber, or of hazle rods, platted together; to serve for gates in enclosures, or to make sheepfolds, &c.

HURDS, or **HARDS** of *Flax* or *Hemp*, the coarser parts, separated in the dressings from the tear or fine stuff. See **HEMP**, and **FLAX**.

HURLE Bone, in a horse, is a bone near the middle of the buttock; very apt to go out of its sockets with a slip or strain.

HURLERS, a number of large stones, set in a kind of square figure near St. Clare in Cornwall; so called from an odd opinion held by the common people, that they are so many men petrified or changed into stones, for profaning the sabbath-day by *hurling* the ball, an exercise for which the people of that country have been always famous.

The *hurlers* are oblong, rude, and unhewed.—Many authors suppose them to have been trophies erected in memory of some battle: Others take them for boundaries to distinguish lands. Lastly, others, with more probability, hold them to have been sepulchral monuments.

HURTS, in heraldry, by some wrote **HEURTS**, and by others **HUERTS**, are azure or blue rundles.

The English heralds distinguish between the colours of rundles, and give them different names agreeable thereto: those of other nations content themselves to call those *torceaux d'azure*; and in other cases, only add the respective colour to the term *torceaux*.

But these being blue, some will have them to signify bruises or contusions in the flesh, which often turn to that colour; others suppose them whortle berries.

HURRICANE, a furious storm of wind, arising from a contrariety and opposition of several winds.

Hurricanes are frequent in the East and West Indies; making terrible ravages in the islands thereof; blowing down houses, rooting up trees, and even whole woods, &c.

They usually begin in the north, some say the west, but turn round; and in a little time veer through all points of the compass.

It is the custom for the French and English Inhabitants in the Caribbee Islands, to send every year about June to the native Caribbees of S. Domingo and S. Vincent, to know whether there will be any *hurricanes* that year; and about ten or twelve days before any *hurricane* come, they constantly send them word.

The prognostics those Barbarians go by, are given us by captain Langford, who, in 1697, engaged one of them, by civilities, to reveal them to him.

It is one of their principles, that all *hurricanes* come either on the day of the full, or of the change, or quarter of the moon; each of which is discovered by a number of phenomena, in the preceding quarters, as, a turbulent sky, sun red, universal calm, the stars appearing red, noises in hollows or cavities of the earth, strong smell of the sea, a settled westerly wind, &c.

That author assures us, he received this benefit from the information, that whereas *hurricanes* are so dreadful, that all ships are afraid to put out to sea while they last, and chuse rather to perish at anchor in the roads; yet, with good management, he found that a vessel may lie out at sea in these, as safely as in other storms, by taking care the ports be well barred and calked, the topmasts and tops taken down, the yards a-port last, and the doors and windows secured.—With these precautions that experienced navigator preserved his vessel in two great *hurricanes*, and taught others how to do the same, by putting out from port, where they would inevitably have perished. And from the prognostics above, he foretold several *hurricanes* at land.

He adds, that all *hurricanes* begin from the north, and turn to the westward, till arriving at the south-east, their force is spent.

HUS

The cause he suggests to be the suns leaving the zenith of those places, and going back towards the south; and the repelling or bounding back of the wind, occasioned by the calming of the general trade wind. *Philosophical Transactions*, N^o 246.

HUSBAND, *Maritus*, a man joined, or contracted with a woman, in marriage.

By the laws of England, the wife is supposed wholly under the dominion of her *husband*, nor can act or will any thing of herself.

In Germany, the power of the *husband* is not so extensive; even the princes of the empire have not a sovereign and despotic power over their wives and children.—Pagenstecher, a German lawyer, has a dissertation to prove, that, by the law of nature, a *husband* has not a despotic power over his wife; and that marriage is not monarchy. He struggles hard to explain that passage of S. Paul to the Ephesians, cap. v. ver. 22. consistently with his scheme.

J. Philip Palthen, professor of law at Gripwald, gives us a very learned dissertation on the *husband* of a queen, who is not king, *De Marito Reginae*. He defines him a man married with a princess that holds a crown by right of inheritance, but who only contracted marriage with him, on condition that the marriage should not change his condition, nor give him any command over his wife, or any joint authority with her; nor entitle him to succeed to any of her royalties after her decease, without the intervention of some further act. Hence he concludes, that in such case it is the queen who is really king.

This, however, does not hinder but the *husband* may be a king elsewhere, and in that quality superior to his wife; for a maiden queen may either marry a sovereign prince, or a subject, and that either of her own realm, or another: of all which cases he gives instances: as, that of Ferdinand and Isabella, whose marriage did not give any authority to the one over the kingdom of Arragon, nor to the other over that of Castile; of Joan daughter of Isabella, and Philip of Austria; Philip II. of Spain, and Mary queen of England; the two Joans queens of Naples; Mary queen of Scots, and the daughter of France; and lastly, queen Anne, whose *husband* was her subject, and who yielded homage to her as a vassal, and took an oath of fidelity to her as her minister.—M. Palthen proceeds to examine in what kingdoms this may happen: and shews, that it cannot be in an elective kingdom, nor in an usufructuary one; whence he concludes, that we shall never see it in Poland, France, or Germany; but that there are instances of it in all the other monarchies, of any standing in Europe. He goes on to shew, that a queen ought not to marry a king; that it is no violation of the conjugal society, for her *husband* to be subject to her; and finally he answers all the difficulties that may be started with regard thereto, particularly from passages of scripture, as 1 Cor. xiv. 34. Gen. iii. 16. Eph. v. 22. Col. iii. 18, &c.

HUSK, among botanists, the part which a flower grows out of.

Of these there are several kinds, as, *bulbous* or *round husks*, *bottle* *shks*, *middle husks*, *foot husks*, *hose husks*. &c. See Supplement: article CALYX.

HUSSARS, **HUSSARDS**, or **HUSSARTS**, an order or species of soldiery in Poland, and Hungary, commonly opposed to the Ottoman cavalry.

The *hussars* are horsemen, clothed in tygers and other skins, and garnished and set out with plumes of feathers. Their arms are the sabre, and bayonet.

They are very resolute; firm partisans; but they are better in a hasty expedition, than in a set battle.

The emperor and king of France have of these *hussars* in their service.

HUSSITES, a party of reformers, the followers of John Hus.

John Hus, from whom the *Hussites* take their name, was born in a little village in Bohemia, called *Husi*.—He fell into the sentiments of Wickliff, and the Waldenses; and in the year 1407, began openly to oppose and preach against divers errors in doctrine, as well as corruptions in point of discipline, then reigning in the church.

He was condemned with Jerom of Prague, by the council of Constance, and burnt, in the year 1415; but his disciples still stuck to his doctrines.—Joh. Zisca, being put at their head in Bohemia, maintained a war a long time against the emperor Sigismund, with great success. And Procopius Holy, another of their leaders, afterwards conducted them with equal courage.

The *Hussites* spread over all Bohemia and Hungary, and even Silesia and Poland; and there are some remains of them still subsisting in all those parts.

HUSTINGS, **HUSTINGUM**, a court of Common Pleas held before the lord mayor and aldermen of London, in Guild-Hall.

Of the great antiquity of this court we find this mention in the laws of king Edward the confessor.—*Debet etiam in London*

London quæ est caput regni & legum, semper curia domini regis singulis septimanis, die lune hustingis sedere & teneri: fundata erat olim & edificata ad instar & ad modum & in memoriam veteris magnæ Trojæ, & usque in bodierum diem, leges, & jura & dignitates, & libertates regioque consuetudines suas una semper inviolabilitate conservat. Taylor, *Hist. of Gavel-kind*.

The court of *hustings* is the principal and highest of all the courts of the city.—Error or attain lies there of a judgment or false verdict in the sheriff's courts.

Other cities and towns had also courts of the same name, as Winchester, Lincoln, York, &c.

HUT, or HUTT, from the Saxon, *hutte*, a small cottage or hovel.

The word is also used for the soldiers lodges in the field; otherwise called *baracks*, or *caserns*. See BARACK.

HUXING of Pike, among fishermen, a particular method of catching that fish.

For this purpose, they take thirty or forty as large bladders as can be got; blow them up, and tie them close and strong; and at the mouth of each, tie a line, longer or shorter, according to the depth of the water. At the end of the line is fastened an armed hook, artfully baited; and thus they are put into the water with the advantage of the wind, that they may gently move up and down the pond.

When a master pike has struck himself, it affords a deal of entertainment to see him bounce about in the water with a bladder fastened to him; at last, when they perceive him almost spent, they take him up.

HYACINTH, or JACINTH, in natural history, a precious stone; originally thus called from its resemblance of the purple flower named *hyacinth*.

Though this, it has been observed, holds of the antient, rather than the modern *hyacinth*, the modern kind being usually of a deep reddish yellow, approaching to a flame colour, or that of the deepest amber. The antient seems to have been a different stone, of a purple colour tending to blue.

There are four sorts of *hyacinths* among our Jewellers: those intermixed with a vermilion colour; those of a saffron colour; those of an amber colour; and, lastly, those of a white, intermixed with a slight red.

Hyacinths, again, are distinguished into *oriental* and *occidental*. The *oriental* come from Calicut and Cambaya, and are equal in hardness to the oriental amethyst.—The *occidental* are found in Bohemia and Portugal, which are a degree softer.

The stone graves or cuts fine, and would be more used for seals, &c. but that the graving frequently costs more than the stone.

The antients used it for amulets and talismans; and bore it about their neck, or set in rings, &c. supposing it to have the virtue of securing them from the plague, &c.

The *hyacinth* used in medicine, and whereof the confection of *hyacinth* is made, is a different stone from all these, of which there are three several sorts: the first about the bigness and figure of a grain of salt, and pretty soft: the second ruddy, and shaped like the point of a diamond, found in divers parts of Italy, Silesia, Bohemia, &c. The third is white, intermixed with yellow, and some other colours; being found in the same places as the red.

In strictness, only the first kind should be used in the confection of *hyacinth*; but the druggists and apothecaries frequently substitute the other. See Supplement: article HYACINTH.

Confection of HYACINTH, is a thin cordial electuary, composed of divers kinds of precious stones, particularly of that whose denomination it bears, with certain earths, seeds, roots, coral, hartshorn, and divers other ingredients, well mixed, and ground together.

HYACINTHIA, in antiquity, feasts held at Sparta, in honour of Apollo, and in commemoration of his favourite Hyacinth.

This Hyacinth was the son of Amyclas, king of Sparta, and was beloved both by Apollo and Zephyrus. The youth showing most inclination to the former, his rival grew jealous; and, to be revenged, one day, as Apollo was playing at the discus, i. e. quoits, with Hyacinth, Zephyrus turned the direction of a quoit which Apollo had pitched, full upon the head of the unhappy Hyacinth, who fell down dead. Apollo then transformed him into a flower of the same name: and as a farther token of respect, they say, commanded this feast.

The *hyacinthia* lasted three days; the first and third whereof were employed in bewailing the death of Hyacinth, and the second in feasting and rejoicing.

The persons who assisted at the ceremony were crowned with ivy; by reason, says Vossius, *De Idolol.* Lib. II. c. 14. that Bacchus and Apollo were the same person.

HYBRISTICA, in antiquity, a solemn feast, held among the Greeks, with sacrifices and other ceremonies; whereat the men attended in the apparel of women, and the women in that of men, to do honour to Venus in quality either of a god, or a goddess, or both.

Or, according to the account given by others, the *hybristica* was a feast celebrated at Argos, wherein the women, being dressed like men, insulted their husbands and treated them with all marks of superiority, in memory of the Argian dames having antiently defended their country with singular courage against Cleomenes and Demaratus.

Plutarch speaks of this feast in his treatise of the great actions of women.—The name, he observes, signifies *infamy*; which is well accommodated to the occasion, wherein the women strutted it about in men's cloaths, while the men were obliged to dangle in petticoats.

HYADES*, in astronomy, are seven stars in the bull's head, famous among the poets for the bringing of rain.

* Whence their name, *Tades*, from the Greek, *ὕει πλάεω*, to rain.

The principal of them is the bull's left eye, by the Arabs called *aldebbaran*. Their longitudes, latitudes, &c. see among those of the other stars in the constellation TAURUS.

The poets feign them to have been the daughters of Atlas and Pleione. Their brother Hyas being torn in pieces by a lioness, they wept his death with such vehemence, that the gods, in compassion to them, translated them into heaven, and placed them in the bull's forehead, where as they say, they continue to weep; this constellation being supposed to preface rain.

Others represent the *Hyades* as Bacchus's nurses, and the same with the *Dadonides*, who fearing the resentment of Juno, and flying from the cruelty of king Lycurgus, were translated by Jupiter into heaven.

HYDATIS, *ὑδατις*, in medicine, a disease of the eyes; being a fatty substance, growing under the skin of the upper eye-lid; by which the whole eye-lid, in children, is sometimes rendered oedematous.

HYDATIS is also used among the modern physicians, for a little bladder of water, occasionally found in divers parts of the body.

HYDATIDES*, in medicine, are little transparent bags or bladders full of water, frequently found in divers parts of the body.

* The word is formed of the Greek, *ὕδω*, water, which in the genitive case, gives *ὑδατος*, whence *ὑδατις*, hydatis.

Hydatides are most common in dropical persons, and are supposed to arise from a distention and rupture of the lympheducts; being found chiefly in the parts abounding in those vessels, as the liver, lungs, &c.—They are also sometimes found in scitrical cases. See DROPSY, JAUNDICE, &c.

We have instances of *hydatides* voided both by stool, by urine, and by vomiting.—They are of all sizes, from a pin's head to that of a pullet's egg.

HYDATOIDES*, *ὑδατοειδής*, a name some authors give to the aqueous humour of the eye, inclosed between the cornea and uvula.

* The word is composed of *ὕδω*, *ὑδατος*, water, and *εἶδος*, form—resemblance. See EYE.

HYDATOSCOPIA*, called also HYDROMANCY, a kind of divination, or method of foretelling future events, by means of water.

* The word is compounded of *ὑδατος*, the genitive of *ὕδω*, water, and *σκοπιω*, I view, I consider.

There is a natural or allowable kind of *hydatoscopia*: it consists in foretelling storms, tempests, hurricanes, &c. from natural signs or indications in the sea, air, clouds, &c.

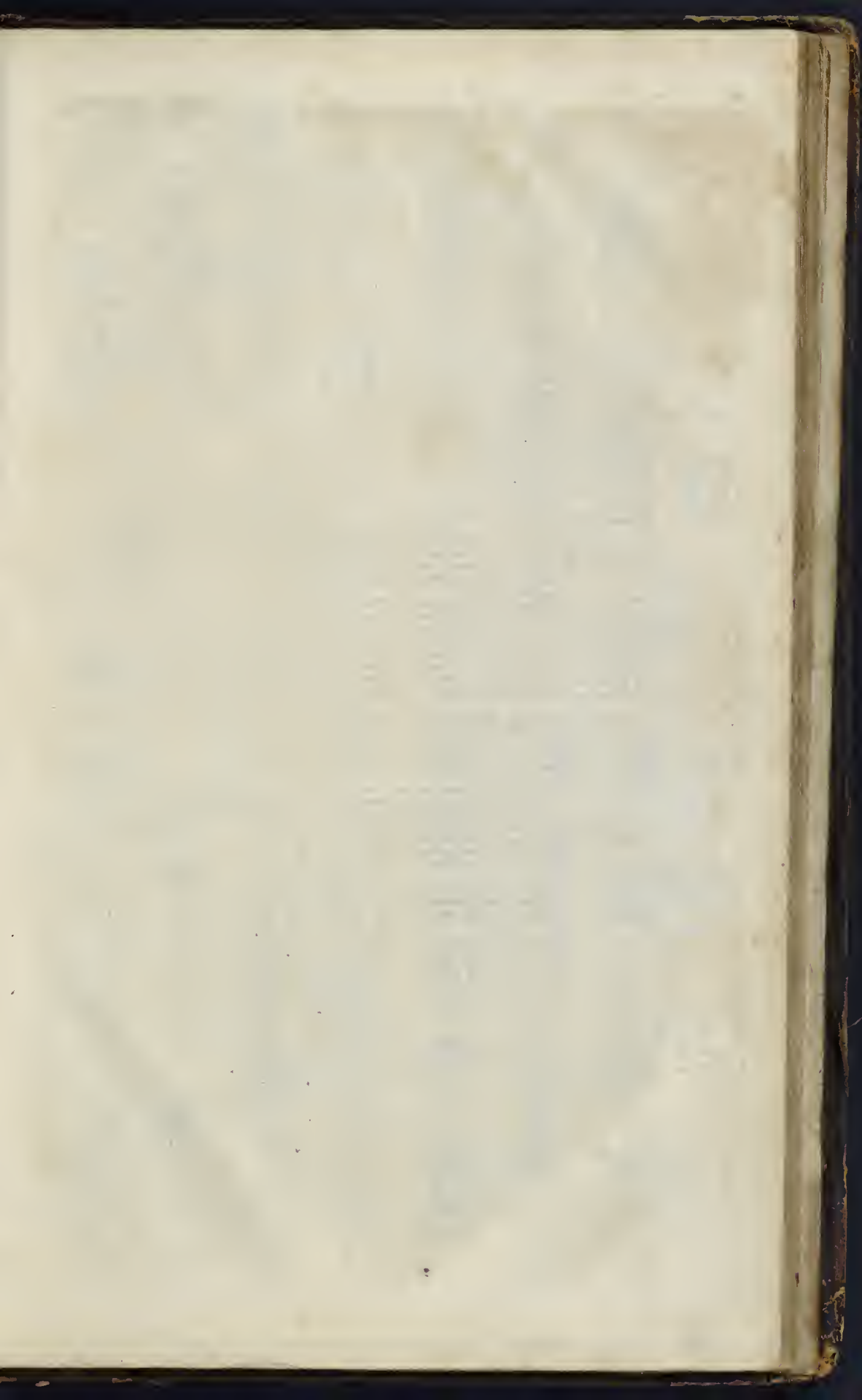
HYDE of Land. See the article HIDE.

HYDE-gild. See the article HIDE-gild.

HYDRA, a southern constellation, consisting of twenty-six stars, imagined to represent a water-serpent.

The stars in *hydra*, in Ptolemy's catalogue, are twenty-five; in Dr. Halley's sixty-eight; the longitudes, latitudes, &c. whereof are as follow.

Names and Situations of the Stars.	Signs	Longitude	Latitude	Magn.
	♋	0	0	1
	♌	5 32 11	22 29 15	4 3
	♍	9 17 52	25 46 6	4 6
North of those preceding in the head	♎	5 59 3	12 23 37	4
Soa. of those preced. again the nostrils	♏	5 53 14	14 38 5	5
	♐	11 58 2	29 44 42	6
5				
In the aperture of the mouth.	♑	7 59 12	14 17 10	4
	♒	7 47 49	11 58 23	5
North of two in the forehead.	♓	8 1 52	11 7 59	4
South. in the forehead.	♈	8 35 4	11 35 0	5
	♉	11 51 6	20 26 5	6
10				
In the hind part of the head	♊	13 15 41	23 50 45	6
	♋	10 15 18	11 0 3 4	
	♌	14 51 58	24 18 44	6
Preced. of two in root of the neck	♍	13 4 5	11 3 45	6
	♎	18 8 22	23 59 9	6



Tab. Hydraulicks & Hydrostaticks

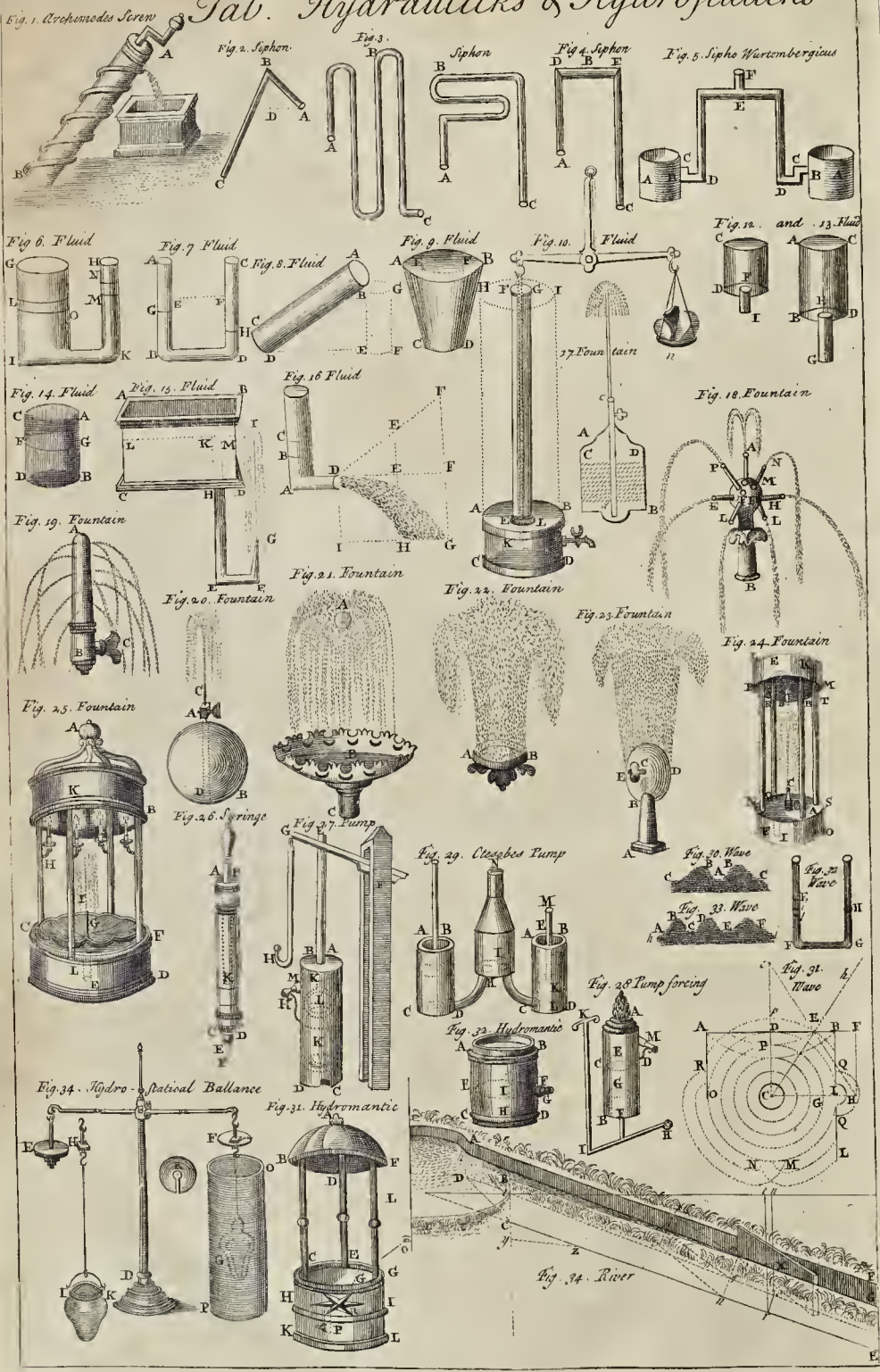


Fig. 1. Archimedes Siren

Fig. 2. Siphon

Fig. 3. Siphon

Fig. 4. Siphon

Fig. 5. Siphon Wiertembergius

Fig. 6. Fluid

Fig. 7. Fluid

Fig. 8. Fluid

Fig. 9. Fluid

Fig. 10. Fluid

Fig. 11. and 12. Fluid

Fig. 14. Fluid

Fig. 15. Fluid

Fig. 16. Fluid

Fig. 17. Fountain

Fig. 18. Fountain

Fig. 19. Fountain

Fig. 20. Fountain

Fig. 21. Fountain

Fig. 22. Fountain

Fig. 23. Fountain

Fig. 24. Fountain

Fig. 25. Fountain

Fig. 26. Spring

Fig. 27. Pump

Fig. 29. Cleves Pump

Fig. 30. Wave

Fig. 31. Wave

Fig. 34. Hydro-Statical Balance

Fig. 31. Hydromantic

Fig. 34. River

H Y D

H Y D

Names and Situation of the Stars,	Signs.	Longitude	Latitude	Magnit.
		o ' "	o ' "	
15	♌	18 26 1	24 0 29	6
Subsequent in the root of the neck		18 34 32	22 11 31	6
		15 57 4	13 2 47	4
		19 23 26	21 8 10	6
		20 14 28	23 23 33	6
20		22 12 42	26 11 13	6
Small one over the heart		21 29 56	23 50 49	6
		21 9 15	19 15 8	6
		23 4 50	22 57 49	6
		23 57 59	22 24 32	2
25		21 15 42	16 44 1	5
Middle of three in bending of the neck South.		21 25 41	15 0 3	5
		23 42 29	19 15 1	7
		25 49 39	22 15 0	7
Left of three in bending of the neck		23 19 19	14 18 17	4
	30			
That following the heart		26 23 18	33 6 24	6
		28 21 17	26 37 6	5
That following this	♌	1 23 33	26 5 14	4
	♌	28 57 20	19 43 16	7
That, again, following this to the North.	♌	4 1 45	23 11 31	5
	35			
Another behind this and more North.		3 22 9	18 24 47	6
		5 7 52	22 29 43	7
		5 4 10	22 1 2	4
		3 33 37	18 20 37	6
Preceding of three following these as [in a right line]		5 3 1	17 24 10	7
		10 44 50	24 40 10	4
		12 22 47	24 8 24	5
		15 52 28	30 11 53	7
Middle of three in the right line		12 58 27	23 14 2	7
		13 45 56	23 29 50	5
45		15 54 24	23 4 24	6
Small one following this		16 3 39	21 49 28	4
		17 26 16	23 45 3	7
		18 44 33	24 59 42	6
		25 1 40	30 16 31	5
Contiguous to bottom of the cup. South. beneath base of the cup		26 14 11	30 41 12	6
	50			
North. beneath base of the cup		24 15 35	37 33 4	4
		3 37 39	31 35 14	3
		6 47 40	33 26 12	4
		9 4 42	31 27 56	4
Antepenultimate of the tail		20 32 8	14 33 15	6
		22 42 30	12 43 18	6
Last but one of tail behind Corvus		1 59 34	12 2 6	6
		4 18 31	13 0 37	4
		5 52 38	13 4 11	6
		8 20 0	12 54 21	5
In the extremity of the tail		9 55 55	14 2 26	5
		12 28 42	8 57 4	5
		12 49 10	9 1 56	6
		13 1 49	9 26 50	6
60		14 8 58	11 3 9	5
		15 52 1	10 13 50	7
		16 43 19	10 23 24	6
Informs following Hydra's tail, between Libra, Centaurus, and Lupus				
65				

HYDRAGOGUES *, ΤΑΡΑΓΩΓΑ, a species of purgative medicines; being such as are supposed peculiarly fitted to discharge ferrous, or watry humours.

* The word is formed of ὕδωρ, water, and ἀγίω, to draw, to lead.

The strongest cathartics, Dr. Quincy observes, chiefly answer to the character of *hydragogues*; in that by their forcibly shaking and vellicating the bowels and their appendages, they squeeze out water enough to make the stools appear little else.

The principal *hydragogues*, in the common opinion, are the juices of the root of iris, of foldanella, mechoacan, jalap, &c. In the general, all sudorific, aperitive, and diuretic medicines, are truly *hydragogues*.

HYDRARGYRUM *, ΥΑΡΡΥΡΟΝ, a name given to mercury, or quicksilver. See MERCURY.

* The word is Greek, formed of ὕδωρ, aqua, water, and ἀργυρεῖον, argentum, silver, q. d. water of silver, by reason of its resembling liquid, or melted silver.

HYDRAULICS *, that part of statics which considers the motion of fluids, and particularly water; with the application thereof in artificial water-works.

* The word is derived from the Greek, ὑδραυλικός, founding water, formed of ὕδωρ, aqua, water, and αἰλῶν, tibia, pipe, or flute: the reason whereof is this; that at the time of the first invention of organs, being unacquainted with the method of applying bellows to blow them, they made use of a cataract or fall of water to make a wind, and found them.

To *hydraulics* belong not only the conducting and raising of water, with the constructing of engines for those purposes; but also the laws of the motion of fluid bodies.

Hydrostatics explain the equilibrium of fluids, or the gravitation of fluids at rest: upon removing that equilibrium, motion ensues; and here *hydraulics* commence.

Hydraulics, therefore, suppose hydrostatics; and the generality of writers, from the immediate relation between the two, join them together, and call them both either *hydraulics* or *hydrostatics*.

The laws of *hydraulics* the reader will find under the article FLUID.

The art of raising waters; with the several machines employed for that purpose, as *siphons*, *pumps*, *syringes*, *fountains*, *jets d'eau*, *fire-engines*, &c. are described under their proper articles, SIPHON, PUMP, SYRINGE, FOUNTAIN, HYDROCANISTERIUM, &c.

The principal writers who have cultivated and improved *hydraulics*, are Jo. Ceva, in his *Geometria Motus*: Jo. Bap. Balianus, *De Motu Naturali Gravium, Solidorum & Liquidorum*: Mariotte, in his *Movement des Eaux & autres Fluides*: D. Guglielmini, in his *Mensura Aquarum Fluentium*, where the higher laws of *hydraulics* are reduced to practice: Sir Isaac Newton, in his *Phil. Nat. Princ. Mathematicæ*; and Varignon, in the *Memoirs of the Royal Academy of Sciences*.

As to *hydraulic* machines, Hero of Alexandria is the first who has wrote thereon. Of the moderns, the principal are, Solomon de Caux, in a French treatise of *Machines*, and chiefly *hydraulic ones*: Casp. Schottus, in his *Mechanica Hydraulica Pneumatica*: De Chales, in his *Mandus Mathematicus*; Boecler in his *Architectura Curiosa*: and Luc. Anthonius Portius.

HYDRAULO-PNEUMATICAL, a compound term applied, by some authors, to such engines as raise water by means of the spring of the air. See AIR, WATER, and ENGINE.

Mr. Boyle mentions a very pretty fountain, which he calls *hydraulico-pneumatical*; made by the spring of the air pressing up water in a pipe, upon the air's being exhausted out of a receiver, and thus the weight of the atmosphere taken off. See FOUNTAIN.

HYDRELÆON *, ΤΑΡΕΑΛΙΟΝ, in pharmacy, a mixture of common oil and water.

* The word is a compound of the Greek, ὕδωρ, aqua, water, and ἄλιον, oleum, oil.

The *Hydræleon* was taken internally, to excite vomiting; externally, it is anodyne, and promotes suppuration.

HYDRENTEROCELE *, ΤΑΡΕΝΤΕΡΟΚΗΛΗ, in medicine, a hernia, or tumor occasioned by a descent of the intestines, and water along with them, into the scrotum. See HERNIA.

* The word is compounded of ὕδωρ, water, εντερες, intestine, and κηλη, tumor.

HYDROCANISTERIUM, a fire-engine; or a machine which spouts water plentifully, and with force, us'd to be applied to the extinguishing of fires and conflagrations of houses, &c.

We have various contrivances to this effect.—The first, and which is, as it were, the basis of all the rest, is a pump inclosed in a cistula or wooden vehicle filled with water, and mounted on wheels; the pump being wrought with long levers which come out of the cistula; and the water it raises directed to the place by means of a jointed tube.

The Dutch and others use a long flexible tube of leather, sail cloth, or the like, which they carry or conduct in the hand from one room to another, as occasion requires; so that the engine may be applied where the fire is only within-side, and does not burst out to expose it to its external action. To improve on this original fire-engine, they have since contrived to make it yield a continued stream; by substituting a forcing or pressing pump in lieu of the sucking pump. See Forcing PUMP.

HYDROCELE *, ΤΑΡΟΚΗΛΗ, in medicine, a swelling or bloating of the outer integument or skin of the scrotum, occasioned by watry humours detained therein.

* The word is formed of the Greek, ὕδωρ, water, and κηλη, tumor.

The *hydrocele*, is distinguished from a hernia, in that the first is formed by slow degrees, and the latter all at once. Youth is most exposed to the *hydrocele*.—It is remedied by drying medicines; or by letting out the water with a lancet, a seton, or the like.—But these only amount to a palliative cure: to go to the bottom of the disease, recourse must be had to cauteries.

HYDROCEPHALUS *, ΤΑΡΟΚΕΦΑΛΟΣ, in medicine, a watry head, or dropsy in the head.

* The word is Greek, formed of ὕδωρ, water, and κεφαλη, caput, head.

The *hydrocephalus* is a congection of water in the head, so as to distend and render it soft.

There are three kinds of *hydrocephali*. The first, when the water is gathered between the skull and the skin: the second, when between the skull and the brain: and the third, when the water is collected in the ventricles of the brain.

Children are more liable to *hydrocephali*, than adults; by reason their head is soft, and has been much compressed in the womb; or, perhaps, by their having been too roughly

handed by the midwife.—Add, that the bones of children's heads being very soft, and their sutures not yet exactly closed; they easily open, and give way to an influx of water from without; whereas in adults, the bones of the cranium are very hard, and closely bound together.

The internal *hydrocephalus* is a disease very difficult to cure.—There is no remedy but severe blistering on the sutures.—It sometimes ends in mortal convulsions, and sometimes in lethargies or apoplexies.

The head, in this case, is sometimes extended to a prodigious bulk; so that the person cannot bear or sustain it. Of this we have an extraordinary instance given us by Dr. Friend, of a girl two years old, whose head was 26 inches in circumference. *Philosoph. Transact.*, N^o. 318. See *Supplement: article HYDROCEPHALUS*.

HYDROGRAPHICAL Maps, more usually called *sea charts*, are projections of some part of the sea, in plano; for the use of navigation.

In these are laid down all the rhumbs or points of the compass, the meridians, parallels, &c. with the coasts, capes, islands, rocks, shoals, shallows, &c. in their proper places, proportions, &c.

Christopher Columbus, the first great discoverer of America, was a man that earned his living by making and selling *hydrographical maps*. He happened to be heir to the memoirs or journals of a noted pilot, one Alonso Sanchez de Huelva, captain of a ship, who, by chance, had been driven by a storm to the island of S. Domingo, and died at Columbus's house soon after his return. This gave Columbus the first hint to attempt a discovery of the West Indies, in which he succeeded.

For the construction of the several kinds of *hydrographical maps*; see **CHART**.

For their uses; see the article **SAILING**.

HYDROGRAPHY *, that part of geography which concerns the sea; principally, as it is navigable.

* The word is compounded of the Greek, ὕδωρ, *agua*, water, and γράφω, *scribo, describo*, I write, describe.

Hydrography teaches how to describe, and measure the sea; it gives an account of its tides, counter-tides, currents, foundings, bays, gulphs, &c. as also of its rocks, shelves, sands, shallows, promontories, harbours, distances, &c. from port to port, with all that is remarkable, either out at sea, or on the coast.

Some of the best authors use the term in a more extensive sense; so as to denote the same with *navigation*.

In this sense *hydrography* includes the doctrine of sailing; the art of making sea charts, with the uses thereof; and every thing necessary to be known, in order to the safest and most expeditious performance of a voyage. See **SAILING**.

Hydrography is the most perfect of all the mathematical sciences; there being scarce any thing wanting to its perfection, but the discovery of the longitude.

The Jesuits Ricciolus, Fournier, and de Chales, are the principal writers on the subject of *hydrography*.

In France they have professors of *hydrography* established in all their sea ports, who are to instruct the youth intended for the sea, in all the parts of navigation, sailing, steering, &c. with the several branches of mathematics necessary thereto; as arithmetic, and the doctrine of the sphere, and trigonometry.

They are royal professors, and teach gratis; having salaries allowed them by the king. They are also charged with the examination of pilots, &c.

HYDROMANCY *, ὙΔΡΟΜΑΝΤΕΙΑ, the act or art of divining or foretelling future events by means of water.

* The word is Greek, composed of ὕδωρ, water, and μανθάνω, divination.

Hydromancy is one of the four general kinds of divination; the other three, respecting the other elements, *viz* fire, air, and earth, are denominated *pyromancy*, *aeromancy*, and *geomancy*.

Varro mentions the Persians as the first inventors of *hydromancy*, adding, that Numa Pompilius and Pythagoras made use thereof.

The writers in optics furnish us with divers *hydromantic machines*, vessels, &c.

To construct a *hydromantic machine*, by means whereof an image or object shall be removed out of the sight of the spectator, and restored again at pleasure; without altering the position either of the one or the other.—Provide two vessels ABF and CGLK, (*Tab. Hydraulics*, fig. 31.) the uppermost filled with water, and sustained by three little pillars, one whereof, BC, is hollow, and furnished with a cock B. Let the lower vessel CL be divided by a partition HI, into two parts; the lower whereof may be opened or closed by means of a cock at P.

Upon the partition place an image, which the spectator in O cannot see by a direct ray GL.

If now the cock B be opened; the water descending into the cavity CI, the ray GL will be refracted from the perpen-

dicular GR to O; so that the spectator will now see the image by the refracted ray OG.—And again, shutting the cock B, and opening the other P, the water will descend into the lower cavity HL; whence, the refraction ceasing, no rays will now come from the object to the eye.—But, shutting the cock P again, and opening the other B, the water will fill the cavity again, and bring the object in sight of O afresh.

To make a *hydromantic vessel*, which shall exhibit the images of external objects, as if swimming in water.—Provide a cylindrical vessel ABCD, (*Tab. Hydraulics*, fig. 32.) divided into two cavities by a glass EF; not perfectly polished: In G apply a lens convex on both sides; and in H incline a plain mirror of an elliptic figure under an angle of 45°; and let IH and HG be something less than the distance of the focus of the lens G; so that the place of the images of object radiating through the same, may fall within the cavity of the upper vessel.—Let the inner cavity be blackened, and the upper filled with clear water.

If now the vessel be disposed in a dark place, so as the lens be turned toward an object illuminated by the sun; its image will be seen as swimming in the water.

HYDROMEL *, ὙΔΡΟΜΕΛΙ, a drink made of water, and honey; called also by the Greeks *μυρμεγαλον*.

* The word is composed of ὕδωρ, water, and μέλι, *mel*, honey.

Hydromel is honey diluted with a sufficient quantity of water, and fermented by a long and gentle heat.

Under the class of *hydromels* come our mead, and me-theglin.

Hydromel is either *simple* called also *aqueous*, where honey and water are the only ingredients, which may be prepared at any time; or *compound*, when other drugs are added to improve and exalt the flavour and virtues.

It is particularly called *vinous hydromel*, when it equals the strength of wine; which it is brought to do, not only by the great quantity of honey used in it, but also by its long coction, insolation, &c. This is only to be made in the heat of summer.

Vinous hydromel, (the same with what we usually call *mead*, &c.) is made of rain water and the best honey, boiled together, and skimmed from time to time, till they become of a consistence to sustain an egg. This done, the liquor is exposed to the sun for forty days, to dispose it to ferment; then adding some Spanish wine, and keeping it two or three months, it acquires a flavour scarce inferior to malmsey.—It fuddles readily; and the drunken fit from it holds longer than that produced by wines, by reason of its more viscid consistence.

Hydromel is the common drink of the Poles and Russians. Diodorus Siculus, Lib. V. and Aristotle, relate, that the Celtiberi and Taulanti, ancient people of Illyria, drank *hydromel* instead of water.

HYDROMETER *, an instrument wherewith to measure the gravity, density, velocity, force, or other properties of water.

* The word is compounded of the Greek, ὕδωρ, water, and μέτρον, *measure*.

That wherewith the specific gravity of water is determined, is more usually called an *areometer*, or *water-poise*. See **AREOMETER**, and **WATER-POISE**.

HYDROMETRIA, **HYDROMETRY**, the mensuration of waters, and other fluid bodies, their gravity, force, velocity, quantity, &c.

Hydrometria includes both hydrostatics, and hydraulics.

The term is modern, but very little in use.—The first instance where we meet with it is in the year 1694, when a new chair or professorship of *Hydrometry* was founded in the university of Bologna, in favour of S. Guglielmini, who had carried the doctrine of running waters, with respect to rivers, canals, dikes, bridges, &c. to an unusual length.

HYDROMPHALUS *, ὙΔΡΟΜΦΑΛΟΣ; in medicine, a tumour in the navel, arising from a collection of water.

* The word is formed of the Greek ὕδωρ, water, and φάλαξ, *umbilicus*, navel.

The *hydromphalus* is distinguished from other tumors of the navel by its being very soft, and yet not tractable and obedient to the touch, so as to diminish or enlarge by compressing it. When viewed, placed to diminish the eye and the light; it is found transparent.

The *hydromphalus* is to be dissolved by emollient and resolu-tive medicines. It is also cured by a puncture made in the middle of the navel.

HYDROMYSTES *, or **HYDROMYSTA**, a name antiently given to certain officers in the Greek church; whose business was to make the holy water, and sprinkle it on the people. See **Holy WATER**.

* The word is compounded of ὕδωρ, *agua*, water, and μύστης, a person set apart for the offices of religion.

HYDROPARASTATÆ *, or **HYDROPARASTÆ**, a sect of heretics, the followers of Tatian: called also *Encratite, Apostatite, Saccophori, Severiani, and Aquarians*.

* The word is formed of the Greek, ὕδωρ, water, and παριστατέω, I present, I offer.

The *Hydroparastatæ* were a branch of Manichees, whose distinguishing tenet was, that water should be used in the eucharist instead of wine.

HYDROPHOBIA*, ἸΔΡΟΦΟΒΙΑ, in medicine, an aversion or dread of water; a symptom arising in persons bitten by a mad dog, or other beast made mad by the bite of that creature.

* The word is Greek, compounded of ὕδωρ, water, and φόβος, timor, fear.

Though the term *hydrophobia* do, in strictness, only denote this one symptom; yet it is frequently applied to the whole disease consequent on such a bite, with all its symptoms.

The history of this horrible disease, as given by Cælius Aurelianus, Dr. Mead, Etmuller, Lister, &c. is as follows:—The bite of a mad dog is attended with this surprizing circumstance, that its effects frequently do not discover themselves till after the cause is forgot; the wound itself closing and healing like any other common wound. But, some time after, direful symptoms ensue: usually they commence in about forty days; sometimes in sixty, sometimes not till six months, and sometimes not till a year, or even two years. The first thing observed, is a wandering pain throughout the whole body, but chiefly about the wounded parts; the patient grows anxious and melancholy, and very prone to anger; complaining of every thing, as the ambient air, the heaviness of his bed-cloaths, &c. He vomits; his pulse intermits, and somewhat of a tremor is observed, with convulsions of the nerves and tendons: Along with these he feels an inward heat and thirst: at last the grand symptom appears, which denominates the disease, viz. the *aquæ pavor*, or dread of water, so that he cannot bear so much as the sight of any liquid, without the utmost contumaciousness; much less can he swallow the smallest drop. This is the pathognomonic sign of the disease's being come to its height; and never happens till two or three days before the patient's death; the disease being then, by the unanimous consent both of ancient and modern physicians, absolutely incurable.

With this there are other concomitant symptoms. —He foams at the mouth, his eyes stare, he cannot swallow his spittle without pain, and his penis is constantly erected; some bark and snarl like dogs, and actually fancy themselves transformed into those creatures, and, in the height of their madness, are ready to fly upon and tear to pieces the by-standers. —Palmarium observes, that the *hydrophobus* patient cannot bear to look in a glass, or any transparent body: and adds that he never recovers, unless he knows himself in a glass, this being a sign that the poison has not laid hold of the vital parts.

An absolute bite or wound is not at all necessary to produce this terrible disease; the saliva of a mad dog, &c. being able to convey the disease by mere contact, or application to the skin. —Thus we have an instance in the *Philosophical Transactions*, of two men catching the disease by putting their fingers in the mouth of a puppy that had been bit by its mad dam, and feeling its tongue and throat; and the like instance we have in the same work, of two children in Ireland, who, by touching and handling the head of a dog that had been bit by a mad dog, and washing the wound, cured the dog, but caught the disease themselves, though not bitten.

For the nature and cause of the *hydrophobia*; —Dr. Mead, from several histories of particular cases, concludes, that it is the effect of a particular kind of inflammation of the blood, accompanied with so great a tension and driness of the nervous membranes, and such an elasticity and force of the fluid with which they are filled, that the most common representations are made to the mind with too great effect; so that the usual impressions on the organs cannot be suffered. —Hence that timorousness, unaccountable anxiety, and inquietude, which are always the forerunners of the dread of liquids; as also, the pain often felt in making of water, and the strange aversions sometimes found in patients at the sight of any thing white; the retina being hurt and grieved by the lively impressions of that colour thereon. —Nor is it hard to conceive, that when the saliva is hot, and the throat inflamed and dry, the swallowing of drink should cause such an intolerable agony.

M. Taury, from a nice dissection and examen of the parts of a person dead hereof, conjectures, that the saliva and bile are the fluids first infected; and that the patient vomiting a mixture hereof, the throat becomes excoriated thereby; and hence that horror for all foods, and particularly for fluids, in regard these dissolve those grievous salts contained in the saliva and bile. He adds, that the nature of the poison is such, as dissolves the balsamic and nutritious part of the blood, whence the veins are dried up, so as not easily to admit any blood from the arteries; and the arterial blood by this means suf-

fering the action and impression of its vessels for so long a time, is still further dissolved, attenuated, and spiritualized, and thus sent, in too great quantity; and with too great rapidity to the brain; whence those convulsions, distractions, &c.

Dr. Lister, from the remarkable history of J. Corton, whom he attended under this disease, concludes, 1^o. That some of the organic parts of his body were actually transformed into, or affected after the nature of a dog, especially the gula, tongue, &c. so that any fluid offered him in the erect posture of a man, was frightful, as well as difficult to take, as much as it would be for us to get a dog to drink standing on his hind legs. But this was not all; for when he was turned upon his belly, and would have acted the dog, he could not drink; though the sight of the liquor in that posture gave him as much pleasure, as in the other posture it did pain; and though he frequently put out his tongue, and lapped; yet he could not endure to take any thing liquid into his mouth, as though something hindered him within. 2^o That his spittle was invenomed; for as oft as he swallowed it, his stomach vehemently abhorring it, it went to his heart, as he said, and was present death to him: And, so liquid things coming nearer to the consistence of spittle, might give him the greater terror, as they tended to promote the discharge of saliva into his mouth: and for the same reason might be more difficult to swallow than solid things.

As to the cure of the *hydrophobia*, D. Mead, after Galen, recommends it, in this as in other venomous cases, to enlarge the wound made by the bite by a circular incision, to apply a cælutery to it, and to keep it open for at least forty days. But if this method seem too cruel, it may suffice to extract the poison by clapping a cupping-glass on the place, having first made a deep scarification. The doctor adds, he has known a person fresh bitten, happily saved by the sole application of the unguentum ægyptiacum made exceedingly hot.

If these external precautions have not been used, or not in time, recourse must be had to internal remedies: Alexipharmachies must be drank; among which, the ashes of river lobsters, or cray fish, are principally extolled by all the ancient physicians; so that Galen affirms, no body had ever died who used this remedy. These ashes to be taken to the quantity of one or two spoonfuls every day for forty days successively, either alone, or with gentian root and frankincense in wine.

But the frequent and sudden plunging of the patient over head and ears in the sea water after the bite, is the least and surest preservative against this disease.

Etmuller recommends cardiacs and alexipharmachies, but all in a double dose, and long continued; and garlic, rue, and salt to be beat together, and applied in form of a cataplasm over the wound. Purging with hellebore and mercurius dulcis is also good; and cantharides are a sort of specific. Scarifying is commended; and after the scarification, an onion roasted under the ashes, is to be applied. But the readiest remedy, he adds, is burning the place affected with a red-hot iron, which effectually removes all the malignity. If the physician be not called till late, a cupping-glass is to be applied very hot: An issue near the place may likewise be of service. Sir Theodore Mayerne gives the following prescriptions for the bite of a mad dog. Pluck the feathers from the breech of an old cock, and apply it bare to the bite: if the dog were mad, the cock will swell and die, and the person bitten, will do well: If the cock dies not, it is a proof the dog was not mad. *Philosoph. Transact. N^o. 101.*

It is a common notion that a hair of the same dog applied on the bite, attracts the venom, and works a cure: but a physician of Rostock, in a formal dissertation some years ago, proved this a popular error; and that the remedy was more like to do harm than good.

The marks whereby to know that a dog is mad, are, his neither eating nor drinking, foaming at the mouth and nostrils, looking sad and sullen, and running at any thing in his way, whether man or beast, known or unknown, without barking. —Baldus, a famous lawyer, died of the *hydrophobia* four months after his being bit in the lip by a little dog. And the same is said of Diogenes the Cynic.

The members of the royal academy of sciences furnish us with various instances of persons cured of the disease by various means. —M. Poupert mentions a woman perfectly recovered by bleeding her to deliquium, binding her in a chair for a year, and feeding her all that time with bread and water. —M. Berger relates, that of several persons bitten, two were cured by bleeding them in the forehead. —M. du Hamel adds, that he has known salt water applied on the wound, effect a cure. —Divers cases are produced of those cured of the *aquæ pavor*, by being overwhelmed with a great quantity of water; and one, by being only tied to a tree, and 200 pails of water thrown on him. —But the best instance is that of M. Morin. A man of twenty years of age having all the symptoms, was bathed in a tub of river water, wherein a bushel of salt had been dissolved. They plunged her in naked again and again, till, harassed almost to death

death, they then left her sitting in it quite senseless.—When she came to herself, she was surprized to find herself looking at the water without any concern. *Histoire de l'Acad. an. 1709.*

HYDROPHORIA *, in antiquity, a feast, or funeral ceremony, held among the Athenians and people of Ægina, in memory of those who perished in the deluge.

* The word is formed of the Greek, *ὕδωρ*, water, and *φορῶν*, I bear, or carry off.

HYDROPIC *, a dropical patient; or a person swelled and bloated with the abundance of water.

* The word is Greek, *ὕδρωπις*, formed of *ὕδωρ*, water, and *ὤψ*, *facies*, face.

HYDROPS *, in medicine. See the article **DROPSY**.

* The word is Greek, *ὕδρωψ*, of *ὕδωρ*, *aqua*, and *ὤψ*, *vultus*.

HYDROPS *ad matulam*, a term sometimes used for a diabetes.

HYDROPOTA *, *ΥΔΡΟΠΟΤΗ*. in medicine, a person who drinks nothing but water.

* The word is Greek, formed of *ὕδωρ*, water, and *ποτός*, *potor*, drinker, of *πιω*, *bibo*, I drink.

It has long been controverted among physicians, whether or no the *hydrapota* live longer than other persons? See **DRINK**.

HYDROSCOPE *, an instrument antiently used for the measuring of time.

* The word is Greek, *ὕδροςκοπος*, formed of *ὕδωρ*, water, and *σκοπεῖν*, I view, I consider.

The *hydrascope* was a kind of water-clock; consisting of a cylindrical tube, conical at bottom: The cylinder was graduated, or marked out with divisions, to which the top of the water becoming successively contiguous, as it trickled out of the vertex of the cone, pointed out the hour.

Synsius describes the *hydrascope* at large in one of his letters. See **CLEPSYDRA**.

HYDROSTATICAL Balance, a kind of balance contrived for the easy and exact finding the specific gravities of bodies, both liquid and solid.

The instrument is of considerable use in estimating the degree of purity of bodies of all kinds; the quality and richness of metals, oars, minerals, &c. the proportions in any mixture, adulteration, or the like: of all which, the specific weight is the only adequate judge.

The *hydrostatical balance* is founded on this theorem of Archimedes, that a body heavier than water, weighs less in water than in air, by the weight of as much water as is equal to it in bulk.—Whence, if we subtract the weight of the body in water from its weight in air, the difference gives the weight of as much water as is equal in magnitude to the solid proposed.

Having, therefore, two bodies, the one firm, the other fluid, together with the weight of each apart; to find their proportion, divide the greater by the lesser, the quotient compared to one, that is unity, will be the antecedent of the proportion desired.

The instrument, with all its apparatus, is represented *Tab. Hydrstatics, fig. 34.* and needs little description.

To use it, the weights *E* are so adjusted as to balance what is to be hung on the other end of the beam; in which state the instrument is ready for application.

Now, to find the specific gravity of a fluid.—Hang to the other end of the beam the little scale *F*, and to the bottom of the scale the bubble *G*; then fill a cylindrical vessel *O P*, about two thirds with common water; and when the bubble is let into it, the beam will remain in an horizontal position, if the water be of the same specific gravity as that in which the bubble was adjusted: If it be not, there will be a variation; which is to be corrected by means of little weights for that purpose.

Having thus adjusted the bubble in that water, the specific gravity of any other fluid will be found by weighing the bubble therein; and since you always weigh so much of the liquid as is equal to the bulk of the bubble, if there be any variation between such quantity, and the like quantity of water, it will be discovered by putting weights into the ascending scale.

2° To find the specific weight of a solid.—Instead of the bubble, hang on the bucket *H I K*, and the beam will be in equilibrium: put the solid intended to be examined therein, and counterpoize it with weights in the other scale: this done, note the weight, and disburden the scale of the solid and its counterpoize, and sink the bucket into the glass of water.—Then, as the bucket will lose as much of its weight, as is the weight of an equal bulk of water; add the scale *R* upon the part, which will bring all to an equilibrium.—Lastly, Put the solid into the bucket, and counterpoise it again with weights; and as it answers in its proportion to water, it may be judged either genuine or adulterate, by comparing it to a standard of that species of bodies to which it is supposed to belong.

HYDROSTATICS *, the doctrine of gravitation in fluids; or that part of mechanics which considers the weight or gra-

vity of fluid bodies, particularly of water; and of solid bodies immersed therein.

* The word is Greek, composed of *ὕδωρ*, water, and *στατικός*, statics; of *σταῖς*, *stans*, standing, of *σταῖς*, *stas*, I stand, I stop: *Hydrostatics* being conceived as the doctrine of the equilibrium of liquors. See **EQUILIBRIUM**, and **STATICS**.

To *hydrostatics* belong whatever relates to the gravities and æquilibria of liquors; with the art of weighing bodies in water, in order to estimate their specific gravities.

Mr. Boyle has applied *hydrostatics* to good purpose, in examining and proving the goodness and purity of metals, minerals, and other bodies, particularly fluids, in an express treatise, entitled *Medicina Hydrstatica*.

The laws of *hydrostatics*, with the application thereof, see delivered at large under the articles **FLUID**, and **SPECIFIC Gravity**.

Hydrostatics are frequently confounded with hydraulics, by reason of the affinity of the subjects; and several authors chuse to treat of the two promiscuously.

The oldest writer on *hydrostatics* is Archimedes, who first delivered the laws thereof in his book *De insiditibus Humido*, Marin Ghetaldus first brought his doctrine to experiment in his *Archimedes Promotus*; and from him Mr. Oughtred took the greatest part of what he has given us on this subject.—

M. Mariotte, in a French treatise, published at Paris in 1686 *Of the motion of Water and other Fluids*, gives most of the propositions of *hydrostatics* and hydraulics, proved by reason, and confirmed by experiments. The Jesuit F. Tertius de Lanis, in the third tome of his *Magisterium Naturæ & Artis*, lays down the doctrines of *hydrostatics* more amply than they are elsewhere found. F. Lamy, in the second part of his mechanics, entitled, *Traite de l'Equilibre des Liquours*, delivers the fundamental laws of *hydrostatics* and hydraulics; and the like is done by Dr. Wallis, in his *Mechanica*. Lastly, Sir Isaac Newton gives some of the sublimer matters, in the second book of his *Philosop. Nat. Princ. Mathematic.*

* The word is Greek, formed of *ὕδωρ*, water, and *σκοπεῖν*, I view, I consider.

It has long been controverted among physicians, whether or no the *hydrapota* live longer than other persons? See **DRINK**.

HYDROTIC *, in medicine. See the article **HYDROTICS**.

* The word is Greek, formed of *ὕδωρ*, *aqua*, water.

HYGIEINE *, *ΥΓΙΕΙΝΗ*, that branch of medicine which considers *health*; and discovers proper means and remedies, with their use in the preservation, of that state.

* The word is Greek. formed of *ὕγιος*, sound, healthy.

The objects of this branch of medicine are the non-naturals. See **NON-NATURALS**.

Hygiene more largely taken is divided into three parts; *prophylactice*, which forestes and prevents diseases; *synergetice*, employed in preserving health; and *analetice*, whose office is to cure diseases, and restore health.

HYGROCIROCELE *, in medicine, a branch of a vein swelled with ill blood, or other humours: or, a varicous tumor of some of the veins of the testes, attended with a gathering of water in the scrotum.

* The word is compounded of the Greek *ὕγρος*, humidus and *κίρσολη*, *ramex varicosus*.

HYGROMETER *, a machine, or instrument whereby to measure the degrees of dryness, or moisture of the air.

* The word is compounded of the Greek *ὕγρος*, humidus, moist, and *μέτρον*, *metron*, I measure. See **HYGROSCOPE**.

There are divers kinds of *hygrometers*; for, whatever body either swells or shrinks by dryness or moisture, is capable of being formed into an *hygrometer*.—Such are woods of most kinds, particularly ash, deal, poplar, &c. Such also is a catgut, the beard of a wild oat, &c.

The best and most usual contrivances for this purpose are as follow.

Construction of HYGROMETERS.—Stretch a hempen cord, or a fiddle-string, as *AB* (See *Tab. Pneumaticæ, fig. 7.*) along a wall, bringing it over a truckle, or pully *B*; and to the other extreme, *D*, tie a weight, *E*; into which fit a style or index, *F G*.—On the same wall fit a plate of metal, *H I*, divided into any number of equal parts; and the *hygrometer* is complete.

For it is matter of undoubted observation, that moisture sensibly shortens the length of cords and strings; and that, as the moisture evaporates, they return to their former length: and the like may be said of a fiddle-string.—The weight therefore, in the present case, upon an increase of the moisture of the air, will ascend; and, upon a diminution of the same, it will descend.

Hence, as the index *F G* will show the spaces of ascent and descent; and those spaces are equal to the increments and decrements of the length of the cord, or gut, *A B D*; the instrument will discover, whether the air be more or less humid now, than it was at another given time.

Or thus: If a more sensible and accurate *hygrometer* be required; strain a whipcord or fiddle-string over several truckles, or pullies, *A, B, C, D, E, F,* and *G,* (*Fig. 8.*) and proceed

proceed with the rest as in the former example. Nor does it matter whether the several parts of the cord AB, BC, CD, DE, EF, and FG, be parallel to the horizon, as expressed in the present figure, or perpendicular to the same.

The advantage of this, above the former *hygrometer*, is, that we have a greater length of cord in the same compass: and the longer the cord, the greater its contraction and dilatation. Or thus:—Fasten a hempen cord, or fiddle-string, A B, (Fig. 9.) to an iron hook, and let the other end, B, descend upon the middle of a horizontal board, or table, E F; near B hang a leaden weight of a pound, C, and fit an index C G. Lastly, from the centre B describe a circle; which divide into any number of equal parts.

Now, it is matter of observation, that a cord or gut twists itself as it is moistened, and untwists again as it dries.—Mr. Molyneux, secretary of the Dublin society, writes, that he could perceive this alternate twisting and untwisting in a cord, by only breathing on it eight or ten times, and then applying a candle toward it. Hence, upon an increase or decrease of the humidity of the air, the index will shew the quantity of twisting or untwisting; and, consequently, the increment or decrement of humidity, or ficity.

Or thus:—Fasten one end of a cord, or fiddle-string, H I, (Fig. 10.) to a hook, H; and to the other end fasten a ball, K, of a pound weight. Draw two concentric circles on the ball, and divide them into any number of equal parts. Fit a style, or index, N O, into a proper support, N, so as the extremity O may almost touch the divisions of the ball. Here, the cord or gut twisting or untwisting, as in the former case, will indicate the change of moisture, &c. by the successive application of several divisions of the circles to the index.

Or thus:—Provide two wooden frames, A B and C D, (Fig. 11.) with grooves therein; and between those grooves fit two thin leaves of ash, A E F C, and G B D H, so as they may easily slide either way. At the extremes of the frames A, B, C, D, confine the leaves with nails, leaving between them the space E G H F, about an inch wide. On I fasten a slip of brass dented, I K; and in L a little dented wheel, upon whose axis, on the other side of the machine, an index is to be put. Lastly, from the centre of the axis, on the same side, draw a circle, and divide it into any number of equal parts.

Now, it being found by experience, that ashen wood readily imbibes the moisture of the air, and swells therewith; and as that moisture slackens, shrinks again; upon any increase of the moisture of the air, the two leaves A F and B H growing turgid, will approach nearer each other: and again, as the moisture abates, they will shrink, and again recede.—Hence, as the distance of the leaves can neither be increased nor diminished without turning the wheel L, the index will point out the changes in respect of humidity, and ficity.

It is to be noted, that all the *hygrometers* above described become sensibly less and less accurate; and, at length, undergo no sensible alteration at all from the humidity of the air. The following is much more lasting.

Take the *MANOSCOPE*, described under that article, and instead of the exhausted ball, E, (Fig. 21.) substitute a sponge, or other body, which easily imbibes moisture. To prepare the sponge, it may be necessary first to wash it in water; and when dry again, in water or vinegar wherein sal ammoniac or salt of tartar has been dissolved, and let it dry again.

Now, if the air become moist, the sponge growing heavier will preponderate; if dry, the sponge will be hoisted up; and, consequently, the index will shew the increase or decrease of humidity of the air.

In the last mentioned *hygrometer*, Mr. Gould, in the *Philosophical Transactions*, instead of a sponge, recommends oil of vitriol, which is found to grow sensibly lighter or heavier, in proportion to the lesser or greater quantity of moisture it imbibes from the air; so that being fatiated in the moiftest weather, it afterwards retains or loses its acquired weight, as the air proves more or less moist.—The alteration in this liquor is so great, that in the space of fifty seven days, it has been known to change its weight from three drams to nine; and has shifted an index or tongue of a balance 30 degrees.—A single grain, after its full increase, has varied its equilibrium so sensibly, that the tongue of a balance only an inch and half long, has described an arch one third of an inch in compass; which arch would have been almost three inches, if the tongue had been one foot, even with so small a quantity of liquor; consequently, if more liquor, expanded under a large surface, were used, a pair of scales might afford as nice an *hygrometer* as any kind yet invented.—The same author suggests, that oil of sulphur per campanam, or oil of tartar per deliquium, or the liquor of fixed nitre, might be substituted in lieu of the oil of vitriol.

This balance may be contrived two ways; by either having the pin in the middle of the beam, with a slender tongue a foot and half long, pointing to the divisions on an arched plate; as represented in Fig. 12.

Or, the scale with the liquor may be hung to the point of the beam near the pin, and the other extreme be made so long,

as to describe a large arch on a board placed for the purpose; as represented in Fig. 13.

From a series of *hygroscopical* observations, made with an apparatus of deal wood, described in the *Philosophical Transactions*, Mr. Coniers concludes; 1^o. That the wood shrinks most in summer, and swells most in winter; but is most liable to change at spring and fall. 2^o. That this motion happens chiefly in the day-time; there being scarce any variation in the night. 3^o. That there is a motion even in dry weather; the wood swelling in the morning, and shrinking in the afternoon. 4^o. The wood, by night as well as day, usually shrinks when the wind is in the north, north-east, and east, both in winter and summer. 5^o. That by constant observation of the motion and rest of the wood, with the help of a thermometer, one may tell the situation of the wind without a weather-cock.

He adds, that the time of the year may be known by it; for in spring it moves quicker, and more than in winter; in summer it is more shrunk than in spring; and has less motion in autumn than in summer.

HYGROSCOPE*, is commonly used in the same sense with *hygrometer*. See **HYGROMETER**.

* The word is compounded of *ὕγρος*, moist, and *σκοπεω*, *αἶδεω*, *σπῆρα*, I see, or consider.

Wolffius, however, regarding the etymology of the word, makes some difference. According to him, the *hygroscopae* only shews the alterations of the air in respect of humidity and driness; but the *hygrometer* measures them. A *hygroscopae*, therefore, is a less accurate *hygrometer*.

HYIOTES, *ΥΙΩΤΗΣ*, *Filiatio*. See **ADOPTION**.

HYKES, a sort of blankets, in great use among the natives

of Barbary. They are wove by the women, who make no use of a shuttle therein, but conduct every thread of the woof with their fingers. One of these *hykes* is usually six yards long, and five or six broad, serving the Kabyle as well as Arab, both male and female, for a complete dress in the day, and for his bed and covering in the night.—It is a loose and troublesome kind of garment, being frequently disconcerted, and falling on the ground; so that the wearer is every moment to be tucking it up, and folding it a new round his body. Dr. Shaw (*Trav.* p. 289.) takes it to be much the same with the peplos, if not with the toga of the antients.

HYLE*, or **HYLEC**, among alchymists, is their first matter; or it is matter considered as produced by nature herself; called also *chaos*.

* The word is Greek, *ἕλη*, which signifies matter.

HYLEG, or **HYLECH**, in astrology, an Arabic term for a planet, or for a point of the heavens, which in a man's nativity becomes as is pretended the moderator and significator of life.

HYLEGIAL Places, among astrologers, are those wherein a planet being found, is qualified to have the government of life attributed to it.

HYLOBII*, or **HYLOBIANS**, a sect of Indian philosophers, thus denominated by the Greeks, in regard they retired to forests, to be more at leisure for the contemplation of nature.

* The name is compounded of the Greek, *ἕλη*, which, beside matter, signifies also wood, forest; and *βίος*, life.

HYMEN, in poetry, a term of invocation.—**HYMEN**, or **HYMENÆUS**, is properly a fabulous divinity, supposed by the antients to preside over marriages; and who accordingly was invoked in epithalamiums, and other matrimonial ceremonies, under the formula, Hymen o Hymenee!

The poets generally crown this deity with a chaplet of roses; and represent him as it were dissolved and enraptured with pleasures; dressed in a yellow robe, and shoes of the same colour; with a torch in his hand.—Catullus, in one of his epigrams, addresses him thus:

*Cinge tempora floribus,
Suaevolentis amaraci.*

It was for this reason, that the new married couple bore garlands of flowers on the wedding-day; which custom also obtained among the Hebrews; and even among the Christians, during the first ages of the church, as appears from Tertullian, *De Corona Militari*, where he says, *Coronant & nuptiae sponsas*.—S. Chrysostom likewise mentions these crowns of flowers; and to this day the Greeks call marriage *εὐφροσύνη*, in respect of this crown or garland.

HYMEN, *ΥΜΗΝ*, in anatomy, a thin membrane or skin, resembling a piece of fine parchment, supposed to be stretched in the neck of the womb of virgins, below the nymphæ; and to be broke when they are deflowered; an effusion of blood following the breach.

The *hymen* is generally looked upon as the test of virginity; and when broke, or withdrawn, shews that the person is not in a state of innocence.—This notion is very antient. Among the Hebrews, it was the custom for the parents to save the blood shed on this occasion, as a token of the virginity of their daughter; and to send the sheets, next day, to the husband's

husband's relations. And the like is said to be still practised in Portugal, and some other countries. And yet authors are not agreed as to the existence of such a membrane. Nothing, Dr. Drake observes, has employed the curiosity of anatomists, in dissecting the organs of generation in women, more than this part: They have differed not only as to its figure, substance, place, and perforation, but even its reality; some positively affirming, and others flatly denying it.

De Graaf himself, the most accurate inquirer into the structure of these organs, confesses he always sought it in vain, though in the most unsuspected subjects and ages: all he could find, was a different degree of straitness or wideness; and different corrugations, which were greater or less, according to the respective ages; the aperture being still the less, and the rugosities the greater, as the subject was younger, and more untouched.

Dr. Drake, on the other hand, declares, that in all the subjects he had had opportunity to examine, he does not remember to have missed the *hymen* so much as once, where he had reason to depend on finding it. The fairest view he ever had of it, was in a maid who died at thirty years of age: in this, he found it a membrane of some strength, furnished with fleshy fibres, in figure round, and perforated in the middle with a small hole, capable of admitting the end of a woman's little finger, and situate a little above the orifice of the urinary passage, at the entrance of the vagina of the womb.

In infants, it is a fine thin membrane, not very conspicuous, because of the natural straitness of the passage itself, which does not admit of any great expansion in so little a room; which might lead De Graaf into a notion of its being no more than a corrugation.

This membrane, like most others, does probably grow more distinct, as well as firm, by age. That it not only exists, but is sometimes very strong and impervious, may be collected from the history of a case reported by Mr. Cowper: In a married woman, twenty years of age, whose *hymen* was found altogether impervious, so as to detain the menes, and to be driven out by the pressure thereof, beyond the labia of the pudendum, not unlike a prolapsus of the uterus. On dividing it, at least a gallon of grumous blood came forth. It seems the husband, being denied a passage that way, had found another through the meatus urinarius; which was found very open, and its sides extruded like the anus of a cock.

Upon a rupture of the *hymen*, its parts shrinking up, are supposed to form those little fleshy knots, called *carunculae myrtiliformes*.

HYMEN is also used by botanists for a fine delicate skin, where with flowers are inclosed while in the bud, and which bursts as the flower blows or opens.

The term *hymen*, in this sense, is particularly used in speaking of roses.

HYMN *, a song or ode in honour of God; or a poem proper to be sung, composed in honour of some deity. See SONG, and ODE.

* The word is Greek, ὕμνος, *hymn*, formed of the verb ὑμᾶν, *celebrate*, I celebrate. Inodors, on this word, remarks, that *hymn* is properly a song of joy, full of the praises of God; by which, according to him, it is distinguished from *threnna*, which is a mourning song, full of lamentation.

The *hymns* or odes of the antients, generally consisted of three stanzas or couplets: the first called *strophe*; second, *antistrophe*; and the last, *epode*.

S. Hilary, bishop of Poitiers, is said to have been the first that composed *hymns* to be sung in churches: he was followed by S. Ambrose. Most of those in the Roman Breviary were composed by Prudentius. They have been translated into French verse by Messieurs de Port Royal. The *Te Deum* is also commonly called a *hymn*, though it be not in verse; so also is the Gloria in excelsis.

In the Greek Liturgy, there are four kinds of *hymns*; but then the word is not taken in the sense of a praise offered in verse, but simply of laud or praise.—The angelic *hymn*, or Gloria in excelsis, makes the first kind; the trisagion the second; the cherubic *hymn* the third; and the *hymn* of victory and triumph, called ἰσχυρισμός, the last. See TRISAGION, &c.

HYOIDES *, ΥΟΕΙΔΕΣ, in anatomy.—The *Os HYOIDES*, called also *bicorne*, is a bone situate at the root of the tongue, making as it were the basis, or foundation thereof.

* It is thus called, from its imperfect resemblance of the Greek upilon Υ ; the word being formed of υ and $\epsilon\iota\delta\epsilon\varsigma$, form; for which reason it is also called *ypsioides*, and *hypsoides*.

It generally consists, in adults, of three little bones; and in children of five or six. The middle bone of the three, which is the shortest and broadest, is called the *basis*, and the two side bones *cornua*, or *horus*; whence also the appellations, *bicornis* and *ceratoides*.

The basis of the *hypoïdes* is about a thumb's breadth long on the outer side, which is convex; the inner being concave.

It is half a finger broad, and has a small protuberance in the middle. The *cornua* are an inch and half long, and broader at bottom than at the extremes, which are about two inches asunder.

It has two cartilaginous processes, called *corniculae*, fastened about the juncture of its *cornua* with the basis. They are tied to the processus styloides by long slender ligaments; though sometimes between them and the styloides there is found a small muscle, beside the *stylocoracohyoïdeus*.

The basis of this bone lies, as it were, on the head of the larynx; and its horns are fastened by ligaments to the upper processes of the cartilago scutiformis, and styloides.

It is moved by five pair of muscles, *viz.* the *sternohyoïdeum*, the *coracohyoïdeum*, the *mylohyoïdeum*, *geniohyoïdeum*, and *stylohyoïdeum*. See each under its proper article.

HYOTHYROIDÆ *, in anatomy, a pair of muscles of the larynx; which arising from the anterior part of the os hyoïdes, are inserted into the cartilago thyroïdes.—They serve as antagonists to the *sternothyroïdes*; and lift up the thyroïd cartilago.

* The word is compounded of *hypoïdes*, and *thyroïdes*. See THYROIDES, &c.

HYPÆTHRION *, or **HYPÆTHRION**, ἤπαιθριον, in the antient architecture, a kind of temple, open at the top, and thereby exposed to the air.

* The word is formed of ἵππος, *sub*, under, and αἶθρα, *air*.

The *hypæthron*, according to Vitruvius, is an open building, or portico, such as antiently were certain temples that had no roof or covering.—Of this we have an instance in the temple of Jupiter Olympius, built by Coscius, a Roman architect at Athens.

Of *hypæthrons*, some were decastyle, others pycnostyle: But they had all rows of columns withinside, forming a kind of peristyle; which was essential to this sort of temple. See PERISTYLE.

HYPALLAGÉ *, *Inmutatio*; a grammatical figure, whereby, of different expressions which give the same idea, we make choice of that which is least natural and obvious; or, when there is a mutual permutation or change of cases, moods, regimens, &c.

* The word is Greek, ὑπαλλαγῆς, formed of ὑπαλλάττω, I change; composed of ὑπα and ἀλλάττω, I change; of ἄλλος, *alter*, another.

As in this instance, *Dare classibus aëfros*, instead of *Dare classis aëfrit*.

HYPAPANTE *, or **HYPANTE**, a name which the Greeks give to the feast of the Purification of the holy virgin; or the presentation of Jesus in the temple.

* The words are Greek, ὑπαάντη, and ὑπαπάντη, which properly signify *humble*, and *lowly meeting*; being compounded of ὑπο, under, beneath, and ἀντή, or ἀπάντη, I meet, of ἀντή, *contra*, against.—The denominations are taken from the meeting of old Simeon and Anna the prophetess in the temple, at the time the child Christ Jesus was brought thither.

HYPER, a Greek word used in the composition of divers terms derived from that language.

The Greek preposition ὑπέρ, *hyper*, literally signifies *above*, *beyond*; and, in composition, it expresses some excess, or something beyond the signification of the simple word it is joined with.—Hence,

HYPERBATON *, or **HYPERBASIS**, in grammar and rhetoric, is a transposition; or, a figurative construction, inverting the natural and proper order of the terms of a discourse. See TRANSPOSITION.

* The word is Greek, ὑπερβατον, or ὑπερβασις, derived of ὑπερβαίνω, *transgressor*, I go beyond; formed of ὑπέρ, *ultra*, beyond, and βαίνω, *eo*, I go.

The *hyperbaton*, Longinus observes, is no other than a transposal of sentiments, or words, out of the natural order and method of discourse; and always implies great violence, or strength of passion, which naturally hurries a man out of himself, and distracts him variously.—Theurides is very liberal in *hyperbatons*.

Quintilian calls the *hyperbaton*, *verbi transgressio*.—It is of use to enliven and animate the discourse: It is very proper to express a violent passion, and represent an agitation of mind in the liveliest manner.

HYPERBOLA, in geometry, one of the curve lines, formed by the section of a cone. See CONIC SECTION.

The *hyperbola* arises when the plane that cuts the cone is not parallel to one of its sides, as it is in the *parabola*; but diverges from it outwards, not inward, as in the *ellipsis*. Thus: If the cone ABC (See *Tab. Conicæ*, fig. 27.) be so cut, as that the axis of the section DQ continued, concur with the side of the cone AC, continued to E; the curve arising from this section is an *hyperbola*.

Some authors define the *hyperbola* to be a section of the cone, by a plane parallel to its axis. But this definition is faulty: for though it be true that such a section really describes a *hyperbola*; yet it is likewise true, that a thousand others may be

be described where the plane is not parallel to the axis, and which of consequence are not included in the definition. Authors sometimes call the plane terminated by this curve, an *hyperbola*; and in respect thereof, call the curve itself the *hyperbolic line*.

A *hyperbola* may be defined, with respect to its properties, to be a curve line, wherein the square of the semi-ordinate is to the rectangle of the absciss into a right line compounded of the same absciss, and a given right line called the *transverse axis*, as another given right line, called the *parameter* of the axis, is to the transverse axis: or it is a curve line, wherein $ay^2 = abx + bxx$, that is, $b : a = y^2 : ax + x^2$.

In the *hyperbola*, a mean proportional between the transverse axis and parameter, is called the *conjugate axis*: And if the transverse axis AB (Tab. Conics, fig. 27. n. 2.) be joined directly to the axis AX, and be bisected in C; the point C is called the *centre* of the *hyperbola*.

If a right line DE pass through the vertex A, (fig. 20.) parallel to the ordinates Mm, it is a tangent to the *hyperbola* sin A.

If a right line DE be drawn through the vertex A of an *hyperbola* parallel to the ordinates Mm, and be equal to the conjugate axis, viz. the parts DA and AE equal to the semi-axis; and right lines CF and CG be drawn from the centre C through D and E; those lines are called *asymptotes* of the *hyperbola*.

The square of the right line CI-or AI, is called the *power* of the *hyperbola*.

Properties of the HYPERBOLA.—In the *hyperbola*, the squares of the semi-ordinates are to each other, as rectangles of the absciss into a certain right line composed of the absciss and transverse axis.—Hence, as the absciss x increases, the rectangles $ax + x^2$, and consequently the squares of the semi-ordinates y^2 , and therefore the semi-ordinates themselves, increase. The *hyperbola*, therefore, continually recedes from its axis.

2°. The square of the conjugate axis, is to the square of the transverse, as the parameter to the transverse axis.—And hence, since $b : a :: PM^2 : AP \cdot PB$, the square of the conjugate axis, is to the square of the transverse; as the square of the semi-ordinate is to the rectangle of the absciss into a line composed of the absciss and transverse axis.

3°. To describe an *Hyperbola*, in a continued motion; the transverse axis, and the distance from the vertex being given. In the two foci F and f, (fig. 28.) fix two nails or pins; and to one of them, in F, tie a thread FMC, fastening the other end C to the ruler Cf, which exceeds the same by the transverse axis AB. The other end of the ruler being perforated, put it on the pin f; and fixing a style to the thread, move the ruler. Thus will the style trace out an *hyperbola*.—Again, with the same data, any number of points in an *hyperbola*, are easily found, which may be connected into an *hyperbola*. Thus, from the focus f, with any interval greater than AB, describe an arch; and making $fb = AB$; with the remaining interval fb , from the point F, draw another arch intersecting the former in m: for, as $f m - m b = AB$; m is a point in the *hyperbola*. And so of the rest.

4°. If in an *hyperbola*, the semi-ordinate PM, (fig. 20.) be produced till it meet the asymptote in R; and the difference of the squares of PM and PR is equal to the square of the conjugate semi-axis DA.—Hence, as the semi-ordinate PM increases, the right line PR decreases, and consequently MR; and therefore the *hyperbola* itself approaches nearer to the asymptote; but it can never absolutely meet it, because, as $PR^2 - PM^2 = DA^2$; it is impossible $PR^2 - PM^2$ should ever become 0.

5°. In an *hyperbola*, the rectangle of MR and Mr, is equal to the difference of the squares PR^2 and PM^2 .—And hence, the same rectangle is equal to the square of the conjugate semi-axis DA; and consequently all rectangles formed in the same manner are equal.

6°. If qm be parallel to the asymptote CF, the rectangle of qm into Cq is equal to the power of the *hyperbola*.—And hence, r°. If we make $CI = AI = a$, $Cg = x$, and $gm = y$, we shall have $a^2 = xy$; which is the equation expressing the nature of the *hyperbola* between its asymptotes. 2°. The asymptotes therefore being given in position, and the side of the power of CI or AI; if in one of the asymptotes CG, you take any number of absciss; so many semi-ordinates will be found, and by them any number of points in an *hyperbola* will be determined by finding third proportionals to the absciss, and the side of the power CI.—3°. If the absciss be not computed from the centre C, but from some other point L; and CL be supposed $= b$; we shall have $Cq = b + x$; and consequently $a^2 = (b + x)y$.

7°. In the *hyperbola*, as the transverse axis is to the parameter; so is the aggregate of the transverse semi-axis and absciss, to the subnormal: and as the aggregate of the transverse semi-axis and absciss is to the absciss; so is the aggregate of the entire transverse axis and absciss to the subtangent. See SUBNORMAL and SUBTANGENT.

8°. If within the asymptotes of an *hyperbola*, from a point

thereof, (fig. 29.) be drawn two right lines Hm and mK, and other two LN and NO, parallel to the same; Hm, mK = LN, NO. And the same will hold, if you draw LN o parallel to the right line thus drawn Hm k, viz. in this case likewise Hm, m k = LN, No.—Consequently, all rectangles formed after this manner of right lines drawn parallel either to the same line Hk, or to two, Hm and mK, are equal to each other.

9°. If a right line Hk be drawn in any manner between the asymptotes of an *hyperbola*; the segments HE and m k intercepted on each side between the *hyperbola* and asymptotes are equal.—And hence, if E m = o; the right line Hk is a tangent to the *hyperbola*: Consequently the tangent FD intercepted between the asymptotes, is bisected in the point of contact V. Lastly, the rectangle of the segments Hm and m k, parallel to the tangent FD, is equal to the square of half the tangent DV.

10°. The square of the semi-ordinate in an *hyperbola*, is to the rectangle of the absciss, and aggregate of the transverse diameter AB, (fig. 30.) and absciss AP, as the square of the conjugate semi diameter AD, is to the square of the transverse semi-diameter CA.—Hence, if you suppose AP x, and $2r^2 = AB = a$, you will have $v^2 r^2 = ax + x^2$; and consequently $y^2 = (x^2 + ax + c^2 x^2) : \frac{1}{2} a = \frac{4c^2 x}{a} + \frac{4c^2 x^2}{a^2}$. Suppose $4c^2 : a = b$; then will $y^2 = bx + \frac{1}{2} bx^2 : a$.

So that the same equation defines the nature of the *hyperbola* in respect of its diameter, as expresses it in respect of its axis; and the parameter is a third proportional to the conjugate diameters DE and AB.

11°. If from the vertex A, and any point of the parabola N, you draw AF and TN parallel to the asymptote CR; the rectangle of TN into TC, will be equal to the rectangle of FA into FC.—Hence, if TC = x, TN = y; the equation expressing the nature of a *hyperbola* within asymptotes, in respect of its diameter, will be $xy = ab$.

12°. An asymptote being taken for a diameter; divided into equal parts, and through all the divisions, which form so many absciss continually increasing equally, ordinates to the curve being drawn parallel to the other asymptote; the absciss will represent an infinite series of natural numbers; and the corresponding *hyperbolic* or asymptotic spaces, will represent the series of logarithms of the same numbers.

Hence different *hyperbola's* will furnish different series of logarithms to the same series of natural numbers; so that to determine any particular series of logarithms, choice must be made of some particular *hyperbola*.—Now, the most simple of all the *hyperbola's* is the equilateral one, i. e. that whose asymptotes make a right angle between them. This, M. de Lagny alledges in favour of the binary arithmetic, as being the result of such equilateral *hyperbola*. See BINARY ARITHMETIC.

For the Locus of an HYPERBOLA. See the article LOCUS.

For the Quadrature of an HYPERBOLA. See QUADRATURE.

Ambigenal HYPERBOLA, is that which has one of its infinite legs inscribed, and the other circumscribed.

Equilateral HYPERBOLA, is that wherein the conjugate axis AB (fig. 20.) and DE are equal.

Properties of the Equilateral HYPERBOLA.—Since the parameter is a third proportional to the conjugate axis, it is also equal to the axis.

Wherefore, if in the equation $y^2 = bx + bx^2 : a$, you suppose $b = a$; the equation $y^2 = ax + x^2$ will express the nature of the equilateral *hyperbola*.

And hence the squares of the ordinates y^2 and z^2 , are to each other as $ax + x^2$ and $az + z^2$: That is, as the rectangles of the absciss into right lines composed of the absciss and parameter.

If you suppose HC = x, CA = r, then will $AP = x - r$, and $PB = r + x$. Consequently $y^2 = x^2 - x^2$.

And since $AE = CA$; the angle ACE will be half right; and consequently the angle of the asymptotes FCG a right angle.

Infinite HYPERBOLA'S, or HYPERBOLA'S of the higher kinds, are those defined by the equation $a y^n + b x^n = az^m (a + x^n)$. Hence, in infinite *hyperbola's* $a y^n + b x^n = a v^m + b x^m (a + x^n) : b x^m (a + z^n)$: That is, $y^n + z^n = v^m + x^m (a + z^n)$.

As the *hyperbola* of the first kind or order has two asymptotes, that of the second kind or order has three, that of the third, four, &c.

In respect of these, the *hyperbola* of the first kind, is called the Apollonian or conical *hyperbola*.

Apollonian HYPERBOLA, is the common *hyperbola*, or the *hyperbola* of the first kind: Thus called in contradistinction to the *hyperbola's* of the higher kinds.

HYPERBOLE, in rhetoric, a figure, whereby the truth, and reality of things is excessively either enlarged or diminished. See EXAGGERATION.

* The word is Greek, υπερβασις, *superlatio*, formed of the verb υπερβασις, *exsuperare*, to exceed, surpass by far.

The character of an *hyperbole* is to exaggerate or extenuate the idea of the thing spoke of, beyond the bounds of truth, or even probability.—As, He ran swifter than the wind; he went slower than a tortoise, &c.

Hyperbole's, says Seneca, lye without deceiving; they lead the mind to truth by fictions, they convey the sentiment intended, tho' by expressing it in terms which render it incredible.—The *hyperbole* premises too much, in order to make you conceive enough.

Aristotle observes, that *hyperbole's* are the favourite figures of young authors, who love excess and exaggeration; but that philofophers should not use them without a great deal of reserve.

The pitch to which an *hyperbole* may be carried, is a point of great delicacy: To carry it too far, is to destroy it: It is of the nature of a bow-string, which, by immoderate tension, slackens; and frequently has an effect quite contrary to that intended. Longinus.

Those *hyperbole's* are best, which are latent, and are not taken for *hyperbole's*. For this reason, they should scarce ever be used but in a passion, and in the middle of some important incident: such is the *hyperbole* of Herodotus, speaking of the Lacedemonians, who fought at Thermopylae, 'They defended themselves, for some time, with the arms that were left them, and at last with their hands and teeth; till the Barbarians, continually shooting, buried them, as it were, with their arrows.' Now, what likelihood is there that naked men should defend themselves with their hands and teeth against armed men; and that so many persons should be buried under their enemies arrows? Yet does there appear some probability in the thing, by reason it is not fought for the sake of the figure; but the *hyperbole* seems to arise out of the subject itself. Id.

Of the like kind is that passage of a comic poet mentioned by Longinus: 'He had lands in the country no larger than a Lacedemonian epistle.'

There are certain manners of tempering the harshness of *hyperbole's*, and giving them an air of probability. Virgil says, that to see the fleets of Anthony and Augustus at the battle of Actium, one would have taken them for the Cyclades floating on the water: and Florus, speaking of the expedition wherewith the Romans built a number of vessels in the first Punic war, says, 'It seemed, not that the ships were built by workmen, but that the trees were transformed into ships by the gods.' They do not say that the ships were floating islands; nor that the trees were metamorphosed into ships; but only that one might have taken them to be so. This precaution serves as a kind of passport to the *hyperbole*, if we may be allowed the phrase, and makes it go down even in prose: for what is excused before it is said, is always heard favourably, how incredible soever it be. Bauhinus.

HYPERBOLIC, or **HYPERBOLICAL**, something relating either to an *hyperbole*, or an *hyperbola*. See **HYPERBOLA**, and **HYPERBOLE**.

Thus we say, an *hyperbolic* expression; an *hyperbolic* image, &c.

HYPERBOLIC *Conoid*. See the article **CONOID**.

HYPERBOLIC *Cylindroid*, is a solid figure, whose generation is given by Sir Christopher Wren, in the *Philosophical Transactions*.

Two opposite *hyperbola's* being joined by the transverse axis, and through the centre a right line being drawn at right angles to that axis; and above that, as an axis, the *hyperbola's* being supposed to revolve, by such revolution, a body will be generated, which is called the *hyperbolic cylindroid*, whose bases, and all sections parallel to them, will be circles. In a subsequent *Transactions*, the same author applies the new figure to the grinding of *hyperbolic* glasses; affirming, that they must be formed this way, or not at all.

HYPERBOLIC *Leg* of a curve, is that which approaches infinitely nearer to some asymptote.

Sir Isaac Newton reduces all curves, both of the first and of the higher kinds, into those with *hyperbolic legs*, and those with parabolic ones. See **CURVE**.

HYPERBOLIC *Line* is used by some authors for what we call the *hyperbola* itself.

In this sense, the plane surface terminated by the curve line is called the *hyperbola*; and the curve line that terminates it, the *hyperbolic line*.

HYPERBOLIC *Mirror*. See the article **MIRROR**.

HYPERBOLIC *Solid*. See the article **CUBATURE**.

HYPERBOLIFORM *Figures*, are such curves as approach, in their properties, to the nature of the *hyperbola*; called also *hyperboloids*.

HYPERBOLOIDES, are *hyperbola's* of the higher kind, whose nature is expressed by this equation: $a y^m x^n = b x^m (a + x^n)$: especially if $m > 1$, or $n > 1$. e.g. $a y^3 = b x^2 (a + x)$.

HYPERBOREAN, ὑπερβορῆος, in the antient geography.—The antients denominated those people, and places *hyperborean*, which were to the northward of the Scythians. They had but very little acquaintance with these

hyperborean regions; and all they tell us of them is very precarious, and much of it false.

Diodorus Siculus says, the *hyperbores* were thus called by reason they dwelt beyond the wind *Boreas*; ὑπερ, signifying above or beyond, and βορέας, Boreas, the north wind. This etymology is very natural and plausible; notwithstanding all that Rudbecks has said against it, who would have the word to be generally Gothic, and to signify nobility.

Herodotus doubts, whether or no there were any such thing as *hyperborean* nations: Strabo, who profess'd that he believed there were, does not take *hyperborean* to signify beyond *Boreas* or the north, as Herodotus understood it: The preposition ὑπερ, in this case, he supposes only to help form a superlative; so that *hyperborean*, on his principle, means no more than *most northern*: by which it appears the antients scarce knew themselves what the name meant by it.

HYPERCATALECTIC *, in the Greek and Latin poetry, is applied to verses which have one or two syllables too much; or beyond the regular measure. See **VERSE**.

* The word is Greek, ὑπερκαταλετικόν; composed of ὑπερ, over, beyond, and καταλεγοι, I put to the number I add; so that *hypercatalctic* denotes as much as *super-added*.

The Greek and Latin verses are distinguished, with respect to their measure, into four kinds: *acatalectic* verses, where nothing is wanting at the end; *catalectic*, which want a syllable at the end; *brachycatalectic*, which want a whole foot at the end; and, lastly, *hypercatalctic*, which have one or two syllables too many.—These last are also called *hypermetra*.

HYPERCATHARSIS *, ὑπερκαθαρσις, in medicine, *super-purgation*; a too violent, and excessive purgation.

* The word is compounded of the Greek, ὑπερ, supra, and καθαρσις, I purge.

HYPERCRISIS *, ὑπερκρισις, in medicine, any immoderate critical excretion.

* The word is compounded of ὑπερ, supra, and κρισις, crisis, judgment.

Thus, when a fever terminates in a looseness, the humours sometimes flow off faster than the strength can bear, and are therefore to be checked.—This is a *hypercrisis*.

HYPERCRITIC *, an over-rigid censor, or critic; one who will let nothing pass, but animadvert severely on the slightest fault.

* The word is compounded of ὑπερ, super, over, above, beyond, and κριτικόν, of κριτής, judge; of κρισις, judge, I judge.

HYPERDULIA *, in the Romish theology, is the worship rendered to the holy virgin. See **VIRGIN**.

* The word is Greek, ὑπερδουλια, composed of ὑπερ, above, and δουλια, worship, service.

The worship offered to saints is called *dulia*; and that to the mother of God, *hyperdulia*; as being superior to the former.

HYPERMETER *, in the antient poetry, the same with *hypercatalctic*. See **HYPERCATALECTIC**.

* The word is composed of ὑπερ, super, and μετρον, measure.

HYPERSARCOSIS *, ὑπερσαρκωσις, in medicine and chirurgery, an excess of flesh; or rather, a fleshy excrecence, such as those generally arising on the lips of wounds, &c.

HYPERTHYRON *, in the antient architecture, a sort of table used after the manner of a frieze, over the jambs of Doric doors and gates, and the lintels of windows. It lies immediately under the corona; and is by our workmen usually called the *king-piece*.

* The word is formed of ὑπερ, super, over, and θυρον, janua, gate.

HYPHEN, ὑφην, an accent or character in grammar, which implies, that two words are to be joined, or connected into one compound word.—As, mal-fanus, mal-administration, &c.

Hyphens serve also to connect the syllables of such words as are divided by the end of the line.

HYPNOTICK *, ὑπνωτικόν, in medicine, a remedy which promotes or induces sleep; called also *seperific*, and *opiate*.

* The word comes from the Greek, ὑπνω, somnus, sleep.

HYPO, ὑπο, a Greek particle, retained in the composition of divers words borrowed from that language; literally denoting under, beneath,—In which sense it stands opposed to ὑπερ, super, above.

HYPOBOLE *, in rhetoric, a figure whereby we answer beforehand, to what we apprehend the adversary will object.

* The word comes from the Greek ὑπο, and βολω, jacio, I cast.

HYPOCATHARSIS *, ὑποκαθαρσις, in medicine, a too faint, or feeble purgation.

* The word is compounded of ὑπο, sub, under, and καθαρσις, I purge.

HYPOCAUSTUM *, ὑποκαυστόν, among the Greeks and Romans, was a subterraneous place, wherein was a furnace that served to heat the baths.—Vitruvius calls it *caldarium*.

* The word is Greek, formed of the preposition ὑπο, sub, under, and the verb καίω, incendo, I burn.

The ancients had properly two sorts of hypocausta; the one called by Cicero vapourarium, and by others laconicum or sudatio; which was a large sweating bath, in which were three brazen vessels called caldarium, tepidarium, and frigidarium, according to the water contained therein.

The other hypocaustum, was a fort of fornax or oven to heat their winter parlours, or carnatiuncula hybernae.

The latter hypocaustum was called aboveus and fornax; and the man that tended the fire, fornacator.

HYPOCAUSTUM, among the moderns, is that part or place where the fire is kept that warms a stove, or hot-house. See STOVE.

HYPochondRIA*, ὑποχονδρία, in anatomy, a space on each side the epigastric region, or upper part of the lower belly. See ABDOMEN, and EPIGASTRIC.

* The word is composed of the preposition ὑπο, sub, under, and χονδρία, cartilage; g. d. cartilaginis subjacens, or under the cartilages of the ribs, &c.

The hypochondria compose the upper part of the epigastrum. They are situate on each side, between the cartilago eniformis, the cartilages of the ribs, and the tip of the breast; and are divided, with respect to their situation, into right and left.

In the right hypochondrium the liver is found; and in the left the spleen, and a great part of the stomach.

Hippocrates sometimes uses the word hypochondrium for the whole lower venter or belly.

The hypochondria are subject to divers disorders.

HYPochondRIAC Affection, or Passion, a popular disease, otherwise called the spleen, vapours, &c.

The hypochondriac is a very comprehensive disease: it is variously denominated, according to the various symptoms it is attended with, and the various parts where it is supposed to be seated, or in which it arises.

When conceived as situate in the hypochondriac regions, or arising from some disorder of the parts contained therein, viz. the spleen, liver, &c. it is properly called the hypochondriacal disease, spleen, &c.

When conceived as owing to some disorder of the womb, it is called the hysterical affection, &c.

And lastly, when the flatulent rumblings in the intestines, belchings, &c. are considered, it is called the vapours.

The hypochondriac is a very common and very obstinate disease: Few men of a sedentary life, and fewer women, are free from it: Its symptoms are very numerous: The most usual, are a pain in the stomach, windiness, vomitings, a swelling or distension of the hypochondriums, or upper part of the belly, noises and rumblings in the lower venter, wandering pains, a constriction of the breast, difficulty of breathing, palpitation of the heart, faintings, vigilie, inquietudes, swimming of the head, fear, suspicions, melancholy, deliriums, &c. Not that all these accidents beset every person seized with this disease; but sometimes some of them, and at other times others, according to the constitution, &c. of the patient.

In effect, the hypochondriacal is a very vague, indeterminate sort of disorder. Dr. Sydenham observes, that its symptoms are or emulate those of most other diseases; and that whatever part it is in, it produces somewhat like the common diseases of that part.—Thus, in the head, it produces a sort of apoplexy; fits like the epilepsy, called hysterical fits; intolerable head-ach, &c. In persons affected with the chlorosis, it produces a palpitation of the heart; sometimes, though rarely, it seizes the lungs, and causes a continual dry cough: It also imitates the colic, and iliac passion, and sometimes the stone, jaundice, &c. In the intestines it produces a diarrhoea; in the stomach, nauces: sometimes it seizes the external parts, and particularly the back, which it renders chilly and painful; and the legs and thighs, which it swells so as to resemble the dropsy, seizing the teeth it resembles the scurvy; (Indeed, Etmuller makes the scurvy itself to be only a great degree of this disease). Lastly, which is the most unhappy circumstance of all, the patient is sometimes more affected in mind than in body.

The feat of this disease is commonly supposed to be in the animal spirits, and the nervous system. Its cause is referred to an acid salt abounding in the mass of blood; to which the ill disposition of the stomach, and the other parts contained in the epigastrum, may greatly contribute. Purul crudities and indigestions as the prime cause. According to Sydenham, vehement motions of the body, or more usually violent perturbations of the mind, as grief, anger, fear, &c. are its procatartic causes.

For the cure, the principal indication is to purify and strengthen the blood, which is to be effected, after proper evacuations, by chalybeats, bitters, strengtheners, and volatile spirits. The cortex has also notable virtues in this disease; as has also a milk diet. Ridding is admirable.

HYPochondRIACAL Medicines, are remedies proper in the hypochondriacal disease.

Such are all those which tend to purify the blood, humours, and spirits; as chervil, baum, agrimony, and the other cephalic and cardiac herbs: such also are those which purge melancholy or atrillias, according to the old authors, and those which dispel wind and vapours; and all medicines good for disorders of the nerves, particularly vervain, both male and female; but above all, frequent, gentle, anodyne purges are excellent.

HYPochondRIACAL Regions. See HYPochondRIA.

HYPochYMA*, or HYPochYSIS, in medicine, a disease of the eyes more usually called a cataract. See CATARACT.

* The word is Greek, ὑποχυμα, which literally denotes shedding, effusion, or pouring out; the disease having formerly been supposed to arise from an effusion of some viscid humour upon the pupil.

HYPochYSIS, in medicine. See HYPochYMA.

HYPocISTIS*, ὑποκίστις, in medicine, a juice, used in the composition of theriaca, &c.

* The word is Greek, formed of ὑπο, under, and κιστις, cistus. The hypocistis is the juice of a shoot or excrescence of the same name, sprouting out from the foot of a kind of cistus, which is called ledon or ladanifera; common enough in the hot countries.

The shoot grows about a foot high; and one, two, or three inches thick; and is somewhat bigger at top than at bottom; and is soft, succulent, of a yellowish colour, and surrounded from space to space with a sort of rings, or brownish knots.

When gathered, they pound it in a mortar, and express the juice: that done, they evaporate it on the fire till it come to the consistence of a hard blackish extract, much like Spanish liquorice. Then they make it up into little masses for carriage. It is of a tart astringent taste, and used to stop fluxes of the belly, vomitings, and hæmorrhages; though anciently much more than at present. It is also an ingredient in some unguents.

It is sometimes used as a substitute to acacia.—Dr. Quincy says, it is the more powerful astringent of the w.

HYPocRAS. See the article HIPPOCRAS.

HYPodROME. See the article HIPPODROME.

HYPogÆUM*, in the ancient architecture, is a name common to all the parts of a building that are under ground; as the cellar, butteries, and the like places.

* The word is Greek, ὑπογαιον, formed of ὑπο, under, and γαια, terra, earth.

HYPogÆUM, ὑπογαιον, in astronomy, is a name given to the celestial houses which are below the horizon; and especially the immo cæli, or bottom of heaven.

HYPogASTRIC Region. See HYPogASTRIUM.

HYPogASTRIC Artery, is an artery arising from the iliaca interna, and distributed to the bladder, the rectum, and the genital parts, particularly in women.

HYPogASTRIC Vein, arises in the same parts, and discharges itself into the iliaca interna.

HYPogASTRIUM*, in anatomy, the lower part of the abdomen, or lower venter; commencing from two or three inches below the navel, and extending to the os pubis.

* The word is Greek, formed of ὑπο, sub, under, and γαστρον, venter, belly.

HYPogLOTTIS*, or HYPogLOSSIS, in anatomy, is a name given to two glands of the tongue.

* The word is Greek, composed of ὑπο, sub, under, and γλωττις, lingua, tongue.

There are four large glands of the tongue; two of them called hypoglotides, situated under it, near the venæ ranulares; one on each side of the tongue. They serve to filtrate a kind of serous matter, of the nature of saliva, which they discharge into the mouth by little ducts near the gums.

HYPogLOTTIS, or HYPogLOSSIS, in medicine, denotes an inflammation or ulceration under the tongue; called also ranula.

HYPomochLION*, in mechanics the fulcrum of a lever; or the point which sustains its pressure, when employed either in raising or lowering bodies.

* The word is Greek, ὑπομochλιον, formed of ὑπο, sub, under, and μοχλος, ἄξελις, lever.

The hypomochlion is frequently a roller set under the lever; or under stones, pieces of timber, &c. that they may be the more easily lifted up, or removed.

HYPOPYON*, in medicine, a disease of the eyes.—It consists in a collection of pus, under or behind the cornea; which sometimes covers the whole pupil, and obstructs the light.

* The word is Greek, ὑποπυον; formed of ὑπο, sub, under, and πυον, pus.

Some will have this disorder the same with unguis; but the more accurate make a difference.

The hypopyon arises from a rupture of the vessels in the uvea, occasioned either by some external violence, or the acrimony of the blood therein.

It is very difficult of cure.---The suppuration is to be prevented by proper cataplasms; or, if these will not take effect, is to be promoted.

HYPORCHEMA, in the Greek poetry, a poem composed in divers kinds of verses, and of different lengths; but always very short, and full of Pyrrhic feet.

HYPOSPATHISMUS*, in the ancient chirurgery, an operation practised, by making three incisions in the forehead, to the very bone, about two inches long; in order to cut or divide all the vessels between those incisions. The design of the operation was to prevent defluxions on the eyes.

* The word is Greek, *υποσπαθισμος*, formed of *υπο*, under, and *σπαθον*, spatula; by reason after incisions were made, they thrust a spatula all along between the pericranium and the flesh.

HYPOSTASIS*, a Greek term, literally signifying *substance*, or *subsistence*; It is used in theology for *person*.

* The word *υποστασις* is compounded of *υπο*, sub, under, and *στημι*, *sto*, *existo*, I stand, I exist; q. d. *substantialia*.

Thus we hold, that there is but one nature or essence in God, but three *hypostases*, or persons.

The term *hypostasis* is of a very ancient standing in the church. S. Cyril repeats it divers times, as also the phrase *Union according to hypostasis*. The first time it occurs in all christian antiquity, is in a letter of that father to Nestorius, where he uses it instead of *ουνοουνοου*, the word we commonly render *person*, which did not seem expressive enough. The philosophers, says S. Cyril, have allowed three *hypostases*: They have extended the divinity to three *hypostases*: They have even sometimes used the word *trinity*: and nothing was wanting but to have admitted the consubstantiality of the three *hypostases*, to shew the unity of the divine nature, exclusive of all triplicity in respect of distinctness of nature, and not to hold it necessary to conceive any respective inferiority of *hypostases*.

This term has occasioned great dissentions in the ancient church; first among the Greeks, and afterwards also among the Latins.

In the council of Nice, *hypostasis* was defined to denote the same with *essence*, or *substance*; so that it was hereby to say that Jesus Christ was of a different *hypostasis* from the Father; but custom altered its meaning.

In the necessity they were under of expressing themselves strongly against the Sabellians, the Greeks made choice of the word *hypostasis*, and the Latins of *persona*; which change proved the occasion of endless disagreement. The phrase *τρεις υποστασεις* used by the Greeks, scandalized the Latins, whose usual way of rendering *υποστασις* in their language, was by *substantia*: The barrenness of the Latin tongue in theological phrases, allowed them but one word for the two Greek ones, *ουνοουνοου* and *υποστασις*; and thus disabled them from distinguishing *essence* from *hypostasis*.---For which reason they chose rather to use the term *tres personae*, than *tres hypostases*.---An end was put to these logomachias, in a synod held at Alexandria about the year 362. at which S. Athanasius assisted; from which time the Latins made no great scruple of saying *tres hypostases*, nor the Greeks of *tres personae*.---Among the Greeks the custom obtained to say *μια ουνοουνοου*, *τρεις υποστασεις*, one *essence*, three *substances*; and among the Latins, *una essentia*, *tres substantiae*, but with the same meaning, *una essentia*, or *substantia tres personae*. Some later Latin writers, to avoid the ambiguity of the words *substance* and *person*, use *subsistence*, and say, one *essence*, three *subsistences*. Those who took the word *hypostasis* in its ancient signification, could not bear to hear of three *hypostases*, which, according to them, were so many divine essences or substances. And yet they who used the word in the new sense against the Sabellians, all along declared, that they meant by it three individuals, or three subjects which subsist alike, and not three different essences or substances: so that in their sense, they admitted three *hypostases* in one and the same essence.---Others, by essence, understood a common and indefinite nature, as humanity is to all men in the general; and by *hypostasis*, a single nature, peculiar to each individual, as each man in particular is a modification of the whole human nature or essence.---But this last signification, which some attribute to S. Basil, if applied to the Deity, would imply trichism: for if the three persons in the Trinity be three *hypostases*, just as Peter, James, and John are, there are manifestly three Gods.

HYPOSTASIS, in medicine, the sediment of the urine, or that thick heavy part of the urine, which subsides and settles at bottom.

HYPOSTATICAL, in theology, is a term used in speaking of the mystery of the incarnation.

Hypostatical Union, is the union of the human nature with the divine.

The Word was united *hypostatically* to the human nature in the person of Jesus Christ.

HYPOSTATICAL Principles, among the chemists, and particularly the Paracelsists, are the three chemical elements, *salt*,

sulphur, and *mercury*; called also the *tria prima*. See PRINCIPLE, and ELEMENT.

HYPOTHECA*, in the civil law, an obligation, whereby the effects of a debtor are made over to his creditor, to secure his debt.

* The word comes from the Greek, *υποθηκα*, a thing subject to some obligation; of the verb *υποθηκεω*, *subpono*, I am subjected: of *υπο*, under, and *θηκα*, *pono*, I put.

As the *hypotheca* is an engagement procured on purpose for the security of the creditor, various means have been made use of to secure to him the benefit of the convention. The use of the pawn or pledge is the most ancient; which is almost the same thing with the *hypotheca*; all the difference consisting in this, that the pledge is put into the creditor's hands; whereas, in a simple *hypotheca* the thing remained in the possession of the debtor. It was found more easy and commodious to engage an estate by a civil covenant, than by an actual delivery: accordingly, the expedient was first practised among the Greeks; and from them the Romans borrowed both the name and the thing: only the Greeks, the better to prevent frauds used to fix some visible mark on the thing, that the public might know it was *hypothecate*, or mortgaged by the proprietor: But the Romans, looking on such advertisements as injurious to the debtor, forbade the use of them.

The Roman lawyers distinguished four kinds of *hypotheca's*: The *conventional*, which was with the will and consent of both parties: The *legal*, which was appointed by law, and for that reason called *tacit*: The *praetor's pledge*, when by the flight or non-appearing of the debtor, the creditor was put in possession of his effects: And the *judiciary*, when the creditor was put in possession by virtue of a sentence of the court.

The *conventional hypotheca* is sub-divided into *general* and *special*. The *hypotheca* is *general*, when all the debtor's effects, both present and future, are engaged to the creditor. It is *special*, when limited to one or more particular things. For the *tacit hypotheca*, the civilians reckon no less than twenty six different species thereof.

HYPOTHENAR*, in anatomy, the second muscle of the little finger.

* The word is compounded of *υπο*, sub, and *θεναρ*, the hollow of the hand.

The *hypothenar* arises from the little bone of the carpus, situate over the others, and is inserted externally into the first bone of the little finger, which it serves to withdraw from the rest.

The sixth and last muscle of the toes is also called *hypothenar*, or *abductor*.

HYPOTHENUSE*, or rather **HYPOTENUSE**, in geometry, is the longest side of a right-angled triangle; or that side which subtends, or is opposite to, the right angle.

* The word is Greek, *υποθενουσα*, *subtendens*, formed of *υπο*, sub, under, and *θενουσα*, *subtendo*, I subtend.

Thus in the triangle KML, (*Tab. Geometry, fig. 71.*) the side ML, opposite to the right angle K, is called the *hypotenuse*.

It is a celebrated problem in geometry, that in every rectilinear right-angled triangle, as KML; the square of the *hypotenuse* ML, is equal to the squares of both the other sides, KL and KM.---This is particularly called the *Pythagorean* problem, from its inventor Pythagoras, who is said to have sacrificed a whole hecatomb to the muses, in gratitude for their assisting him therein.

HYPOTHESIS*, in logic, is a proposition or principle which we suppose, or take for granted, in order to draw conclusions therefrom, for the proof of a point in question. See POSITION, and PRINCIPLE.

* The word is Greek, *υποθεσις*, formed of *υπο*, sub, under, and *θεσις*, *positio*; of *θηκα*, *pono*, I put.

In disputation, they frequently make false *hypotheses*, in order to draw their antagonists into absurdities; and even in geometry truths are often deducible from such false *hypotheses*.---Thus, if the sky should fall, we should catch larks: The consequence is good, though drawn from a false *hypothesis*.

Every conditional or hypothetical proposition, may be distinguished into *hypothesis* and *thesis*: The first rehearces the conditions under which any thing is affirmed or denied; and the latter is the thing itself affirmed or denied.

Thus, in the proposition, A triangle is half of a parallelogram, if the bases and altitudes of the two be equal: The latter part is the *hypothesis*, if the bases, &c. and the former the *thesis*, a triangle is half a parallelogram.

In strict logic, we are never to pass from the *hypothesis* to the *thesis*; that is, the principle supposed must be proved to be true, before we require the consequence to be allowed.

HYPOTHESIS, in physics, &c. denotes a kind of system laid down from our own imagination, whereby to account for some phenomenon or appearance of nature.

Thus

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Thus we have *hypotheses* to account for the tides, for gravity, for magnetism, for the deluge, &c.

The real and scientific causes of natural things generally lie very deep: Observation and experiment, the proper means of arriving at them, are in most cases extremely slow; and the human mind is very impatient: Hence we are frequently driven to feign or invent something that may seem like the cause, and which is calculated to answer the several phenomena; so that it may possibly be the true cause.

Philosophers are divided as to the use of such fictions or *hypotheses*, which are much less current now than they were formerly.—The latest and best writers are for excluding *hypotheses*, and standing wholly on observation and experiment.

Whatever is not deduced from phenomena, says Sir Isaac Newton, is an *hypothesis*; and *hypotheses*, whether metaphysical, or physical, or mechanical, or of occult qualities, have no place in experimental philosophy. *Phil. Nat. Prin. Meth. in Calc.*

The Cartesians take upon them to suppose what affections in the primary particles of matter they please; just what figures, what magnitudes, what motions, and what situations they find for their purpose.—They also feign certain unseemly, unknown fluids, and endue them with the most arbitrary properties; give them a subtilty which enables them to pervade the pores of all bodies, and make them agitated with the most unaccountable motions. But is not this to set aside the real constitution of things, and to substitute dreams in their place! Truth is scarce attainable even by the surest observations; and will fanciful conjectures ever come at it? They who found their speculations on *hypotheses*, even though they argue from them regularly, according to the strictest laws of mechanics, may be said to compose an elegant and artful fable; but it is still only a fable. *Cotes in Prefat. ad Newton. Princip.*

HYPOTHESIS is more particularly applied, in astronomy, to the several systems of the heavens: or the divers manners wherein different astronomers have supposed the heavenly bodies to be ranged, moved, &c.

The principal *hypotheses* are the *Ptolemaic*, *Copernican*, and *Tychonic*.

The Copernican is now become so current, and is so well warranted by observation; that the retainers thereto, hold it injurious to call it an *hypothesis*.

HYPOTHETICAL Proposition, is a combination of two categorical propositions, the latter whereof follows from the former, which is distinguished by the particle *if*.

Such, *e. g.* are; If he be a man, he is an animal: If the Turk sleep, the cock crows: If you repent, you shall be forgiven.

HYPOTRACHELION*, in anatomy, denotes the lower part of the neck. See **NECK**.

* It is thus called from *υπο*, *sub*, under, and *τραχηλος*, *collum*, neck.

HYPOTRACHELION, in architecture, is used for a little frieze in the Tuscan and Doric capital, between the astragal and annulets; called also the *colerin*, and *gorgerin*.

The word is also applied by some authors in a more general sense, to the neck of any column; or that part of the capital thereof below the astragal.

HYPOTYPOSIS*, in rhetoric, a figure whereby a thing is so lively described or painted, that it does not seem to be read, or heard, but actually seen, or presented before the eyes.

* The word is Greek, *υποτυπωσις*, formed of the verb *υποτυπω*, *per figuram demonstro*, I shew, represent, or make any thing be seen; of *υπο*, under, and *τυπος*, type, image, resemblance.

Such is that elegant one of Cicero, wherein he paints the barbarity of Verres: *Ipse inflammatus scelero et furore in furum venit. Ardebat oculi; toto ex ore crudelitas emanabat. Expellabant omnes quo tandem progressurus, aut quidem accuris esset; cum repente hominem corripit, atque in foro medio nudari ac deligari, et virgas expedire jubet. Clamabat ille miser se civem esse Romanum, &c.*

The *hypotyposis* is frequently used by the poets, and particularly Virgil, who abounds in paintings.

HYPOZOMA, in anatomy, a name given to such membranes as separate two cavities.

In this sense, the mediastinum is a *hypozoma*.

HYPSILOGLOSSUS, in anatomy, the same with *basiloglossus*.

HYPSILOIDES, in anatomy. See **HYOIDES**.

HYPsISTARII*, **HIPsISTARIANS**, a sect of heretics in the fourth century; thus called from the profession they made of worshipping the most high God.

* The word is Greek, *υπισταριος*, formed from *υψιστος*, *hypsis*, highest.

The doctrine of the *Hypsistarians*, was an assemblage of Pa-

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ganism, Judaism, and Christianity. They adored the most high God with the Christians; but they also revered fire and lamps with the Heathens; and observed the sabbath, and the distinction of clean and unclean things, with the Jews.

The *Hypsistarii* bore a near resemblance to the Euchites, or Maffalians.

HYSSOP, **HYSSOPUS**, a medicinal herb, of a detergent cleansing quality, and chiefly used in diseases of the breast and lungs. It is a standing ingredient in pectoral apozems. There are also a syrup, and a simple distilled water from it, used in the shoops.

It has also a faculty to comfort and strengthen; and is prevalent against melancholy and phlegm.—It is propagated only by slips.

Its tops and flowers reduced to powder, are by some reserved to strew upon the colder fallet herbs.

HYSSOPIC Art, a name which Paracelsus gave to chymistry, considered as that art purifies metals, minerals, &c. in allusion to that text in the Psalm, 'Purge me with *hyssp*, and I shall be clean.'

HYSTERALGY*, in medicine, a pain in the matrix or womb, occasioned by some inflammation, or other disorder therein.

* The word is compounded of the Greek, *υστερ*, *matrix*, womb, and *αλγος*, *alor*, pain.

HYSTERIC* Affection, or *Passion*, a disease in women, called also *suffocation of the womb*, and vulgarly *fits of the mother*.

* The word is Greek, *υστερικος*, formed of *υστερα*, womb.

Hysterie affection is generally used by authors promiscuously with *hypochondriac affection*; the two diseases being supposed to be, in reality, the same.—They only differ indeed in point of relation and circumstance.

The *hysterie* is properly a species or branch of the hypochondriac, peculiar to women, and supposed to arise from some disorder of the womb.

One of the symptoms, or effects of hypochondriac diseases, is convulsions, or fits not unlike those of the epilepsy; these we call *hysterie fits*; and the disease that produces them, the *hysterie affection*. *Sydenham*.

It is also particularly denominated *hysterie suffocation*, from one of its principal symptoms, which is a contraction of the breast, and a difficulty of breathing.

Some women under this disorder, fancy a rope tied about their necks, ready to strangle them; and others, think a piece of something is got into their throats, which they cannot swallow, but which stops their breath: and some will even remain a good while as if really strangled, without any sense or motion.

The more common symptoms or accidents of this disease, are a swimming of the head, a dazzling of the eyes, inquietudes, pains of the abdomen, belches, nauasas, vomitings, deliriums, and convulsions. It is not always attended with all these symptoms, but sometimes with more, and sometimes with fewer of them, and those more or less violent.

Dr. Purcell describes a *hysterie* paroxysm, as beginning with a sense of coldness creeping up the back, and afterwards spreading over the whole body; then ensues a head-ach, and sometimes a palpitation of the heart, with a fainting, from which the patient soon recovers. Sometimes, after the coldness, there succeeds a remarkable heat, which brings on the forementioned symptoms.—Baglivi adds, that *hysterie* women feel a sense of cold in the crown of the head; and this he takes to be the chief diagnostic of the disease.

The ordinary causes of this disorder are violent passions, rage, love, grief, ill news, sweet smells, &c. As for the popular notion of malignant vapours arising from the womb, and occasioning all these symptoms, the learned all discard it, and hold men as subject to the disease as women. The real cause they affirm is in the animal spirits, and the nervous system; and the affection does not differ from the hypochondriac.

For the cure; as many of the symptoms are convulsive, antispasmodics are indicated. During the paroxysm, fetid things, whether internally or externally applied, are of advantage; particularly castoreum, the smoke of burnt horn, or burnt feathers held to the nose. Volatile spirits also help to wake the patient out of the paroxysm; as also tickling in the soles of the feet. Where it is feverish than ordinary, recourse must be had to puncture, scarification, vesicatories, and even to caustics.

HYSTERICs, or **HYSTERIC Medicines**, are remedies proper to remove *hysterie* affections; and to remedy disorders of the womb.

There are divers species of *hysterics*: some evacuate or cleanse the womb, by expelling any impurities lodged therein: others tend to stop immoderate fluxes thereof; and others strengthen the tone of the part.

According to Dr. Quincy, *hysterie* affections arise either from too titillating, or too uneasy sensations: The former proceed from that irritation of the nerve, which the make and secretion of those parts have naturally subjected them to, and which, in some sorts of constitutions, arise to that degree,

as to draw the whole system into disorder, and occasion a surprizing variety of symptoms; *e. g.* several sorts of convulsions, and species of madnes; which therefore are by some termed *furores uterini*.

These disorders are most effectually allayed by such things as are in a manner the reverse of cordials, and are both in smell and taste very offensive and disagreeable: they seem to answer this end by suffocating, as it were, the spirits, and damping their inordinate sallies, so that such stimulation ceases, and the fibres return to their natural tone and motions: for, as what is grateful to the senses, gives an inexpressible emotion to the fine nervous filaments; so does what is fetid and disagreeable quite destroy that emotion, and deaden it: and as the former kind consist chiefly of fine subtile volatile parts, by which, as before explained under CEPHALICS, they are fitter to enter the nerves; so these are generally of a clammy viscous contexture, and therefore the fitter to envelope and entangle that subtile juice; whereby its motion is much retarded.

HYSTEROLOGY*, HYSTEROLOGIA, in rhetoric, a vicious manner of speaking, wherein the natural order of things is inverted; called also by the Greeks *ὑστερον προτερον*; *q. d.* putting the first thing where the last should be.

* The word is Greek, *ὑστερον προτερον*, signifying a discourse inverted.

HYSTERON-PROTERON, *ὑστερον προτερον*. See HYSTEROLOGY.

HYSTEROTOMIA*, ὙΤΕΡΟΤΟΜΙΑ, in anatomy, an anatomical dissection of the uterus, or womb. See MATRIX.

* The word is formed of the Greek, *ὑστερον*, matrix, womb, and *τομή*, *secto*, I cut, I dissect.

HYSTEROTOMOTOCY, ὙΤΕΡΟΤΟΜΟΤΟΚΙΑ in chirurgery, an operation more usually called the *Cæsarian section*. See CÆSARIAN.

HYTH, or HITH, a port, wharf, or little haven, to embark or land wares at.—Such is *Queen-hith*, &c.

I.

I, The ninth letter of the English alphabet: It is both a vowel and a consonant; agreeable to which two different powers, it has two different forms.

The Hebrews called the *j* consonant *jod*, *י* from *י band* and *space*; in regard it is supposed to represent the hand clenched, so as to leave the space underneath void. With them, it was pronounced as the consonant *y*, as it still is among the Germans, and some other people. The Greeks had no *j* consonant, and for that reason used their vowel *i* instead of it, as coming the nearest in sound. The French and English have two kinds of *j* consonants; the first has a stiffling kind of sound, and serves to modify that of the vowels, pretty much in the manner of *g*; as in *jew*, *just*, *jevial*: the latter is pronounced like the Hebrew *jod*; instances of which we have in some of our words, which are indifferently written with a *y* or an *i* before a vowel; as *voiage*, *voyage*, *loial*, *loyal*, &c. in which cases, the *i* is apparently a consonant, as being only a motion of the palate, which gives a modification to the following vowel.

The vowel *i*, according to Plato, is proper for expressing fine and delicate, but humble things: on which account that verse in Virgil.

Accipiant inimicum imbrem, rimisque fatiscunt;

which abounds in *i*'s is generally admired.

The vowel *i* was the only vowel which the Romans did not mark with a dash of the pen, to shew when it was long; instead of which, to denote it long, they used to make it bigger than ordinary, as in *Plis*, *Vivus*, &c.—According to Lipsius, they often repeated it when it was to be long, as in *dii*. They sometimes also denoted the length of this letter by adding *e* to it, and turning it into a diphthong, as *divei* for *divi*, *omneis* for *omnis*, &c.

I, was antiently a numeral letter, and signified a hundred, according to the verse,

I. c. compar erit, & centum significabit.

I, in the ordinary way of numbering, signifies one; and when repeated, it signifies as many units as it is repeated times.

In abbreviatures and ciphers, *I* frequently represents the whole word *Jesus*, whereof it is the first letter.

JABA JAHITES, a sect among the mussulmen, who, according to Ricaut, teach, That God is not perfectly wife; that his knowledge does not extend to every thing; and that time and experience have furnished him with the knowledge of many things whereof he was before ignorant.—Thus, say they, not being apprized from all eternity of every event that shall happen in the world, he is now obliged to govern it according to the chance, and occurrence of those events.

JACK, in a ship, is that flag which is hoisted up at the sprit-sail-top-mast head. See *Tab. Nip. fig. 1. n. 146*.

In falconry, *Jack* signifies the male of birds of sport. See HAWK, and FALCON.

JACK-Ketch, is a name given by the populace to the public hangman.

JACK in a Lantern. See the article *IGNIS FATUUS*.

JACOBS'S STAFF, a mathematical instrument for taking heights, and distances; the same with the *cross-staff*. See *CROSS-STAFF*.

JACOBINS, a name given in France to the religious who follow the rule of S. Dominic, on account of their principal convent, which is near the gate of S. James, in Latin *Jaco-*

bus, at Paris; and which, before they became possessed of it in the year 1218, was an hospital of pilgrims, dedicated to the said saint.

Others maintain, that they have been called *Jacobins* ever since they were established in Italy, in regard they pretended to imitate the lives of apostles.

They are also called *friars predicants*, or preaching friars, and make one of the four orders of mendicants.

JACOBITES, a sect of heretics, who were antiently a branch of the Eutychians, and are still subsisting in the Levant.

They were so called from *Jacobus*, James, of Syria, who was one of the heads of the Monophysites, or sectaries, who owned but one nature in Jesus Christ.

The Monophysites were a sect of vast extent, comprehending the Armenians, Copts, and Abyssinians; but those among them who are properly *Jacobites*, were but few; and among those too, there is now a division, some being Romanised, and others perfectly averse to the Romish church: each of which parties have their several patriarchs, the one at Cæremis, and the other at Derzapharan.

As to their faith, all the Monophysites, both *Jacobites* and others, follow the doctrine of Dioscorus touching the unity of nature, and perion in Jesus Christ.

JACOBITE, in England, is a term of reproach bestowed on such persons as disallow the late Revolution, and still assert the rights, and adhere to the interests, of the late abdicated king James and his line.

JACOBUS, a gold coin, worth 25 shillings; so called from king James the first of England, in whose reign it was struck. We usually distinguish two kinds of *Jacobus*, the *old*, and the *new*; the former valued at 25 shillings; weighing six penny weight ten grains: the latter, called also *Carabus*, valued at 23 shillings; in weight five penny weight, twenty grains.

JADE, a greenish stone, bordering on olive colour, much esteemed for its hardness, which exceeds that of porphyry, agat, or jasper, and is only to be cut with diamond dust. It is in mighty esteem among the Turks and Poles, who adorn all their fine works with it, and especially the handles of their sabres.

This stone applied to the reins, is said to be a preservative from the nephritic colic.—M. Bernier tells us, that the caravans of Tibet carry it to Cachemire, and that the Galibis prize it as highly as the diamond. The natives of South America value it on account of the virtues they attribute to it in the epilepsy, stone, and gravel.—In a treatise on it printed at Paris, it is called the *divine stone*. See supplement: article **JADE**.

JALAP, JALAPIUM, or JALAPPA, a root of a plant not much unlike our briony, and therefore by some called *bryonia Peruviana*; as being brought to us chiefly from Peru and New-Spain, much used as a cathartic.

The mechoacan and this are reckoned of a species, and therefore as this is sometimes called *mechoacana nigra*, that goes as often by the name of *jalapinum album*.

As *jalap* does not appear to have been known to the antients, it has its place in medicine only since those parts of America which produce it, have been traded to by the Europeans.

That which breaks blackest, most brittle, sound, and shining withinside, is the best; by reason the resinous parts, which give

give it those properties, are supposed to contain its medicinal virtues.

Some take great pains to extract its resin, which is to be done with any spirituous menstruum, but afterwards they want correctors for it: the most common is salt of tartar, or loaf sugar; but if correcting consists in separating its parts, as it certainly does, the drawing it from the root, and making it into a resin, should seem to be needless. — M. Boullieu, who has made several experiments on it, says, it is one of the best cathartics we have, taken as nature only has prepared it.

IAMBIC, a kind of verse, found in the Greek and Latin poets; consisting wholly, or at least in great part, of *iambus's*, or feet so called.

Iambic verses may be considered, either with regard to the diversity, or the number of their feet: under each of which heads there are distinct kinds, which have different names. — 1^o. *Pure iambics*, are those which consist entirely of *iambus's*; as the fourth piece of Catullus made in praise of a ship:

Phæsus ille, quem videtis hospites.

The second kind are those called simply *iambics*. — These have no *iambus's* but in the even feet, though there are sometimes *tribrachy's* added to them, excepting to the last, which is always an *iambus*; and in the uneven feet they have *spondees*, *anapæsts*, and even a *dactyl* in the first: Such is that of Meæda in Ovid,

Servare potui, perdere an possim rogas ?

The third kind are the *free iambic* verses, in which it is not absolutely necessary there should be any *iambus*, excepting in the last foot; of which kind are all those of *Phædrus*:

Aniuit meritò proprium, qui alienum appetit.

In comedies, the ancient authors seldom confine themselves more, frequently less, as we may observe in *Plautus* and *Terence*: but the sixth is always indispensibly an *iambus*.

As to the varieties, occasioned by the number of syllables; — *Dimeter iambis*, is that which has but four feet:

Queruntur in sylvâ avos.

Those which have six are called *trimeters*: These are the most beautiful, and are used principally for the theater; particularly in tragedy; wherein they are vastly preferable to the verses of ten or twelve feet, used in our modern drama; in regard they come nearer to the nature of prose, and favour less of art and affectation.

*Dii conjugales, tuque genialis tori
Lucina custos, &c.*

Those with eight, are called *tetrameters*, and are only used in comedies:

Pecuniam in loco negligere maximum interdum est lucrum. Terent.

Some add an *iambic* monometer, with two feet:

Virtus hec.

They are called *monometers*, *dimeters*, *trimeters*, and *tetrameters*; that is, of one, two, three, and four measures, because a measure consisted of two feet; the Greeks measuring their verses two feet by two feet, or by *dipodys*, or *epitrites*, joining the *iambus* and *spondee* together.

All the *iambics* hitherto mentioned are *perfect*; they have their just number of feet, without any thing either deficient or redundant. — The *imperfect iambics* are of three kinds; the *catalectic*, which want a syllable:

Musæ Jovem cavebant.

The *brachycatalectic*, which want an entire foot:

Musæ Jovis gnate.

The *hypercatalectic*, which have either a foot or a syllable too much:

Musæ sorores sunt Minervæ,

Musæ sorores Palladis lugent.

Many of the hymns and anthems used in the Romish church, are *dimer iambics*, that is, consisting of four feet.

IAMBUS*, ΙΑΜΒΟΣ, in the Greek and Latin prosody, a poetical foot, consisting of a short syllable followed by a long one; as in

— — — — —

Θεῶ, Διῶ, Δεῖ, μέτ.

Syllaba longa brevi subiecta vocatur iambus, as *Horace* expresses it; who also calls the *iambus* a swift, rapid foot, *pes celeris*.

* The word, according to some, took its rise from *Iambus*, the son of *Pan* and *Echo*, who invented this foot; or perhaps, who only used sharp biting expressions to *Ceres*, when afflicted for the death of *Proserpine*: Some rather derive it from the Greek, *ισα*, *venenum*, poison; or from *ισαμιζω*, *malicio*, I rail, or revile; because the verses composed of *iambus's* were at first only used in satire.

JAMES — S. JAMES of the *Sword*, San JAGO del Espada, a military order in Spain, instituted in 1170, under the reign of Ferdinand II. king of Leon and Galicia.

Its end was, to put a stop to the incursions of the Moors; three knights obliging themselves by a vow to secure the roads.

An union was proposed and agreed to in 1170, between these

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and the canons of S. Eloy; and the order was confirmed by the pope in 1175.

The highest dignity in this order, is that of grand master, which has been united to the crown of Spain. — The knights are obliged to make proof of their descent from families that have been noble for four generations on both sides: they must also make it appear, that their said ancestors have neither been Jews, Saracens, nor heretics; nor even to have been called in question by the Inquisition.

The novices are obliged to serve six months in the galleys, and to live a month in a monastery. — Heretofore they were truly religious, and took a vow of celibacy; but Alexander III. gave them a permission to marry. They now make no vows but of poverty, obedience, and conjugal fidelity; to which, since the year 1652, they have added that of defending the immaculate conception of the holy virgin. — Their habit is a white cloke, with a red cross on the breast. — This is esteemed the most considerable of all the military orders in Spain: the king carefully preserves the office of grand master in his own family; on account of the rich revenues and offices, whereof it gives him the disposal. — The number of knights is much greater now than formerly, all the grandees chusing rather to be received into this, than into the order of the golden fleece; inasmuch as this puts them in a fair way of attaining to commands, and gives them many considerable privileges in all the provinces of Spain, but especially in Catalonia.

JANIZARIES*, an order of infantry in the Turkish armies; reputed the grand seignior's foot guards.

* *Vossius* derives the word from *genizars*, which, in the Turkish language, signifies *novi homines*, or *milites*: *d'Herbelot* tells us, that *jenitcheri* signifies a new band, or troop; and that the name was originally given by *Amurath I.* called the Conqueror, who chusing out one fifth part of the Christian prisoners, whom he had taken from the Greeks, and instructing them in the discipline of war, and the doctrines of their religion, sent them to *Hagi Bektaşie* (a person whose pretended piety rendered him extremely revered among the Turks) to the end that he might confer his blessing on them, and at the same time give them some mark to distinguish them from the rest of the troops. — *Bektaşie*, after blessing them in his manner, cut off one of the sleeves of the fur gown which he had on, and put it on the head of the leader of this new militia; from which time, viz. the year of Christ 1361, they have still retained the name *jenitcheri*, and the fur cap.

As, in the Turkish army, the European troops are distinguished from those of Asia; the *janizaries* are also distinguished into *janizaries of Constantinople*, and of *Damascus*.

Their pay is from two aspers to twelve per diem; for when they have a child, or do any signal piece of service, their pay is augmented.

Their dress consists of a dolyman, or long gown, with short sleeves, which is given them annually by the grand seignior, on the first day of *Ramazan*. They wear no turban, but in lieu of that a kind of cap, which they call *zarcola*, and a long hood of the same stuff hanging on their shoulders. On solemn days they are adorned with feathers, which are stuck in a little case in the fore part of the bonnet.

Their arms, in Europe, in a time of war, are a sabre, a carbine, or musquet, and a cartouch-box hanging on the left side. — At Constantinople, in a time of peace, they only carry a long staff in their hand. In Asia, where powder and firearms are more uncommon, they wear a bow and arrows, with a poniard, which they call *bavars*.

The *janizaries* were heretofore a body formidable even to their masters, the grand seigniors: *Osman*, they first stripped of his empire, and afterwards of his life; and *sultan Ibrahim* they deposed, and at last strangled in the castle of the Seven towers: but they are now much less considerable. Their number is, or ought to be, fixed to twenty thousand.

The *janizaries* are children of tribute, levied by the Turks among the Christians, and bred up to the military life. — They are taken at the age of twelve years, to the end, that forgetting their country and religion, they may know no other parent, but the sultan. However, generally speaking, they are not now-a-days raised by way of tribute; for the carach, or tax, which the Turks impose on the Christians, for allowing them the liberty of their religion, is now paid in money; excepting in some places, where money being scarce, the people are unable to pay in specie, as in *Mengrelia*, and other provinces near the Black sea.

The officer who commands the whole body of *janizaries*, is called the *janizar agasi*; in English, *aga* of the *janizaries*; he is one of the chief officers of the empire.

Though the *janizaries* are not prohibited marriage, yet they rarely marry, nor then, but with the consent of their officers; as imagining a married man to make a worse soldier than a bachelor.

The *janizaries* were at first called *jaja*, that is, footmen, to distinguish them from the other Turks, the troops whereof consisted mostly of cavalry.

Vigenere tells us, that the discipline observed among the *janizaries*,

nizaries, is extremely conformable, in a great many things, to that used in the Roman legions.

JANIZARIES, at Rome, are officers, or pensioners of the pope, called also *participantes*, by reason of certain rights or dues which they enjoy in the annates, bulls, or expeditions of the Roman chancery.

Most authors are mistaken in the nature of their office; the truth is, they are officers of the third bench, or college of the Roman chancery.—The first bench consists of writers, the second of abbreviators, and the third of *janizaries*; who are a kind of correctors and revisers of the pope's bulls.

JANSENISM, the doctrine of Cornelius Janfen, commonly called *Janfenius*, bishop of Ypres in Flanders, with relation to grace, and free-will.

Janfenism made no great noise in the world, till after the death of its author, in 1638; when Fromond and Calenus, his executors, published his book, entitled *Augustinus*.

The whole doctrine was reduced by the bishops of France into five propositions, which follow: I. Some commands of God are impossible to righteous men, even though they endeavour, with all their powers, to accomplish them: the grace being wanting, by which they should be enabled to perform them. II. In the state of corrupted nature, a man never resists inward grace. III. To merit and demerit in the present state of corrupt nature, it is not requisite a man should have that liberty which excludes necessity: that which excludes constraint is sufficient. IV. The Semipelagians admitted the necessity of inward preventing grace to each act in particular, and even to the beginning of faith: but they were heretics, in regard they asserted that this grace was such, as that the will of man might either resist or obey it. V. It is Semipelagianism to say, that Jesus Christ died, or shed his blood for all men in general.

Janfenism consists in maintaining these doctrines, which may be done two ways: 1^o. By asserting, that these propositions are found, and orthodox. 2^o. In affirming, that they are evil and heretical in the sense wherein the church has condemned them; but that this sense is not that of *Janfenius*.

Janfenism has been condemned by the popes Urban VIII, Innocent X, Alexander VII, and Clement XI.

JANUARY*, the name of the first month of the year, according to the computation now used in the west.

* The word is derived from the Latin *Januarius*, a name given it by the Romans, from *Janus*, one of their divinities, to whom they attributed two faces; because, on the one side, the first day of *January* looked towards the new year, and on the other towards the old one.—The word *Januarius* may also be derived from *Janua*, gate; in regard this month being the first, is, as it were, the gate of the year.

January and *February* were introduced into the year by Numa Pompilius; Romulus's year beginning in the month of March.

The Christians heretofore fasted on the first day of *January*, by way of opposition to the superstition of the Heathens, who, in honour of Janus, observed this day with feasting, dancing, masquerades, &c.

JAPAN *Earth*, or *Catechu*, a medicinal substance, of a dark purple colour; very austere upon the palate, seeming to melt, in the mouth, and leaving somewhat of a sweetish taste behind it.

It is famous for stopping fluxes of all kinds: and is the juice of a vegetable not an earth, as its name imports. See *CATECHU*.

JAPANING, the art of varnishing, and drawing figures on wood, &c. after the same manner as the workmen do who are natives of Japan, a famous island not far from the coast of China.

The manner of *japaning* on wood, ordinarily practised among us, is said to be this:—They take a pint of spirit of wine well dephegmated, and four ounces of gum lacca, (which last must be separated from the sticks and rubbish) then bruising it roughly in a mortar, they put it to steep in spring-water, tied up in a bag of coarse linnen, together with a little Castile soap, for the space of twelve hours. This done, they rub out all the tincture, and add to it the spirit and a little allum, and reserve it apart; they then add as much mastic and white amber, dissolved in a maras, with spirit of wine, by a two days digestion, frequently stirring it, that it do not stick to the glass; then they strain the whole, and press it out into another vessel.

This done, they take the wood to be *japaned*, and cover it with a layer of this varnish, till it be sufficiently drenched with it; then taking some of the colour the figures are to be of, they incorporate it with seven times as much of the varnish, and apply it with a pencil, going over each part three several times, each a quarter of an hour after the other: two hours after this they polish it with apottle, or with Dutch reeds.

As to the colours used in this art, for a fair red they take Spanish vermilion, with a fourth part of Venice laque: Black, they make of ivory calcined between two crucibles; for blue, they use ultramarine, and only twice as much varnish as co-

lour.—The rest are applied as above directed, except the green, which is difficult to make fair and lively, and therefore is seldom used.—Thus far my author, on whose authority I desire this article may stand. *D. Ryff*. tom. I.—Parker will give much ampler instructions. See his treatise *Of Japaning*, Folio. Oxford, 1683, passim.

NIPT JAPANING, is performed by applying three or four layers with the colours first, then two of pure varnish uncoloured, made according to the former process. Before it be dry, they fit some aventurine, or gold wire reduced to powder, over it, and then cover it with as many layers of pure varnish, as render it like polished glass; and lastly, rub it over with tripoli, oil of olive, or a hatter's felt. See *VARNISH*.

JAR*, or **JARR**, an earthen pot or pitcher, with a big belly, and two handles.

* The word comes from the Spanish, *jarra*, or *jarro*, which signify the same.

JAR is used for a sort of measure, or fixed quantity of divers things.—The *jar* of oil, is from eighteen to twenty six gallons: the *jar* of green ginger, is about an hundred pound weight.

JASPER*, **JASPIS**, a sort of precious stone, chiefly opake, but sometimes transparent in certain parts; and not much different from the agate, excepting in this, that it is more soft, and does not take so good a polish.

* The word is Hebrew, and has neither been changed by the Greeks, Latins, nor us: some Greek versions give it the name of *beryl*. Onkelos calls it *panther*, in regard of its being spotted like that animal.

In some of these stones, as also in the agates, nature has amused herself, in representing rivers, trees, animals, landscapes, &c. as if they were painted.—The *jasper*, found in the Pyreneans, is usually stained with various colours; though there are some that have but one colour, as red, or green; but these are the least valuable: The most beautiful is that bordering on the colour of lacca, or purple; next to that, the carnation; but what is now most valued, is the green spotted with red. See Supplement: article *JASPER*.

JATRALIPTIC, **JAT PAAEITIKKE**, that part of physic which cures by unguents and frictions; and the application of fomentations, plasters, &c.

It was one Prodicus, a disciple of *Æsculapius*, and native of Selymbria, who first instituted the *jatraliptic* art.

JAVELIN, a kind of spear, or half pike, used by the antients both on horseback, and on foot.

It was five foot and a half long, and the steel, wherewith it was headed, had three sides or faces, which all terminated in a point.

JAUNDICE*, a disease consisting in a suffusion of the bile, and a rejection thereof to the surface of the body, whereby the whole exterior habit is discoloured.

* The word is derived from the French, *jaunisse*, yellowness, of *jaune*, yellow.

Of this there are three kinds, the first, properly called the *jaundice*, or *yellow jaundice*, is owing to the yellow bile, which, in this case, is too exalted, or too abundant in the mass of blood; or perhaps to an obstruction of the glands of the liver, which prevents the gall's being duly separated from the blood: or finally to a stoppage of the porous *lilarius*, or the like means, whereby the mixture of that fluid with the aliment in the intestines is prevented.

The second, called the *black jaundice*, is owing to the same bile's being mingled with acids.

The third, bordering on *green*, takes its rise also from a different mixture of bile with an acid:—This is usually called the *chlorosis*, or *green sickness*; and is a distemper pretty common in young women.

In the *yellow jaundice*, the albuginea, or white of the eye, and the skin, are chiefly yellow; and besides, they are troubled with an itching.—In the *black jaundice*, the natural colour is lost, by reason of an aratriary humour spread underneath the skin: it first appears brownish, and afterwards of a lead colour.

The *jaundice* often proves a forerunner of the dropy.—A doctor of the faculty of Montpellier, calls the *yellow jaundice*, attended with periodical pains, a *rhumatism of the liver*; and another of the same place calls it, a *quartan ague of the liver*.

The acid spirit of sal ammoniac, is said to be an excellent remedy against the *jaundice*. See Supplement: article *ICTERUS*.

JAW, in anatomy. See the article *MAXILLA*.

ICADES, the name of an antient feast, celebrated every month by the Epicurean philoosophers, in memory of their master *Epicurus*.

The day on which it was held, was the twentieth day of the moon, or month; which was that whereon *Epicurus* came into the world: And hence came the name *icades*, from *ικαδαι*, of *ικαοι*, twenty.

They adorned their chambers on this day, and bore his image in plate about their houses, making sacrifices, &c.

ICE, a brittle, transparent body, formed of some fluid frozen or fixed by cold.

Towards

Towards the poles there are found vast piles of ice, reaching two or three hundred feet above the surface of the water, and appearing like islands; about whose origin there are different opinions: some ascribe them to snow, which falling in great abundance in these cold climates, and melting in the sea, accumulates gradually, till those huge heaps are at length formed: But the more common opinion is, that this ice is formed from the fresh waters which flow from the neighbouring lands. Bartoli has written an Italian treatise expressly on *Ice and Coagulation*. And the Acta Eruditorum furnish us with an account of a French author on the same subject. See COAGULATION and COLD.

ICH-DIEN, the motto of the arms of the prince of Wales, signifying in High Dutch, *I serve*.

Sir Henry Spelman judges it to be Saxon, *ic bien, Ic thien*; the Saxon *ic*, with a transverse stroke *s*, being the same with *th*, and signifying, *I serve, or am a servant*; as the ministers of the Saxon kings were called *thiens, or thanes*.

ICHOGRAPHY*, in perspective, the view of any thing cut off by a plane parallel to the horizon, just at the base, or bottom of it.

* The word is derived from the Greek, *ιχθος, vestigium, foot-step, and γραφω, scribo, I describe*; as being a description of the footstep, or traces of a work.

Ichnography, is the same with what is otherwise called the *plan, geometrical plan, or ground-plot* of any thing.

ICHOGRAPHY, in architecture, is a transverse section of a building, exhibiting the circumference of the whole edifice, and of the several rooms and apartments in the given story; together with the thickness of the walls, and partitions, the dimensions of the doors, windows, and chimneys; the projects of the columns, and peers; with every thing visible in such a section.

The drawing or designing of this is properly the work of the master-architect or surveyor, it being indeed the most difficult of any.

ICHOGRAPHY, in fortification, denotes the plan or representation of the length and breadth of a fortress, the distinct parts of which are marked out, either on the ground itself, or upon paper.

ICHOGLANS*, the grand seignior's pages, serving in the seraglio.

* The word, according to some authors, is composed of the two Turkish words, *ich, or iteb*, which signifies *within, and glan, page*. In which sense *ichoglan* is a page serving within the palace, or seraglio. Others derive it from the barbarous Greek, *ιχθωγαν, or ιχθωγαν*, which was formed from the Latin, *incola*. These two etymologies give nearly the same sense to *ichoglan*, taking *incola* for *domus incola*.

These are the children of Christians, and are bred up in an austerity scarce to be conceived. The sultan prefers them to offices more or less considerable, as they appear more or less capable and devoted to his service; but it is to be observed, they are incapable of offices till forty years of age, unless they have some particular dispensation from the grand seignior. They are educated with a great deal of care in the seraglio's of Peria, Adrianople and Constantinople. They are under the direction of a capl aga, who presides over their exercises, and treats them with a world of severity. They are divided into four odas, or chambers, where, according to their several talents, or inclinations, they are instructed either in the languages, religion, or exercises of the body.

ICHOR*, properly signifies a thin watry humour, like serum; but is sometimes also used for a thicker kind, flowing from ulcers; called also *Jamies*.

* The word is originally Greek, *ιχθυος*; where it signifies *any humour, or humidity*.

ICHTHYOCOLLA*, popularly called *isnglass*, a medicinal substance procured from a fish, common in the Danube; which has no bones except about the head.

* The word is Greek, *ιχθυοκολλα*, formed of *ιχθυος, piscis, fish, and κολλα, gluten, glue*.

After the bladder and other membranous parts of this fish are cut in small pieces, they boil them in water to a thick jelly; which is spread abroad and dried, then rolled up, and brought to us in the form we see it in the shops.

It is of a very glutinous quality, and consequently good in all disorders, which arise from too thin, and sharp a state of the fluids.

ICHTHYOPHAGI*, *Fish-eaters*, a name given to a people, or rather to several different people, who lived wholly on fishes.

* The word is Greek, *ιχθυοφαγος* compounded of *ιχθυος, piscis, fish, and φάγω, edere, to eat*.

The *Ichthyophagi* spoke of by Ptolemy are placed by Sanfon in the provinces of Nanquin and Yantong. Agatharcides calls all the inhabitants between Carmania and Gedrosia by the name *Ichthyophagi*.

From the accounts given us of the *Ichthyophagi* by Herodotus, Strabo, Solinus, Plutarch, &c. it appears, indeed, that they had cattle, but that they made no use of them, excepting as they say, to feed their fish withal. They made their houses of large fish-bones, the ribs of whales serving them for their beams. The jaws of these animals served them for doors, and the mortars wherein they pounded their fish, and baked it at the sun, were nothing else but their vertebrae.

ICONOCLASTES*, or **ICONOCLASTÆ**, breakers of images; a name which the church of Rome gives to all who reject the use of images in religious matters.

* The word is Greek, *εικονοκλαστης*; formed from *εικων, imago, and κλαω, rumpere, to break*.

In this sense, not only the reformed, but some of the eastern churches are called *Iconoclastes*, and are all esteemed by them heretics, as opposing the worship of the images of God and the saints, and breaking their figures and representations in churches.

ICONOGRAPHIA*, the description of images, or ancient statues of marble, and copper; also of busts and semi-busts, penates, paintings in fresco, mosaic works, and antient pieces of miniature.

* The word is Greek, *εικονογραφια*, derived from *εικων, imago, and γραφω, scribo, I describe*.

ICONOLATRA*, or **ICONOLATER**, one who worships images; a name which the Iconoclastes give to those of the Romish communion, on account of their adoring images, and of rendering to them the worship only due to God.

* The word comes from the Greek, *εικων and λατρωω, cole, I worship*.

ICONOLOGIA*, the interpretation of antient images, monuments, and emblems.

* The word is formed from the Greek, *εικων, and λαλω, I speak*.

ICOSAHEDRON, a regular body, or solid, terminated by twenty equilateral and equal triangles.

The *icosahedron* may be considered as consisting of twenty triangular pyramids, whose vertices meet in the center of a sphere, imagined to circumscribe it; and therefore they all have their heights and bases equal; wherefore the solidity of one of those pyramids, multiplied by 20, the number of bases, gives the solid content of the *icosahedron*.

ICTERIC*, a term in physic, applied to such persons as have the jaundice, which the Latins call *icterus, aurigo, or morbus regius*. See JAUNDICE.

* The word is derived from the Greek *ικτερος*, which signifies the same, and which some derive further from *ικτις*, a kind of weasel with yellow eyes.

Icteric medicines are those remedies prescribed in cases of the jaundice.

IDEA*, **ΙΔΕΑ**, the image, or resemblance of a thing, which, though not seen, is conceived by the mind. See IMAGE.

* The word is Greek; Cicero renders it in Latin by *exemplar, and exemplum*, and Plato himself, in some places, by *παράδειγμα*. Cicero, in his *Topics*, also expresses it by *forma, and species*.

Plato has only given the *idea* of a perfect commonwealth: *Plato ideam tantum adumbravit, seu depinxit perfecti status reipublicæ*. Cic.

IDEA, in psychology, denotes the immediate object of the mind about which we are employed, when we perceive or think of any thing.

Thus, when we look at the sun, we do not see that luminary itself, but its image or appearance conveyed to the soul by the organ of sight; and this image we call *idea*.

The origin of *ideas* has been a long time disputed among philosophers. The Peripatetics maintain, that external objects emit species which resemble them all around; and that these species striking on our senses, are by them transmitted to the understanding; and that being material and sensible, they are rendered intelligible by the active intellect, and are at length received by the passive.

Others are of opinion, that our souls have of themselves the power of producing *ideas* of things we would think upon; and that they are excited to produce them by the impressions which objects make on the body; though these impressions are not images in any respect like the objects that occasioned them. And in this, say they, it is, that man is made after the image of God, and that he partakes of his power; for as God made all things out of nothing, and can reduce them to nothing when he pleases, so man can create as many *ideas* as he pleases, and annihilate them when he has done.

Others maintain, that the mind has no occasion for any thing besides itself to perceive objects; and that by considering itself and its own perfections, it is able to discover all things that are without.—Others with Descartes, hold that our *ideas* were created and born along with us.

Malebranche, and his followers assert, that God has in himself the *ideas* of all the beings he has created; that thus he sees all things, in considering his own perfections to which they correspond.

correspond; and that as he is intimately united to our souls by his presence, our mind sees and perceives things in him which represent created beings; and that it is thus we come by all our *ideas*. He adds, that though we see all sensible and material things in God, yet that we have not our sensations in him. When we perceive any sensible object, in our perception is included both a sensation and a pure *idea*. The sensation is a modification of the soul, and it is God who causes it in us: but for the *idea* joined with the sensation, it is in God, and it is in him that we see it.

The Cartesians distinguish three kinds of *ideas*.—The first *innate*; such they say is that we have of God, as of a being infinitely perfect.—The second *adventitious*; which the mind receives in proportion as bodily objects present themselves to our senses: Such is the *idea* of body, sound, figure, light, &c.—The third, according to these philosophers, are *fantastic*; which are those which the mind forms, by uniting and assembling the *ideas* which it already had: and these are called *complex*. But Mr. Locke seems to have put this matter out of dispute; having made it appear that all our *ideas* are owing to our senses; and that all innate, created, and fantastic *ideas*, are mere chimeras.

Our mind, he shews, has not absolutely any *ideas* besides those presented to it by the senses, and those which it forms by its own operations, on those others which the senses furnish. So that a man destitute of one of his senses, would never have any *idea* belonging to that sense; and supposing him destitute of all the senses, he would never have any *idea* at all; external objects having no other way of producing *ideas* in him, but by means of sensation. He would have no *ideas*, not even of reflexion; because in wanting all sensation, he wants that which should excite in him the operations of his mind, which are the objects of his reflexion.

It is plain, therefore, there is no innate *idea*; no general truth, or first principle inherent in the soul, and created with it; no immediate object of the mind before it had perceived external objects by means of the senses, and reflected on that perception. Those *ideas* only seem to be innate, because we find we have them as soon as we come to the use of reason; but they are, in effect, what we formed from the *ideas* wherewith the mind was insensibly filled by the senses. Thus when the mind is employed about sensible objects, it comes by the *ideas* of bitter, sweet, yellow, hard, &c. which we call *sensations*; and when employed about its own operations, perceiving and reflecting on them as employed about the *ideas* before got by sensation, we get the *ideas* of perception, thinking, doubting, willing, &c. which we call *inward sensation* or *reflexion*: and these two, *viz.* external material things as the objects of sensation, and the operations of our own minds as the objects of reflexion, are the only originals, whence all our *ideas* have their rise.—When we have considered these, and their several modes and combinations, we shall find that they contain our whole stock of *ideas*; inasmuch that the understanding does not seem to have the least glimmering of any *ideas* that it did not receive from one of those sources.

And thus far the mind appears merely passive, as not having it in its power to chuse whether it will have these first beginnings or materials of knowledge, or not. For the objects of sense will obtrude their *ideas* upon the mind, and the operations of the mind will not let us be without some (however obscure) notion of them.

Ideas are divided into *simple* and *complex*.

Simple IDEAS, include all those which come into the mind by sensation; and though the qualities of bodies that affect our senses are in the things themselves so mixed and united, that there is no separation between them; yet the *ideas* they produce in the mind are simple and un-mixed. Again, some of these *ideas* we acquire purely by means of one sense; as the *ideas* of colours only by the eye, of sounds by the ear, of heat by the touch, &c. Other *ideas* we gain by several senses; as of space, extension, figure, rest, motion, &c. for these have their effect both on the sight and the touch. There are other simple *ideas*, again, formed in the mind both by sensation and reflexion jointly; as those of pleasure, pain, power, existence, unity, succession, &c. And of some of these kinds of *ideas* are all, or at least the most considerable of those simple *ideas* which the mind hath, and out of which is made all its other knowledge.

The better to comprehend the nature of simple *ideas*, it will be convenient to distinguish between them as they are *ideas* of perceptions in our minds, and as they are modifications of the bodies that cause such perceptions in us, that we may not think, as is usually done, that they are exactly the images and resemblances of something inherent in the object: for most of those of sensation are in the mind no more the likeness of any thing existing without us, than the names that stand for them are the likeness of the *ideas*.

But here the qualities of bodies which produce those *ideas* in our minds are to be distinguished into *primary* and *secondary*. *Primary qualities* are such as are utterly inseparable from the body, in what state soever it be; and such as our senses con-

stantly find in every particle of matter; which are solidity, extension, figure, mobility, and the like. *Secondary qualities* are such as are, in reality, nothing in the objects themselves, but only powers to produce various sensations in us by means of their primary qualities; that is, by the figure, bulk, texture, &c. of their particles, as colour, sounds, taste, &c.

Now the *ideas* of primary qualities are in some sense resemblances of them, and their patterns do really exist in the bodies themselves; but the *ideas* produced in us by those secondary qualities, have no resemblance of them at all. There is nothing like our *ideas* existing in the bodies themselves that occasion them. They are in the bodies we denominate from them, only a power to produce those sensations in us: and what is sweet, warm, blue, &c. in the *idea*, is no more than the bulk, figure and motion of the particles of the bodies themselves which we call so.

The mind has several faculties of managing these simple *ideas*, which are worthy of notice; as, 1. That of discerning justly, and distinguishing rightly, between one and another; in which consists the accuracy of judgment.

2. That of comparing them one with another in respect of extent, degree, time, place, or any other circumstances of relation, or dependence one on another.

3. That of compounding or putting together the simple *ideas* received by sensation and reflexion, in order to make complex ones.

4. Children, by repeated sensations, having got some *ideas* fixed in their memories, by degrees learn the use of signs; and when they can speak articulately, they make use of words to signify their *ideas* to others.

Hence, the use of words being to stand as outward marks of our internal *ideas*, and those *ideas* being taken from particular things; if every particular *idea* that we take in, should have a particular name affixed to it, names would grow endless.—To prevent this inconvenience, the mind has another faculty, whereby it can make the particular *ideas* received from such objects, become general; which is done, by considering them as they are in the mind such appearances, separate from all other existences, and circumstances of existence, as time, place, and other concomitant *ideas*: And this is called *abstraction*; whereby *ideas* taken from particular things, become general representatives of all of that kind, and their names, general names, applicable to whatever exists conformable to such abstract *ideas*. Thus, the same colour being observed to-day in chalk or snow, which we observed yesterday in paper or milk, we consider that appearance alone, make it a representative of all the same kind, and give it the name of *whiteness*; by which found we always signify the same quality, whosoever to be met with or imagined.

From the powers of combining, comparing, and separating, or abstracting simple *ideas*, acquired by sensation and reflexion, all our complex *ideas* are formed; and, as before, in the perception of *ideas*, the understanding was passive, so here it is active, exerting the power it hath in the several acts and faculties above mentioned, in order to frame compound *ideas*.

Complex IDEAS, though their number be infinite, and their variety endless, yet may they all be reduced to these three heads, *viz.* *modes*, *substances*, and *relations*.—*Modes* are such complex *ideas*, as however compounded, are not supposed to exist by themselves, but are considered as dependencies on, or affections of substances; such are the *ideas* signified by the words *triangle*, *gratitude*, *murder*, &c.

These are of two kinds: 1. Such as are only variations, or different combinations of the same simple *idea*, without the mixture of any other, as a dozen, a score, &c. which may be called *simple modes*. 2. There are others compounded of simple *ideas* of several sorts put together, to make one complex one, as beauty, theft, &c.

Substances have their *ideas* from such combinations of simple *ideas*, as are taken to represent distinct particular things subsisting by themselves; in which the supposed or confused *idea* of substance, such as it is, is always the first and chief.

Relations are a kind of complex *ideas*, arising from the consideration or comparison of one *idea* with another. Of these some only depend on the equality or excess of the same simple *idea* in several subjects, and these may be called *proportional relations*; such as equal, more, bigger, sweeter.—Another occasion of comparing things together, is owing to the circumstances of their origin and beginning; which, not being afterwards to be altered, make the relations depending thereon, as lasting as the subjects to which they belong. Thus it is with natural relations, as father, mother, uncle, cousin, &c. Thus also it is with relations by institution, as prince and people; general and army, &c. As to moral relations, they are the conformity or disagreement of mens free actions to laws and rules, whether human or divine.

Further, *ideas* may be divided into *clear*, or *distinct*, and *obscure*, or *confused*.

Simple IDEAS are *clear*, when they continue such as the objects represent them to us when our organs of sensation are in a good tone and order; when our memories retain them,

and can produce and present them to the mind whenever it has occasion to consider them; and when, with this, the mind sees that these simple *ideas* are severally different one from another.—The contrary to which is what we call *obscurity and confusion of ideas*.

Again, *ideas*, with respect to the objects whence they are taken, or which they are supposed to represent, come under a threefold distinction; being, either *real* or *fantastical*; *true* or *false*; *adequate* or *inadequate*.

By Real IDEAS, are meant such as have a foundation in nature, such as have a conformity with the real being or existence of things, or with their archetypes.

Fantastical IDEAS, are such as have no foundation in nature, nor any conformity with that being to which they are referred as their archetypes.

All our simple *ideas* are real; not that they are images or representations of what does exist, but as they are the certain effects of powers in things without us, ordained by our maker to produce in us such sensations. They are real *ideas* in us, in regard, that by them we distinguish the qualities that are really in the bodies themselves; their reality lies in the steady correspondence they have with the distinct constitutions of real beings, but whether with those constitutions as causes or patterns, it matters not, so long as they are constantly produced by them.

As to complex *ideas*, in regard they are arbitrary combinations of simple *ideas* put together, and united under one general name, in forming whereof the mind uses its own liberty, some are found *real*, and some *imaginary*. 1^o. Mixed modes and relations having no other reality than what they have in the minds of men, are real; nothing more being required to their reality, but a possibility of existing conformable to them. These *ideas* being themselves archetypes, cannot differ from their archetypes, and so they cannot be chimerical, unless any one jumbles inconsistent *ideas* in them: Indeed, those that have names assigned to them, ought to have a conformity to the ordinary signification of those names, to prevent their appearing fantastical. 2^o. Our complex *ideas* of substances being made in reference to things existing without us, whose representations they are thought, are no further real, than as they are combinations of simple *ideas* really united and co-existing in things without us. Those are fantastical, that are made up of several *ideas* that never were found united; as centaur, &c.

As to true and false IDEAS, it may be observed, that truth and falshood in propriety of speech belong only to propositions; and that when *ideas* are termed *true* or *false*, there is some tacit proposition, which is the foundation of that denomination. Our *ideas* being nothing else but appearances or perceptions in the mind can no more be said to be true or false, than single names of things can be said to be so; for truth and falshood lying always in some affirmation or negation, our *ideas* are not capable of them, till the mind passes some judgment of them.—In a metaphysical sense they may be said to be true, *i. e.* to be really such as they exist; though in things called *true*, even in that sense, there seems to be a secret reference to our *ideas*, looked upon as the standards of that truth; which amounts to a mental proposition. When the mind refers its *ideas* to any thing extraneous to it, they are then capable of being true or false; because in such a reference, the mind makes a tacit supposition of their conformity to that thing; which supposition, as it is true or false, so the *ideas* themselves come to be denominated.

Real Ideas are divided into *adequate*, and *inadequate*.

Adequate IDEAS, are those which perfectly represent those archetypes which the mind supposes them taken from, and which it makes them stand for.

Inadequate IDEAS, are such as do but partially or incompletely represent those archetypes to which they are referred.

IDENTITATE Nominis, a writ which lies for him who upon a capias or exigent is arrested, and committed to prison for another man of the same name.

IDENTITY, Sameness; that by which a thing is itself, and not any thing else.—In which sense, *identity* differs from *similitude* as well as *diversity*.

Our idea of *identity* we owe to that power which the mind has of comparing the very being of things; whereby, considering any thing as existing at any certain time and place, and comparing it with itself as existing at any other time, &c. we accordingly pronounce it the same.

When we see any thing in any certain time and place, we are sure it is that very thing, and can be no other, how like soever it may be to something else in all other respects: In regard we conceive it impossible, that two things of the same kind should exist together in the same place, we conclude, that whatever exists any where at the same time, excludes all of the same kind, and is there itself alone. When therefore we demand, whether any thing be the same or no; it refers always to some thing that existed at such a time, in such a

place; which, it was certain, at that instant, was the same with itself, and no other.

We have ideas of three sorts of substances: of God; of finite intelligences; and of bodies.—God being eternal, unalterable, and every where, concerning his *identity* there can be no doubt. Finite spirits having had their determinate place and time of beginning to exist, the relation to that time and place will always determine to each its *identity* as long as it exists.

—And the same will hold of every particle of matter to which no addition or from which no subtraction is made. These three exclude not one another out of the same place, yet each exclude those of the same kind, out of the same place.—The *identity* and diversity of modes and relations are determined after the same manner that those of substances are; only the actions of finite beings, as motion and thought, consisting in succession, cannot exist in different times and places as permanent beings: for no motion or thought considered as at different times, can be the same, each part thereof having a different beginning of existence. From whence it is plain, that existence itself is the *principium individuationis*, which determines a being to a particular time and place incommunicable to two beings of the same kind.

Thus, suppose an atom existing in a determined time and place, it is evident, that considered in any instant, it is the same with itself, and will be so, as long as its existence continues. The same may be said of two, or more, or any number of particles, whilst they continue together, the mass will be the same, however jumbled; but if one atom be taken away, it is then not the same mass.

But in vegetables, the *identity* depends not on the same mass, and is not applied to the same thing. The reason of this, is the difference between an inanimate body, and a crude mass of matter; this latter being only the cohesion of particles any how united, the other such a disposition or organization of parts, as is fit to receive and distribute nourishment, so as to continue and frame the wood, bark, leaves, &c. (of an oak, for instance) in which consists the vegetable life.

That, therefore, which hath such an organization of parts, partaking of one common life, continues to be the same plant, though that life be communicated to new particles of matter vitally united to the living plant.—The case is not so much different in brutes, but that any one may hence see what makes an animal, and continues it the same. The *identity* of the same man likewise consists in a participation of the same continued life, in succeeding particles of matter vitally united to the same organized body.

To understand *identity* aright, we must consider what *idea* the word stands for; it being one thing to be the same substance; another, the same man; and a third, the same person. An animal is a living organized body; and the same animal is the same continued life communicated to different particles of matter, as they happen successively to be united to that organized living body; and our notion of man is but of a particular sort of animal. Person stands for an intelligent being, that reasons and reflects, and can consider itself the same thing in different times and places; which it doth by that consciousness, that is inseparable from thinking. By this every one is to himself, what he calls *self*, without considering whether that self be continued in the same or in diverse substances. In this consists personal *identity*, or the sameness of a rational being; and so far as this consciousness extends backward to any past action, or thought, so far reaches the *identity* of that person. It is the self-same now it was then; and it is by the same self, with this present one, that now reflects on it, that that action was done. Self is that conscious thinking thing, whatever substance it matters not, which is conscious of pleasure and pain, capable of happiness or misery; and so is concerned for itself as far as that consciousness extends. That with which the consciousness of this present thinking thing can join itself, makes the *same* person, and is one self with it; and so attributes to itself, and owns all the actions of that thing as its own, as far as that consciousness reaches.

This personal *identity* is the object of reward and punishment, being that by which every one is concerned for himself. If the consciousness went along with the little finger, when that was cut off, it would be the same self, that was just before concerned for the whole body.—If the same Socrates, waking, and sleeping, did not partake of the same consciousness, he would not be the same person: Socrates waking could not be in justice accountable for what Socrates sleeping did; no more than one twin, for what his brother twin did, because their outdies were so like, that they could not be distinguished.

But suppose I wholly lose the memory of some parts of my life, beyond a possibility of retrieving them, so that I shall never be conscious of them again; am I not again the same person that did those actions, though I have forgot them? I answer, we must here take notice what the word *I* is applied to, which in this case is the man only: And the same man being presumed to be the same person, *I* is easily here supposed to stand also for the same person. But if it be possible

for the same man to have a distinct incommunicable consciousness at different times, it is past doubt the same man would at different times make different professions.—Which we see is the sense of mankind in the solemnest declaration of their opinions; human laws not punishing the madman for the sober man's actions, nor the sober man for what the madman did; thereby making them two persons.

Thus we say in English, such an one is not himself, or is beside himself; in which phrases it is insinuated, that self is changed, and the self-same person is no longer in that man. But is not a man, drunk or sober, the same person? Why else is he punished for the same fact he commits when drunk, though he be never afterwards conscious of it? Just as much the same person, as a man that walks, and does other things in his sleep, is the same person, and is as answerable for any mischief he shall do in it. Human laws punish with a justice suitable to their way of knowledge; because, in these cases, they cannot distinguish certainly, what is real, and what is counterfeit; and so the ignorance in drunkenness or sleep is not admitted as a plea. For though punishment be annexed to personality, and personality to consciousness, and the drunkard is not conscious perhaps of what he did; yet human judicatures justly punish him, because the fact is proved against him, but want of consciousness cannot be proved for him. But in the great day, wherein the secrets of all hearts shall be laid open, it may be reasonable to think no one shall be made to answer for what he knows nothing of, but shall receive his doom, his own conscience accusing, or else executing him.

To conclude this article, whatever substance begins to exist, it must, during its existence, be the same: whatever composition of substances begin to exist, during the union of those substances, the concrete must be the same. Whatever mode begins to exist, during its existence it is the same; and so if the composition be of distinct substances, and different modes, the same rule holds. Whence it appears, that the difficulty or obscurity that has been about this matter, rather arises from names ill used, than from any obscurity in the things themselves. For whatever makes the specific idea, to which the name is applied, if that idea be steadily kept to, the distinction of any thing into the same and diverse, will easily be conceived.

IDEOT. See the article IDIOT.

IDES*, IDUS, in the Roman calendar, a denomination given to eight days in each month; commencing, in the months of March, May, July and October, on the 15th day; and in the other months on the 13th day: and reckoned backward, so as in the four months above specified to terminate on the 8th day, and in the rest on the 6th.

* The origin of the word is contested: Some will have it formed from *ides*, to see; by reason the full moon was commonly seen on the day of the *ides*; others from *ιδος*, species, figure, on account of the image of the full moon then visible: Others from *idulium*, or *ovis idulis*, a name given by the Hetrurians to a victim offered on that day to Jupiter: Others from the Hetrurian word *iduo*, i. e. *divido*; by reason the *ides* divided the moon into two nearly equal parts.

The *ides* came between the calends and the nones.

The 15th day, in March, May, July and October, and the 13th in the other months, being called the *ides* of those months; *idus Martii*, *Maii*, &c. The fourteenth day of the same four months, and the 12th of the other eight, were *pridie idus*, or the eve of the *ides* of March, &c. The 13th day in the four months, and the 11th in the eight, was called the third of the *ides* of such months, 3 *idus Martii*, &c. So, the 12th day in the four, and the 10th in the eight months, were the 4th of the *ides*, 4 *idus Martii*, &c. And thus of the rest, to the 8th and 6th days, which made the 8th of the *ides*, 8 *idus Martii*, &c.

This way of accounting is still in use in the Roman chancery, and in the calendar of the breviary.—The *ides* of May were consecrated to Mercury: the *ides* of March were always esteemed unhappy, after Cæsar's murder: the time after the *ides* of June was reckoned fortunate for those who entered into matrimony: the *ides* of August were consecrated to Diana, and were observed as a feast-day by the slaves. On the *ides* of September, auguries were taken for appointing the magistrates, who formerly entered into their offices on the *ides* of May, and afterwards on those of March.

IDIOM*, IDIOMA, is sometimes used for the peculiarities of a language; sometimes for a dialect; or the language of some particular province; differing, in some respects, from the language of the nation in general, whence it is derived.

* The word comes from the Greek, *ιδιωμα*, propriety; of *ιδος*, proper, own.

IDIOPATHY*, a disease, or indisposition peculiar to some member, or part of the body; not caused by any other disease, or preceding affection; nor having any dependence on the rest of the body.

* The word is Greek, *ιδιοπαθεια*; derived from *ιδος*, proper, particular, and *παθος*, passion, affection.

In which sense it stands opposed to *sympathy*, which is when

the indisposition takes its rise from some prior disorder in some other part of the body.

Thus a cataract in the eye is an *idiopathy*: an epilepsy is either *idiopathic*, or *sympathic*; *idiopathic*, when it happens purely through some fault in the brain; *sympathic*, when it is preceded by some other disorder.

IDIOSYNCRASY*, in phisic, a temperament peculiar to some body, in consequence whereof, whether in sickness or in health, it has a more than ordinary aversion, or inclination to certain things, or is more affected with them, than others usually are.

* The word is derived from the Greek, *ιδιος*, proper, own, with, and *κρασις*, *crasis*, mixture, temperament.

IDIOT*, or IDIOT, in the English laws, denotes a natural fool, or fool from his birth.

* The word is originally Greek, *ιδιωτης*, which primarily imports a private person, or one who leads a private life, without any share or concern in the government of affairs.

A person who has understanding enough to measure a yard of cloth, number twenty rightly, and tell the days of the week, &c. is not an *idiot* in the eye of the law.

IDIOT, *Idiota* is also used by ancient writers for a person ignorant, or unlearned; answering to *illiteratus*, or *imperitus*. In this sense, Victor tells us, in his *Chronicon*, that in the consullhip of Messala, the holy gospels, by command of the emperor Anastasius, were corrected and amended, as having been written by *idiot* evangelists: *Tanquam ab idiotis evangelistis composita*.

IDIOTA *inquirendo vel examinando*, a writ issued out to the sheriff of a county, where the king has notice that there is an idiot naturally born, so weak of understanding, that he cannot govern, or manage his inheritance; directing him to call before him the party suspected, and examine him, and enquire by a jury of twelve men whether he be an idiot. For the king by his prerogative, has the government of the lands and substance of such as are naturally defective in their own discretion.

IDIOTISM*, in grammar, a phrase, or manner of speaking peculiar to a language, and which cannot be rendered word for word into any other.

* The word is derived from the Greek, *ιδιος*, proper, peculiar. *Idiotism* is defined, by some authors, an inflexion of some verb, or a particular construction of some phrase or particle that is anomalous, and deviates from the ordinary rule of the language of the nation, but which is in use in some particular province of it.

Several authors have written of the *idiotisms* in the Greek and Latin languages; that is, of the particular turns in those tongues which vary the most from each other, and from the more popular among the modern tongues: but the examples of these *idiotisms* being borrowed from the best authors, *idiotisms*, in this sense, cannot properly be called an irregularity.

IDOL*, a statue or image of some false god, to whom divine honours are paid, altars and temples erected, and sacrifices offered.

* The word comes from the Greek, *ειδωλον*, which signifies the same, of *ειδος*, *imago*, *imago*, *figure*.

IDOLATRY*, the worship and adoration of false gods; or the giving those honours to creatures, or the works of man's hand, which are only due to God.

* The word comes from the Greek *ειδωλαθρηια*, which signifies the same; composed of *ειδος*, *imago*, *image*, and *θρηια*, *servire*, to serve.

Several have written of the origin, and causes of *idolatry*; among the rest, Vossius, Selden, Godwyn, and Tennison; but it is still a doubt who was the first author of it. It is generally allowed, however, that it had not its beginning till after the deluge, and many are of opinion that Belus, who is supposed to be the same with Nimrod, was the first man that was deified.

But whether they had not paid divine honours to the heavenly bodies before that time, cannot be determined; our acquaintance with those remote times being extremely slender.

All that can be said with certainty, is, That 426 years after the deluge, when God led Terah and his family out of Chaldaea, and Abraham passed over Mesopotamia, Canaan, the kingdom of the Philistines, and Egypt, it does not appear that *idolatry* had then got any footing in any of those countries; though some idly pretend that Abraham himself was an idolater.

The first mention we find made of it, is in Gen. xxxi. 19, where Rachel is said to have taken the idols of her father; for though the meaning of the Hebrew word *theraphim* *תְּרָפִים* be disputed, yet it is pretty evident they were idols. Laban calls them his gods, and Jacob calls them strange gods, and looks on them as abominations.

Cluverius, *Germ. Antiq.* Lib. I. maintains Cain to have been the first idolater, and the false gods that he worshipped to have been the stars, to whom he supposed God had left the government of the lower world: but this is mere conjecture.

The principal causes that have been assigned for *idolatry*, are, the indelible idea which every man has of God, and the evidence which he gives of it to himself: an inviolable attachment to the senses, and an habit of judging and deciding by them, and them only: the pride and vanity of the human mind, which is not satisfied with simple truth, but mingles and adulterates it with fables: the ignorance of antiquity, or of the first times, and the first men, whereof we have but very dark and confused knowledge by tradition, they having left no written monuments or books: the ignorance and change of languages: the style of the oriental writings, which is figurative and poetical, and personifies every thing; the superstition, scruples, and fears, inspired by religion: the flattery of writers: the false relations of travellers: the fictions of poets: the imaginations of painters and sculptors: a smattering of physics, that is, a slight acquaintance with natural bodies, and appearances, and their causes: the establishment of colonies, and the invention of arts, mistaken by barbarous people: the artifices of priests: the pride of certain men, who have affected to pass for gods, the love and gratitude bore by the people to certain of their great men and benefactors: and finally the scriptures themselves ill understood.

IDYLLION*, in poetry, a little poem, containing the description, or narration of some adventures.

* The word is derived from the Greek, a *ιδύλλιον*, diminutive of *ιδύω*, figure, representation; in regard this poetry consists in a lively natural image, or representation of things.

Theocritus is the oldest author who has written *idyllions*. The Italians imitate him, and have brought the *idyllion* into modern use.

The *idyllions* of Theocritus have a world of delicacy; they appear with a clownish, rustic kind of simplicity; but are full of the most exquisite beauties; they seem drawn from the breast of nature herself, and to have been dictated by the graces.

The *idyllion* is a kind of poetry, which paints the objects it describes; whereas the epic poem relates them, and the dramatic acts them.—The modern writers of *idyllions* do not keep up to that original simplicity observed by Theocritus; the people of our days would not bear an amorous fiction, resembling the clumsy gallantries of our peasants.—Boileau observes, that the shortest *idyllions* are usually the best.

J E A L O U S Y, *Waters of*. See the article **W A T E R S**.

J E A T. See the article **J E T**.

J E C T I G A T I O N, in physics, a trembling, palpitation, or disorderly and convulsive motion, of the whole body, of one side, or only of the heart, and pulse of a sick person; this shews that the brain, which is the origin of the nerves, is attacked, and threatened with convulsions.

J E C U R. See the article **L I V E R**.

J E C U R U t e r i n o m.—The *placenta* is by some thus called, from the supposed similitude of its figure, and office, with that of the liver. See **P L A C E N T A**.

J E E R C a p t a n. See the article **C A P T A N**.

J E H A G H, in the eastern chronology. See **G R E A G H**.

J E J U N E S t y l e. See the article **S T Y L E**.

J E J U N U M, the second of the small guts; thus called from the Latin *jejunus*, hungry; because always found empty. See **I N T E S T I N E S**.

J E N N E T, in horsemanship. See the article **H O R S E S**.

J E O F A I L L E, or **J E O F A Y L E**, a compound of three French words, *je* *oy* *faillie*. I have failed; it is used in a legal sense, when the parties to any suit have, in pleading, proceeded so far, that they have joined issue, which shall be tried, or is tried by a jury, and this pleading or issue is badly joined, so that it will be error if they proceed.

In this case, one of the parties might, by their counsel, shew it to the court, as well after verdict given, as before the jury was charged, by saying, *This inquest you ought not to take: or, To judgment you ought not to go.*

But this occasioning great delays in suits; for the redress thereof several statutes were made, viz. 32 H. III. c. 30. by which it was enacted, 'That if the jury have once passed upon the issue, though afterwards there be found a *jeofaille* in the pleading, yet shall judgment be given according to the verdict of the jury.' Other statutes have also been made relating to the same thing, in the time of king James I. and queen Elizabeth, and yet the fault not mended.

J E R O N Y M I T E S, or **H I E R O N Y M I T E S**, a denomination given to divers orders, or congregations of religious; otherwise called *Hermits of S. Jerom*.

The first, called *Hermits of S. Jerom of Spain*, owe their origin to the third order of S. Francis, whereof the first *Jeronymites* were members.—Gregory the eleventh confirmed this order, under the name of *S. Jerom*, whom they had chosen for their patron and their model, and gave them the constitutions of the convent of S. Mary of the Sepulchre, with the rule of S. Augustin; and for habit, a white tunic, with a scapulary, a little capuche, and a mantle, all of their natural colour, without dying, and of a mean price.

The *Jeronymites* are in possession of the convent of S. Laurence, in the Elcurial, where the kings of Spain are buried.

—In Spain there is likewise an order of nuns of S. Jerom, founded by a lady towards the close of the 15th century. Sixtus put them under the jurisdiction of the *Jeronymites*, and gave them the constitutions of the monastery of S. Martha of Cordoua, which were afterwards changed by Leo X. for those of the order of S. Jerom.

Hermits of S. Jerom, of the Observance, or of Lombardy, were founded by Lupus d'Olmedo in 1424, in the mountains of Cazalla, in the diocess of Sevil.

The third order of *Jeronymites* was founded by Peter Gambacorti about the year 1377; but the vows they made were only simple till 1568, when Pius V. appointed them to be solemn. They have houses in Tirol, Italy, and Bavaria.

The fourth congregation of *Jeronymites*, are the *Hermits of S. Jerom of Fiesoli*, begun in 1360, when Charles de Montegraneli, of the family of the count of that name, retiring into solitude, first established it at Verona. It was approved by Innocent VII. under the rule and constitutions of S. Jerom. But Eugenius, in 1441, changed it for that of S. Augustin.—As the founder was of the third order of S. Francis, they preserved that habit; but, in 1460, Pius permitting such as pleased to change it, occasioned a division among them. This order was finally suppressed by Clement XI. in 1668.

J E S I L B A S C H, *Green-beard*, a name of reproach, which the Persians give to the Turks, because their emirs wear a green turban.

J E S S A N T*, in heraldry, is applied to a flower-de-luce, or the like figure, seeming to spring, or shoot out of some other charge.—He bears sable three leopards heads; *jessant*, flowers de lis, or.

* The word is formed from the obsolete French *jeffer*, to rise or spring out.

J E S U A T E S, **J E S U A T E**, an order of religious, otherwise called *apostolical clerks*, or *Jesuates of S. Jerom*.

They were founded by John Columbin, and approved of by Urban V. in 1367, at Viterbo; where he himself gave, to such as were present, the habit they were to wear.—They followed the rule of S. Augustin, and were ranked by Pius V. among the order of mendicants.

They were called *Jesuates*, because their first founders had the name of Jesus continually in their mouths: to which they added the name of *S. Jerom*, by reason they chose that saint for their protector.

For two centuries the *Jesuates* were mere lay brothers; but in 1606 Paul V. gave them leave to enter into holy orders.

—In most of their houses they were employed in pharmacy, others practised distillation, and sold aqua viæ, which occasioned their being called *agua-vite-mongers*.

Being very rich in the state of Venice, that republic solicited their suppression, and obtained it of Clement IX. and their effects being employed towards supporting the expenses of the war in Candia.

J E S U I T S, an order of religious, founded by Ignatius Loyola, called also *the society of Jesus*.

This order has rendered itself very considerable by its missions into the Indies, and by its other employments relating to the study of the sciences, and the education of youth. The council of Trent calls them, *regular clerks of the company of Jesus*.

It was in the year 1538, that Ignatius having assembled ten of his companions at Rome, chosen mostly out of the university of Paris, proposed to them to make a new order. After this, he presented the plan of his institution to Paul III. who appointed three commissioners to examine it; upon whose report the pontiff confirmed the institution, under the name of *the company of Jesus*, by a bull in 1540.—By this bull, their number was restrained to sixty; but that restriction was taken away, two years afterwards, by another bull.—The order has since been confirmed by several succeeding popes, who have added many new rights and privileges to it.

The end principally proposed by this order, is to gain converts to the Romish church; with which view they disperse themselves in every country and nation, and with amazing industry and address pursue the end of their institution. No difficulty so great that they cannot surmount, no danger so imminent that they will not undergo, and as some say no crimes so shocking that have not been perpetrated by them for the service of their cause.

They have no particular habit; but change and accommodate it to times, and occasions. The order consists of five different classes; *professed fathers*, *spiritual cadjutors*, *approved scholars*, *lay-brothers*, called also *temporal cadjutors*, and *novices*.

The *professed fathers*, which make the body of the company, take the three solemn vows of religion publicly, and to these add a special vow of obedience to the head of the church; as to what regards missions among idolaters, heretics, &c.—The *spiritual cadjutors* also make public vows of chastity, poverty, and obedience; but omit the fourth relating to missions.—*Approved scholars* are those, who, after two years

years noviciate, have been admitted, and have made three vows of religion; not solemn, indeed, but yet declared.—These are in the way to become professed, or spiritual coadjutors, according as the general thinks fit. These degrees, especially that of professed, are never conferred till after two years noviciate, and seven years study, seven of regency, a third year of noviciate, and thirty three years of age. The vows of the scholars are absolute on their side, but only conditional on the side of the order; the general having it in his power to dispense with them.

The order is divided into *assistances*, the assistances into *provinces*, and the provinces into *houses*.—It is governed by a general, who is perpetual and absolute. He resides at Rome, and is elected by a general congregation of the order. He has with him five persons, who are, as it were, his ministers. They are called *assistants*, and bear the name of the kingdom or country to which they belong, and by which they are appointed, *viz.* of Italy, France, Spain, Germany, and Portugal.—To these belongs the care of preparing the matters of their respective assistances, and of putting them in a method to facilitate their dispatch. It is by these, that both inferiors and superiors go regularly before the general.—They are chosen by the congregation, and are not only the general's counsellors to assist him in his business, but are also to observe his conduct; and, if they find occasion, they may call a general congregation without his consent, who may depose him in form; or they have it in their power to depose him themselves, after having, by letter, obtained the suffrages of their provinces.

Each province has four kinds of *houses*, *viz.* *professed houses*, which can have no lands belonging to them; *colleges*, where the sciences are taught; *residences*, where are a number of workmen employed in such offices, as have any immediate relation to preaching, confession, missions, &c. and houses of *novices*. Among the colleges, there are some called simply *colleges*, and others called *seminaries*.—These last are set apart for the young Jesuits to go through their courses of philosophy and theology in; the others are for strangers.

Each province is governed by a *provincial*, and each house by a *superior*, who is called a *rector* in the colleges, and a *superior* in the other houses.—Ignatius regulated the discipline of these houses, and especially of the colleges, by what he had observed in the Sorbonne, while he studied at Paris.

The professed of this order renounce, by a solemn vow, all preferment, and especially prelacy; and cannot receive any, unless enjoined thereto by the pope, under pain of sin.—This the pope sometimes does; inasmuch that they have had eight cardinals of their order.

JET, *Gagates*, called also *black amber*, a light, smooth, pitchy, fissile stone, extremely black; formed of a bituminous juice in the earth, in the manner of coal.

It works like amber, and has most of its qualities: It abounds in Dauphine, but the best in the world is said to be produced in Yorkshire.—It readily catches fire, flashes, and yields a bituminous smell.

There is also a factitious *jet*, made of glass, in imitation of the mineral *jet*: This is now usually drawn out into long hollow threads, which are cut and fashioned at pleasure.—It is much used in embroideries, and in the trimmings of mourning, and may be made of any colour, though it is usually black, and white; and of late is denominated *bugles*. See supplement: article GAGATES.

JET D'EAU, a French word, signifying a fountain that casts up water to any considerable height in the air. See FOUNTAIN. Mariotte shews, that a *jet d'eau* will never raise water so high as its reservoir, but always falls short of it by a space, which is in a subduplicate ratio of that height.—The same author shews, that if a greater *jet* branch out into many smaller ones, or be distributed through several *jets*, the square of the diameter of the main pipe, must be proportioned to the sum of all the expences of its branches: and that if the reservoir be 52 foot high, and the adjutage half an inch in diameter, the pipe ought to be three inches in diameter.

JETSON. See the article FLOTSON.

JEWEL OFFICE, or **JEWEL-HOUSE**; an office which takes care of fashioning and weighing the king's plate; and delivering it out by warrants from the lord chamberlain.

When his majesty makes any present of plate, &c. they have the charge of providing it; with some other things less material.

The principal officers are,—the *master of the jewel office*, whose salary is 450 *l.* per ann. a *yeoman*, a *groom*, and a *clerk*; all in the king's gift.

There are also in this office, in the gift of the lord chamberlain, the poet laureat at 100 *l.* per ann. salary: the king's historiographer, at 200 *l.* per ann. the history painter, and principal painter, at 200 *l.* per ann. the painter in enamel, and the surveyor and keeper of the pictures, at 200 *l.* per ann. each.

The *goldsmith* and *jeweller* are employed by the master, and are usually in his gift.

JEWS. See the article JUDAISM, ELECTION, &c.

JEWS-EAR, *Auriculae Judaee*, or *Fungus Sambucinus*, a kind of fungus, or spungy substance, that grows about the root of the elder tree.

It is chiefly used in decoction, which is found detergent, and vulnerary, and a good gargle in sore throats.

JEWISH Oeconomy, } See the articles { OECONOMY,
JEWISH Hours, } { HOUR, &c.

JEZIDES, or **JEZIDEANS**, a term used among the Mahometans, to signify *heretics*.

In which sense *Jeziidean* stands opposed to *Musfulman*. Leunclavius tells us, that the name is derived from an emir, called *Jeziid*, who killed the two sons of Ali, Hafan and Hussein, two grandsons of Mahomet on their mother's side, and perished the posterity of the prophet.—The Agareuians, whose emir or prince he was, looked on him as an impious and heretical person, and hence took occasion to call all whom they accounted heretics, *Jeziideans*.

Some authors mention the *Jeziides* as a particular people, speaking a language different both from the Turkish and Persian, though somewhat akin to the last.—They further tell us, that there are two kinds of *Jeziides*; the one *black*, the other *white*. The white have no slit in the bosom of their shirt; but barely an opening for the head to pass through: a thing that they observe with a great deal of strictness, in memory of a circle of gold and light which they say fell from heaven upon the neck of their grand sheikh, or chief of their sect.—The black *Jeziides* are *safaqirs*, or religious.

The Turks and *Jeziides* bear a strong aversion to each other; and the greatest affront one can put upon a Turk, is to call him a *Jeziidean*.—On the contrary, the *Jeziides* love the Christians; being persuaded that *Jeziid*, their chief, is Jesus Christ; or rather, because some of their traditions mention, that *Jeziid* made an alliance with the Christians against the Mussulmen.

They drink wine, even to excess when they can get it, and eat swine's flesh.—They never undergo circumcision, excepting when they are forced to it by the Turks. Their ignorance is surprizing; they have no books. Indeed they pretend to believe in the gospel, and in the sacred books of the Jews; but they go without ever reading either one or other of them. They make vows, and go on pilgrimage; but have no mosques, temples, nor oratories, no feasts, nor ceremonies; all their religious worship consisting in singing hymns to Jesus Christ, the virgin, Moses, and Mahomet.—When they pray, they look towards the east, in imitation of the Christians; whereas the Mussulmen turn towards the south.—They believe the devil may possibly, one day, come into favour again with God; and that he is the executor of God's justice in the other world: For which reason, they make it a point of prudence not to speak ill of him, lest he should revenge himself of them.

The black *Jeziides* are reputed saints; and it is forbidden to weep at their death; instead whereof, they make rejoicings; and yet, for the generality, they are no more than shepherds. They are not allowed to kill the animals they eat; that office belongs to the white *Jeziides*.—The *Jeziides* go in companies, like the Arabs. They often change their habitations, and live in black tents made of goats-hair, and encompassed with large rushes and thorns interwoven. They dispose their tents in a circle, placing their flocks in the middle.—They buy their wives: the stated price whereof is 200 crowns, be they better or worse. They are allowed divorce, provided it be to become *safaqirs*.—It is a crime among them to shave the beard, though ever so little.—They have some customs which intimate that they sprung originally out of some sect of Christians: for instance, in their feasts one of them presents a cup full of wine to another, bidding him take the cup of the blood of Jesus Christ; which last kisses the hand of him who presents it, and drinks.

IGNIS Fatuus, a common meteor, chiefly seen in dark nights, frequenting meadows, marshes, and other moist places:—known among the people by the appellations, *Will with a wisp*, and *Jack with a lantern*.

It seems to arise from a viscous exhalation, which being kindled in the air, reflects a sort of thin flame in the dark, without any sensible heat.

It is often found flying along rivers, hedges, &c. by reason it there meets with a stream of air to direct it.

IGNITION, in chymistry, the application of fire to metals, till such time as they become red-hot, without melting.

This happens in gold, and silver, but especially in iron: But lead and tin are too soft and fusible to bear ignition.

IGNORAMUS, q. d. *We do not know*; a word used by the grand jury, impelled on the inquisition of causes criminal, and written upon the bill, when they dislike their evidence, as defective, or too weak to make good the presentment.

The effect of which is, that all farther enquiry upon that prey for that fault is thereby stopped, and he is delivered without farther answer. See **BILLA**.

IGNORANCE, the privation, or want of knowledge.

Ignorance is chiefly owing to three causes; want of ideas; want of a discoverable connection between the ideas we have; and want of tracing and examining our ideas.

There are some things we are ignorant of for want of ideas: All the simple ideas we have, are confined to the observation of our senses, and the operations of our own minds, which we are conscious of in our selves. What other ideas it is possible other creatures may have, by the assistance of other senses or faculties, more or perfecter than we have, or different from ours, is not for us to determine: but to say there are no such, because we conceive nothing of them, is no better an argument, than if a blind man should be positive there was no such thing as light and colours; because he had no manner of idea of any such thing.—What faculties therefore other species of creatures have, to penetrate into the nature and inmost constitutions of things, we know not: This we know, and certainly find, that we want other views of them, besides those we have, to make discoveries of them more perfect. The intellectual and sensible world are in this perfectly alike, that the parts which we see of either of them, hold no proportion with that we see not; and whatsoever we can reach with our eyes, or our thoughts, of either of them, is but a point, almost nothing in comparison of the rest.

Again, the want of ideas, which we yet seem capable of, is another great obstacle in our way, and keeps us in *ignorance* of things, which we conceive capable of being known. Bulk, figure and motion we have ideas of; yet not knowing what is the particular bulk, motion, and figure of the greatest part of the bodies of the universe, we are ignorant of the several powers, efficacies and ways of operation, whereby the effects we daily see are produced. These are hid from us in some things, by being too remote, and in others by being too minute. When we consider the vast extent of the known and visible parts of the world, and the reasons we have to think, that what lies within our ken, is but a small part of the immense universe; we shall then discover an huge abyss of *ignorance*: What are the particular fabrics of the great masses of matter, which make up the whole stupendous frame of corporeal beings, how far they are extended, and what is their motion, and how continued, and what influence they have upon one another, are contemplations, that at first glimpse our thoughts lose themselves in!—If we confine our thoughts to this little canton, this system of our sun, and the grosser masses of matter which visibly move about it; what several sorts of vegetables, animals, and intellectual corporeal beings, infinitely different from those of our little spot of earth, may probably be in the other planets; to the knowledge of which, even of their outward figures and parts, we can no way attain, whilst we are confined to this earth; there being no natural means, either by sensation or reflexion, to convey their certain ideas into our minds?—There are other bodies in the universe, no less concealed from us by their minuteness. These insensible corpuscles being the active parts of matter, and great instruments of nature, on which depend all their secondary qualities and operations; our want of precise distinct ideas of their primary qualities, keeps us in incurable *ignorance* of what we desire to know about them.

Did we know the mechanical affections of rhubarb or opium, we might as easily account for their operations of purging and causing sleep, as a watchmaker can for the motions of his watch.—The dissolving of silver in aqua fortis, or gold in aqua regia, and not *vice versa*, would be then perhaps no more difficult to know, than it is to a smith to understand, why the turning of one key will open a lock, and not the turning of another.—But whilst we are destitute of senses acute enough to discover the minute particles of bodies, and to give us ideas of their mechanical affections, we must be content to be ignorant of their properties and operations: nor can we be assured about them any farther, than some few trials we make are able to reach; but whether they will succeed again another time, we cannot be certain.—This hinders our certain knowledge of universal truths concerning natural bodies; and our reason carries us herein very little beyond particular matter of fact: and therefore it is matter of doubt, that how far soever human industry may advance useful and experimental philosophy in physical things, yet scientific will still be out of our reach: because we want perfect and adequate ideas of those very bodies which are nearest to us, and most at our command.

This, at first sight, shews us how disproportionate our knowledge is to the whole extent, even of material beings: to which, if we add the consideration of that infinite number of spirits that may be, and probably are, which are yet more remote from our knowledge, and whereof we have no cognizance at all; we shall find this cause of *ignorance* conceals from us, in an impenetrable obscurity, almost the whole intellectual world; a greater, certainly a more beautiful world, than the material: For abating some very few ideas of spirits, which we get from our own mind by reflexion, and

from thence the best we can collect of the Father of all spirits, the author of them, and us, and all things; we have no certain information so much as of the existence of other spirits, but by revelation: such lets have we distinct ideas of their different natures, states, powers, and several constitutions, wherein they agree, or differ one from another, and from us: And therefore, in what concerns their different species and properties, we are under an absolute *ignorance*.

Another cause of *ignorance*, is the want of discoverable connection between those ideas we have: where we want that, we are utterly incapable of universal and certain knowledge, and are, as in the former case, left only to observation and experiment.—Thus the mechanical affections of bodies, having no affinity at all with the ideas they produce in us, we can have no distinct knowledge of such operations beyond our experience; and can reason no otherwise about them, than as the effects or appointments of an infinitely wise agent, which perfectly surpass our comprehensions.—The operation of our minds upon our bodies, is as unconceivable: how any thought should produce a motion in body, is as remote from the nature of our ideas, as how any body should produce any thought in the mind. That it is so, if experience did not convince us, the consideration of the things themselves would never be able, in the least to discover to us.—In some of our ideas there are certain relations, habitudes, and connections, so visibly included in the nature of the ideas themselves, that we cannot conceive them separable from them by any power whatsoever: in these only we are capable of certain and universal knowledge.—Thus the idea of a right lined triangle necessarily carries with it an equality of its angles to two right ones; but the coherence and continuity of the parts of matter, the production of sensation in us, of colours and sounds, &c. by impulse and motion, being such wherein we can discover no natural connection with any ideas we have, we cannot but ascribe them to the arbitrary will and good pleasure of the wise architect.—The things that we observe constantly to proceed regularly, we may conclude do act by a law set them; but yet by a law we know not, whereby though causes work steadily, and effects constantly flow from them, yet their connections and dependancies being not discoverable in our ideas, we can have but an experimental knowledge of them.—Several effects come every day within the notice of our senses, of which we have so far sensitive knowledge; but the causes, manner, and certainty of their production, we must, for the foregoing reasons, be content to be ignorant of. In these we can go no further than particular experience informs us of matter of fact; and, by analogy, we guess what effects the like bodies are upon other trials like to produce. But as to perfect science of natural bodies, (not to mention spiritual beings) we are far from being capable of any such things, that it may be reckoned left labour to seek after it.

The third cause of *ignorance*, is our want of tracing those ideas we have, or may have; and finding out those intermediate ideas, which may shew us what habitude of agreement or disagreement they may have one with another: And thus many are ignorant of mathematical truths for want of application, in enquiring, examining, and by due ways comparing those ideas.

JIG, in music, &c. See the article **GIG**.

ILIAC * *Passion*, a violent, and dangerous kind of colic; called also *volvulus*, *miserere mei*, and *chordeus*.

* It takes its name from the intestine *ilium*, in regard of its being usually affected in this distemper; or perhaps from the Greek verb *ilaui*, to wind, or twist; whence also it is the Latins call it *volvulus*.

It consists in an expulsion of feculent matter by vomit, accompanied with a swelling and tension of the abdomen, an intense pain, and a total constipation of the bowels.

The immediate cause of the *iliac passion*, seems owing to an irregularity, or inversion of the peristaltic motion of the guts, *viz.* where it begins with the lower, and is continued upwards.

Other causes are, the hardness of the excrements, inflammation of the intestines, and their engagement in the scrotum, as sometimes happens in hernias; or their twisting, and entering within one another.

Persons afflicted with the *iliac passion*, have sometimes been found to return suppositories and glisters as well as their stools by the mouth.

Some have been cured of it by swallowing a great quantity of quicksilver; or a musket ball. When the guts are twisted, or enter one within another; the weight of these bodies sometimes sets them to rights again. See *Supplement*: article **ILIACA PASSIO**.

ILIAC Vessels. See the articles **ARTERY**, and **VEIN**.

ILIACUS Externus, or *Pyiformis*; a muscle of the thigh, which arises from the internal concave part of the os sacrum, towards the bottom; and descending obliquely along the great sinus of the os ilium, from a round fleshy origin, joins the glutæus medius, and is inserted by a round tendon at the bottom of the great trochanter.

ILIACUS *Internus*, a muscle of the thigh, which arises fleshy from the internal concave part of the os ilium; and in its descent over the inferior part of it, joins with the psoas magnus; and is inserted with it, under the termination of the pectineus.

This, with the psoas magnus, moves the thigh forward in walking.

ILIAD *, *ΙΑΪΔΕ*, the name of an antient epic poem, the first, and finest of those composed by Homer.

* The word is derived from the Greek *Ilas*, of *Ilion*, *Ilium*, Troy, a famous city in Asia, which the Greeks besieged for the space of ten years, and at last destroyed, on account of the rape of Helena, which makes the subject of the work.

The poet's design in the *Iliad*, was to shew the Greeks, who were divided into several little states, how much it was their interest to preserve an harmony, and good understanding among them.—In order to which, he sets before their eyes, the calamities that befel their ancestors from the wrath of Achilles, and his misunderstanding with Agamemnon; and the advantages that afterwards accrued to them from their union.

The *Iliad* is divided into twenty four books, which are marked with the letters of the alphabet.—Pliny gives us an account of an *Iliad* written on so very slender a paper, that the whole might be contained in a nut-shell.

For the conduct of the *Iliad*, see Father Bossu, Madam Dacier, and M. de la Motte.

The critics maintain the *Iliad* to be the first, and yet the best poem that ever appeared in the world: Aristotle's *Poetics* are almost taken wholly from it; the philosopher had nothing to do, but to form precepts from the poet's practice.—Some authors tell us, that Homer invented not only poetry, but all other arts and sciences; and that there are the visible marks of a perfect knowledge in every one of them, to be seen in the *Iliad*.

The ingenious Mr. Barns of Cambridge, has very strenuously attempted to prove Solomon to have been the author of the *Iliad*.

ILIUM *Intestinum*. See the article **INTESTINE**.

ILIUM *Os*. See the article **OFFA INNOMINATA**.

ILLEGITIMATE Birth, or *Delivery*. See **DELIVERY**, and **ABORTION**.

ILLEVIABLE, in law, a debt, or duty which cannot, or ought not to be levied. See **LEVY**.

The word *nihil* is usually set on a debt or due that is *illeviable*.

ILLUMINATION, in a general sense, denotes the act of a luminous body, or a body that emits light; sometimes also the passion of an opaque body that receives it.

ILLUMINATIVE *Lunar Month*. See **MONTH**.

ILLUMINED, *ILLUMINATI*, a church term, antiently applied to such persons as had received baptism.

This name was occasioned by a ceremony in the baptism of adults, which consisted in putting a lighted taper in the hand of the person baptized, as a symbol of the faith and grace he had received in the sacrament.

ILLUMINED, *ILLUMINATI*, is also the name of a sect of heretics, who sprang up in Spain about the year 1575; and were called by the Spaniards, *Alumbrados*.

Their leaders were Villalpando, a priest, originally of the isle of Tenerife, and a Carmelite, called *Catherine de Jesus*.—These had a great number of disciples and followers, most of whom were apprehended, and clapped up in the Inquisition at Cordova; some of them were put to death, and the rest abjured their errors.

Their principal doctrines were, That by means of a sublime manner of prayer, which they had attained to, they entered into so perfect a state, that they had no occasion for ordinances, sacraments, nor good works; and that they could give way, even to the vilest actions, without sin.

The sect of *illumined* was revived in France in the year 1634, and were soon after joined by the Guerinets, or disciples of Peter Guerin, who together made but one body, called also *illumined*: but they were so hotly pursued by Louis XIII. that they were soon destroyed.

The brothers of the *osy cross*, are sometimes also called *illumined*. See **ROSYCRUCIAN**.

ILLUSTRIOUS, *ILLUSTRIS*, was heretofore in the Roman empire a title of honour peculiar to people of a certain rank.

It was first given to the most distinguished among the knights, who had a right to bear the *latus clavus*: afterwards, those were entitled *illustrious*, who held the first rank among those called *honarati*; that is, the præfecti prætorii, præfecti urbis, treasurers, comites, &c.

There were, however, different degrees among the *illustres*: As in Spain they have *grandees* of the first and second class, so in Rome they had their *illustres*, whom they called *grandes*; and others less, called *illustres minores*.—For instance, the præfectus prætorii was a degree below the master of the offices, though they were both *illustres*.

The *novels* of Valentinian distinguish as far as five kinds of *illustres*; among whom, the *illustres administratores* bear the first rank.

IMAGE *, *IMAGO*, in optics, a natural, lively representation of an object, opposed to a smooth well polished surface, or mirror.

* The Latin word, *imago*, comes originally from the Greek *μιμησις*, *imitari*, to imitate or mimic.

IMAGE, taken more largely, denotes the spectre, or appearance of any object, whether by reflexion, or refraction.

In all plane mirrors, the *image* is of the same magnitude as the object; and appears as far behind the mirror, as the object is before it.

In convex mirrors, the *image* appears less than the object; and farther distant from the centre of the convexity, than from the point of reflexion.

Mr. Molyneux gives the following rule for finding the diameter of an *image*, projected in the distinct base of a convex mirror: As the distance of the object from the mirror is to the distance from the *image* to the glass; so is the diameter of the object, to the diameter of the *image*.

IMAGE is also used for the trace, or mark which outward objects impress on the mind, by means of the organs of sense.

IMAGE also signifies an artificial representation performed by man; as in painting, sculpture, and the like.—In which sense, the word is now generally used in speaking of things holy, or imagined to be so.

The use and adoration of *images*, are things that have been a long time controverted in the world.—The Lutherans condemn the Calvinists for breaking the images in the churches of the Catholics, looking on it as a kind of sacrilege; and yet they condemn the Romanists (who are professed *image-worshippers*) as idolaters: Nor can these last keep pace with the Greeks, who go far beyond them in this point; which has occasioned abundance of disputes among them.

The Jews absolutely condemn all *images*; and do not so much as suffer any statues or figures in their houses, much less in their synagogues, or places of worship.

The Mahometans have a perfect aversion to *images*; which was what led them to destroy most of the beautiful monuments of antiquity, both sacred and profane, at Constantinople. The noble Romans preserved the *images* of their ancestors with a great deal of care and concern; and had them carried in procession at their funerals and triumphs. These were commonly made of wax, or wood; though sometimes of marble, or brass. They placed them in the vestibles of their houses; and they were to stay there, even if the houses happened to be sold, it being accounted impious to displace them.—Appius Claudius was the first who brought them into the temples, in the year of Rome 259; and he added inscriptions to them, shewing the origin of the persons represented, and their brave and virtuous achievements.

It was not, however, allowed for all, who had the *images* of their ancestors in their houses, to have them carried at their funerals; this was a thing only granted to such as had honourably discharged themselves of their offices; for those who failed in this respect, forfeited that privilege: and in case they had been guilty of any great crime, their *images* were broken in pieces.

IMAGE also signifies a lively description of any thing in a discourse.

Images in discourse, are defined by Longinus, to be, in general, any thoughts proper to produce expressions, and which present a kind of picture to the mind.

But, in the more limited sense, he says *images* are such discourses as come from us, when by a kind of enthusiasm, or an extraordinary emotion of the soul, we seem to see the things whereof we speak, and present them before the eyes of those who hear us.

Images in rhetoric, have a very different use from what they have among the poets: the end principally proposed in poetry is astonishment and surprize; whereas the thing chiefly aimed at in prose, is to paint things naturally, and to shew them clearly.—They have this, however, in common, that they both tend to move each in its kind.

These *images*, or *pictures*, are of vast use, to give weight, magnificence, and strength to a discourse. They warm and animate it; and when managed with art, according to Longinus, seem, as it were, to tame and subdue the hearer, and put him in the power of the speaker.

IMAGINARY Root, in algebra. See the article **ROOT**.
IMAGINATION, a power or faculty of the soul, whereby it conceives, and forms ideas of things, by means of impressions made on the fibres of the brain, by sensation.

The organs of our senses, are composed of fibrillæ, or little fibres, which, at one end, terminate in the outward parts of the body and skin, and at the other in the middle of the brain.

These fibres may be moved two ways; either beginning at that end which terminates in the brain, or at that which terminates without.—Now the agitation of these fibres cannot be communicated to the brain, but the soul will be affected, and

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and perceive something.—If then the agitation begins where objects make their first impression, viz. on the external surface of the fibres of our nerves, and is communicated thence to the brain; the soul in that case, judges that what she perceives is without; that is, she perceives an external object as present: But if only the interior fibres be moved by the course of the animal spirits, or in some other manner; the soul then imagines, and judges, that what she perceives is not without, but within the brain; that is, she perceives an object as absent: And herein lies the difference between sensation and imagination.

To give a more distinct idea of the faculty of *imagination*, according to the doctrine of Malebranche, it must be observed, that as often as there happens to be any alteration in that part of the brain where the nerves terminate, there also happens an alteration in the brain; that whenever there is any motion in that part, to change the order of its fibres, there also happens a new perception in the soul, and she finds something new, either by way of sensation or *imagination*; neither of which can be without an alteration of the fibres in that part of the brain.—So that the faculty of *imagining*, or *imagination*, only consists in the power which the soul has of forming images of objects, by producing a change in the fibres of that part of the brain, which may be called the principal part, because it corresponds to all the parts of our body, and is the place where the soul (if it may be so said) immediately resides.—It matters not which that part is, nor whether the opinion of Willis be true, who places the common sense in the two bodies, called *corpora striata*, and the *imagination* in the *corpus callosum*, or that of Fernelius, who places sensation in the pia mater, that encompasses the substance of the brain; or that of Descartes, who places it in the pineal gland: it suffices that there is some such part.

Since then the *imagination* only consists in a power which the soul has of forming images of objects, by impressing them on the fibres of the brain, it follows that the larger and more distinct the vestigia, or tracks of the animal spirits, which are the lines or strokes, as it were, of those images, are; the more strongly and distinctly the soul imagines those objects.—Now as the breadth, depth, and clearness of the strokes of a sculpture depend on the force wherewith the graver acts, and the obedience which the copper yields; so the depth and clearness of the tracks of the *imagination* depend on the force of the animal spirits, and the constitution of the fibres of the brain; and it is that variety which is found in those two things, to which we owe almost all that vast difference which we observe in peoples minds.—On the one side are abundance and scarcity, briskness and slowness, largeness and smallness of the animal spirits; and on the other hand delicacy or grossness, humidity or dryness, stiffness or flexibility of the fibres of the brain; and, lastly, a particular relation which the animal spirits may have with those fibres. From the various combinations of which things, will result a sufficiently great variety, to account for all the different characters which appear in the minds of men: and from the same principle flows that difference which is observed in the same person's mind, at different times, and under different circumstances, as in childhood, manhood, and old age, in sickness, health, &c.

It may here be observed, that the fibres of the brain are more agitated by the impression of objects, than by the course of the animal spirits; and for this reason the soul is more affected with objects, which it perceives by sensation, and which it looks on as present, and capable of giving it pleasure or pain, than by those perceived by *imagination*, which it judges to be distant.—And yet it sometimes happens, that in persons, whose animal spirits are extremely agitated by sitting, waking, drinking, a fever, or some violent passion, these spirits move the inward fibres of the brain as forcibly as outward objects do; so that those persons perceive things by sensation, which they should only perceive by *imagination*; for *imagination* and *sensation* only differ from each other, as the greater from the less. See Malebranche, *Recher. de la Verité* Lib. II. See also the articles MADNESS, DELIRIUM, PHRENSY, MELANCHOLY, &c.

I M A M, or **IMAN**, a minister in the Mahometan church, answering to a parish priest among us.

The word properly signifies what we call a prelate, *antistes*, one who precedes others; but the Mussulmen frequently apply it to a person who has the care and intendency of a mosque, who is always there the first, and reads prayers to the people, which they repeat after him.

I M A M is also applied by way of excellence to the four chiefs, or founders of the four principal sects in the Mahometan religion.

Thus Ali is the *imam* of the Persian, or of the sect of the Schiaites: Abu-beker the *imam* of the Sunnites, which is the sect followed by the Turks. Saphii, or Saf-y, the *imam* of another sect, &c.

The Mahometans do not agree among themselves about this *imate*, or dignity of the *imam*. Some think it of divine

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right, and attached to a single family, as the pontificate of Aaron.—Others hold, that it is, indeed, of divine right, but deny it to be so attached to any single family, as that it may not be transferred to another. They add, that the *imam* is to be clear of all gross sins, and that otherwise he may be deposed, and his dignity may be conferred on another. However this be, it is certain, that after an *imam* has once been owned as such, by the Mussulmen, he who denies that his authority comes immediately from God, is accounted impious; he who does not obey him is a rebel; and he who pretends to contradict what he says, is esteemed a fool, among the orthodox of that religion.

I M B A R G O, or **EMBARGO**, a stop, or stay put upon ships, or merchandize, usually by public authority. See **EMBARGO**.

I M B E C I L L I T Y, a state of languor, or decay; wherein the body is not able to perform its usual exercises or functions.

I M B E Z Z L E, or **IMBEZZLE**, to waste, pilfer, or purloin.

As where a person intrusted with goods, wastes, consumes, and diminishes them, he is said to *embezzle* them.

I M B I B E, is commonly used in the same sense as *absorb*; viz. where a dry porous body takes up another that is moist.

I M B R I C A T E D, is used by some botanists to express the figure of the leaves of some plants, which are hollowed like an *imbrex*, or gutter-tile, or are laid in close series over one another like the Tiles on a house.

I M I T A T I O N, in music, a kind of composition wherein one part is made to imitate another either throughout the whole piece, which is one of the kinds of canon, or only during some measures, which is a *simple imitation*.

Sometimes the movement, or the figure of the notes, alone, is *imitated*; and that, sometimes even by a contrary motion, which makes what they call a *retrograde imitation*.

Imitation differs from *figure*, in regard, in the former the repetition must be a second, a third, a sixth, seventh, or ninth, either above or below the first voice: whereas if the repetition were in unison, a fourth, fifth, or eighth, higher or lower, it would be a *figure*.

I M M A C U L A T E, *without stain*.—A term much used among the Romanists, when speaking of the conception of the blessed virgin, they call it *immaculate*: intimating, that she was born without original sin.

When the cap is given to a doctor of the Sorbonne, he is obliged to swear that he will defend the *immaculate* conception. This was decreed by an act of the Sorbonne in the fourteenth century; in imitation of which, eighty other universities made the same order.

The military orders in Spain are all solemnly obliged to defend this prerogative of the virgin. See **CONCEPTION**.

There is also a Congregation of the **I M M A C U L A T E C O N C E P T I O N**; in most nunneries whereof is a society of secular maids, whose end is to honour the *immaculate* conception: of which they make a public protestation every year, and a private one every day.

I M M A N E N T, in logic.—The schoolmen distinguish two kinds of actions; the one *transient*, which pass from the agent to the patient; the other *immanent*, which continue in the agent.

I M M A T E R I A L, something devoid of matter, or that is pure spirit.

Thus God, angels, and the human soul, are *immaterial* beings.—Plato proves the *immateriality* of the soul from these six topics. 1°. Its simplicity. 2°. Its independency on the body, which is two-fold; in its *esse* and in its *operari*, in existing, and in acting or operating separately. 3°. Its rule and authority over the body. 4°. Its likeness and similitude to God, which discovers itself in the pleasure it enjoys in spiritual things, in its aiming at spiritual objects, &c. 5°. Its spiritual manner of perceiving material objects. And lastly, its indivisibility, capacity, activity, and immortality. See **S O U L**.

I M M E D I A T E, that which precedes, or follows some other thing, without any interposition.

I M M E D I A T E, also signifies something that acts without means, or without medium. In which sense we say, *immediate* grace, an *immediate* cause, &c.

There have been great disputes among divines about *immediate* grace.—The question in debate is, Whether grace act on the heart and mind by an immediate efficacy, independent of all external circumstances; or, Whether a certain emblemage and improvement of circumstances, joined to the ministry of the word, may produce the conversion of souls? See **G R A C E**.

I M M E D I A T E M O D E. } See the article } **M O D E**
I M M E D I A T E F I R E. } } **F I R E**.

I M M E M O R I A L, an epithet given to the time or duration of any thing whose beginning we know nothing of.

In a legal sense, a thing is said to be of time *immemorial*, or time out of mind, that was before the reign of our king Edward II.

I M M E N S E, that whose amplitude, or extension no finite measure whatsoever, or how oft soever repeated, can equal.

I M M E R-

IMMERSION, an act by which any thing is plunged into water, or some other fluid. See **FLUID**.

In the first ages of Christianity, baptism was performed by *immersion*; by three *immersions*.—The custom of *immersion* is said to be still preserved in Portugal, and among the Anabaptists in other parts.

IMMERSION, in pharmacy, is the preparation of some medicine, by letting it steep for some time in water, in order to take some ill quality or taste from it.

This is done in rhubarb, to moderate its force; in lime, to take away its salt; and in olives, which are preserved in brine.

IMMERSION, in astronomy, is when a star or planet comes so near the sun, that we cannot discern it; being as it were enveloped, and hid in the rays of that luminary.

IMMERSION also denotes the beginning of an eclipse of the moon; that is, the moment when the moon begins to be darkened, and to enter into the shadow of the earth.

The same term is also used with regard to an eclipse of the sun, when the disk of the moon begins to cover it.

In this sense, *immersion* stands opposed to *emergence*, which signifies the moment wherein the moon begins to come out of the shadow of the earth; or the sun begins to show the parts of his disk which were hid before.

IMMERSION is frequently applied to the satellites of Jupiter, and especially to the first satellite; the observation whereof is of so much use for discovering the longitude.

The *immersion* of that satellite, is the moment in which it appears to enter within the disk of Jupiter; and its *emergence* the moment wherein it appears to come out.

The *immersions* are observed from the time of the conjunction of Jupiter with the sun, to the time of his opposition: and the *emergences* from the time of his opposition to his conjunction.—The peculiar advantage of these observations, is, that during eleven months of the year, they may be made, at least, every other day.—The perfection of this theory, and the praxis thereon, we owe to M. Cassini.

Scruples of IMMERSION. See the article **SCRUPLE**.

IMMORTAL, that which will last to all eternity; as having in itself no principle of alteration, or corruption.

Thus, God, and the human soul, are *immortal*. Plato defines *immortality*, *αἰώνιος ἀσώρευτος καὶ ἀδίκτος ψυχή*, animated essence and eternal mansion; and proves the *immortality* of the soul from two kinds of arguments; the one *artificial*, the other *inartificial*.

The *inartificial* arguments for the soul's *immortality* are testimonies and authorities, whereof he cites several, and adds in general, that all the great men and poets, who had any thing divine in them, have at all times asserted the *immortality* of the soul.

Artificial or proper arguments for the *immortality* are either *speculative* or *practical*: of the first kind are those drawn from 1°. The simple, uniform, spiritual and divine nature of the soul. 2°. From its infinite capacity. 3°. Its desiring and longing after *immortality*, and its inward horror of falling into nothing; proving it absurd that the soul should die, when life is its proper and adequate object. 4°. Its rational activity; proving that whatever has in itself a principle of rational and spontaneous motion, by which it tends towards some supreme good, is *immortal*. 5°. The various ideas which it has of spiritual things; particularly the idea it has of *immortality*. And 6°. Its immateriality.

His *practical* or moral arguments for the *immortality* of the soul, are drawn from, 1°. The justice of God, which can never suffer the wicked to escape unpunished, nor the good unrewarded after death. 2°. The dependance which religion has on this opinion, in regard, without this persuasion, there would be no religion in the world. 3°. The opinion which men have, that justice and every kind of virtue are to be cultivated, that they may at last live with God. 4°. The stings of conscience, and anxious solitude we are under about a future state.

IMMUNITY, a privilege or exemption from some office, duty, or imposition.

Immunity is more particularly understood of the liberties granted to cities, and communities.

The princes heretofore granted all kinds of *immunities* to ecclesiastics, exempting them from all impositions; but the ecclesiastics of those days were not so rich as those of ours: they gave all they had to the poor.

There is still a privilege of *immunity* in some places, and especially in Italy, belonging to ecclesiastical things, and persons, who are exempted from certain dues, and are sheltered from the pursuits of justice. Though there are some crimes for which they cannot plead the privileges of their *immunity*, as premeditated murder, &c.

IMMUTABILITY, the condition of a thing that cannot change.

Immutability is one of the divine attributes.

There is a two-fold *immutability* in God; a *physical* and a

moral one.—The *physical immutability* consists in this, that the substance of God does not, nor cannot receive any alteration.—His *moral immutability* consists in his not being liable to any change in his thoughts, will, or designs; but that what he wills, he has willed from all eternity. See **GOD**.

IMPALED, in heraldry, is understood of a shield party per pale, or divided into two halves by a line drawn palewise through the middle, from the top to the bottom.

When the coats of arms of a man and his wife, who is not an heiress, are born in the same escutcheon, they must be *impaled*, or marshalled in pale, i. e. the husband's on the right side, and the wife's on the left; and this the heralds call *baron and feme*, two coats *impaled*.

If a man have had two wives, he may *impale* his coat in the middle between theirs; and if he have had more than two, they are to be marshalled on each side of his in their proper order.

IMPALEMENT, in a penal sense. } See **EMPALEMENT**.

IMPALEMENT, in phytology.

IMPALPABLE, that, whose parts are so extremely minute, that they cannot be distinguished by the senses, particularly by that of feeling.

IMPANATION, a term used among divines to signify the opinion of the Lutherans with regard to the eucharist; who believe that the species of bread and wine remain, together with the body of our Saviour, after consecration.

IMPANATORÉS. See the article **ADESSENARI**.

IMPANELLING, in law. See **EMPAPELLING**.

IMPARES Scamilli. See the article **SCAMILLI**.

IMPARANLANCE, or **EMPARANCE**. See **EMPARANCE**.

IMPASSIBLE, that which is exempt from suffering; or which cannot undergo pain, or alteration.

The Stoics place the soul of their wife man in an *impassible*, imperturbable state. See **APATHY**.

IMPASTATION, the mixture of divers materials of different colours, and consistencies, haked or bound together with some cement, and hardened either by the air, or fire.

IMPASTATION is sometimes used for a sort of masons-work, made of stucco, or stone ground small, and wrought up again in manner of a paste.

Authors are of opinion that the obelisks, and the huge antique columns still remaining, were made, some by *impastations*, and others by fusion; but this is wholly erroneous: they are all cut out of quarries, yet open in Ægypt, Arabia, &c.

IMPASTING, in painting. See **EMPASTING**.

IMPEACHMENT of Waste, a restraint from committing of waste upon lands, and tenements; or a demand of recompence for waste made by a tenant who has but a limited estate in the land granted.

He that hath a lease without *impeachment of waste*, hath by that a property or interest given him in the houses and trees, and may make waste in them without being called to an account for it.

IMPECCABILITY, the state of a person who cannot sin: or a grace, privilege, or principle which puts him out of a possibility of sinning.

The schoolmen distinguish several kinds and degrees of *impeccability*: That of God, belongs to him by nature: That of Jesus Christ, considered as man, belongs to him by the hypothetical union: That of the blessed, is a consequence of their condition: That of men, is the effect of a confirmation in grace, and is rather called *impeccance* than *impeccability*; accordingly divines distinguish between these two: this distinction is found necessary in the disputes against the Pelagians, in order to explain certain terms in the Greek and Latin fathers, which without this distinction are easily confounded.

IMPEDIT, in law. See the article **QUARE Impedit**.

IMPENETRABILITY, a quality whereby a thing becomes unable to be pierced or penetrated; or a property of body whereby it so fills up a certain space, as that there is no room in them for any other body.

Dr. Harris defines *impenetrability*, the distinction of one extended substance from another, by means whereof the extension of one thing is different from that of another: so that two extended things cannot be in the same place, but must necessarily exclude each other.

IMPENITENCE, or **IMPENITENCY**, a hardness of heart, which makes a person persevere in vice, and prevents his repentance.

Final impenitence, is the sin against the holy Ghost, which is neither pardoned in this life, nor in that to come.

IMPERATIVE, in grammar, is one of the moods or manners of conjugating a verb, serving to express a commandment; as, *egre, come*, &c. See **MOOD**.

In Hebrew and other oriental languages, the future tense has frequently an *imperative* signification.

IMPERFECT Plants, among botanists, are such as either really want flower, and seed, or are supposed to want them; no flower or seed having yet been discovered in the greater part of those plants included in this class by the botanical writers.

Mr. Ray distinguishes the plants called imperfect in his time according to the places of their growth, into,

I. *Aquatics*, or such as grow in the water: and that either, 1°. In the sea, and then they are called *marine plants*; which are either of a hard and stony consistence, as the corals, and corallines; or of a more soft and herbaceous one. Of these last some are like herbs, and are of two kinds; the greater, which are caulesiferous, as the fucus; the lesser, as the alga: the others have more of the mucous, or fungus appearance, as the spongia. 2°. *Fresh water plants*, and those have either no leaves, but are capillaceous, as the conservæ; or their leaves are either single or divided into three parts, as the lens palustris, and lenticula palustris trifida.

II. *Imperfect Plants*, which grow in dry ground; these are divided into; (1°.) Such as have their substance, either woody or fleshy; and have scarce any thing common with the *perfect plants*, neither the green herbaceous colour nor the texture of herbs, nor flower, seed, nor leaf, properly speaking; as all the fungi, which are either, 1°. Such as grow on trees, and therefore are called *arborescens*, as the fungus loricis, called *agaric*, and the fungus sambuci, which we call *Jews-ear*. 2°. Terrestrial, and those either caulesiferous with heads either lamellated or porous underneath, or without stalks, as the pezize of Pliny, and fungus pulverulentus, crepitus lupi, or common puff-balls. 3°. Subterraneous, as the tubera terre, or truffles. (2°.) Such as have a more soft and dry consistence, and this more like that of herbs; of which some are both caulesiferous and branched, as the musci, or mosses; others are without stalks, adhering like a crust to the surface of the earth, stones, trees, or wood; as the lichen terrestris and arborescens. This was the opinion of Mr. Ray, as to the class of imperfect plants; but their number has been, since his time, greatly diminished; almost all of these named here, having been found lately to have real seeds. See Supplement: articles FUNGUS, CORALLIUM, and MUSCUS.

IMPERFECT *Tenses*, in grammar, signifies an indefinite time between the present and the past; as, *I taught, I heard*.

IMPERFECT *Flowers*, are those which want the petals; hence also called *apetalous*, and *stamineous flowers*.

IMPERFECT *Numbers*, in arithmetic, are those whose aliquot parts taken together, do not make the just number itself, but either come short of it, in which case they are called *deficient numbers*; or exceed it, and then they are called *abundant numbers*.

IMPERFECT *Mixts*. See the article MIXT.

IMPERIAL, something belonging to an emperor, or empire.

Thus we say, his imperial majesty, the imperial crown, imperial arms, &c.

IMPERIAL *Crown*. See the article CROWN.

IMPERIAL *Chamber*, is a sovereign court established for the affairs of the immediate fiefs of the empire. See CHAMBER.

IMPERIAL *Cities*, in Germany, are those which own no other head but the emperor.

These are a kind of little commonwealths; the chief magistrate whereof does homage to the emperor, and pays him the Roman money; but in other respects, and in the administration of justice, the magistrate is sovereign.

The *Imperial cities* have a right of coining money, and of keeping forces and fortified places: their deputies assist at the imperial diets, where they are divided into two branches, that of the Rhine, and that of Suabia.—There were formerly twenty two in the former, and thirty seven in the latter; but there are now only forty eight in all.

IMPERIAL *Diet*, is an assembly or convention of all the states of the empire.

It is usually held at Ratibon; where the emperor, either in person, or by his commissioner, and the electors, secular and ecclesiastical, princes, prelates, princesses, counts, and deputies of imperial cities, assist.

The diet is divided into three colleges, which are those of the electors, the princes and the cities.—The electors alone form the first; the second consists of princes, prelates, princesses, and counts, and the third of the deputies of imperial cities.

Each college has its *director*, who presides, in the consultations: the elector of Mentz, in the college of electors; the archbishop of Saltzburg, in that of the princes; and the deputy of the city of Cologne, in that of the cities.

In the diet, each principality has a voice; but all the prelates (so they call the abbots and provosts of the empire) have but two voices, and all the counts but four.

Though the three colleges agree, yet the emperor has a negative voice: when he also consents, the resolutions pass into a law, which obliges all the states of the empire, both mediate, and immediate.

IMPERIAL *Medals*. See the article MEDAL.

IMPERIAL *Recessus*. See the article RECESSUS Imperii.

IMPERSONAL *Verb*, in grammar, is such an one, as is only used in the third person singular; as, *operte, licet, &c*.

IMPERVIOUS, a thing not to be perceived, or passed through; either by reason of the closeness of its pores, or the

particular configuration of its parts. See PORE, PENETRATION, &c.

IMPETIGŌ, in medicine, an extreme roughness, and foulness of the skin, attended with an itching and plentiful scurf.

In which sense it amounts to the same with *lichen, volatica*, and *mentagra*.

The *impetigo* is a species of dry, pruriginous itch, wherein scales, or scurf succeed apace; arising from saline corrosive humours thrown out upon the exterior habit of the body, by which means the internal parts are usually relieved.

It is divided into *mitis*, mild, not accompanied with any malignity; and *seva*, severe, which comes near to a leprosy.

IMPETRATION, the act of obtaining any thing by request or prayer.

IMPETRATION was more particularly used in our statutes for the pre-obtaining of benefices, and church-offices in England from the court of Rome, which did belong to the disposal of the king and other lay-patrons of the realm; the penalty whereof is the same with that of provisors, 25 E. III. See PROVISOIR.

IMPETUS, in mechanics. See MOMENTUM, and MOTION.

Paracentric IMPETUS. See the article PARACENTRIC.

IMPING, in falconry, the inserting of a feather in the wing of a hawk, in the place of one that is broke.

IMPLANTATION, one of the six kinds of transplantation, used by some for the sympathetic cure of certain diseases.

Implantation is performed by placing plants, or at least the roots of plants, in a ground prepared for that purpose, and watered with what the patient has used to wash himself withal. By which means, it is pretended, the disease is translated into the plant.—If the plant happen to die before the cure be perfected, by reason of the ill qualities it imbibes, other plants, they say, must be placed instead of it, and the process be continued as in the first: but this is all idle and absurd.

IMPLEAD, to sue, or prosecute by course of law. See PLEADING.

IMPLEMENTS*, is used for all things necessary for a trade, or the furniture of an household.

* The word is formed either from the Latin *implere*, to fill up; or from the French, *employer*, to employ.

In this sense we frequently find it used in wills, and conveyances of moveables.

IMPLEX *Action*. See the article ACTION.

IMPLICITE*, something tacitly comprized, or understood; that is, contained in a discourse, clause, or proposition, not in express terms, but only by induction and consequence.

* The word is derived from the Latin *in*, and *plere*, I fold.

IMPLICITE *Faith*. See the article FAITH.

IMPLICITE *Condition*. See the article CONDITION.

IMPLY *a contradiction*, a phrase used among philosphers, in speaking of the object of divine omnipotence.

God can do every thing that does not imply a contradiction proceeding from God: by which is not meant a relation of the action to the executive power of God; for to say that God by this power could do whatever does not imply a contradiction proceeding from this power, would only be to say, that God can do what he can do.—In that proposition therefore is meant a relation to the other attributes and simple perfections of God: Thus, God can do whatever does not imply a contradiction to some other of his attributes. For instance, he cannot attest a false religion by his word or by miracle, because this is repugnant to his goodness and truth.

But because all things that imply a contradiction, cannot be said to have such a respect to the attributes of God; therefore we may say more generally, that those things imply a contradiction, which involve a contrariety between the terms or object.—For there are two things requisite to the being of any thing; the one on the side of the agent, viz. a power of acting; the other on that of the patient or object, viz. a non-resistance.—For want of the first condition, there are a thousand things which we cannot do; and for want of the second condition, there are many things that God cannot do: for that which, when it is affirmed, is yet denied, is impossible.

IMPORTATION, the act of importing, or bringing in merchandizes from foreign countries.

IMPOSITION of *Hands*, an ecclesiastical action, by which the evangelical mission, and the power of absolving, is conveyed.

Imposition of Hands was a Jewish ceremony, introduced, not by any divine authority, but by custom; it being the practice among those people, whenever they prayed to God for any person, to lay their hands on his head.

Our Saviour offered the same custom, both when he conferred his blessing on children, and when he cured the sick; adding prayer to the ceremony.—The apostles likewise laid hands on those whom they bestowed the holy Ghost on.

—The priests observed the same custom when any one was received into their body.—And the apostles themselves underwent the *imposition of hands* a-fresh, every time they entered upon any new design.—In the ancient church, *imposition of hands* was even practised on persons when they married; which custom the Abyssinians still observe.

But this term, which, in its original signification, is general, is now restrained by custom, to that *imposition*, which is practised at ordination.—Spanheim has written a treatise *de Impositione Manuum*; and Tribenhorius and Braunius have done the same. See **ORDINATION**.

IMPOSITION, is also a kind of transplantation practised for the cure of certain diseases.

It is performed by taking some of the implanted spirit or excrement of the part affected, or of both together, and placing them in a tree, or a plant, between the bark and the wood, after which it is covered up with mud. Instead of this, some bore a hole in the tree with an auger; and shutting up the hole again with a tampion of the same wood, cover it over with mud.

If it be desired the effect should be lasting, a tree is chosen that will continue long, as an oak. If it be desired the effect should be speedy, they choose a tree that grows fast; in which last case, the matter serving as the medium of transplantation must be taken out of the tree as soon as the effect has followed, because the too great alteration of the spirit, might be some prejudice to the patient. But all this is idle and absurd, and the whole business of such cures deservedly laughed out of the world.

IMPOSITION of Turnage, &c. See **DUTY, &c.**

IMPOSSIBLE, that which cannot be done.

A proposition is said to be *impossible*, when it contains two ideas which mutually destroy each other, and which can neither be conceived, nor united together in the mind.

Thus it is *impossible* that a circle should be a square; because we conceive clearly that squareness and roundness destroy each other by the contrariety of their figure.

There are two kinds of *impossibilities*, *physical* and *moral*.

Physical IMPOSSIBILITY, is that which cannot be done by the powers of nature.

A thing is *Morally IMPOSSIBLE*, when of its own nature it is possible, but yet is attended with such difficulties, as that, all things considered, it appears *impossible*.

Thus it is *morally impossible* that all men should be virtuous, or that a man should throw the same number with three dice an hundred times successively.

Any thing contrary to decency and good sense is also said to be *impossible*, among those who reason from moral topics; thus the lawyers say *Omne turpe impossibile*: Those conditions are *impossible*, which sense and decorum do not allow to be performed, though in themselves very possible to those who have no regard to good sense, &c.

IMPOST, in law, properly denotes the tribute or tax appointed by a sovereign to be paid for such merchandize as is brought into any haven in his dominions from foreign nations.

Impost is distinguished from *custom*, in that, custom more properly signifies the duties paid to the king for goods shipped off or exported.—But the two are frequently confounded together. See **CUSTOM**.

IMPOSTHUME, a collection of matter, or pus in any part of the body; either owing to an obstruction of the fluids in that part, which makes them change into such matter; or to a translocation of it from some other part where it was generated. See **ABSCESS**.

IMPOSTS, in architecture, the capitals of pillars or pilasters which support arches. See also *Tab. Archit. fig. 36. lit. d. fig. 40.*

An *impost*, sometimes also called *chaprel*, is a sort of plinth or little cornice which crowns a pier, and supports the first stone whence an arch or vault commences.

Imposts conform to their proper orders.—The Tuscan, is a plinth only; the Doric has two faces crowned; the Ionic has a larmier over the two faces, and its mouldings may be carved; the Corinthian and Composite have a larmier, freeze, and other mouldings.

The projecture of the *impost* must not exceed the naked of the pilaster.—Sometimes the entablature of the order serves for the *impost* of the arch; and this looks very grand and stately.

The *impost* is a thing essential to an ordonnance; inasmuch as without it, in the place where the curve line of the arch meets with the perpendicular line of the pillar, there always seems a kind of elbow.

IMPOTENCE*, or **IMPOTENCY**, a want of strength, power, or means to perform any thing.

* The word is derived from the preposition *in*, taken privatively; and *potentia*, power.

Divines and philosophers distinguish two kinds of *impotency*; *natural* and *moral*.—The first is a want of some physical principle necessary to an action; or it is where a being is absolutely defective, or not free, and at liberty to act: the se-

cond only imports a great difficulty; as a strong habit to the contrary; a violent passion, inclination, or the like.—*Impotency*, is more particularly used for a natural inability to coition.

In this sense, *impotency* is defined an inability or insufficiency in the male to impregnate the female.

The Decretals idly distinguish three causes or rather species of *impotency*; viz. *frigidity*, *witchcraft*, and *impotentia coeundi*.

IMPRECATION*, a curse, or wish, that some evil may befall any one.

* The word is derived from the Latin *in*, and *precor*, I pray.

The ancients had their goddesses called *Imprecations*, in Latin *Diræ*, i. e. *Deorum iræ*, who were supposed to be the executors of evil consciences.—They were called *Diræ* in heaven, *Furies* on earth, and *Eumenides* in hell.

The Romans owned but three of these *Imprecations*, and the Greeks only two.—They invoked them, with prayers and pieces of verses, to destroy their enemies.

IMPREGNATION*, the emission of the seed of the male in coition, by which the female conceives, or becomes with young.

* The word is derived from the Latin *impregnare*, of *pregnans*, a woman with child.

IMPREGNATION is also figuratively used in pharmacy, when a liquor imbibes the particles of some other body.

Thus a menstruum is said to be *impregnated* with a body dissolved in it, as much as its pores are able to receive.

IMPRESSED Species. See the article **SPECIES**.

IMPRESSION, in philology, is applied to the species of objects, which are supposed to make some mark or *impressions* on the senses, the mind, and the memory.

The Peripatetics tell us, that bodies emit species resembling them, which species are conveyed by the exterior senses to the common sensory: These *impressed* species, being material and sensible, they say, are rendered intelligible by the active intellect; and when thus spiritualized, are called *expressions* or *express species*, as being expressed from the others.

IMPRESSION, is also frequently used in speaking of the editions of a book, or of the number of times it has been printed.

M. Arnaud assures us, there were above two hundred *impressions* of the Louvain Bible in one age; and it is affirmed, that Thomas a Kempis of the *Imitation of Christ*, has undergone more *impressions* than there have been months since it was first composed.

Impression, however, differs from *edition*: the former, properly speaking, takes in no more than what belongs to the printing, the letter, paper, margin, page, distances of words and lines, and the disposition of every thing that may have a good or bad effect on the eye: the latter, besides all this, takes in the care of the editor, who has revised the copy, corrected or augmented it, adding notes, tables, and other like things, which he judged might contribute towards making the book more useful, and correct.

Indeed, very frequently the word *edition* only refers to this latter part; as when, in speaking of the works of S. Augustin, we quote the edition of Erasmus, the Lovainists, Benedictines, &c. where we have no regard to the printing part, but only to the care and pains of the editors.

Privilege for IMPRESSION. See the article **PRIVILEGE**.

IMPRES'T, *Auditors of*. See the article **AUDITORS**.

IMPRISONMENT, the state of a person restrained of his liberty, and detained under the custody of another.

False IMPRISONMENT. See the articles **FALSE**, and **APPEAL**.

IMPROPER Fractions, are such as have their numerators equal to, or greater than, their denominators.

Such, e. g. are, $\frac{9}{3}$, $\frac{23}{12}$, &c.

These, properly speaking, are not *fractions*, but either whole, or mixed numbers; and are only put into the form of *fractions*, in order to be added, subtracted, multiplied, or divided, &c.

IMPROPER Motion. See the article **MOTION**.

IMPROPRIATION, is a term used where the profits of an ecclesiastical benefice are in the hands of a layman.

In which sense it stands distinguished from *appropriation*, which is, where the profits of a benefice are in the hands of a bishop, college, &c. though the two are now often used promiscuously.—There are said to be 3845 *impropriations* in England.

IMPROPRIETY, the quality of something that is not fit, or proper. See **PROPER**, and **PROPRIETY**.

Grammarians observe three kinds of faults in language; a *solecism*, *barbarism*, and *impropriety*: An *impropriety* is committed when a word is used that has not a proper signification. See **SOLECISM**, and **BARBARISM**.

IMPROVIDE, in law. See **QUA IMPROVIDE**.

IMPULSIVE, a term in philosophy, applied to the action of a body which impels, or pushes another.

Thus the arm is said to give an *impulsive* motion to the stone that it throws. See **PROJECTILE**.

In this sense, *impulsive* stands contradistinguished from *attractive* and *repulsive*.

Sir Isaac Newton suggests that attraction itself may possibly be effected by an *impulsive* power.

IMPUTATION, a term much used among divines, sometimes in a good, and sometimes in an ill sense: in the latter it is used to signify the charging the sin to the account of one, which was committed by another.

Thus Adam's sin is *imputed* to all his posterity; all his descendants, by his fall, becoming as criminal in the sight of God, as if they had fallen themselves; and bearing the just punishment of his first crime. See **ORIGINAL SIN**.

Imputation, used in a good sense, signifies the charging of another's justice, or merit.

Thus the justice of Jesus Christ is imputed to us; his merits and the price of his sufferings being applied to us.

The *imputation* of the merits of Christ signifies no more, among the Reformed, than an extrinsic justice, which does not make us truly just, but only makes us appear so; which hides our sins, but does not efface them.

For this reason, those of the Romish communion decline the use of the word *imputation*, and assert, that the justifying grace, which applies to us the merits of Jesus Christ, not only covers our sins, but also effaces them; that this grace is intrinsic and inherent, renewing intirely the inward man, and rendering him pure, just, and without spot before God; and that this justice is given him on account of the justice of Jesus Christ, that is, by the merits of his death and passion.

—In a word, say they, though it is the obedience of Jesus Christ that has merited justifying grace for us, yet it is not the obedience of Jesus Christ that renders us formally just: And in like manner, it is not the disobedience of Adam that makes us formally sinners, but it is this disobedience that has merited for us, both that we should be sinners, and that we should undergo the punishment of sin.

Protestants say, that the sin of the first man is *imputed* to his descendants; they being looked on as culpable, and punished as such, because of the sin of Adam.—Catholics hold, that this is not enough; we are not only esteemed and punished as criminals, say they, but we are actually criminal ourselves by original sin.

Again, Protestants say, that the justice of Jesus Christ is *imputed* to us, and that our justification is only the *imputation* of Christ's justice; his sufferings standing instead of ours, and God accepting his death as a satisfaction in lieu of our own.—But Catholics teach, that the justice of Christ is not only *imputed*, but actually communicated to the faithful, by the operation of the Holy Ghost: so that they are not only reputed just, but also are made so.

INACCESSIBLE *Height*, or *distance*, is that which cannot be actually measured, by reason of some impediment in the way; as water, or the like. See **DISTANCE**, &c.

INACTION, *Cessation of Action*, a term much used in the mystical divinity; by which is understood a privation, or annihilation of all the faculties; whereby the door is, as it were, shut to all external objects, and a kind of extasy is procured, during which God speaks immediately to the heart. It is the state of *inaction* that is held the most proper for receiving the holy Spirit; and in this fit of dozing, they say, it is that God communicates sublime, and ineffable sentiments and graces to the soul.

Some do not make it consist in this stupid kind of indolence or general suspension of all sensation; but by *inaction* only mean a cessation of desires, in which as the soul does not determine itself to any positive acts, neither does it abandon itself to useless meditations, or the vain speculations of reason; but demands in general every thing that may be agreeable to God, without prescribing any thing to him.

This latter is the doctrine of the autient mystics, and the former that of the modern ones, or the quietists.

In general, however, it may be said, that *inaction* is not the most likely way of pleasing God; it is our actions chiefly by which we are to gain his favour; he will have us to act; so that *inaction* cannot be agreeable to him.

INACTIVITY of *Matter*. See **VIS INERTIA**.

INADEQUATE *Idea*, or *Nation*, is a partial or incomplete representation of any thing to the mind. See **IDEA**.

INALIENABLE, that which cannot be validly alienated, or made over to another. See **ALIENATION**.

Thus the dominions of the king, the church, minors, &c. are *inalienable*, otherwise than with a reserve of the right of redemption for ever.

INAMELLING, or **ENAMELLING**, See the article **ENAMELLING**.

INANIMATE*, denotes a body that has either lost its soul, or that is not of a nature capable of having any.

* The word is derived from the Latin preposition *in*, taken privatively, and *anima*, soul.

Thus, a dead man is an *inanimate* lump, and metals are *inanimate* bodies.

INANITION, a term in physic, signifying emptiness; or the state of the stomach, when it is empty, and needs food.

There are flatulencies which proceed from repletion, and others from *inanition*, which last are the more dangerous.

INARTICULATE, an epithet applied to such sounds, syllables, or words, as are not pronounced distinctly. See **ARTICULATION**.

INAUGURATION*, the coronation of an emperor, or king; or the consecration of a prelate; so called, in imitation of the ceremonies used by the Romans, when they were received into the college of augurs.

* The word comes from the Latin *inaugurare*, which signifies to dedicate a temple, or to raise any one to the priesthood, having, in order to that, first taken auguries. See **AUGUR**, and **AUGURY**.

INCA; or **YNCA**, an appellation which the natives of Peru give to their kings, and princes of the blood.

The chronicle of Peru relates the origin of the *incas*: This country had been a long time the theatre of all sorts of wars, horrible crimes, and dissensions, till at length there appeared two brothers, the one of whom was called *Manguacapa*, of this person the Indians use to tell wonders; they say he built the city of Cusco, settled laws and policy, and taught them to adore the sun: and he and his descendants took the name of *inca*, which in the language of Peru, signifies *king*, or *great lord*. These *incas* grew so powerful, that they made themselves masters of the whole country, from Paizo to Chili, 1300 leagues long, and held it till the divisions between *inca* Guascar, and Atabalipa; which the Spaniards laying hold of, made themselves masters of Peru, and put an end to the empire of the *incas*.

They number only twelve of these *incas*.—It is said, the most considerable among the nobles of the country still bear the name of *inca*.

INCALESCENCE*, the growing hot of any thing, either by motion and friction, or as quick-lime does, by pouring water on it.

* The word is compounded of *in*, and *calco*, or *calisco*, I grow warm.

INCAMERATION*, in the apostolical chancery, the union of some land, right, or revenue to the domain of the pope. See **CHAMBER**.

* The word is derived from the Latin *in*, and *camera*, chamber.

INCANTATION*, *Enchantment*; words and ceremonies used by magicians to raise devils; or rather to impose on the credulity of the people. See **MAGIC**, **FASCINATION**, **WITCHCRAFT**, &c.

* The word is derived from the Latin *in*, and *canto*, I sing. See **CHARM**, and **CARMEN**.

INCAPACITY, in matters of benefices among the canons, is of two kinds: the one renders the provision of a benefice null in its original; the other is accessory, and annuls the provisions, which at first were valid.

Incapacities of the first kind, are the want of a dispensation for age in a minor, for legitimation in a bastard, for naturalization in a foreigner, &c.

Of the latter kind, are grievous offences and crimes; as being concerned in seeing a sentence of death executed, &c. which they decree, vacate the benefice to all intents, or render the holding it irregular.

INCARNATION, in theology, signifies the act whereby the Son of God assumed the human nature; or the mystery by which Jesus Christ, the eternal Word, was made man, in order to accomplish the work of our salvation.

The Indians own a kind of Trinity in the Godhead, and say, that the second person thereof has been incarnate nine times, and will be *incarnate* a tenth; and they give him a different name in each of these *incarnations*. See Kircher. *Chin. Illustr.*

The *era* used among Christians, whence they number their years, is the time of the *incarnation*, that is, of Christ's conception in the virgin's womb.

This *era* was first established by Dionysius Exiguus, about the beginning of the sixth century, till which time the *era* of Dioclesian had been in use.

Some time after this, it was considered, that the years of a man's life were not numbered from the time of his conception, but from that of his birth: which occasioned them to postpone the beginning of this *era*, for the space of one year, retaining the cycle of Dionysius entire, in every thing else.

At Rome they reckon their years from the *incarnation*, or birth of Christ, that is, from the 25th of December, which custom has obtained from the year 1431.—In France, and several other countries, they also reckon from the *incarnation*; but then they differ from the other in the day of the *incarnation*, fixing it, after the primitive manner, not

to the day of the birth, but conception of our Saviour.—Though the Florentines stick to the day of the birth, and begin their year from Christmas. See Petav. *de Doct. Temp.* Grandamicus *de Die Nat.*

INCARNATION*, in medicine, signifies the healing and filling up ulcers and wounds with new flesh.

* The word is formed from *in*, and *caro*, flesh.

The medicines which effect this, are commonly called *incarnatives*.

INCARNATIVE, in medicine and chirurgery, is applied to medicines, bandages, and futures, which dispose a wound or ulcer to fill up with flesh. Whence they are also called *anaplerotics*, from *ανα*, again; and *πληρωω*, to fill.

INCARNATIVE Medicine, is such a one as makes the flesh heal and unite.

INCARNATIVE Bandage, is a fillet with an eye or noose at one end of it, so as the other end may be put through it.—To make use of this bandage, they apply the middle of it to the side opposite to the wound; so that the aperture may be over the wound itself; and slipping the other end through it, they draw the lips of the wound close to each other, that they may grow together.

INCARNATIVE Suture, is such a one as, by rejoining the lips of a wound, and keeping them together, by means of a thread drawn through them with a needle, occasions them to grow up and heal.

INCARTATION, in chymistry, the refining of gold, by means of silver and aquafortis.

This is the same with what is otherwise called *departing*. See **DEPART**.

INCENSE*, an aromatic, odoriferous resin; otherwise called *frankincense*.

* The word comes from the Latin *incensum*, q. d. *burnt*; as taking the effect for the thing itself.

Incense was formerly burnt in the temples of all religions, to do honour to the divinities that were there adored. Many of the primitive Christians were put to death, because they would not offer *incense* to idols. In the Romish church they still retain the use of *incense* in many of their ceremonies, particularly at solemn funerals, bestowing it on such persons as they would honour, as on prelates, &c. and sometimes also on the people.

INCEPTIVE, a word used by Dr. Wallis to express such moments, or first principles, which though of no magnitude themselves, are yet capable of producing such as are. See **INFINITE**, and **INDIVISIBLE**.

Thus a point has no magnitude itself, but is *inceptive* of a line which it produces by its motion. So a line, though it have no breadth, is yet *inceptive* of breadth; that is, it is capable, by its motion, of producing a surface which has breadth, &c.

INCEST, the crime of several commerce between persons who are related in a degree prohibited marriage by the laws of the country.

Some are of opinion, that marriage ought to be permitted between kinsfolks, to the end that the affection, so necessary in marriage, might be heightened by this double tie; and yet the rules of the church have formerly extended this prohibition even to the seventh degree, but time has now brought it down to the third or fourth degree.

The words *adultery* and *incest* are not indecent, though they signify very infamous things; because they represent them as covered with a veil of horror, which makes us look on them only as crimes: the words, therefore, rather signify the guilt of those actions, than the actions themselves.

Most nations look on *incest* with horror, Persia and Egypt alone excepted. In the history of the antient kings of those countries we meet with instances of the brother's marrying the sister: the reason was, because they thought it too mean to join in alliance with their own subjects; and still more so, to have married into the families of any foreign princes.

As to the Persians, there was a still more abominable sort of *incest* practised by their magi: If we may trust Catullus, *carm.* 91.

*Nam magus ex matre & gnato gignatur oportet,
Si vera est Persarum impia religio.*

Spiritual INCEST, is the like crime committed between two persons who have a spiritual alliance, by means of baptism, or confirmation.

Spiritual INCEST is also understood of a vicar, or other beneficiary, who enjoys both the mother and the daughter; that is, holds two benefices, the one whereof depends on the collation of the other.

Such a *spiritual incest* renders both the one and the other of those benefices void.

INCESTUOUS, the name of a sect or heresy, which arose in Italy about the year 1065.

The heresy of the *Incestuus* had its beginning at Ravenna; the learned of which place being consulted by the Florentines about the degrees of affinity which prohibit marriage, made

answer, that the seventh generation, mentioned in the canons, was to be taken on both sides together; so that four generations were to be reckoned on one side, and three on the other.

They proved this their opinion by a passage in Justinian's *Institutes*, where it is said, that a man may marry his brother's or sister's grand-daughter, though she be but in the fourth degree: Whence they concluded, that if my brother's grand-child be in the fourth degree with respect to me, she is in the fifth with respect to my son, in the sixth with respect to my grandson, and in the seventh with respect to my great grandson.

Peter Damian wrote against this opinion, and pope Alexander II. condemned it in a council held at Rome.

INCH, a known English measure, the twelfth part of a foot.

INCH of Candle, a manner of selling goods among merchants. The method of it is thus.—Notice is usually given upon the Exchange in writing, and elsewhere, when the sale is to begin: against which time the goods are divided into several parcels, called *lots*, and papers printed of the quantity of each, and of the conditions of sale; as, that none should bid less than a certain sum more than another has bid before. During the time of bidding, a small piece, of about an *inch*, of wax-candle, is burning; and the last bidder, when the candle goes out, has the lot or parcel exposed to sale.

INCHASING, in sculpture. See the article **ENCHASING**.

INCHOATIVE, a term signifying the beginning of a thing, or action; the same with what is otherwise called *inceptive*. See **INCEPTIVE**.

INCHOATIVE Verbs, according to the strict rules of the Latin tongue, are used by the best authors indifferently with primitives, having almost all the tenses in common with them; nay, ordinarily they express our sentiments with more energy, and the actions themselves in a more perfect state.

INCIDE, *Cut*.—Those medicines are said to *incide*, which consist of pointed, and sharp particles; as acids, and most salts; by the force or insinuation of which, the particles of other bodies, which before cohered, are divided from one another.

And thus some expectorating medicines are said to *incide*, or cut the phlegm, when they break it, so as to occasion its discharge. See **EXPECTORATION**.

INCIDENCE, in mechanics, expresses the direction in which one body strikes on another; otherwise called *inclination*.

In the incursions of two moving bodies, their *incidence* is said to be *perpendicular* or *oblique*, as their directions or lines of motion make a straight line, or an oblique angle at the point of contact.

Angle of INCIDENCE, commonly denotes the angle comprehended between an *incident ray* or other body, and a perpendicular to the plane in point of incidence.

Thus, supposing AB (*Tab. Optics, fig. 26.*) an incident ray proceeding from the radiant point A, to B the point of incidence, and HB a perpendicular to DE in the point of incidence: the angle ABH, comprehended between AB and HB, is the *angle of incidence*—by others called the *angle of inclination*.

Angle of INCIDENCE, is also used by Dr. Barrow and some others for the complement of the above angle, or of the angle of inclination.

Thus, supposing A B an incident ray, and H B a perpendicular, as before; the angle ABD comprehended between it and the reflecting or refracting plane D E, is the *angle of incidence*; and the angle ABH, the angle of inclination.

Others, with Wolfius, make another distinction; which see under the articles **ANGLE**, **REFLEXION**, and **REFRACTION**. It is demonstrated by optical writers, 1^o. That the *angle of incidence*, ABH, *fig. 26.* is always equal to the angle of reflexion HBC, or the angle ABD to the angle CBE.

2^o. That the sines of the *angles of incidence* and reflexion, are to each other reciprocally as the resistances of the mediums.

3^o. That from air to glass the sine of the *angle of incidence* is to the sine of the reflected angle as 300 to 193, or nearly as 14 to 9: on the contrary, that from glass to air, the sine of the *angle of incidence*, is to the sine of the refracted angle as 193 to 300, or as 9 to 14.

It is true, Sir Isaac Newton having shewn that the rays of light are not all equally refrangible, there can be no precise ratio fixed between the sines of the angles of refraction and incidence; but the proportion which comes nearest, is that above specified. See **LIGHT**, **COLOUR**, **REFRANGIBILITY**, &c.

INCIDENCE of Eclipse. See the article **ECLIPSE**.

Axis of INCIDENCE. See the article **AXIS of Incidence**.

Cathetus of INCIDENCE. See **CATHETUS of Incidence**; see also **REFLEXION**.

Line of INCIDENCE, in catoptrics, denotes a right line, as A B, *Tab. Optics, fig. 26.* whereby light is propagated from a radiant point A, to a point B, in the surface of a speculum.—This is also called an *incident ray*.

Line of INCIDENCE, in dioptrics, is a right line, as AB, *fig. 56.* whereby light is propagated unrefracted, in the same medium,

dium, from the radiant point to the surface of the refracting body H K L L.

Point of INCIDENCE. See the article **POINT of Incidence.**

Scruples of INCIDENCE. See the article **SCRUPLES.**

INCIDENT, in a moral sense, denotes an event; or a particular circumstance of some event.

INCIDENT, in a poem, is an episode or particular action, tacked to the principal action, or depending on it.

A good comedy is to be full of agreeable incidents, which divert the spectators, and form the intrigue. The poet ought always to make choice of such incidents, as are susceptible of ornament suitable to the nature of his poem. The variety of incidents well conducted make the beauty of an heroic poem, which ought always to take in a certain number of incidents to suspend the catastrophe, that would otherwise break out too soon.

INCIDENT Ray. See the articles **RAY, INCIDENCE, and INCLINATION.**

INCINERATION *, in chymistry, the reduction of vegetables into ashes, by burning them gently.

* The word is derived from the Latin preposition *in,* and *cinis,* ashes.

Thus fern is *incinerated* for the making of glass.

INCISION Crucial. See the article **CRUCIAL.**

Grafting by Double INCISION. See **ENGRAFTING.**

INCISIVE, INCISIVUS, in anatomy, is applied to several teeth, a double muscle, and certain orifices situated near to those teeth.

INCISIVI Dentes, called also *incisores,* or *cutters,* and sometimes *vivores,* because they show themselves in laughing, are eight in number; four in each jaw, situate in the fore side, and in the middle of the others.—See *Tab. Anat. (Osteol.) fig. 2. lit. d.*

They are shorter and sharper than the others, and are inserted into their alveoli by a single root, or twang; for which reason they fall easily, especially those of the upper side.

They are called *incisivi,* because their office is to cut or incise the meat. See **TOOTH.**

INCISIVUS is also an appellation given to the first proper muscle of the upper lip; because it has its origin in the bone of the upper jaw, near the place of the *incisive* teeth; hence it passes, and is inserted into the upper lip, which it serves to draw up.

The maxillary bones, have four internal orifices, two whereof are called **INCISIVA,** as being directly under the *dentes incisivi.*

INCLINATION, in medicine and chymistry, the operation of pouring off a clear liquor from some feces, or sediment, by only gently sloping the vessel.

This amounts to the same with what is otherwise called *deantation.*

INCLINATION, in physics, expresses the mutual approach, or tendency of two bodies, lines, or planes, towards one another; so that their directions make either a straight line at the point of contact, or an angle of a greater or lesser magnitude.

INCLINATION of a Right Line to a Plane, is the acute angle, which such right line makes with another right line drawn in the plane through the point where the inclined line intersects it, and through the point where it is also cut by a perpendicular drawn from any point of the inclined lines.

INCLINATION of an Incident Ray, is the angle which it makes with a line drawn to the point of incidence, perpendicular to the reflecting or refracting surface.

This is otherwise called the *angle of inclination:* sometimes also the *angle of incidence.*

INCLINATION of a reflected Ray, is the angle which a ray after reflexion makes with the axis of inclination.

Thus, if *AB, Tab. Opt. fig. 26.* be the incident ray, *HB* a perpendicular to *DE* in the point *B,* and *BC* the reflected ray; *CBH* will be the *inclination of the reflected ray;* and *ABC* the *inclination of the incident ray.*

INCLINATION of the Axis of the Earth, is the angle which it makes with the plane of the ecliptic; or the angle between the planes of the equator and ecliptic.

INCLINATION of a Planet, is an arch or angle comprehended between the ecliptic, and the place of a planet in his orbit.

The greatest inclination of Saturn, according to Kepler, is $2^{\circ} 32'$; of Jupiter $1^{\circ} 20'$; of Mars $1^{\circ} 50' 30''$; of Venus $3^{\circ} 22'$; of Mercury $6^{\circ} 54'$. According to De la Hire, the greatest declination of Saturn is $2^{\circ} 33' 30''$; of Jupiter $1^{\circ} 19' 20''$; of Mars $1^{\circ} 51' 0''$; of Venus $3^{\circ} 23' 5''$; of Mercury $6^{\circ} 52' 0''$.

INCLINATION of a Plane, in dialing, is the arch of a vertical circle, perpendicular both to the plane and the horizon, and intercepted between them.

To find this, take a quadrant and apply its side to the side of a square, and apply the other side of your square to your plane: if the plummet fall parallel to the side of the square, then the lower side of the square stands level; by which draw a horizontal line, whereon erect a perpendicular, and apply your square to that perpendicular; and if the plummet falls parallel to the side of the square, then that is also a level line, and your plane stands horizontally: If the plummet falls not parallel to the side of the square, then turn your square, un-

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til it does; and draw an horizontal line, on which erect a perpendicular, to which apply your square, and observe what angle your plummet makes on the quadrant, with the side of the square; that is the angle of the inclination of the Plane.

INCLINATION of two Planes, is the acute angle made by two lines drawn one in each plane, through a common point of section, and perpendicular to the same common section.

Thus, in *Tab. Geometry, fig. 98.* the inclination of the plane *KEGL* to the plane *ACDB* is the angle *HFI,* or *fh'*; made by the right lines *HF* and *FI* in the point *F,* perpendicular to the line of section *EG.*

Angle of INCLINATION, in optics, is the same with what is otherwise called the *angle of incidence.*

Thus, in *Tab. Optics, fig. 26.* supposing *AB* an incident ray, proceeding from the radiant *A* to the point of incidence *B,* on the surface of a mirror; the angle *BH* comprehended between it and the perpendicular *HB,* is called indifferently by Mr. Molyneux and others the *angle of inclination,* or of *incidence.*

Argument of INCLINATION. See **ARGUMENT.**

INCLINATION, in a moral sense. See **APPETITE.**

INCLINED Plane, in mechanics, is that which makes an oblique angle with the horizon.

It is demonstrated in mechanics, that a body, as *B (Tab. Mechanics, fig. 56.)* laid on an inclined plane, always loses part of its weight; and that the power or weight *L,* required to sustain it, is to the weight of *D,* as the height *BA* of the plane is to the length of it *CA.*—And hence also it follows, that the inclination of the plane may be so small, that the greatest weight may be sustained on it by the smallest power.

Hence it becomes a rule, that the force wherewith any heavy body would descend on an inclined plane, is to the force of the descent in the perpendicular, as the sine of the angle of the plane's inclination, is to the radius. See **DESCENT.**

Suppose, therefore, a body or weight given, and it were required to find the power necessary to sustain it on an inclined plane *D.*—Call the weight *W,* and the power *P:* Then by the above rule, $R : W :: S : P.$ that is, as radius is to the weight, so is the sine of the angle of the plane's inclination to the horizon, to the power sought: where, the three first being given, the fourth is known of course.

INCLINERS, in dialing. See **DIAL, and DEINCLINERS.**

INCOGNITO, a term borrowed from the Italians, used when a person is in any place where he would not be known; but it is more particularly applied to princes or great men, who enter towns, or walk the streets, without their ordinary train, or the usual marks of their distinction and quality.

The grandees in Italy make a common custom of walking the streets *incognito;* and always take it amiss, on such occasion, when people pay their compliments to them. It is not barely to prevent their being known, that they take these measures, but because they would not be treated with ceremony, nor receive the honours due to their rank.

When the horses in princes, cardinals, and ambassadors coaches have no tassels, which they call *focchi;* and the curtains, which they call *bandinelle,* are drawn, they are reputed to be *incognito;* and no body that meets them is obliged to stop, or make his honours to them.

The cardinals also, when they would be *incognito,* leave off the red hat.

INCOMBUSTIBLE, that which cannot be burnt or consumed by fire.

Metals melt, stones calcine, and are yet *incombustible.*—Cloth made of lapis amianthus is *incombustible;* it is cleaned by fire, but not burnt. See the article **ASBESTOS.**

At Dole, in France, is said to be an *incombustible* taper: Gregory of Tours speaks of some wooden kettles in his time that bore the fire as long as those of iron.—Sylla undertook to burn down a tower of wood which defended Archelaus, one of Mithridates's lieutenants; but he could not attain his end, by reason of its being coated with alum.—It is alum water wherewith those people besmeare themselves, who handle burning coals, melt Spanish wax on their tongues, &c. See **FIRE-EATER,** and **ALUM.**

INCOMMENSURABLE, a term in geometry, used where two lines, when compared to each other, have no common measure, how small soever, that will exactly measure them both.

In the general, two quantities are said to be *incommensurable,* when no third quantity can be found that is an aliquot part of both: or, when those quantities are not to one another as unity to a rational number; or as one rational number to another.

The side of a square is *incommensurable* to the diagonal, as is demonstrated by Euclid; but it is commensurable in power; the square of the diagonal being equal to twice the square of the side.

Pappus, lib. 4. prob. 17. speaks also of *incommensurable* angles. Surfaces which cannot be measured by a common surface, are also said to be *incommensurable* in power.

INCOMPATIBLE, that which cannot subsist with another without destroying it.

Thus cold and heat are *incompatible* in the same subject; the strongest overcoming and expelling the weakest.

INCOMPLEX Opposition. See the article **OPPOSITION**.

INCOMPOSITE Numbers, are the same with what Euclid calls *prime numbers*. See **PRIME**, and **NUMBER**.

INCONCINNOUS Discords. } See the article { **DISCORDS**.
INCONCINNOUS System. } SYSTEM.

INCORPORATION*, the mixing the particles of different bodies so together, as to make an uniform substance or composition of the whole, without leaving any possibility of discerning the ingredients or bodies mixed, in any of their particular qualities.

* The word is formed from *in*, and *corpus*, body.

INCORPOREAL, *Spiritual*; a thing or substance which has no body. See the articles **SPIRIT**, and **BODY**.

Thus the soul of man is *incorporeal*, and may subsist independent of the body. See **SOUL**.

Those ideas which are independent of bodies, can neither be corporeal themselves, nor be received within a corporeal subject. They discover to us the nature of the soul, which receives within itself what is *incorporeal*, and receives it in a corporeal manner too. Whence it is that we have *incorporeal* ideas even of bodies themselves. *Feuilon*.

INCORRUPTIBLE, that which cannot be corrupted. See **CORRUPTION**.

Thus spiritual substances, as angels, human souls, &c. and thus also glass, gold, mercury, &c. may be called *incorruptible*.

INCORRUPTIBLES, **INCORRUPTIBLES**, the name of a sect which sprang out of the Eutychians.

Their distinguishing tenet was, That the body of Jesus Christ was *incorruptible*; by which they meant, that after and from the time wherein he was formed in the womb of his holy mother, he was not susceptible of any change, or alteration; not even of any natural, and innocent passions, as of hunger, thirst, &c. So that he eat without any occasion, before his death, as well as after his resurrection.—And hence it was that they took their name.

INCRASSATING, the act of condensing, or rendering fluids thicker, by the mixture of other less fluid particles; or by expelling the finer particles, and compinging, and bringing the grosser nearer together.

INCRUSTATION, the lining, or coating of a wall, either with glossy stones, rustics, marble, pottery, or stucco work; and that either equally, or in pannels and compartments.

INCURSTED, or **INCURSTATED Calumn**, is a column consisting of several pieces or slips of some precious marble, masticated or cemented around a mould of brick, or other matter; which is done, not only to save the precious stone, whether it be agat, jasper, or the like, but also for the sake of shewing pieces of it of uncommon largeness, by the neatness and closeness of the *incrustations*, which renders the joints imperceptible, where the cement is of the same colour.

INCUBATION, the action of a hen, or other fowl, brooding on her eggs.

INCUBUS*, *Night-Mare*; a disease consisting in an oppression of the breast, fo very violent, that the patient cannot speak, or even breathe.

* The word is derived from the Latin *incubare*, to lie down on any thing and press it: The Greeks called it *ἐπιδήμιος*, q. d. *salvator*, leiper, or something that rather on a person.

In this disease the senses are not quite lost, but they are drowned and astonish'd, as is also the understanding and imagination; so that the patient seems to think some huge weight thrown on him, and ready to strangle him.

Children are very liable to this distemper; so are fat people, and men of much study and application of mind; by reason the stomach in all these finds some difficulty in digestion.

The *incubus* seems to be cousin-german to the epilepsy and apoplexy; for if it lasts long, it degenerates into one or other of those distempers. Others reckon it a kind of asthma, and call it *asthma nocturnum*; and say it proceeds from the same causes, and is helped by the same means, as the common asthma.

INCUMBENT, in law, a clerk resident in his benefice, with cure.

He is called *incumbent* of such church, because he ought to bend his whole study to discharge his cure. See **RECTOR**.

INCUMBRAVIT, in law. See **QUARE INCUMBRAVIT**.

INCURVATION, the act of bending a bone, or other body, from its natural shape.

INCURVATION of the Rays of Light. See **LIGHT**, and **REFRACTION**.

INCUS, in anatomy, the second of the ossicles or little bones of the ear. See the article **EAR**.

INDE. See the article **INDIGO**.

INDEFESIBLE, or **INDEFEAZABLE**, in our law, signifies what cannot be defeated or made void:—As, a good and *indefesible* estate.

INDEFINITE, *Indeterminate*; that which has no certain

bounds, or to which the human mind cannot affix any.

Descartes uses the word in his philosophy, instead of *infinite*, both in numbers and quantities, to signify an *inconceivable* number, or number so great, that an unit cannot be added to it: and a quantity so great, as not to be capable of any addition.

Thus he says, the stars, visible and invisible, are in number *indefinite*, and not, as the ancients held, infinite; and that quantity may be divided into an *indefinite* number of parts, not an infinite number.

INDEFINITE is also used in the schools to signify a thing that has but one extreme; for instance, a line drawn from any point, and extended infinitely.

Thus what they call *eternity a parte ante*, or *eternity a parte post*, are *indefinite* durations.

INDEFINITE Proposition. See the article **PROPOSITION**.

INDEFINITE, in grammar, is understood of nouns, pronouns, verbs, participles, articles, &c. which are left in an uncertain indeterminate sense, and not fixed to any particular time, thing, or other circumstance.

INDELEIBLE*, that which cannot be blotted out, or effaced.

* The word is formed from the Latin *delere*, to blot, with the preposition *in* taken negatively.

Thus baptism, and the order of the priesthood, are said to convey *indeleible* characters.

INDEMNITY*, an act by which one promises to guarantee, or save harmless, some other person from any loss or damage, that might accrue to him on any particular account.

* The word is originally Latin, and is formed from the negatives *in*, and *damnum*, loss.

When a church is appropriated to an abbey or college, the archdeacon leseth his induction-money for ever: in recompence whereof, he shall have yearly out of the church so appropriate, one or two shillings, more or less, for a pension, as was agreed at the time of the impropriation. And this pension is called an *indemnity*.

INDENTED, **INDENTER**, in heraldry, is when the outline of a bordure, ordinary, &c. is notched, in form of the teeth of a saw.

INDENTED Verge. } See the article { **DENTED**.
INDENTED Moads. } **MEDALS**.
INDENTED Wheel. } **WHEEL**.

INDENTURE, in law, a writing which comprises some contract between two at least; being indented at top answerable to another part, which has the same contents.

It differs from a deed-poll; in that this last is a single deed, and is unindented.

INDEPENDANT Troop. See the article **TROOP**.

INDEPENDENTS, a sect of Puritans in England and Holland; so called, as denying not only any subordination among their clergy, but also all *dependency* on any other assembly.

They maintain, that every separate church, or particular congregation, has in itself radically and essentially every thing necessary for its own government; that it has all ecclesiastical power and jurisdiction; and is not at all subject to other churches or their deputies, nor to their assemblies or synods.

Though the *Independents* do not think it necessary to assemble synods; yet, if any be held, they look on their resolutions as weighty and prudential counsels, but not as decisions to be peremptorily obeyed.

They agree, that one or more churches may help another church with their advice and assistance, and even reprove it when it offends; provided they do not pretend to any superior authority or right to excommunicate, &c.

In matters of faith and doctrine, the *Independents* agree with the rest of the reformed; so that the difference is rather political, than religious.

During the civil wars in England, the *Independents* becoming the most powerful party, and getting to the head of affairs, most of the other sects, that were averse to the church of England, joined them: which occasioned them to be distinguished into two sects.

The first are in effect Presbyterians, only differing from them in matters of discipline.—The others, whom M. Spanheim calls *Pseudo-Independents*, are a confused assemblage of Anabaptists, Socinians, Antinomians, Familists, Libertines, &c.

F. Orleans speaks of the rise of the *Independents* in the following terms. ‘ Out of the same sect (the Presbyterians) had risen some time ago, on pretence of further reformation, a new sect, which was not only averse to the monarch, but the monarchy, both which it undertook to destroy; and in lieu thereof to form a republic.—They were called by the name of *Independents*, in regard that, professing to carry the gospel liberty still further than the other Puritans, they rejected not only bishops, but also synods, pretending each assembly ought to govern itself independently of all others; in which, said they, consists the liberty of the children of God. At first they were only distinguished among the Presbyterians, as the more zealous from the more indifferent, the more rigid
‘ from

from the more remote, by a greater aversion to all pomp and pre-eminence both in church and state, and by a more ardent desire to reduce the practice of the gospel to its primitive purity. It was their maxim of *independency* that first distinguished them, and rendered them suspected to the rest. But they had address and artifice enough to gain ground, and in effect they made abundance of proselytes out of all other parties and persuasions.

Independency is peculiar to Great Britain, the British colonies, and the United Provinces. One Morel in the 16th century endeavoured to introduce it into France; but it was condemned at the synod of Rochel, where Beza presided, and again at the synod of Rochel in 1644.

INDETERMINATE, in geometry, is understood of a quantity either of time, or place, which has no certain or definite bounds. See **INDEFINITE**. See **INDEFINITE**.

INDETERMINATE Problem, is that, whereof there may be infinite different solutions.

For instance, if a number be required that may be a multiple of 4 and 5; where the answer may be 20, 40, 60, &c. to infinity: or, if it were required to find two numbers whose sum, together with their product, may be equal to a given number; or, to make a rhomboides, wherein the rectangle under the two sides may be equal to a given square.—Both of which problems admit of infinite solutions.

INDEX*, in anatomy, denotes the fore-finger.

* It is thus called from *index*, I point or direct; because that finger is generally so used: whence also the extensor indicis is called *indicator*.

The Greeks call it *αγγυρ*, *licker*; this finger being used to be dipped in sauces, &c. in order to stir them; after which it is usually licked; or, as others will have it, because the nurses use it to take up the food wherewith they feed their infants; first licking it, to taste whether or no it be hot.

INDEX, in arithmetic, is the same with what is otherwise called the characteristic, or exponent of a logarithm. See **LOGARITHM**.

The *index* is that which shews of how many places the absolute number belonging to the logarithm consists, and of what nature it is, whether an integer or a fraction.

Thus, in this logarithm 2,521293, the number standing on the left hand of the point is called the *index*; and because it is 2, it shews you that the absolute number answering to it consists of three places: for it is always one more than the *index*, because the *index* of 1 is 0; of 10 is 1; and of 100 is 2, &c.—As in this example:

0 1 2 3 4 5 6 7 8 9

1 2 3 4 5 6 7 8 9 where the upper numbers are *indices* to the lower. And therefore in those small tables of Briggs's logarithms, where the *index* is omitted, it must be always supplied, before you can work by them.

If the absolute number be a fraction, the *index* of the logarithm has a negative sign, and is marked thus, 2,562293; which shews the corresponding number to be a decimal fraction of three places, *viz.* 1.365.

Mr. Townly has a peculiar way of noting these *indices*, when they express fractions, now much in use, *viz.* by taking, instead of the true *index*, its Arithmetical complement to 10; so that he would write the logarithm now mentioned thus: 8,562293.

How *indices* are to be added and subtracted, see under the article **LOGARITHM**.

INDEX of a *Globe*, is a little style fitted on to the north-pole, and turning round with it, pointing to certain divisions in the hour-circle.

It is sometimes also called *gnomon*. See **GLOBE**.

INDEX, or **INDICE**, is also the denomination of a congregation at Rome, whose business is to examine books, and to put such as they think fit to prohibit the reading and selling of, into an *index*.

Indices, or *expurgatory indices*, is the name by which the catalogues of prohibited books are called; among which, however, there is this difference, that some are condemned purely and absolutely, and others only *donec corrigantur*, till they be corrected.

Philip II. of Spain was the first who procured an *index* to be published of the books condemned by the inquisition of Spain. Pope Paul IV. took the hint, and in 1559 ordered the congregation of the holy office at Rome to print a second. Pius V. recommended the matter to the council of Trent, who made another. After this, the Duke of Alva procured another to be printed at Antwerp, in 1571.—Clement VIII. in 1596, published a very copious one, called by the name of the *Roman index*.—There were two others published in 1583, and 1612, by the cardinals Guircio and Sandoval, and several others by the inquisitors and masters of the sacred palace. The most considerable of all the *indices* is that of Sottomayor, which was made for all the states subject to the king of Spain, and comprehends all the others; coming down as low as the year 1667.

INDIA, or *East INDIA Company*, *Coin*, *Silk*, &c. See **COMPANY**, **COIN**, **SILK**, &c.

INDIAN Ink. } **INK**.

INDIAN Ocean. } See the article { **OCEAN**.

INDIAN Wood, called also *Jamaica* and *Campeche Wood*, is taken out of the heart of a large tree growing plentifully in the isles of Jamaica, Campeche, &c. used in dyeing, its decoction being very red.

It has been observed, that putting some of this decoction into two bottles, and mixing a little powder of alum with the one, it will become of a very beautiful red, which will hold; the other in a day's time becoming yellow, though both bottles were stopp'd from the air alike; and that if a little of the same decoction be exposed to the air, it will become as black as ink in the same space of time.

INDICATION, a sign discovering, or pointing out something to be done.

INDICATION, in physic, signifies the pointing out or discovering what is fit to be done, and what means applied in any case, from a knowledge of the nature of the disease, and the virtues of medicines.

Indications are of four kinds: *preservative*, or *prophylactic*, which direct how to cut off the cause of an approaching disease; *curative*, which shew how to remove a disease actually formed; *palliative*, which direct how to lessen its effects, or take off some of its symptoms, before it can be wholly removed; and *vital*, which relate to the strength of the body. That part of physic which treats of *indications* is called *semeiotica*. See **SEMEIOTICA**.

INDICATIVE, in grammar, the first mood or manner of conjugating verbs, shewing either the time present, past, or future.

I love, is the present tense; *I loved*, the past; and *I will love*, is the future of the *indicative* mood.

INDICATIVE Column. See the article **COLUMN**.

INDICATOR, in anatomy, a muscle of the index, or finger next following the thumb. See **INDEX**.

The *indicator* is the first proper muscle of the index; and is so called, because it serves to extend that finger to point at any thing without.

It has its origin in the middle and hind part of the cubitus, and is inserted by a double tendon into the second phalanx of the index, and to the tendon of the great extensor, with which it acts in conjunction in fretching out the finger.

See *Tab. Anat. (Myol.) fig. 7. n. 10. 49.*

INDICTAMENT, *Tenore mittendo*.

INDICTION, signifies the convoking of an ecclesiastical assembly; as a synod, or council, and even a diet.

INDICTION is also applied to the several sessions of the same councils.

Hence it is, that at the end of the sessions of the council of Trent, the decree by which the council appoints the day of the future session, is called the *indiction* of that session.

INDICTION, in chronology, a term used for a kind of epoch, or manner of accounting time among the Romans; containing a cycle or revolution of fifteen years, which, when expired, begins anew, and goes round again without intermission.

This method of computation has no dependence on the heavenly motions.—Petavius says, there is nothing in chronology less known than the Roman *indiction*; he means, than its origin and commencement.—It is the general opinion that it was instituted in the time of Constantine, but this is a mere guess.—There were *indictions* in the time of the emperor Constantius, as appears from the Theodosian Code.—The learned hold, that *indictions* were originally no other than certain annual taxes, the tariffs whereof were published every year: but why they were so called, why confined to a cycle of fifteen years, when, and on what occasion instituted, is not known!

We find three kinds of *indictions* mentioned in authors; the *indiction* of Constantinople, beginning on the first of September; the Imperial or Cæsarian *indiction*, on the 14th of September; and the Roman or papal *indiction*, which is that used in the pope's bulls, and which begins on the first of January.

The popes have dated their acts by the year of the *indiction*, ever since Charlemain made them sovereigns; before which time they dated them by the years of the emperors.

At the time of the reformation of the calendar, the year 1582 was reckoned the tenth year of the *indiction*: so that beginning to reckon hence, and dividing the number of years elapsed between that time and this by 15, the remainder will be the year of *indiction*, corresponding to the present year of our Lord 1749.

The *indiction* may also be found by adding 3 to the year of our Lord, and dividing the sum by 15, the remainder is then the year of the *indiction*: if there be no remainder, the *indiction* is 15.

The word *indiction* comes from *indicatio*, which signifies establishment,

blishment, order, or denunciation.—The time of the *indictio* among the Romans, was that wherein the people were summoned to pay a certain tribute; and it is for this reason that the Imperial *indictio* began towards the end of September, because the harvest being then got in, it was supposed the people could more easily pay their tax.

INDICTIVE, *INDICTIVUS*, an epithet given to certain feast-days appointed by the Roman magistrates, *viz.* the consular or praetor.

INDICTMENT*, in law, a bill, or declaration of complaint, drawn up in form of law, for the benefit of the commonwealth; exhibited as an accusation of one for some offence, criminal or penal, unto jurors, and by their verdict found to be true, and presented before a judge, or officer who has power to punish or certify the same offence.

* The word is derived from the French *indicare*, or according to M. Lambard, from *indicare*, I charge, I inform against.

INDICTMENT, in common law, signifies as much as *accusatio* among the civilians; though in some points it differs. See **ACCUSATION**.

It seems to be an accusation, because the jury who enquire of the offence, do not receive it, till the party that offereth the bill, appearing, subscribe his name, and proffer his oath for the truth of it.

It is always at the suit of the king, and differs from an *accusatio* in this, that the pretenser is no way tied to the proof thereof upon any penalty, if it be not proved, except there appear a conspiracy.

INDICUM Folium. See the article **FOLIUM**.

INDICUS Cocculus. See the article **COCCLUS**.

INDICUS Costus. See the article **COSTUS**.

INDIGESTION, a crudity, or want of due coction, either in a food, a humour of the body, or an excrement.

In the system of trituration, *indigestion*, which is a crudity, may be very naturally accounted for, from the relaxation of the fibres of the stomach.—A bilious *indigestion*, in the opinion of Haquet, a great advocate for trituration, is owing to too much force in the stomach, or too much vivacity in its oscillations, which spoil the digestion, by rendering the trituration imperfect. But this is hardly satisfactory, for it should seem that digestion would be the more perfect, in proportion as the force of the stomach is increased. See **DIGESTION**, and **TRITURATION**.

INDIGETES, a name which the antients gave to some of their gods.

There are various opinions about the origin, and signification of this word; some pretending it was given to all the gods in general; and others only to the semi-gods, or great men deified: others say, it was given to such gods as were originally of the country, or rather such as were the gods of the country that bore this name; and others again hold it was ascribed to such gods as were patrons, and protectors of particular cities.

Those of the first opinion maintain, that the gods were so called by antiphrasis, because they wanted nothing; the word coming from the verb *indiges*, I want.—If this were true the word *indiges* would signify nearly the same thing in Latin with the Hebrew *שָׂדַד* *schaddai*, which the scripture frequently gives to God; as signifying that he is sufficient for himself, and needs nothing.

Those of the second opinion derive the word from *indigare*, to call, or invoke; it being these gods who were ordinarily invoked, and who it was supposed lent the readiest ear to the vows that were made them.—To this purpose they cite Macrobius, who uses the word *indigare* in that sense; telling us, the Vestals make their invocations thus, Apollo Physician! Apollo Pean! *Vestalibus ita Indigant, Apollo Medice! Apollo Pean!*—They add, that their books of prayers and forms of invocation were called *indigentamenta*.

Lastly, others hold *indiges* to be derived from *inde genitus*, or in loco degens, or from *inde* and *ago*, for *dego*, I live, I inhabit; which last opinion seems the most probable.

In effect, it appears, 1. That these *indiges* were also called *local gods*, *dii locales*, or *topical gods*, which is the same thing. 2. The *indiges* were ordinarily men deified, who indeed were, in effect, local gods, being esteemed the protectors of those places where they were deified; so that the second and third opinion are very consistent. 3. Virgil joins *patrii* with *indiges*, as being the same thing, *Georg. I. Dii patrii, indiges*. 4. The gods to whom the Romans gave the name *indiges*, were Faunus, Vesta, Aeneas, Romulus, all the gods of Italy; and at Athens Minerva, says Servius; and at Carthage, Dido.—It is true, we meet with Jupiter *indiges*, but that Jupiter *indiges* is Aeneas, not the great Jupiter; as we may see in Livy, Lib. I. c. 3. in which last sense, Servius assures us, *indiges* comes from the Latin, *in diis ago*, I am among the gods.

INDIGNATORIUS, a muscle thus called, as being supposed to draw the eye from its inner corner outwards, which gives an appearance of scorn and anger.

But this is properly a compound motion of two muscles: for which see **EYE**.

INDIGO, a dyer's drug, of a deep blue colour, brought hither from the West Indies.

It is drawn from the leaves of a plant which the Spaniards call *anil*, and we *avel*, *nil*, *Indian weed*, *glostin Indicum*, *blue weed*, and *indigo*.

The method of preparation is said to be this.—When the plant has arrived at a certain height, and its leaves are in a good condition, they cut them down, and throw them into a kind of vat, covering them with water. These they boil together for the space of twenty four hours; at the top there swims a scum, with all the different colours of the rainbow. Then the water is let off into another vessel, where they agitate and churn it, as it were, with five or six long poles, fitted together for that purpose. This they continue to do, till the water becomes of a deep green, and till the *grain*, as they call it, forms itself, which they discover by taking a little of it out into another vessel, and putting it in it; for if then they perceive a bluish dreg subsiding, they cease to beat. The matter then precipitates of itself to the bottom of the vessel, and when it is well settled, they pour off the water. After this they take out the *indigo*, and put it into little linen bags, and let it drain; which done, they put it into shallow wooden boxes, and when it begins to dry, they cut it into slices, and let them harden in the sun.

There are several kinds of *indigo*; the best is that called *serquisse*, from the name of a village where it is prepared. That is usually the best which is in flat pieces, of a moderate thickness and pretty hard; it should also be clean, light enough to swim in the water, inflammable, of a fine blue colour, marked a little on the inside with silver streaks, and appearing purplish when rubbed on the nail. *Indigo* is used among the painters, who grind and mix it with white to make a blue colour; for without that mixture it would paint blackish.

They also mix it with yellow, to make a green colour.—It is also used in dying, and by the handresses, to give a bluish cast to their linen.

In the *Hortus Indus Malabaricus*, is an account of the plant whence *indigo* is drawn: the decoction of whose root is said to be excellent against nephritic colics; its leaves, applied to the abdomen, good to promote urine; and the *indigo* itself is said to be of good use in drying of tumors.

INDIRECT Modes, of syllogisms, in logic, are the five last modes of the first figure, expressed by the barbarous words *baralippton*, *celantis*, *dabitis*, *frisysonorum*. See **MODE**.

It is the conversion of the conclusion which renders the *modes indirecti*: for instance a syllogism in *darii*, and another in *dabitis*, would be perfectly alike, were it not for that conversion; the propositions having the same quantity, and the same quality, and the middle term being the subject in the major, and the attribute in the minor in both. It remains then, that to make a distinction, that which is the subject of the conclusion in *darii*, be the attribute in the conclusion of *dabitis*; and that which is the attribute in the first, the subject in the last. See **SYLLOGISM**.

DA—Every thing that promotes salvation is advantageous:

RI—There are afflictions which promote salvation;

I—Therefore there are afflictions which are advantageous.

DA—Every thing that promotes salvation is advantageous:

BI—There are afflictions which promote salvation;

TI—Therefore some things promoting salvation are afflictions.

INDIRECT Confirmation. See **CONFIRMATION**.

INDIVIDUAL, **INDIVIDUUM**, in logic, a particular being of any species; or that which cannot be divided into two or more beings, equal, or alike.

The usual division in logic is made into genera, or genus; those genera into species, and those species into *individuals*. See **GENUS**, **SPECIES**, and **DIVISION**.

The schoolmen make a fourfold distinction of *individuals*: *viz.*

INDIVIDUUM Vogum, that, which though it signifies but one thing, yet may be any of that kind; as when we say a man, a certain person, or one said so and so; though but one person is meant, yet that person, for aught that appears to the contrary, may be any body.

INDIVIDUUM Determinatum, is when the thing is named and determined; as, Alexander, the river Nile, &c. this is also called *individuum signatum*.

INDIVIDUUM Demonstrativum, is when some demonstrative pronoun is used in the expression; as, this man, that woman.

INDIVIDUUM ex Hypothese, or by supposition; when an universal name or term is restrained, by the supposition, to a particular thing: as when we say, the son of such an one, and it be known that he had but one son.

INDIVISIBLES, in geometry, those indefinitely small elements, or principles, into which any body or figure may be ultimately resolved.

A line is said to consist of points, a surface or parallel lines, and a solid of parallel and similar surfaces; and because each of these elements is supposed *indivisible*, if in any figure a line

be drawn through the elements perpendicularly, the number of points in that line will be the same as the number of the elements.

Whence it appears, that a parallelogram, prism, or cylinder, is resolvable into elements, or *indivisibles*, all equal to each other, parallel, and like to the base: And a triangle into lines parallel to the base, but decreasing in arithmetical proportion: so also are the circles, which constitute the parabolic conoid, and those which constitute the plane of a circle, or the surface of an isofceles cone.

A cylinder may be resolved into cylindrical curve surfaces, having all the same height, and continually decreasing inwards, as the circles of the base do; on which they insit.

This way of considering magnitudes is called the method of *indivisibles*, which is only the ancient method of exhaustions, a little disguised and contracted.

It is found of good use in shortning mathematical demonstrations; of which we may give an instance in that famous proposition of Archimedes, That a sphere is two thirds of a cylinder subscribing it.

Suppose a cylinder, an hemisphere, and an inverted cone (*Tab. Geometry, fig. 99.*) to have the same base and altitude, and to be cut by infinite planes all parallel to the base, of which dg is one; it is plain, the square of db will every where be equal to the square of ke (the radius of the sphere) the square $bc = eb$ square; and consequently, since circles are to one another as the squares of the radii, all the circles of the hemisphere will be equal to all those of the cylinder, deducting thence all those of the cone: wherefore the cylinder, deducting the cone, is equal to the hemisphere; but it is known, that the cone is one third of the cylinder, and consequently the sphere must be two thirds of it.

INDIVISO.—*PRO* INDIVISO. See the article *PRO*.

INDOCTORUM Parliamentum. See *PARLIAMENTUM*.

INDORSEMENT, any thing written on the back of a deed or instrument. See *ENDORSEING*.

A condition written on the back of an obligation is commonly called an *indorsement*; for *ins*, and *orsum*, back.

INDORSEMENT of a Bill of Exchange. See *ENDORSEMENT*.

INDUCIARUM Petitis. See the article *PETITIO*.

INDUCTION, in logic, a consequence drawn from several propositions, or principles first laid down.

Thus, the conclusion of a syllogism, is an *induction* made from the premises. See *SYLLOGISM*.

INDUCTION is also used for a kind of syllogism itself; being a medium between an enthymeme and a gradation, in regard it wants a proposition (which, however, is understood) as in the enthymeme, and abounds in assumptions (which yet are collateral, or of the same degree) which is the case in a gradation.

For instance; every terrestrial animal lives, every aerial animal lives, every aquatic animal lives, and every reptile animal also lives; therefore every animal lives.

Here, it may be observed, are various assumptions, from the more general species of the animal kind collected into one; which this proposition is supposed to precede, *e. g.* that every animal is either terrestrial, aerial, aquatic, or reptile.

Suidas reckons three kinds of *induction*; that just mentioned, which concludes or gathers some general proposition from an enumeration of all the particulars of a kind, he calls the *dialectic induction*.

The second proceeds by interrogation, and concludes probably, or with a verisimilitude. This is what the Greeks called *επιλογισμός*, and was that which Socrates ordinarily made use of, as Cicero in his *Topics*, and Quintilian have observed.

The third kind of *induction* is properly rhetorical; being a conclusion drawn from some example, or authority.

This is a very imperfect *induction*, all its force lying in a proposition which is concealed, and which will hardly bear being expressed.—Thus, he that says, Codrus died bravely for his country, therefore I must die bravely for my country, proves nothing unless this proposition be carried in mind, that I must do the same with Codrus. Again, Archimedes, and the other mathematicians say, the sun is much bigger than the earth; therefore, it must be owned the sun is much bigger than the earth. Where this proposition is understood, *viz.* whatever Archimedes, and the other mathematicians say, is true.

INDUCTION, in the English laws is usually taken for the giving possession to an incumbent of his church, by leading him into it, and delivering him the keys, by the collator, or bishop's deputy, and by his ringing one of the bells.

When a clerk is instituted into a benefice, he is to exhibit his mandate from the bishop to the archdeacon, or other person to whom it is directed, and hath a right thereby to be inducted into his living; and if he be refused *induction*, he hath a remedy both in the ecclesiastical court, and also an action of the case in common law, against the archdeacon.

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If the inductor, or person to be inducted, be kept out of the church or house by laymen, the writ *de vi laica* lies for the clerk, which is directed out of the chancery to the sheriff of the county, to remove the force, &c.—If another clergyman, presented by the same patron, keep possession, a spoliation is grantable out of the spiritual court; whereby the tithes, &c. shall be sequestred, till the right be determined.

The archdeacon rarely inducts a clerk in person, but usually issues out a warrant to the clerks and lettered persons within the archdeaconry, empowering any of them to do it in his stead.

The usual form and manner of *induction*, is, for the inductor to take the clerk by the hand, and then to lay it on the key of the church, which must be then in the door, and to say, 'By virtue of this instrument, I induct you into the real, actual and corporal possession of the rectory or vicarage of —, with all its fruits, profits, members, and appurtenances.' This done, he opens the door, and puts the clerk in possession of the church, and shuts the door upon him; who, after he hath tolled a bell (if there be any) comes out, and desires the inductor to indorse a certificate of his *induction* on the archdeacon's warrant, and that all present will signify it under their hands. If the church key cannot be had, it is sufficient that the clerk lays hold of the ring of the door, and within the time limited read the Common Prayer, and thirty-nine articles of the church, in the church-porch. Within two months after this, the clerk must read the thirty-nine articles, and all the service of the day, both at morning and evening-prayers, and declare his assent and consent; he must also then read the bishop's English certificate, in which is the declaration of his conformity; and of all this he must have two or three good witnesses, who must sign that they heard him do it, and be ready to attest it, *viva voce*, if required; and within three months after *induction*, he must also take the abjuration-oath at the quarter-sessions, or in some one of the courts at Westminster-Hall.

INDULGENCE, in the Romish theology, the remission of a punishment due to a sin, granted by the church, and supposed to save the sinner from purgatory.

The Romanists found their *indulgences* on the infinite treasure of the merits of Jesus Christ, the holy virgin, and all the saints; which they suppose the church has a right of distributing, by virtue of the communion of saints.

The Roman jubilee carries with it a plenary, or full *indulgence*, for all the crimes committed therein.

The pope also grants bulls of plenary *indulgence* to several churches, monasteries, and even to private persons; and it is a frequent thing to have general *indulgences* for the time of the principal feasts of a year.—Their casuists say, that a plenary *indulgence* does not always prove effectual, for want of complying with the conditions whereon it was granted.

For the extirpation of hereticks it has been a common practice with the popes to grant *indulgences*. Thus Clement XII.

'That we may stir up and encourage the faithful to exterminate this ungracious crew of forlorn wretches, [the Cevennois, when in arms against Lewis XIV.] we fully grant and indulge the full remission of all sins, whatever they may be, (relying upon that power of binding and loosing, which our Lord conferred upon his chief apostle) to all those that shall list themselves in this sacred militia, if they shall happen to fall in battle.' See *ABSOLUTION*.

INDULGENCE, or *INDULTO*, signifies also a special favour or privilege, conferred either on a community, or a particular person, by the pope's bulls; in virtue whereof the party is licensed to do or to obtain something contrary to the intention and disposition of the common laws.

There are two kinds of *indulto's*; the one *active*, which consists in a power of nominating and presenting freely, and without reserve to benefices that are otherwise limited, and restrained by the laws of the apostolical chancery; such are those ordinarily granted to secular princes, cardinals, bishops, &c.

Passive indulto's; consist in a power of receiving benefices and expectative graces; of which kind are those of a parliament, of graduates, and mandatories.

The *indulto* of kings, is the power given them of presenting to consistorial benefices, either by treaty, by favour, or special privilege.

The *indulto* of cardinals, is a licence for holding regular as well as secular benefices, and for disposing of benefices in commendam, or continuing them, &c.

Indulto of parliament, is a right of privilege granted to the chancellor, presidents, counsellors, and other officers in the parliaments of France, to obtain a benefice of the collator, upon the king's nomination directed to him.—This is a kind of advowson, or patronage belonging to the French king; the *indulto* being a mandate or grace, by which he is permitted to name to any collator he pleases, a counsellor, or other officer of parliament, on whom the collator shall be obliged to bestow a benefice: so that the right of the *indulto* resides

radically in the king, the officers being only the objects thereof.

INDURATING, a term applied to such things as give a harder or firmer consistence to others, either by the greater solidity of their particles, or by dissipating the thinner parts of any matter, so as to leave the remainder harder.

Thus a tumor is *indurated*, either by the addition of earthy and solid particles, as in the scirrhi and knotty swellings; or by transpiring the thinner parts through the skin, whereby the remainder grows more fixed, as in an oedema.

INDUSTRY, *Fruits of*. See the article FRUITS.

INEQUALITY of natural days. See EQUATION.

INEQUALITY Optical. See the article OPTICAL.

INERTIÆ *Vis*. See the article *Vis Inertiæ*.

INESCATION *, a kind of transplantation, practised for the cure of certain diseases by a supposed sympathetic power. See TRANSPLANTATION, and SYMPATHETIC.

* The word is derived from the privative preposition *in*, and *esca*, food.

It consists in impregnating a proper medium or vehicle, with some of the munitia, or vital spirit of the patient, and giving it to some animal to eat. It is pretended, the animal unites and assimilates that munitia with itself, correcting it, and imbibing its vicious quality; and by that means restoring health to the person whereto the munitia belonged. If the animal happens to die before the cure be effected, a second animal must be pitched on, and the experiment repeated. — Some tell us, that the blood of the patient well putrefied or fermented, does the business better than any other part; but all this is idle and absurd, and now deservedly laugh'd out of the world.

INESCUTCHEON, in heraldry, a small *escutcheon* born in a larger one, as part of some other coat. See ESCUTCHEON.

He beareth ermin, and *inescutcheon* gules.

This is also sometimes called an *escutcheon of pretence*.

He who marries an heiress, bears her coat of arms on an *inescutcheon*, or *escutcheon of pretence*, in the middle of his own coat.

IN ESSE is applied to things which are actually existing. Authors make a difference between a thing *in esse*, and a thing *in posse*: a thing that is not, but may be, they say is *in posse*, or *potentia*; but a thing apparent and visible, they say is *in esse*, that is, it has a real being *eo instanti*, whereas the other is casual, and at best but a possibility.

INFALLIBLE *, that which cannot deceive, or be deceived.

* The word comes from the Latin preposition *in*, taken privatively, and *fallo*, I deceive.

Upon this term stands one of the principal heads of controversy between the Reformed and the Catholics: the latter of whom maintain, that the church, assembled in general council, is *infallible*; which the former deny. See CHURCH.

The principal reasons alledged for the *infallibility*, are drawn from the obscurity of the scriptures, the insufficiency of private judgment, and the necessity there is of some *infallible* judge for the decision of controversies.

The *infallibility* of the pope is a doctrine of a late standing, and is not entirely quieted in, even in their own communion. — Du Pin, a doctor of the Sorbonne, has written against it; and the late behaviour of the cardinal de Noailles, and the protesting bishops, seconded by a considerable part of the clergy of France, shew to how low an ebb the pope's *infallibility* is reduced in that country.

INFAMOUS *, in the ordinary use of the word, signifies something notoriously contrary to virtue, or honour.

* The word is derived from the Latin *in*, and *fama*, fame, report.

Aulus Gellius uses the word *infamæ materias*, for what we ordinarily call *paradoxes*, i. e. discourses remote from the common opinion; propositions that appear opposite to truth; &c. as the elogy of Theristes, the praise of a quarantæque, &c.

INFAMOUS, in law denotes a person, or thing which is of no repute or esteem in the world.

There are two kinds of *infamy*; some persons being *infamous* by right, *de jure*, as those who have been noted by the laws, or stigmatized by public judgment.

Others are *infamous* in fact, *de facto*, as those who exercise some scandalous profession, as a catchpole, a merry andrew, a hangman, an informer, &c.

Heretofore, there were crowns of *infamy* given by way of punishment to criminals: they were made of wool.

INFANT, in a law sense, a person under the age of one and twenty years.

An *infant* eight years of age, or upwards, may commit homicide, and be hanged for it, if it appear by any other act

that he had knowledge of good and evil; for here *malitia supplebit ætatem*; yet Coke on Littleton, sect 405. says, 'An infant shall not be punished till the age of fourteen; which, according to him, is the age of discretion.'

INFANTE, and **INFANTA**, are titles of honour given to the children of some princes, particularly those of the houses of Spain and Portugal.

It is usually said that the appellation *infante* was introduced into Spain, on occasion of the marriage of Eleanor of England with king Ferdinand of Castile, and that their son Sancho was the first that bore it. — But this is contradicted by Pelagius bishop of Oviedo, who lived in the year 1100, and who informs us, that the titles *infante* and *infanta*, were used in Spain ever since the reign of king Evremond II.

INFANTRY, the body of foot-soldiers, in an army or other corps.

The *infantry* stand contradistinguished from the *cavalry*, or horse.

INFATUATE *, to prepossess any one in favour of some person or thing that does not deserve it, so far as that he cannot easily be disabused.

* The word *infatuare* comes from the Latin *fatuus*, fool; of *feri*, to speak out, which is borrowed from the Greek $\phi\alpha\omega$, whence *φαῖν*, which signifies the same with *aites* in Latin, or *prophet* in English; and the reason is, because their prophets or priests used to be seized with a kind of madness or folly, when they began to make their predictions, or deliver oracles.

The Romans called those persons *infatuati*, *infatuati*, who fancied they had seen visions, or imagined the god Faunus, whom they called *Fatuus*, had appeared to them.

INFECTION *, the catching a disease, by some effluvia, or fine particles, which fly off from disordered bodies, and mixing with the juices of others, occasion the same disorders, as were in the bodies they came from.

* The word comes from the Latin verb *inficere*, which properly signifies to dye of some other colour; *inficere*, i. e. *facere ut aliquid intus fit*, to occasion something to be imbibed. See CONTAGION.

INFERIOR, **INERIOR**, stands opposed to *superior*. See SUPERIOR.

INFERIOR Maxilla.	} See the article	MAXILLA.
INFERIOR Ocean.		OCEAN.
INFERIOR Planet.		PLANET.
Obliquus INFERIOR.	} See the article	OBLIQUUS.
Serratus INFERIOR.		SERRATUS.
Subscapularis INFERIOR.	} See	SUBSCAPULARIS.
INFERIORIS Labii Depressor.		DEPRESSOR.
INFERIORIS Labii Elevator.		ELEVATOR.

INFIDEL, a term applied to such persons as are not baptized, and that do not believe the truths of the Christian religion.

It is baptism that makes the specific difference between an heretic, and an *infidel*.

INFINITE, that which has neither beginning nor end: in which sense God alone is *infinite*.

INFINITE is also used to signify that which has had a beginning, but will have no end; as angels, and human souls.

This makes what the schoolmen call *infinium à parte post*; as, on the contrary, by *infinium à parte ante*, they mean that which has an end, but had no beginning. See INDEFINITE, and FINITE.

INFINITE, in mathematics, is applied to quantities which are either greater or smaller than any assignable ones.

In which sense it differs not much from what we otherwise call *indefinite*, or *indeterminate*. Thus, an

INFINITE, or **INFINITELY great line** in geometry, denotes only an indefinite, or indeterminate line; to which no certain bounds, or limits are prescribed.

INFINITE Series. See the article SERIES.

Arithmetic of INFINITES. See the article ARITHMETIC.

Characters in Arithmetic of INFINITES. See CHARACTER.

INFINITE Proposition, in logic. See PROPOSITION.

INFINITE Distress, in law. See the article DISTRESS.

INFINITELY small quantity, called also an *infinitesimal*, is that which is so very minute, as to be incomparable to any finite quantity; or it is that which is less than any assignable quantity. An *infinite* quantity cannot be either augmented, or lessened, by adding or taking from it any finite quantity. Neither can a finite quantity be either augmented, or lessened, by adding to, or taking from it an *infinitely small quantity*.

If there be four proportionals, and the first be *infinitely greater* than the second; the third will be *infinitely greater* than the fourth.

If a finite quantity be divided by an *infinitely small* one, the quotient will be an *infinitely great* one. And if a finite quantity be multiplied by an *infinitely small* one, the product will be an *infinitely small* one: if by an *infinitely great* one, the product will be a finite quantity.

If an *Infinite* small quantity be multiplied into an *infinitely* great one, the product will be a finite quantity.

INFINITELY Infinite Fractions, or all the powers of all the fractions whose numerator is one, are together equal to an unit. See the demonstration hereof given by Dr. Wood, in Hooke, *Phil. Coll.* N^o. 3. p. 45, *seq.*

Hence it is deduced, 1^o. That there are not only *infinite* progressions, or progressions in *infinitum*; but also *infinitely* farther than one kind of infinity. 2^o. That the *infinitely* infinite progressions are notwithstanding computable, and to be brought into one sum; and that not only finite, but so small as to be less than any assignable number. 3^o. That of *infinite* quantities, some are equal, others unequal. 4^o. That one *infinite* quantity may be equal to two, three, or more other quantities, whether *infinite* or finite.

INFINITE Series. See the article **SERIES**.

INFINITIVE, in grammar, the name of one of the moods, which serve for the conjugating of verbs.

The *infinitive* does not denote any precise time, nor does it determine the number, or persons, but expresses things in a loose indefinite manner; as, *to teach*, &c.

In most languages, both antient and modern, the *infinitive* is distinguished by a termination peculiar to it; as *verbum* in the Greek, *scribere* in the Latin, *scrire* in the French, *scrivere* in the Italian, &c. but the English is defective in this point; so that to denote the *infinitive*, we are obliged to have recourse to the article *to*; excepting sometimes when two or more *infinitives* follow each other.

The practice of using a number of *infinitives* successively, is a great, but a common fault in languages; as, *he offered to go to teach to write English*.—Indeed, where the *infinitives* have no dependence on each other, they may be used elegantly enough; as, *to mourn, to sigh, to sink, to swoon, to die*.

INFINITY, the quality which denominates a thing *infinite*.

The idea signified by the name *infinity* is best examined, by considering to what things *infinity* is by the mind attributed, and how the idea itself is framed: finite and infinite are looked upon as the modes of quantity, and are attributed primarily to things that have parts, and are capable of increase or diminution, by the addition or subtraction of any the least part. Such are the ideas of space, duration and number.—When we apply this idea to the supreme being, we do it primarily in respect of his duration and ubiquity; and more figuratively, when to his wisdom, power, goodness, and other attributes, which are properly inexhaustible and incomprehensible: for when we call them *infinite*, we have no other idea of this *infinity*, but what carries with it some reflection on the number or the extent of the acts or objects of God's power and wisdom, which can never be supposed so great, or so many, that these attributes will not always surmount and exceed, though we multiply them in our thoughts with the *infinity* of endless number. We do not pretend to say, how these attributes are in God, who is infinitely beyond the reach of our narrow capacities; but this is our way of conceiving them, and these are our ideas of their *infinity*.

We come by the idea of *infinity* thus: Every one that has any idea of any stated length of space, as a foot, yard, &c. finds that he can repeat that idea, and join it to another, to a third, and so on, without ever coming to an end of his additions. From this power of enlarging his idea of space, he takes the idea of infinite space, or immensity. By the same power of repeating the idea of any length or duration we have in our minds, with all the endless addition of number, we also come by the idea of eternity.

If our idea of *infinity* be got, by repeating without end our own ideas, it may be asked, Why do we not attribute it to other ideas, as well as those of space and duration; since they may be, as easily and as often repeated in our minds as the other? yet nobody ever thinks of infinite sweetness, or whiteness, though he can repeat the idea of sweet or white, as frequently as those of yard or day? To this it is answered, that those ideas which have parts, and are capable of increase by the addition of any parts, afford us by their repetition an idea of *infinity*; because with the endless repetition there is connected an enlargement, of which there is no end: but it is not so in other ideas; for, if to the perfectest idea I have of white, I add another of equal whiteness, it enlarges not my idea at all. Those ideas, which consist not of parts, cannot be augmented to what proportion men please, or be stretched beyond what they have received by their senses; but space, duration, and number, being capable of increase by repetition, leave in the mind an idea of an endless room for more; and so those ideas alone lead the mind towards the thought of *infinity*.

We are carefully to distinguish between the idea of the *infinity* of space, and the idea of a space infinite.—The first is nothing but a supposed endless progression of the mind over any repeated idea of space: but to have actually in the mind the idea of a space infinite, is to suppose the mind already passed over all those repeated ideas of space, which an end-

less repetition can never totally represent to it; which carries in it a plain contradiction. See **SPACE**.

This will be plainer, if we consider *infinity* in numbers: The *infinity* of numbers, to the end of whose addition every one perceives there is no approach, easily appears to any one that reflects on it: but how clear forever this idea of the *infinity* of numbers be, there is nothing yet more evident, than the absurdity of the idea of an actual infinite number.

INFIRMARY, a place where the sick and weak belonging to any society, or community are disposed, either for nursing or cure. See **HOSPITAL**.

INFLAMMATION*, in phisic, a tumor attended with a preternatural heat, and redness; frequently arising from some obstruction; by means whereof the blood flowing into some part faster than it can run off again, swells up, and causes a tension, with an unusual soreness, redness, and heat.

* The word comes from the Latin *in*, and *flamma* flame.

The immediate cause of *inflammations* is an excess, or overflowing of blood in the part affected: other causes, more remote, may be the density and coagulation of the blood, or the relaxation and contusion of the fibres.

Physicians have given particular names to the *inflammations* of several parts; that of the eyes is called *ophthalmia*, that of the lungs *peripneumonia*, and that of the liver *hepatitis*.

INFLATION*, *blowing up*; the act of stretching or filling any flaccid, or distensible body, with a flatulent or windy substance.

* The word is formed from the Latin *in*, and *flatus*; of *fl*, I blow.

INFLECTION, in optics, is defined, by Dr. Hook, a multiple refraction of the rays of light, caused by the unequal density and fluctuating motion of the constituent parts of the medium; whereby the progress of the rays is hindered from going on in a right line, and *inflected*, or deflected by a curve.

This property was first taken notice of by Dr. Hooke; who shews that it differs both from *reflection* and *refraction*; in that those are both made at the superficies of the body, but this in the middle of it within.

Sir Isaac Newton discovered also by plain experiment this *inflection* of the rays of light; and M. de la Hire assures us, he found, that the beams of the stars being observed, in a deep valley, to pass near the brow of a hill, are always more refracted, than if there were no such hill, or the observations were made on the top thereof; as if the rays of light were bent down into a curve, by passing near the surface of the mountain.

Sir Isaac Newton, in his *Optics*, makes several experiments and observations on the *inflection* of the rays of light; which see under **LIGHT**, and **RAYS**.

INFLECTION, in grammar, the variation of nouns and verbs, in their several cases, tenses, and declensions.

Inflection is a general name, under which are comprehended both conjugation and declension. See **CONJUGATION** and **DECLENSION**.

Point of INFLECTION, of a curve, in geometry, is the point, or place where the curve begins to bend, or turn a contrary way. See **POINT**.

If a curve line, as AFK (*Tab. Geometry, fig. 100.*) be partly concave, and partly convex towards any right line, as AB, or towards a fixed point; the point F, which divides the concave, from the convex part, and consequently is at the beginning of the one, and end of the other, is called the *point of inflection*, as long as the curve, being continued beyond F, keeps its course the same: when it returns back again towards that part or side, from whence it took its original, it is called the *point of retrogression*. See the article **RETROGRESSION**.

To conceive this, it is to be considered, that whatever quantity goes on continually increasing or decreasing, it cannot change from a positive to a negative expression, or from a negative to a positive one, without first becoming equal to an infinite, or nothing. It becomes equal to nothing, if it continually decrease; and equal to an infinite, if it continually increase.

Now, if through the point F be drawn the ordinate EF, and the tangent FL, and from any point, as M, on the same side, as AF, be drawn the ordinate MP, and the tangent MT; then, in curves which have a *point of inflection*, the absciss AP continually increases, and the part AT of the diameter, intercepted between the vertex of the diameter and the tangent MT, increases also, till the point P fall into E; after which it again begins to diminish: whence the line AT must become a maximum AL, when the point P falls into the point E.

In those curves which have a point of retrogression, the part AT increases continually, and the absciss increases, till the point T falls in L; after which it again diminishes: whence AP must become a maximum, when the point T falls in L.

If

If $AE = x$, $EF = y$, then will $AL = \frac{y^2}{x} - x$, whose

fluxion, which is $\frac{y^2 x - x^2 \dot{y} - \dot{x} y^2}{x^2}$ supposing x constant, being divided by \dot{x} , the fluxion of AL must become nothing; *i. e.* $-\frac{2y}{x^2} = 0$; so that multiplying by y^2 , and dividing by $-y$,

$\dot{y} = 0$; which is a general form for finding F , the point of inflection, or retrogression, in those curves whose ordinates are parallel to one another. For the nature of the curve AFK being given, the value of y may be found in x ; and taking the fluxion of this value, and supposing x invariable, the value of \dot{y} will be found in x ; which being put equal to nothing, or infinity, serves in either of these suppositions to find such a value of $A E$, as that the ordinate EF shall intersect the curve AFK in F , the point of inflection, or retrogression.

INFLUENCE, a quality supposed to flow from the bodies of the stars, either by their heat, or light, to which astrologers vainly attribute all the events which happen on the earth.

Alchemists, also, who to this ascribe the philosophers stone, tell us, that every thing in nature is produced by the influence of the stars, which, in their passage through the atmosphere, imbibe many of its moist parts, the grossest whereof they deposit in the sands and earths where they fall; that these filtrating through the pores of the earth, descend even to the centre, whence they are driven, by the central fire, back again to the surface; and in their ascent, by a natural kind of sublimation, as they find earths duly disposed, they form natural bodies, as metals, minerals, and vegetables, &c.— Thus, chymistry consisting in an artificial imitation of these natural operations, and in applying active principles to passive principles, it is pretended it can form natural bodies, make gold, &c. See **TRANSMUTATION**, and **PHILOSOPHERS STONE**.

INFLUENT, a term used where a liquor or juice, by the contrivance of nature, and the laws of circulation, falls into any current, or receptacle.

Thus, with respect to the common receptacle, the chyle is its *influent* juice; and in it is the bile to the gall-bladder; the venal blood to the heart in its diastole; and the like.

INFORCED. } See the article **REINFORCED.**
INFORCEMENT. } **REINFORCEMENT.**

IN FORMA PAUPERIS, in law. See **FORMA Pauperis**.

INFORMATION, in law, for the king, is much the same with what is called *declaration* for a common person: It is not always done directly by the king, or his attorney, or the clerk of the crown office; but sometimes by another, who sues as well for the king as himself, on a breach of some penal law or statute, wherein a penalty is given to the party that will lie for the same. See **DECLARATION**.

INFORMATUS non sum, or *Non sum INFORMATUS*; a formal answer made of course by an attorney, who is commanded by the court to say any thing he thinks good in behalf of his client; who having nothing material to urge, makes answer he is not informed: on which judgment passes for the other party.

INFORMIS, *unformed*; that which has not the form, or perfection it should have.

Stellæ INFORMES, in astronomy, are such stars as have not yet been reduced into any constellation; otherwise called *Sperrades*.

Of this kind there was a great number left by the ancient astronomers; but Hevelius, and some others of the moderns, have provided for the greater part of them, by making new constellations.

INFRACTION*, a rupture, or violation of a treaty, law, ordinance, or the like.

* The word is formed from the preposition *in*, and the supine of *frango*, I break.

INFURALAPSARII, the name of a sect of Predestinarians, who maintain, that God has created a certain number of men only to be damned, without allowing them the means necessary to save themselves, if they would. This doctrine they maintain in different manners, the sect itself being divided into two branches: Some hold, that God, independently of every thing, and antecedently to all knowledge or foresight of the fall of the first man, resolved to signalize both his mercy and his justice: his mercy, by creating a certain number of men, to make them happy to all eternity; and his justice, by creating likewise a number of other men, to be miserable to all eternity.

Others hold, that God did not take this resolution, but in consequence of original sin, and of the knowledge which he had from all eternity; that Adam would commit it: for say they, man, by this sin, having forfeited all pretences to his

original justice, deserves nothing now but punishment. All mankind is become a mass of corruption, which God may abandon to eternal destruction, without any impeachment of his justice. However, to shew his mercy too, as well as his justice, he has resolved to select some out of this mass, to sanctify them, and to make them happy.

Those who maintain the doctrine in the first manner, are more properly called *supralapsarii*, as believing that God formed the resolution of damning a number of men, *supra lapsum*, before Adam's fall, and independently of it.

Those of the second opinion are called *infralapsarii*, as holding, that God made that resolution, *infra lapsum*, after his knowledge of the fall, and in consequence thereof.

INFRASPINATUS, a muscle which arises from the inferior parts of the basis, spine, and under-coast of the scapula, and which filling the lower interscapulum, passes on between the spine and teres minor in a triangular form, and growing tendinous at the cone, is inserted into the head of the humerus, and draws directly backwards.—See *Tab. Anat. (Myol.) fig. 7. n. 33*.

INFULA, a name antiently given to one of the pontifical ornaments worn on the head. Festus tells us, that the *infula* were filaments or fringes of wool, wherewith the antients used to adorn their priests, their victims, and even their temples. Several authors confound the *infula* with the mitre, tiara, or cap wore by the priests; but there is a great deal of difference: The *infula* was properly a fillet or headband of white wool, covering that part of the head where the hair grows, as far as the temples; whence, on each side, hung down two fringes, called *vittæ*, to bind it withal; and this has given occasion to some authors to confound the *infule* with *vittæ*.

The *infula* was the same thing to priests that the diadem was to kings; *viz.* the badge of their dignity and authority. The difference in shape between the diadem and the *infula* consisted in this, that the diadem was flat and broad, and the *infula* was rounded and twisted.

INFUNDIBULIFORM Flowers. See **FLOWERS**.

INFUNDIBULUM, a Latin word, signifying a funnel; whence divers parts in the human body, having a resemblance thereto in shape, are called by the same name.

Such, *e. g.* are, the *infundibulum cerebri*, and *infundibulum renum*. See **BRAIN** and **KIDNEYS**.—See also *Tab. Anat. (Osteol.) fig. 5. lit. e.*

Hence also certain parts of plants are called *infundibuliformes*. The word *infundibulum* is also used by the metallurgick writers to signify a vessel of a conic shape, used to pour a melted metal into: a modern translator of Cramer's Art of Essaying, not knowing this, has ordered the pouring some melted silver into a funnel.

INFUSIO, an operation in pharmacy, whereby the virtues of plants, roots, and the like, are drawn out, by letting them steep in some convenient fluid menstruum, without boiling them therein.

Infusio is used in bodies of a lax texture, whose parts are so light, as not to admit of a greater motion, without hazard of flying away in vapour.

Its chief use is to communicate the virtues of bodies to liquors, either in order to regulate their force, or correct their ill qualities.

Some *infusions* are made in common water, others in wine, vinegar, milk, spirit of wine, &c.

INFUSIO is also used to signify the action of conveying a liquor into the body by the veins. See **INJECTION**.

Some physicians have found out a new method of purging, by *infusing* a cathartic into the veins, which operates pretty much after the manner of a clyster.

INGEMINATED Flowers, are those where one flower stands on, or naturally grows out of, another.

INGENDRING. See the article **ENGINEERING**.

INGENITE, *Inborn*; signifies any disease, or habit, which comes into the world with a person: nearly the same with *hereditary*. See **HEREDITARY**.

INGENUOUS, **INGENUUS**, among the Romans, a title applicable to a person born free, or of free parents. See **FREE**.

Isidore says, they are called *ingenui*, *qui libertatem habent in genere, non in factis*; those who are born free, not those who acquire their freedom.

A person was accounted *ingenuous*, if only the mother were free, and the father a slave.

These could give their votes, and enjoy offices, from which the *liberti*, or freedmen, &c. were debarred.

INGENUUS is sometimes also used to signify a native of a country, in contradistinction to a foreigner. See **NATIVE**.

ENGINEER, or **ENGINEER**. See the article **ENGINEER**.

INGLUVIES, *Craus*, or *Crops*; a part in granivorous fowls which serves for the immediate reception of the food; where it remains some time for maceration, before it be transmitted to the stomach.

This *ingluvies* is furnished with glands, which, the patrons of fermentation maintain, convey a menstruum thither, that impregnates the aliment, and serves instead of mastication.

INGOT,

INGOT*, a mass, or lump of gold, or silver, from the mines, melted down and cast in a sort of mould, but not coined, or wrought.

* The word *feans* formed from the French *lingot*, which signifies the same.

INGOT is also a name given to the moulds, or cavities wherein they cast melted metals, or regulus, of semimetals.

INGRAFTING, or **ENGRAFTING**. See **ENGRAFTING**.

INGRAILED. See the article **ENGRAILED**.

INGRAVING, or **ENGRAVING**. See **ENGRAVING**.

INGREDIENTS, all the simples which go into the composition of any medicine, ointment, fauce, or the like.

INGRESS, in astronomy, the sun's entering the first scruple of one of the four cardinal signs, especially Aries.

INGRESSU, in law, a writ of entry, whereby a person seeks entry into lands or tenements.—It lies in various cases, and has various forms. See **ENTRY**.

INGROSSATOR *Magni Rotuli*, is the same as clerk of the pipe. See **CLERK of the Pipe**.

INGROSSER, in common law, is one who buys up corn growing, or any provisions by wholesale, before the market, to sell again.

It also signifies a clerk, who writes records, or instruments of law on skins of parchment.

INGUEN*, that part of the body, reaching from the head of the thigh to above the secret parts; commonly also called the *groin*, and by anatomists *pubes*.

* The word is pure Latin, and is derived, according to some, from *unguen*, ointment, because these parts are frequently anointed: Others derive it from *ango*, because pains happen frequently there; and others again from *inguenes*, because the genital parts are here.

INGUINALIS, an appellation given to any subdivisions made of the *inguens*; or any thing therein contained, or applied thereto by way of medicine, or the like.

INHARMONICAL, *Relation*, in music. See **RELATION** *Inharmonical*.

INHERENCE, in philosophy, is applied to the juncture or connexion of an accident with its substance.

Thus quantity has a necessary *inherence* in a natural body.

INHERITANCE, *Hereditas*; a perpetuity in lands and tenements, to a man and his heirs.

Inheritance is not understood where a man hath *inheritance* of lands and tenements by descent, or heritage; but every fee-simple or fee-tail, that a man hath by his purchase, may be said to be an *inheritance*, for that his heirs may inherit it after him.

INHIBITION, a writ to inhibit, or forbid a judge from farther proceeding in a cause depending before him.

Sometimes *prohibition* and *inhibition* are put together, as of the same import; but *inhibition* is most commonly a writ issuing out of a higher court Christian to a lower; and *prohibition* out of the king's court to an inferior court. See **PROHIBITION**.

INHUMATION. See the article **INTERRING**.

INJECTION, in pharmacy; any liquid medicine made to be injected or thrown into the body, or any of its parts, by a syringe, clyster-pipe, or other instrument.

INJECTION is also used for the operation of filling the vessels with coloured wax, or any other proper matter, to shew their figures and ramifications.

INITIALIA, a name antiently given to the mysteries of Ceres. See **CEREA**.

INITIANTS *Punctum*. See article **PUNCTUM**.

INITIATED*, a term properly used in speaking of the religion of the antient heathens; where it signifies, being admitted to the participation of the sacred mysteries.

* The word comes from the Latin *initiatum*, of *initiare*, *initiare*; which properly signifies to begin sacrificing, or to receive or admit a person to the beginning of the mysteries, or of ceremonies of less importance.

The antients never discovered the deeper mysteries of their religion, nor even permitted some of their temples to be open to any but those who had been *initiated*.

Cassaubon, upon Athenæus, observes, that all the mysteries were not communicated at once to the persons who presented themselves for the priesthood, but that at first they purified them, then admitted them to the less considerable matters, to dispose them for the more important; and at last they drew the veil quite, and laid open all the most sacred and solemn parts of religion. See **MYSTERY**.

INJUNCTION, a writ grounded upon an interlocutory order or decree out of the court of Chancery or Exchequer, sometimes to give possession to the plaintiff, for want of the defendant's appearance; sometimes to the king's ordinary court, and sometimes to the court Christian, to stop proceedings in a cause, upon suggestion made, that the rigour of the law, if it take place, is against equity and conscience in that case.

INJURY*, *INJURIA*, in a general sense, signifies any thing contrary to justice and equity; that is, any wrong or damage

done to a man's person, reputation, or goods.

* The word is derived from the Latin preposition *in*, which here has a negative power, and *jus*, law, right; *injuria dicitur omne quod non jure fit*. The antients made a goddess of *Injury*, and called her *Aie*. Homer makes her the daughter of Jupiter, and says, she did mischief to every body, even to her father; that she was very nimble and tender-footed, and walked altogether on mens heads, without ever touching the ground.

Civilians define *injuria*, a private offence, committed designedly, and with an evil intention, to any man's prejudice.—The author of the *Rhetorics* to Herennius says, *Injuria est que aut pulsatione, aut convicio, aut turpitudine, corpus, aures, aut vitium alienis visiovit*.

By the Roman law, the action for an *injuria* was annual; that is, no reparation could be required after the expiration of a year. By the law of the twelve tables, where the *injuria* was the breaking of a limb, the injured person might demand talionem, that is, that he might break the same limb of the criminal.

For the breaking of a bone there were also considerable pecuniary punishments assigned: For other *injuries* only twenty asses were decreed, which the poverty of those times thought a sufficient penalty; but the pretors afterwards finding this too slender a satisfaction, in lieu thereof, appointed the injured person to set a rate on the *injuria*, which they afterwards increased or lessened as they thought good.

INK, a liquor wherewith to write on paper or parchment. The common writing *ink* is a composition of vitriol, galls, gum arabic, and water.

Printing *ink* is made of nut-oil, or linseed-oil, turpentine, and lamp-black. See **PRINTING**.

Indian, or Chinese *ink*, is an admirable composition, in vain attempted to be imitated in Europe. It is not fluid, like our writing *inks*; but solid, like our mineral colours, though much lighter. They make it of all figures, but the most usual is rectangular, about a quarter of an inch thick. Some of the sticks are gilt with figures of dragons, birds, flowers, &c.

In order to do this, they have little wooden moulds, so curiously wrought, that we could hardly equal them in metals. To use this *ink*, there must be a little hollow marble, or other stone, with water in it, on which the stick of *ink* must be ground, till the water becomes of a sufficient blackness. It makes a very black shining *ink*; and though it be apt to sink when the paper is thin, yet it never runs or spreads: so that the letters are always smooth and evenly terminated, how big soever they be. It is of great use in designing, because it may be weakened or diminished to any degree one pleases; and there are abundance of things which cannot be represented to the life without it.

The Chinese make it with smoke-black of different kinds, but the best is said to be made of the smoke of fat pork, burnt at a lamp. They mix a kind of oil with it, to make it more smooth, and add some odoriferous ingredients to take away the rankness of the smell.—After they have mixed it into a paste of a proper consistence, they put it into a mould to figure it. *Sympathetic Ink*. See the article **SYMPATHETIC**.

INLAND, implies any thing situate in the main land, or heart of a country, far from the sea-coasts.

Hence *inland bills*, in traffic, are such bills as are payable in the same land wherein they are drawn. See **BILL**.

INLAYING. See **VENEERING**, **MOSAIC**, and **MARQUETRY**.

INMATES, such persons as are admitted, for their money, to live in the same house or cottage with another man, in different rooms, but going in at the same door: being usually supposed to be poor, and not able to maintain a whole house themselves.—These are enquireable in a court-leet.

INNATE *Air*. } See the article **AIR**.

INNATE *Heat*. } **HEAT**.

INNATE Ideas, or *Principles*, are certain primary notes or characters, by many supposed to be stamped on the mind of man when it first receives its being, and which it brings into the world with it.

But the doctrine of *innate ideas* is abundantly confuted by Mr. Locke. See **IDEA**.

INNER Barristers. See the article **BARRISTER**.

INNINGS, lands recovered from the sea, by draining, and banking.

INNOCENTS Day, the name of a feast celebrated in commemoration of the infants murdered by Herod.

Heretofore it was the custom to have dances in the churches on this day, wherein were persons who represented bishops, by way of derision, as some suggest, of the episcopal dignity. Though others, with more probability, suppose it done in honour to the innocence of childhood. See **EPISCOPUS Puerorum**.

By a canon of the council of Cognac, held in 1260, these were expressly forbid.

INNOMINATI, *Ch INNOMINATI*, *Anonymi*, persons who have no names; a title by which the academists of Parma distinguish themselves.

Most cities in Italy have an academy, and each has its proper name; thus those at Parma entitle themselves *Gli innominati*, as if it was their characters to have no name at all. **INNOMINATUM**, in general, signifies any thing without a name.

Many parts of the body are left under this indistinct term; as the *innominata glandula oculi*, now called *saruncula oculi*: *innominata tunica oculi*, &c. See **EYE**.

Os INNOMINATUM, is that otherwise called *Os coxae*, or *cox-endix*: being composed of three bones; viz. the ilium, the pubis and ischium, only connected by cartilages.—See *Tab. Anat. (Osteol.) fig. 3. n. 16, 17, 18, 19.*

INNS—Our colleges of municipal, or common law professors, and students, are still called *inns*; the old English word for houses of noblemen, bishops, and others of extraordinary note; being of the same signification with the French word *hotel*.

INNS of Courts, are so called, as some think, because the students there are to serve, and attend the courts of judicature; or else because antiently these colleges received none but the sons of noblemen, and better sort of gentlemen, who were here to be qualified to serve the king in his court, as Fortescue affirms.

—Of these we have four principal ones; viz. the two *Temples*, heretofore the dwelling of the knights-templars, purchased by some professors of the common law about 300 years ago; and *Lincoln's-Inn* and *Gray's-Inn*, antiently belonging to the earls of Lincoln and Gray.

These societies are no corporations, nor have any judicial power over their members, but they have certain orders among themselves, which have, by consent, the force of laws: for lighter offences persons are only excommunicated, or put out of commons; for greater, they lose their chambers, and are expelled the college; and when once expelled out of one society, they are never received by any of the others.

The whole company of gentlemen in each society may be divided into four parts; benchers, utter-barristers, inner-barristers, and students. See **BENCHER**, and **BARRISTER**.

INNS of Chancery, were probably so called, because antiently inhabited by such clerks as chiefly studied the forming of writs, which regularly belonged to the curators, who are officers of Chancery.

The first of these is *Thornes-Inn*, begun in the reign of Edward III. and since purchased by the society of *Lincoln's-Inn*; beside this we have *New-Inn*, *Synonds-Inn*, *Clements-Inn*; *Cliffords-Inn*, antiently the house of the lord Clifford; *Staple-Inn*, belonging to the merchants of the staple; *Lions-Inn*, antiently a common inn with the sign of the lion; *Furnivals-Inn*, and *Bernards-Inn*.

These were heretofore preparatory colleges for younger students, and many were entered here, before they were admitted into the *inns* of court. Now they are mostly taken up by attorneys, solicitors, &c.

They belong all to some of the *inns* of court, who send yearly some of their barristers to read to them.

INNUENDO, is a word frequently used in writs, declarations, and pleadings, to ascertain a person or thing which was named, but left doubtful, before: as, He (*innuendo* the plaintiff) did so and so; mention being before made of another person.

INOCULATION, in agriculture and gardening, a kind of grafting; or an artificial operation, by which the bud of one fruit-tree is set into the stock or branch of another, so as sometimes to make different sorts of fruit grow in the same tree. See **ENGRAFTING**.

There are various ways of performing this: The antient method was, by making a shallow incision in the bark, where the knot of a shoot or eye, *oculus* (whence the operation takes its name) begins to bud forth, into this a promising shoot of another kind was inserted, and the incision closed up with fat earth or clay.

The method of *inoculation* among our gardens, as delivered by Mr. Lawrence, is as follows: They cut off a vigorous shoot from the tree that is to be propagated, a month before or after Midsummer; then chuse out a smooth place in the stock (which should not be above three or four years growth) making a perpendicular slit in the bark, a little above an inch long, and another at right angles to it, at the lower end, to give way to the opening of the bark. This done, the bark is gently loosened from the wood on both sides with a penknife, beginning at the bottom.

They then prepare the bud, cutting it off from the aforefaid vigorous shoot, and taking with it as much of the wood above as below it, and as near as may be to the length of the slit in the stock. When the bud is thus cut off, they take out the woody part of the bud, and put the bud itself in, between the bark and the wood of the stock, at the cross-slit before opened, leading it upwards by the stalk, where the leaf grew, till it exactly closes. They then bind it about with woollen yarn, the better to make all parts of it close exactly, that the bud may imboddy it self with the stock which it will do in about three weeks time.

This operation is said to be best performed in a cloudy day, or in the evening; and it is observed, that the quicker it is done, the better it always succeeds.

This practice has the advantage of engrafting in many respects, both as it is more secure, it seldom failing of having effect, especially if two or three buds are put into the same stock; and as its success is more readily discovered. Indeed when large stocks are to be practised on, *inoculation* is not proper, and they are then obliged to have recourse to grafting.

This one rule is observed to hold universally; viz. That no success is to be expected in *inoculation*, if the sap does not run well; that is, if the bark will not part readily from the wood of the stock. See *Supplement*: article **INOCULATION**.

INOCULATION, in a physical sense, is used for the transplantation of distempers from one subject to another; particularly for the ingraftment of the small-pox; which is a new practice among us, but of antient use in the eastern countries.

The method of performing the operation is as follows: After the body is rightly disposed and prepared, by proper diet and evacuations, two small incisions are made, one in the muscular part of the arm, about the place where an issue is usually cut, and the other in the leg of the opposite side; then being provided of a small quantity, as a drop or less of well concocted variolous matter, chosen from the distinct or best sort of pustules, before the turn of the distemper, and imbibed by two small doffils of lint; these are immediately put into the incisions, whilst the matter remains warm, and are kept on by a proper bandage: in a day or two the bandages are opened, the lint thrown away, and only a colewort-leaf or the like applied over the incisions. This dressing is continued daily.

The incisions usually grow sore, inflame and enlarge of themselves, and discharge matter more plentifully as the distemper rises. The eruptions generally appear within eight or ten days after the operation; during which time the patient is not confined, or obliged to observe a very strict regimen.

The practice seems to be beneficial, because the most proper age, the most favourable season of the year, the most regular method of preparation, and all possible precautions, may here be used, according to the wishes of the patient, his parents, and the physician; advantages impossible to be had when the distemper is caught in the natural way.

It has been almost constantly observed, that the best sort of small-pox is hereby occasioned; that the eruptions are few, the symptoms light, the danger next to none, and the recovery easy; and that the patient is equally secured from this distemper for the future, as he would be by having gone through it in the natural manner.

INORDINATE Proportion, is where three magnitudes being in one rank, and three others proportional to them in another; you compare them in a different order.

E. gr. If there be in one rank these three numbers, 2, 3, 9; and in another rank, these other three, 8, 24, 36, which are proportional to the precedent, in a different order; so that 2 be to 3 as 24 to 36, and 3 to 9 as 8 to 24: Then casting away the mean terms in each rank, you conclude the first 2 in the first rank to be the last, 9; as 8, and the first of the other rank, to the last, 36.

INOSCULATION. See **ANASTOMASIS**, and **ARTERY**. **IN PACE**, a Latin term, used among monks, to signify a prison, where such of them are shut up as have committed any grievous fault.

Formerly, there used to be a great deal of ceremony at the putting a religious *in pace*, but now it is not much regarded. Such as are shut up in perpetual imprisonment, are also said to be *in pace*.

Sometimes, also, the words *requiescat in pace* are used by way of allusion to a custom in the Romish church, of praying that the soul of the deceased may rest in peace.

The same words are also frequently seen at the bottom of epitaphs, in lieu of those used by the antient Romans, *S. T. T. L. i. e. Sit tibi terra levis*, Light lie the earth; or, *Sit humus cineri non onerosa tuo*.

IN PALE. See the article **PALE**.

IN PROMPTU, or **IM PROMPTU**, a Latin word frequently used among the French, and sometimes in English, to signify a piece made off-hand, or extempore; without any previous meditation; by the mere force, and vivacity of imagination.

Many authors pique themselves on their *in promptu's*, which yet were in truth done at leisure, and in cold blood.

INQUEST, or **ENQUEST**. See **ENQUEST**, and **ARREST**. **INQUIRENDO**, an authority given to a person, or persons, to inquire into something for the king's advantage.

Inquirendo Idiota. } See the article } **IDIOTA.**
Ad Inquirendum. } **AD.**

INQUISITION, in the civil and canon law, a manner of proceeding for the discovery of some crime by the sole office of the judge, in the way of search, examination, or even torture.

INQUISITION is also used in common law, for a like process in the king's behalf, for discovery of lands, profits, and the like. In which sense it is also confounded with office. See **OFFICE**. **INQUI.**

INQUISITION, or the *Holy Office*, denotes an ecclesiastical jurisdiction established in Spain, Portugal, and Italy, for the trial and examination of such persons as are suspected to entertain any religious opinions, contrary to those professed in the church of Rome.

It is called *Inquisition*, because the judges of their office take cognizance of crimes on common report, without any legal evidence, except what they themselves fish out.

Some people fancy they see the original of the *Inquisition* in a constitution made by pope Lucius, at the council of Verona, in 1184, where he orders the bishops to get information, either by themselves, or by their commissaries, of all such persons as were suspected of heresy; and distinguishes the several degrees, of suspected, convicted, penitent, and relapsed, &c. However this be, it is generally allowed, that pope Innocent III. laid the first foundation of the *Holy Office*; and that the *Vaudois* and *Albigenses* were what gave the occasion to it. That pontiff sent several priests, with S. Dominic at their head, to Tholouse, in order to blow up a spirit of zeal and persecution amongst the prelates and princes. These missionaries were to give an account to the pope of the number of heretics in those parts, and of the behaviour of the princes and persons in authority to them; and thence they acquired the name of *Inquisitors*: but these original inquisitors had not any court, or any authority; they were only a kind of spiritual spies, who were to make report of their discoveries to the pope.

The emperor Frederic II. at the beginning of the 13th century, extended their power very considerably; He committed the taking cognizance of the crime of heresy to a set of ecclesiastical judges; and as fire was the punishment decreed for the obstinate, the inquisitors determined indirectly with regard both to the persons and the crimes: by which means the laity was cut off from its own jurisdiction, and abandoned to the zeal and devout madness of the ecclesiastics.

After the death of Frederic, who had long before repented the power he had given the churchmen, as having seen some of the fruits of it; pope Innocent IV. erected a perpetual tribunal of inquisitors, and deprived the bishops and secular judges of the little power the emperor Frederic had left them. And this jurisdiction, which depended immediately on himself, he took care to introduce into most of the states of Europe. But the inquisitors were so fiery hot, and made such horrible butchery among the reputed heretics, that they raised an universal detestation, even in some catholic countries themselves. Hence it was that their reign proved very short both in France and Germany; nor was even Spain entirely subject to them till the time of Ferdinand and Isabella, in 1448, when their power was increased, under pretence of clearing the country of Judaism and Mahometanism.

The power of the *Inquisition* is very much limited in some countries, particularly at Venice, where it is received under such modifications, as prove a great check on its authority. Indeed at Venice it seems rather a political than a religious contrivance, and serves rather for the security of the state, than for that of the church. There are appeals from the subaltern *Inquisitions* in Italy, to the congregation of the holy office residing at Rome.

It is the constant practice of the *Inquisition*, to affect, in all their procedures, to inspire as much terror and amazement as possible; every thing is done with the profoundest silence and secrecy, and with the greatest rigour and pretended impartiality. When a person is seized, all the world abandons him, not the nearest friend dares to speak a word in his defence; that alone would be enough to render them suspected of heresy, and would bring them within the claws of the *Inquisition*. The criminals are seized, examined, tried, tortured, and, unless they recant, are even condemned and executed, without ever seeing or knowing their accusers; whence the revenged have a fair occasion of wreaking their malice on their enemies. When the *Inquisition* has done with them, and condemned them to death, they are turned over to the secular arm, with a world of prayer and pious intreaty, that their lives may not be touched.

Time is no manner of security in point of heresy: nor does the grave itself shelter the accused from the pursuits of the *Inquisition*; even the deceased have their trials, and they proceed in all their form and solemnity against the dead carcasses. The executions are always deferred till the number of the condemned is very great, that the multitude of sufferers may strike the deeper horror, and make the scene more terrible and shocking. See *ACT of Faith*.

The *Inquisition* of Rome is a congregation of twelve cardinals, and some other officers, where the pope presides in person. This is accounted the highest tribunal in Rome; it began in the time of pope Paul IV. on occasion of the spreading of Lutheranism.

The *Inquisition* is very severe in the Indies. It is true, there must there be the oaths of seven witnesses to condemn a man; but the depositions of slaves or children are taken. The person is tortured till he condemns himself, for his accusers are never brought to confront him. Persons are accused for the slenderest expression against the church, or even for a disrespectful word of the *Inquisition*.

The standard of the *Inquisition* is a piece of red damask, or which is painted a cross, with an olive-branch on one side, and a sword on the other: with those words of the psalm, *Exurge, Domine, & judica causam meam*.

INQUISITORS, among us, are sheriffs, coroners *super visum corporis*, or the like, who have authority to enquire into certain cases *ex officio*.

IN QUO, *Medium in quo*. See the article *MEDIUM*.

INROLEMENT, in law, the registering, recording, or entering of any lawful act, or instrument, in the records of Chancery; as a recognizance acknowledged, or a statute, or a fine levied.

Inrolements are also made in the rolls of the Exchequer, King's-bench, or Common-pleas; in the huffings at Guildhall, London; and by the clerk of the peace in any county.

Clerk of the INROLEMENTS. See the article *CLERK*.

INSANUM Parliamentum. See *PARLIAMENTUM*.

INSCONCED, in the military art, denotes that a part of an army have fortified themselves with a *scence*, or small fort, in order to defend some pass, &c. See *SCENCE*.

INSCRIBED, in geometry.—A figure is said to be *inscribed* in another, when all the angles of the figure *inscribed* touch either the angles, sides, or planes of the other.

INSCRIBED Hyperbola, is such a one as lies entirely within the angle of its asymptotes; as the conical *hyperbola* doth. See *HYPERBOLA*; see also *CIRCUMSCRIBING*.

INSCRIPTION, a title, or writing, affixed to any thing, to give some further knowledge thereof.

Antiquaries are very curious, in examining ancient *inscriptions* found on stones, and other monuments of antiquity. Sanchoniaton, cotemporary, as it is said, with Gideon, drew most of the memoirs, whereof his history is composed, from *inscriptions*, which he found in temples, and on columns, both among the Heathens and the Hebrews.

It appears, indeed, that the ancients engraved upon pillars the principles of sciences, as well as the history of the world. Those mentioned by Herodotus shew, that this was the first way of instructing people, and transmitting histories and sciences to posterity. This is confirmed by Plato, in his *Hippias*, wherein he says, that Pisistratus engraved, on stone-pillars, precepts useful for husbandmen. Pliny assures us, that the first public monuments were made plates of lead; and that the treaties of confederacy, concluded between the Romans and the Jews, were written upon plates of brass; that, says he, the Jews might have something to put them in mind of the peace and confederacy concluded with the Romans. The Greeks and Romans were great dealers in *inscriptions*, and were extremely fond of being mentioned in them; and hence it is that we find so many, in those countries of ancient learning, that large volumes have been composed of them; as the collection of Gruter, &c.

Since Gruter's collection, Th. Reinesius has compiled another huge volume of *inscriptions*. M. Fabretti published another volume at Rome in 1699, wherein he has corrected abundance of errors which had escaped Gruter, Reinesius, and other antiquaries, &c. and added a great number of *inscriptions* omitted by them.—Since all these, Grævius has published a complete collection of *inscriptions*, in three volumes in folio. In France is an academy of *inscriptions* and medals, consisting of ten honorary and ten pensionary members, ten associates, and as many novices, who are to meet twice a week, and to employ themselves in the examination of medals and ancient monuments, and other parts of Greek and Roman literature, and to compose a history of the kings of France from medals.—Such was the academy at the time of its institution, or rather restoration, in the beginning of this century; but as they are not now wholly employed about medals and *inscriptions*, they have changed their name for one of a greater latitude, and are called the *Academy des Belles Lettres*.

Notes or Abbreviations used in INSCRIPTIONS. See *CHARACTER*.

INSCRUTABLE, *Unsearchable*, in theology, is usually understood of the secrets of providence, and the judgments of God, which cannot be found out, or into which human reason cannot penetrate.

INSECTS, *INSECTA*, in natural history, a smaller sort of animals, commonly supposed to be exanguinous; and distinguished by certain incisions, cuttings, or indentings in their bodies.

* The word is originally Latin, formed of *in*, and *scere*, I cut; the reason of which is, that in some of this tribe, as ants, the body seems to be cut or divided into two; or because the bodies of many, as worms, caterpillars, &c. are composed of divers circles, or rings, which form a sort of inclosure.

Insects, according to Mr. Ray, in his *Methodus Insectorum*, are either, 1st, *Arthropoda*, such as do not change their form: or, Secondly, *Metamorphosantes*, such as do really change their form.

INSECTS, which do not change their form are either, 1^o, *Arachnæ*, without feet; or, 2^o, *Pedata*, with feet; and of these there are some kinds that cast their skins, and others that do not.

INSECTS

INSECTS without feet, are either *terrestrial*, i. e. land-insects, or *aquatic*.

Terrestrial INSECTS, are either, First, Such as are produced on the land; as the lumbrici terrestres, which are either of the larger sort, and called *dew-worms*; or of a smaller size: And of these there are some red, and others green, with yellow tails; which last are commonly called *gilt tails*.—Or, Secondly, Such as are found in the bowels of animals; of which some are found in the intestines of men; as, 1^o. The lumbrici teretes. 2^o. Lumbrici lati, which are also called *teniae*, 3^o. Cucurbitini, which some will have to be only the fragments of the *teniae*. 4^o. Ascarides, which are chiefly found in the rectum.—Others are found in the intestines of beasts, which are of two sorts, the *oblongi* and *pellucidi*, of the thickness of an horse-hair, and therefore called *vermiculi setiformes*: And the *breves*, and *crassiores*, which are often found in horses, and are called the *botis*.
To the genus of *terrestrial insects*, many natural historians also refer snails, whether with or without shells.

Aquatic INSECTS without feet, not changing their form; are, either, First, of the greater sort, which have a peculiar way of moving, by first fixing their head to the ground, and then drawing up their tail towards it, &c. Of these, some are *teretes*, round and smooth, of which there are three sorts, as, the medicinal *hirundines*, or leaches, the *common black horse leaches*, and the *ash-coloured sea-leaches*: but there is also a sort of this kind, which is smaller and flatter, found sticking to stones in the bottom of little brooks.—Or, Secondly, of the *lesser sort*, which have a different way of crawling or moving from the former.—These are also either round or flat: of the round sort, there is one that is black, with two small horns on its head, found sticking to wet stones on the watry tops of hills; and another which is red, of about a finger's length, with a forceps at the tail, found at the bottom of fish-ponds, and stagnant waters. The flat sort are very small and thin, and are called *slukes*, being sometimes found in waters, and sometimes in the branches of the porous bilarius in sheep.

INSECTS not changing form, and having feet, are either, First, *hexapoda*, with six feet. Secondly, *octopoda*, with eight feet. Thirdly, *decatassarapoda*, with fourteen feet. Or, fourthly, *polypoda*, with more numerous feet.

Those that have but six feet, are either *terrestrial* or *aquatic*. the *terrestrial* are either, first, of a larger kind; as, 1^o. The *yellowish insects*, found in rotten or decaying oaks. 2^o. The *black one*, on the ground, called by Mouffet, *vermicivorous*. 3^o. The *black one*, living under ground, with a forceps at the tail. 4^o. A *white* sort, with square black spots on its back. 5^o. The *farinarium*, bred in meal, of a whitish colour.—Or, secondly, a smaller sort; some of which are found about the bodies of animals; as, 1^o. The *cimex*, bug, or wall-louse, of a stinking smell. 2^o. *Ricinus*, the tick. 3^o. *Pediculus*, the common louse. 4^o. *Pediculus ferus seu inguinalis*, the crab-louse. Of some of which there are various kinds.—Others are not found on the bodies of animals; as, 1^o. One that in higness and figure resembles a louse, but is very nimble and swift, and is found in books and rotten wood. 2^o. Another with a very long body, and a forcipital tail. 3^o. The *black insect*, found often in the flowers of the chelidonium. 4^o. A subterraneous sort, a little whitish. 5^o. One that skips like a grasshopper, but is much less.

The *aquatic*, are, First, The *pediculus morinus grandis*, which adheres to fishes. Secondly, The *squilla fluviatilis*, with a pyramidal tail, and two hairs or bristles at the end. *Insects* not changing form, and having eight feet, are either those with a tail, as the scorpion; or without; as, first, The *spider*: of which some spin no web, have but two eyes, and very long legs, as the *opilia*, or shepherd: Others spin a web, and of these they count three sorts: 1^o. The *aranea Colchensis abdomine tumido, subrotundo, & elato*. 2^o. The spider with the thorax, or middle part of his body, as big as the abdomen. 3^o. The spider with the long abdomen, found among reeds, rushes, grass, &c. Secondly, The *ricini octopodes*, which are some more flat and compressed; as, the rambling ticks that run over the bodies of animals, but do not fasten; and some more round and thick, which do adhere to the skin. Thirdly, The *tyronea*, or mites.

Insects not changing form, and with fourteen feet, and therefore called *tetradecapoda*, are the *aselli*; of which there are three sorts; as, 1. The *sea-asellus*, the longest and largest of all, living amongst the rocks. 2. *Asellus lividus*, which rolls itself up into a ball. The common wood-lice, fows, or chefs bugs. 3. *Asellus spinosus*, with a forked tail: not rolling itself up.

To this species may also be added, 1^o. The *asellus marinus figura brevioris*, rolling itself up. 2^o. *Asellus aquarum dulcium*, with long legs and two bristles on its tail. 3^o. *Pulex aquaticus*, both in fresh and salt water. And 4^o. The *Pediculus aquaticus*, which fastens upon fish.

Insects not changing form, with twenty-four feet, have the eight fore-feet lesser, and the sixteen hinder ones larger: there

are two kinds of them observed, both with long bodies; one larger, and of an obscure colour, among the rocks by the seaside; the other of a silver colour, found in houses.

There is also a kind with thirty feet, of an oblong shape, chestnut colour, and full flattish body, usually lying under logs, and trunks of trees: This is very agile and swift.

Insects not changing form with yet more numerous feet called *pentapoda*, are some on land, and either roundish in body, with all their legs rising out of the middle of the belly, (nearly) as the *julus*; or more flat and compressed, with their legs, not rising, as before, from a point in the middle of their body, but growing along on the sides; as, the *scelopendra*.

Others are aquatic, of which Mr. Ray makes three differences; 1^o. The *equiseta lugs*, used for baits in catching fish, with thirty-eight legs, and a smooth roundish body. 2^o. The *scelopendra murina corpore plano*. 3^o. *Animalculum bicarpus*, or rather *bicaudatum*, lying in the clefts of stones under the salt water.

INSECTS which undergo a change of their form, are called *metamorphosa*, though improperly; since, as Swammerdam shews, there is no real transformation, but only an explication of the parts of the animal, latent before in miniature, like the plant in the seed; and an increase of all the parts by proper degrees. In these the first species of transmutation or change is instantaneous, there being no sensible rest or stop between the old and the new form.—The *insects* of this order do not lose their motion at the time they shift the pellicula, at least not to appearance.—This is when the vermiculus, leaving the former shape of the nympa, with which it appeared in the egg, and subsisted without food, now beginning to feed, has its members or parts visibly increased and stretched out, and takes the form of a new nympa, which is not without motion; and from thence becomes a flying *insect*.

Insects of this sort are, 1^o. The *libella*, or *perla*, which are produced from an *insect* of six feet, one kind of which Mouffet takes for the *pulex marinus*, or, as before he calls it, *locusta aquatica*.—Out of the crustaceous skin, or husk, of this *insect*, the libella breaks by a fissure, which begins between the eyes, and is continued to the roots of the wings, and is there joined to the lateral fissures. 2^o. The *cimex sylvester*, whose characteristic marks (according to Willughby) are, First, A long proboscis, not spiral, but straight. Secondly, Their upper wings to the middle are thick, and like leather; thence to the ends thin and membranous. Thirdly, There is the figure of S. Andrew's cross on their back. 3^o. The *locusta*, which Willughby refers to the *scelopendra murina*. 4^o. The *gryllis campestris*. 5^o. The *gryllis domesticus*, or crickets. 6^o. The *gryllus talpa*, mole-cricket. 7^o. The grass-hopper. 1^o. The *blatta*, according to Swammerdam. 9^o. The *tipula aquatica*, which run very swiftly on the surface of the water, and have a sting in their mouths like the cimices, or ticks. 10^o. The *scorpius aquaticus*, with a sting also in its mouth. 11^o. The *musca aquatica*, called by Aldrovandus, *ape amphibica*. 12^o. The *bemerobius*, or *ephemera*, or *diaria* of Swammerdam. and 13. The *forficula*, or *auricularia*.

The second species of transmutation includes such *insects* as undergo a double metamorphosis, or change of shape, 1^o. Into a *chrysalis* or something analogous to it. 2^o. Into a flying *insect*.

These kinds of *insects*, a while before they change, lie quite still, without feeding, or changing place; and in respect of their wings are, First, *Κατοπιηγα*, or vaginipennia, as the *scarabaei*, beetles. Secondly, *Αυδηλα*, whose wings are open and expanded: and the wings of these are either farinaceous, as in the *papiliones*, &c. or membranous, as in the *opes*, *musca*, &c. and these are either *διωιγα*, with two wings, or *τετραωιγα*, with four wings.

The *scarabaei* may be divided, 1^o. In respect of their horns, into the *nasicornis*, *bucrota*, and *ceruus volans*, or *taurus*. 2^o. In respect of their antennae, which are of many kinds; whereof the most eminent are those called *capricorni*. 3^o. With regard to their motion, as the *salustrius*. 4^o. With regard to their colour, as *cantharides*, green, &c.

To the beetle-kind may also be referred the *cicindela*, or glow-worm; the *staphylinus*, called, by Willughby, *quadrupes*, the *proscarabaeus*, or oil-beetle, so called from its emitting from its joints a kind of oil, on its being pressed or squeezed: The *anelytra* with farinaceous or mealy wings, are called *papiliones*, butterflies; and these are either diurnal, or nocturnal: The specific distinction of the diurnal is, that they always settle with their wings erect, are produced from an angulus aurelia, and have their antennae knobbed; of these there are a vast number of species observed in England.—The nocturnal butterflies, or *phalena*, are vastly numerous, and cannot very clearly be methodized. But for memory and distinction sake they may be divided into,

1^o. The *geometrigena*, which come from an *eruca* (called *geometra*, from the manner of its walk, which is anatinous, by curling up its back like the handle of a cup) with eight or ten feet. 2^o. Such as come from *eruca* with fourteen feet:

of this kind, which is very numerous, there hath been distinguished the *phalæna fasciata*, whose wings are in patches or areas of different colours; *phalæna lineata*, whose wings are marked with transverse lines; *phalæna punctata*, whose wings are marked with one or more points; and, these excepted, all the others are distinguished into greater, lesser, and those of a middle size, between both.—Some of the larger kinds may be distinguished also by their inner wings running out beyond the upper, when they fit or rest: and another sort, by the appearance of the figure of the eyes upon the wings: And a third, by their long tails, and narrow sharp wings; which by some are called *phalæna pradorices*, or *accipitrina*.

The *anelytra*, with membranous wings, are *bees*, *flies*, *wasps*, *bombilli*, *crabroves*, &c. And to this kind the *culx vulgaris*, or gnat, according to Swammerdam, is referred; as also the *fermica*, or ant.

Hither also must be referred such water insects as are covered by a theca, according to the observations of Willughby. These are either, first, An immovable theca, or case, which is fixed to the stones; and this case is either of a round figure, or one more compressed and flat. Secondly, A moveable portable theca; and these are commonly called *phryganæ*: And their theca is either, 1^o. Straight, and that either composed of straws, and little festucae, lying parallel one to another; of which there are two kinds; a *greater*, where the festucae are two inches long; and a *lesser*, which are very common, and are called *festucae-vivens*. Or else the festucae lie transversely, and are shorter, having also sometimes pieces of shells, or stones, intermixed with them: Others, whose cases are straight also, have no festucae, but always either sand or gravel; and of these some have the theca round, and are called *cad-batts*; others are flat and compressed. 2^o. The crooked, or horned, which run tapering; of these Mr. Ray reckons four kinds; a *greater* and *less black* sort, and a *greater* and *less ash-coloured* one. These all produce flies, with large wings like butterflies.

The *third* species of transmutation, is a simple change from a vermiculus to a flying insect; but with a fenible *ovovivæ*, rest, or stop, between one form and the other. This exchange Swammerdam thus describes: 'The vermiculus excluded from the egg gets nourishment by little and little from without, and under that first skin, or covering, has its members increased by degrees; not slipping it, or putting it off as other vermiculi do when they change into nymphæ, but after fuming the figure of a nymphæ in it: for a time it is quite motionless, till the superfluous moisture is evaporated, and then in a few days, it recovers its motion again, and casting off this skin, which is as it were double, it becomes a fly.' Of this kind are our *fish-flies*, and all that come from the *nymphæ variformes*, the *vispa ichneumonis*, &c. Reaumur and others have, since the time of Mr. Ray, greatly improved the History of Insects. See Supplement: article PAPILO, ERUCA, MUSCÆ, &c.

Generation of Insects.—The world is now generally convinced, that insects are not bred of corruption, but ex ovo; though the contrary was believed by the antients, because of the vast numbers that were sometimes hatched as it were at once, and because they could not discern the particular manner of their propagation. See GENERATION.

Malpighi, Swammerdam, and Redi, have abundantly disproved the doctrine of equivocal generation, as well as the chimerical transformation of the caterpillar into the butterfly, and other the like metamorphoses; and have shewn, that all the members of the butterfly were originally inclosed under the skin or nymphæ of the caterpillar, as the parts of a plant are in the seed.

Insects take particular care to deposit their eggs, or seed in such places where they may have a sufficient incubation, and where the young, when hatched, may have the benefit of proper food till they become able to shift for themselves.—

Those whose food is in the water, lay their eggs in the water; those to whom flesh is a proper food, in flesh; and those to whom the fruits, or leaves of vegetables are food, are accordingly deposited, some in this fruit, some in that tree, and some in one plant, and some in another, but constantly the same kind in the same tree, or plant.—As for others, that require a more constant and greater degree of warmth, they are provided by the parent animal with some place in or about the body of other animals; some in the feathers of birds, some in the hair of beasts, some in the scales of fishes, some in the nose, some in the flesh, may some in the bowels, and in most recesses of man, and other creatures.—And as for others, to whom none of those methods are proper, the parents make them nests by perforation in the earth, in wood, in combs, and the like, carrying in and sealing up provisions that serve both for the production of their young, and for their food, when produced.

In flies, butterflies, &c. it is observed there is a kind of glutin, by which the female fastens her eggs to the bearing buds of trees, &c. so that the rains cannot wash them off.—These eggs will not be hurt by the greatest frost.

Andry, *De la Generation de Vers dans le Corps de l'Homme*,

takes notice, that the antients were mistaken in denying that insects did breathe, on the account of their wanting lungs: for modern observations convince us, that insects have a greater number of lungs than other animals.

The antients thought also that insects had no blood, because many of them had no red liquor like our blood; but it is not the colour, but the use of that liquor that is to be regarded.

They believed also that insects had no hearts; whereas our microscopes do now discover, that when insects have several lungs, they have also several hearts; and in particular, it is found, that silk-worms have a continued chain of hearts, reaching from the head almost to the very extremity of the tail.—It is this number of hearts and lungs, that occasions those insects to give signs of life long after they are divided into several parts.

Andry observes also, that it is wrong to call insects imperfect animals, since they want no parts either necessary or convenient for their use, to render them complete in their kind.—

There are some who affirm, that the earth-worms, and those round tailed worms, which are found in the intestines of men and horfes, &c. also snails and horse-leeches, are hermaphrodites; but that such worms as become flies, and silk-worms, are not so; being of no sex, but only peculiar cases of real animals, which we see in time come out with wings.

The moderns have proceeded much farther in the knowledge of insects than the antients, as having the advantages of the microscope, which distinguishes their minute parts, whereof they have published draughts and descriptions.—Dr. Hooke has published a Micrographia in folio; and Fran. Redy, a physician at Florence, has published several figures with new and curious experiments of his own.—Sig. Malpighi, Bartholin, and the *Philosophical Transactions* of London, Paris, and Leipzig, have a great number of fine observations and experiments on insects.—Swammerdam has written a general history of insects in Dutch, and assures us, there were before that above 400 writers on this subject; among others he speaks well of Wotton, Gesner, Aldrovandus, Mouffet, Harvey, Fabricius ab Aquapendente, Goedart, &c. Hoeffnagel, painter to the emperor Rudolphus, has given very good designs of above 300 species, Goedart has described above 400, and Mr. Albin has given us a new history of the English insects, with beautiful figures; and, since that, the late Mr. Wilkes, and many others have given histories and figures of many kinds. But the work of the above mentioned Monsieur de Reaumur is, by far, the most valuable treatise of the kind.

INSEMINATION, one of the four kinds of transplantation in use for the sympathetic cure of certain diseases.

It is performed by mixing the medium impregnated with the mummy taken from the patient, with some fat earth, wherein has been sown the seed of a plant appropriate to that disease; but care must be taken from time to time, to sprinkle it with the water wherein the part affected has been washed. It is supposed the diseases will decline, in proportion as the plant grows.—By mummy is here meant part of the vital spirit of the patient, as the writers on that subject express themselves. But all this idle stuff is now laughed out of the world.

INSEPARABLE Modes. See the article MODES.

INSERTED Column. See the article COLUMN.

INSERTION, a term frequently used in anatomy, to signify the implication of one part within another.

Thus we say, the *insertion* of a muscle.

The *insertion* of the bones, muscles, and nerves, in the members of an animal, is exceeding artful: The vena cava has its *insertion* in the right ventricle of the heart.

INSERTION is also used in agriculture for the inclosing a graft within the cleft of a tree. See ENGRAFTING.

INSESSUS, or **INSESSIO**, in medicine, a kind of half-bath, usually prepared with a decoction of several herbs proper for the lower parts, wherein the patient sits down to the navel.

It has several uses, as the easing of pain, softening the parts, dispelling of flatulent matter, and frequently promoting the menses.

INSINUATION, denotes a cunning, and covert way of creeping into any person's favour.

INSINUATION of a Will, among civilians, is the first production of it, or the leaving it with the register, in order to its probate. See WILL.

INSIPID, *tasteless*, that which has nothing in it pungent enough to affect the palate, tongue, &c. and to occasion that sensation we call *tasting*.

INSITION, **INSITIO**, in botany, denotes the same with engrafting; viz. the act of inserting and uniting a cyon, bud, or the like, into the substance of the stock. See ENGRAFTING.

INSOLATION *, in pharmacy, a method of preparing certain fruits, drugs, &c. by exposing them to the heat of the sun's rays; either to dry, to maturate, or to sharpen them: as is done in vinegar, figs, &c.

* The word comes from the Latin verb, *insolare*, which is used by Pliny and Columella, and signifies to expose to the sun.

INSOLVENT, a term applied to such persons as have not wherewithal to pay their just debts.

A person dying, and not leaving estate sufficient to discharge these, is said to die *insolvent*.

INSPECTOR, a person to whom the care, and conduct of any work is committed.

INSPECTORS, in the Roman law, were such persons as examined the quality and value of lands and effects, in order to the adjusting or proportioning taxes and impositions to every man's estate.

The Jews also have an officer in their synagogue, whom they call *inspector*, *חזן* *hazan*. His business consists principally in *inspecting* or overlooking the prayers and lessons, in preparing and shewing them to the reader, and in standing by him to take care he reads right, and, if he makes mistakes, he is to correct him.

INSPICIENDO Ventre. See the article **VENTRE**.

INSPIRATION, among divines, &c. implies the conveying of certain extraordinary and supernatural notices, or motions into the soul.

Thus the prophets are said to have spoken by divine *inspiration*; and the sinner is converted, when he ceases to resist the *inspiration* of grace.

Some authors reduce the *inspiration* of the sacred writers to a particular care of providence, which prevented any thing they had said from failing, or coming to nought; maintaining, that they never were really *inspired*, either with knowledge or expression.

According to M. Simon, *inspiration* is no more than a direction of the holy Spirit, which never permitted the sacred writers to be mistaken.

It is a common opinion, that the *inspiration* of the holy Spirit regards only the matter, not the style, or words; and this seems to fall in with M. Simon's doctrine of direction.

Among the heathens, the priests and priestesses were said to be divinely *inspired* when they gave oracles.

The poets, also, laid claim to it; and to this end, they always invoked Apollo and the muses at the beginning of any great work.

INSPIRATION, in physic, is understood of that action of the breath, by which the air is admitted into the lungs.

In which sense, *inspiration* is a branch of respiration, and stands opposed to *expiration*.

This admission of the air depends immediately on its spring, or elasticity, at the time when the cavity of the breast is enlarged by the elevation of the thorax and abdomen, and particularly by the motion of the diaphragm downwards: so that the air does not enter the lungs, because they are dilated; but those dilate, because the air enters within them. Nor is it the dilatation of the breast which draws in the air, as is commonly thought; though this is a condition absolutely necessary to *inspiration*; but there is an actual intrusion of the air into the lungs.

INSPISSATING, in pharmacy, an operation whereby a liquor is brought to a thicker consistence, by evaporating the thinner parts.

Thus, juices, as that of liquorice, are *inspissated*.

INSTALLMENT*, a settling, or installing any person in a dignity.

* The word is derived from the Latin *in*, and *stallum*, a term used for a seat in church, in the choir, or a seat or bench in a court of justice, &c. Though Vossius is of opinion the word is of German origin.

INSTALLMENT is chiefly used for the induction of a dean, prebendary, or other ecclesiastical dignitary, into the possession of his stall, or proper seat in the cathedral church to which he belongs.

This is sometimes also called *infallation*.

INSTALLMENT is likewise used for the ceremony, whereby the knights of the Garter are placed in their rank, in the chapel of St. George at Windsor, and on many other like occasions.

INSTANT, such a part of duration, wherein we perceive no succession; or it is that which takes up the time of only one idea in our minds.

It is a maxim in mechanics, that no natural effect can be produced in an *instant*.—Hence may appear the reason why a burthen seems lighter to a person, the faster he carries it; and why, the faster a person slides, or scates on the ice, the less liable is the ice to break.

The schoolmen distinguish three kinds of *instants*; a temporary, a natural, and a rational *instant*.

Temporary **INSTANT**, is a part of time immediately preceding another: thus the last *instant* of a day, precedes immediately and really the first *instant* of the following day.

Natural **INSTANT**, is what we otherwise call a *priority of nature*, which obtains in things that are subordinated in acting; as, first and second causes; or causes and their effects. For the nature of things requires, that if there be a second cause, there must be a first; and that there must be a cause, if there be an effect.

Rational **INSTANT**, is not any real *instant*, but a point which the understanding conceives to have been before some other *instant*, founded on the nature of the things which occasion

it to be conceived. For instance, as God has made several things voluntarily, which he could otherwise have let alone; there is a reasonable foundation to conceive God, such as he is in himself, before he had made any of those voluntary determinations; but as there was no real *instant* when God had not formed any determination, this *instant* is called a *rational instant*, by way of opposition to an *instant* of time.

INSTANTANEOUS Action. See the article **ACTION**.

INSTATING. See the article **REINSTATING**.

INSTAURATION*, the re-establishment, or re-inauguration of a religion, a church, or the like, to its former state.

* The word is by some derived from the old Latin, *insaurum*, which signified the stock of things necessary for the tilling, and manning of grounds; as, cattle, tools, harness, &c. The word *insaurum* is only of the middle age; but *insauratio* is of much greater antiquity, and by some is derived from *insar*, like; as importing a thing's being brought to its former likeness or appearance.

INSTINCT, a natural disposition or sagacity wherewith animals are endued; and by virtue wherof they are enabled to provide for themselves, and know what is good for them, and are determined to preserve and propagate their species.

Instinct bears some analogy to reason, and supplies the defects of it in brutes.

INSTITUTES, INSTITUTA, in the civil law, a book, containing the elements, or principles of the Roman law; and which constitutes the last part of the corpus juris civilis.

The *Institutes* are a compendium or summary of the whole body of civil law, in four books, composed by Tribonianus, Theophilus and Dorotheus, by order of the emperor Justinian, for the use of young students; who having the first elements of the whole profession in this little treatise, might the sooner gain a competent knowledge of it, without being discouraged by the bulk of the other books.

INSTITUTES likewise denote a system of laws, or rules in any science.

INSTITUTION, in a general sense, the act of ordaining, founding or establishing any thing.

Thus we say, Moses *instituted* the ceremonies of the old law; Jesus Christ *instituted* the sacraments of the new.

INSTITUTION, in canon and common law, is the act of the bishop, or of one commissioned by him, whereby a clerk is invested with the spiritualities of a rectory, or vicarage. See **PRESENTATION**.

The clerk kneels down before the bishop, whilst he pronounces these words of *institution*; (*Instituto te rectorem ecclesie de A. B. cum cura animarum, & accipe curam tuam & meam*) and the clerk holds the written instrument, with the episcopal seal annexed, in his hand, during the ceremony.

Before the clerk is *instituted*, he must subscribe the thirty-nine articles of religion, in the presence of the ordinary, or his substitute; and this subscription must be without reserve, exception, or qualification, else his *institution* is, ipso facto, void and null, and the church is still vacant.—At the same time the ordinary requires the clerk to subscribe the other two articles mentioned in the 26th canon about the king's supremacy, and the lawfulness and use of the liturgy. The clerk must also before *institution* subscribe to that part of the declaration enjoined by the act of uniformity, 14 Car. II. c. 24. viz. *I will conform to the Liturgy of England, as by law established*.—Before *institution*, he must also take the oaths mentioned in the first statute of William and Mary, c. 8. instead of the former oaths of allegiance and supremacy, required by stat. 1 Eliz. And then he must take the oath against simony, enjoined by the 40th canon, and the oath of canonical obedience. And he is to have certificates given him of his subscribing the declaration contained in the act of uniformity, in English, in a distinct instrument, under the hand and seal of the bishop; and of his other subscriptions and oaths in Latin.

The clerk ought by all means to have witnesses of his *institution*, his taking the oaths, making subscriptions, &c. and therefore he should desire some present to write their names on the back of his instruments; and make memorandums who they are, and where they live.

The church, by *institution*, is full against all persons, but the king; and the clerk by it may enter upon the glebe, and take the tithes; but he cannot let or grant them, nor sue for them, if they be refused to be paid, till he be inducted.

After *institution*, the clerk is to receive a written mandate from the ordinary to the archdeacon, or other proper person, in order to his induction; without which he has not a full right to his temporalities; unless the benefice be a donative. See **INDUCTION**.

INSTITUTIONS, in literary matters, denote a system of the elements, or rules of any art or science.

Thus physical, or medicinal *institutions*, are such as teach the necessary praeognita to the practice of medicine, or the cure of diseases.

INSTRUCTIVE Column. See the article **COLUMN**.

INSTRUMENT, denotes a thing which is subservient to a cause for producing its effect. See **EFFECT**.

INSTRUMENTS of Sacrifice, in the antique architecture, are ornaments, as vases, patenes, candlesticks, knives, &c. wherewith

the victims were killed, &c. Instances of which we see in a Corinthian frieze in the remains of a temple behind the capitol at Rome, &c.

INSTRUMENT, is also used in law, to signify some public act, or authentic deed, by means whereof any truth is made apparent, or any right or title established, in a court of justice. See **ACT**, and **DEED**.

Wind **INSTRUMENTS**. See the article **WIND**.

INSTRUMENTAL Arithmetic. See **ARITHMETIC**.

INSTRUMENTAL Cause. See the article **CAUSE**.

INSTRUMENTUM Synodale. See **SYNODALE**.

INSULATE, or **INSULATED**, a term applied to a column, or other edifice which stands alone, or free and detached from any contiguous wall, &c. like an island in the sea; whence the denomination is apparently derived.

INSULT, a military term used for the attack of any post with open force; without the apparatus of trenches, saps, or any regular approaches.

INSUPER, a word used by the auditors of the Exchequer.—In their accounts they say, so much remains *insuper* to such an account; that is, so much remains due on his account.

INSURANCE, security given in consideration of a sum of money paid in hand, to make good ships, merchandizes, houses, &c. to the value of that for which the premium is received, in case of loss by storm, pirates, fire, or the like. See **ASSURANCE**.

INTACTE, right lines to which curves do continually approach, and yet can never meet with them; more usually called *asymptotes*. See **ASYMPTOTE**.

INTAGLIO'S, precious stones, having the heads of great men, inscriptions, and the like, engraven on them; such as we frequently see set in rings, seals, &c.

IN-TAKER, a name antiently given to certain banditti, or free-booters, who inhabited part of the north of England, and made frequent incursions into the very middle of Scotland, plundering the inhabitants wherever they came.

Those who made the expeditions were called *out-parters*, and those who were left behind to receive the booty, *in-takers*.

INTEGERS, in arithmetick, denote whole numbers, in contradistinction to fractions.

Integers may be defined to be numbers which refer to unity, as a whole to a part.

INTEGRAL, or **INTEGRANT**, is applied by the schoolmen, to those parts which are necessary to the integrity of a whole.

In which sense they stand contradistinguished from *essential* parts.

Thus the arms, legs, &c. are *integral* parts; body and soul essential parts of a man.

INTEGRAL Calculus, in the new analysis, is the counterpart to the differential calculus.

This last has been complexly explained by the Marquis de l'Hospital, but the other still remains imperfect, having been yet but little cultivated.

The *integral calculus* of Leibnitz, and other foreigners, answers to what the English call *inverse method of fluxions*. See **FLUXIONS**, and **CALCULUS**.

INTEGRITY of the action. See the article **ACTION**.

INTEGRUM.—*Restitutio in integrum*. See **RESTITUTION**.

INTEGUMENTS*, in anatomy, denote the common coverings which invest the body; as the cuticula, cutis, and even the panniculus carnosus, and tunica reticularis, if there be really any such part.

* The word is Latin, formed of *in*, and *tegumentum*; of *tego*, I cover.

INTEGUMENT, is also extended to the particular membranes which invest certain parts of the body; as, the coats or tunics of the eye.

INTELLECT, a term used among philosophers, to signify that faculty of the soul usually called the *Understanding*. See **UNDERSTANDING**.

The Peripatetics make two kinds of *intellect*, *active*, and *passive*.

Active **INTELLECT**, they say, is that which receives the impressed species emitted by objects to the exterior senses, and conveys them to the common sensorium.

These impressed species being material and sensible, are supposed to be rendered intelligible by the *active intellect*, and fit to be received into the *passive intellect*.

The species, so spiritualized, are called *expressed species*, as being expressed from those others impressed; and it is by these, according to them, that the *passive intellect* comes to know material things.

INTELLECTUAL Thinking. See **THINKING**.

INTELLIGIBLE, any thing capable of being understood or conceived by the mind.

Philosophers have invented certain beings which are purely *intelligible*, and only subsist in the understanding; such are the entia rationis, universal ideas, and other chimeras.

The *intelligible*, or intellectual world, is the idea of the

world in the divine mind, frequently spoken of by Malebranche.

INTENDANT, one who has the conduct, inspection, and management of any thing.

This is a title frequent among the French: they have *intendants of the marine*, who are officers in the sea-ports, whose business is to take care the ordinances and regulations relating to sea-affairs be observed: *intendants of the finances*, who have the direction of the revenues: *intendants of provinces*, who are appointed by the king to take care of the administration of justice, policy, and finances in the provinces: also *intendants of buildings*, of houses, &c.

INTENDMENT of Law, the sense, the sense, or true meaning of the law.

The judges ought to judge according to the common *intendment* of the law. *Coke*.

INTENSIONE, in law, a writ which lies against him who enters after the death of the tenant in dower, or tenant for life, and holds out him in the reversion or remainder.

INTENT, in the civil law, signifies to begin, or commence an action, or process.

INTENTION, or **INTENSION**, in medicine, that judgment, or method of cure, which a physician forms to himself from a due examination of the symptoms.

INTENTION, in physics, the increase of the power, or energy of any quality, as heat, cold, &c.

By which it stands opposed to *remission*, which signifies its decrease or diminution. See **REMISSION**.

INTENTION, in metaphysics, denotes an exertion of the intellectual faculties with more than ordinary vigour; when the mind with earnestness fixes its view on any idea, considers it on all sides, and will not be called off by any sollicitation. The schoolmen also speak of terms of first and second *intention*.

A *Term of first INTENTION*, is that which signifies a thing; the primary design of man, in establishing words, being to express things, or the ideas they have of things.

A *term of second INTENTION*, is that which does not signify a thing, but another term, or sign.

Thus, a tree, a man, &c. are terms of *first intention*; and the terms in rhetoric, grammar, &c. as figure, kind, &c. are terms of *second intention*.

INTENTIONAL Qualities. See **QUALITIES**.

INTERCALARY Day*, denotes the odd day inserted in the leap year. See **BISSEXTILE**.

* The word is derived from the Latin *intercalaris*, of *cal*, *calare*, which antiently signified to call with a loud voice; an *intercalary* day among the Romans, signifying a day inserted between two other days; which, for that reason, was proclaimed by the priests with a loud voice.

INTERCESSOR*, a person who prays, expostulates, or intercedes in behalf of another.

* The word comes from the Latin *inter*, and *cedo*, I go between.

In the Roman law, *intercessor* was the name of an officer, whom the governors of provinces appointed principally to raise taxes, and other dues.

INTERCESSOR is also a term heretofore applied to such bishops, as, during the vacancy of a see, administered the bishoprick, till a successor to the deceased bishop had been elected. See **BISHOP**.

The third council of Carthage calls these *intercessors*.

INTERCOLUMNIATION, or **INTERCOLUMNATION**, in architecture* signifies the space between two columns.

Vitruvius calls it *intercolumnium*; which according to that author, is of five kinds; viz. *picnostyle*, *listyle*, *eustyle*, *diastyle*, and *areostyle*: which see explained under their proper heads. **PICNOSTYLE**, &c.

For a medium, some authors have laid down the following proportions: in the Tuscan order, the *intercolumniation* is to be four diameters of the body of the column below; in the Doric three; in the Ionic two; in the Corinthian two, one quarter; and in Composite one and a half.

INTERCOMMONING, is when the commons of two manors lie together, and the inhabitants of both have, time out of mind, caused their cattle to feed promiscuously in each.

INTERCOSTAL, in anatomy, signifies any thing between the costae, or ribs.

INTERCOSTAL Nerves, are two nerves so called, because in descending they pass near the roots of the ribs.—They are formed in the brain, by three branches of nerves, two whereof come from the sixth pair, and the third from the fifth.—The *intercostal* nerves have a great communication with those of the eighth pair, and send several branches to the breast and lower belly.

INTERCOSTAL Arteries, are two; the *upper*, which comes from the subclavian, and distributes itself within the four spaces of the upper ribs; and the *under*, which comes from the lower trunk of the great artery, and diffuses itself within the spaces between the eight lower ribs and the neighbouring muscle.

INTERCOSTAL Vein, is a vein which arises from the four spaces between the upper ribs, and terminates in the subclavian.

vian.—See *Tab. Anat. (Angeiol.) fig. 1. n. 31. fig. 6. lit. f.*

INTERCOSTAL Muscles, are either *external* or *internal*; and are forty-four in number, one of each sort being between every two ribs.

They arise from the lower edges of each superior rib, and are inserted into the upper edges of each inferior rib.—Their fibres cross one another; those of the external run obliquely from the back-part forwards; but those of the internal from the fore-part backwards; they are thin and fleshy.—See *Tab. Anat. (Myol.) fig. 1. n. 43. fig. 2. n. 27.*

INTERDICT, a censure inflicted by a pope, or bishop, suspending the priests from their functions, and depriving the people of the use of sacraments, divine service, and Christian burial.

In common law, *interdict* is also used in the same sense as in the canon law; where it is defined to be, *causura ecclesiastica prohibens administrationem divinarum.*

INTERDICT is most properly understood of a general excommunication of a country or city, as appears by the Decretals. See **EXCOMMUNICATION.**

There is a *local* and a *personal interdict*; where these two are joined, the *interdict* is said to be *mixed*.

This punishment, as well as general excommunications, were but little known till the time of pope Gregory VII.

In excommunicating a prince, all his adherents, that is, his subjects who retain their allegiance, are excommunicated, and the whole country is put under an *interdict*—In the reign of king John, the kingdom of England lay under a papal *interdict* for above six years together: it began *A. D. 1208.*

In imitation of the popes, the bishops also soon began to *interdict*; and it became a common thing for a city or town to be excommunicated for the sake of a single person whom they undertook to shelter. But this severity was found to have such ill effects, that they have been obliged to moderate it.

An *interdict* is denounced, and taken off again, with the same formalities as an excommunication.

INTERDICTS, in the Roman law, certain formulae of words, by which the pretor, when the possession of any thing was contested between many, ordered or forbid something to be done with it, till the right or property should be legally determined.

Which formulae were called *interdicts*, because they related to the possession of the thing in the interim, or till the right was ascertained.

They had three kinds of *interdicts*, *prohibitory*, *restitutory*, and *exhibitory*.

Prohibitory INTERDICTS, were those by which the judges forbid any one to vex another in the possession of any thing legally belonging to him.

Restitutory, were those by which the judges appointed any one, who had been expelled out of his estate, to be repossessed, before his right was legally ascertained; and this was the same with what they called the *reintegrant*.

Exhibitory, were those by which any thing in dispute was ordered to be exhibited; as a testament, &c.

There was also a second division of *interdicts*; viz. into *adipiscendae*, *retinendae*, and *recuperandae*. The first tending to the acquiring a new possession, as the *interdict quorum bonorum*, &c. the second to the keeping an old one till it was further determined, as the *uti possidetis*, &c. the last to the recovering one lost, as *unde vi*, &c.

INTERDICTION OF Water and Fire, a sentence anciently pronounced against such, as for some crime were to be banished.

They were not directly adjudged to banishment; but by giving order that nobody should receive them, but deny them *fire and water*, they were condemned, as it were, to a civil death: and this they called *legitimum exilium*. Livy.

INTEREST, a sum of money, reckoned for the loan and forbearance of some other sum, lent for, or due at, a certain time, according to some certain rate.

In respect hereof, the sum lent or forborn is called the *principal*, because it is the sum that procreates the *interest*, or from which the *interest* is reckoned.

Interest is either *simple* or *compound*.

Simple INTEREST, is that counted from the principal only. This is easily computed by the golden rule, either *simple* or *compound*, thus: Let that which is the principal or cause of the *interest* be put in the first place, that which betokened time in the second place, and the remaining in the third: under this conditional part place the two other terms, each under its like, and there will be a blank to supply under one of those above, either under the first, second, or third.

100 . 12 . 6
50 . 3

Here the blank will be under the third place: multiply the three last for a dividend, and the two first for a divisor, the quotient of these gives the sixth; that is, 6 x 50 x 3 = 900, and 100 x 12 = 1200. Now 1200) 900.0 (73 = 15 s. required. If the demand had been, In how many months would 50 l.

have gained 15 s. or, if 100 l. in twelve months gain 6 l. what shall the principal be that in three months would gain 15 s. ? In these cases the blank would have been under the first or second term: Then, by another rule, multiply the first, second, and last for a dividend, and the third and fourth for a divisor; and the quotient is the answer.

l. Months. l.
100 . 12 . 6

3 . 75 = 15 s. Then by the rule 100 x 12 x . 75 = 900.00 and 6 x 3 = 18) 900. (50 l. required.

This rule shows *simple interest*, and all that belongs to it, with ease, and was thus found: Put P for the principal, T for the time, and G for the gain in the conditions, and *p t g* answering, it will be, P : G :: t : $\frac{G p}{P}$ And T :

G p :: t : $\frac{G p t}{T P} = g$, which is the first rule; that is, multiply the three last for a dividend, and the two first for a divisor. And because $\frac{G p t}{T P} = g$, therefore G t p = T P g,

and consequently t = $\frac{T P g}{G p}$ and p = $\frac{T P g}{G t}$, which is the second rule.

Compound INTEREST, is that which is counted both from the principal, and the *simple interest* forborn; called also *interest upon interest*.

Compound interest arises from the principal and its *interest* put together, as that *interest* becomes due.—To find this, it is necessary to find the new principal, which is still created by the increase of the growing money, at the several times when the payments of *interest* were due.

If R be the amount of one pound for one year, then R² will be the amount for two years, R³ for three years, &c. As one pound is to its amount for any given time; so is any proposed principal sum to its amount for the same time.

Punitive INTEREST. See the article **PUNITIVE**.

INTERFERING, in the manage. See **CUTTING**.

INTERJECTION, in grammar, an expression used to denote some sudden motion, or passion of the mind; as *oh! eh! &c.*

As the greatest part of the expressions used on these occasions are taken from nature alone, the real *interjections* in most languages are monosyllables. And as all nations agree in these natural passions, so do they agree in the signs and indications of them, as of love, mirth, &c.

Some deny the *interjections* to be words, or any part of speech, and make them mere natural signs of the motions or passions of the mind, expressed by these inarticulate sounds, several whereof brute have in common with us. But as these are passions, and must be represented in discourse, the *interjection* has a good foundation in nature, and is a necessary part of speech.

The Greeks confound their *interjections* with *adverbs*; and the Hebrews confound them with their *adverbs* and *prepositions*, calling them all by the general name *particle*.

INTERIM, a term borrowed from the Latin, signifying *in the mean time*; it was first brought into popular use by Charles V. in order to compose the disturbances of Germany.

The *interim* of that prince was a kind of ordinance or regulation to be observed in the empire, with regard to the articles of religion then controverted, till such such time as they should be determined by a council; and therefore was called *interim*.

It was said to have been drawn up by two Catholics and a Protestant: but as it retained most of the doctrines and ceremonies of the Romanists, excepting that of marriage, which was allowed to priests, and communion, which was administered to the laity under both kinds; most of the Protestants rejected it—those who admitted it were nick-named *Interimists*, or *Adiaphorists*. Indeed the *interim* equally diffused the generality of both parties, the Protestants and Catholics.

Besides this, there were two other *interims* made; the one called the *interim* of Leipzig; the other by the divines of Franconia, who refusing to accept the two former, made another for themselves.

INTERIOR. See **INTERNAL**, and **INTERNUS**.

Angle of INTERIOR Figure. See the article **ANGLE**.

INNERIOR Polygon. } See the article } **POLYGON**.
INNERIOR Talus. } **TALUS**.

INTERLINEATION, something inserted between two lines.

INTERLOCUTORY Order, that which decides not the cause, but only settles some intervening matter relating to the cause.

As, where an order is made in Chancery, for the plaintiff to have an injunction, to quit possession till the hearing of the cause: This order not being final, is called *interlocutory*.

INTERLOPING, the intercepting or disturbing the traffic of a company; or the taking up a new trade or employment,

ployment, to the prejudice of those who were brought up in it.

INTERLOPERS, are properly those, who without due authority hinder the trade of a company, or corporation lawfully established, by dealing in the same way.

INTERLUCATION, in husbandry, the thinning of a wood, or letting in light between, by lopping, or cutting away boughs.

INTERLUDE, an entertainment exhibited on the theatre between the acts of a play; to amuse the spectators while the actors take breath, and shift their dress; or to give time for changing the scenes, and decorations.

In the ancient tragedy, the chorus sung the *interludes*, to show the intervals between the acts.

Interludes, among us, usually consist of songs, dances, feats of activity, concerts of music, &c.

Aristotle and Horace give it for a rule, that the *interludes* should consist of songs built on the principal parts of the drama: But since the chorus has been laid down, dancers, buffoons, &c. ordinarily furnish the *interludes*.

INTERMEDIATE, something betwixt two.—It is usually understood of the space of time elapsed from any certain point to any other.

INTERMEWING, in falconry, is a hawk's *metwino*, from the first change of her coat till the turn white.

INTERMITTENT, a thing which ceases its action for some time; which time is called the *interval*.

Thus fevers which go off, and soon return again, are called *intermittents*, in opposition to those which are always continued.

So a pulse which after so many strokes stops, or loses one in its due time, is called an *intermitting pulse*. See **PULSE**.

With regard to this it has been observed, that as often as the stomach is much inflated with wind, the nerves or plexus cardiacus at its orifice must suffer a contraction, which being continued to the heart, will occasion a twitching; and this, as it is more or less violent, will produce either only a simple *intermission* of pulse, or a real palpitation of the heart.

INTERNAL ANGLES, are all angles made by the sides of any right-lined figure within.

The sum of all the *internal angles* of any right-lined figure, is equal to twice as many right angles as the figure hath sides, except 4.

In a triangle, as KLM, (*Tab. Geometry fig. 19.*) the angles L and M, are particularly called *internal* and *opposite*, in respect of the external angle IKM, which is equal to them both.

INTERNAL Angle is also applied to the two angles formed between two parallels by a line intersecting those parallels, on each side the intersecting line.

Such are the angles z and y, and x and s, (*Tab. Geometry, fig. 36.*) formed between the parallels OP and QR, on each side the intersecting line ST.

The two *internal angles* are always equal to two right angles.

INTERNAL and opposite angle is also applied to the two angles s and y, (*Tab. Geometry, fig. 36.*) formed by a line cutting two parallels.

These are respectively equal to A and u, called the *external* and *opposite angles*.

INTERNAL Affection.

INTERNAL Denomination.

INTERNAL Ear.

INTERNAL Modes.

INTERNAL Orthography.

INTERNAL Place.

INTERNAL Sense.

INTERNUS Brachiauis.

INTERNUS Rectus Major Capitis.

INTERNUS Rectus Minor Capitis.

INTERNUS Cubitaus.

INTERNUS Iliacus.

INTERNUS Orbiter.

INTERNUS Pterygoideus.

INTERNUS Vastus.

INTERNODIUM, in botany, the space that is between two knots, or joints, of the stalk of a plant; e. gr. of the stalk or straw of wheat, or other corn.

INTEROSSEI Muscles, the muscles which move the fingers; thus called from their situation, as being contained, *inter ossa*, between the spaces of the bones of the metacarpus.

Some reckon six of them, and others eight.—One half lie between the spaces these bones leave towards the palm of the hand; these are called the *internal interossei*, arising from the upper part of the bones of the metacarpus next the carpus; and being inserted on the internal sides of the first bones of the fingers with the lumbricales, serve as adductores digitorum, to bring the fingers to the thumb.

The other half, called *interossei externi*, are contained in the

spaces that the bones of the metacarpus leave on the back of the hand: these rise from the upper part of the bones of the metacarpus next the carpus, and are inserted on the external sides of the first bones of the fingers: These serve as abductores digitorum, to draw the fingers from the thumb. See *Tab. Anat. (Myol.) fig. 6. n. 23. fig. 7. n. 9, 50.*

INTEROSSEI Pedis, the muscles which move the toes; in number, use, origin, and insertion, they answer exactly to those of the hand.

INTERPLEAD, or **ENTERPLEAD**. See **ENTERPLEAD**.

INTERPOLATION, a term used by critics in speaking of ancient writings and manuscripts, in which some spurious additions, or alterations have been since made.

To establish, or ascertain an *interpolation*, P. Ruinart gives us the five following rules. 1. That the piece supposed to be interpolated appear to have all the antiquity it pretends to: 2. That there be good proofs that it has been interpolated. 3. That the supposed interpolations agree to the time of the interpolator. 4. That the interpolations do not touch the foundation of the work, and that they be not too frequent, nor entirely disfigure the piece. 5. That the restitution made, agree perfectly to the rest of the work.

INTERPOSED Actio. See the article **ACTIO**.

INTERPOSITION, the situation of a body between two others, so as to hide them, or prevent their action.

The eclipse of the sun is occasioned by an *interposition* of the moon between the sun and us; and that of the moon by the *interposition* of the earth between the sun and moon.

INTERPRETER*, a person who explains the thoughts, words, or writings of some other; which before were unintelligible.

* The word *interpretes*, according to Isidore, is composed of the preposition *inter*, and *partes*, as signifying a person in the middle betwixt two parties, to make them mutually understand each other's thoughts: Other derive it from *inter*, and *pres*, i. e. *adjutor*; q. d. a person who serves as security between two others, who do not understand one another.

There have been great debates about *interpreting* scripture: The Romanists contend, that it belongs absolutely to the church; adding, that, where she is silent, reason may be consulted; but where she speaks, reason is to be disregarded. The Protestants generally allow reason to be the sovereign judge, or *interpreter*; though some among them have a strong regard to synods, and others to the authority of the primitive fathers. Lastly, others have recourse to the spirit within every person to *interpret* for them. Which is what Bochart calls *arabistic* or *enigmatibus*.

INTERREGNUM, the time during which a throne is vacant, or a kingdom without a head. See **INTERREX**.

In hereditary kingdoms, as England, there are properly no *interregnums*. In elective kingdoms, the *interregnums* are extremely liable to factions, and disorders. In Germany, the emperors have lost the greatest part of their dominions during the *interregnums*.

INTERREX, a magistrate who governs during an *interregnum*, or in the interval between the death of a monarch, and the election or inauguration of his successor.

This magistrate was established in old Rome, and was almost as ancient as the city itself: After the death of Romulus there was an *interregnum* of a year, during which the senators were each *interrex* in their turn, five day apiece.

After the establishment of consuls and a commonwealth, though there were no kings, yet the name and function of *interrex* was still preserved: For, when the magistrates were absent, or when there was any irregularity in their election, or they had abdicated, so that the comitia could not be held; provided they were unwilling to create a dictator, they made an *interrex*, whose office and authority was to last five days; after which they made another. To the *interrex* was delegated all the regal and consular authority, and he performed all their functions. He assembled the senate, held comitia, or courts, took care the election of magistrates was according to the rules. Indeed, at first it was not the custom of the *interrex* to hold comitia; at least we have no instance of it in the ancient Roman history.

The patricians alone had the right of electing an *interrex*.—This office fell with the republic, when the emperors made themselves masters of every thing.

INTERMENT; **INTERMENT**, or **ENTERMENT**, the act of *interring*, i. e. burying, or laying a deceased person in the ground.

The kings of England are *interred* at Westminster; that of France at Dennis, &c.—The excommunicated are not to be *interred* in holy, i. e. in consecrated, ground. The ancients did not *inter* their dead: they burnt them, as the Indians do at this day.

The custom of burning the dead ceased among the Romans under the empire of the Antonians; long before the Christians were allowed to *inter* in churches, which was even prohibited kings and emperors.

The Abyssinians, in lieu of *interring* their dead, flut them up in the bodies of trees, dug hollow for this purpose. Gardeners also *INTERR*, or earth up, fellery, endive, and lettuce, to blanch, or whiten, and make them the tenderer.

To *interr* wild flocks in ditches, is what Columella calls, *deponere semina scrobibus*.—There are some trees, as willows, olives, &c. which grow very well, by *interring* their truncheons, *i. e.* cutting a truncheon, or piece off at both ends, and planting it in the ground: which is what the Latins call, *inburnare taleas, taleis ferere*.

INTERROGATE, a judiciary act, performed by a judge, or commissioner deputed to examine, or question a party; who first gives his oath, that he will answer truly to every thing he is *interrogated*.

INTERROGATION, a figure of rhetoric, in which the passion of the speaker introduces a thing by way of question, to make its truth more conspicuous.

The *interrogation* is a kind of apostrophe which the speaker makes to himself; and it must be owned, that this figure generally adds an uncommon briskness, action, and force to discourse.

INTERROGATION, in grammar, is a point which serves to distinguish such parts of a discourse, where the author speaks as if he were asking questions. Its form is this?

INTERRUPTION, in matters of proportion, denotes the same with *disjunction*.

It is noted thus (: :) and signifies the breaking off of the ratio in the middle of four disjunct or discrete proportionals: as A : B : : C : D; that is, as A is to B, so is C to D. See **RATIO, PROPORTION, &c.**

INTERRUPTION is also a figure in rhetoric, wherein a person breaks off his discourse suddenly, to shew some passion.

INTERSECTION, in mathematics, the cutting of one line, or plane, by another; or the point or line wherein two lines, or two planes, cut each other.

The mutual *intersection* of two planes is a right line. The centre of a circle is in the *intersection* of two diameters. The central point of a regular or irregular figure of four sides, is the point of *intersection* of the two diagonals.

The equinoxes happen when the sun is in the *intersections* of the equator and ecliptic.

INTERSOILING, in husbandry, the laying one kind of soil, or mould, upon another; as clay on sand, sand on earth, &c.

INTERSPERSUM *Vacuum*. See the article **VACUUM**.

INTERSPINALES *Collæ*, the name of five pair of small muscles discovered by Mr. Cowper; and by him so called, from their position along the spina.

They arise from each double process of the spine of the neck, and run from the upper one to the next below, into which they are inserted.

They serve to draw together the vertebrae of the neck; and are more especially proper to this part, as having both their origin and insertion in it.

INTERSTELLAR, a word used by some authors to express those parts of the universe which are without, and beyond, the limits of our solar system.

In the *interstellar* regions are supposed to be several other systems of planets moving round the fixed stars, as the centres of their respective motions: And if it be true, as it is not improbable, that each fixed star is thus a sun to some habitable orbs, that move round it, the *interstellar* world will be infinitely the greatest part of the universe.

INTERTIËS, or **INTERDUCES**, in architecture, those small pieces of timber which lie horizontally betwixt the summers, or betwixt them and the fell, or rafter.

INTERTRANSVERSALES *Collæ*, certain muscles between the *transverse* processes of the vertebrae of the neck; serving for divers motions of the head: of the same size and figure with the *interspinales*, and observed by the same author. See *Philosoph. Transact.* n. 251. p. 131.

INTERVAL *, the distance or space between two extremes, either in time, or place.

* The word comes from the Latin *intervalum*, which, according to Isidore, signifies the space *inter fossam et murum*, between the ditch and the wall: Others note, that the flakes or piles, driven into the ground in the ancient Roman bulwarks, were called *valla*, and the interstices or vacancy between them *inter-valla*.

Angle of **INTERVAL**. } See the article { **ANGLE**.
Lucid **INTERVALS**. } **LUCID**.

INTERVAL, in music, the difference between two sounds, in respect of acute and grave; or that imaginary space terminated by two sounds differing in acuteness or gravity.

When two or more sounds are compared in this relation, they are either equal or unequal in the degree of tune: Such as are equal are called *unisons*, with regard to each other, as having one tune; the other, being at a distance from each other, con-

stitute what we call an *interval* in music; which is properly the distance in tune between two sounds.

Intervals are distinguished into *simple* and *compound*.

Simple INTERVAL, is that without parts, or division: such are the octave, and all that are within it; as the second, third, fourth, fifth, sixth, and seventh, with their varieties.

Compound INTERVAL, consists of several lesser *intervals*: such are all those greater than the octave; as the ninth, tenth, eleventh, twelfth, &c. with their varieties.

But this distinction, it is to be observed, regards practice only, because there is really no such thing as a least *interval*. Besides, by a *simple interval* is not meant here the least practised, but such as though it were equal to two or more lesser which are in use, yet when we would make a found move so far up or down, we always pass immediately from one of its terms to the other.—What is meant then by a *compound interval*, will be very plain: It is such, whose terms are in practice taken either in immediate succession, or such where the found is made to rise and fall from the one to the other, by touching some intermediate degree; so that the whole becomes a composition of all the *intervals* from one extreme to the other.

What we here call a *simple interval*, the ancients called a *diastem*, and the *compound* they called a *system*.

Each of these has its differences; even of the *simple* there are some greater, and others less: but they are always discord; but of the *compound* or *systems*, some are concord, others discord. Unisons, it is plain, cannot possibly have any variety; for where there is no difference, as in unisonance, which flows from a relation of equality, it is plain there can be no distinction: Unisons therefore must all be concords. But an *interval* depending on a difference of tune, or a relation of inequality, admits of variety; and so the terms of every *interval*, according to their particular relation or difference, make either concord or discord. Some indeed have restrained the word *concord* to *intervals*, making it include a difference in tune: but this is precarious; for as the word *concord* signifies an agreement of sounds, it is certainly applicable to unisons in the first degree. *Intervals*, it is plain, may differ in magnitude, and there may be an infinite variety, according to the possible degrees of tune; for there is no difference so great or so little, but a greater or a less may possibly be conceived. It is true, with regard to practice, there are limits, which are the greatest and least *intervals* our ears are judges of, and which may be actually produced by voice or instrument.

The degrees of tune are proportional to the numbers of vibrations of the sonorous body in a given time, or the velocity of their courses and recourses.—Now these differences in tune constitute, as has been already said, the *intervals* in music; these therefore must be greater or less, as the differences are; and it is the quantity of these, which is the subject of the mathematical part of music.

Those *intervals* are measured, not in the simple differences or in arithmetical ratio's of the numbers expressing the lengths or vibrations, but in their geometric ratio's; so that the same *interval* depends on the same geometrical ratio, and *vice versa*. It is however to be observed, that in comparing the equality of *intervals*, the ratio's expressing them must be all of one species; otherwise this absurdity will follow, that the same two sounds may make different *intervals*.—To describe the particular methods of measuring the inequality of *intervals*, would be too tedious: this one rule may be observed, that, to determine in general which of two or more *intervals* are the greatest, take all the ratio's as proper fractions, and the least fraction will be the greatest *interval*.

The ancients were extremely divided about the manner of measuring *intervals*.—Pythagoras and his followers measured them by the ratio's of numbers. They supposed the differences of gravity and acuteness, to depend on the different velocities of the motion which causes found; and therefore concluded, that they could only be accurately measured by the ratio's of those velocities. Which ratio's are said to have been first investigated by Pythagoras, on occasion of his passing by a smith's shop, and observing a concordance between the sounds of hammers striking on the anvil.

Aristoxenus opposed this. He thought reason and mathematics had nothing to do in the case, and that sense was the only judge in the dispute; the other being too subtle to be of any use. He therefore determined the octave, fifth and fourth, which are the most simple concords, by the ear; and by the difference of the fourth and fifth, he found out the tone; which, once settled as an *interval*, the ear could judge of, he pretended to measure every *interval* by various additions, and subtractions made of these mentioned one with another: But this method is very inaccurate.

Ptolemy keeps a middle course betwixt the two: He finds fault with the one for despising reason, and with the other for excluding sense; and shews how these two may mutually assist each other in this matter.

Concinnous INTERVALS. }
 Diminished INTERVAL. } See the article }
 Harmonical INTERVAL. } CONCINNOUS:
 DIMINISHED:
 HARMONICAL.

INTER TWISTED SUTURE. See the article SUTURE.
 INTESTATE, a person who dies without making a will.
 An heir *ab-intestate*, is a person who inherits an estate by some other right, than that of will or testament.

Heretofore, those who died *intestate*, were held infamous, and accursed; in regard, by the canons of several councils, every person was enjoined to bequeath a part of his estate (and Matthew Paris says it was at least to be a tenth part) to the church, for the safety of his soul; which, a person who neglected to make a will, and to leave this legacy to the church, was judged to have abandoned.—Several councils took on them to command the priests to solicit dying persons to be charitable to the church; and this they did so earnestly, that absolution and the viaticum were denied to those whom they could not prevail on; so that they made no difference between these *intestates* and self-murderers; and they were alike denied christian burial.—Du Cange adds, that all who died without absolution, without receiving the viaticum, and without leaving alms to the church, (even though they died suddenly) had their effects seized and confiscated to the use of the church, the bishop, &c.

In the English law there are two kinds of *intestates*: the one *de facto*, which are those who make no will at all; the other *de jure*, called also *quasi intestati*, which are those who make a will; but such a one as is null and void, either from the executors refusing to act, or from some other cause: in which case they are judged to die as *intestate*, *quasi intestati*.

INTESTINE Motion, that change of place which is found between the component particles whereof any body or mass consists.

The Cartesian suppose a continual *intestine motion* essential to fluidity.

It is certain, where the attracting corpuscles of any fluid are elastic, they must necessarily produce an *intestine motion*; that is, a visible motion or change of place among the minute parts of such fluid; and this greater or less, according to the degrees of their elasticity, and attractive forces. For two elastic particles after meeting, will fly from one another (abstracting the resistance of the medium) with the same degree of velocity with which they met: But when in flying back from one another, they approach other particles, their velocity will be increased.

INTESTINE War. See the article WAR.

INTESTINES, INTESTINA, in anatomy, the *guts*, or *bowels*; those hollow, membranous, cylindrical parts, extended from the right orifice of the stomach to the anus; by which the chyle is conveyed to the lacteals, and the excrements are voided.

The *intestines* seem to be nothing but a continuation of the stomach; as, consisting of the same number of coats, and fabricated in the same manner; they are protended with various circinvolutions and inflexions to the anus, through which they discharge the excrementitious part of their contents out of the body.

They are, when separated from the mesentery, to which they are all along connected, of a very great length; ordinarily about six times as long as the persons height whose they were. And though they seem to be but one continued channel or fistula, yet because in several parts their magnitude, figure, and thickness are different, they are in general divided into the *thick* and *small*; and these again are each of them subdivided into three; the three small are called *duodenum*, *jejunum*, and *ileum*; and the thick, *cæcum*, *colon*, and *rectum*.

They have all of them, in common, a kind of vermicular motion, which, beginning at the stomach, is propagated downwards, and is called the *peristaltic motion*. To facilitate that, they are generally lubricated with a great deal of fat, especially the thick ones, whose surface being somewhat more uneven, and the contents less fluid than those of the small, they need somewhat more to make them slide easy.—See *Tab. Anat. (Splanch.) fig. 3. lit. m. fig. 6. lit. a. b. c. fig. 7. d. e.* see also PERISTALTIC.

INTESTINA tenuia, the *Small Guts*.—The first is called *duodenum*, and reaches from the right orifice of the stomach, as far as the vertebræ of the back on the left side, where, at the first angle made by the *intestines* it ends, which is about twelve inches, from which measure it seems to have taken its name. This measure, however, is far from being very exact, as being much too largely computed. Into this gut the gall-duct and pancreatic-duct empty themselves, and their several liquors here mix with the chyle.

The next *intestine* is the *jejunum*, so called, because it is generally found more empty than the rest; which may be occasioned partly by the fluidity of the chyle, which is greater in this *intestine* than in any of those that follow it; and partly by its capacity, being somewhat larger than that of the *duodenum*, and therefore it gives a freer passage; and perhaps

also the irritation of this gut through the acrimony of bile, which is discharged into the *intestines* a little before the beginning of this gut, may contribute something towards accelerating the passage of the contents. However, it may seem sufficient, that through the great number of lacteals, with which this gut abounds more than any other, the descent of the contents, which are here deprived of their most fluid parts, should in the rest be more sluggish, by reason of their great confidence.—This *intestine* is allowed to possess almost the whole umbilical region, and its length is generally computed to be about twelve or thirteen hands breadth.

The *ileum*, which is the third *intestine*, is situated below the navel, and fills the ilia with its numerous folds and convolutions.—It is much the longest of all the *intestines*, being esteemed to be one and twenty hands long: But these estimates are somewhat arbitrary, because it is not exactly settled among anatomists, where the jejunum ends, or the ileum begins; neither is it easy or necessary to do it.—In both this and the preceding *intestine*, the inner tunic is much corrugated, the loose folds of which have been thought to do, in some measure, the office of valves, and have therefore by authors been called *valvule conniventes*; which are framed, as in the stomach, only by the inner coat being larger than the outward.

INTESTINA crassa, the *Thick Guts*.—The first is called the *cæcum*, which has a lateral insertion into the upper end of the colon, and is not perforated at its other extremity, but hangs to it like the finger of a glove, and is about three or four inches long. The true use of this part is not yet determined, and some late anatomists have thought that the name likewise is mistaken, not allowing this to be the *cæcum* of the ancients, which they imagined to be that thick globous part of the colon, which is immediately appended to the ileum, and therefore they have given this part the name of *appendicula vermiformis*. This *cæcum*, or appendix, is proportionally bigger in infants than in adults, and in many other animals even smaller than in men; and is, at the unperforated extremity, slightly connected to the right kidney.

The next of the thick *intestines* is the *colon*, which is much the largest, and most capacious of them all. It begins with the *cæcum*, and is with that connected to the right kidney. Thence with a winding course it proceeds towards the liver, where it is sometimes tied to the gall-bladder, and by that is tinged with yellow. From the liver it runs across under the bottom of the stomach, where it is by very fine thin membranes fastened to the spleen, and marches over the left kidney, where its cavity is sometimes very much freighted, and descending so to the bottom of the os ileum, and from thence returning to the upper part of the os sacrum, and there making the figure of a circumflex, it ends in the rectum.—At the entrance of the ileum into this gut there is placed a valve, formed out of the production of the inward coat of the ileum, which, like the finger of a glove, when its extremity is cut off, hangs loose in the cavity of the colon, by which means it stops the return of the excrements, though sometimes, as in inversions of the peristaltic motion, it proves not sufficient for that use. It has a great many cellular, or, as it were, distinct cavities, framed by a coarctation of the gut by two ligaments, or bundles of membranous fleshy fibres, about half a finger broad, each running on either side the gut opposite to each other, the whole length of it; and as it were girding it in at certain distances, thereby making it resemble a glass incorporator used in mixing oil and vinegar.—The last of the *intestines* is the *rectum*, which reaches from the os sacrum to the anus, and is plain, without cells. It is fast tied to the ossa sacrum and coccygis, by means of the peritonæum, and in men to the neck of the bladder of urine; in women to the vagina uteri, to which it is so strongly connected by a membranous substance, that the substance of the vagina and *intestine* are hardly distinguishable from one another. The length of this gut is ordinarily about a hand's breadth and an half, and its capacity about the thickness of three fingers; its lower end, the anus, is furnished with three muscles, *viz.* the *sphincter ani*, and two *levatoris ani*, which see.

There are also in the *intestines* a great number of glands, which, in the *intestina tenuia*, are gathered together in heaps, as it were, like bunches of grapes. In these *intestines* they are very small, and were it not for their coacervation, they would be scarce visible. But in the *intestina crassa* they are much larger, not gathered like the others, but dispersed; and, though very numerous, they come under the denomination of *solitary glands*. These glands discharge a liquor into the *intestines*, whether ordinarily for any thing more than the lubrication of the *intestines*, and diluting their contents, is not certain; though through these seems the greatest part of the discharge to be made, which, either upon extraordinary fluxes, or upon the administration of cathartics, we have frequent occasions to observe.

The *intestines*, in general, are furnished with blood from the mesenteric arteries, which is returned by the meseric veins: But the duodenum receives a branch of an artery from the cæliac, which is called *duodena*; to which answers a vein of the

same.

same name, that likewise returns the blood to the porta; the rectum receives others, which are called *hæmorrhoids*; the internal from the inferior mesenteric, and the external from the hypogastric, with veins corresponding of the same name, that also go to the porta. These vessels spread the *intestines* with abundance of ramifications, and are frequently diversified in several subjects of the same species; much less are they to be depended upon for a uniform appearance in animals of different kinds. The nerves of the *intestines* come some of them from those of the stomach, and some from the great mesenteric plexus, which distributes branches to all the *intestines*. The remaining vessels of the *intestines* are the lymphæducts, and venæ lactææ.

INTIRE *Tenancy*. See the article **ENTIRE TENANCY**.
INTRANSITIVE Verbs, in grammar, such whose action does not (*transire*) pass on an object, or subject. See **VERBS Nouter**.

INTRIGUE*, or **INTREAGUE**, an assemblage of events, or circumstances occurring in an affair, and perplexing the persons concerned in it.

* The word is French, *intrigue* formed from the Latin *intricare*; which, according to Nonius, comes from *tricare*, entanglements; and that from the Greek *τροχον*, hairs: *quod pilis gallinæis involvant & impediunt capilli*. Which conjecture is adopted by Tripaud, who will have the word *intrigue* to be primarily and properly understood of chickens, which have their feet entangled in hair: and to be derived from the Greek *ει*, and *τροχ*, hair.

INTRIGUE, is more particularly used to signify the plot of a play, or romance; or that point wherein the principal characters are the most embarrassed, through the artifice and opposition of certain persons, of the unfortunate falling out of certain accidents, and circumstances.

In a tragedy, comedy, or epic poem, there are always two designs; the first and principal is that of the hero of the piece; the second contains the designs of all those who oppose him. These opposite causes produce opposite effects, to wit, the efforts of the hero for the execution of his design, and the efforts of those who thwart it. As those causes and designs are the beginning of the action, so those efforts are the middle, and there form a knot or difficulty, which we call an *intrigue*, that makes the greatest part of the poem. It lasts as long as the mind of the reader or hearer is suspended about the event of those opposite efforts; the solution or catastrophe commences when the knot begins to unravel, and the difficulties and doubts begin to clear up.

The *intrigue*, or plot of the *Iliad* is twofold; the first comprehends the three days fighting in Achilles's absence, and consists, on the one side, in the resistance of Agamemnon and the Greeks, and on the other, in the inexorable temper of Achilles. The death of Patroclus unravels this *intrigue*, and makes the beginning of a second. Achilles resolves to be revenged, but Hector opposes his design; and this forms the second *intrigue*, which is the last day's battle.

In the *Æneid* there are also two *intrigues*: the first is taken up in the voyage and landing of Æneas in Italy; the second in his establishment there. The opposition he met with from Juno, in both those undertakings, forms the *intrigue*.

As to the choice of the *intrigue*, and the manner of unravelling it, it is certain they ought both to spring naturally from the ground and subject of the poem.—Bosiu gives us three manners of forming the *intrigue* of a poem; the first, is that already mentioned; the second, is taken from the fable and design of the poet; in the third, the *intrigue* is so laid, as that the solution follows from it of course.

INTRINSIC, a term applied to the inner, real, and genuine values, properties, &c. of any thing; in opposition to their *extrinsic*, apparent, or popular values, &c. See **EXTRINSIC**.

INTRONATI, the name of an academy at Sienna in Italy.

The members of this academy contented themselves, at their first institution, with establishing the following six short laws: 1^o. To pray. 2^o. To study. 3^o. To be merry. 4^o. To offend no body. 5^o. Not to credit too lightly. 6^o. To let the world talk.

INTRUSION*, in the canon law, signifies the enjoyment of a benefice, or exercise of an office, without a good title to it. See **ENTRUSTION**.

* The word is derived from the Latin verb *intrudere*, to thrust in, or enter by force.

Intrusion disqualifies the party from ever holding the benefice.
INVALID, a person wounded, maimed, or disabled for action by age.

At Chelsea and Greenwich are magnificent hospitals, or rather colleges, built for the reception and accommodation of *invalids*, or soldiers and seamen, worn out and disabled in the service.

At Paris is a college of the same kind, called *les Invalides*, which is accounted one of the finest buildings in that city.

INVECTED, in heraldry, denotes a thing fluted, or furrowed.

Invected is the just reverse of *engrailed*, in which the points are turned outward to the field; whereas in *invected* they are turned inward to the ordinary.

INVENTION, denotes the act of finding any thing new; or even the thing thus found.

Thus we say, the *invention* of gun-powder, of printing, &c.

The alcove is a modern *invention* owing to the Moors.

The Dorick, Ionic, and Corinthian orders are of Greek *invention*; the Tuscan and Composite of Latin *invention*.

Janfon ab Almelooven has written an *Onomasticon of inventions*, wherein are shewn, in an alphabetical order, the names of the inventors, and the time, place, &c. where they were made.—Pancirollus has a treatise of old *inventions* that are lost, and new ones that have been made; Polydore Virgil has also published eight books of the *inventors* of things, *De Inventoribus Rerum*.

INVENTION is also used for the discovery of a thing hidden.

The Romish church celebrates a feast on the fourth of May, under the title of, *invention of the holy cross*.

INVENTION is also used for subtilty of mind, or somewhat peculiar in a man's genius, which leads him to the discovery of things new.

In which sense we say, a man of *invention*: Wolfius has made some essays towards an art of *invention*.

INVENTION, in rhetoric, signifies the finding out, and chusing of certain arguments which the orator is to use for the proving his point, or moving his hearers passions.

Invention, according to Cicero, is the principal part of oratory: He wrote four books *De Inventionibus*, whereof we have but two remaining.

This *invention* of the orators cannot, according to lord Bacon, be properly called *invention*: to *invent*, is to discover things not yet known, not to recollect those that are; whereas the use and office of this rhetorical *invention*, is only out of the stock of knowledge laid up in the mind, to select such articles as make for the purpose.

The same author divides this faculty of *invention* into two parts, the one *topical*, the other *promptuary*; the first points out the way in which we are to pursue the argument, the latter only lays up and disposes things, for which we have frequent occasion, in the mind.

INVENTION, in poetry, is applied to whatever the poet adds to the history of the subject he has chosen, as well as to the new turn he gives it.

INVENTION, in painting, is the choice which the painter makes of the objects that are to enter the composition of his piece.

M. Felibien gives the general name *invention* to every thing that depends on the genius of the painter, as the ordonnance, the disposition of the subject, and even the subject itself, when it is new.

In another place that author distinguishes *invention* into two kinds; to wit, that which arises immediately from the mind of the painter, and that which he borrows from some other. The first is, when he absolutely invents the subject himself; and the second, when he borrows it from history, fable, &c.

De Piles observes, that *invention* is different from *disposition*, and that it is those two things together that form *composition*: for after having made a good choice of objects proper for the subject, they may be ill-disposed; and then, though the *invention* be never so good, the disposition or ordonnance will be faulty, and the piece will displease.

Of all the parts of painting, *invention*, doubtless, is that which gives the painter the fairest occasions of shewing his genius, his imagination, and his good sense.

INVENTORY, in law, a catalogue, or repertory orderly made, of all a dead man's goods, and chattels, prized by four or more credible men, which every executor or administrator is obliged to exhibit to the ordinary at such time as he shall appoint.

The use of the *inventory* is borrowed from the civil law; for whereas by the law of the ancient Romans the heir was obliged to answer all the testator's debts; by which means, inheritance sometimes became rather prejudicial than profitable: To obviate this inconvenience, Justinian ordained, that if the heir would first exhibit a true *inventory* of all the testator's effects, he should be no farther charged than to the value of the *inventory*.

INVENTORY, in trade, is a list or particular valuation of goods, &c. See **VALUE, APPRAISEMENT, &c.**

INVERSE, is applied to a manner of working the rule of three, or proportion, which seems to go backwards, or contrarily to the order of the common and direct rule.

In the rule of three direct, the first term is to the second, as the third is to the fourth; that is, if the second be greater than

than the third, or less than the first, in any proportion, the fourth is less than the third in the same proportion. — But in the *inverse* rule, the fourth term is as much greater than the third, as the second is less than the first.

In the *inverse* rule, therefore, the proportion is not, as the first is to the second, so is the third to the fourth; but as the fourth is to the first, so is the second to the third.

For instance, in the direct rule we say, If three yards of tapestry cost twenty pounds, how much will six cost? The answer is, forty. In the *inverse* rule we say, If twenty workmen make ten yards in four days, in how many days will forty do it? The answer to this is, in two days.

INVERSE Method of Fluxions. See the article FLUXIONS.

INVERSE Planting. See the article PLANTING.

INVERSE Proportion. See the article PROPORTION.

INVERSION, the act whereby any thing is inverted, or turned backwards.

Problems, in geometry, and arithmetic, are often proved by *inversion*, that is, by a contrary rule or operation.

INVERSION, in grammar, is where the words of a phrase are ranged in a manner not so natural as they might be.

For an instance: 'Of all vices, the most abominable, and that which least becomes a man, is impurity.'—Here is an *inversion*: the natural order being this Impurity is the most abominable of all vices, and that which least becomes a man.

An *inversion* is not always disagreeable, but sometimes has a good effect.

INVERTED Crescent.

INVERTED Point. } See the article } CRESCENT.

INVERTED Volt. } } POINT.

} } VOLT.

INVESTIGATION, properly denotes the searching, or finding any thing out by the tracks, or prints of the feet.

Hence mathematicians, schoolmen, and grammarians, came to use the term in their respective researches.

INVESTIGATION of a Theme, is the art, method, or manner of finding the themes of verbs, that is, the primitive tense, mood, and person, of any verb, far removed from its source. To understand a Greek author, it is absolutely necessary to be well acquainted with the method of *investigating* a theme: This theme in the Greek tongue, is the present tense of the indicative mood.

Clenard was the first who introduced this term into grammar; he gives the title *investigatio thematicis*, to that part where he teaches the manner of finding whence any person or tense of a verb proceeds, and of reducing it to its primitive word, or finding its indicative.

INVESTING, the act of conferring on any one the right or property of a fee, dignity or office; or of ratifying and confirming what has been obtained elsewhere.

The emperor pretends to a right of *investing* several princes both in Germany and Italy: There was formerly a particular ceremony for the *investing* of bishops.

After the election of a knight of the garter, he is *invested* by the sovereign with two principal ensigns of the order, the garter and George.—Before his installation, he is also *invested* with the habit of the order.

INVESTING, in the military art, signifies the opening a siege, and the incamping of an army round the place, to block up its avenues, and prevent all ingress and egress.

It is the cavalry that always begins to *invest* a place.

INVESTING, in common law, signifies the putting in possession. A tenant is *invested* by giving him a verge or rod into his hands, and administering an oath.

Others define it thus, *Investive est in suum jus aliquem introducere*, to give lively of seisin or possession. See LIVERY, and SEISIN.

INVESTITURE, is used both for the right, and the act, of investing a tenant or vassal; that is, of receiving the faith and homage, by which a vassal becomes seized and possessed of a fee by his lord.

Investiture was antiently performed by rehearsing a formula of words; afterwards, by the delivery of such things as had the nearest resemblance to what was transferred. Thus, land passed by the delivery of a turf; and to these the trees were transferred at the same time, a bough was cut, and delivered along with it.

In after-times the things by which *investitures* were made, were not so strictly observed. — Many were invested by the delivery of a staff, a glove, a knife, a piece of a cloke, of a strap, and a girdle; or by pricking the thumb, by giving the keys, a spit, a blow, a ring, a turf, a bough, a straw, &c. The *investiture* of a kingdom or lordship was performed by a standard, a banner, a cap, a sword, a bow, arrows, spurs, &c. The symbols were sometimes preserved in the repositories of the houses, and were annexed to the titles.

INVESTITURES were also used with regard to spiritual benefices. These were frequently performed by delivering the crozier and pastoral ring.

The kings of England and France, the emperors of Germany, &c. had formerly this right: so that on the death of a prelate, his clergy sent the crozier, &c. to their sovereign,

to be used at the ceremony of *investing* his successor. The first who disputed this privilege with them, was Gregory VI. Gregory VII. did it to some purpose; he excommunicated the emperor Henry IV. and forbade all ecclesiastics, under pain of *excommunication*, to receive *investiture* at the hands of secular princes. Paschal II. however, was obliged to confirm Henry V. in the right of giving *investitures*; but repenting what he had done, he excommunicated him, and reduced him to a necessity of begging absolution. At length that emperor was obliged, by pope Gelasius II. solemnly to renounce all *investitures* and elections.

INVOCATION, an act whereby we adore God, and call on him for his assistance.

The Romanists also practise *invocation* of saints; begging them to intercede with God in their behalf. This is one of the grand articles of dispute between the Romanists and the Reformed.

INVOCATION, in poetry, an address at the beginning of a poem, wherein the poet calls for the assistance of some god, particularly of his muse, or the deity of poetry. See MUSES.

This part is absolutely necessary in an epic poem, in regard the poet relates things which he could not be supposed to know, unless some deity inspired him. Besides, this serves his readers as an example of piety and devotion, which ought to be the foundation of his whole work. To these it may be added, that the gods themselves are to have a part in the action, and it is not decent he should set them to work, without first asking them leave.

Indeed, in the course of an epic poem, there are usually several *invocations*; particularly where any thing extraordinary or miraculous comes to be related, as that when Virgil describes the metamorphosis of Æneas's fleet into sea-nymphs: but the first *invocation* is always the most considerable.

In the *invocation*, Boffu considers two things; the first is, what the poet requests, the second, to what deity he addresses his request. — As to the first, Homer has joined the *invocation* so closely to the proposition, that he seems to *invoke* his muse for the whole work. — But Virgil, on the contrary, only requests his muse to furnish him with a part of his subject, and even mentions what particular part it is he desires.—After proposing his matter in all its extent, he begs the muse to acquaint him with the cause of it. See PROPOSITION.

As to the deity *invoked*, the same author observes, that it must always be, either the divinity that presides over poetry in general, or that which presides over the particular subject of the work. — Ovid's *invocation*, in his *Metamorphoses*, is of this latter kind, and so is that of Lucretius: those of Homer and Virgil are of the former kind; they only invoke the muses; and thus they distinguish between the divinities who preside over poetry, and those who preside over the actions of the poem, and have parts in it.

By the way, it may be observed, that the deities *invoked* are not looked on, even by the poets themselves, as divine personages from whom they expect any real assistance.—Under the name of *muses*, they wish for the genius of poetry, and for all the qualities necessary for the execution of their design.—These are mere allegories, or manners of expressing themselves poetically; just as when they make gods of sleep, of rest, fame, and other natural and moral things. And thus the muses come to be of all ages, countries, and religions; there are Pagan, Christian, Greek, Latin, and English muses.

INVOICE, or **INVOYCE**, a list or account of commodities, with their value, customs, provision, charges, &c. sent by a merchant to his factor, or correspondent in another country.

Book of INVOICE. See the article BOOK.

INVOLUNTARY Motion. See the article MOTION.

INVOLUTION, in algebra, the raising any quantity from its root to any height, or power assigned. See POWER.

Thus, if $a+b$ were to be squared, or raised to its second power, they say, *involve* $a+b$; that is, multiply it into itself, and it will produce $a^2 + 2ab + b^2$.

And if it be *involved* again, or if that square be multiplied by the root, the cube or third power will be produced, *viz.* $aaa + 3aab + 3bba + bbb$. See EVOLUTION.

INWARD banking Angle. See the article ANGLE.

JOACHIMITES, the name of a sect, the followers of one Joachim, abbot of Flora, in Calabria, who was esteemed a prophet while he lived, and left, at his death, several books of prophecies, besides other works; which were condemned together with himself in 1215, by the council of Lateran; and by the council of Arles, in 1260.

The *Joachimites* were particularly fond of certain ternaries. The Father, said they, operated from the beginning till the coming of the Son; the Son from that time to theirs, *viz.* the year 1260, and the holy Spirit then took it up, and was to operate in his turn.—Hence, they divided every thing that related to men, time, doctrine, and manner of living, into three classes or states, according to the three persons in the Trinity; every one of which states either had already, or was hereafter to succeed in its turn: and hence they called their divisions *ternaries*.

The first ternary was that of *men*: This comprehended three states or orders of men; the first state was that of married people, which had lasted, according to them, the whole period of the Father; that is, the time of the Old Testament: The second was that of clerks, which lasted during the time of the Son: The third was that of monks, wherein was to be an uncommon effusion of grace, by the holy Spirit.—The second ternary was that of *doctrine*, which they divided also into three: The Old Testament, which they attributed to the Father; the New, which they attributed to the Son; and the everlasting gospel which they attributed to the holy Spirit.—In the ternary of *time*, they gave all the time elapsed from the beginning of the world till the coming of Christ, to the Father; in which time, said they, the spirit of the law of Moses prevailed. They gave to the Son the 1260 years from Jesus Christ to their time; during which the spirit of grace prevailed.—Lastly, the third, which was to come, and which they called the time of the *greatest grace*, was for the holy Spirit.—Another ternary consisted in the manner of living: In the first time, under the Father, men lived according to the flesh; in the second under the reign of the Son, men lived according to the flesh and the spirit; in the third, which was to last to the end of the world, they were to live according to the Spirit only. The *Jacobinites* maintained, that in the last times all sacraments and signs were to cease; and the truth was to appear openly, and without any veil.

JOBBER, a person who undertakes *jobs*, or small pieces of work.

In some statutes, *jobber* is used for a person who buys and sells cattle for others. See **BROKER**.

JOBENT Nails. See the article **NAILS**.

JOHIS, a sect of heathen religious in the East Indies, who never marry, nor hold any thing in private property; but live on alms, and practise strange severities on themselves. They are subject to a general, who sends them from one country to another to preach. They are properly a kind of penitent pilgrims, and are supposed to be a branch of the ancient Gynnostophists.

They frequent principally such places as are consecrated by the devotion of the people, and pretend to live several days together without eating or drinking. After having gone through a course of discipline for a certain time, they look on themselves as impeccable, and privileged to do any thing; upon which they give a loose to their passions, and run into all manner of debauchery.

JOHN.—*Christians of S. JOHN*. } See } **CHRISTIANS**.
Hermits of S. JOHN Baptist. } } **HERMITS**.
Presters JOHN. } } **PRESTERS**.

JOINDER, or **JOYNDER**, in law, is the coupling or joining two persons in one action, or suit against another.

JOINERY. } See the article } **JOINERY**.

JOINING of Issue. } See the article } **ISSUE**.

JOINT, the juncture, articulation, or assemblage of two, or more things. See **ARTICULATION**.

JOINTS, in architecture, denote the separations between the stones, which are filled with mortar, plaister, or cement.

JOINT, in carpentry, &c. is applied to several manners of assembling, or fitting pieces of wood together.—Thus we say, a *dove-tail joint*, &c. See **MORTISE**, **DOVE-TAIL**, &c.

JOINT-Battery. } See the article } **BATTERY**.

JOINT-Rule. } See the article } **Carpenters JOINT RULE**.

JOINTENANTS, or **JOINT-TENANTS**, in law, those who come to, and hold lands and tenements by one title, *pro indiviso*, or without partition.

These are distinguished from *soli*, or several tenants, from *coparceners*, and from *tenants in common*.—Antiently they were called *participes*, and not *heredes*. See **SOLE Tenant**.

Jointtenants must jointly plead, and be jointly impleaded and sued by others; which is common to them and coparceners.

—But *joint-tenants* have a peculiar quality of survivorship, which coparceners have not; so that if there be two or three *joint-tenants*, and one hath issue, and dies, he, or those *joint-tenants* that survive, shall have the whole by survivorship.

JOINTURE, a covenant whereby the husband, or some friend in his behalf makes over to his wife, on condition of marriage, certain lands and tenements for term of her life, or otherwise, in lieu of dower. See **DOWER**.

JOISTS, or **JOYSTS**, in architecture, those pieces of timber, framed into the girders and summers, on which the boards of floors are laid.

Joists are from six to eight inches square, and ought seldom to lie at a greater distance from each other than ten inches, never than twelve; nor ought they ever to bear at a greater length than ten foot, or to lie less into the wall than eight inches.

Sometimes the carpenters furr their *joists*, as they call it, that is, they lay two rows of *joists*, one over the other.

JONCTURE, or **JOINTURE**, the same with *joint*, which see.

IONIC, in architecture, the name of one of the five orders of columns.—See *Tab. Architect. fig. 32*.

The first idea of the *Ionic* was given by the people of Ionia; who, according to Vitruvius, formed it on the model of a young woman, dressed in her hair, and of an easy, elegant shape: whereas the *Doric* had been formed on the model of a strong, robust man.

The *Ionic* column is the third in order, and is distinguished from the Composite, in that it has none of the leaves of acanthus in its capital; and from the Tuscan, *Doric*, and Corinthian, by the volutes, or rams-horns, which adorn its capital; and from the Tuscan and *Doric* too, by the channels or fluting in its shaft.

This column is a medium between the massive and the delicate orders, the simple and the rich. Its height is eighteen modules, or nine diameters of the column taken at the bottom.—When it was first invented, its height was but sixteen modules; but the artists to render it still more beautiful than the *Doric*, augmented its height, by adding a base to it, which was unknown in the *Doric*.

M. le Clerc makes its entablature to be four modules and ten minutes, and its pedestal six entire modules; so that the whole order makes twenty-eight modules ten minutes.

It is said, the temple of Diana at Ephesus, the most celebrated edifice of all antiquity was of this order.—At present, it is properly used in churches and religious houses, and in courts of justice, and other places of tranquillity and devotion.

This order has one advantage above any of the rest; and it consists in this, that the fore and hind parts of its capital are different from the sides. But this is attended with an inconvenience, when the ordonnance is to turn from the front of the building to the side: to obviate which, the capital may be made angular, as is done in the temple of Fortuna Virilis. Scamozzi, and some other modern Architects, have introduced the upper part of the composite capital in lieu of the *Ionic*, imitating that of the temple of Concord, whose four sides are alike: to render it more beautiful, the volute may be made a little oval and inclining.

IONIC Base. } See the article } **BASE**.
IONIC Corniche. } } **CORNICHE**.
IONIC Frieze. } } **FRIEZE**.
IONIC Pedestal. } } **PEDESTAL**.

IONIC Dialect in grammar, a manner of speaking peculiar to the people of *Ionia*.

At first it was the same with the antient Attic; but passing into Asia, it did not arrive at that delicacy and perfection to which the Athenians attained. Instead of that, it rather degenerated, in Asia Minor; being corrupted with the admixture of foreign idioms.

In this dialect it was that Herodotus, Hippocrates, and Galen wrote.

IONIC Transmigration, was heretofore a celebrated epocha, which took its rise from the retreat of the Athenian colonies; who, upon the death of Codrus, put themselves under the command of his son Neleus, and established the twelve cities of *Ionia* in Asia.

These colonies, according to Eratosthenes, were established fifty years after the return of the Heraclidæ; and, according to Martham, seventy seven years after the taking of Troy.

IONIC Sect, was the first of the antient sects of philosophers.

The founder of this sect was Thales, who being a native of Miletus in Ionia, occasioned his followers to assume the appellation of *Ionic*.

It was the distinguishing tenet of this sect, that water was the principle of all natural things.

This is what Pindar alludes to in the beginning of his first Olympic ode.

JOVIALE Arcanum. } See the article } **ARCANUM**.

JOVIALE Bezoardicum. } } **BEZOARDICUM**.

JOURNAL, a day-book, register, or account of what passes daily. See **DIARY**.

JOURNAL, in merchants accounts, is a book into which every particular article is posted out of the waste-book, and made debtor.—This is to be very clearly worded, and fairly engrossed.

JOURNAL, in sea-affairs, is a register kept by the pilot and others, wherein notice is taken of every thing that happens to the ship from day to day, and from hour to hour, with regard to the winds, the rhumbs, the rake, soundings, &c. in order to enable him to adjust the reckoning, and determine the place where the ship is.

JOURNAL, is now become a common name for news-papers, which detail the daily transactions of Europe.

JOURNAL is also used for the title of several books which come out at stated times, and give abstracts, accounts, &c. of the new books that are published, and the new improvements daily made in arts, and sciences.

The first journal of this kind was the *Journal des Savans*, printed at Paris: The design was set on foot for the ease of such as too busy, or too lazy, to read the entire books themselves. It seems an excellent way of satisfying a man's curiosity, and of becoming learned upon easy terms: And so useful

ful has it been found, that it has been executed in most other countries, though under a great variety of titles.

Of this kind are the *Philosophical Transactions* of London; the *Acta Eruditorum* of Leipzig; the *Nouvelles de la Republique des Lettres* of Mr. Bayle, &c. the *Bibliothèque Universelle, Choisie, & Ancienne & Moderne*, of M. le Clerc; the *Memoires de Trevoux*, &c.

In 1692, Juncker printed in Latin, *An Historical Treatise of the Journals of the Learned*, published in the several parts of Europe; and Wolfius, Struvius, Morhoff, Fabricius, &c. have done something of the same kind.

The *Memoirs of the Royal Academy of Sciences*; those of the *Academy des Belles Lettres*; the *Miscellanea Naturæ Curiosorum*; the experiments of the academy del Cimento; the *Acta Philo-Sophicorum Naturæ & Artis*, which appeared from March 1686 to April 1687, and which are a history of the academy of Breffe; and the *Miscellanea Berolinensia*, or memoirs of the academy of Berlin, are not so properly Journals, though they are frequently ranked in the number.

Juncker and Wolfius give the honour of the first invention of Journals to Photius. His *Bibliotheca*, however, is not altogether of the same nature with the modern Journals; nor was his design the same. It consists of Abridgments, and extracts of books which he had read during his embassy in Persia.

M. Salo first began the *Journal des Savans* at Paris in 1665, under the name of the Sieur de Hedouville; but his death soon after interrupted the work. The abbot Galois then took it up, and he in the year 1674 gave way to the abbot de la Roque, who continued it nine years, and was succeeded by M. Cofin, who carried it on till the year 1702; when the abbot Bignon instituted a new society, and committed the care of continuing the *Journal* to them, who improved and published it under a new form.—This society is still continued, and M. de Voyer has the inspection of the *Journal*; which is no longer the work of any single author, but of a great number.

The other French Journals are the *Memoirs and Conferences of Arts and Sciences*, by M. Dennis, during the years 1672, 1673, and 1674: *New Discoveries in all the Parts of Physic*, by M. de Blegny. The *Journal of Physic*, begun in 1684; and some others, discontinued almost as soon as begun.

The *Nouvelles de la Republique des Lettres*, news from the republic of letters, were begun by M. Bayle in 1684, and carried on by him till the year 1687, when M. Bayle being disabled by sickness, his friends, M. Bernard and M. de la Roque, took them up, and continued them till 1699. After an interruption of nine years, M. Bernard resumed the work, and continued it to the year 1710. The *History of the Works of the Learned*, by M. Bafnage, was begun in the year 1680, and ended in 1710. The *Universal Historical Library*, by M. le Clerc, was continued to the year 1693, and continued twenty five volumes. The *Bibliothèque Choisie* of the same author, began in 1703. The *Memoirs for a History of Sciences and Arts*, usually called *Memoires des Trevoux*, from the place where they are printed, began in 1701. The *Essays of Literature*, reached but to a twelfth volume in 1702, 1703, and 1704: These only take notice of ancient authors. The *Journal Litteraire*, by father Hugos, begun and ended in 1705.

At Hamburg, they have made two attempts for a French Journal, but the design failed: An *Ephemerides Savantes* has also been undertaken, but that soon disappeared. A *Journal des Savans*, by M. Darts, appeared in 1694, and was dropt the year following. That of M. Chauvin begun at Berlin in 1696, held out three years; and an essay of the same kind was made at Geneva. To these may be added, the *Journal Litteraire* begun at the Hague in 1715; and that of Verdun, and the *Memoires Litteraires de la Grande Bretagne*, by M. de la Roche, whereof there have been fifteen tomes, and which is confined to English books alone.

The English Journals are, the *History of the Works of the Learned*, begun at London in 1699. *Conjura Temperum*, in 1708. About the same time there appeared two new ones; the one under the title of, *Memoirs of Literature*, containing little more than an English translation of some articles in the foreign Journals, by M. de la Roche; the other a collection of loose tracts, entitled, *Bibliotheca curiosa*, or a *Miscellany*.

The Italian Journals are, that of abbot Nazari, which lasted from 1668 to 1681, and was printed at Rome. That of Venice began in 1671, and ended at the same time with the other: The authors were, Peter Moretti and Francis Miletta. The *Journal of Parma*, by Roberti and father Bacchini, was dropped in 1690, and resumed again in 1692. The *Journal of Ferrara*, by the abbot de la Torre, begun and ended in 1691. *La Galeria di Minerva*, begun in 1696, is the work of a society of men of letters. Signior Apostolo Zeno, secretary to that society, begun another *Journal* in 1710, under the protection of the grand duke: it is printed at Venice, and several persons of distinction have a hand in it. The *Paffi Eruditi della Bibliotheca Volante*, were published at Parma.

The principal among the Latin Journals is that of Leipzig, kept under the title of *Acta Eruditorum*, begun in 1682. P. P. Manzani begun another at Parma. The *Nova Litteraria*

Maris Baltici, lasted from 1698 to 1708. The *Nova Litteraria Germanica*, collected at Hamburg, begun in 1703. The *Acta Litteraria ex Manuscriptis*, and the *Bibliotheca curiosa*, begun in 1705, and ended in 1707, are the work of Struvius. Meff. Kuffer and Sike, in 1697, begun a *Bibliotheca Novorum Librorum*, and continued it for two years. The *Swiss Journal*, called *Nova Litteraria Helvetica*, was begun in 1702, by M. Scheuchzer; and the *Acta Medica Hafnensia*, published by T. Bartholin, make five volumes from the year 1671, to 1679.

There are two Low-Dutch Journals; the one under the title of *Boeckzal van Europe*: it was begun at Rotterdam in 1692, by Peter Rabbus; and continued from 1702 to 1708, by Meff. Sewel and Gavern; the other is done by a physician, called Ruiter, who began in 1710.

The German Journals of best note are, the *Monatlichen Unterredungen*, which held from 1689, to 1698. The *Bibliotheca curiosa* begun in 1704, and ended in 1707, both by M. Tentzel. The *Journal of Hanover* begun in 1700, and continued for two years by M. Ecard, under the direction of M. Leibnitz, and afterwards carried on by others. The *Theological Journal*, published by M. Loeffcher, under the title of *Altes & Neues*, that is, old and new. A third at Leipzig and Francfort, the authors Meff. Walterck, Kraufe, and Groschuffius; and a fourth at Hall, by M. Turk.

JOURNEY, Sabbath Day's. See the article SABBATH.

JOURNEY-MAN*, antiently signified a person who wrought with another by the day; though now, by the statute, it extends to those likewise who covenant to work with another in their occupation or trade by the year.

* The word is formed from the French *journee*, a day's work.

JOY. See the articles PLEASURE, and PAIN.

JOYNER'S Press. See the article PRESS.

JOYNERY, the art of working in wood, and of fitting or joining various parts or members of it together.

The French call it *menuiserie*, from *minutaria* small work; by which it is distinguished from *carpentry*, which is conversant in the larger and less curious work.

Column of JOYNERY. See the article COLUMN.

IPECACUANHA, a little wrinkled root, about the thickness of a moderate quill, brought hither from several parts of the West-Indies; much used as an emetic, and against diarrhoeas and dysenteries.

There are four kinds of *Ipecacuanha*; viz. a *brown*, a *black*, a *grey*, and a *white* one;—the grey is most esteemed in physic; though the brown is that the most used, as being easiest had:—This latter is firm, twisted, difficult to break, of a sharp bitter taste, and grows plentifully not far from Carthagea.—The root of the grey *ipecacuanha* is longer than any of the other sorts: It is also more violent in its operation. It comes from Peru, by the way of Porto-bello: The Spaniards call it *hexagilla*.—The white *ipecacuanha* differs from the others, not only in colour, but in figure too, being less twisted, or rugged, than them; and more resembling the root of white dittany: This grows in Brazil and Martinico.

The *ipecacuanha* is purgative, and astringent; it is also an excellent vomitive; and is found one of the best and surest remedies hitherto discovered for a dysentery.

There are divers false species of *ipecacuanha*, or roots, which, on account of their external appearance, bear the denomination of *ipecacuanha*; and are sometimes sold for it.—Dr. Douglas mentions two: the one *white*, resembling the true white, only larger in size, straighter and softer to the touch.—The other *brown*, of a deeper colour than the true brown, and sometimes mixed with red: whence it has also been called *red ipecacuanha*.—These are both produced in Maryland and Virginia, where they are used as vomitives by the lower sort. Sir Hans Sloane has discovered, that the latter is no other than the root of a poisonous apocynum, described by him in his *Natural History of Jamaica*. See *Philosoph. Transact.* N^o. 410. p. 156, seqq.

IRASCIBLE, a term in the old philosophy, applied to an appetite, or a part of the soul where anger, and the other passions which animate us against things difficult, or odious, were supposed to reside.

Of the eleven kinds of passions attributed to the soul, philosophers ascribe five to the *irascible* appetite; viz. wrath, boldness, fear, hope, and despair: the six others are charged on the concupiscible appetite; viz. pleasure, pain, desire, aversion, love and hatred.

Plato divided the soul into three parts; the reasonable, *irascible*, and concupiscible parts. The two last, according to that philosopher, are the corporeal and mortal parts of the soul, which give rise to our passions.

Plato fixes the seat of the *irascible* appetite in the heart; and of the concupiscible, in the liver; as the two sources of blood and spirits, which alone affect the mind.

IRENARCHIA*, a military officer in the Greek empire; whose business was to provide for the peace, security, and tranquillity of the provinces.

* The word is Greek, *ειρηαρχης*, composed of *ειρη*, peace, and *αρχη*, prince, from *αρχω*, command, *οικει*.

In Justinian's code it is mentioned, that the *irenarchæ* are sent into the provinces to maintain the public peace, by punishing crimes, and putting the laws in execution.

Besides this, there was another *irenarcha* in the cities, to whom belonged the preserving of peace, and quelling sedition among the citizens. This officer was sometimes also called *præfectus urbis*.

The emperors Theodosius and Honorius suppressed the office of *irenarchæ*, on account of their abusing their trust, and distreſſing and persecuting the people, instead of maintaining peace among them.

IRIS*, *Rainbow*. See the article RAINBOW.

* The word is Greek, *ἶρις*, supposed by some to be derived from *ἴριον*, I speak, I tell; as being a meteor that is supposed to foretel rain.

IRIS, in anatomy, a striped variegated circle round the pupil of the eye, formed of a duplicate of the uvea.

The *iris*, in different subjects, is of several very different colours: In its middle is a perforation through which appears a little black speck, called the *fight, pupil, or apple of the eye*, round which the *iris* forms a ring.

IRIS is also applied to those changeable colours which sometimes appear in the glasses of telescopes, microscopes, &c. so called from their similitude to a rainbow.

The same appellation is also given to that coloured spectrum, which a triangular prismatic glass will project on a wall, when placed at a due angle in the sun-beams.

IRISH Terms. See the article TERMS.

IRON, a hard, fusible, and malleable metal, of great use in the affairs of life.

Iron consists of an earth, salt, and sulphur, but all impure, ill mixed, and digested; which renders it extremely liable to rust.

It is the hardest, driest, and the most difficult to melt, of all metals. It may be softened by heating it often in the fire, hammering it, and letting it cool of itself; and it is hardened by extinguishing it in water.

It may be rendered white, by cooling it in sal armoniac and quicklime. The strongest temper of *iron* is said to be that which it takes in the juice of earth worms.

A red hot *iron* applied to a roll of sulphur, dissolves and falls into a fine dust.

Iron has a great conformity with copper; and the two are not easily separated, when folded together: whence arises that uncommon friendship which the poets feign between Mars and Venus.

It has a great conformity also with the loadstone. Rohault observes that it is itself an imperfect loadstone; and that if it be a long time exposed in a certain situation, it becomes a real loadstone; and mentions the *iron* in the temple of Notre Dame at Chartres as an instance.

There are several kinds of *iron*, which have properties very different from one another:—as,

English Iron, which is coarse, hard, and brittle, fit for fire-bars, and such uses.

Swedish Iron, which is a fine, tough sort, will best endure the hammer, is softest to file, and in all respects the best to work upon.

Spanish Iron, which would be as good as the Swedish, were it not subject to red-ſear, that is, to crack betwixt hot and cold.

German Iron, commonly called among us *Dort square*, because it is brought hither from Dort, and is wrought into bars of three quarters of an inch square; this is a coarse *iron*, and only fit for ordinary uses.

There is another sort used for making of wire, which is the softest, and toughest of all: This is not peculiar to any country, but is indifferently made wherever *iron* is made, though of the worst sort; for it is the first *iron* that runs from the mine-stone, when it is melting, and is reserved purely for the making of wire.

Generally speaking, the best *iron* is that which is softest and toughest, and which, when it breaks, is of an even greyish colour, without any glittering specks, or any flaws or divisions like those seen in broken antimony.

To give *iron* a blue colour, with a grid-stone they rub off the black scurf, then heat it in the fire; and as it grows hot, it will change colour by degrees; become first of a gold colour, and then of a beautiful blue. Sometimes the workmen rub a mixture of indigo and salad oil on it, while it is heating, and let it cool of itself.

Square and flat bars of *iron* are sometimes twisted, for ornament; the manner of doing which is this: After the bar is square, or flat forged, they give it a flame heat, or if the work be small, only a blood-red heat; in which state it is easy to twist it about as much or as little as they please, with the tongs, vice, or the like.

The several heats which smiths give their *iron* in working are, 1^o. A sparking or welding heat, which is used when they double up their *iron*, or weld two pieces of *iron* together, end

to end. 2^o. A flame or white heat, which is used when the *iron* has not its form and size, but must be forged into both. 3^o. A blood-red heat, which is used when the *iron* has already its form and size, but wants a little hammering to smooth and fit it for the file.—If the *iron* be made too hot, it will red-ſear; i. e. break or crackle under the hammer while it is working between hot and cold.

We have a great number of *iron works* in most parts of England; those in the forest of Dean, in Gloucestershire, are in most repute.

The ore is there found in great abundance, differing much in colour, weight, and goodness. The best, called *brugh-ore*, is of a blueish colour, very ponderous, and full of little shining specks, like grains of silver; this affords the greatest quantity of *iron*, but being melted alone, it produces a metal very short and brittle, and therefore not so fit for common use. For the remedying whereof, the workmen make use of another sort of material, termed *cinder*, which is nothing but the refuse of the ore, after the metal has been extracted; and which being mingled with the other, in a due quantity, gives it that excellent temper of toughness, which causes this *iron* to be preferred before any brought from foreign parts.

After they have provided the ore, their first work is to calcine it, which is done in kilns, much after the fashion of our ordinary lime-kilns: these they fill up to the top with coal and ore, stratum super stratum, that is, one layer upon another: and so putting fire to the bottom, they let it burn till the coal be wasted, and then renew the kilns with fresh ore and coal, in the same manner as before.—This is done without fusion of the metal, and serves to consume the more drossy part of the ore, and to make it brittle; supplying the beating, and washing which are used in other metals.

From hence they carry it to their furnaces, which are built of brick or stone, and are about twenty four foot square on the outside, and near thirty foot in height within, not above eight or ten foot over where widest, which is about the middle: the top and bottom having a narrow compass, much like the shape of an egg. Behind the furnace are fixed two huge pair of bellows, the noses of which meet at a little hole near the bottom: these are compressed together by certain buttons, placed on the axis of a very large wheel, which is turned about by water, in the manner of an over-shot mill. As soon as these buttons are slid off, the bellows are raised again by the counterpoise of weights, whereby they are made to play alternately, the one giving its blast while the other is rising.

At first they fill the furnace with ore and cinder, intermixed with fuel, which in these works is always of charcoal, laying them hollow at the bottom, that they may more easily take fire; but after they are once kindled, the materials run together into a hard cake or lump, which is sustained by the fashion of the furnace: and through this the metal, as it melts, trickles down into the receivers set at the bottom, where there is a passage open, by which the men take away the scum and dross, and let out the metal as they see occasion. Before the mouth of the furnace there lies a great bed of sand, wherein they make furrows of the shape into which they would have their *iron* cast. As soon as the receivers are full, they let in the metal, which is made so very fluid by the violence of the fire, that it not only runs to a considerable distance, but stands afterwards boiling for a good while.

When the furnaces are once at work, they keep them constantly employed for many months together, never suffering the fire to slacken night or day, but still supplying the wasting of the fuel, and other materials, with fresh poured in at the top: charcoal is used altogether in this work, sea-coal will scarcely do.

From these furnaces the workmen bring their *sows* and *pigs* of *iron*, as they call them, to their forges, where they are wrought into bars.

For the refining of IRON.

For the conversion of IRON into Steel.

Harping IRON.

See { REFINING.

{ STEEL.

{ HARPING.

IRON-MOULDS, yellow lumps of earth or stone, found in chalk-pits, about the Chiltern in Oxfordshire and elsewhere; being in reality a kind of Pyrites or indigested *iron* ore.

IRON-SICK, is applied to a ship or boat, when her bolts, nails, or spikes are so eaten with rust, that they make hollows in the planks, whereby the ship leaks.

IRONY*, a figure in speech, wherein we plainly intend something very different from what our words express: as when we seem to praise a person at a time when we evidently railly, and discommend him.

* The word is derived from the Greek, *ἰρωνία*, dissimulation.

Hence Quintilian calls this figure *diversilequium*, *dissimulation*, and *illusio*.

Thus we say, John's a very honest fellow; meaning he is a rank knave: A fine historian indeed! meaning, a liar.—The *irony* discovers itself rather in the tone of the speaker than in the words.

IRRADIATION, signifies an emanation, or shooting out of rays, or subtle effluvia from any body. See EMANATION, RAY, EFFLUVIA, and QUALITY.

IRRATIONAL

IRRATIONAL Numbers, the same as *surd numbers*. See **SURD**, and **NUMBER**.

IRRATIONAL Quantities. } See { **RATIONAL Quantities**.
IRRATIONAL Soul. } { **SOU**.

IRREGULAR, something that deviates from the common forms or rules.

Thus we say, an *irregular fortification*, an *irregular building*, an *irregular figure*, &c. See **BUILDING**, **FORTIFICATION**, **FIGURE**, **BASTION**, and **PLACE**.

IRREGULARS, in grammar, are such inflexions of words as vary from the general rule, or pattern.

IRREGULAR, among casuists, is applied to a person who is unequalled for entering into orders, as being a bastard, maimed, &c. or to an ecclesiastic, who is interdicted, suspended, or censured, and by that means rendered incapable of holding a benefice, or discharging any of the sacred functions.

IRREGULAR Bodies, are solids not terminated by equal and similar surfaces.

IRREGULAR, in the art of building, is applied not only to the parts of an edifice which deviate from the proportions established by antique monuments, and confirmed by architects; as when a Doric column is made nine modules high, or a Corinthian eleven; but also to the places and figures of buildings, where the angles and sides are made unequal, as in most of the ancient castles; where, without any necessity or confinement from the situation, they affected such irregularity.

A column is also said to be *irregular*, not only when it deviates from the proportions of any of the five orders, but when its ornaments, whether in the shaft or the capital, are absurd and ill chosen.

IRREGULARITIES in the Moon's motion. See **MOON**.

IRREPLEVIABLE Returnum. See **RETURNUM**.

IRREPLEVIABLE, or **IRREPLEVISABLE**, in common law, signifies what may not be replevied, or set at large upon furesities.

IRRORATION, sometimes denotes a kind of transplantation, used for the cure of certain diseases, by sympathy. It consists in sprinkling every day either trees, or other proper plants, with the urine or sweat of the patient, or with the water wherein his body, or at least the part affected, has been washed; till such time as the disease is removed.—As soon as the sprinkling has been made, they throw fresh earth about the roots, in order to prevent the virtue of the munda, that is, of the vital spirit of the liquid, from evaporating into the air. This is all an idle and foolish practice, now deservedly laughed out of the world.

ISCHIADIC*, **ΙΣΚΙΑΔΙΚΟΣ**, an epithet given by physicians to two veins of the foot, which terminate in the crural.

* The word is derived from the Greek, *ισχιας*, or *ισχιας κοκα*, the hip.

The first, called the *great ischiadic*, is formed by ten little branches, proceeding from the toes, which uniting together, pass by the muscles of the calf of the leg.

The *lesser ischiadic* is formed by several ramifications, proceeding from the skin and muscles, which incompass the articulation of the thigh.—They are also called *sciatic veins*.

ISCHIAS, **ISCHIADICA**, or **ISCHIATICA**. See the article **SCIATICA**.

ISCHIUM*, or **ISCHION**, in anatomy, the name of one of the bones of the hip; called also *coxa*, and *coxendix*.

* The word is derived from the Greek, *ισχυς*, *robur*, strength.

In the *ischium* is a deep cavity, called *cystyle*, or *acetabulum*, which receives the head of the thigh-bone. This cavity is incompassed with a cartilaginous circle, which serves to strengthen the thigh.

The *ischium* is one of the ossa innominata of authors.—See *Tab. Anat. (Ofteol.) fig. 3. lit. S. n. 19. fig. 12. lit. c.*

ISCHURIA*, in phisic, a disease consisting in an entire suppression of urine.

* The word is Greek, *ισχυρισια*, formed from *ισχυς*, I stop, and *ουρον*, urine.

It is occasioned by any thing which may obstruct the passages of the reins, ureters, or the neck of the bladder, as sand, stone, mucus, &c.—It may also arise from an obstruction of the nerves, which pass to the reins or bladder, as we see it does, in a palsy of the parts below the diaphragm.—The too great distention of the bladder may also produce the same effect; for the fibres being much lengthened, and consequently condensed, the spirits necessary for their contraction cannot get admittance; whence it is that persons, who have retained their urine a long time, find a great deal of difficulty in discharging it.

ISELASTICS, **ISELASTICA**, a kind of games, or combats, Vol. I.

celebrated in the cities of Greece and Asia, in the time of the Roman emperors.

The victors at these games had very considerable privileges conferred on them; after the example of Augustus, and the Athenians, who did the like to the conquerors at the Olympic, Pythian, and Isthmian games. They were crowned on the spot, immediately after their victory; had pensions allowed them; were furnished with provisions at the public cost; were carried home in triumph, and made to enter their cities through a breach in the walls; whence their appellation, from *ισοδωρις*, to enter.

ISIA, **ΙΣΙΑ**, feasts and sacrifices antently solemnized in honour of the goddess Isis.

The *isia* were full of the most abominable impurities; and for that reason, those who were initiated into them were obliged to take an oath of secrecy. They held for nine days successively, but grew so scandalous, that the Senate abolished them at Rome, under the consulate of Piso and Gabinius.—Two hundred years after this, they were re-established by the emperor Commodus, who himself assisted at them, appearing among the priests of that goddess with his head shaven, and carrying the Anubis.

ISIACI, priests of the goddess Isis.—Dioscorides tells us that they bore a branch of sea-wormwood in their hands instead of olive. They sung the praises of the goddess twice a-day, viz. at the rising of the sun, when they opened her temple; after which they begged alms the rest of the day, and, returning at night, repeated their orisons, and shut up the temple.

Such was the life and office of the *Isiaci*; they never covered their feet with any thing but the thin bark of the plant papyrus, which occasioned Prudentius and others to say they went bare-footed. They wore no garments but linen, because Isis was the first who taught mankind the culture of this commodity. See Diodorus Siculus, and Plutarch's *Isis and Osiris*.

ISING-GLASS, a name given to Muscovy tale, and to **ICHTHYOCOLLA**; which see.

ISLAND, or **ISLE**, a tract of dry land, encompassed with water; either with the sea, a river, or lake.—In which sense *island* stands contradistinguished from *continent*, or *terra firma*.

Some conclude, from Gen. x. 5. and from Eccl. xliii. 23. that *islands* are as antient as the world, and that there were some at the beginning: whatever become of this proof, it is by no means probable, that the large *islands*, far remote from the continent, are new, or that they either arose out of the sea, or were torn from the main land. Nor is it less certain, that there have been new *islands* formed by the casting up of vast heaps of clay, mud, sand, &c. as that, for instance, of T'fongming, in the province of Nanquin in China: or by the violence of the sea, which has torn off large promontories from the continent, as the antients imagined Sicily, and even Great Britain to have been formed. It is also certain, that some have emerged above the waves, as Santorini formerly, and three other *isles* near it lately; the last in 1707, which rose from the bottom of the sea after an earthquake, that was supposed to have loosened it from its hold.

Several naturalists are of opinion, that *islands* were formed at the deluge; others think they have been rent and separated from the continent by violent storms, inundations, and earthquakes. These last have observed, that the East-Indies, which abound in *islands* more than any other part of the world, are likewise more annoyed with earthquakes, tempests, lightnings, vulcano's, &c. than any other part.

Varenius thinks most of these opinions true in some instances, and believes that there have been *islands* produced each of these ways. S. Helena, Atension, and other steep rocky *islands* he supposes to have become so, by the seas overflowing their neighboring champaigns. By the heaping up huge quantities of sand, and other terrestrial matters, he thinks the *islands* of Zealand, Japan, &c. were formed: Sumatra and Ceylon, and most of the East-Indian *islands*, he rather thinks were rent off from the main land; and concludes, that the *islands* of the Archipelago were formed in the same way; imagining it probable, that Deucalion's flood might contribute towards it.

The antients had a notion, that Delos, and some few other *islands*, rose from the bottom of the sea; which, how fabulous soever it might appear, agrees very well with some later observations. Seneca takes notice, that the *island* Therasia rose thus out of the *Ægean* sea in his time, of which the mariners were eye-witnesses.

They had also an opinion, that there are some *islands* which swim in the sea. Thales, indeed, thought the whole earth, which we inhabit, floated, thus, in the ocean; but his opinion is easily refuted, the channel of the sea being found continuous to the shore: but floating *islands* are no ways improbable, especially if the earth whereof they consist be light and sulphureous.—Seneca says, that near the *Cutlæ* he saw such an *island*, and mentions several others of the same kind; and it was even a common opinion among the antients, that all the Cyclades had done the same.

Gryphander has written a Latin treatise expressly on *islands, de Insulis*.

Fortunate ISLANDS.

ISLAND Crystal.

Refraction in ISLAND Crystal.

ISLES, in architecture, the sides, or wings of a building.

See WING.

ISOCHRONAL, or ISOCHRONOUS, is applied to such vibrations of a pendulum, as are performed in equal times.

Of which kind are all the vibrations, or swings of the same pendulum, whether the arcs it describes be longer or shorter; for when it describes a shorter arc, it moves so much the slower; and when a long one, proportionably faster.

ISOCHRONAL Line, is that wherein a heavy body is supposed to descend without any acceleration.

Leibnitz, in the *Act. Erud. Lips.* for April 1689, has a discourse on the *linea isochrona*, in which he shews, that a heavy body, with a degree of velocity acquired by its descent from any height, may descend from the same point by an infinite number of *isochronal* curves, which are all of the same species, differing from one another only in the magnitude of their parameters; such as are all the quadratocubical paraboloids, and consequently similar to one another. He shews also, how to find a line, in which a heavy body descending, shall recede uniformly from a given point, or approach uniformly to it.

ISOMERIA, in algebra, a method of freeing an equation from fractions, by reducing all the fractions to one common denominator, and then multiplying each member of the equation by that common denominator.

This amounts to the same with what is otherwise called *conversion of equations*. See CONVERSION of equations.

ISOPERIMETRICAL Figures, are such as have equal perimeters, or circumferences.

It is demonstrated in geometry, that among *isoperimetical* figures, that is always the greatest which contains the most sides, or angles.—From whence it follows, that the circle is the most capacious of all figures which have the same circumference with it.

That of two *isoperimetical* triangles, which have the same base, and one of them two sides equal, and the other unequal; that is the greater whose sides are equal.

That of *isoperimetical* figures whose sides are equal in number, that is the greatest which is equilateral, and equiangular.

Hence flows the solution of that popular problem, To make the hedging or walling which will fence in one acre, or any other determinate number of acres, *a*, fence in any other greater number of acres whatever.

For, call *x* one side of a parallelogram, whose area is the number of acres *a*; then will $\frac{a}{x}$ be the other side, and $2 \cdot \frac{a}{x}$

$+ 2x$, will be the circumference of the parallelogram: which must be equal to four times the square root of *b*, that is

$2 \cdot \frac{a}{x} + 2x = 4\sqrt{b}$, whence the value of *x* will easily be had;

and infinite numbers of squares and parallelograms may be made, which shall have the same perimeter, yet different areas.—*E. gr.* If one side of a square be 10, and one side of a parallelogram be 19, and the other 1, such square and parallelogram will be *isoperimetical*, viz. each 40; yet the area of the square will be 100, and of the parallelogram only 19.

ISOsceLES Triangle, is a triangle which hath two equal sides.

In an *isosceles* triangle, FDE (*Tab. Geometry, fig. 69.*) the angles *y* and *u*, opposite to the equal sides, are equal; and a line drawn from the top or vertex, F, cutting the base into two equal parts, is perpendicular to the base.

ISSUANT, ISSUING, in heraldry, is understood of a lion, or other animal, in a coat of arms, that seems just coming out from under a chief, fesse, a house, a wood, or the like, and only shews half his body.

It is not very easy to distinguish the lion *issuant* from the lion *naissant*: some say the *issuant* is that which comes out from the bottom of the chief, shewing his head, neck, the tip of his fore-legs and his tail, against the chief of the coat; whereas the *naissant* has its rise about the middle of the field, and shews all his fore-part, with the tip of his tail, as if he were rising out of the earth.

ISSUE, in common law, has divers applications; being sometimes taken for the children begotten between a man and his wife—sometimes, for profits growing from americiaments or fines—sometimes, for profits of lands and tenements—but more frequently, for the point of matter depending in suit, whereupon the parties join, and put their cause to the trial of the jury.

In all these occasions, *issue* has but one signification, which is, an effect of a cause preceding; as, the children are the effect of the marriage between the parents: The profits growing to the king or lord, from the punishment of any man's offence, is the effect of his transgression: The point referred

to the trial of twelve men, is the effect of pleading, or process.

Issue in this last signification, is either *general*, or *special*.

General ISSUE seems to be that whereby it is referred to the jury to bring in their verdict, whether or no the defendant hath done any such thing as the plaintiff lays to his charge.

For example, if it be an offence against any statute, and the defendant plead Not guilty; this being put to the jury, is called the *general issue*.—So if a man complain of a private wrong, which the defendant denies, and pleads no wrong, nor default; and this be referred to the jury, it is likewise the *general issue*.

Special ISSUE, is that wherein special matters being alledged by the defendant in his defence, both parties join on this point, and to go to a demurrer, if it be *questio juris*; or else to a trial by the jury, if it be *questio facti*: As in assault and battery, where the defendant pleads that the plaintiff struck first.

ISSUES, in physic, small artificial apertures in a fleshy part of the body, to drain off superfluous moisture, or give vent to any noxious humor.

They are usually made in the arms, legs, or back, either by caustics or incision. Caution is used to place them about the middle of a muscle, that the necessary motion of the part may not incommode them, or pain the patient.—

There is an easy way of making an *issue*, which succeeds best in children; it is done after this manner: Having applied a small piece of blistering plaister, about the bigness of a small pea, to the part where you would have an *issue*, and letting it lie on for a few hours, it will cause a blister; the skin being raised, apply a pea as usual, and compress it tight with a bandage, till by degrees it sinks in, and forms an *issue*. *Issues* are very useful in many distempers, several of which, when obstinate, cannot be cured without them; as an hydrocephalus, ophthalmia, old ulcers, &c.

ISTHMIÀ, ΙΣΘΜΙΑ, or ISTHMIAN Games, *Ludi ISTHMI*, were solemn sports, held in honour of Neptune: being the third in rank of those so much celebrated in antient Greece.

Plutarch, in the life of Theseus, tells us, they were instituted by that hero in imitation of Hercules, who had before instituted the Olympic games; but Archias refers their institution to Melicerta, or Palaemon, whom the Latins call *Portunus*.—Others say, they were instituted by Nisus, son of Neptune; and others, by Sisypus, brother of Athamas, king of Corinth, about 1350 years before Christ: however this be, it was in the *Isthmus* of Corinth they were celebrated, and hence arose their name.

Archias and others say, the conqueror's prize at these games was a crown of parsley.—Plutarch and Strabo say, it was at first a crown of pine; and that this was afterwards changed for one of parsley, but that at length the pine was refused; and to this was added a reward of 100 silver drachmæ.

These games were held every three years, or, according to Pliny, every five, and were esteemed so sacred, that after the destruction of Corinth, the Sicyonians were charged with the keeping them up. They were so celebrated, and the concourse at them was so great, that only the prime persons of the most remarkable cities could have place in them.—The Athenians had only as much room allotted them as the sail of a ship, which they sent yearly to Delos, could cover.

ISTHMUS, ΙΣΘΜΟΣ, a narrow neck, or slip of ground, which joins two continents; or joins a peninsula to the terra firma, and separates two seas.

The most celebrated *Isthmus's* are those of Panama or Darien, which joins North and South America; that of Suez, which connects Asia and Africa; that of Corinth, or Peloponnesus, in the Morea; that of Crim-Tartary, otherwise called *Taurica chersonesus*; that of the peninsula Romania and Erioso, or the *Isthmus* of the Thracian chersonesus, twelve furlongs broad; being that which Xerxes undertook to cut through.

The antients had several designs of cutting the *Isthmus* of Corinth, which is a rocky hillock, about ten miles over; but they were all vain, the invention of sluices being not then known.—There have been attempts, too, for cutting the *Isthmus* of Suez, to make a communication between the Red-sea and the Mediterranean.

ISTHMUS, is also applied by anatomists to several parts of the human body, particularly that narrow part of the throat, situate betwixt the two tonsils.

Also, to the ridge that separates the two nostrils. See NOSE.

ITALIAN, the language spoke in Italy.

This tongue is derived principally from the Latin, and of all the Languages formed from the Latin, there is none which carries with it more visible marks of its original than the *Italian*.

It is accounted one of the most perfect among the modern tongues, containing words and phrases to represent all ideas, to express all sentiments, to deliver one's self on all subjects, to name all the instruments, and parts of arts, &c.—It is complained indeed, that it has too many diminutives and superlatives; or rather augmentatives; but without any great reason:

reason: for if those words convey nothing further to the mind than the just ideas of things, they are no more faulty than our pleonasm and hyperbole's.

The character of the Italian tongue, it must be owned, is very different from that of our own, which is the reason perhaps why we are so apt to find fault with it: for though the *Italian* be proper for all kinds of writing, for all styles, and for all subjects; yet there are many of their celebrated authors that do not succeed when translated into English, and which an Englishman cannot read, with pleasure, even in their original.—The language corresponds to the genius of the people; they are slow, and thoughtful, and accordingly, their language runs heavily, though smoothly, and many of their words are lengthened out to a great degree.—They have a great taste for music; and, to gratify their passion this way, have altered abundance of their primitive words; leaving out consonants, taking in vowels, softening and lengthening out their terminations, for the sake of the cadence.

Hence the language is rendered extremely musical, and succeeds better than any other in opera's, and some parts of poetry; but it fails in strength and nerves: hence also a great part of its words, borrowed from the Latin, become so far dignified that they are not easily known again.

The multitude of sovereign states into which Italy is divided, has given rise to a great number of different dialects in that language; which, however, are all good in the place where they are used.—The Tuscan is usually preferred to the other dialects, and the Roman pronunciation to that of the other cities; whence the *Italian* proverb, *Lingua Toscana in Bocca Romana*.

The *Italian* is generally pretty well understood throughout Europe, and is frequently spoken in Germany, Poland, and Hungary.—At Constantinople, in Greece, and in the ports of the Levant, the *Italian* is used as commonly as the language of the country; indeed in those places it is not spoke so pure as in Tuscany, but is corrupted with many of the proper words and idioms of the place, whence it takes a new name, and is called *Frank Italian*.

ITALIAN Coins.	} See the article	} COIN.		
ITALIAN Measures.			} MEASURE.	
ITALIAN Money.				} MONEY.
ITALIAN Silks.				

ITALIC, or **ITALIAN Hours**, are the twenty-four hours of the natural day, accounted from the sun-setting of one day, to the same again the next day.

This way of reckoning was used by the Jews of old, and is used by the Italians to this day.

ITALIC Character, in printing. See **LETTER**.

ITALIC *best*, is the name of a party of ancient philosophers, founded by Pythagoras; so called, because that philosopher taught in Italy; spreading his doctrine among the people of Tarentum, Metapontus, Heraclea, Naples, &c.

ITCH, a disease of the skin, wherein it is corrupted by the oozing out of certain sharp bilious humours, which gather into pustules, and occasion a pruritus, or itching.

There are two kinds of *itch*, a *humid* and a *dry* kind. The latter has been usually supposed to be owing to an atrabiliary humour, and the former to a saline pituita: they are both contagious.

Dr. Bononio has given a much more rational account of the cause of this distemper, than any author before him: he carefully examined several globules of the matter picked out of the pustules of itchy persons with a microscope, and found them to be minute living creatures, in shape resembling a tortoise, of brisk motion, with six feet, a sharp head, and two little horns at the end of the snout.—Hence he makes no scruple to impute this contagious disease to the continual biting of these animalcules in the skin; by means of which some portion of the serum oozing out through the small apertures of the cutis, little watry bladders are made, within which the insects continuing to gnaw, the infected are forced to scratch, and by scratching increase the mischief; breaking not only the little pustules, but the skin too, and some little blood-vessels, and so making scabs, crusty sores, &c.

Hence we perceive how the *itch* comes to be catching; since these creatures, by simple contact, may very easily pass from one body to another; their motion being wonderfully swift, and their crawling on the surface of the body, as well as under the cuticula.

Hence also we learn the reason of the cure of this disease by lixivial washes, baths, and ointments made of salts, sulphurs, mercury, &c. these being very powerful in killing the vermin lodged in the cavities of the skin, which scratching will never do; they being too minute to be caught under the nails. And if in practice it is found that this disease, after it seemed to be cured by unction, frequently returns again; this is easily accounted for; since, though the ointment may have killed all the living creatures, yet it may not, possibly, have destroyed all their eggs laid, as it were, in the nests of the skin; from which they afterwards breed again, and renew the distemper.

ITINERANT Judges, or **Justices**, such as were formerly sent with commissions into divers counties, to hear chiefly those causes called *pleas of the crown*: the same with what are otherwise called *justices in eyre*. See **JUSTICE**.

ITINERARY, the description a traveller gives of the course of his journey, and of the curiosities, &c. he observed therein.

The *Itinerary* of Antonine shews all the grand Roman roads in the empire, and all the stations of the Roman army.—It was drawn up by order of the emperor Antoninus Pius; but is now very defective, having suffered much under the hands of the copists, and editors.

ITINERARY Column. } See the article { **COLUMN**.
ITERATION. } **REITERATION**.

JUBILEE *, among the Jews, denotes every fiftieth year; being that following the revolution of seven weeks of years; at which time all the slaves were made free, and all lands reverted to their ancient owners.

* The word, according to some authors, comes from the Hebrew, *jobel*, which signifies fifty: But this must be a mistake; for the Hebrew יובל *jobel*, does not signify fifty; neither do its letters, taken as cyphers, or according to their numerical power, make that number; being 10, 6, 2, and 3, that is, 48.—Others say, that *jobel* signifies a ram, and that the *jubilee* was thus called because proclaimed with a ram's-horn, in memory of the ram that appeared to Abraham in the thicket.—Masius chuses to derive the word from *jubal*, the first inventor of musical instruments, which, for that reason, were called by his name; whence the words *jobel* and *jubilee* came to signify the year of deliverance and remission, because, proclaimed with the sound of one of those instruments, which at first was no more than the horn of a ram.

JUBILEE, in a more modern sense, denotes a grand church-solemnity, or ceremony, celebrated at Rome, wherein the pope grants a plenary indulgence to all sinners; at least to as many as visit the churches of S. Peter, and S. Paul at Rome.

The *jubilee* was first established by Boniface VIII. in 1300, in favour of those who should go ad limina apostolorum; and it was only to return every hundred years. But the first celebration brought in such store of wealth to Rome, that the Germans called this the golden year; which occasioned Clement VI. to reduce the period of the *jubilee* to fifty years.—Urban VI. appointed it to be held every thirty-five years, that being the age of our Saviour; and Sixtus IV. brought it down to every twenty-five, that every person might have the benefit of it once in his life.

Boniface IX. granted the privilege of holding *jubilees* to several princes, and monasteries: for instance, to the monks of Canterbury, who had a *jubilee* every fifty years; when people flocked from all parts to visit the tomb of Thomas a Becket. *Jubilees* are now become more frequent, and the pope grants them as often as the church, or himself, have occasion for them.—There is usually one at the inauguration of a new pope.

To be entitled to the privileges of the *jubilee*, the bull enjoins fasting, alms, and prayers. It gives the priests a full power to absolve, in all cases, even those otherwise reserved to the pope; to make commutations of vows, &c. in which it differs from a *plenary indulgence*. During the time of *jubilee* all other indulgences are suspended.

One of our kings, viz. Edward III. caused his birth-day to be observed in manner of a *jubilee*, when he became fifty years of age, but never before or after. This he did, by releasing prisoners, pardoning all offences except treason, making good laws, and granting many privileges to the people.

There are particular *jubilees* in certain cities, when several of their feasts fall on the same day: at Pucey en Velay, for instance, when the feast of the Annunciation happens on Good-Friday; and at Lyons, when the feast of S. John Baptist concurs with the feast of Corpus Christi.

In 1640. the Jesuits celebrated a solemn *jubilee* at Rome; that being the centenary, or hundredth year from their institution; and the same ceremony was observed in all their houses throughout the world.

JUBILEUS, or **JUBILEUS**, is used among the Romanists to signify a religious who has been fifty years in a monastery, or an ecclesiastic who has been in orders fifty years.

Such veteran religious are dispensed with in some places from attending matins, or a strict observance of any other of their rules.

JUBILEUS is also extended to any man a hundred years old; and to a possession, or prescription for fifty years. *Si ager non invenitur in scriptione, inquiratur de senioribus, quantum temporis fuit cum altero, & si sub certo jubileo mansit sine vituperatione maneat in eternum.*

JUDÆ Auricula. See the article **AURICULA**.

JUDAICUS Lapis, a small, grey, soft, brittle stone, in form of an olive, having lines drawn regularly on its surface, as if they were formed by art.

It is of some use in physic; being supposed to be endued with a lithontriptic power; and therefore is given to dissolve the stone in the bladder. It is a kind of extraneous fossil, being a spine of an Echinus marinus petrified. See **Supplement**: article **JUDAICUS LAPIS**.

JUDAISM, the religious doctrines, and rites of the Jews.

Judaism was warranted by divine authority, being delivered to that people immediately from heaven; it was, however, but a temporary dispensation, and was to give way, at least the ceremonial part of it, at the coming of the Messiah.—For a complete system of *Judaism*, see the books of Moses. *Judaism* was anciently divided into several sects; the principal whereof were the Pharisees, Sadducees, and Essenians.

At present there are but two sects among the Jews, *viz.* the *Caraites*, who admit of no rule of religion, but the law written by Moses; and the *Rabbinists*, who add to the law, the traditions of the Talmud.

It has been observed, that *Judaism*, of all other religions, is that which is the most rarely abjured.—In the 18th of Edward I. the parliament granted the king a fifteenth for the expulsion of *Judaism*.

In England, formerly, the Jews and all their goods belonged to the chief lord where they lived, and he had such absolute property in them, that he might sell them; for they had not liberty to remove to another lord without leave. Mat. Paris tells us, that Henry III. sold the Jews to earl Richard his brother for a term of years, that *quos rex excoaraverat, comes eviferaret*.

They were distinguished from the Christians both living and dying, for they had proper judges and courts wherein their causes were tried, and they wore a badge on their breast over their clothes in shape of a table, and they were fined if they stirred abroad without such badges. They were never buried in the country, but always brought up to London, and interred without the walls.

JUDGE, an officer appointed by the sovereign powers of any country, to distribute that justice to their subjects which they cannot administer in person.

The character of *judge* is a part of the regal authority, whereof the king divests himself.

The chief function of *judges* is for the trial of causes both civil and criminal.

The English *judges* are chosen out of the sergeants at law and are constituted by letters patent. Their commissions are bounded with this limitation, *Facturi quod ad justitiam pertinet secundum legem & consuetudinem Angliæ*; and at their creation they take an oath, that they will indifferently minister justice to all them that shall have any suit, or plea before them; and this they will not forbear to do, though the king by his letters, or by express word of mouth, should command the contrary.

The *judges* have salaries from the king, besides many very considerable perquisites; and these salaries granted them, *quandiu bene se gesserint*, to keep them free and independent of the court.

Itinerant JUDGE. See the article *ITINERANT*.

JUDGE, in scripture, is applied to certain eminent persons chosen by God himself to govern the Jews, from the time of Joshua, till the establishment of the kings.

The Hebrews were governed by fifteen *judges*, for the space of 340 years, *viz.* from the time of Othniel their first, to that of Heli their last *judge*.

The *judges* were not ordinary magistrates, but were appointed by God on extraordinary occasions, as, to head the armies, to deliver the people from their enemies, &c.—Salian has observed, that they not only presided in the courts of justice, but were also at the head of the councils, the armies, and of every thing that concerned the government of the state; though they never assumed the title either of princes, governors, or the like.

In some respects they resembled kings, *viz.* 1^o. In that their authority was given them for life, and not for a limited time.

2^o. They ruled alone, and without any dependancy, which occasioned Josephus to call their state monarchical.

Salian remarks seven points wherein they differed from kings.

1^o. They were not hereditary. 2^o. They had no absolute power of life and death, but only according to the laws, and dependently of them. 3^o. They never undertook war at their own pleasure, but only when they were commanded by God, or called to it by the people. 4^o. They exacted no tribute.

5^o. They did not succeed each other immediately, but after the death of one there was frequently an interval of several years ere a successor was appointed. 6^o. They did not use the ensigns of sovereignty the scepter or diadem. 7^o. They had no authority to make any laws, but were only to take care of the observation of the laws of Moses.

JUDGES, or *Book of JUDGES*, is a canonical book of the Old Testament, containing the history of the Israelite *judges*, whereof we have been speaking.

The author is not known: It is probable the work did not come from any single hand, being rather a collection of several little histories, which at first were separate, but were afterwards collected by Elders, or Samuel, into a single volume; and, in all likelihood, were taken from the ancient journals, annals, or memoirs, composed by the several *judges*.

JUDGMENT, a faculty of the soul, by which it perceives the relation between two, or more, ideas.

Thus when we *judge* that the sun is greater than the moon, the understanding first compares the two ideas of the sun and the moon, and finding the idea of the sun greater than that of the moon, the will perfectly acquiesces in that perception, nor puts the mind upon any farther enquiry.

It is not the understanding then that *judges*, as is ordinarily thought; *judgments* and reasonings, on the part of the understanding, are but mere perceptions; it is the will alone that *judges*, by acquiescing in what is represented to it by the understanding.

The only difference then between *perception*, *judgment*, and *reasoning*, so far as the understanding is concerned in them, is this, that it perceives a thing simply, without any relation to any other thing, in a simple perception; that it perceives the relations between two or more things, in *judgments*; and lastly, that it perceives the relations that are between the relations of things, in reasonings; so that all the operations of the understanding are in effect no more than pure perceptions.

Thus, when we perceive, for instance, twice 2, or 4, this is no more than a simple perception; when we *judge* that twice 2 are 4, or that twice 2 are not 5, the understanding does no more than barely perceive the relation of equality that is between twice 2 and 4, or of inequality between twice 2 and 5. Further, reason consists in perceiving the relation, not between two or more things, for that would be a *judgment*, but of two or more relations of two or more things. Thus, when I conclude, that 4 being less than 6, twice 2 being 4, are by consequence less than 6; I perceive not only the relation of inequality between 2 and 4, and 6, (for this were only a *judgment*) but also the relation of inequality between the relation of twice 2 and 4, and the relation between 4 and 6; which constitutes a reasoning. The understanding therefore only perceives, and it is the will that *judges*, and reasons, in assenting voluntarily to what the understanding represents.

Indeed, when the things which we consider appear clear, and perfectly evident, it seems as if it were not voluntarily that the mind consents to them; whence we are led to think, that it is not properly the will, but the understanding that *judges* of them.—But to clear this point, it must be observed, that the things which we consider, never appear entirely evident till the understanding has examined them on all sides, and has perceived all the relations necessary to *judge* of them; whence it happens, that the will not being able to will any thing without knowledge, cannot act on the understanding; that is, cannot desire it to represent any thing new in its object, as having already viewed it on all sides that have any relation to the question in hand. It is obliged then to rest in what has been already represented, and to cease to agitate and disturb it any farther; in which cessation it is, that *judgment* consists.

This rest or *judgment*, then, not being free when things are in their last evidence, we are apt to imagine, that it is not the effect of the will. So long as there is any thing obscure in the subject that we consider, or that we are not fully satisfied that we have discovered every thing necessary to resolve the question, as it happens in most of those things that are difficult, and that contain various relations; we remain at liberty not to acquiesce: the will may command the understanding to pursue its enquiries further, and to make new discoveries; whence it is, that we are more ready to allow the *judgments* formed on these subjects to be voluntary.

Most philosophers, however, maintain, that even the *judgments* which we form on obscure things are not voluntary; and will have our consenting to the truth to be an action of the understanding, which they call *assent*, to distinguish it from our consenting to goodness, which they attribute to the will, and call it *consent*.

But their error is owing to this, that in our present state, we frequently see things to be evidently true, without the least reason to doubt of them; in which case the will is not at liberty either to give or refuse her assent: but it is not so in matters of goodness; there being nothing, which we do not know some reason for forbearing to love. So that we here perceive a manifest indifference, and are fully convinced, that when we love any thing, even God, for instance, we use our liberty, and do it voluntarily. But the use we make of our liberty is not so apparent, when we consent to the truth, especially when it appears perfectly evident: And this leads us to think, that our consent to truth, that is, our *judgment*, is not voluntary; as if an action, to be voluntary, must be indifferent; as if the blessed above did not love God voluntarily, because they cannot be diverted from it by any other thing; nor we consent freely to this evident proposition, that twice 2 are 4, because we have no appearance of reason to dissuade us from it.

In a legal sense a sentence or decision pronounced by authority of a king, or other power, either by their own mouth

or by that of their judges and officers, whom they appoint to administer justice in their stead.

Of judgments some are definitive, others only preparatory, provisional or interlocutory. See DEFINITIVE, INTERLOCUTORY, &c.

The ancient words of judgment are very significant, *consideratum est*, &c. because judgment is ever given by the court upon consideration had of the record and matter before them.—In every judgment there ought to be three persons, *actor*, *reus*, and *judex*; plaintiff, or prosecutor, defendant, and judge.

JUDGMENT of God. }
Assigning false JUDGMENT. }
Mafs of JUDGMENT. } Sec { JUDICUM Dei.
Arrest of JUDGMENT. } { ASSIGNING.
Villainous JUDGMENT. } { MASS.
 } { ARREST.
 } { VILLAINOUS.

JUDICATURE, the quality, or profession of those who administer justice.

In which sense *judicature* is a kind of priesthood.—In France offices of *judicature* are venal.

JUDICATURE, is also used to signify the extent of the jurisdiction of a judge, and the court wherein he sits to render justice.

JUDICE.—*Coram non* JUDICE. See CORAM.

JUDICIAL. }
Judicial Astrology. } See the article { EXTRAJUDICIAL.
Judicial Writ. } { ASTROLOGY.
 } { WRIT.

JUDICIALIS Lex. See the article LEX.

JUDICIARY Astrology. } See the article { ASTROLOGY.

JUDICIARY Deposit. } See the article { DEPOSIT.

JUDICIO Falso. See the article FALSO.

JUDICIUM Dei*, JUDGEMENT of God, was a term anciently applied to all extraordinary trials of secret crimes; as those by arms, and single combat, and the ordeals, or those by fire or red-hot plow-shares, by plunging the arm in boiling water, or the whole body in cold water, in hopes God would work a miracle, rather than suffer truth and innocence to perish.

* *Si super defendere non possit, iudicio Dei scil. aqua vel ferro ferret de eo iustitia.*

These customs were a long time kept up, even among Christians, and they are still in use in some nations. See ORDEAL, WATER, COMBAT, DUEL, and CHAMPION. Trials of this sort were usually held in churches, in presence of the bishops, priests and secular judges, after three days fasting, confession, communion, and a world of adjurations and ceremonies, described at large by Du Cange.

JUDICIUM Affise. See the article ASSISA.

JUGULAR, among anatomists, is applied to certain veins of the neck, which terminate in the subclavians. See VEIN.

The jugular veins are two on each side; the one external, receiving the blood from the face, and the external parts of the head; the other internal, which receives the blood from the brain.—See *Tab. Anat. (Angeiol.) fig. 6. lit. ii. ll.*

JUGULAR is also applied to certain glands of the neck, in the spaces between the muscles.

The jugular glands are in number fourteen; they are of different figures, some larger, others less; they are fastened to each other by certain membranes and vessels; and their substance is like that of the maxillaries.

They separate a lymph, which is conveyed by those vessels to the adjacent muscles.—It is an obstruction in those glands which occasions the kings-evil. *Dionis.*

JUICE, a liquid substance, which makes part of the composition of plants; being diffused among all the solid parts, and serving for their nutriment and growth.

The juice, or sap, is that to plants, which blood is to animals.

There are juices of divers kinds, aqueous, vinous, oleaginous, gummy, resinous, and bituminous; and of all tastes, and colours.

Dr. Lister observes, that most juices of plants coagulate; whether they be such as are drawn from the wounds of a plant, or such as spontaneously exude; and that he has made curds, and cakes of the juices of a great number of plants; he adds, that as the juices of plants seem to be compounded and mixed of liquors of different kinds; it is probable, if the caustic part be narcotic, for instance, the whey may not be so; or the one may be hurtful, and the other a good and useful medicament.

JUICE is also applied to several, and even to all, the fluids or humours in an animal body.

Nervous JUICE, is a liquor, which, according to some physicians, is found in the canals of the nerves, whence it takes its name. Glisson, Wharton, and Willis, were the first who made mention of the nervous juice; they take it to be a kind of vehicle for the animal spirits, serving to prevent their dissipating too hastily; and think it also serves to nourish the parts of the body: but a great part of our modern physicians deny the existence of this juice.

Pancreatic JUICE, is a liquor separated in the glands of the pancreas. See PANCREAS, and PANCREATIC.

JUICE is also applied to the vapours, and humidities inclosed in the earth.

Thus crystal is said to be formed of a lapidific juice; and metals to be generated of vapours and juices, condensed in the earth.

JUJUBS, JUJUBÆ, *Zizyphus*, the fruit of a tree of the same name, growing very common in Italy, and Provence.

The jujubs are about the size of a plum, oval, red without, yellow within, of a sweet, and commonly vinous taste: they are pectoral and aperitive, soften the acrimony of the humours, and promote a discharge by sputation.

In the general, they have much the same virtues with figs, and are used in much the same intentions.

Pliny tells us, that Sextus Papius brought the first jujubs from Syria, and truffles from Africa, towards the end of Augustus's reign.

JULEP*, or JULAP, JULAPIUM, in pharmacy, an easy, agreeable, extemporaneous potion, prescribed to sick persons; usually composed of distilled waters, or light decoctions, and sweetned with sugar, or proper syrups.

* The word, according to Menage, is derived from the Arabic, *gulap*, or rather from the Greek, *κολοπιον*. Olearius derives it from *gulep*, a Persian word, signifying *rest-water*.

Juleps are sometimes used as the ordinary drink in certain diseases, but more usually as a vehicle for other forms of medicines; serving chiefly to dilute, to correct the peccant humours, restore the declining force of the heart, and promote sleep.

JULIAN Year*. See the article JULIAN YEAR.

* The Julian is the old account of the year, still in use among us in England. It is so called from its founder Julius Cæsar, and by that name is distinguished from the new, or Gregorian account, used in most other parts of Europe.

JULIAN Period. See the article JULIAN PERIOD.

The Julian period is so called, as being adapted to the Julian year.

It is made to commence before the creation of the world, and that more or less, according to the hypothesis that is followed. Its principal advantage consists in this, that the same years of the cycles of the sun, moon, and indiction, belonging to any year of this period, will never fall together again till after the expiration of 7980 years; which, according to the received opinions, will scarce happen before the consummation of all things. The first year of the Christian æra, in all our systems of chronology, is always the 4714th of the Julian period.

To find what year of the Julian period any given year of Christ answers to: To the given year of Christ add 4713, (because so many years of the Julian period were expired before A. D. 1.) and the sum gives the year of the Julian period sought.

For instance, I would know what year of the Julian period A. D. 1720 answers to. Now $1720 + 4713 = 6433$, the year sought of the Julian period.

On the contrary, having the year of the Julian period given, to find what year of Christ answers thereto: From the year of the Julian period given, subtract 4713, and the residue will be the year sought.

For instance, I would know what year of Christ answers to the Julian period 6433; wherefore, $6433 - 4713 = 1720$, the year sought.

If the year of the Julian period given be less than 4713, then subtract the same from 4714 (which is the year of the Julian period that answers to the year of Christ 1.) and the residue will shew how long before (the beginning of the common computation from the nativity of) Christ, the given year of the Julian period was.

For instance, the city of Rome is said to have been built 7. P. 3960, I would know how long it was built before Christ? Now $4714 - 3960 = 754$, wherefore Rome was built 754 years before Christ.

JULIAN Calendar. } See the article { CALENDAR.

JULIAN Epocha. } See the article { EPOCHA.

JULUS*, IOYAOE, an ancient hymn sung by the Greeks, and after them by the Romans, during the time of their harvest in honour of Ceres and Bacchus; to render those deities propitious.

* The word is derived from the Greek *ιαω*, whence *ιαωω*, a sheaf.

This hymn was sometimes also called *demetritulus* or *demetriulus*, that is, *Iulus* of Ceres.

JULUS is also a name which botanists give to those worm-like tufts, or palms (as they are called in willows) which, at the beginning of the year, grow out, and hang pendulous down from hazels, walnut trees, oaks, chestnut-trees, mulberry-trees, ashes, &c. and are by us popularly called *catkins*.

Mr. Ray observes that they are collections of the stamina of the flowers of the tree, because in fertile trees and plants they have abundance of seminal apparatus; which opinion is adopted by Bradley, who makes them to be the male blossoms, and to serve to impregnate the rudiments of the fruit, or female blossoms, which appear on the same trees,

or others of the same sort. See PLANT, and GENERATION.

JULY *, the seventh month of the year; during which the sun enters the sign Leo.

* The word is derived from the Latin *Julius*, the surname of C. Caesar the dictator, who was born in it—Mark Antony first gave this month the name *July*, which before was called *Quintilis*, as being the fifth month of the year, in the old Roman calendar established by Romulus, which began in the month of March.—For the same reason, August was called *Senilis*, and September, October, November, and December, still retain the name of their first rank.

Quæ sequitur, numero turba notata suo. Ovid Fast.

On the 15th day of this month the dog-days are commonly supposed to begin; when, according to Hippocrates and Pliny, the sea boils, wine turns sour, dogs go mad, the bile is increased and irritated, and all animals decline and languish, &c.

JUNCTURE, any joint, or closing of two bodies. See JOINT.

JUNE *, the sixth month of the year; during which the sun enters the sign of Cancer.

* The word comes from the Latin *Junius*, which some derive à *Junone*. Ovid, in the 6th of his *Fæsti*, makes the goddess say,

Junius à nostro nomine nomen habet.

Others rather derive it à *junioribus*, this being for young people, as the month of May was for old ones.

Junius est juvenum, qui sunt ante senam.

In this month is the summer solstice.

JUNIPER Berries, the fruit of the shrub *juniperus*; much used in medicine.

Et Müller had a vast opinion of *juniper berries*: The rob made of the expressed juice of the green berries, has been called by many the *theriaca Germanorum*; so much are they esteemed by that nation for their alexipharmatic qualities.

They are certainly carminative; but their most remarkable properties are in scouring the viscera, and particularly the reins and urinary passages, as all things of the turpentine kind do.

The wood of this shrub is also of considerable use in physic: it strengthens the stomach, expels wind, clears the lungs, provokes the menses, and removes obstructions of the viscera: It is further said to be sudorific, cephalic, and hysterical.—From it they draw a spirit, a tincture, an elixir, extract, and a ratafia.

It is said it will last an hundred years without corrupting; the chymists add, that a coal of *juniper*, covered with ashes of the same kind, will keep on fire an entire year.

JUNTA, called also **JUNTO**, and **JUNCTO**, a council or company of several persons meeting for the dispatch of any business.

The term is particularly used in the Spanish, and Portuguese affairs.—On the death of Charles II. king of Spain, the kingdom was governed, during the absence of Philip V. by a *junta*.

In Portugal they have three considerable *juntas*; the *junta* of commerce, that of the three estates, and that of tobacco.—The first was established by king John IV. this is a council of marine. The same king also assembled the states of his kingdom to create the tribunal of the *junta* of the three estates. King Peter II. created the *junta* of tobacco in 1675, it consists of a president and six counsellors.

IVORY, the tooth, or tusk of an elephant, growing on each side of his trunk, somewhat in form of an horn.

Ivory is much esteemed for its colour, its polish, and the fineness of its grain when wrought.—Dioscorides says, that by boiling it the space of six hours with the root of mandragoras, it becomes so soft and tractable, that any one may manage it as he pleases.

The *ivory* of the isle of Ceylon, and that of the island of Achem, have this peculiarity, that they never become yellow, as those of the Terra firma and East-Indies do; on which account the former are much dearer.

Black IVORY, is the native *ivory* burnt, and taken out in leaves or shivers when become black. It is then either powdered dry, or ground with water, and made up into little cakes or troches, used by the painters.

JUPITER, in mythology, &c. See the article GOD.

Flamen of JUPITER. See the article FLAMEN and DIALIS.

JUPITER, ♃, in astronomy, one of the superior planets, remarkable for its brightness; and which, by its proper motion, seems to revolve round the earth in about twelve years. See PLANET.

Jupiter is situate between Saturn and Mars: It has a rotation round its own axis in 9 hours, 56 minutes; and a periodical revolution round the sun in 4332 days, 12 hours, 20 $\frac{1}{2}$.

Jupiter is the biggest of all the planets: its diameter to that of the sun appears, by astronomical observations, to be as 1077 is to 10000; to that of Saturn as, 1077 to 839, to that of the earth as 1077 to 104. The force of gravity on its surface is to that on the surface of the sun, as 797,15 is to 10000; to that of Saturn, as 797,15 to 534,337; to that of

the earth, as 797,15 to 407,832. The density of its matter is to that of the sun as 7404 to 10000, to that of Saturn as 7404 to 6011, to that of the earth as 7404 to 3921. The quantity of matter contained in its body, is to that of the sun as 9,248, to 10000, to that of Saturn as 9,248 to 4,223, to that of the earth as 9,248 to 2,0044.

The mean distance of *Jupiter* from the sun is 5201 of those parts, whereof the mean distance of the earth from the sun is 1000, though Kepler only makes it 5196 of those parts.

—M. Cassini calculates *Jupiter's* mean distance from the earth to be 115,000 semi-diameters of the earth.—Gregory computes the distance of *Jupiter* from the sun to be above five times as great as that of the earth from the sun; whence he gathers, that the diameter of the sun, to an eye placed in *Jupiter*, would not be a fifth part of what it appears to us; and therefore his disk would be twenty-five times less, and his light and heat in the same proportion.

The inclination of *Jupiter's* orbit, that is, the angle formed by the plane of its orbit, with the plane of the ecliptic, is 1 deg. 20 min. His eccentricity is 250; and Huygens computes his surface to be four hundred times as large as that of our earth.

Jupiter is one of the superior planets, that is, of the three which are above the sun. Hence it has no parallax, its distance from the earth being too great, to have any sensible proportion to the diameter of the earth. See PARALLAX.

Though it be the greatest of the planets, yet its revolution about its axis is the swiftest. Its polar axis is observed to be shorter than its equatorial diameter; and Sir Isaac Newton determines the difference to be as 8 to 9. So that its figure is a spheroid, and the swiftness of its rotation occasions this spheroidism to be more sensible than that of any other of the planets.

Jupiter appears almost as large as Venus, but he is not altogether so bright: He is eclipsed by the moon, by the sun, and even by Mars.—Hevelius is said to have once observed *Jupiter's* diameter seven inches, having inequalities like the moon.

Jupiter has three appendages, called *zones*, or *belt*s, which Sir Isaac Newton thinks are formed in his atmosphere.—In these are several *maculae*, or spots; from whose motion, the motion of *Jupiter* round its axis is said to have been first determined. The discovery of which is controverted between Eustachio, P. Goticinus, Cassini and Campani.

The four little stars, or moons, which move round *Jupiter*, were first discovered by Galileo, who called them the *astra Mediceæ*; but we the *satellites* of *Jupiter*.

Cassini observed, that the first or innermost of these satellites was five semi-diameters of *Jupiter* distant from *Jupiter* itself, and made its revolution in one day, 18 hours, and 32 minutes. The second, which is somewhat greater, he found eight diameters distant from *Jupiter*, and its revolution 3 days, 13 hours, and 12 minutes. The third, which is the greatest of all, is distant from *Jupiter* 13 semi-diameters, and finishes its course in 7 days, 3 hours, and 50 minutes. The last, which is the least of all, is distant from *Jupiter* 23 semi-diameters; its period is 16 days, 18 hours, and 9 minutes.

These four moons must make an extremely pleasing spectacle to the inhabitants of *Jupiter*, if it be true that there are any; for sometimes they rise all together; sometimes they are all together in the meridian, ranged one under another; and sometimes all appear in the horizon. Add, that they frequently undergo eclipses, the observations whereof are found of especial use in determining the longitude. Cassini has made tables for calculating the immersions and emersions of *Jupiter's* first satellite.

Comparative Astronomy of JUPITER.—The day and night are of the same length in *Jupiter* all over his surface, viz. five hours each: the axis of his diurnal-rotation being nearly at right angles to the plane of his annual orbit. See DAY.

Though there be four primary planets below *Jupiter*, yet an eye placed on his surface would never perceive any of them; unless, perhaps, as spots passing over the sun's disk, when they happen to come between the eye and the sun.—The parallax of the sun, viewed from *Jupiter*, will scarce be sensible, no more than that of Saturn, neither being much above 20 seconds; so that the sun's apparent diameter in *Jupiter* will not be above six minutes.—The outermost of *Jupiter's* satellites will appear almost as big as the moon does to us, viz. five times the diameter, and 25 times the disk of the sun.—Dr. Gregory adds, that an astronomer in *Jupiter* would easily distinguish two kinds of planets, four nearer him, viz. the *satellites*, and two, viz. the *Sun* and *Saturn*, more remote. The former, however, will fall vastly short of the sun in brightness, notwithstanding the great disproportion in the distances and apparent magnitude. From these four different moons, the inhabitants of *Jupiter* will have four different kinds of months, and the numbers of moons in their year will not be less than 4500. These moons

moons are eclipsed as often as, being in opposition to the sun, they fall within the shadow of *Jupiter*; and again, as oft as being in conjunction with the sun, they project their shadows to *Jupiter*, they make an eclipse of the sun to an eye placed in that part of *Jupiter* where the shadow falls. But in regard the orbits of these satellites are in a plane which is inclined to, or makes an angle with the plane of *Jupiter's* orbit, their eclipses become central, when the sun is in one of the nodes of these satellites; and when out of this position, the eclipses may be total, though not central, because the breadth of *Jupiter's* shadow is nearly decuple to that of the breadth of any of the satellites; and the apparent diameter of any of these moons is nearly quintuple the apparent diameter of the sun. It is owing to this remarkable inequality of diameters, and the small inclination the plane of the orbits of the satellites has to the plane of *Jupiter's* orbit, that in each revolution they happen eclipses both of the satellites and of the sun; though the sun be at a considerable distance from the nodes. Further, the inferior among these satellites, even when the sun is at its greatest distance from the nodes, will occasionally eclipse and be eclipsed by the sun to an inhabitant of *Jupiter*; though the remotest of them, in this case, escapes falling into *Jupiter's* shadow, and *Jupiter* into his, for two years together. To this it may be added, that one of these satellites sometimes eclipses another; where the phases must be different, nay frequently opposite to that of the satellite falling into the shadow of *Jupiter* just mentioned; for in this the eastern limb immerses first, and the western immerses last; but in the others it is just the reverse.

The shadow of *Jupiter*, though it reaches far beyond its satellites, yet falls much short of any other planets; nor could any other planet, Saturn alone excepted, be immersed in it, even though it were infinite. Indeed, *Jupiter's* shadow could not reach Saturn, unless *Jupiter's* diameter were half that of the sun; whereas, in effect, it is not one ninth of it.

The courses of *Jupiter's* satellites, and their various eclipses, would render navigation very sure and easy on the globe of *Jupiter*. Even we, at this distance, can make very good use of them; those eclipses being found one of our best means for determining the longitude at sea.

JUPITER, among alchymists, signifies the philosophers gold.

The gentlemen of this profession apply every thing to their art which the mythologists mention of the god *Jupiter*, pretending that the ancient fables are to be understood in a figurative sense: for instance, *Jupiter* is the master of the gods; and gold, say they, is the most precious of metals. Mercury is the ambassador of *Jupiter*; and this shows with how much ease Mercury insinuates into every thing. *Jupiter* holds the thunderbolt as his scepter; which evidently points out the external sulphur used in projection. *Jupiter* has the heavens for his ordinary habitation; this shews him volatile, dry, and hot. The debauches of *Jupiter*, who sought for pleasure in the low, but prolific and fruitful earth, discover, say they, its fecundity; and that gold might be made, were but the way of preparing it discovered. In a word, *Jupiter* is the son of Saturn, which shews some resemblance between the qualities of gold and lead.

JURATAM.—*Affisa cadit in juratam*. See **ASSISA**.

JURATI. See the article **JURATS**.

Non ponendo in JURATIS. See the article **NON ponendo**.

JURATS, JURATI, magistrats in the nature of aldermen, for the government of several corporations. See **ALDERMAN**.

Thus we meet with the mayor and *jurats* of Maidstone, Rye, Winchelsea, &c.—So also Jersey has a bailiff and twelve *jurats*, or sworn assistants, to govern the island.

JURE.—*De JURE*. See **DE FACTO**, and **POSSESSION**.

Quo JURE. See the article **Quo Jure**.

JURIDICI Dies. See the article **DIES**.

JURISCONSULTUS, or **JURECONSULTUS**, **ICTUS**, among the Romans, was a person learned in the law; a master of the Roman jurisprudence; who was consulted on the interpretation of the laws, and customs, and the difficult points in law-suits.

The fifteen books of the *Digest* were compiled wholly from the answers, or reports of the ancient *jurisconsulti*. Tribonianus, in destroying the two thousand volumes from whence the *Code* and *Digest* were taken, has deprived the public of a world of things, which would have given them light into the office of the ancient *jurisconsulti*.

We should scarce have known any thing beyond their bare names, had not Pomponius, who lived in the second century, taken care to preserve some circumstances of their office.

The Roman *jurisconsulti* seem to have been the same with our chamber-counsellors, who arrived at the honour of being consulted, through age and experience, but never pleaded at the bar. Their pleading advocates, or lawyers, never became *jurisconsulti*.

In the times of the commonwealth, the *advocati* had by much the more honourable employment, as being in the ready way

to attain to the highest preferments. They then despised the *jurisconsulti*, calling them in derision *formularii* and *legulei*, as having invented certain forms, and monosyllables, in order to give their answers the greater appearance of gravity and mystery. But in process of time they became so much esteemed, that they were called *prudentes* and *sapientes*, and the emperors appointed the judges to follow their advice. Augustus at length advanced them to be public officers of the empire; so that they were no longer confined to the petty counsels of private persons.

Bern. Rutilius has written the lives of the most famous *jurisconsulti*, who have lived within these 2000 years.

JURISDICTION, a power, or authority which a man has to do justice in cases of complaint made before him.

There are two kinds of *jurisdiction*, the one *ecclesiastical*, the other *secular*.

Secular JURISDICTION, belongs to the king and his justices, or delegates. See **JUSTICE**, and **COURT**.

Ecclesiastical JURISDICTION, belongs to bishops, and their deputies. See **BISHOP**, and **OFFICIAL**.

Bishops, &c. have two kinds of *jurisdiction*, the one *internal*, which is exercised over the conscience in things purely spiritual; and this they are supposed to hold immediately of God: The other is *contentious*, which is a privilege some princes have given them of terminating disputes between ecclesiastics, and laymen. See **CONTENTIOUS**.

JURISPRUDENCE, the science of what is just and unjust, or of the laws, rights, customs, statutes, &c. necessary for the doing of justice.

Civil jurisprudence, is that of the Roman law; *canonical*, that of the canon law; and *feudal*, that of fees.

JUROR, JURATOR, in a legal sense, is one of those twenty-four, or twelve men, who are sworn to deliver truth upon such evidence as shall be given them touching any matter in question.

The punishment of petty jurors attainted of giving a verdict contrary to evidence, willingly, is very severe. See **ATTAINT**.

Challenge to the JURORS. See the article **CHALLENGE**.

JURY, in common law, signifies twenty-four, or twelve men, sworn to enquire of a matter of fact, and declare the truth, upon such evidence as shall be delivered them touching the matter in question.

The *jury* is to be chosen out of the same class or rank with the accused; and if he be a foreigner, he may demand a *jury* half foreigners and half Englishmen.

There are ordinarily thirty-six impanelled, whereof, in criminal cases, the person accused has the liberty to challenge or set aside twenty-four, and to pick out twelve at his pleasure.

—These twelve are present at the trial, after which they withdraw into a chamber by themselves, where they are to be shut up without fire or candle, victuals or drink, till such time as they agree in their verdict, and declare unanimously that the defendant is either guilty of the charge laid against him, or not guilty. Upon which, the judge passes the sentence prescribed by the law.

In England there were formerly three sorts of trials, *viz.* one by *parliament*, another by *battle*, and a third by *affize* or *jury*.

The trial by *affize* (be the action civil or criminal, public or private, personal or real) is referred for the fact to a *jury*, and as they find it, so passes the judgment. See **ASSIZE**.

This *jury* is not only used in circuits of justices errant, but also in other courts and matters of office: But though it appertains to most courts of the common law, yet it is most remarkable in the half year courts of the justices errant, commonly called the *great assizes*, and in the quarter-sessions; and in them it is most ordinarily called a *jury*: In other courts it is usually called an *inquest*, and in the court-baron, a *jury of the homage*.

In the general *assize* there are usually many *juries*, because there are a great many causes, both civil and criminal, commonly to be tried; whereof one is called the *grand jury*, and the rest the *petit juries*; of which, it seems, there should be one in every hundred.

Grand JURY, consists of twenty-four grave and substantial gentlemen, or some of the better sort of yeomen, these are to be chosen indifferently by the sheriff out of the whole shire, to consider of all bills of indictment preferred to the court; which they do either approve, by writing upon them *bills vera*; or disallow, by indorsing *ignoramus*.

Such as they do approve, if they touch life and death, are farther referred to another *jury*, to be considered of, because the case is of much importance; but others of lighter moment are, upon their allowance, without more ado, fined by the bench; except the party traverse the indictment, or challenge it for insufficiency, or remove the cause to a higher court by certiorari; in which two former cases it is referred to another *jury*, and in the latter, transmitted to a higher bar.

bar. And presently upon the allowance of this bill, by the grand inquest, a man is said to be *indicted*. Such as they disallow, are delivered to the bench, by whom they are forthwith cancelled, or torn.

Petit JURY, consists of twelve men at the least, and these are impanelled as well upon criminal as upon civil causes: those that pass upon offences of life and death, bring in their verdict either guilty, or not guilty; whereupon the prisoner, if he be found guilty, is said to be *convicted*, and receives judgment and condemnation, or otherwise he is acquitted, and set free.

Those that pass upon civil causes real, are all, or so many as can conveniently be had, of the same hundred, where the land or tenement in question doth lie, being four at least; and they, upon due examination, bring in their verdict either for the defendant, or tenant.

Clerk of the JURIES. See the article **CLERK**.

JURY-MAST, an appellation given by the seamen to an extemporaneous sort of mast, patched up of yards, or other pieces of timber, and set up in the room of a true mast, which has been lost in a fight, or by a storm.

JUS, and **JURA**. See the article **LAW**, **RIGHT**, &c.

Jus Coronæ, *Rights of the Crown*, is part of the Law of England, which differs in many things from the general law concerning the subject. *Coke on Litt.*

Quale Jus. } See the article { **QUALE jus**,
Jus Togæ. } { **TOGA**.

JUST*, a sportive kind of combat on horseback, man against man, armed with lances.

* The word is by some derived from the French *juste*, of the Latin *justa*, because the combatants fought near one another. Salmastus derives it from the modern Greek *zastra*, or rather *zastres*, which is used in this sense by Nicephorus Gregoras. Others derive it from *justa*, which in the corrupt age of the Latin tongue was used for this exercise, by reason it was supposed a more just and equal combat than the tournament.

Antiently, *justs* and tournaments made a part of the entertainment at all solemn feasts, and rejoicings.—The Spaniards borrowed these exercises from the Moors, and call them *juego de cannas*, reed, or cane play.—Some take them to be the same with the *ludus Trojanus*, antiently practised by the youth of Rome.

The Turks use them still, and call them *lancing the gerid*.

The difference between *justs* and tournaments consists in this, that the latter is the genus, of which the former is only a species. Tournaments included all kinds of military sports, and engagements, which were made out of gallantry and diversion.—*Justs* were those particular combats where the parties were near each other, and engaged with lance and sword; add, that the tournament was frequently performed by a number of cavaliers, who fought in a body. The *just* was a single combat of one man against another.—Though the *justs* were usually made in tournaments, after a general rencounter of all the cavaliers, yet they were sometimes singly, and independent of any tournament.

He who appeared for the first time at a *just*, forfeited his helm or calque, unless he had forfeited before at a tournament.

JUST Appui. See the article **Appui**.

JUSTICE, **JUSTITIA**, a constant desire or inclination to give every one his due; or a habit by which the mind is disposed, and determined to give every man his own.

Justice may be divided into *distributive*, *commutative*, and *legal*.

Distributive JUSTICE, is concerned in matters of government, and of beneficence, and is either remuneratory, or punitive: it observes an equality in dealing rewards and punishments, according to each man's condition and merit; for as actions are either good or evil, for the good, rewards must be assigned; and for the evil, punishments: and herein a geometrical proportion is observed.

Commutative JUSTICE, is conversant in matters of commerce, and in the equal commutation or changing of things, and proceeds according to an arithmetical equality, without any regard to persons and circumstances.

Legal JUSTICE, is that which resides in the state, or monarch, by whose power and authority the effects of *commutative* and *distributive justice* are frequently superadded, or suspended; as in a dearth of corn, if a person that has a stock by him will not sell it, it shall be taken from him, and the like.

Hand of JUSTICE. } See the articles { **HAND**,
Officers of JUSTICE. } { **OFFICE**,
Poetical JUSTICE. } { **POETICAL**.

Temperament ad JUSTITIAM. See the article **TEMPERAMENT**.

JUSTICE, **JUSTITIARIUS**, is likewise an officer appointed by the king, or commonwealth, to do right by way of judgment.

He is called *justice*, not *judge*; antiently *justicia*, not *justitiarius*, because he has his authority by deputation, as dele-

gate to the king, and not *jure magistratus*; so that he cannot depute any other in his stead, the *justice* of the forest only excepted.

Of these *justices*, we have various kinds in England: *viz.*

Chief JUSTICE of the King's-bench, is the capital *justice* of Great Britain, and is a lord by his office.—His business is chiefly to hear and determine all pleas of the crown; that is, such as concern offences against the crown, dignity, and peace of the king, as treasons, felonies, &c.

This officer was formerly not only *chief justice*, but also chief baron of the exchequer, and master of the court of wards.—He usually sat in the king's palace, and there executed that office, formerly performed per comitem palatii; he determined, in that place, all the differences happening between the barons and other great men.

He had the prerogative of being vicegerent of the kingdom, whenever the king went beyond sea, and was usually chosen to that office out of the prime nobility; but his power was reduced by king Richard I. and King Henry I.—His office is now divided, and his title changed from *capitalis Angliæ justitiarius*, to *capitalis justitiarius ad placita*, *coram rege tenenda*, or *capitalis justitiarius hanc regii*.

Chief JUSTICE of the Common-pleas, he who, with his assistants, hears and determines all causes at the common law; that is to say, all civil causes between common persons, as well personal as real: and he also is a lord by his office.

JUSTICE of the Forest, is a lord by his office, who has power and authority to determine offences committed in the king's forests, &c. which are not to be determined by any other court, or *justice*.

Of these there are two; whereof one has jurisdiction over all the forests on this side Trent; and the other beyond it.

By many antient records, it appears to be a place of great honour and authority, and is never bestowed but on some person of great distinction.—The court where this *justice* sits, is called the *justice-seat of the forest*.

This is the only *justice* who may appoint a deputy; he is also called *justice in eyre of the forest*.

JUSTICES in Eyre, *Justitiarum Itinerantes*, or *Errantes*, were those who were antiently sent with commission into divers counties to hear such causes, especially, as were termed *pleas of the crown*; and that for the ease of the subject; who must else have been hurried to the courts of Westminster, if the cause were too high for the county courts.

According to some, these *justices* were sent once in seven years, but others will have them to have been sent oftner.—Camden says, they were instituted in the reign of king Henry II. but they appear to be of an older date.

They were somewhat like our *justices of assize* at this day; though for authority, and manner of proceeding, very different.

JUSTICES of Assize, are such as were wont, by special commission, to be sent into this or that county, to take assizes, for the ease of the subjects.

For whereas these actions pass always by jury, so many men might not without great damage and charge, be brought up to London; and therefore *justices*, for this purpose, by commission particularly authorized, were sent down to them.

These continue twice every year to pass the circuit, by two and two, through all England, dispatching their several businesses by several commissions; for they have one commission to take assizes, another to deliver goals, and another of oyer and terminer, &c.

JUSTICES of Goal-delivery, those commissioned to hear and determine causes appertaining to such as for any offence are cast into prison.

Their commission is now turned over to the *justices of assize*.

JUSTICES of Nisi-prisus, are now the same with *justices of assize*: It is a common adjournment of a cause in the common-pleas, to put it off to such a day, *Nisi prius justitiarum venerint ad eas partes ad capiendas assisas*: from which clause of adjournment, they are called *justices of nisi prius*, as well as *justices of assize*, by reason of the writ, and actions they have to deal in.

JUSTICES of Oyer and Terminer, were *justices* deputed on some special occasions to hear and determine particular causes.

The commission of oyer and terminer is directed to certain persons, upon any insurrection, heinous demeanor, or trespass committed.

JUSTICES of the Peace, are persons of interest, and credit, appointed by the king's commission to attend the peace of the county where they live.

Of these, some, for special respect, are made of the *quorum*, so as no business of importance may be dispatched without the presence, or assent of them, or one of them. See **QUORUM**.

The office of a *justice of the peace*, is to call before him, examine, and commit to prison all thieves, murderers, wandering rogues, those that hold conspiracies, riots, and almost all delinquents, which may occasion the breach of the peace, and quiet of the subject; to commit to prison such as cannot find bail, and to see them brought forth in due time to trial.

The original of *justices of the peace*, is referred to the fourth year

JUS

year of Edward III. They were first called *conservators*, or *wardens of the peace*.

JUSTIFICATION, in theology, that grace which renders a man just in the sight of God, and worthy of eternal happiness.

The Romanists and Reformed are extremely divided about the doctrine of *justification*; the latter contending for *justification* by faith alone, and the former by good works.

JUSTIFYING Grace. See the article **GRACE**.

JUSTNESS, the exactness, or regularity of any thing.

Justness is chiefly used in speaking of thought, language, and sentiments.—The *justness* of a thought consists in a certain precision, or accuracy, by which every part of it is perfectly true, and pertinent to the subject.

Justness of language, consists in using proper, and well-chosen terms; in not saying either too much, or too little.

M. de Mere, who has written on *justness* of mind, distinguishes two kinds of *justness*; the one arising from taste and

JUX

genius; the other, from good sense, or right reason.—There are no certain rules to be laid down for the former, *viz.* to shew the beauty and exactness in the turn, or choice of a thought; the latter consists in the just relation which things have to one another.

JUVENALIA, or **JUVENALES Ludi**, games, exercises of body, and combats, instituted by Nero the first time his beard was shaved.

They were celebrated in private houses, and even the women had a share in them: Probably, they were the same with what were otherwise called *Neroniana*.

JUXTAPOSITION, is used by philosophers to denote that species of growth, which is performed by the apposition of new matter to the surface, or outside of old.

In which sense, it stands opposed to *intus-fusception*; where the growth of a body is performed by the reception of a juice within it, diffused through its canals. See **NUTRITION**.



K A B

K, A double consonant, and the tenth letter of the alphabet. It is borrowed from the Greek *kappa*; and was but little used among the Latins: Priscian looked on it as a superfluous letter, and says, it was never to be used except in words borrowed from the Greek. Dausquius, after Sallust, observes, that it was unknown to the ancient Romans.—Indeed we seldom find it in any Latin authors, excepting in the word *kalende*, where it sometimes stands in lieu of a *c*.—Carthage, however, is frequently spelt on medals with a *K*: SALVIS AUG. ET CAES. FEL. KART. and sometimes the letter *K* alone stood for *Carthage*.—M. Beger has observed, that a capital *K*, on the reverse of the medals of the emperors of Constantinople, signified KONSTANTINUS; and on the Greek medals he will have it to signify ΚΟΙΛΗ ΣΥΡΙΑ, Coele-syria.

Quintilian tells us, that in his time some people had gotten a mistaken notion, that wherever the letter *c* and *a* occurred at the beginning of a word, *k* ought to be used instead of the *c*. See C.

Lipius observes, that *K* was a stigma, anciently marked on the foreheads of criminals with a red-hot iron.

The letter *K* has various significations in old charters, and diplomas; for instance, KR. stood for *carus*, KR. C. for *caru civitas*, KRM. for *carmen*, KR. A. M. N. *carus amicus noster*, K. S. *chaos*, K. T. *capite torsus*, &c.

The French never use the letter *k*, excepting in a few terms of art, and proper names borrowed from other countries.—Ablancourt, in his dialogue of the letters, brings in *k* complaining, that he has been often in a fair way to be banished out of the French alphabet, and confined to the countries of the North.

In the English, the *k* is used much more than needs be, particularly at the ends of words after *c*, as in publick, physick, &c. where it is of no manner of service.

K is also a numeral letter, signifying 250, according to the verse;

K quoque ducentos et quinquaginta tenet.

When it had a stroke at top, **K̄**, it stood for 250000.

K ABIN, KHABIN, KEBIN, or KUBIN, a temporary kind of marriage, in use among the Mahometans.

The *kabin* is contracted before the *cadi*, in whose presence the man espouses the woman for a certain time, upon condition that if he quits her at the end of that term, she shall be allowed a certain sum of money.

Some authors say, that the *kabin* is only permitted among the Persians, and in the sect of Ali; but others maintain, that it is also practised among the Turks.

K ADARI, or KADARITES, a sect among the Mahometans, who deny the favourite tenet of the Mussulmen, predestination; and maintain the doctrine of liberty and free-will in all its latitude.

K ALENDAR. } See the article { CALENDAR.

K ALEND S. } CALEND S.

K ALI, a plant growing on the sea-coasts, and, sometimes even in the sand of the sea; whose ashes are of great use in the making of glass, and soap.

The name *kali*, or *alkali*, was given it by the Arabians: among naturalists it is also called *salicornia*, *soda*, &c. and in English, *glass-wort*, and *salt-wort*.

Kali grows in great abundance in Egypt, and Syria; as also in Languedoc, and Provence, where it is cultivated by the farmers, who sow whole fields of it to good effect, and in many other places.

Being burnt, its ashes made into a lye, and boiled with oil, make the best soap.

Out of the same ashes, called also *pulverine*, is extracted a salt, called *alkali salt*; which mixed with a fine sort of sand, make the fine glass called *crystal*.

The manner of preparing, or procuring the ashes, in Languedoc, is this: When the plant is grown up to its pitch, they cut it down, and let it dry; afterwards they burn and calcine it in certain pits like lime-kilns, dug in the ground for that purpose, which are close covered up with earth, so as no air may come at the fire.—The matter by this means is not reduced into ashes only, but is made into a very hard stone, like rock-salt, which they are forced to break with hammers to get it out, and this matter they call *salicorn*, or *soda in the stone*.

They make such quantities of it there, that they export it into several other countries, but principally into Italy, where the Venetians manufacture it into those beautiful glasses, which they afterwards return into most countries in Europe. However, the soda made here is inferior to that brought

K E B

from Alicant. The best is in little dry sonorous lumps, of a bluish grey colour, and full of little eyes, or holes.

K ALIPH. See the article CALIPH.

K AN, or KHAN, the name of an officer in Persia; answering to that of *governor* in Europe.

There are *kans* of Provinces, countries, and cities, who have different additions to distinguish them.

K API, a term in the eastern countries for *gate*.

Thus the chief gate of the palace of the emperor of Persia is called *alla kapi*, the gate of God.—Hence also, the officer who has the command of the grand seignior's palace-gates, is called *kapighi bachi*.

K ARABE. See the article CARABE.

K ARATA, by some called *caraguata maca*, a kind of aloe growing in America; whose leaves, when boiled, are made into a thread, of good use for making cloth, fishing-nets, &c. Its root, or leaves, thrown into the water, stun the fishes to that degree, that they are easily taken with the hand: Its stalk, when dried and burnt, serves for tinder; and when briskly rubbed on a harder wood, it takes fire, and consumes itself.

K ARKRONY, a building where the royal manufactures of Persia are carried on.

Here are made their tapestries, cloth of gold, silk, wool, and brocades, velvets, taffeties, coats of mail, fibres, bows, arrows, and other arms.—There are also in it painters in miniature, goldsmiths, lapidaries, &c.

K ARLE, a Saxon word, used in our laws, sometimes simply for a *man*, and sometimes for a *servant*, or *clerk*.

Hence the Saxons call a seaman a *buscarle*, and a domestic servant a *buscarle*.

K ASL, a term in the East, applied to the fourth pontiff of Persia, who is also the second lieutenant civil, and judges of temporal as well as spiritual affairs.

He has two deputies, who determine matters of less consequence; particularly quarrels arising in coffee-houses, which make a great part of their business.

K AUR-Y SAOUL, a body of soldiers who form the last of the five corps of the king of Persia's guards.

They are in number 2000, and are all horse, commanded by the constable, and in his absence by the captain of the watch.—They keep watch in the night around the palace, serve to keep off the crowd when the sopher goes on horse-back, keep silence at the audience of ambassadors, seize the kans and other officers when disgraced, and cut off their heads when the sopher commands it.

K AY*, or KEV, a wharf or place by the water-side, in a sea-port for the loading, and unloading of merchandise.

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

K AYAGE, the money, or toll, paid for loading, or unloading wares at keys.

K EBER*, the name of a sect among the Persians, who, for the generality, are rich merchants.

* The word signifies *infidel*, formed from the Turkish *kiapbir*, a renegade; or, rather, they both come from כפר *capbar*; which, in the Chaldee, Syriac, and Arabic, signifies, *to deny*.

Though they inhabit the middle of Persia, and are found in great numbers in the suburbs of Isfahan, yet it is not known whether or no they are originally Persians, as having nothing in common with the other Persians, but only the language.—They are distinguished by their beard, which they wear very long; and by their dress, which is quite different from that of the rest.

They are, in effect, heathens, but are in great reputation for the regularity of their life.—Some authors say, they adore fire, in imitation of the antient Persians; but this is contradicted by others: They believe the immortality of the soul, and have some things like what the antients taught of hell, and the Elysian fields.

When any of them die, they let loose a cock in his house, and drive it out into a field; if a fox seizes it, and bears it off, they make no doubt but the soul of the deceased is saved. If this first experiment does not satisfy them, they have recourse to a second, which is conclusive; they carry the carcass into the burying-ground, and prop it against the wall with a fork: if the birds peck out the right-eye, they look on him as one of the predestinated, and bury him with a great deal of ceremony, letting him down gently into the grave; but if the birds begin with the left eye, they conclude him a reprobate, and throw him headlong into a ditch.

K EBLA, or KEBLAH, called also KEBLEH, KIBLEH, and ALKEBLA, among the Mussulmen, denotes that point, or quarter,

KER

quarter, to which they turn themselves when they say their prayers.

Mahomet at first durst not propose any other *kebla*, to his followers, but the temple of Jerusalem, which was the *kebla* of the Jews and Christians. — In course of time, however, being willing to bring his own off from any communication in matters of religion with the Jews and Christians, he appointed them in the *Alcoran*; to turn themselves, at prayer, towards the temple of Mecca; from which time they called those two temples the *keblatan*, or two *keblas*.

Ricaut adds, that it is not the temple of Mecca, properly speaking, that the Turks call *kebla*, but rather the large square tower in the middle of the amphitheatre of that temple.

KEBLA is also used for an altar, or rather a *niche*, as Ricaut calls it, which the Mahometans have in all their churches, and which is placed very exactly on that side towards the temple of Mecca.

Hence also *kebla* comes to be used metaphorically for the object, or end proposed, in doing any thing.

Thus, the *kebla* of kings, is their crown and authority; that of men of business, is money; that of gluttons, good cheer, &c.

KEBLA-NOMA, or **KEBLEH-NOMA**, a name which the Turks and Persians give to a little pocket compass, which they always carry with them, in order to place themselves the more exactly when they go to prayers.

KE D G I N G, a sea term, used when a vessel is brought up or down a narrow river by the wind, though the tide be contrary to it.

To do this, the seamen set their fore-fail, foretop-fail, and mizen-fail, and let her drive with the tide, that they may flat her about. — If she come too near the shore, they have a little anchor ready, called the *kedger*, or *kedje-anchor*, with a hawser fastened to it from the ship; and this they drop in the midst of the current, by which means they wind her head about; and this done, take up the anchor again.

KE F E L, the lowest piece of timber in a ship, placed in the bottom of her hull; one end thereof being let into the stern-post, and the other into the stem.

Into this are all the ground-timbers and hooks fastened, and bolted, fore and aft.

When a ship has a deep *keel*, she is said to have a *rank keel*; and this serves to keep her from rolling. — See *Tab. Ship*, fig. 2. n. 57.

Falſe KEEL. See the article *FALSE*.

KEEPER of the Forest, otherwise called *chief warden of the forest*, is an officer who has the principal government of all things belonging to a royal forest, and the check of all the other officers.

The lord chief justice in eyre of the forest, when he thinks fit to hold his justice seat, sends out his general summons to the *keeper* forty days before, to warn all under-officers to appear before him at a day assigned in the summons. See *JURISPRUDENCE of the Forest*.

KEEPER of the Great Seal, is a lord by his office, and is stiled *lord keeper of the great seal*. He is one of the king's privy council, through whose hands pass all charters, commissions, and grants of the king under the great seal, without which seal, all such instruments, by law, are of no force; for the king is, in the interpretation of the law, a corporation, and passes nothing firmly but under the said seal; which is, as the public faith of the kingdom, in the highest esteem and reputation.

The lord *keeper* has the same place, authority, pre-eminence, jurisdiction, execution of laws, and all other customs, commodities, and advantages as the lord chancellor of England has for the time being. — Both these officers cannot properly subsist at the same time, since the statute of 5 Eliz.

KEEPER of the Privy Seal, is a lord by his office; through whose hands pass all charters signed by the king, before they come to the great seal, and some things which do not pass the great seal at all. He is of the king's privy council, and was antiently called *clerk of the privy seal*, yet reckoned in the number of the great officers of the realm, 12 Ric. II. c. 11. 27 Hen. VIII. c. 11.

KEEPING of Books. See the article *BOOK-KEEPING*.

KEPLER'S Problem. See the article *PROBLEM*.

KERAMIANS, a sect among the Mussulmen, so called from Mohammed Ben Keram, its author.

The *Keramians* maintain, that whatever the *Alcoran* says of the arms, eyes, and ears of God, is to be understood literally; so that they admit the tagiaffum, that is, a kind of corporeity in God; which, however they explain very variously.

KERANA, a long sort of trumpet, somewhat in form of a speaking-trumpet; used by the Persians.

To the sound of this, they add a confused noise of hautboys, timbrels, drums, and other instruments, every evening at sunset, and two hours after midnight.

KERMES, a kind of little animal, found in great plenty on an ever-green of the oak kind, and of considerable use both in physic, and dying.

The *kermes*, called also *scarlet grain*, and by the Greeks *coc-*

KEY

cus baphica, by the Latins *vermiculus*, by the French sometimes *vermillon*, or *grain de gall*, or *vermeil*, is about the size of a juniper-berry, round, smooth, and glossy; of a beautiful red colour, and full of a mucilaginous juice, of the same dye; it is found adhering to the bark on the stem and branches of this peculiar sort of scarlet oak, called by botanists *illex aculeata cœci-glandifera*: growing in Spain, Languedoc, and other hot countries.

The *kermes* is of a vinous smell, a bitter, rough, agreeable taste; and its pulp, or juice, is pregnant with numerous minute ova.

The animal retains these ova under her belly, 'till they hatch into a very numerous off-spring.

Hence, when the *kermes* is dried, there comes out of it an infinite number of little insects, and flies, so small that they are scarce visible; inasmuch that the whole inward substance seems converted into them: To prevent this inconvenience, they usually steep the *kermes* in vinegar before it be dry.

They draw the juice, or pulp, from the *kermes*, by pounding it in a mortar, and then straining it through a sieve. Of this they make a syrup, by adding a sufficient quantity of sugar. — Sometimes, they dry the pulp separate from the hulk; which pulp thus dried, they call *pastel of kermes*.

The *kermes* grain is of great use in physic: it is cardiac, desiccative, and astringent; it fortifies the stomach, and prevents abortion; of this is made that celebrated confection, called *alkermes*.

It is, however, of greater use in dying scarlet; for which use, the manner of preparing it is as follows. — The *kermes* being taken when ripe, they spread it on linnen; and at first, while it abounds most in moisture, turn it twice or thrice a day, to prevent its heating; till such time as there appears a red powder among it; this they separate, by passing it through a sieve; and then again spread abroad the grain on the linnen, till they perceive the same redness of powder, when they repeat the sifting: thus they proceed, while they discover any red powder on the surface of the grain, which is still passed through the sieve, till it yield no more.

In the beginning, when the small red grains are found to move, as they will always do, they are sprinkled over with strong vinegar, and rubbed between the hands. — Were not this precaution taken, out of every grain would be formed little insects, which would be of no use in dying.

The grain being quite emptied of its pulp, or red powder, by the process above-mentioned, is washed in wine, and then exposed to the sun; after this, it is put up into small bags; and along with it, the proportion of red dust that it had afforded.

According to M. Marfigli's experiments made at Montpellier, the *kermes* has the effect of galls, when mixed with vitriol, and makes a good ink: Mixed with oil of tartar, or lime-water, its colour turns from a vermilion to a crimson colour. In a decoction of turnsole flowers, it retains its proper colour. — They have not been able to get any fixed essential salt from it, but a volatile salt it yields in abundance; which, in M. Marfigli's opinion, would have a better effect in medicine if taken in a liquid, than when inclosed in conserves, and confections, which hinder its action. See *Supplement: article KERMES*.

KERN, or **KERNE**, a term in the ancient Irish militia, signifying a *foot-soldier*.

Camden tells us, the armies of Ireland consisted of cavalry, called *galloglasses*; and infantry, lightly armed, called *kernes*. — The *kernes* bore swords, and darts; to the last were fitted cords, by which they could recover them, after they had been launched out.

KERNES, in our laws, signify idle persons, or vagabonds. See *VAGABOND*.

KETCH, a kind of vessel. See the article *BOMB-KETCH*.

KEY, a little iron instrument, for the opening of locks.

L. Molinus has a treatise of *keys*, *De Clavibus Veterum*, printed at Upsal: he derives the Latin name *clavis*, from the Greek *κλεις*, *claudio*, I shut; or from the adverb *clam*, privately; and adds, that the use of *keys* is yet unknown in some parts of Sweden.

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

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

There was also another *key*, called *βαλλαντινα*, made in the manner of a male screw, which had its corresponding female in a bolt affixed to the door.

KEY is, hence, become a general name for several things serving to shut up, or close others.

KEY, or **KEY-STONE**, of an *Arch*, or *Vault*, is the last stone placed atop thereof; which being wider and fuller at the top than bottom, wedges, as it were, and binds in all the rest.

The *key* is different in the different orders; in the Tuscan and Doric, it is a plain stone, only projecting; in the Ionic, it is cut, and waved somewhat after the manner of consoles; in the Corinthian and Composite, it is a console enriched with sculpture, foliages, &c.—See *Tab. Archit. fig. 36. lit. c. fig. 50. lit. f.*

The name **KEY-stones**, or *Arch-stones*, is sometimes also given to all the stones which form the sweep of an arch, or vault—answering to what the French more distinctly call *voussoirs*.

KEY, is also used for the ecclesiastical jurisdiction; particularly, for the power of excommunicating, and absolving.

The Romanists says, the pope has the power of the *keys*, and can open and shut paradise as he pleases; grounding their opinion on that expression of Jesus Christ, *I will give thee the keys of the kingdom of heaven.*

In S. Gregory we read, that it was the custom heretofore for the popes to send a golden *key* to princes, wherein they always inclosed a little of the filings of S. Peter's chains, kept with a world of devotion at Rome; and that these *keys* were wore in the bosom, as being supposed to contain some wonderful virtues.

KEY, in polygraphy, and steganography, denotes the alphabet of a cypher; which is a secret known only to the person who writes the letter, and him who decyphers it. See **ALPHABET**.

Some cyphers have a single *key*, where the same characters are used throughout; in other cyphers, the characters are varied, and the *key* is double.

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

To get an idea of the use of the *key*, it may be observed, that as in an oration there is a subject, *viz.* some principal person or thing to which the discourse is referred, and which is always to be kept in view, that nothing unnatural and foreign to the subject may be brought in; so in every regular piece of music there is one note, *viz.* the *key*, which regulates all the rest.—The piece begins and ends in this; and this is, as it were, the musical subject, to which a regard must be had in all the other notes of the piece.—Again, as in an oration there are several distinct articles, which refer to different subjects, yet so as they have all a visible connection with the principal subject, which regulates and influences the whole; so in music there may be various subaltern subjects, that is, various *keys*, to which the different parts of the piece may belong; but then they must be all under the influence of the first and principal *key*, and have a sensible connection with it.

To give a more distinct notion of the *key*, we must observe, that the octave contains in it the whole principles of music, both with respect to consonance or harmony, and succession, or melody; and if either scale be continued to a double octave, there will, in that case, be seven different orders of the degrees of an octave, proceeding from the seven different letters with which the terms of the scale are marked.—Any given sound therefore, *i. e.* a sound of any determinate pitch or tune, may be made the *key* of the piece, by applying to it the seven natural notes arising from the division of an octave, and repeating the octave above or below, at pleasure. The given note is applied as the principal note or *key*, of the piece, by making frequent closes, or cadences upon it; and in the progress of the melody, no other but those seven natural notes can be admitted, while the piece continues in that *key*, every other note being foreign to the fundamental, or *key*.

For instance, suppose a song begun in any note, and carried on upwards, or downwards, by degrees and harmonical distances, so as never to touch any notes, but what are referable to that first note as a fundamental, *i. e.* are the true notes of the natural scale proceeding from the fundamental; and let the melody be so conducted through those natural notes, as to close and terminate in the fundamental, or any of its octaves above or below; that note is called the *key* of the melody, because it governs all the rest, limiting them so far, as that they must be to it, in the relation to the seven essential notes of an octave; and when any other note is brought in, it is called, *going out of the key.*

From which way of speaking, *viz.* a song's continuing in, or going out of the *key*, it may be observed, that the whole octave, with its natural notes, come under the idea of a *key*; though the fundamental, or principal note is, in a peculiar sense, called the *key*.

In which last sense of the word *key*, (*viz.* where it is applied to one fundamental note) another note is said to be out of the *key*, when it has not the relation to that fundamental of any of the natural notes belonging to the continuous division of the octave.

Here too it must be added, with respect to the two different divisions of the octave, that a note may belong to the same *key*, *i. e.* it may have a just musical relation to the same fundamental in one kind of division, and be out of the *key*, with respect to another.

Now a piece of music may be carried through several *keys*; *i. e.* it may be given in one *key*, and be led out of that into another, by introducing some note foreign to the first, and so on to another: but a regular piece must not only return to the first *key*, but those other *keys*, too, must have a particular connection with the first.—It may be added, that those other *keys* must be some of the natural notes of the principal *key*, though not any of them at pleasure.

As to the distinctions of *keys*, we have already observed, that to constitute any given note or sound, a *key*, or fundamental note, it must have the seven essential or natural notes added to it; out of which, or their octaves, all the notes of the piece must be taken, while it keeps within the *key*, *i. e.* within the government of that fundamental.—It is evident, therefore, there are but two different species of *keys*, which arise according as we join the greater or less third, these being always accompanied with the sixth and seventh of the same species; the third *g*, for instance, with the fifth and seventh *g*; and the third *l*, with the sixth and seventh *l*.

This distinction is expressed under the names of *sharp key*, which is that with the third *g*, &c. and the *flat key*, which is that with the third *l*, &c. whence it is plain, that how many different closes forever there be in a piece, there can be but two *keys*, if we consider the essential difference of *keys*; every *key* being either flat, or sharp, and every sharp *key* being the same, as to melody, as well as every flat one.

It must be observed, however, that in common practice the *keys* are said to be different, when nothing is considered but the different tune, or pitch of the note, in which the different closes are made.—In this sense, the same piece is said to be in different *keys*, according as it is begun in different notes, or degrees of tune.

To prevent any confusion which might arise, from using the same word in different senses, M. Malcolin proposes the word *mode* to be substituted instead of the word *key*, in the former sense; that is, where it expresses the melodious constitution of the octave, as it consists of seven essential, or natural notes, besides the fundamental; and in regard there are two species of it, he proposes, that that with a third *g* be called the *greater mode*; and that with a third *l*, the *lesser mode*; appropriating the word *key* to those notes of the piece in which the cadence is made; all of which may be called *different keys*, in respect of their different degrees of tune.

To distinguish, then, accurately between a *mode* and a *key*, he gives us this definition, *viz.* an octave, with all its natural and essential degrees, is a *mode*, with respect to the constitution, or manner of dividing it; but, with respect to its place in the scale of music, *i. e.* the degree, or pitch of tune, it is a *key*; though that name is peculiarly applied to the fundamental.

Whence it follows, that the same *mode* may be with different *keys*; *i. e.* an octave of sounds may be raised in the same order, and kind of degrees, which makes the same *mode*; and yet be begun higher or lower; *i. e.* be taken at different degrees of tune, with respect to the whole, which makes different *keys*; and, *vice versa*, that the same *key* may be with different *modes*, *i. e.* the extremes of two octaves may be in the same degree of tune, yet the division of them be different.

KEYS also denote those little pieces in the forepart of an organ, spinette, or harpsicord; by means whereof the jacks are played, so as to strike the strings of the instrument, and wind is given to the pipes, by raising and sinking the sucker of the sound-board.

They are in number twenty-eight, or twenty-nine. In large organs, there are several sets of these *keys*; some to play the small second organ, some for the main organ, some for the trumpet, and some for the echoing-trumpet. In some there are but a part that play, the rest being for ornament. There are twenty flats in large *keys*, which make the half notes.

M. Bullioudi, of Douliez, pretends to have invented a new kind of *keys*, much preferable to the common ones. With these, he says, he can express sounds, which follow each other in a continual geometrical proportion; and so can furnish all the sounds in music, and by consequence all the imaginary intervals and concords; whereas the common *keys* do but yield some of them.

KEY, in a naval sense. See the article **KAY**.

KHAZINE, the grand signior's treasury. See **TREASURY**, and **EXCHEQUER**.

Here are kept registers of receipts, accounts of provinces, in drawers, marked with the years, and the places names: Here also is kept part of the emperor's wardrobe.

K I N

Every day of the divan this treasury is opened, either to take out, or put something in: And the principal officers who have the charge of it, are all to assist at this opening. The Tchaouch-Bachi, in their presence, first breaks the wax where-with the key-hole had been sealed up, and carrying it to the grand vizier, that minister first kisses it, and then draws out of his bosom the grand seignior's gold seal; in the mean time he looks narrowly after the officer, who, when he has done his business in the treasury, locks and seals up the place, and returns the seal to the vizier with the same ceremony as before.

Besides this, there are other apartments for the money, where the officers are never allowed to enter with any clothes that have pockets in them.

KIBES. See the article **CHILBLAIN**.

KIDNEY, Rein; a part of an animal, whose use is to separate the urine.

The kidneys are two, situate one on each side; one between the liver and musculus lumbaris, on the right side; the other between the spleen and the same muscle, on the left side. In man, the right is lower than the left, but in quadrupeds it is usually the contrary; they are fastened to the loins and the diaphragm by their exterior membrane, and to the bladder by the ureters; the right is also fastened to the intestine cœcum, and the left to the colon: their figure resembles a bean, or rather a crescent, being curve on the side of the vena cava, and on the outside gibbous.

There are ordinarily but two kidneys, though sometimes three have been found, and sometimes four, and sometimes on the other hand only one. In men they are commonly about five inches long and three broad, and one and a half thick: their substance is composed of glands, and very small urinary pipes, or canals; the glands form the circumference, and serve to separate the urine; the papillæ, or urinary tubes, form the inner part, they come out of the glands, and carry the urine into a cavity, in the concave part of the kidney, called the *pelvis*, whence it passes through the ureters into the bladder. See **PELVIS**.

The kidneys are covered with two membranes; they have each of them arteries and veins; the arteries come from the aorta, and the veins terminate in the cava; these are all called *emulgent*. They have nerves also, which take their origin from the plexus renalis, formed by the ramifications of the intercostal nerve, and the nerves of the loins.

The kidneys secrete the urine from the blood, which, by the motion of the heart, is driven through the arteries into the emulgent arteries, and these carry it into the little glands where its serosity being separated, is received in at the orifices of the urinary pipes, which go from the glands to the pelvis, and thence runs by the ureters into the bladder; the blood, which could not enter the glands, is brought back by the emulgent veins.—See *Tab. Anat. (Splanchn)* fig. 1. lit. II. fig. 4. lit. bb. cc.

KILDERKIN, a kind of liquid measure, which contains two firkins, or eighteen gallons beer measure, and sixteen ale measure.

Two *kilderkins* make a barrel, and four a hoghead.

KING*, a monarch, or potentate, who rules singly and sovereignly over a people. See **SOVEREIGN, PRINCE, &c.**

* Camden derives the word from the Saxon *Cynn*, which signifies the fame, and that from *Can*, power, or *Ken*, knowledge, wherewith every monarch is supposed to be invested. The Latin *rex*; the Scythian *reiks*; the Punic, *reicb*; the Spanish *rey*; and French *roy*; come all, according to Pottel, from the Hebrew **מֶלֶךְ** *reisch*, chief, head.

Kings, both among the ancient Greeks and Romans, were priests as well as princes. Virgil, speaking of Anius, king of Delos, says,

Rex Anius, rex idem hominum, Phœbique sacerdos.

As to the Romans, Livy and Dionysius are express; they say, that though Numa instituted a great number of orders of priesthood, yet some he discharged himself, and in person.—After the expulsion of the *kings*, they were obliged to create a *rex sacrorum*, a king of the sacrifices, for the administration of the priestly part of the royalty.

Lawyers say, the king of England is a mixed person, a priest as well as a prince: At his coronation he is anointed with oil, as the priests and kings of Israel were, to intimate, that his person is sacred.

Among the Greeks, the king of Persia had antiently the appellation of the *great king*; the king of France now has that of the *most christian king*, and the king of Spain has that of *catholic king*. See **CATHOLIC**.

The king of the Romans is a prince chosen by the emperor, as a coadjutor in the government of the empire.

The kings of England, by the Lateran council, under pope Julius II. had the title of *christianissimus* conferred on them; and that of *defender of the faith*, was added by pope Leo X. though it had been used by them some time before.

V O L. I.

K I N

The title of *grace* was first given to our *kings* about the time of Henry IV. and that of *highness* and *majesty* first to Henry VIII.

In all public instruments and letters, the king styles himself *nos*, we, though till the time of king John, he spoke in the singular number.

The Hungarians formerly gave the name *king* to their queen Mary, to avoid the infamy which the laws of that country cast upon those who are governed by women: Accordingly, she bore the title of *king* Mary, till her marriage with Sigismund, at which time she laid aside her kingship, and took up the quality of queen.

The laws make it high treason barely to imagin or intend the death of the *king*; and, because the destruction of the *king* may ensue that of his great counsellors or officers, it is felony in any of the *king's* servants to conspire even that; though in other capital cases, it is a rule, that *voluntas non reputabitur pro facto*; and an Englishman shall not, in any other case be put to death, unless the deed follow the intent. The *king's* office, (as he promises at his coronation) is to preserve the rights and privileges of the church, the prerogative of the crown, the laws and customs of the realm, &c. or as Fortescue has it, he is *pugnare bella populi sui & eos rectissime judicare*. He acknowledges no precedence in any other prince but the emperor.

He has the supreme right of patronage, called *patronage paramount*, over all the ecclesiastical benefices in England.

He has power, by his prerogative, without any act of parliament to make war or peace, conclude leagues and treaties, give commissions for impressing soldiers, dispose of magazines, castles, ships, public monies, &c. He convokes, adjourns, prorogues, and dissolves parliaments, and may refuse his assent to any bill passed by both houses, without giving his reasons for it.

He may encrease the number of members of either house at pleasure, by creating new peers, and bestowing privileges on other towns for sending burgesses to parliament. He has also power to enfranchise an alien, and make him a denizen.

Debts due to him are always to be satisfied in the first place, in case of executorship, &c. and till his debt is discharged, he may protect the creditor from the arrests of others. He may distrain for the whole debt on a tenant that holds but part of the land, is not obliged to demand his rent as others are, may sue in what court he pleases, and distrain where he lists. In all doubtful cases, *semper presumitur pro rege*: no statute restrains him, unless he be particularly named. In all cases where the *king* is plaintiff, his officers may enter with an arrest; and if entrance be denied, break open a house, and seize the party; though in other cases a man's house is his castle, and has a privilege to protect him against all arrests.

He has custody of the persons and estates of idiots and lunatics: he is *ultimus hæres regni*, and to him revert all estates, when no heir appears. All treasure trove (*i. e.* money, plate, or bullion found, and the owners not known) belongs to him; so all waifs, strays, wrecks, lands recovered from the seas, gold and silver mines, royal fishes, &c. belong to him. He can unite, separate, enlarge or contract the limits of bishopricks, or ecclesiastical benefices, and by his letters erect new bishopricks, colleges, &c. See **REGALIA**.

He can dispense with the rigor of the ecclesiastical laws, except those which have been confirmed by an act of parliament, or declared by the hill of rights; as, for a bastard to be a priest, for a bishop to hold a benefice in commendam, &c. He has also power to dispense with several acts of parliament and penal statutes, by a non-obstante, where himself is alone concerned; to moderate the rigour of the law, according to equity; to pardon a man condemned by law, except in appeals of murder; and to interpret by his judges, in statutes, and cases not defined by law.

The laws esteem him God's vicegerent on earth, and ascribe various perfections to him, not belonging to any other man. No flaw or weakness is found in him: no injustice or error; no negligence, infamy, stain, or corruption of blood. By his crown he is, *ipso facto*, cleared of all attainder: no non-age, or minority are allowed in him, and his very grants of lands, though held in his natural capacity, cannot be avoided by non-age. Nay more, the law ascribes a kind of perpetuity, or immortality, to him; *Rex Angliæ non moritur*. His death is termed his *demise*, because the crown is thereby demised to another.

He is said not to be liable to death, as being a corporation of himself, that lives for ever. There is no interregnum, but the minute one *king* dies, his heir is *king*, fully and absolutely, without any coronation, ceremony, &c.—To these it may be added, that the law attributes a kind of ubiquity to the *king*; he is in a manner every where, in all his courts, and therefore cannot be non-suited.

Some things, however, there are which the *king* cannot do, *viz.* he cannot do wrong, nor can he divest himself, or successors of any part of his regal prerogative, authority, &c.

—There are several things also which he cannot do *salvo jure, salvo juramento, & salva conscientia sua*: In particular, there are two things which he cannot do without the consent of parliament, *viz.* make new laws, or raise new taxes.

Champion of the KING.	} See the article	}	CHAMPION.
Charters of the KING.			CHARTER.
Committee of the KING.			COMMITTEE.
Peace of the KING.			PEACE.
Quarantain of the KING.			QUARANTAIN.
Tenant of the KING.			TENANT.
Widow of the KING.			WIDOW.

KING of the sacrifices, Rex sacrificulus, or sacrorum, was a title of an ancient priest, or minister of Religion at Rome; who was superior to the flamen dialis, but inferior to the pontifex maximus.

He was created at the comitia centuriata, or assembly of the centuries, and was at first chosen out of the number of the patricians. He could not, during his office, hold any magistracy, nor harangue the people. He presided at all the sacrifices, proclaimed the feasts, &c.

His wife bore the title of *queen of the sacrifices, regina sacrorum,* and had herself a part in the sacred ceremonies.

KING at arms, or of arms, is an officer of great antiquity, and antiently he was of great authority, his business is to direct the heralds, preside at their chapters, and have the jurisdiction of armory.

In England we have three kings of arms, *viz.* *garter, clarencieux,* and *Norroy.*

Garter, principal KING at arms, See the article GARTER.

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

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

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

These two last are also called *provincial heralds,* in regard they divide the kingdom between them into two provinces.

These, by charter, have power to visit noblemens families, to set down their pedigrees, distinguish their arms, appoint persons their arms, and, with *garter,* to direct the other heralds.

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

To these may be added, *Lyon KING at arms,* for Scotland, who is the second *king at arms* for Great Britain; he is invested and crowned with great solemnity. To him belong the publishing the king's proclamations, marshalling funerals, reversing arms, &c.

KINGDOM, among chymists, is a term which they apply to each of the three orders, or classes of natural bodies; *animal, vegetable,* and *mineral.*

KING'S Bench, bancus regius, a court, or judgment-seat, so called, in regard the king is supposed to sit in person as judge of the court, and may do so whenever he pleases; for which reason all writs, and other process in this court, are made returnable coram nobis, that is, before the king himself, and not coram judicariis nostris, as is the form in the common pleas.

The judges of this court are the lord chief justice, and three other petty justices.

In this court are principally determined matters relating to the crown, and the peace.—When any person is aggrieved by an order of justices, or quarter-sessions, they have recourse hither; the rights of elections of mayors, bailiffs, constables, &c. are often upon mandamus's, brought before this court to be settled, and prohibitions are hence issued out to stay proceedings in the ecclesiastical, admiralty, or any inferior court, where the matters appear to be triable at common law. The subject has also a right to sue in this court for any debt or contract, as well as in any other court, and may as advantageously and expeditiously proceed.

The *chief justice* is constituted by writ, and he is to hold, *quandiu se bene gesserit,* and so cannot be displaced without some great misdemeanour; though formerly the chief justice, and other inferior judges, were made only durante beneplacito, and accordingly were turned out at the king's pleasure. The salary of the lord chief justice used to be but 1500l. per ann. but it is now 500l. per term.—He presides under his majesty in this court; but when the court divides, in giving judgment upon any special argument, he hath but one voice; so that if the opinion of the court should be equally divided, the

matter must rest till one of the judges shall see just reason to alter his opinion.—He is to attend the lords in parliament, though he has no vote, unless he be a peer himself, but is to give his opinion and advice to the house by virtue of a writ of assistance; and is frequently therefore consulted by them, both in making and repealing laws, and in altering or explaining them.—He makes a return of all writs of error in parliament directed to this court, and with his own hand delivers the writ of error, and a transcript of the proceedings in the cause into the house of lords.

The three petty, or *inferior judges* of this court go the circuits, and are in commission of oyer and terminer at the Old-Baily. Their salary is 375l. per term, to which they, as well as the chief justice, are entitled, though they happen not to fit one day in court in the term, unless they give their assent so slightly, as, on a *scire facias,* to be charged with negligence: these also hold by *quandiu se bene gesserit.*

There are several *officers* belonging to this court, as two chief clerks, or prothonotaries, who are supposed to enter all the pleadings and judgments between party and party; although this is in reality done by an entering-clerk under them; and all writs of latitat, non omittas, bills of Middlesex, habeas corpus, &c. are subscribed with the names of these chief clerks.

The *secondary acts* as master of the office on the pleas side, and is the chief clerk's deputy; his business is to examine any person, who is to be sworn an entering-clerk, or attorney at large, whether he be duly qualified, and to present him to the chief justice.—He also signs all judgments, and gives costs upon them; and the court, upon any motion, in relation to the irregular practice of any clerk or attorney, generally refers the examination thereof to him.—He also takes all affidavits in court (unless on the crown-side) and the acknowledgment of all deeds in court.

KING'S Evil. } See the article { EVIL.
KING'S Exchange. } EXCHANGE.
KING'S Household. See HOUSEHOLD, GREENCLOTH, CONFERRER, &c.

KING'S Privy Council. See the article COUNCIL.

KING'S Silver, the money due to the king in the court of common pleas, pro licentia concordandi, in respect of a licence there granted to any man for levying a fine of lands, or tenements to another person.

KING'S Thames. } See the article { THANE.

KING'S War. } WAR.

KING'S Wardrobe. See the article WARDROBE.

KINTAL, or QUINTAL, a weight of one hundred pounds, more or less, according to the different usage of divers nations. The *kintal* of Smyrna is 123 pounds, 3 ounces, 9 drams; or 120 pounds, 7 ounces, 12 drams; but that of Aleppo is 465 pounds, 11 ounces, 15 drams.

KIPPER-TIME, a space of time between the festival of the finding of the Holy Cross, May the third, and Twelfth-day; during which, salmon-fishing in the river Thames, from Gravesend to Henley, is forbidden by *Rot. Parl.* 50 Edw. III.

KIRK-MOTE, a synod. See the article SYNOD.

Sometimes the word is also taken for a meeting in the church, or vestry. See MOTE.

KIRK-SESSIONS, the name of a petty ecclesiastical judicatory in Scotland. Each parish, according to its extent, is divided into several particular districts, every one of which has its own elder and deacon to oversee it. A consistory of the ministers, elders, and deacons of a parish, form a *kirk-sessions.*

These meet once a week, the minister being their moderator, but without a negative voice. It regulates matters relating to public worship, elections, catechizing, visitations, &c. It judges in matters of less scandal; but greater, as adultery, are left to the presbytery, and in all cases an appeal lies from it to the presbytery.

KIZILBASCH, or KEZELBASCH, a Turkish term, signifying *red-head:* applied by way of obloquy to the Persians, ever since Ishmael Sophi, founder of the family last reigning in Persia, who ordered his soldiers to wear a red cap, round which is a scarf or turban with a dozen plaits in it, in memory of the twelve imams, successors of Ali, from whom he pretended to descend.

Vignere writes the word, *kezelbasch,* and adds, that according to the vulgar interpretation among the Persians, the twelve plaits signify the twelve sacraments of their law. Vignere, not contented with this, looks out for another original, and tells us there is a mystery in it, derived from the antient Paganism, when the Persians adored fire, whose heat is denoted by the red colour, which in some measure symbolizes with the sun, held by them in the highest veneration. He adds, that the twelve plaits shew the twelve months of the year, and the twelve signs in which that luminary performs his course.

KNAVE*, an old appellation for a man-servant, and so used in 14 E. III. stat. 1. cap. 3.

* The word is formed from the Saxon *cnapa,* or Flemish *knape,* which signify the same.

KNAVE, also signifies a male-child or boy; in which sense, *knave.*

knave-child has been frequently used, in contradistinction to a *girl*; and in this sense Wickliff uses the word in his translation of Exod. i. 16. and other places of the Bible. In the old Saxon translation of Mat. viii. 6. *Puer meus jacet in domo paralyticus*, was turned, *Myn knapa*.

KNAVE has sometimes also been used as an addition; as, *Williamus Cowper de Denbigh, knave, &c.*

It is a common opinion that Rom. i. 1. was translated, *Paul a knave of Jesus Christ*. This mistake was occasioned by a Bible in the duke of Lauderdale's library, where the word *knave* is inserted in less characters than the others, and a rature might be easily discerned.

KNEELING. See the article **GENUFLEXION**.

KNEES.—*Carling KNEES*. See **CARLING**.

KNIGHT*, properly signifies a person, who for his virtue and martial prowess, is, by the king, raised above the rank of gentlemen, into an higher class of dignity and honour.

* The word *knicht*, in its original German, *knecbt*, signifies a *servant*; and has since been used for a soldier, or man of war.—We have but one instance among us where *knicht* is used in the first sense, and that is in *knicht of the pits*, who properly *sew* in parliament for such a county.—In the Latin, French, Spanish, Italian, and Dutch languages, *knicht* is expressed by a word which properly signifies a *husbandman*, as being usually employed on horseback. Indeed our common law calls them *milites*, soldiers, because they usually held lands in *knicht-service*, to serve the king as soldiers in his wars; in which sense the word *miles* was used *prævalent*.

Knighthood was the first degree of honour in the ancient armies, and was usually conferred with a great deal of ceremony on those who had distinguished themselves by some notable exploit in arms. They were originally said to be adopted, which we now call *dubbed*; as being supposed, in some measure, the sons of him who knighted them.

The ceremonies at the creation of a *knicht* have been various. The principal were a box on the ear, and a stroke with a sword on the shoulder. Then they put on him a shouder-belt, and gilt sword, spurs, and the other military accoutrements; after which, being armed as a *knicht*, he was led in great pomp to the church.

The manner of making a *knicht* with us, is described by Camden in a few words: *Qui equestrem dignitatem suscipit, flexis genibus leviter in humero percutitur, princeps his verbis affatur, sus vel sis Chevalier au non de Dieu, surge vel sis eques in nomine Dei*. This is meant of *knights-bachelors*, which is the lowest, though the most ancient order of knighthood among us.

Knights grew so very numerous, that the dignity became of much less repute. Charles V. is said to have made five hundred in a single day: on which account, therefore, new orders of knighthood were instituted, in order to distinguish the more deserving from the crowd.—For the several kinds of *knights* among us, see **BACHELOR**, **BANNERET**, **BARONET**, **BATH**, **GARTER**, &c.

KNIGHT, is also understood of a person admitted into any order, either purely military, or military and religious, instituted by some king or prince, with certain marks and tokens of honour and distinction.

Such are the *knights of the garter*, of the *elephant*, of the *holy Ghost*, of *Malta*, &c. All which see under their proper names, **GARTER**, **ELEPHANT**, &c.

KNIGHT, Eques, among the Romans, was the second degree of the nobility; following immediately that of the senators.

At the time of building the city of Rome, the whole army of Romulus consisted of 3000 foot and 300 horse; which 300 horse were the original of the Roman *equites*, or *knights*. They made the second order that had places in the senate.

Manutius and Sigonius are of opinion that besides the equestrian order, and those *knights* immediately below the senators, Romulus instituted a military order, whereof the Roman cavalry was composed. But no ancient author takes notice of any order of knighthood instituted on purpose for the war, nor any other *knights* but those 300, which, as we have observed, were the first foundation of the equestrian order.

The *knights* had a horse kept them at the public charge; but when they were taken in among the senators, they resigned that privilege: To be a *knicht*, it was necessary they should have a certain revenue, that their poverty might not disgrace the order; and when they failed of the prescribed revenue, they were expunged out of the list of *knights*, and thrust down among the plebeians. Ten thousand crowns is computed to have been the revenue required.

The *knights* grew so very powerful, that they became a balance between the power of the senate and the people. They neglected the exercises of war, and betook themselves principally to civil employments in Rome; insomuch that Pliny observes, in his time, they had no longer a horse kept at the public expence.

Some say, that the order of *knights*, as distinct from the people, did not begin before the time of the Gracchi; others say the privilege was then first granted them, that no judge

should be chosen, but out of their order: some time after which, they took them into the senate. This, however, is certain, it was only from that time that a certain revenue was necessary, and that this invited them to the knighthood, without being descended from ancient *knights*.

KNIGHTHOOD, a military order, or honour; or a mark, or degree of ancient nobility, or reward of personal virtue, and merit.

There are four kinds of *knighthood*; *military*, *regular*, *honorary*, and *social*.

Military KNIGHTHOOD, is that of the ancient *knights*, who acquired it by high feats of arms.

These are called *milites*, in ancient charters, and titles, by which they were distinguished from bare *bachelors*, &c.

These *knights* were girt with a sword and a pair of gilt spurs, whence they were called *equites aurati*.

Knighthood is not hereditary, but acquired. It does not come into the world with a man, like nobility; nor can it be revoked. The sons of kings and kings themselves, with all other sovereigns, heretofore had *knighthood* conferred on them as a mark of honour. They were usually knighted at their baptism or marriage, at their coronation, before or after a battle, &c.

Regular KNIGHTHOOD, is applied to all military orders, which profess to wear some particular habit, to bear arms against the infidels, to succour and assist pilgrims in their passage to the holy land, and to serve in hospitals where they should be received; such were the *knights templars*, and such still are the *knights of Malta*, &c.

Honorary KNIGHTHOOD, is that which princes confer on other princes, and even on their own great ministers, and favourites; such are *knights of the garter*, *S. Michael*, &c.

Social KNIGHTHOOD, is that which is not fixed, nor confirmed by any formal institution, nor regulated by any lasting statutes; of which kind there have many orders been erected on occasion of factions, of tilts and tournaments, masquerades, and the like.

The abbot Bernardo Justiniani, at the beginning of his history of *knighthood*, gives us a compleat catalogue of the several orders: according to this computation they are in number 92. Favin has given us two volumes of them under the title of *Theatre d'Honneur & de Chevalerie*. Menenius has published *Deliciae Equestrium Ordinum*, and Andr. Mendo has written de *ordinibus Militaribus*. Beloi has traced their original, and Geliot, in his *Armorial Index*, has given us their institutions. To these may be added *Father Menestrier, de la Chevalerie Ancienne & Moderne*; *Michiell's Tresor Militaire*, *Caramuel's Theologia Regularis*, *Mirus's Origines Equestrium sive Militarum Ordinum*: But above all, Justinian's *Historie Chronologique dell' Origine de gl' Ordine Militari, e di tutte le Religione Cavaleresche*: The edition which is fullest, is that of Venice in 1692, in 2 vols. fol.

KNIGHTS of S. Catherine of Mount Sina. See **CATHERINE**.

KNIGHTS of the Chapel. } See the article } **CHAPEL**.

KNIGHTS of the Collar. } See the article } **COLLAR**.

KNIGHTS-ERRANT, a pretended order of chivalry, whereof ample mention is made in the old romances.

They were a kind of heroes, who travelled the world in search of adventures, redressing wrongs, rescuing damsels, and taking all occasions of signaling their prowess.

This romantic bravery of the old *knights* was heretofore the chimæra of the Spaniards; among whom there was no cavalier but had his mistress, whose esteem he was to gain by some heroic action. The duke of Alva, for all his age and gravity, is said to have vowed the conquest of Portugal to a young lady.

KNIGHTS of S. George. } See the article } **GEORGE**.

KNIGHTS of Honour. } See the article } **HONOUR**.

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

KNIGHTS of the Mine. See the article **MINE**.

KNIGHTS of Mary. } See the article } **MARY**.

KNIGHTS of Mount Carmel. } See the article } **CARMEL**.

Rad KNIGHTS. } See the article } **RAD**.

KNIGHTS of the round Table. } See the article } **TABLE**.

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

These, when every man who had a *knights-fee* was customarily constrained to be a *knicht*, were of necessity to be *milites gladio civitatis*, for so the writ runs to this day; but now custom admits *esquires* to be chosen to this office.

They must have at least 500 l. per ann. and their expences properly are to be defrayed by the county, though this is seldom, now, required.

KNIGHTS, in a ship, two thick, short pieces of timber usually

ally carved in the figure of some head, having in each four flivers, three for the halliards, and one for the top-ropes to run in.

One of them stands abaft the main-mast, and for that reason is called the *main-knight*.—The other stands abaft the fore-mast, on the second deck, and is called the *fore-knight*.

KNIGHTS-FEE, an ancient law term, signifying so much land of inheritance as was esteemed sufficient to maintain a knight with suitable retinue; which, in Henry the Third's days, was reckoned at 15 *l.* per ann. And by a stat. 1 Edward II. such as had 20 *l.* per ann. in fee, or for life, might be compelled to be knights.—But this statute is repealed 17 Car. I. Sir T. Smith rates a *knights-fee* at 40 *l.* yearly.—According to Coke, a *knights-fee* contained twelve carucates, or plow-lands.—Stow says, that there were found in England, at the time of the conqueror, 60211 *knights-fees*; according to others, there were 60,215: whereof the religious houses, before their suppression, were possessed of 28,015. See **FEE**.

KNIGHTS-SERVICE, *Servitium Militare*, a tenure whereby several lands in this nation were anciently held of the king; which drew after it homage, service in war, escuage, wardship, marriage, &c. But taken away by the statute 12 Car. II. c. 24.

KNIT Stockings. See the article **STOCKINGS**.

KNOCKING Mill. See the article **STAMPING**.

KNOT, properly denotes a part of a tree from whence it shoots out branches, roots, or even fruit.

The wood is harder and closer in the *knots* than in any other part, but it is also more subject to split there. Vines and dwarf fruit-trees are pruned at the second *knot* of the new shoot.

The use of the *knots* of plants is to strengthen the stem: They serve also as sieves to filtrate, purify, and refine the juice raised up for the nourishment of the plant.

KNOTS of the log-line, at sea, are the divisions of it. See **LOG**.

These are usually seven fathoms or forty-two feet asunder, but they should be fifty feet; and then, as many *knots* as the log-line runs out in half a minute, so many miles doth the ship sail in an hour, supposing her to keep going at an equal rate, and allowing for yaws, lee-way, &c.

KNOT, in medicine, a protuberance in the joints of old gouty people: consisting of a thick, viscid, crude, indigested pituita, accompanied with a bilious humour, hot and acrimonious; the grossest and most terrestrial part whereof clogs and converts into a stony substance like chalk.

Knots appear to be generated like stones in the bladder. Physicians sometimes also call them *nodes*, and *tophi*. See **TOPHUS**, and **NODE**.

KNOT is also used for the intrigue of a romance, or dramatic piece; being that part where the persons are the most embarrassed, by a conjuncture of affairs whose end it is not easy to foresee.

Aristotle, under this term, includes all the incidents of a tragedy, from its beginning to the place where it begins to unravel. The *knot* holds as long as the mind is kept suspended about the event. The *knot* ought always to last to the middle of the fifth act, otherwise the rest of the piece languishes.

Order of the KNOT, is the name of a military order in the kingdom of Naples, instituted in 1352, by queen Jane I. on occasion of the peace established between her and the king of Hungary, by means of her marriage with Louis, Prince of Tarentum.

The order consisted of sixty knights: Clement VI. approved this order, and gave it the rule of S. Basil: It chose S. Nicholas for its protector, but it dwindled away after the death of its founders.

KNOWING, *Principles, and Rules of*. See **PRINCIPLE**, and **RULE**.

KNOWLEDGE, according to Mr. Locke, consists in the perception of the connection and agreement, or disagreement and repugnancy, of our ideas. See **IDEA**. In which sense, *knowledge* stands opposed to *ignorance*. See **IGNORANCE**.

To *know* that white is not black, is only to perceive that these two ideas do not agree. So, in *knowing* that the three angles of a triangle are equal to two right ones; what do we more than perceive, that equality to two right ones necessarily agrees to, and is inseparable from, the three angles of a triangle?

Kinds of KNOWLEDGE.—For what relates to the agreement or disagreement of ideas, we may reduce the whole doctrine, and consequently the whole flock of our *knowledge*, to four heads; *viz.* identity or diversity, relation, co-existence, and real existence.

As to the identity, or diversity of our ideas, we may observe, that it is the first act of the mind to perceive its own ideas; and so far as it perceives them, to *know* each what it is, and thereby to perceive their difference; that is, the one not to

be the other: by this the mind clearly perceives each idea to agree with itself, and to be what it is; and all distinct ideas to disagree.—This it does without any pains, or deduction, by its natural power of perception, and distinction; and for doing this, men of art have established certain general rules, or principles; as, that what is, is; and that it is impossible for the same thing to be, and not to be.—But no maxim can make a man *know* clearer, that round is not square, than the bare perception of the two ideas, which the mind, at first sight, perceives to disagree.

The next kind of agreement, or disagreement, the mind perceives, in any of its ideas, may be called *relative*, and is nothing but the perception of the relation between any two ideas, of what kind soever; that is, their agreement, or disagreement, one with another, in the several ways, or respects, the mind takes of comparing them.

The third sort of agreement, or disagreement to be found in our ideas, is co-existence, or non co-existence, in the same subject; and this belongs particularly to substances.—Thus, when we pronounce concerning gold that it is fixed, it amounts to no more but this, that fixedness, or a power to remain in the fire unconfumed, is an idea which always accompanies that particular sort of yellowness, weight, fusibility, &c. which make our complex idea signified by the word *gold*.

The fourth sort, is that of actual and real existence, agreeing to any idea.

Within these four sorts of agreement, or disagreement, seems contained all the *knowledge* we have, indeed all we are capable of; for all that we *know*, or can affirm concerning any idea, is, that it is, or is not the same with some other; as, that blue is not yellow: that it does or does not co-exist with another in the same subject; as, that iron is susceptible of magnetical impressions: that it hath that or this relation to some other ideas; as, that two triangles upon equal bases, between the same parallels, are equal: or, that it has a real existence without the mind; as, that God is.

The mind becomes possessed of truth, in several manners, which constitute to many different species of *knowledge*.—Thus, when the mind has a present view of the agreement, or disagreement of any of its ideas, or of the relation they have one with another, it is called *actual knowledge*.

Secondly, a man is said to *know* any proposition, when having once evidently perceived the agreement, or disagreement, of the ideas whereof it consists, and so lodged it in his memory, that whenever it comes to be reflected on again, the mind assents to it without doubt, or hesitation, and is certain of the truth of it: this may be called *habitual knowledge*.—And thus a man may be said to *know* all those truths which are lodged in his memory, by a foregoing, clear, and full perception.

Of *habitual knowledge*, there are two sorts; the one consists of such truths, laid up in the memory, as whenever they occur to the mind, it actually perceives the relation that is between their ideas; and this is in all those truths where the ideas themselves, by an immediate view, discover their agreement, or disagreement, one with another.—The other is of such truths, whereof the mind having been convinced, it retains the memory of the conviction, without the proofs.—Thus a man that remembers certainly, that he once perceived the demonstration, that the three angles of a triangle are equal to two right ones, *knows* it to be true, when that demonstration is gone out of his mind, and cannot possibly be recollected: but he *knows* it in a different way from what he did before; namely, not by the intervention of those intermediate ideas; whereby the agreement, or disagreement, of those in the proposition, was at first perceived; but by remembering, that is, *knowing* that he was once certain of the truth of this proposition. That the three angles of a triangle are equal to two right ones.—The immutability of the same relations between the same immutable things, is now the idea, that shews him, that if the three angles of a triangle were once equal to two right ones, they will always be so.—And hence he comes to be certain, that what was once true, is always true; what ideas once agreed, will always agree; and consequently, what he once *knew* to be true, he will always *know* to be true, as long as he can remember that he once *knew* it.

Degrees of KNOWLEDGE.—As to the different degrees, or clearness of our *knowledge*, it seems to lie in the different way which the mind has of perceiving the agreement, or disagreement, of any of its ideas.—When the mind perceives this agreement, or disagreement, of two ideas immediately by themselves, without the intervention of any other, we may call it *intuitive knowledge*; in which case the mind perceives the truth, as the eye doth light, only by being directed towards it.—Thus the mind perceives, that white is not black; that three are more than two, and equal to one and two.—This part of *knowledge* is irrefutable; and, like the bright sun-shine, forces itself immediately to be perceived, as soon as ever the mind turns its view that way.—It is on this intuition that depends all the certainty, and evidence of our

our other *knowledge*; which certainty, every one finds to be so great, that he cannot imagine, and therefore cannot require a greater.

The next degree of *knowledge* is, where the mind perceives not this agreement or disagreement immediately, or by the juxtaposition, as it were of the ideas; because those ideas, concerning whose agreement or disagreement, the enquiry is made, cannot by the mind be put together, as to shew it. — In this case, the mind is obliged to discover the agreement, or disagreement, which it searches for, by the intervention of other ideas: and this is that which we call *reasoning*.

Thus, if we would *know* the agreement, or disagreement, in bigness, between the three angles of a triangle, and two right angles, we cannot do it by an immediate view, and comparison of them, because the three angles of a triangle cannot be brought together at once, and compared with any other one or two angles; and so of this the mind has no immediate, or intuitive *knowledge*. — But we must find out some other angles, to which the three angles of a triangle have equality; and finding those equal to two right ones, we come to *know* the equality of these three angles to two right ones.

Those intervening ideas, which serve to shew the agreement of any two others, are called *proofs*; and where the agreement, or disagreement is by this means plainly and clearly perceived, it is called *demonstration*: and a quickness in the mind to find those proofs, and to apply them right, is that which is called *facility*.

This *knowledge*, though it be certain, is not so clear and evident as intuitive *knowledge*; it requires pains and attention, and steady application of mind, to discover the agreement, or disagreement, of the ideas it considers; and there must be a progression by steps, and degrees, before the mind can, in this way, arrive at any certainty. — Before demonstration, there was a doubt, which, in intuitive *knowledge*, cannot happen to the mind that has its faculty of perception left in a degree capable of distinct ideas, no more than it can be a doubt to the eye, (that can distinctly see white, and black) whether this ink, and paper, be all of a colour. — Now, in every step that reason makes in demonstrative *knowledge*, there is an intuitive *knowledge* of that agreement, or disagreement it seeks with the next intermediate idea, which it uses as a proof; for if it were not so, that yet would need a proof, since without the perception of such agreement, or disagreement, there is no *knowledge* produced.

By which it is evident that every step in reasoning, that produces *knowledge*, has intuitive certainty; which, when the mind perceives, there is no more required, but to remember it, to make the agreement, or disagreement of the ideas concerning which we enquire, visible and certain. — This intuitive perception of the agreement, or disagreement, of the intermediate ideas in each step, and progression of the demonstration, must also be exactly carried in the mind; and a man must be sure that no part is left out, which, because in long deductions, the memory cannot easily retain; this *knowledge* becomes more imperfect than intuitive, and men often embrace falsehoods for demonstrations.

It has been generally taken for granted, that mathematics alone are capable of demonstrative certainty: but to have such an agreement or disagreement, as may be intuitively perceived, being, as we imagine, not the privilege of the ideas of number, extension, and figure alone; it may, possibly, be the want of due method and application in us, and not of sufficient evidence in things, that demonstration has been thought to have so little to do in other parts of *knowledge*. For in whatever ideas the mind can perceive the agreement or disagreement immediately, there it is capable of intuitive *knowledge*; and where it can perceive the agreement or disagreement of any two ideas, by the intuitive perception of the agreement or disagreement they have with any intermediate ideas, there the mind is capable of demonstration, which is not limited to the ideas of figure, number, extension, or their modes.

The reason why it has been generally supposed to belong to these only, is because, in comparing their equality or excess, the modes of numbers have every, the least difference, very clear and perceivable: And in extension, though every the least excess is not so perceptible, yet the mind has found out ways to discover the just equality of two angles, extensions, or figures; and both numbers and figures can be set down by visible and lasting marks. — But in other simple ideas, whose modes and differences are made, and counted by degrees, and not quantities, we have not so nice and accurate a distinction of their differences, as to perceive or find ways to measure their just equality, or their least differences. For, those other simple ideas being appearances, or sensations produced in us, by the size, figure, motion, &c. of minute corpuscles, singly insensible; their different degrees also depend on the variation of some, or all of those causes; which since

it cannot be observed by us in particles of matter, whereof each is too subtle to be perceived, it is impossible for us to have any exact measures of the different degrees of these simple ideas.

Thus, not knowing what number of particles, nor what motion of them is fit to produce any precise degree of whiteness, because we have no certain standard to measure them by, nor means to distinguish every, the least difference; the only help we have, is from our senses, which in this point fail us. But where the difference is so great as to produce in the mind ideas clearly distinct, these ideas, as we see in colours of different kinds, blue and red for instance, are as capable of demonstration, as ideas of number and extension. — And what is here said of colours, holds true in all secondary qualities.

These two then, *intuition* and *demonstration*, are the degrees of our *knowledge*; and whatever comes short of one of these, is only *faith*, or *opinion*, not *knowledge*; at least in all general truths.

There is indeed another perception of the mind, employed about the particular existence of finite beings without us, which going beyond probability, but not reaching to either of the foregoing degrees of certainty, passes under the name of *knowledge*.

Nothing can be more certain, than that the idea we receive from an external object, is in our minds: This is intuitive *knowledge*; but whether we can thence certainly infer the existence of any thing without us, corresponding to that idea, is that whereof some men think there may be a question made; because men may have such an idea in their minds, when no such thing exists, nor any such object affects their senses.

But it is evident, that we are invincibly conscious to ourselves of a different perception, when we look on the sun in the day, and when we think on it by night; when we actually taste wormwood, or smell rose, or only think on that favour, or odour: so that we may add to the two former sorts of *knowledge*, this also of the existence of particular external objects, by that perception and consciousness we have of the actual entrance of ideas from them, and allow these three degrees of *knowledge*, viz. *intuitive*, *demonstrative*, and *sensitive*.

But since our *knowledge* is founded on, and employed about our ideas only, will it follow thence, that it must be conformable to our ideas, and that where our ideas are clear and distinct, obscure and confused, there our *knowledge* will be so too? — We answer, no; for our *knowledge* consisting in the perception of the agreement or disagreement of any two ideas, its clearness, or obscurity, consists in the clearness, or obscurity of that perception, and not in the clearness, or obscurity of the ideas themselves. — A man, (for instance) who has a clear idea of the angles of a triangle, and of equality to two right ones, may yet have but an obscure perception of their agreement, and so have but a very obscure *knowledge* of it: but obscure, and confused ideas, can never produce any clear or distinct *knowledge*; because, as far as any ideas are obscure, or confused, so far the mind can never perceive clearly, whether they agree, or disagree: or, to express the same thing in other words, he that has not determined ideas to the words he uses, cannot make propositions of them, of whose truth he can be certain.

From all this it follows; 1^o. That we can have no *knowledge* farther than we have ideas.

2^o. That we have no *knowledge* farther than we can have perception of the agreement, or disagreement of our ideas, either by intuition, demonstration, or sensation.

3^o. We cannot have an intuitive *knowledge*, that shall extend itself to all our ideas, and all that we would *know* about them; because we cannot examine, and perceive all the relations they have one to another by juxtaposition, or an immediate comparison one with another. — Thus we cannot intuitively perceive the equality of two extensions, the difference of whose figures makes their parts incapable of an exact immediate application.

4^o. Our rational *knowledge* cannot reach to the whole extent of our ideas, because between two different ideas which we would examine, we cannot always find such proofs where-by we can connect one to another, with an intuitive *knowledge* in all the parts of the deduction.

5^o. Sensitive *knowledge*, reaching no farther than the existence of things, actually present to our senses, is yet much narrower than either of the former.

6^o. From all which it is evident, that the extent of our *knowledge* comes not only short of the reality of things, but even of the extent of our own ideas. — We have the ideas of a square, a circle, and equality, and yet perhaps shall never be able to find a circle equal to a square. See CIRCLE.

Extent, and Limits of KNOWLEDGE. — The affirmations, or negations we make concerning the ideas we have, being reduced to the four sorts abovementioned, viz. identity, co-existence, relation, and real existence, let us enquire how far our *knowledge* extends in each of these: 1^o. As to identity, and di-

verity,

verfity, or intuitive *knowledge* is as far extended, as our ideas themselves; and there can be no idea in the mind, which it does not presently, by an intuitive *knowledge*, perceive to be what it is, and to be different from any other.

2°. As to the agreement, or disagreement of our ideas of co-existence, our *knowledge* herein is very defective, though it is in this that the greatest and most material parts of our *knowledge*, concerning substances, consists: for our ideas of substances being nothing but certain collections of simple ideas, co-existing in one subject, (our idea, of flame, for instance, is a body hot, luminous, and moving upwards.) When we would know any thing farther, concerning this or any other sort of substance, what do we but enquire what other qualities, or powers, these substances have, or have not? which is nothing else but to *know* what other simple ideas do, or do not exist with those that make up such complex idea.—The reason of this is, that the simple ideas which make up our complex ideas of substances, have no visible necessary connection, or inconsistency, with other simple ideas, whose co-existence with them we would inform ourselves about.—These ideas being likewise, for the most part, secondary qualities, which depend upon the primary qualities of their minute or insensible parts, or on something yet more remote than these from our comprehension; it is impossible we should *know* which have a necessary union, or inconsistency, one with another, since we *know* not the root from whence they spring, or the size, figure, and texture of parts on which they depend, and from which they result.—Besides this, there is no discoverable connection between any secondary quality, and those primary qualities that it depends on.—We are so far from *knowing* what figure, size, or motion produces, (for instance) a yellow colour, or sweet taste, or sharp sound; that we can by no means conceive how any size, figure, or motion, can possibly produce in us the idea of any colour, taste, or sound, whatsoever; there being no conceivable connection between the one and other.

Our *knowledge*, therefore, of co-existence, reaches little further than experience. Some few, indeed, of the primary qualities have a necessary dependance, and visible connection, one with another: as figure necessarily supposes extension; receiving or communicating motion by impulse, supposes solidity: but qualities co-existent in any subject, without this dependance and connection, cannot certainly be *known* to co-exist, any farther than experience by our senses informs us.—Thus though, upon trial, we find gold yellow, weighty, malleable, fusible, and fixed; yet because none of these have any evident dependance, or necessary connection with the other, we cannot certainly *know*, that where any four of these are, the fifth will be there also, how highly probable soever it may be. But the highest degree of probability amounts not to certainty, without which there can be no true *knowledge*: for this co-existence can be no farther *known*, than it is perceived; and it cannot be perceived but either in particular subjects, by the observation of our senses, or, in general, by the necessary connection of the ideas themselves.

As to incompatibility, or repugnancy to co-existence, we *know* that no subject can have of each sort of primary qualities, more than one particular at once, as one extension, or one figure; and so of sensible ideas peculiar to each sense: for whatever, of each kind, is present in any subject, excludes all other of that sort; for instance, one subject cannot have two smells, or two colours at the same time.

As to powers of substances, which makes a great part of our enquiries about them, our *knowledge* reaches a little farther than experience; because they consist in a texture and motion of parts, which we cannot by any means come to discover, and, I doubt whether, with those faculties we have, we shall ever be able to carry our general *knowledge* much farther in this part. Experience is that which in this part we must depend on, and it were to be wished that it were more improved.—We find the advantages some mens generous pains have this way brought to the stock of natural *knowledge*; and if others, especially the philosophers by fire, had been so wary in their observations, and sincere in their reports, as those who call themselves *philosophers* ought to have been, our acquaintance with the bodies here about us, and our insight into their powers and operations, might have been yet much greater.

As to the third sort, the agreement, or disagreement of our ideas in any other relation; this is the largest field of *knowledge*, and it is hard to determine how far it may extend: this part depending on our sagacity, in finding intermediate ideas, that may shew the habitudes and relations of ideas, it is an hard matter to tell when we are at an end of such discoveries.—They who are ignorant of algebra, cannot imagine the wonders of this kind that are to be done by it: and what farther improvements, and helps, advantageous to other parts of *knowledge*, the sagacious mind of man may yet find out, is not easy to determine.

This, at least, we may believe, that the ideas of quantity are

not the only ones capable of demonstration, and *knowledge*; and that other, and perhaps more useful parts of contemplation would afford us certainty, if vices, passions, and domineering interest did not oppose, or menace endeavours of this kind.

As to the fourth sort of *knowledge*, viz. of the real actual existence of things, we have an intuitive *knowledge* of our own existence, a demonstrative *knowledge* of the existence of God, and a sensitive *knowledge* of the objects that present themselves to our senses.

Hitherto we have examined the extent of our *knowledge*, in respect of the several sorts of beings that are: there is another extent of it, in respect of universality, which will also deserve to be considered; and this in regard our *knowledge* follows the nature of our ideas.—If the ideas, whose agreement, or disagreement we perceive, are abstract, our *knowledge* is universal; for what is *known* of such general ideas, will be true of every particular thing in which that essence, that is, that abstract idea is found: and what is once *known* of such ideas, will be perpetually, and for ever true; so that, as to all general *knowledge*, we must search, and find it only in our own minds; and it is only the examining our own ideas, that furnishes us with it.—Truths belonging to essences of things, (that is, to abstract ideas) are eternal, and are to be found out by the contemplation only of those essences; as the existence of things is to be *known* only from experience.

Reality of Knowledge.—It is evident, that the mind *knows* not things immediately, but by the intervention of the ideas it has of them.—Our *knowledge*, therefore, is real only so far, as there is a conformity between our ideas, and the reality of things. But how shall we *know* when our ideas agree with things themselves? it is answered, There are two sorts of ideas, that we may be assured agree with things; these are,

1°. Simple ideas, which, since the mind can by no means make to itself, must be the effect of things operating upon the mind in a natural way, and producing therein those perceptions, which, by the will of our maker, they are ordained, and adapted to.—Hence it follows that simple ideas are not fictions of our fancies, but the natural and regular productions of things without us, really operating upon us; which carry with them all the conformity our state requires, which is to represent things under those appearances they are fittest to produce in us.—Thus the idea of whiteness, as it is in the mind, exactly answers that power which is in any body to produce it there; and this conformity between our simple ideas, and the existence of things is sufficient for real *knowledge*.

2°. All our complex ideas, except only those of substances, being archetypes of the mind's own making, and not referred to the existence of things, as to their originals, cannot want any conformity necessary to real *knowledge*; for that which is not designed to represent any thing but itself, can never be capable of a wrong representation.—Here the ideas themselves are considered as archetypes, and things are no otherwise regarded, than as conformable to them.—Thus the mathematician considers the truth, and properties belonging to a rectangle, or circle, only as they are ideas in his own mind, which possibly he never found existing mathematically, that is, precisely true; yet his *knowledge* is not only certain, but real, because real things are no farther concerned, nor intended to be meant by any such propositions, than as things really agree to those archetypes in the mind.

3°. But the complex ideas, which we refer to archetypes without us, may differ from them, and so our *knowledge* about them may come short of being real; and such are our ideas of substances.—These must be taken from something, that does, or has existed, and not be made up of ideas arbitrarily put together, without any real pattern.—Herein, therefore, is founded the reality of our *knowledge* concerning substances, that all our complex ideas of them must be such, and such only, as are made up of such simple ones, as have been discovered to co-exist in nature: and our ideas being thus true, though not perhaps very exact copies, are the subject of real *knowledge* of them.—Whatever ideas we have, the agreement we find they have with others, will be *knowledge*.—If those ideas be abstract, it will be general *knowledge*; but to make it real, concerning substances, the ideas must be taken from the real existence of things.—Wherever, therefore, we perceive the agreement, or disagreement of our ideas, there is certain *knowledge*; and wherever we are sure those ideas agree with the reality of things, there is certain real *knowledge*.

Method of improving or enlarging Knowledge.—It being the received opinion amongst men of letters, that maxims are the foundation of all *knowledge*, and that sciences are each of them built upon certain præcognita, from whence the understanding is to take its rise, and by which it is to conduct itself in its inquiries in the matters belonging to that science; the beaten road of the schools has been to lay down, in the beginning, one or more general propositions, called *principles*, as foundations whereon to build the *knowledge* that was to be had of that subject.

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That which gave occasion to this way of proceeding, was the good success it seemed to have in mathematics; which, of all other sciences, have the greatest certainty, clearness, and evidence in them. But if we consider it, we shall find that the great advancement, and certainty, of real *knowledge* men arrived to in these sciences, was not owing to the influence of those principles; but to the clear, distinct, and compleat ideas their thoughts were employed about; and to the relation of equality and excess, so clear between some of them, that they had an intuitive *knowledge*, and by that a way to discover it in others, and this without the help of those maxims. For is it not possible for a lad to *know*, that his whole body is bigger than his little finger, but by virtue of this axiom, 'The whole is bigger than a part;' nor be assured of it, till he has learned that maxim? Let any one consider which is *known* first and clearest by most people, the particular instance, or the general rule; and which it is that gives life and birth to the others: these general rules are but the comparing our more general, and abstract ideas, which ideas are made by the mind, and have names given them, for the easier dispatch in its reasonings: but *knowledge* began in the mind, and was founded on particulars, though afterwards perhaps no notice be taken thereof; it being natural for the mind to lay up those general notions, and make the proper use of them, which is to disburthen the memory of the cumbersome load of particulars. — The way to improve in *knowledge*, is not to swallow principles with an implicit faith, and without examination, which would be apt to mislead men, instead of guiding them into truth; but to get, and fix in our minds, clear and compleat ideas, as far as they are to be had, and to annex to them a proper and constant names: and thus barely by considering our ideas, and comparing them together, observing their agreement, or disagreement, their habits, and relations, we shall get more true and clear *knowledge*, by the conduct of this one rule: than by taking up principles, and thereby putting our minds into the disposal of others.

We must therefore, if we will proceed as reason advises us, adapt our methods of inquiry to the nature of the ideas we examine, and the truth we search after.—General and certain truths are only founded in the habitudes and relations of abstract ideas; therefore a sagacious methodical application of our thoughts for the finding out these relations, is the only way to discover all, that can with truth and certainty be put into general propositions. By what steps we are to proceed in these, is to be learned in the schools of the mathematicians, who from very plain and easy beginnings, by gentle degrees, and a continued chain of reasonings, proceed to the discovery, and demonstration of truths, that at first sight appeared beyond human capacity.—This may reasonably be said, that if other ideas that are real, as well as nominal essences of their species, were pursued in the way familiar to mathematicians, they would carry our thoughts farther, and with greater evidence, and clearness, than possibly we are apt to imagine.—This is reason sufficient to advance that conjecture above-mentioned, viz. 'That morality is capable of demonstration, as well as mathematics; for moral ideas being real essences, which have a discoverable connection, and agreement one with another, so far as we can find their habitudes and relations, so far we shall be possessed of real and general truths.'

In our *knowledge* of substances, we are to proceed after a quite different method; the bare contemplation of their abstract ideas, (which are but nominal essences) will carry us but a very little way in the search of truth and certainty.—Here experience must teach us what reason cannot; and it is by trying alone, that we can certainly *know* what other qualities co-exist with those of our complex idea; for instance, whether that yellow, heavy, fusible body, I call *gold*, be malleable or no; which experience (however it prove in that particular body we examine) makes us not certain that it is so in all, or any other yellow, heavy, fusible bodies, but that which we have tried; because it is no consequence, one way or other, from our complex idea. The necessity, or inconsistency of malleability, has no visible connection with the combination of that colour, weight, and fusibility in any body.—What is here said of the nominal essence of gold, supposed to consist of a body of such a determinate colour, weight, and fusibility, will hold true, if other qualities be added to it.—Our reasonings from those ideas will carry us but a little way, in the certain discovery of the other properties in those masses of matter wherein all those are to be found. As far as our experience reaches, we may have certain *knowledge*, and no farther.—It is not denied, that a man, accustomed to rational and regular experiments, shall be able to see farther into the nature of bodies, and their unknown properties, than one that is a stranger to them: but this is but judgment, and opinion, not *knowledge*, and certainty.

This would make it suspected, that natural philosophy is not capable of being made a science. From experiments, and historical observations, we may draw advantages of ease, and health, and thereby increase our stock of conveniences for this life; but beyond this, it is to be feared, our talents reach

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not, nor are our faculties able to advance farther. See *PHYSICS*.

From whence it is obvious to conclude, that since our faculties are not permitted to penetrate the real essences of bodies, but yet plainly to discover to us the being of a God; and the *knowledge* of ourselves, enough to give us a clear discovery of our duty, and great concernment, it will become us, as rational creatures, to employ our faculties about what they are most adapted to, and follow the direction of nature, where it seems to point us out the way. For it is rational to conclude, that our proper employment lies in those enquiries, and that sort of *knowledge* which is most suited to our natural capacities, and carries in it our greatest interest; and therefore it is that morality is the proper science, and business of mankind in general, (who are both concerned, and fitted to search out their summum bonum) as several arts conversant about the several parts of nature, are the lot, and private talent of particular men, for the common use of human life, and their own particular subsistence in this world.

The ways to enlarge our *knowledge* as far as we are capable, seem to be these two: The first is, to get and settle in our minds, as far as we can, clear, distinct, and constant ideas of those things we would consider, and *know*; for it being evident that our *knowledge* cannot exceed our ideas, where they are either imperfect, confused, or obscure, we cannot expect to have certain, perfect, or clear *knowledge*.—The other art is, of finding out the intermediate ideas, which may throw us the agreement or repugnancy of other ideas, which cannot be immediately compared.

That these two (and not relying on maxims, and drawing consequences from some general propositions) are the right method of improving our *knowledge* in the ideas of other modes, besides those of quantity, the consideration of mathematical *knowledge* will easily inform us; where, first, we shall find, that he who has not clear and perfect ideas of those angles, or figures, of which he desires to *know* any thing, is utterly thereby incapable of any *knowledge* about them.—Suppose a man not to have an exact idea of a right angle, scalenum, or trapezium, and it is clear that he will in vain seek any demonstration about them.

And farther it is evident, that it was not the influence of maxims, or principles, that led the masters of this science into those wonderful discoveries they have made: let a man of good parts *know* all the maxims of mathematics never so well, and contemplate their extent, and consequences, as much as he pleases, he will, by their assistance, scarce ever come to *know*, that the square of the hypotenuse, in a right-angled triangle, is equal to the squares of the two other sides. This, and other mathematical truths have been discovered by the thoughts otherwise applied. The mind had other objects, other views before it, far different from those maxims, which men well enough acquainted with those received axioms, but ignorant of their method who first made those demonstrations, can never sufficiently admire.

Our *knowledge*, as in other things, so in this also, has so great a conformity with our sight, that it is neither wholly necessary, nor wholly voluntary. Men, who have senses, cannot chuse but receive some ideas by them; and if they have memory, they cannot but retain some of them; and if they have any distinguishing faculty, cannot but perceive the agreement or disagreement of some of them one with another. As he that has eyes, if he will open them by day, cannot but see some objects, and perceive a difference in them; yet he may chuse whether he will turn his eyes towards an object, curiously survey it, and observe accurately all that is visible in it. But what he doth see, he cannot see otherwise than he doth; it depends not on his will to see that black, which appears yellow. Just thus it is with our understanding: All that is voluntary in our *knowledge*, is the employing or withholding any of our faculties from this or that sort of objects, and a more or less accurate survey of them; but they being employed, our will hath no power to determine the *knowledge* of the mind one way or other; that is done only by the objects themselves, as far as they are clearly discovered. Thus, he that has got the ideas of numbers, and has taken the pains to compare one, two, and three, to six, cannot chuse but know they are equal. He also that hath the idea of an intelligent, but weak and frail being, made by, and depending on another, who is eternal, omnipotent, and perfectly wise, and good, will as certainly know that man is to honour, fear, and obey God, as that the sun shines when he sees it. But yet, be these truths never so certain, never so clear, he may be ignorant of either, or both of them, who will not take the pains to employ his faculties as he should, to inform himself about them.

KOPPA. See the article *Numeral CHARACTERS*.

KûL, or Kool, a Turkish term, properly signifying a *slave*, or *servant*.

Meninsky tells us, the name is given to all the soldiers in the Ottoman empire, particularly to those of the grand seignior's guard, and the infantry.—The captains of the infantry, and those who command the guards, are called *kûl zabytlers*, and the soldiers of the guard *kûpû killers*, i. e. *slaves of the Court*.—Others inform us, that all who hold any places depending

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on the crown, or receive wages from it, in a word, all who are in any measure the grand seignior's servants, take the title of *kül*, or *kool*, i. e. *slave*, as more creditable than that of subject; even the grand vizier and the bashaws value themselves upon it. A *kül*, or slave, of the grand seignior, has authority to abuse any who are only his servants; but a subject who should affront a *kül*, or slave, would be severely punished. The *küls* are entirely devoted to the will of the grand seignior, and look on it as a kind of martyrdom that merits heaven when they die either by his order, or in the execution of his commands.

KURTCHI, an order of soldiery among the Persians.

The word, in its original, signifies *army*, and is applied to a body of cavalry consisting of the nobility of the kingdom of Persia, and the posterity of those conquerors, who placed Ismael sopheri on the throne. They are in number about 18000 men.

Their commander is called *kurtchi bashi*, which was formerly the first post in the kingdom; equivalent to a constable of France.

KYPHONISM*, **KYPHONISMUS**, or **CYPHONISMUS**, an ancient punishment, which was frequently undergone by the martyrs in the primitive times; wherein the body of the person

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to suffer was anointed with honey, and so exposed to the sun, that the flies and wasps might be tempted to torment him. This was performed in three manners; sometimes they only tied the patient to a stake; sometimes they hoisted him up into the air, and suspended him in a basket; and sometimes they stretched him out on the ground, with his hands tied behind him.

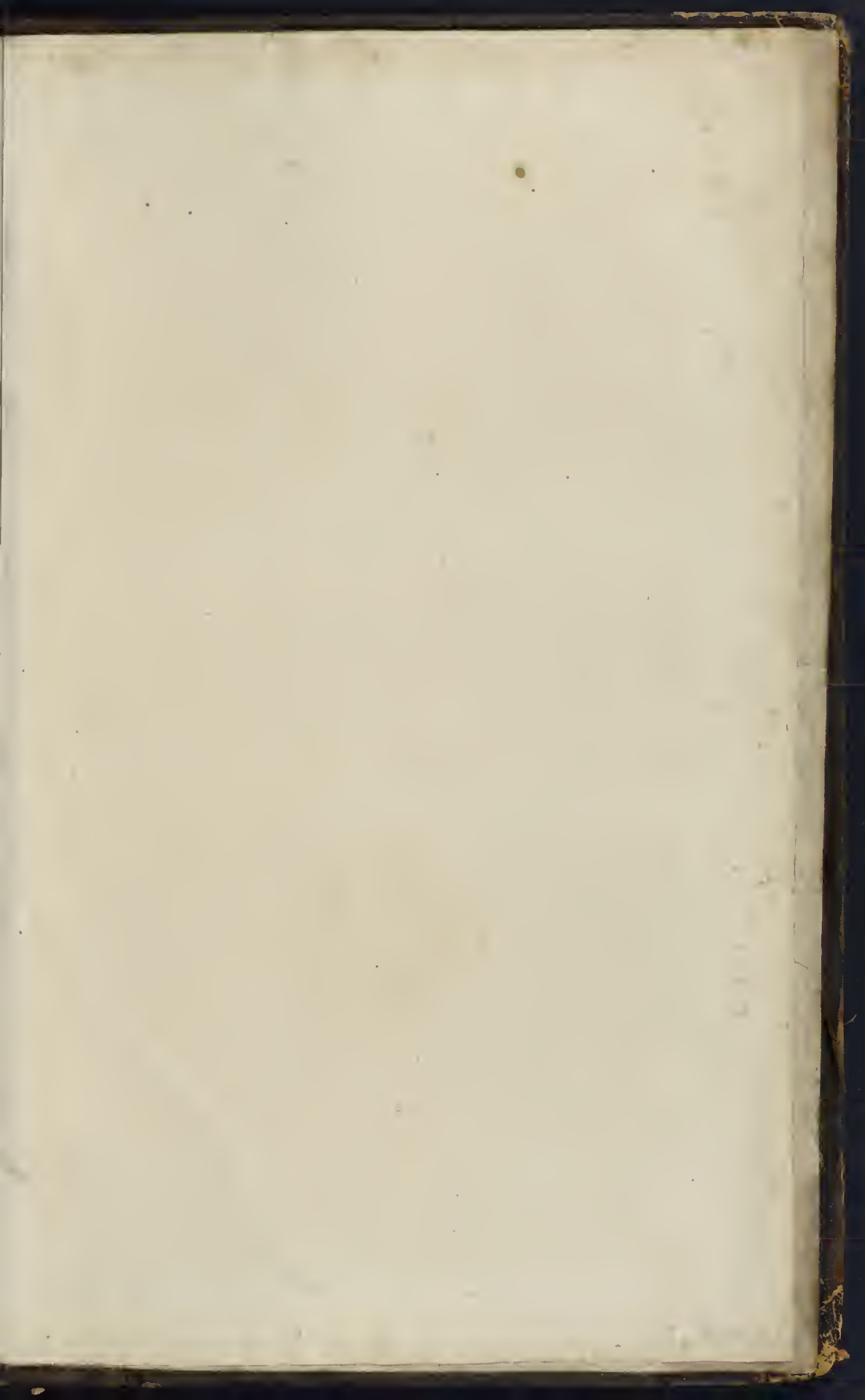
* The word is originally Greek, and comes from *κρυψω*, which signifies either the *stake* to which the patient was tied, the *collar* fitted to his neck, or an *instrument* wherewith they tormented him: The scholiast on Aristophanes says, it was a wooden lock, or cage, and that it was so called from *κρυψω*, to crook, or bend, because it kept the tortured in a crooked, bowing posture: Others take the *κρυψω* for a log of wood laid over the criminal's head, to prevent his standing upright: Hesychius describes the *κρυψω*, as a piece of wood whercon criminals were stretched and tormented. In effect, it is probable, the word might signify all these several things. It was a general name, whereof these were the species.

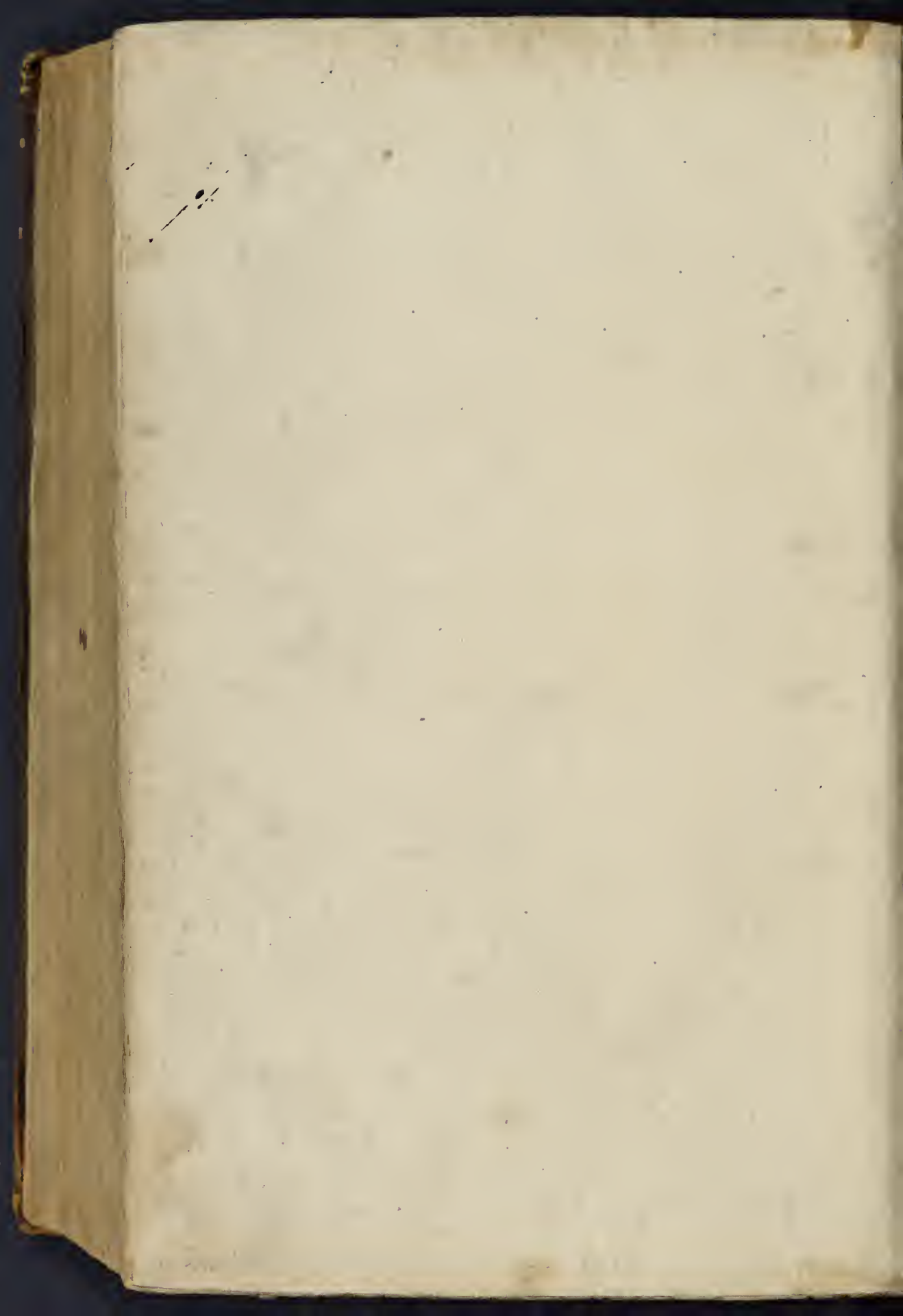
Suidas gives us the fragment of an old law, which punished those who treated the laws with contempt, with *kypnonism* for the space of twenty days, after which they were to be precipitated from a rock, dressed in womens habit.

KYSTIS, **ΚΥΣΤΙΣ**, in medicine. See the article **CYSTIS**.

The End of the FIRST VOLUME







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OLDHAM.

